European Studies of Population

# Childbearing Trends and Prospects in Low-Fertility Countries

## A Cohort Analysis

Tomas Frejka and Jean-Paul Sardon

European Association for Population Studies

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Childbearing Trends and Prospects in Low-Fertility Countries

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# Childbearing Trends and Prospects in Low-Fertility Countries

*A Cohort Analysis*

*by*

TOMAS FREJKA

and

JEAN-PAUL SARDON

With the assistance of
Alain Confession

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# Dedication

This book is dedicated to the memory of our dear friend and colleague Gérard Calot (1934-2001), Honorary President of the European Association for Population Studies, Director of the Institut National d'Études Démographiques (1972-1992), Founder and Director of the Observatoire Démographique Européen (1995-2001). Without his determination and relentless effort for a quarter of a century to assemble and organize the data this project would not have been possible.

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# Demographic Revolutions or Transitions? A Foreword

On the shelves in my study I keep a book that stands out through the dullness of its cover. The spine is cracked; the author's name, the title and the selling price of 350 Fr. printed on it are barely legible. The quality of the book's paper is terrible. All pages are discolored at their edges; the writing areas almost fill them. But I like the text and I keep a slip of paper on page 391. Now that I open it there again I see to my dismay that at one time I must have been stupid enough to mark the most crucial passage in the margin with my pen. The paragraph I marked argues that just as the great political changes that occurred in France in 1789 are customarily characterized as a revolution, so one should speak of a demographic revolution ["... *il faut parler ... d'une révolution démographique*"]. For in demography as in other fields, so the author argues, a change in regime signifies a revolution, even if such a change does not occur suddenly. Thus, when we characterize the substitution of unlimited procreation by limited procreation as a '*révolution démographique'* we do nothing more than adhere to that clear definition ["... *sans y rien ajouter*"].

That book, so many will now guess, is Adolphe Landry's *Traité de Démographie*, published by Payot (Paris) in 1945. The frontispiece identifies the (principal) author for the readers as the *Président de l'Union Internationale pour l'Étude Scientifique des Problèmes de la Population*, at that time obviously the most prestigious qualification the publisher could think of. And indeed, Landry was an internationally respected scholar with stimulating papers to his credit. In spite of this reputation and high position, the term 'revolution' which he first suggested at the very least a dozen years earlier (Landry 1933), failed to win international favor. In their publications from around the end of the Second World War, the Princeton group headed by Notestein, Kirk and Davis replaced it by 'transition'. Understandable, perhaps, given their focus on what might, or should happen elsewhere in the world, and most notably in Third World countries. However, it has gradually dawned upon me that this terminological substitution may have been a serious mistake. This simply for the reason that as

far as the outcome of a regime change is concerned the term demographic revolution is more neutral than the term demographic transition. The term demographic revolution implies nothing more than the replacement of one demographic regime by another. Implied in the use of the term demographic transition, however, was the idea that over time, a long-term equilibrium seeking demographic regime would be replaced by the next. More specifically, a regime characterized by quasi stability resulting from the combination of a high level of mortality with a high level of fertility to match that, would be replaced by a new balance in the components of natural growth at low levels of both mortality and fertility. Elsewhere I have typified Notestein's excellent rendering of the transition process as 'a good story' precisely because of that inherent element of common sense and logic (Van de Kaa 1996). Everyone easily understood that mortality decline, if not followed by a decline in fertility, would lead to runaway population growth. The capacity to reproduce had to be brought into line with the new, more limited needs.

The general acceptance of the transition concept has had far-reaching consequences. It was a starting point for the formulation of policies, the idea being that the transition to low fertility could be greatly speeded by public education 'in a climate of social economic development' and the provision of contraception (see Notestein 1964). It is also easily recognizable in the discussions about the desirability of reaching 'zero population growth', while for a great many years it determined the input and outcome of the population projections of the United Nations. As John Bongaarts (2001, p. 260) neatly puts it, if "fertility in contemporary post-transitional societies had indeed leveled off at or near replacement level, there would have been limited interest in the subject because this would have been expected."

In their illuminating book Tomas Frejka and Jean-Paul Sardon document very carefully how inappropriate the transition concept has turned out to be. They provide solid evidence that the very low levels of fertility observed in the post-transitional countries at the end of the 20$^{th}$ century are likely to persist for the foreseeable future. That evidence is based on a detailed cohort analysis of fertility trends in well over 30 populations and thus covers the whole range of developed country experience. The two authors 'humbly' present their work as complementary to that done by others on the subject. In my view that is far too modest! But it is of course true that cohort and cross sectional analyses have different strengths and weaknesses, and in that more limited sense their point is well taken. The European countries and the developed countries overseas together represent a harlequin's mantle of languages, cultural heritage and endowment. In a cohort approach this will find much stronger expression than in

a cross sectional analysis that is likely to highlight temporal changes. It is not surprising, for example, that Frejka and Sardon conclude that in cohort behavior a great deal of dynamism and diversity between individual countries and regions remains characteristic. By the same token it is understandable that they do not express themselves explicitly on the important question whether the numerous changes in demographic behavior found represent a new change in demographic regime. Is there a second demographic revolution after Landry's first? Lesthaeghe and I (1986) have given the name 'second demographic transition' to that very complex set of shifts in demographic behavior so clearly in evidence in the European region from the mid-1960s onward. In hindsight it would probably have been better if we had gone back to Adolphe Landry's term and had chosen the combination with 'revolution' instead. For the outcome of the new constellation can, again, not be predicted with any certainty. But, judging from Frejka and Sardon's book, it would be a real surprise if it were to result in a long-term quasi equilibrium of sorts. The weight of the two components of natural growth seems too thoroughly out of balance for that.

Frejka and Sardon seek to interpret their findings in theoretical or explanatory frameworks that emphasize the, in many ways fundamental, changes in the circumstances young men and women of the post-war birth cohorts face when making decisions about partnerships and reproduction. And indeed, the adolescents and young adults of today can no longer follow a standard chronological pattern of behavior. They are largely free to determine their own sequence of life course events. Individual family formation 'careers' depend to a large extent on the choices made regarding parallel 'careers' in education, gainful employment, mobility, housing, and long-term financial security. Consequently, they are faced with competing priorities, while aspirations in each separate career are high. A partner has to provide emotional support, has to be socially competent, while there should be a good meeting of minds. But, the partner should also be a good lover and should, ideally, be able to earn a good income. For both partners the long-term implications of becoming a parent are daunting and the (opportunity) costs of a choice for children are high. Thus, the two authors are, no doubt, correct in their view that the contemporary changes in family formation and fertility can only be understood in a framework that is cognizant of social change, of the many changes in the culture and structure of our postindustrial societies.

In all fairness I should now confess that my admiration for Landry stems in part from the way in which he discusses the role of '*les pratiques anticonceptionnelles'* in the first demographic revolution. In his book he resorts to a rhetorical device in trying to define that clearly. The question he poses is,

freely: "Would marital fertility also have declined so strongly and generally, if abstinence [*la continence*] had been the only contraception available?" The obvious answer is that the decline would have been very different from that observed and would no doubt only have been small ["*... cette fécondité n'eût sans doute baissé que peu*"]. In going over the rich collection of graphs and tables presented by Frejka and Sardon on the development of cumulative fertility by age, parity, parity progression ratios, proportion of childbearing after age 27, total cohort fertility, and so on, I found it difficult not to pose Landry's rhetorical question again and again? Could all the shifts possibly have happened in the absence of modern contraception? Were not the pill, the IUD, frequently combined with sterilization and abortion, the catalytic force, at the very least the enabling force? Did not the second contraceptive revolution (Leridon *et al.*, 1987) generate the second demographic '*révolution*'? Was it not the fundamental change in the means of birth control that transformed a fertility regime grounded in the practice of 'preventive contraception' into one based on the principle of 'self-fulfilling conception', as I have exaggerated the contrast between them (Van de Kaa 1987, p. 11)?

Tomas Frejka and Jean-Paul Sardon could base their wonderful book on an equally wonderful and detailed data set largely built up by Gérard Calot, arguably the most assertive and original of the European colleagues I ever had the pleasure of working with. Calot was fully aware of the fact that Europe's colorful quilt of regions and countries offered unique possibilities for comparative analysis. He took an unrivalled interest in the vital statistics produced by national statistical offices. He assembled them, made sure they were adjusted to make them fully compatible, and where necessary devised new methods for their analysis. Judging from his parsimonious use of references all that work left him little time for reading. But if one came to visit him he had all the time in the world. Gloriously enclosed by the masonry of a battery of RadioShack computers he would print you whatever graph or table took your fancy. Tomas Frejka and Jean-Paul Sardon have dedicated this volume to Calot's memory. I'm very happy to be able to compliment them on this well-conceived book that will prove to be a true landmark in the history of demographic research on industrialized societies. I'm equally glad to be able to join them in their tribute to Gérard Calot, an unforgettable friend and colleague.

The Hague, July 2002

Dirk J. van de Kaa
Honorary President, European Association for Population Studies

# Preface

This research project was initiated in 1999. During that year Gérard Calot and Tomas Frejka exchanged many electronic messages and subsequently had the opportunity to discuss the plans for the project in detail at the European Population Conference in The Hague in September. The first paper "The cohort fertility story: industrialized countries in the second half of the 20th and in the early 21st century" was presented at the Annual Meeting of the Population Association of America in Los Angeles in March 2000. When an abbreviated version of that paper was being prepared for submission to the *Population and Development Review*, in June 2000 our dear colleague Gérard was diagnosed with cancer. Despite his illness, he continued to collaborate in the designing and writing of a number of subsequent papers and of this book. Altogether eleven papers or presentations at conferences emanated from the project.[1] In one way or another they are all utilized in this book. Jean-Paul Sardon, based on his experience with analyzing cohort fertility (Sardon 1990), was collaborating in the project from the beginning, and got increasingly involved during Gérard's illness. Up until his demise on 15 March 2001, Gérard was involved in preparing data, solving methodological issues, writing and reviewing manuscripts. It is the honor of the surviving collaborators to dedicate this book to Gérard's memory.

The authors are greatly indebted to the numerous institutions and colleagues who have collaborated in the major undertaking of accumulating the data over more than two decades. During this period so many individuals and organizations have been involved that it would be impossible to list them all. The Observatoire Démographique Européen especially values the fruitful cooperation with Eurostat, the Council of Europe and national statistical offices, which has facilitated the accumulation of the voluminous body of data. The

[1] Papers and conference presentations were: Frejka and Calot, 2000, 2001a-d; Frejka, Kingkade, Calot and Sardon, 2001; Frejka, Kingkade, Katus, Calot and Sardon, 2001; Frejka and Kingkade, 2003; Frejka and Sardon, 2002, 2003a-b.

authors also wish to express their gratitude to the non-European colleagues for providing data. A number of colleagues were most helpful in providing critical comments either on papers of the project or on parts of the manuscript for this book. Foremost among them were Francesco Billari, David Coleman, Paul Demeny, Richard Gisser, Joshua Goldstein, Hans-Peter Kohler, Henri Leridon, Ian Pool, Robert Schoen and anonymous reviewers. Kalev Katus and Ward Kingkade were directly involved in co-authoring Chapter 10 on the Baltic Region. Our thanks are also directed to the institutions with which one or both of the authors were associated while working on this project, the Institut National d'Études Démographiques in Paris, the Max Planck Institute for Demographic Research in Rostock, the Vienna Institute for Demography and the US Bureau of the Census in Washington, DC We are especially grateful to François Héran, director of INED, who secured funds to further the publication of the book, and to Gijs Beets, the editor-in-chief of this book series for his guidance and encouragements. We also thank Tonny Nieuwstraten who with devotion and passion prepared the final layout of this volume. More than to anybody else we wish to thank our spouses, Eva and Anne-Marie, for their support and understanding.

Sanibel, Florida and Paris, August 2003

# 1. Introduction

Major changes in childbearing behavior occurred in the developed countries after the Second World War. By the end of the 20th century unprecedented low levels of fertility were reached in practically all European countries as well as in the overseas countries of European settlement and in Japan. Even though the majority of couples that opted to have children still had two, larger families were all but disappearing, many had just one child or were remaining without any children at all. Thus the numbers of children born are not sufficient to replace their parents' generations.

Our book aims to provide insights of how this situation came about and what can be expected in the foreseeable future. It does so applying a specific demographic approach, cohort fertility analysis, i.e. observing and analyzing childbearing patterns of groups of women born in the same year. We use the approach developed simultaneously by Henry (1953), Whelpton (1954) and Ryder (see, for example, 1951 and 1986), which in turn was based on the work of nineteenth-century German demographers, of whom the best known is Lexis (1875). The present study applies the cohort approach thoroughly and does so with detailed data covering over half of the 20th century for 35 populations. In distinction to most previous use of the cohort method we apply it not only for the elucidation of past trends, but also to capture aspects of contemporary fertility patterns, and, finally, it is utilized to indicate possible future developments. The value of this approach is in the potential for a realistic assessment of past and present levels of fertility, and in the robust demographic analysis which provides conditions for making reasonable judgments about probable trends in the near future.

We would like to emphasize that we have no pretensions of being comprehensive. Our results are humbly presented as complementary to the wealth of other work that has been done on the subject.[2] The complementarity is

[2] See, for instance, Bongaarts and Feeney 1998; Caldwell 1982; Calot 1999; Casterline 1999; Chesnais 1992; Coale 1973; Demeny 1997; Frejka and Ross 2001; Kirk 1946,

underscored by the fact that cohort analysis renders particular insights that otherwise do not come to light. For instance, by comparing fertility of successive generations one can measure the extent to which younger ones surpass or fail to reach the fertility of their predecessors; and the amount of fertility needed for the former to reach fertility of the latter once they have started childbearing.

The principal substantive contribution of the analysis in this book is that it provides solid evidence that the low levels of fertility at the end of the 20th century are likely to persist or even decline further in the foreseeable future, i.e. during the first and probably even during the second decade of the 21st century. At the turn of the century there were only scant signs that trends of declining cohort fertility[3] might reverse course. In almost all countries the generations currently in the middle or at the onset of their childbearing careers were having fewer children than generations only several years older. In the western countries fewer children are born when women are young, whilst there has been only a limited fertility increase when these same women reach their late 20s and 30s. In the formerly socialist countries, which are being transformed into western-type democratic societies with market economies, fertility is declining at all ages. For cohort fertility to be maintained at levels of the women born during the 1960s, in the West and even more so in central and
ern Europe, women who were in their early to mid-20s at the turn of the century would have to have unusually high fertility when older. Is that going to happen?

There is one big unknown: future fertility behavior of those yet to enter their reproductive years. For the time being nothing indicates that the children of today will have good reasons to bear more children than contemporary young adults. One possibility would be for major basic economic and social structural changes to take place that would modify societal conditions shaping childbearing behavior. One could imagine that the years needed for advanced education could be shortened due to technological developments and young adults could start working earlier in life. In addition, technological advances

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1996; Landry 1933, 1934; Lesthaeghe 1983; Mason 1997; Notestein 1945, 1953; UN Population Division 2000 and Van de Kaa 1987.

3 Period fertility, i.e. total period fertility rates (TPFRs), which in practically all low-fertility countries was below cohort fertility, may fluctuate. Other things being equal, trends in period fertility are directly related to the timing of childbearing (Bongaarts and Feeney 1998 and Bongaarts 2002). Wherever and whenever the delay in childbearing slows down or is halted altogether (assuming no change in completed cohort fertility), period fertility will increase.

could also lead to a shortening of hours of work to the extent that more time would be freed up for childbearing. Another possibility would be that goals of fertility increases would rise to the top of the list of governments' social policies generating substantial restructuring of expenditures which would result in meaningful changes in the living conditions of young adults and these in turn would be a possible but not necessarily a sufficient condition to induce more childbearing. Major economic and social structural changes as well as substantial policy remodeling are conceivable, but both appear unlikely to occur during the coming 10 to 15 years.

The approach and analysis are predominantly demographic yet since population developments are an intrinsic component of the complex paths of societies in time, the demographics are put into a broader context. In and of itself the demographic analysis is a major task, therefore we welcomed the option to apply appropriate theoretical constructs that were developed by colleagues and by one of the authors. We consider three such frameworks to be especially suitable for our empirical analysis. One was elaborated by Hobcraft and Kiernan (1995) and is mainly but not exclusively applicable to western market-economy societies. A second one dealing with the formerly socialist societies was formulated by Frejka (1980). The third one is the work of Kohler, Billari and Ortega (2002).[4] In addition, throughout the book the contributions of numerous other authors were employed when exploring factors modifying fertility patterns in countries and regions.

The theoretical principles, the many intriguing ideas and the 'bold explanatory sketch' of childbearing behavior in Europe of Hobcraft and Kiernan (1995) fittingly complement our exposition which for the most part starts with the cohorts born around 1930 and covers the period following the Second World War to the present. It is mainly the five contexts or preconditions of importance to the transition to parenthood (pp. 46-49), the different consequences of becoming a parent for women and men (pp. 49-53) and the 'bold explanatory sketch' elucidating the main circumstances of becoming a parent during most of the 20th century (pp. 53-57), that all help to understand the cohort fertility levels and trends analyzed in our study. In turn, the detailed analysis of cohort fertility behavior presented in this book validates many of the Hobcraft/Kiernan hypotheses and theories.

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[4] It is our idiosyncratic judgment that these papers provide appropriate concise theoretical frameworks for our empirical study, however, this is not meant to imply any superiority over the work of other authors who have dealt with the issues at hand.

As these considerations are implicit and important throughout our study we will present a grossly simplified abstract of the underlying theory.[5] Most women/couples in low fertility countries[6] in the second half of the 20th century consider the following conditions necessary before becoming a parent: "being in a partnership; having completed full-time education and training; having a home of one's own; being in employment with an adequate income, and less concretely, a sense of security" (p. 46). The sense of security following the Second World War was achieved by the reality of full employment and a high level of social protection from birth to death. By the end of the century both were eroded and thus the sense of security has diminished (p. 49). Differential gender consequences emanate from becoming a parent. For women it often means reduced occupational mobility or loss of seniority and lesser earnings. Women tend to be caught between demands of the home and the workplace; in any event, much more than men. In the household typically women have the main responsibility for the daily organization and do most of the routine tasks, such as meal preparation, cleaning and laundry. The burdens fall disproportionately on the mother even if she is in full-time employment (p. 53).

Hobcraft and Kiernan begin their explanatory sketch with the 1930s. We pick up after the Second World War because that is when our 1930 birth cohorts start their childbearing. Postponed parenthood combined with a flood of new marriages within which children were born in closer succession generated the post-war baby boom. High fertility continued into the 1950s and 1960s. The modern welfare state was established and strengthened substantially covering costs of health and education, providing child benefits and tax relief for those with larger families. It was also a period of unprecedented economic growth with increasing real wages and low unemployment as well as available relatively cheap housing (p. 55). The sharp declines in fertility of the 1960s and 1970s and the lingering sub-replacement fertility of the 1980s and 1990s were brought about by a number of interacting factors. Increased female labor force participation heightened the pressure on the work-family-leisure nexus disproportionately for women and the time available for household maintenance and childbearing was reduced. The advent of reliable modern means of contraception and access to safe and legal induced abortion contributed to the realization of delayed parenthood. Changing patterns of partnership together

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[5] A complementary discussion of factors generating the post-war baby-boom and the subsequent fertility decline can be found in Section *4.2 England and Wales*.

[6] The circumstances were somewhat modified in the formerly socialist countries, but since 1990 basic differences between the western and the latter countries are gradually disappearing.

with increasing divorce rates led to greater uncertainty about the security of the partnerships. Also the economic situation had changed. Entry into the labor force and subsequent asset accumulation was delayed by extended training and by youth unemployment. As a consequence of changing economic and political circumstances the welfare state was weakened in many countries (pp. 56-57).

Some of the factors shaping and modifying childbearing in the formerly socialist countries were rather different from the West (Frejka 1980). The respective development policies generated powerful constraints to childbearing which were counteracted by a combination of generous social welfare measures coupled with various degrees of restrictions in access to modern contraception and induced abortions, and an underlying indefinite yet fairly general sense of economic security.

Beginning with the initial stages of building the socialist economies in the late 1940s and the 1950s, the Soviet model of emphasis on the rapid growth of industrial capacity primarily heavy industry (mining, metallurgy, capital goods) was introduced. Investments in consumer goods industries, housing and services, as well as technological development were neglected. The functioning of market forces was severely restricted by the overwhelming enforcement of centralized planning by governments and the Council for Mutual Economic Assistance (COMECON).[7] This included rules for the labor market which aimed to guarantee employment and thus contributed to a reasonable sense of economic security. The economies became increasingly labor intensive with low productivity and developed a large and growing demand for labor which could not be met by natural growth of the male population and therefore led to a rapid increase in female labor force participation. This was ideologically reinforced as employment was considered a prerequisite for the equal status of women. In Czechoslovakia, for instance, the female labor force participation rate of women between the ages of 20 and 30 increased from 30 to 60 per cent between 1950 and 1961 (Frejka and Frejka 1965). In and of itself such a rapid increase in female employment was fertility depressing, which was reinforced by chronic shortages of housing, a deficient network of shopping facilities, shortages and limited choice of consumer goods, including foodstuffs, and a lack of childcare facilities.

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[7] COMECON, an international organisation formed in 1949, primarily active between 1956 and 1991 for the co-ordination of economic policy among certain nations then under Communist domination, including Albania (which did not participate after 1961), Bulgaria, Cuba, Czechoslovakia, East Germany, Hungary, Mongolia, Poland, Romania, and the Soviet Union. Yugoslavia participated in matters of mutual interest.

To counter the fertility depressing forces a wide range of social welfare measures, which varied by country, were gradually introduced and strengthened. These included direct financial inducements to and compensation for the costs of childbearing, such as monthly child care allowances, basic paid maternity leave as well as optional extended maternity leave (up to the second birthday of an additional child), leave to care for sick children, a lump sum grant at the birth of each child, income tax reductions with the birth of each child, and low-interest loans to newlywed couples earmarked for buying and furnishing homes with the principal being reduced at the birth of each child. Childrearing costs were alleviated indirectly by a variety of measures: subsidies for nurseries and kindergartens, and school meals, subsidized prices of children's clothing, textbooks and transportation costs; rents in government-owned housing were reduced by up to 50 per cent depending on the number of children; child and maternal health care was totally free of charge. A special factor inducing early childbearing was preferential assignment of housing to married couples with children.

Birth control in general was facilitated by liberal abortion legislation introduced almost in all the formerly socialist countries in the mid-1950s (Frejka 1983). On the other hand, in most countries access to modern contraceptive means was severely restricted (Stloukal 1997 a, b). Socialist governments considered them detrimental to women's health, and the medical establishment preferred induced abortions as the major tool for birth control. At the same time, restrictions were periodically imposed on the use of induced abortions, the extreme case being Romania in 1957, a total ban.

Kohler *et al*. (2002) aim to develop a comprehensive understanding of 'lowest-low fertility' (total period fertility rates below 1.3), which has evolved in the 1990s in many South European and in formerly socialist countries of central and eastern Europe. Their construct involves detailed empirical analysis combined with identifying mechanisms affecting postponed childbearing and low progression probabilities after the first birth. The principal causal mechanisms involve socioeconomic incentives to delay childbearing and social interaction effects on the timing of fertility. These are intensified by social multiplier effects and additional interactions of postponement and low fertility.

High youth unemployment rates in southern Europe and general economic uncertainty in the central and East European formerly socialist countries are the basis of uncertainty in early adulthood and are thus important among the socioeconomic incentives for delayed fertility. Powerful inducements to invest

in education include increased returns as well as improved employment options, lowered opportunity costs of extended education due to employment risks, and advanced education as insurance against economic uncertainty constitute further reasons for late childbearing. Finally, high costs of securing rental or privately owned housing for a newly-wed couple contribute to postponed family formation and delayed childbearing.

Various forms of social interaction —usually with multiplier effects— include learning about the optimal timing of fertility which is being revealed at an increasingly later age; normative influences on the desired timing of fertility; feedback mediated through the marriage market, which in Italy and Spain, for instance, implies late home-leaving and late union-formation; and feedbacks through competition in the labor market caused by the presence of high unemployment.

Kohler *et al*. (2002) stress that they are interested in the social interaction effects not only because of their direct effect on individual behavior, but also because of the associated multiplier effects. These tend to be complex processes. For instance, "[T]he multiplier effect occurs … because changes in innovative subpopulations in response to new socioeconomic conditions imply an erosion and transformation of prevailing social norms that influence such behavior. The behavioral change of the innovators thus has an indirect effect on the incentives and normative context of fertility decisions in the population in general, and this indirect effect makes it more likely that others will adopt the new behavior as well."

Finally, delayed childbearing is associated with postponement-quantum interactions that reduce completed fertility.

The three theoretical constructs dovetail each other and to some degree overlap and, most importantly, they provide a fitting framework for the empirical analysis presented in this book.

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The brief introductory chapter is followed by one on Methods (Chapter 2). That chapter describes the basic concepts, the methodological principles and specific analytical methods applied throughout the book; sources of the data and the way in which these were made comparable; how countries/

populations were selected for the study and which ones were excluded; and how these populations were grouped into regions.

Chapters 3-11 describe and analyze developments in individual regions and countries. The structures of these chapters are as uniform as possible, but there are exceptions. Each of these chapters has a general introduction for the region, individual country studies, a section comparing countries within the region and putting the regions and countries into the overall context, and finally a brief concluding section. A series of figures in each chapter is always located at the end of the chapter. The formal aspects of figures and tables, including their numbering, are also structured uniformly. Each country and each region has its alphabetical code and whenever possible the same type of graph or table appears under an identical number. The one exception is the chapter on the Baltic countries which does not have separate country studies.

Chapter 12, possibly the principal one of the book, consists of a comparative analysis of cohort fertility behavior of western market economies with the formerly socialist countries, as well as of regions and countries. Whoever is short of time and/or is not particularly interested in the details concerning countries or regions can concentrate on this and the following chapter to acquire the main knowledge emanating from this study.

Chapter 13 summarizes findings, discusses implications of the findings for the foreseeable future and discusses principal conclusions.

There are several ways to utilize this book. The regional Chapters (3-11) as well as the country studies are reasonably self-contained so that readers interested in specific geographical entities may select sections of special interest. Such perusal might necessitate an occasional peek into Chapter 2 *Methods*, although many users will be familiar with the concepts and methods used. Finally, as already indicated above, the concluding chapters summarize the analysis, as well as findings and conclusions, and therefore these may appear satisfactory to readers interested in the big picture. Alternatively, the concluding chapters can be used to familiarize oneself with the main issues and subsequently the reader may wish to seek more detailed knowledge and information in the regional chapters and country studies.

# 2. Methods

## 2.1 | Basic concepts

Our study deals with childbearing in low fertility-countries. At first sight these concepts seem straightforward and unequivocal, not in need of any explanation or description. Closer scrutiny reveals that clear definitions of the concepts generally used when discussing fertility are called for. Only the ones used in our study will be briefly described in the following paragraphs.

The *Crude Birth Rate* (CBR), the simplest and most commonly used index, consists of the number of live births during a specific period (usually one year) divided by the average number of population in that period. In addition to being simple the CBR has the advantage that it can provide information about periods in the more distant as well as the very recent past. For instance, for a few countries CBRs are known for almost three centuries. Norway's CBR in the 1730s was around 30 per thousand inhabitants; in 1930 it was 17.0 (Chesnais 1992); and in 2001 it was 12.6 (Council of Europe 2002). The adjective "crude" is justified, because the size of the CBR is influenced by the age and sex structure of the population but these effects are concealed.

The A*ge-Specific Fertility Rate* (ASFR) is similar to the crude birth rate. It consists of live births borne by women of a single-year childbearing age group between the ages of 15 and 49, during a given period/year. Single year ASFRs are used throughout our study. Young women at early ages tend to have low ASFRs, the highest single year rates tend to be among women when they are in their 20s and thereafter ASFRs decline and they are again low when women are in their 40s. Norwegian women of the 1940 birth cohort had their highest fertility at age 24, namely about 0.206 per woman, or 206 per 1000 women of that age (Cf. Figure NR-3 at the end of Chapter 3).

The *total fertility rate* (TFR) is the sum of single year age-specific fertility rates from age 15 to 49. There are two ways of adding up the ASFRs, either for a

cross-section of women in a calendar year, which is referred to as the *total period fertility rate* (TPFR), or for a cohort of women *born* in the same period, usually a year (or a five year period), which is referred to as the *total cohort fertility rate* (TCFR). Each of these can be perceived of as the average number of children a woman would bear during her childbearing years if she were to experience the prevailing single year age-specific fertility rates. In the case of the TPFR these are the ASFRs of the respective calendar year; in the case of the TCFR these are the ASFRs of the birth cohort in question. Each has its advantages and disadvantages.

The TPFR has a similar advantage as the CBR in that it can provide information about periods in the more distant as well as the very recent past. Norway's TPFR in 1855 was 4.61; in 1950 it was 2.52 (Chesnais 1992); and in 2001 it was 1.78 births per woman (Council of Europe 2002). Its disadvantage is that it is based on the lifetime course of childbearing of many generations of women. If and when some of these generations had their children early in life and other generations later, the adding up of such ASFRs will 'inflate' the TPFR. The opposite can also occur, namely that a particular TPFR is 'deflated'. Furthermore, couples or women of all ages may react to certain economic, social or political events (for instance, wars) or to policy measures (pronatalist incentives or reforms of induced abortion legislation) in a certain direction which can cause a relatively abrupt change in the TPFR. Note in the scientific and popular literature when the concept 'total fertility rate' is used it is automatically understood that this is the total *period* fertility rate.

The TCFR, alternatively called the *completed cohort fertility rate*, has the advantage that it reflects more closely actual individual level experience of childbearing. Its disadvantage is that the TCFR is known only after the respective cohort has actually completed its childbearing[8] and it therefore communicates information on past developments. The 1930 Norwegian birth cohort had a TCFR of 2.48; and women born in 1965 had a TCFR of 2.06 births per woman (Council of Europe 2002).

As will become clear throughout our study *cumulated cohort fertility rates* (CCFR), namely the addition of ASFRs up to a certain age, can provide

[8] It possible to estimate TCFRs for cohorts that are in their late reproductive years, because only a small proportion of total childbearing takes place when women are in their 40s or even late 30s. For details see section *Estimating procedures for cohorts that are in the later stage of their reproductive period* below.

information which when subjected to appropriate analysis renders meaningful insights.

The N*et Reproduction Rate* (NRR) appraises the extent to which one generation is being replaced by a following one. It takes into account female births and their survival rates into reproductive age.[9] For instance, a NRR=1.5 implies that the next generation will be 50 per cent larger than the present one; NRR=0.8 implies a future generation 20 per cent smaller. The NRR=1.0 is the special case when one generation is being replaced by a generation of equal size. The corresponding TFR is labeled as replacement fertility. With the low mortality of contemporary advanced societies a TFR equal to approximately 2.1 is considered replacement fertility, namely each couple would be replaced by two children and the additional 0.1 child is needed because biologically slightly fewer daughters than sons are born and some of the daughters do not survive into reproductive ages. Norway's NRR in 1960 was 1.38; in 2001 it was 0.86.

Our research project deals with low-fertility countries, namely those with below replacement fertility. More specifically, at the turn of the century, all countries in the study had NRRs below unity, all had TPFRs below 2.1 and in all of them the female birth cohorts born in the early to mid-1960s were having TCFRs below 2.1 births per woman.[10] These countries were low-fertility in distinction to less developed regions where the average TPFR for the period 2000-2005 is estimated by the United Nations as 2.9 and for the least developed countries as 5.2 births per woman (United Nations 2001).

Even though the low-fertility countries have the common feature of below-replacement fertility, there is a considerable amount of variation between these countries with regard to their fertility levels and trends. At the turn of the century the range of the TPFRs was from 1.1 births per woman in the Czech Republic to 2.1 in the United States[11] (Appendix C) and the range of the TCFRs among the

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9 For details on how the NRR and other fertility measures are derived see Haub (2003).

10 For more comprehensive information about below replacement fertility see Kohler and Ortega (2003).

11 Replacement fertility reemerged in the United States in 2000 after having been below that level for three decades.

1962 birth cohorts[12] was between 1.6 in West Germany and 2.3 births per woman in New Zealand (Appendix A).

Note the range of values is larger among the TPFRs than among the TCFRs. As will be seen throughout the book in almost all countries the range within which the TPFRs move through time is larger than that of the TCFRs (see any of the first figures in Chapters 3-11). In other words, the trends of the TCFRs tend to be much smoother than those of the TPFRs. In large part this is due to the fact mentioned above, namely that TPFRs are the sum total of age-specific fertility rates each from a different cohort of women. And because age patterns of fertility tend to change from one cohort to the next it happens that high age-specific fertility rates of older women may be combined with relatively high fertility rates of younger ones resulting in inflated TPFRs. Conversely, low age-specific fertility rates of older women may be combined with relatively low fertility of younger ones resulting in deflated TPFRs. From a statistical point of view, the trend line of the TCFRs in a particular country can be seen as analogous to a moving average of the TPFRs.

What is considered high, medium or low fertility depends on the time or cohort; on the country, region or larger grouping; and on the type of measure (TPFR, TCFR or specific CCFR) that is being discussed. In the group of the "low fertility" countries the range of the TPFR in 1950 was from 5.8 in Macedonia to 2.1 in Austria and West Germany (Appendix C); in 2000 it was from 2.1 in the United States to 1.1 in the Czech Republic. Among the 1930 birth cohorts the range of the TCFRs was from 3.8 in Macedonia to 2.1 in Hungary (Appendix A), whereas among the 1962 birth cohorts it was between 2.3 in New Zealand and 1.6 in West Germany. Looking at individual countries, in Macedonia, for instance, the TPFR went from a high of 5.8 in 1950 to a low of 1.8 in 1999. The highest TPFR ever experienced in the same 50 year period in Latvia was in 1951, only 2.3 births per woman; it fluctuated somewhat over time and declined considerably in the 1990s to a low of 1.1 in 1997 and 1998 (Appendix C). In Canada the TCFR declined from 3.4 births per woman in the 1930 cohort to 1.7 in the 1964 cohort; in Sweden the TCFR was the same in the cohort of 1915 and 1965 and fluctuated in a narrow range between 2.0 and 2.2 in between those two cohorts.

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[12] The 1962 birth cohort is the last one for which reliable estimates are available for all countries in the study except for Bosnia and Herzegovina (due to the registration disruptions caused by the war of the 1990s).

Based on recent historical experience of the low fertility countries in the 1990s TPFRs around the replacement level, i.e. TPFRs of 1.85 and above can be considered as comparatively high; TPFRs between 1.35 and 1.84 can be classified as medium and those below 1.35 as low. As a matter of fact, Kohler *et al*. (2002) consider countries with TPFRs of such low values as having 'lowest-low fertility.'

Any classification of completed cohort fertility has to apply a different scale. Because TCFRs are not known before birth cohorts have basically concluded their childbearing, therefore the information provided by known TCFRs to a considerable extent reflects past developments. Taking the birth cohorts of the early 1960s, in about one third of the countries TCFRs were above 2.0 and these could be considered as high. Over one third of the countries had TCFRs between 1.8 and 2.0, and these justifiably could be labeled as medium. TCFRs below 1.8 births per woman were low. As already indicated in the previous chapter, the main substantive contribution of our analysis is that fertility is likely to continue to decline in the foreseeable future and this applies particularly to cohort fertility. It is reasonable to expect that the birth cohorts of the mid-1970s might have average TCFRs of 1.6 which implies that in a number of countries values around 1.4 will appear.

## 2.2 | The main method

The principal demographic method applied in this project is the cohort fertility analysis. It is done in the following way:

- An analysis of completed cohort fertility, including estimates of completed cohort fertility of cohorts that have not yet completed their fertility at the time of analysis.

  Traditionally cohort fertility has been analyzed for those women who had reached age 50. We argue that relatively small proportions of total cohort fertility occur after age 40 and often even to women in their late 30s in low-fertility populations. Thus, possible errors in estimates of fertility of women in their late 30s and their 40s are likely to be relatively small, exceptionally amounting to a few per cent of eventual total completed cohort fertility. Our mechanical cut-off measure is to include cohorts in which we estimate at most about 15 per cent of their total cohort fertility rate (TCFR) needs to be

added to the already observed cumulated fertility. This incremental fertility is not likely to be very different from that observed in the immediately preceding single-year birth cohorts, thus implying small errors. Therefore reasonably accurate estimates of TCFRs can be made at least for some, if not for all, cohorts of women born in the 1960s, who, though still relatively young, were approaching the end of their childbearing years around 2000. The specific method is described and discussed below.

- An analysis of cohort fertility patterns of young women.

  We undertake a comparative cohort fertility analysis, within countries and between countries, of women who have reached, for instance, 27 or 22 years of age. This demonstrates how cohorts of young women were starting out on or proceeding through their reproductive paths. Such an analysis indicates whether young women were following in the footsteps of previous cohorts or whether they adopted a different pattern of reproductive behavior. Whatever the result of this exercise, it does not guarantee that throughout their remaining childbearing years these women will continue to have lower, equal or higher fertility than previous cohorts. But it shows the initial base, which can be significantly altered only if in future years fertility is radically different.

- An analysis of the degree of 'advancement' or 'postponement' of childbearing of cohorts that have reached the end of their reproductive lifetime.

  We analyze changes in the age patterns of completed cohort fertility. We compare the fertility behavior of cohorts during their late 20s and their 30s to their fertility behavior in their teens and early to mid-20s in absolute and relative terms. Also, we compare age-specific fertility behavior of different birth cohorts. This enables us to establish, whether and to what degree, women who had relatively low fertility when young postponed births into later years, or, vice versa, whether and to what degree, women who had relatively high fertility when young advanced their childbearing. This provides some guidance for making assumptions about future fertility behavior of contemporary young cohorts as they grow older.

- An analysis of trends in cohort parity distributions.

  We describe the extent to which childlessness of successive generations is increasing or declining. We further provide data about the distribution of women by number of children born. As above, this analysis includes some estimates concerning women who have not quite reached the end of their childbearing years.

- An analysis of parity progression ratios.

  This demonstrates changes in the propensity of women to progress from one birth order to the next. Again as above, this analysis includes some estimates concerning women who have not quite reached the end of their childbearing years.

- An analysis of the average age of cohort childbearing.

  This provides an analysis of a summary measure of changes in the age patterns of fertility that have been under way.

## 2.3 | Sources of data and their quality

The project was made possible through our access to a unique body of data on fertility for a large number of cohorts in 35 countries listed below. These data were gathered at the Institut National d'Études Démographiques since the end of the 1970s and since 1996 by the Observatoire Démographique Européen, which was founded by Gérard Calot and of which Jean-Paul Sardon has been director after Gérard passed away. The Observatoire has an ongoing system for the collection of detailed demographic data for European countries; in addition we have obtained data for several non-European low-fertility countries.

One important activity of the Observatoire is to make data strictly comparable, because country authorities use different definitions to gather data. Some countries establish data on births by the age of the mother in completed years at the time of delivery, while other countries use the age the mother has or will have attained in the course of the calendar year. The details of this and other methodological procedures are explained in Appendix D.

Throughout the course of gathering and processing data special attention is devoted to achieve and maintain the highest possible quality and comparability of the data. The fact that since 2000 the Council of Europe has employed the Observatoire to prepare all tables and graphs for its yearbook *Recent Demographic Developments in Europe* (Council of Europe 2002) is an expression of the level of confidence generally placed in the quality of the data.

We will now focus on important methodological principles applied in the project.

## 2.4 | The age dividing young and older women

In parts of the project we compare childbearing patterns of young women between countries and in time. Elsewhere relationships between the fertility patterns of younger women are compared with those of older women in the reproductive period. Age 27, more precisely the 27$^{th}$ birthday, was selected as the dividing point. The main reason for doing so is formal, namely it is half way between the ages of 15 and 40, the latter being the effective age of completed childbearing in low fertility countries during the second half of the 20$^{th}$ century. There was also a pragmatic reason. At the time when we started the project, in most countries data for young women of the 1970 birth cohorts were available only up to the 27$^{th}$ birthday. There was also a substantive empirical reason. As will be demonstrated, in many countries often age 27 was the approximate dividi ng point for delaying childbearing from the lower into the higher ages among the cohorts born since the 1940s.

The 27$^{th}$ birthday is applied as the dividing point in international comparative analyses. Wherever the analysis deals only with a single country, specific age groups of actual fertility surpluses and deficits (see below) are applied. This is the case almost without exception in the first table of each country study.

## 2.5 | Fertility deficits and surpluses

Changes in the age structure of cohort fertility can be observed by comparing age-specific fertility rates of one cohort with that of another. In this study usually cohorts born ten or five years apart are compared. When the age-specific fertility rates of a cohort born later (a younger cohort) is *higher* than that of a cohort born

earlier (an older cohort), the difference is considered a *surplus*. When the age-specific fertility rates of a cohort born later (a younger cohort) is *lower* than that of a cohort born earlier (an older cohort), the difference is considered a *deficit*. Frequently whole age ranges in a younger cohort tend to be either higher or lower compared to the older cohort.

## 2.6 | The postponement of childbearing

Many authors have referred to the shift of births (or childbearing) from young to older ages as *postponement of births (or childbearing)*. The term 'postponement' means that what is being postponed will take place in the future. That is inherent in the definition Hajnal (1947: 151) introduced, namely "[B]y 'postponement' of childbearing I mean a fall in fertility rates balanced by a subsequent rise so that the size of the family remains relatively constant." This can be considered a formal demography definition. In reality frequently there is not a good match between the fall and the subsequent rise of fertility. The latter can be smaller or larger than the earlier fertility decline. Hajnal leaves some leeway in his formulation: "…so that the size of the family remains *relatively* constant" (emphasis added). Should the profession use the term 'postponement' even when the subsequent rise is far smaller or larger than the initial fall in fertility rates?

The issue gets further complicated when individual subjective decision-making is taken into consideration. In a paper reporting on fertility expectations in the United States in the early 1960s, Freedman and Bumpass (1966: 189) write: " … the recently lower birth rates of the younger groups were mainly due to a *postponement of births regarded as temporary by the couples involved*, although it may turn out to have been permanent or at least to have involved fewer births than expected" (emphasis added). This is a 'social demography' use of the concept.

A major issue arises when analyzing data for women who are at the onset or in the middle of their childbearing periods. A fertility decline among women of a specific cohort when young does not necessarily mean they are postponing their births. That can be determined with any certainty only later in the life of the cohort in question. Alternatively, in-depth sociological knowledge, for instance, may inform about whether the process is perceived by the majority of the couples involved as birth postponement or as clear decisions to have less or even

no children. To automatically assume that lower fertility of young women is a postponement of births may mean that a quantum change is considered as a matter of timing. The lower fertility of young women in a particular cohort is a composite of postponement and decisions to remain childless or have a relatively small number of children. The size of the components will not be known before the respective cohort completes its childbearing. It will be expressed in the changes of parity distributions of completed fertility of successive cohorts. An additional issue is measurement, mainly the selection of the base against which the change is measured. In this study usually periods ten, occasionally five years apart, are used.

To conclude this brief section, frequently a fertility decline of young women is misinterpreted as a postponement of childbearing, although in reality it is a combination of postponement and decisions to have less or no children at all. Lower fertility of young women constitutes 'pure' postponement only if completed fertility remains unchanged, i.e. if all the postponed births are actually born later in the life of a respective cohort.

## 2.7 | Commencement of the fertility transition

The country studies in the following chapters usually start with basic facts about the early phases of the fertility transition. What is described is the initial phase of fertility decline as captured by national aggregate statistics to the extent that these are available (Chesnais 1992). In West European countries this occurred usually in the latter part of the 19th century.

Conceivably, this may be a simplification. It has long been common knowledge that in western Europe nuptiality patterns, in particular late marriage, were associated with relatively low 'pre-transition' fertility, total period fertility rates around five births per woman.[13] The notion persisted in demography that the

[13] The findings of Hajnal (1965) are pertinent in this connection. A unique marriage pattern, the 'European pattern' characterized by late age at marriage and a high proportion of people who never married, 15 per cent or higher, apparently persisted throughout Western Europe already in the 18th century. Because marriages on average took place when both partners were in their late 20s, fertility was lower than it would have been had they married in their teens as was customary in Eastern Europe and elsewhere around the world. The European pattern extended over all of Europe west of an imaginary line running from St. Petersburg to Trieste which became to be known as the 'Hajnal line'.

modern fertility transition started with the deliberate control of fertility by the help of intentional contraception and induced abortion, usually within marriage (Coale 1973 and Knodel and van de Walle 1979). Thorough and detailed historical demographic research (for instance, Szreter and Garrett 2000) makes the case that fertility was being consciously controlled in response to the initial development of industrial societies, probably throughout western Europe, through the postponement of marriage. Usually this process took place earlier than at the end of the 19th century. In England a critical initial period for such behavior was early in the 19th century. This was presumably an important reason for the reinforcement of the already relatively low 'pre-transition' fertility.

It is also a reasonable and logical explanation/rationalization for the relatively high pre-transitional fertility East of the Hajnal line[14] (Hajnal 1965). The change in nuptiality patterns in 'eastern' Europe did not take place before the end of the 19th century because industrialization and the concomitant social and economic developments came about much later than in western Europe. Moreover, marriage patterns in eastern Europe even then were ambivalent often with continued widespread relatively early and universal marriage.

## 2.8 | Estimating procedures for cohorts that are in the later stage of their reproductive period

Measures related to cohorts that have completed their fertility have the drawback of providing information about the past, namely about cohorts that have passed through their reproductive periods. We consider it reasonable to estimate completed fertility for more recent cohorts, because in contemporary low fertility countries usually only 1-2 per cent of life-time fertility occurs after age 40. Estimates for the more recent cohorts are computed by taking recorded cumulated fertility up to ages in the late 30s or early 40s, and adding estimated fertility for the remaining years assuming that the fertility at these ages will equal the experience of the closest previous cohorts. These age-specific fertility rates are 'frozen.' The procedure can be used for estimating the total cohort fertility rate, the mean age of childbearing, birth order cohort fertility, parity distributions and childlessness. Obviously this creates a possibility of under- or over-estimation depending on the actual future fertility of the older women. Caution is taken to minimize the possibility of error by estimating only a small

[14] Cf. previous footnote.

proportion of the respective measure, a maximum of 15 per cent. As will be demonstrated the proportion of the measure that is estimated is between 5 and 15 per cent only for very few cohorts. The actual errors tend to be minimal.

The applied methods of estimation have been checked for many birth cohorts with data available from vital registration. The results, for example, in the case of France for the birth cohorts 1875-1948, show that errors rarely exceed 0.02 births per woman when the last rate observed for the considered cohort is that at 35 years of age. France was used as an example, because detailed data were available for more than 70 birth cohorts and major changes in cohort fertility trends occurred (Figures CO-1 [Chapter 12] and WE-1 [Chapter 4]).

Estimation has been applied only as a complement. Most analyses, especially those of the earlier cohorts as well as the incomplete cumulated fertility rates of the younger cohorts, are based on observed and registered data. Whenever estimation is applied, it is done with great caution to ensure that any bias is minimal. As mentioned above, the cut-off point for including an estimate is when less than 15 per cent of its value needs to be estimated. However, there are very few such cases. For individual countries, series of total cohort fertility rates are presented with the final values typically being those for the mid-1960s. It is only for the *last* birth cohort that close to 15 per cent of the TCFR had to be added to the observed cumulated fertility rate. The estimated proportions for previous cohorts decline rapidly. In Denmark, for instance, for the 1965 birth cohort 11.1 per cent of the TCFR was estimated; for the 1964 cohort it was 8.0 per cent; and for the 1963 cohort it was 5.5 per cent; and obviously much less for each preceding cohort. For the 1960 birth cohort the estimated proportion was only 1.3 per cent. Given that the cut-off point is 15 per cent, the number of birth cohorts for which estimates can be prepared varies. In countries where childbearing occurs at relatively early ages, it is possible to make estimates for a few cohorts that are younger than the Danish ones. As a rule, in the formerly socialist countries estimates of TCFRs could be made for cohorts born in the late 1960s. For the Czech Republic the latest estimate was for the 1969 birth cohort for which 11.7 per cent of the TCFR was estimated. The estimated proportions of the TCFRs of previous birth cohorts diminished rapidly for each preceding cohort. For the 1968 cohort it was 9.7 per cent, with a further succession of 8.8, 6.7, 5.0 etcetera, until it was less than one per cent for the 1959 cohort. Analogous principles were used for estimating birth order cohort fertility and childlessness. In sum, the indicated trends of the total cohort fertility rates and of

any other measures are based on observed data and the estimated proportions are very small. The actual error is then a fraction of the estimated proportion.

## 2.9 | Criteria for including countries in the study and their regional classification

Included in the project were countries that had low fertility —at or below replacement— at the end of the 20th century, and single year age-specific fertility data were generally available for a minimum of about 30 cohorts. On this basis the majority of European countries, four overseas countries where most of the population was of English-speaking European stock, and Japan became subjects of the project. Countries were included according to boundaries at the end of the 20th century, but there was one exception to this rule. The populations of the two Germanys as they existed during most of the second half of the 20th century are treated as separate units in the analysis.

Countries were classified into regions primarily on a geographic basis. At the same time, in most of the regions the countries have common economic, political, social, and frequently also shared linguistic, cultural, ethnic, and other characteristics. The classification is not perfect and the titles of some regions might seem awkward. Some regions are more homogeneous than other. The societal systems of East and West Germany were substantially different from each other for most of the period and there would have been good reasons to include East Germany, for instance, in a group of formerly socialist countries. We decided to have the two Germanys in the same region because we are analyzing them in a joint study. Japan should be in a category of its own considering the nature of most of its fertility trends. It is treated that way in the analysis, but formally we included it in the Non-European Countries region.

The classifications of the regions with the respective countries included are as follows:

*Nordic Region (NR)*: Denmark (DK), Finland (FL), Norway (N), Sweden (S);
*Western Europe (WE)*: Belgium (B), England and Wales (EW), France (F), Netherlands (NL);

*West Central Europe (WCE)*: Austria (A), Former Federal Republic of Germany (FRG),[15] Former German Democratic Republic (GDR),[8] Switzerland (CH);
*Southern Europe (SE)*: Greece (G), Italy (I), Portugal (P), Spain (SP);
*East Central Europe (ECE)*: Czech Republic (CZ), Hungary (H), Slovak Republic (SL);
*Eastern Europe (EE)*: Bulgaria (BU), Romania (R), Russia (RU);
*West Balkan Region (WBR)*: Bosnia and Herzegovina (BH), Croatia (CR), Macedonia (MK), Slovenia (SV), Yugoslavia (YU);
*Baltic Region (BR)*: Estonia, Latvia, Lithuania;
*Non-European Countries (NEC)*: Australia (AUS), Canada (C), Japan (J), New Zealand (NZ), United States of America (US).

## 2.10 | Comparative analysis

A final almost self-evident, but important note is that the research is based on comparative analysis: Comparative analysis in time within countries and regions, and international comparative analysis between countries and regions.

[15] The term 'West Germany' and the 'Former Federal Republic of Germany' are used interchangeably and they apply to the territory of the Federal Republic of Germany as it existed before reunification in 1989 and the 'Alte Länder,' including West Berlin, thereafter. Analogously, the term 'East Germany' and the 'Former German Democratic Republic' are used interchangeably.

# 3. Nordic region

At the end of the 20th century the inhabitants of Denmark, Finland, Norway and Sweden were among the wealthiest, healthiest, best educated, and experiencing the most favorable political and social conditions in the world. Their economies were modern and their people were enjoying high incomes, between $ 23,000 and 30,000 of gross national income per person in purchasing power parity and their income distribution was the most equitable in the world (World Bank 2002). The infant mortality rate was around four deaths per 1,000 live births, female life expectancy at birth was around 80 and male life expectancy about 75 years. This does not mean that the Nordic countries were totally without any public health challenges. Suicide rates, for instance, were among the highest in the western countries. An Organization for Economic Cooperation and Development (2000) survey ranked Sweden, Denmark and Norway in the first to third places and Finland in the seventh place with respect to adult literacy and skill levels among 20 of the most advanced countries. While these societies no doubt have a modicum of political tensions and problems they are among the best functioning and efficient democracies. The social welfare systems, although having been questioned as possibly excessive, were such that according to a UNICEF (2000) report these countries had the lowest levels of relative child poverty in the world with Sweden, Norway and Finland in the first to third places and Denmark in the sixth. These countries are also renowned as being the most gender egalitarian societies. More than in any other parts of the world, men participate in child-rearing and household activities. Most women, including those who have small children, tend to be employed outside the home, often full-time, and more than in other countries women are politically active.

It is obvious that the Nordic countries enjoy economic, social and political conditions more favorable and desirable than almost any other country in the world. What kind of impact were these conditions having on contemporary reproductive patterns and those of the recent past? This will be discussed in country studies and then in a comparative section.

## 3.1 | Denmark

Throughout the 19th century fertility was stable with a crude birth rate around 30 births per 1,000 population. During the first decade of the 20th century the total period fertility rate (TPFR) was around four births per woman. It then declined rapidly to reach below replacement by the late 1920s, i.e. in less than two decades. Fertility remained at that level throughout the 1930s, but recovered in the early 1940s and reached a peak in 1945-46 with a TPFR of about three births per woman (Chesnais 1992). The TPFR enjoyed two decades of stability at around 2.5-2.6, but experienced a rapid decline between 1966 and 1970 and the decrease then became more moderate through the early 1980s, when the TPFR declined to around 1.4 (Figure NR-1). This was followed by a period of increasing period fertility. By the mid-1990s the TPFR was at 1.8 and remained at that level through 2000.

Denmark's population has evolved into a prosperous, healthy and productive society. Its per capita gross national income (in purchasing power parity) was $ 27,120 in 2000, one of the highest in the world. In the late 1990s 70 per cent of its GDP was produced in the service sector where over 70 per cent of the population was employed. Both men and women had high labor force participation rates. Between 1966 and 1994 the labor force participation rate for married women increased from 50 to more than 90 per cent with a large proportion of these women working full-time (Matthiessen 1997).

The successive governments of Denmark have never promulgated a population policy "aimed at influencing the size, the growth, or the structure of population" (United Nations *et al.* 1994c). For several decades, however, extensive government welfare measures have been in place and these were being continuously expanded. Most recently, 'since 1994 a number of reforms have been implemented to improve the situation for families with small children.' For instance, parents can take a partly compensated leave up to one year to look after their child; many collective agreements include provisions to create more family friendly working conditions, such as paid leave to look after a sick relative; and the government has secured the possibility for all parents to have their children taken care of during working hours and thus from 1993 to 1998 140,000 new day-care places were provided (United Nations *et al.* 1999a).

The generations born in the 1920s had a total cohort fertility rate (TCFR) above the replacement level of between 2.3 and 2.4 children per woman (Figures NR-1

and NR-2). Starting with the birth cohorts of the mid-1930s the TCFR declined for almost 20 consecutive cohorts and the generations born in the mid-1950s had values slightly below 1.9 children per woman. Estimated TCFRs for the generations born in the early 1960s which were completing their childbearing around 2000 were just about at 1.9 children per woman.

Successive generations changed their age patterns of childbearing quite considerably. Despite a decline in completed fertility, the peak of childbearing remained stable at the ages 24 to 25 from the generations born in the late 1920s through those born around 1950, with age pattern changes occurring before and after the peak. Compared to older cohorts, those of the late 1930s and early 1940s had a large proportion of their children when they were young and once they reached their late 20s their fertility was relatively low. At ages 33 to 44 fertility at individual ages was 30 to 55 per cent lower in the 1940s compared to the 1930s cohort (Figure NR-3).

The cohorts of the 1940s still had relatively high fertility as young teenagers, but in their late teens and particularly when in their 20s fertility was considerably lower than that of older generations. Between the ages of 19 to 24, at the peak of the reproductive period, fertility of the 1950 cohort was 18 to 35 per cent lower than among women born in 1940. There was a slight tendency to catch up later in their lives when they were in their late 30s and early 40s. In percentage terms there were some spectacular differences in fertility. For instance, at ages 43 and 44 fertility was 150 per cent higher between the two cohorts, but this made little difference in total cohort fertility, because only few children were born at those ages.

A major change in the age patterns of fertility took place among the birth cohorts of the 1950s. The propensity to postpone births when they were young was unmistakable and grew stronger from one birth cohort to the next. Equally vigorous was the propensity to eventually bear all the postponed children when these women were in their late 20s and in their 30s (Figure NR-3). The childbearing peak of the 1960 birth cohort had shifted distinctly to the right to ages 28-29. This shift was also conspicuous in the continuing upward trend of the average age of childbirth, which was at 29.7 in 2000 on a cross-sectional basis and at 28.5 for the 1960 birth cohort (Figure NR-4). At ages 16 to 24 fertility of the 1960 cohort was 30 to 70 per cent lower at individual ages compared to the 1950 cohort. Subsequently, between the ages of 30 and 42 the difference was 40 to 100 per cent in the opposite direction. As a result

completed fertility will apparently remain essentially unchanged for all the cohorts of the 1950s and early 1960s (Figure NR-1).

Table DK-1 provides an overview of the changes in childbearing when comparing cohorts ten years apart in terms of absolute numbers of children born. The 1940 birth cohort had a surplus of 0.14 children between the ages of 15-26 compared to the 1930 cohort. This surplus was offset by a deficit of 0.25 after age 26, resulting in an overall deficit of 0.12 births per woman. The 1950 cohort compared to the 1940 cohort had a large deficit of 0.38 births per woman between the ages of 19 and 34 and only a small part of that was compensated at ages outside of that age range, resulting in an overall deficit of 0.33 births per woman. In contrast, the 1960 cohort had relatively few children up to age 27 included with a deficit of 0.39 children compared to the 1950 cohort. Its comparative surplus after age 27 was of almost equal size and thus the total cohort fertility rates of these two cohorts were practically equal.

A complementary view of the described changes in the cohort age patterns of childbearing is depicted in Figure NR-6. By age 27 the 1960 birth cohort had 0.4 less children than the 1950 cohort. By age 40 the deficit between the two cohorts was less than 0.05 children and our estimates indicate that the difference will be fully erased as just demonstrated in Table DK-1. The postponement of childbearing as well as the catching up at later ages was also manifest in the 1965 cohort. By age 26 this cohort had 0.5 children less than the 1950 cohort but during their late 20s these women were at the peak of their childbearing with higher fertility than the 1960 cohort (Figure NR-5). By age 35 the 1965 cohort had the same cumulated fertility as the 1960 cohort (Figure NR-6) which indicates that these women have the potential to eventually match the completed fertility of the cohorts of the 1950s.

*Table DK-1. Fertility deficits and surpluses comparing birth cohorts, Denmark, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 27-49 | -0.254 | 19-34 | -0.378 | 15-27 | -0.388 |
| Surplus | 15-26 | +0.137 | 15-18 | +0.010 | 28-49[a] | +0.377 |
| | | | 35-49 | +0.034 | | |
| Total | | -0.117 | | -0.333 | | -0.011 |

Note: [a] Includes estimated data for ages 41-49 in the 1960 cohort.

The propensity to postpone births continues to be displayed by the cohorts which were at the beginning of their childbearing periods during the 1990s. In Figures NR-5 and NR-6 one can see that the 1970 cohort is on a childbearing path lower than that of the older cohorts and there is an indication that the 1975 and 1980 cohorts are aiming for even lower paths. This is expressed in numerical terms in Table DK-2. Women of the 1970 cohort had 51 per cent fewer children by age 20 and 29 per cent fewer by age 25 compared to women ten years older. Fertility of the youngest women, the birth cohorts 1975 and 1980 was also lower compared to the respective older cohorts. It is impossible to predict how forceful the propensity to bear children later in life will be among the young generations. However, since these young generations have had relatively low fertility in their teens and early 20s, they would have to have unusually high fertility in their late 20s and 30s to catch up with the older generations.

Data regarding birth order and parity[16] were available only for a limited number of birth cohorts of the late 1940s through the early 1960s. The overriding feature for these cohorts was reasonable stability.

A moderate decline in the second order TCFR and in the progression ratio to the second birth between the 1950 and 1960 cohort occurred (Figures NR-7 and NR-8). The 'two-child family' was the most common parity, however, it was starting to decline, and parity one women were on the increase among the cohorts of the 1950s (Figure NR-9). The proportion of childless women was relatively low and fluctuating around 13 to 14 per cent (Figure NR-10; see also section 3.5 below and Chapter 12, Table CO-12 and Figure CO-4).

*Table DK-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Denmark, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.661 | 1.665 | … | … | … | -6 | 1 | … | … | … |
| 30 | 1.170 | 1.120 | 1.039 | … | … | -22 | -13 | -11 | … | … |
| 25 | 0.525 | 0.417 | 0.374 | 0.316 | … | -40 | -41 | -29 | -24 | … |
| 20 | 0.096 | 0.051 | 0.047 | 0.044 | 0.038 | -52 | -62 | -51 | -13 | -19 |

[16] Throughout the book wherever birth order and parity is referred to it is always 'biological birth order', i.e. the $n^{th}$ birth of the respective woman, in contrast to 'birth order within the current marriage' (Cf. Section 6 in Appendix D).

## 3.2 | Finland

The fertility transition in Finland started around 1910, prior to which known data indicate a stable total period fertility rate (TPFR) of almost five births per woman for at least half a century (Chesnais 1992). Within two decades fertility declined to below the replacement level, the TPFR was 2.3 in the year 1933. Toward the end of the 1930s fertility increased somewhat, and the trend during the Second World War was rather erratic. Immediately following the war Finland experienced a distinct baby boom with a peak TPFR in 1948 of 3.5. Thereafter a prolonged decline began which was at first moderate —through 1963— and then quite steep between that year and 1973 when the TPFR hit 1.5 births per woman. Since then the TPFR has been stable fluctuating within a range of 1.60 to 1.85. In 2000 it was 1.73 births per woman (Figure NR-1).

Finland was the least industrialized of the Scandinavian countries after the Second World War. Roughly half of the active labor force was engaged in agriculture and forestry. Since then the economy has progressed and changed considerably so that the Finns have become as affluent as their neighbors. In 2000 GNI per capita in comparable PPP (purchasing power parity) was estimated at $ 24,610 compared to $ 23,770 in Sweden, for instance. The largest proportion of the gross domestic product is produced in the service sector, over 60 per cent. In the late 1990s about 50 per cent of men and 80 per cent of women were employed in the service sector. Women's labor force participation, 74 per cent in 1994, was almost equal to that of men and the majority of women were in full-time jobs. Such high female labor force participation was in part due to the apparent need for two incomes in a household to cover costs of mortgages as even low income families tended to own their living quarters. On the other hand, a comprehensive day care system enabled women with small children to work full-time (Nikander 1998).

The population was healthy and well educated. Life expectancy at birth for women in 1998 was almost 81 years and the infant mortality rate was less than 4 deaths per 1,000 live births. Over 15 per cent of the population had a university level education. In the mid-1990s slightly more women than men were studying at the university level. Ethnically and culturally Finland has a very homogeneous population. Ninety three per cent are ethnic Finns and six per cent Swedes, with practically no foreign-born people. Immigration was negligible. Over 85 per cent belong to the Lutheran church, however, a rapid process of secularization appears to be under way.

Finland does not have a distinctly defined population policy and there have been no efforts to influence fertility. Social and family policies, however, favor families with children. Parents of small children are given the opportunity to care for them at home through a generous system of leaves and allowances. This is combined with the obligation of local municipalities to provide quality day care facilities for all children under seven years of age (Nikander 1998).

The total cohort fertility rate (TCFR) was around 2.6 births per woman for the cohorts born in the early 1920s (Figures NR-1 and NR-2). A considerable decline of the TCFR started with these birth cohorts. The generations born in the late 1930s experienced replacement level fertility and those of the late 1940s TCFRs of below 1.9 children per woman. The cohorts of the 1950s had slightly higher TCFRs with the reliable estimate for the women born in 1960 being about 1.95, but thereafter it appeared that a slight decline was again setting in.

A detailed analysis of the rapid decline of cohort fertility between the cohorts of the early 1920s and those of the late 1940s, and then the stabilization around 1.9 through the cohorts of the early 1960s, reveals considerable changes in the lifetime age patterns of fertility of different birth cohorts.

The cohorts born around 1930 had relatively high fertility at all ages with a peak in their mid-20s (Figure NR-3). The subsequent decline of cohort fertility was brought about by a considerable reduction in fertility mainly when women were in their 30s. The drop in fertility of the cohorts born in the late 1930s compared to those ten years older was over 30 per cent for each single year age group between the ages of 29 and 39. The 1940 birth cohort had 0.47 children less than the 1930 cohort between the ages of 24 and 49 (Table FL-1). This was

*Table FL-1. Fertility deficits and surpluses comparing birth cohorts, Finland, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 24-49 | -0.471 | 20-28 | -0.340 | 17-26 | -0.178 |
| Surplus | 15-23 | +0.047 | 15-19 | +0.019 | 15-16 | +0.001 |
| | | | 29-49 | +0.142 | 27-49[a] | +0.274 |
| Total | | -0.424 | | -0.179 | | +0.097 |

Note: [a] Includes estimated data for ages 41-49 in the 1960 cohort.

slightly offset by higher fertility at the younger ages. The net result was a TCFR smaller by 0.42 births per woman.

The cohorts born during the 1940s gradually adopted different lifetime patterns of childbearing. The difference is evident in the comparison of the age patterns of fertility between the 1940 and the 1950 birth cohorts (Figure NR-3). The latter cohort had considerably lower fertility during the peak childbearing years of 21 to 25, i.e. these women presumably postponed some of their childbearing until later. Between the ages of 20 and 28 the 1950 cohort had a comparative deficit of 0.34 children per woman. A part of that deficit was then realized after age 28 (Table FL-1 and Figure NR-3), for the most part when these women were in their early 30s. On balance the 1950 cohort did have fewer children than the one ten years older.

The presumed postponement of childbearing was quite pronounced among the cohorts born during the 1950s. Fertility of these women when they were young was lower than in previous cohorts. The peak of childbearing shifted from age 26 for the 1950 birth cohort to ages 28-30 in the 1960 cohort and the mean age of childbearing increased from 27.4 to 28.7 (Figures NR-3 and NR-4). Between the ages of 18 and 21 fertility of the 1960 birth cohort was about 40 per cent below that of the 1950 cohort, however, starting with age 29 and into their late 30s fertility of women of the 1960 cohort was by more than 30 per cent higher compared to those ten years older. As a result the 1960 cohort more than equaled the completed cohort fertility of the 1950 cohort and had 0.1 births more than the older cohort (Table FL-1). In other words, women of the 1960 birth cohort when in their late 20s and 30s caught up in full with the cohort ten years older. These women did eventually have all the children they had postponed when they were young. This is also evident in Figure NR-2. Note the narrowing of the distance between the curves of ages 20 and 25, for instance, for the 1960 birth cohort compared to earlier ones, and then the broadening of the distance between the curves of ages 28 and 35.

Figure NR-6 illustrates how each subsequent cohort of the 1950s through those of the 1970s, in comparison to previous ones, tends to postpone its births until later in the reproductive period. The curves of the differences between the cumulated cohort fertility rates for the cohorts of 1955 and even of 1960 initially decline until they reach a trough at the ages 26 to 27. These curves subsequently climb and eventually cross and then rise above the base line of the 1950 cohort. This indicates that the younger cohorts made up all the births they postponed up

to their mid-20s, and that their total cohort fertility rates will be higher than the base line, even though only marginally.

The pronounced changes in the age patterns of fertility are also expressed in the notable changes of the average age of childbearing over time and between cohorts (Figure NR-4). This age was 26.4 for the 1940 birth cohort and it is estimated at 29.1 for the 1965 cohort.

The data available for the cohorts which are still at the beginning or in the middle of their childbearing years do indicate a possible moderate decline in cohort fertility of the youngest cohorts (Table FL-2 and Figures NR-5 and NR-6). Given the experience of the birth cohorts of the 1950s which caught up with the fertility of earlier cohorts, it is conceivable that this will also happen with the cohorts of the 1960s and 1970s. Indeed, the curve for the 1965 birth cohort shows that after age 26 it turns upward and thus the difference with the 1950 base line diminishes (Figure NR-6). The last five columns in Table FL-2 indicate that the differences between the cumulated fertility diminish with increasing age of the respective cohort. The difference between the cumulated cohort fertility rate (CCFR) of the 1965 cohort and the one ten years older at age 20 was 44 per cent, at age 25 it was 32 per cent, by age 30 it was 12 per cent and by age 35 only a mere three per cent. This is an indication that the catching up process is in progress. At the same time, note in the rows for the respective ages in Table FL-2 the CCFR values for each successive cohort are declining. At age 25 the CCFR for the 1975 cohort was 0.359 compared to 0.429 for the 1965 cohort. This implies that the 1975 cohort has a larger amount of catching up ahead of it in absolute terms.

*Table FL-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Finland, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.682 | 1.617 | … | … | … | 2 | -3 | … | … | … |
| 30 | 1.178 | 1.103 | 1.018 | … | … | -8 | -12 | -14 | … | … |
| 25 | 0.538 | 0.429 | 0.416 | 0.359 | … | -24 | -32 | -23 | -16 | … |
| 20 | 0.103 | 0.074 | 0.059 | 0.054 | 0.048 | -38 | -44 | -43 | -27 | -19 |

## 3.3 | Norway

The Norwegian population experienced a rapid fertility decline starting late in the 19th century into the 1920s and 1930s. The total period fertility rate (TPFR) fell from 4.5 births per woman in the 1890s to 2.2 around 1930 and was considerably below the replacement level throughout the 1930s. There was a well-defined post-war recovery of fertility, a baby boom, with a TPFR peak in 1964 of 3.0 children per woman (Figure NR-1). This was followed by a precipitous decline reaching a trough in the late 1970s and early 1980s at the level of about 1.7. The TPFR increased slightly in the late 1980s to reach 1.9 in 1990 and has since fluctuated in a narrow range between 1.8 and 1.9 through the year 2000. This was moderately above the median for western low fertility countries.

During the second half of the 20th century Norway's population lived through many of the common social and economic transformations of industrialized and post-industrial societies. Women's participation in the labor force was continuously increasing as was educational attainment. Employment was shifting into the service sector; about 85 per cent of employed women in 1990 were in that sector. Norway's economy was less vulnerable to recession pressure because Norway developed its own oil production. Compared to other European countries, Norway continued to be homogeneous in terms of ethnic and religious composition, and a certain secularization process appeared to be afoot. An unequivocal betterment in living standards and housing conditions was transpiring (Noack and Østby 1996).

While Norway never had an explicit population policy, it did have policies that affected fertility behavior. Legislation concerning families and children as well as the equality of opportunity for men and women are believed to have contributed to the modest fertility increase of the late 1980s. Parental leave, for instance, was gradually increased so that couples in the mid-1990s had the right to either 42 weeks of leave with full salary or 52 weeks with 80 per cent compensation (Noack and Østby 1996).

The trend of the total cohort fertility rate (TCFR) for women born since the mid-1920s at first showed an increase from 2.3 children per woman for the 1923 birth cohort to 2.6 for the 1933 cohort (Figure NR-1). This was followed by a gradual decline with cohort replacement fertility being reached by generations of the late 1940s. For the generations that followed cohort fertility was moving

within an extremely narrow band of slightly below replacement fertility estimated to be between 2.05 and 2.10 births per woman. The latest estimates of the TCFRs for the 1960s indicate an ever so moderate decline from 2.10 for 1961 to 2.05 for 1966. Will the downward trend continue?

While the TCFR trend appeared to be smooth, the age patterns of childbearing were remarkably different from one cohort to the next (Figures NR-2 and NR-3 and Table N-1). The TCFRs of the 1930 and the 1940 birth cohorts were almost identical, 2.48 and 2.45, respectively. Yet there was a considerable fertility increase among young women born in 1940 compared to those of the 1930 cohort. The age curve of childbearing moved substantially to the left. Between the ages of 16 and 22, fertility was 40 to 95 per cent higher for individual ages. On the other hand, once the women of the 1940 birth cohort got into their 30s and 40s they were having considerably fewer children than the cohort born ten years earlier. Between the ages of 34 and 46 they were having 35 to 60 per cent less children. In absolute terms, the 1940 cohort compared to the 1930 cohort had 0.36 more children between the ages of 15 and 27, and 0.39 less children per woman between 28 and 49 years of age (Table N-1).

Among the birth cohorts of the 1940s TCFRs declined from 2.45 for the 1940 to 2.09 for the 1950 cohort. It was mainly a consequence of a fertility decline while women were in their prime reproductive period (Figures NR-2 and NR-3 and Table N-1).

The TCFR of the 1950 and the estimated TCFR of the 1960 birth cohort were identical, 2.09 births per woman. But a further profound change in the age pattern of childbearing took place, namely a pronounced and genuine shift into the older ages. Up to the age of 26 women in the 1960 cohort were having fewer

*Table N-1. Fertility deficits and surpluses comparing birth cohorts, Norway, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 28-49 | -0.392 | 21-34 | -0.403 | 18-26 | -0.366 |
| Surplus | 15-27 | +0.360 | 15-20 | +0.022 | 15-17 | +0.003 |
| | | | 35-49 | +0.025 | 27-49[a] | +0.360 |
| Total | | -0.032 | | -0.356 | | -0.003 |

Note: [a] Includes estimated data for ages 41-49 in the 1960 cohort, which were very small.

children than previous generations; between the ages of 19 and 22 over 40 per cent less than the cohort born ten years earlier and the absolute deficit between the ages of 18 to 26 was 0.37 births per woman. In contrast, when these women were in their 30s they were having more children than the older cohort; between the ages of 33 and 37 the increase was 60 to 70 per cent. Between ages 27 and 49 the increase was 0.36 births per woman. This was one of the rare cases, nonetheless typical for the Nordic countries that a birth cohort made up for the whole fertility deficit it forewent when it was young. In Figure NR-6 note the ascent of the curves after ages 26-27 for the cohorts born in 1965 or earlier which followed the declines. By age 40 the curve for the 1960 birth cohort was only slightly below the base line of the 1950 cohort. The 1965 cohort was following a similar path at a slightly lower level.

What are the childbearing levels and age patterns of the youngest birth cohorts of the late 1960s and 1970s going to be like? For the time being, as of the year 2000, each successive birth cohort was experiencing lower fertility than the previous one. By age 35 the 1965 cohort had a cumulated cohort fertility rate of 1.805, which was only two per cent less than the generation born ten years earlier (Figure NR-6 and Table N-2). By age 30 the 1970 cohort had a CCFR of 1.172 and by age 25 the 1975 cohort had a CCFR of 0.413 or 12 and 28 per cent below that of the ten years older cohorts, respectively. Finally, by age 20 the 1980 cohort had a CCFR of 0.060 or 33 per cent less than the generation born ten years earlier (Table N-2). Note, however, in the last five columns of the table that the relative differences between the generations decline with age. This indicates that the tendency for cohorts to make up for the deficits incurred when the cohorts were young continues.

*Table N-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Norway, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.839 | 1.805 | … | … | … | -5 | -2 | … | … | … |
| 30 | 1.339 | 1.269 | 1.172 | … | … | -17 | -11 | -12 | … | … |
| 25 | 0.651 | 0.571 | 0.507 | 0.413 | … | -35 | -30 | -22 | -28 | … |
| 20 | 0.143 | 0.099 | 0.089 | 0.069 | 0.060 | -35 | -54 | -38 | -31 | -33 |

The curves in Figure NR-5 illustrate how each successive cohort of the 1960s and 1970s is postponing more births than any previous cohort. Practically every single age-specific fertility rate when women are young is lower than the one of the five years older cohort. The propensity to catch up becomes noticeable in the tail-ends of the 1965 and the 1970 curves. By age 35 the 1965 birth cohort did catch up with the 1960 cohort and apparently its TCFR may exceed that of the 1960 cohort (Figure NR-6).

The trends of the birth cohorts of the 1970s are an indication that cohort fertility is likely to decline in the future. Even if these generations make up for their fertility deficits (calculated in comparison to cohorts ten years older) when they will be older, their completed fertility is likely to be lower than that of the generations born earlier. Note that the cohort born in 1975 had a deficit of 0.6 children per woman by age 25 compared to the 1950 cohort (Figure NR-6). Women of the 1970s birth cohorts would have to overcompensate for their earlier fertility deficits when they will be in their 30s in order to reach replacement fertility.

The meager data on cohort birth order that are at our disposal to date provide limited, but important information (Table N-3). As expected, the proportion of higher order births is becoming smaller for the younger cohorts. By age 40 the 1940 birth cohort had almost one half of all children of order three or higher compared to the 1958 cohort in which only one third of births were of that order. By age 30 with data available for the 1968 cohort there were 12 per cent of children of order three or more in that cohort, compared to 31 per cent in the 1940 cohort. Even though a relatively large proportion of higher order births are borne by women in their 30s and 40s the approximate relation between these two birth cohorts is likely to be similar once these cohorts will have concluded their childbearing.

On the other end of the spectrum, there is a clear indication that the proportion of women not having any children is increasing among the younger cohorts (Table N-3). For women at age 40 their proportion increased from 10 to 12 per cent between the 1940 and the 1958 birth cohorts. Comparing the 1968 and the 1940 birth cohorts at age 30 there was almost a doubling of the per cent of women remaining childless. Considering that women of the younger generations are postponing their childbearing compared to the older generations, it can be surmised that the difference between these two cohorts will diminish by the end

*Table N-3. Parity distribution and average number of children by age and birth cohort, Norway, cohorts 1935-1978*

| Age | Birth cohort | Parity distribution (in per cent) | | | | | Average number of children |
|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4+ | |
| 20 | 1940 | 79.6 | 16.9 | 3.2 | 0.3 | 0.0 | 0.24 |
| | 1960 | 83.9 | 14.4 | 1.6 | 0.1 | 0.0 | 0.18 |
| | 1978 | 92.5 | 6.8 | 0.7 | 0.0 | 0.0 | 0.08 |
| 30 | 1940 | 15.8 | 16.8 | 36.0 | 22.0 | 9.3 | 1.92 |
| | 1960 | 25.9 | 25.1 | 35.1 | 11.7 | 2.2 | 1.39 |
| | 1968 | 30.1 | 26.2 | 31.7 | 10.0 | 2.0 | 1.27 |
| 40 | 1940 | 9.7 | 10.1 | 33.9 | 29.0 | 17.3 | 2.34 |
| | 1958 | 12.3 | 14.2 | 40.2 | 24.9 | 8.4 | 2.03 |

Source: Lappegård 2000.

of their childbearing periods. But there can be no doubt that there is a trend of increasing proportions of childless women among the younger cohorts in Norway.

## 3.4 | Sweden

As in most other European countries, fertility was not very high in pre-industrial Sweden of the 19th century. The fertility transition started from an average total period fertility rate (TPFR) of about 4.5 births per woman in the 1870s. During the remainder of the 19th and in the first decade of the 20th century the decline was very gradual. It then accelerated and by the mid-1920s, Sweden was among the first countries where fertility reached and fell below replacement. Fertility was very low throughout the 1930s and early 1940s. Sweden's mid-century 'baby boom' started earlier than elsewhere in part because Sweden remained a neutral country during the Second World War. A fertility peak was reached in 1944-46 with a TPFR of 2.6 and remained above the replacement level between 2.2 and 2.5 through the mid-1960s (Figure NR-1). Another two-decade long period of below replacement fertility was experienced from the late 1960s through the mid-1980s. The TPFR rose temporarily to 2.1 in 1990 only to decline again by 1997 to 1.5 births per woman. It has remained at that level through the year 2000.

Within a period of one century, Sweden was transformed from an agricultural to an industrial and eventually to a service society. In the 1880s three quarters of the population was employed in agriculture. By 1990, 60 per cent of the gross domestic product (GDP) originated in the service sector; 53 per cent of men and 85 per cent of women were employed in this sector. By 1990 the GDP had increased tenfold since the beginning of the century (Granström 1997). Living standards in Sweden have been among the highest in the world since the 1930s. Its GNI per capita expressed in purchasing power parity was $ 23,770 in 2000. While the long-term trend of rising living standards is undeniable, various short-term critical developments occurred and influenced people's wellbeing and behavior.

Sweden was one of the first European countries to change from a country of emigration to one attracting foreigners in significant numbers. Between the middle of the 19th century and the 1930s almost one and a half million people emigrated to North America. Since then about one million people have immigrated so that by the late 1990s 11 per cent of the population was foreign born (Granström 1997).

The population has become very well educated, in particular during the last three decades of the 20th century. The proportion of the population with a medium level education rose from about 30 to 45 per cent between 1970 and 1990; and the proportion with a higher level education increased even faster during the same period, from less than 8 to over 20 per cent. The fraction of women with a tertiary education was marginally higher than that of men, 21.3 compared to 20.7 per cent. The labor force participation rates of both genders were high and almost equal. In 1990 it was 86 per cent for men and 83 for women, arguably the highest in the world (Granström 1997). Women were also deeply involved in politics. Following the 1994 elections 41 per cent of members of Parliament (Riksdag) were women as were 11 of 22 cabinet members (Chesnais 1996).

The above is an expression of a number of long-term progressive social policies and attitudes. Gender equality in Sweden has been affirmed as a basic principle and right longer than in any other country and supported by policy and practical measures since the 1930s. Social arrangements aim to minimize the conflict between childbearing, family responsibilities and career. Parental allowances are generous and apply to both parents. There is a well-established network of child-care facilities, and at the same time a large proportion of women are working

part-time. The family friendly social policies of the Swedish governments were continuously considered an important priority and undoubtedly exerted an influence on fertility levels and trends. For instance, the increase in the total period fertility rate from 1.6 in the early 1980s to 2.1 in 1990-92 (Figure NR-1) was at least in part due to a financial incentive which was significantly strengthened during the 1980s and favored the close spacing of births (Hoem 1990).

The total cohort fertility rate (TCFR) has been remarkably stable for many generations, i.e. those born since the 1920s. The cohorts born around 1920 had a TCFR of 2.0 and it appears that that will be the value for the 1960 cohort as well. The highest TCFR ever —2.16— was reached by the birth cohort of 1933-1934 (Figure NR-1). Given the long history of accurate Swedish population statistics, TCFRs are known for the generations born late in the 19$^{th}$ century. The generations born during the first decade of the 20$^{th}$ century which were at the height of their childbearing during the late 1920s and the 1930s did have TCFRs of around 1.8 children per woman (Figure NR-2).

Even though the trend of total cohort fertility rates was stable, the age patterns of childbearing differed quite perceptibly from one cohort to the next (Figures NR-2 and NR-3). The 1930 cohort had births spread out quite evenly over the childbearing period with a peak in the mid-20s. Women of the 1940 cohort had most of their children early in their reproductive period; their fertility was higher than that of women ten years older when they were in their 20s and much lower when in their 30s, 30 to 40 per cent lower between the ages of 34 and 38. The subsequent cohorts started a trend of postponing births. Women of the 1950 cohort had visibly fewer children at the peak of their childbearing but caught up with the 1940 generation when they were in their 30s and early 40s. Between the ages of 35 and 43 fertility of the 1950 cohort was 40 to 80 per cent higher than that of the cohort ten years older. The practice of postponing births was even more pronounced among the cohorts born during the 1950s. The 1960 cohort had considerably lower fertility, from 30 to 70 per cent lower, from ages 16 to 23. The peak years of childbearing shifted into the late 20s and especially from age 28 to age 34 fertility of the 1960 birth cohort was very high compared to any previous cohort (Figure NR-3).

While the life-time patterns of childbearing changed quite considerably between cohorts, basically the deficits at particular ages were offset by surpluses at other ages (Table S-1). Contrary to numerous other countries, in Sweden the cohorts

of women born in the 1940s and especially those born in the 1950s who decided to have their children later in life actually did so.

Women of the 1950 birth cohort had 0.19 children fewer than women ten years older when they were young, i.e. between the ages of 19 and 29. After age 29, however, they had 0.13 children more than the ten years older generation. They did not catch up altogether but their completed cohort fertility rate was only 2.3 per cent smaller than that of the 1940 generation, a difference of 0.05 births. The 1960 cohort even had a small net fertility surplus of 0.04 births.

Note the dip in the curve for the cumulated difference between the 1960 curve and the base line of the 1950 cohort at the trough of the curve at age 26 in Figure NR-6. The difference was almost minus 0.3 children. More precisely, it was 0.28 (Table S-1). As, however, this cohort experienced a fertility surplus of 0.32 between the ages of 26 to 49 compared to the 1950 cohort the net difference was 0.04 children. The TCFR was 1.8 per cent larger than that of the 1950 cohort even though at specific individual ages the fertility difference was more than 50 per cent smaller or larger, respectively. The 1960 curve of cumulated fertility differences crosses the 1950 base line in Figure NR-6 at age 34 and then stays above that line.

What is difficult to predict is the future childbearing behavior of those cohorts that were at the beginning or in the middle of their fertile period in the late 1990s. There are certain signs that point to probable trends which can be deduced from the information in Table S-2 and Figures NR-5 and NR-6. The cohorts born in the mid-1960s, represented here by the 1965 birth cohort,

*Table S-1. Fertility deficits and surpluses comparing birth cohorts, Sweden, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 20-21 | -0.003 | 19-29 | -0.194 | 15-25 | -0.279 |
| | 28-43 | -0.188 | | | | |
| Surplus | 15-19 | +0.014 | 15-18 | +0.013 | 26-49[a] | +0.315 |
| | 22-27 | +0.104 | 30-49 | +0.133 | | |
| | 44-49 | +0.001 | | | | |
| Total | | -0.072 | | -0.048 | | +0.036 |

Note: [a] Includes estimated data for ages 41-49 in the 1960 cohort.

display a trend comparable to that of the 1960 generation. The shape of the curve for this generation is quite similar to that of the 1960 cohort, but the postponement of births prior to age 25 is even more pronounced, however —as far as the curve goes— once the 1965 cohort reaches its mid-30s, the propensity to catch up weakens.

The available data for the younger cohorts born in the late 1960s and 1970s are for even shorter periods of the childbearing experience. So far these data show that the decline of fertility, the presumed postponement of births of these generations, was very strong (Figures NR-5 and NR-6 and Table S-2). It is impossible to say how forceful the catching up will be when these cohorts will be older. It is clear that the large deficits that will be accumulated by these generations during their teens and 20s will require inordinately large surpluses if they were to come anywhere close to replacement level fertility. In other words, it appears likely that the generations born in Sweden in the late 1960s and 1970s will be the first ones after a long time to have significantly below replacement fertility. The TCFR of the 1975 birth cohort could be as low as 1.5 births per woman.

## 3.5 | A comparative perspective

Fertility developments in each of the Nordic countries had their specifics and idiosyncrasies, and they also shared many common features. At the end of the 20th century the Nordic countries were at, or close to their, historic lows in period and completed cohort fertility. Nevertheless, in comparison to the other western countries their total cohort fertility rates were among the highest (Table

*Table S-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Sweden, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.799 | 1.706 | … | … | … | 0 | -4 | … | … | … |
| 30 | 1.245 | 1.237 | 1.033 | … | … | -12 | -5 | -17 | … | … |
| 25 | 0.526 | 0.504 | 0.474 | 0.302 | … | -34 | -25 | -10 | -40 | … |
| 20 | 0.093 | 0.057 | 0.063 | 0.047 | 0.034 | -50 | -64 | -33 | -17 | -45 |

CO-2).[17] The estimated TCFRs of the cohorts born in the early 1960s were at, or only moderately below, the replacement level ranging from 1.9 in Denmark to 2.1 in Norway.

Similarly as in other low fertility countries, TCFRs were declining from their peak rates, typically experienced by the generations born around 1930, i.e. those which started childbearing during the first years after the Second World War, for at least 20 successive cohorts (Table CO-2 and Figure CO-1). The TCFRs of the 1950 birth cohorts in the Nordic countries were lower than the TCFRs of the 1930s birth cohorts by similar orders of magnitude as in many other countries. Contrary to the other countries, however, cohort fertility did not continue its decline in the Nordic countries among the cohorts of the 1950s. The total cohort fertility rates in Denmark, Norway and Sweden were almost identical for the 1950 and 1960 birth cohorts. In Finland the latter was even five per cent higher. In almost all the other low fertility countries the decrease of the TCFRs was maintained among the cohorts of the 1950s.

The demographic mechanism which underlies the difference in the trends of TCFRs between the Nordic countries and the other western countries is the following. Starting with the cohorts born in the late 1940s there was a strong tendency to lower fertility at younger ages practically in all western countries, including the Nordic ones. This propensity persisted in most countries and was still evident among the cohorts born in the 1960s. Furthermore, a propensity to compensate at least part of the deficit when women reached their late 20s or 30s was also apparent. In no country, however, did the cohorts of the 1940s make up the deficit which they incurred when they were young (Table CO-6). The Nordic countries were unique because contrary to most other western countries the birth cohorts of the 1950s actually made up the deficits incurred early in the fertile periods when they were in their late 20s and 30s.

Whilst the Nordic countries had the relatively forceful propensity for older women of the cohorts of the 1950s to make up the deficits incurred when they were young, changes in their basic age patterns of childbearing were in line with most other western countries (Table CO-3 and CO-4). In the cohorts born around 1930 roughly one half of all children were brought into the world before and the other half after the mother's 27$^{th}$ birthday (Table CO-3). This

[17] In the comparative sections of the regional Chapters 3-11 occasionally reference will be made to tables and figures of Chapter 12.

relationship underwent rapid changes during the second half of the 20th century. The proportion borne by young women increased among the 1930s cohorts and reached around 60 per cent among the cohorts of the 1940s. As births were being postponed starting with the cohorts born in the late 1940s the relative numbers of children borne by young women decreased. Basically in all the Nordic countries there was a reversal in the value of the proportions born before and after the 27th birthday within a span of about ten annual cohorts. In Table CO-3 this is exemplified by Denmark where 61 per cent of children were born before the 27th birthday by women of the 1950 birth cohort compared to the cohort born ten years later which bore only 41 per cent of its children by the same age.

The estimates of the proportions of children to young mothers for the 1965 cohorts were even lower. They ranged from 35 to 41 per cent in the Nordic countries, a very low proportion by historical standards, but generally in line with other western countries.

What was the cohort fertility experience of the generations that were initiating their childbearing or were in the middle of their reproductive years in the Nordic countries compared to other western countries?

The propensity for young women in the Nordic countries to postpone births continued to be powerful among the 1960s birth cohorts, which again was a trend shared with the other western countries (Table CO-7). The 1970 birth cohorts in the Nordic countries had cumulative cohort fertility rates (CCFRs) between 0.612 and 0.758 compared to the 1960 cohorts' range of 0.776 to 0.921 births per woman by their 27th birthday. Thus, if the 1970 cohorts were to catch up with the 1960 cohorts' completed fertility, 1.283 to 1.348 of their children still remained to be born after their 27th birthday (fourth column in Table CO-8). This is 9-15 per cent more (sixth column in Table CO-8) than the number of children born after the 27th birthday of the 1960 cohorts. Compared to most other western countries, the needed catching up effort of the 1970 cohorts' fertility with that of the 1960 cohorts would be smaller than in other western countries.

In the Nordic countries the fertility decline among young women, which can be considered as a postponement of births of women before their 27th birthday, was even more pronounced among the cohorts of the early 1970s, but data were available only for a few of the other western countries for comparison.

It is important to point out that young women of the 1975 birth cohorts in the four Nordic countries were noticeably embarked on a lower course of childbearing compared to earlier cohorts (Figures NR-5 and NR-6). By age 25 the CCFRs of the 1975 cohorts were between 34 and 42 per cent lower than those of the 1960 cohorts and on downward slopes. This implies that the 1975 cohorts would have considerably more catching up ahead of them than the 1960 cohorts in order to reach 1950 levels which were close to replacement fertility. Also, the extent of catching up between the birth cohorts 1960 and 1965 compared to those of 1950 to 1960 demonstrates a loss of momentum in three countries (last columns in Table CO-6). There is, of course, much uncertainty about the future course of events, but the combination of rapidly declining fertility among young women in the Nordic countries, the birth cohorts of the 1970s, combined with a weaker propensity to bear children when women are older, strengthens the probability that completed fertility is likely to decline also in the Nordic countries.

As far as can be determined, fertility was continuing to decline among the youngest women. CCFRs for women prior to their 22$^{nd}$ birthday in the 1978 cohorts were noticeably below any of the older cohorts (Table CO-9).

The decline of total cohort fertility rates and of cumulated cohort fertility rates of the younger cohorts in the Nordic countries born in the 1960s would not have been possible without changes in birth order distributions, parity progression ratios and parity distributions. Even though the available data are sparse, it is clear that the proportions of higher order births had declined and were low (Figures NR-7, NR-8 and NR-9). What is less known is the recent trend in the decline of proportions of women having first births. The other side of this development was, of course, an increase in the proportion of women that do not bear any children (Figure NR-7, NR-8 and NR-10). Compared to other countries the proportions of childless women were still relatively low in Denmark and Norway, although they were increasing (Tables CO-10 and CO-11; Figure CO-4).

The most frequent parity among women born around 1960 was 2 children. The proportions of women with 'the two child family' were around 40 per cent in Sweden to 46 per cent in Denmark (Figure NR-9 and Table CO-11). The tail-end of the respective curve in Figure NR-9 for Denmark indicated a downward trend resembling trends in England and Wales and in the United States.

The relatively high and stable TCFRs of the 1950s and early 1960s birth cohorts, and their low levels of childlessness, have in part been attributed to favorable long-term governmental policies as well as to a modern broad-based tradition of relative gender equality. Compared to other western countries, welfare state measures regarding children and family life have apparently been more intensive and effective. Hoem (1990) conducted a detailed analysis of the timing of second and third order births in Sweden and concluded that "recent demographic developments in Sweden can in part be attributed to the low-key and largely indirect pronatalism of Swedish social policies."

The governments of all four Nordic countries claim they did not have population policies or deliberate pronatalist policies (UNECE *et al*. 1993, 1998). All four countries did, however, have in common generous social welfare policies and a set of policy priorities impacting on reproductive behavior. These include the principle of gender equality, i.e. equal opportunities for men and women; a commitment to minimize conflicts between childbearing, child rearing, family responsibilities and employment, especially for women; and in general the implementation of family friendly policies.

The social reality of the Nordic countries reflects these priorities. Women are highly educated. The proportions of women with second and third level education have been increasing rapidly and in the 1990s were very similar to those of men. The proportions of women working outside the home are the highest in the world, almost as high as those of men. Women are also very active in public life, as mentioned in the section on Sweden, following the 1994 elections 41 per cent of members of Parliament were women as were 11 of 22 cabinet members.

What remains an open issue is whether the social policies of the governments in the Nordic countries will be sufficiently influential for couples and women of the young generations, those born in the late 1960s and during the 1970s, to have all the births not born earlier in their life (Tables CO-7, CO-8 and CO-9). The propensity to lower fertility at young ages was continuing among the cohorts born during the 1970s, possibly even intensifying. The cohorts of the 1970s would have to have higher fertility than the birth cohorts of the 1960s in their late 20s and 30s in order to have comparable total cohort fertility rates. To achieve such an outcome would probably require major strengthening of social policies and of practical measures.

## 3.6 | Conclusions

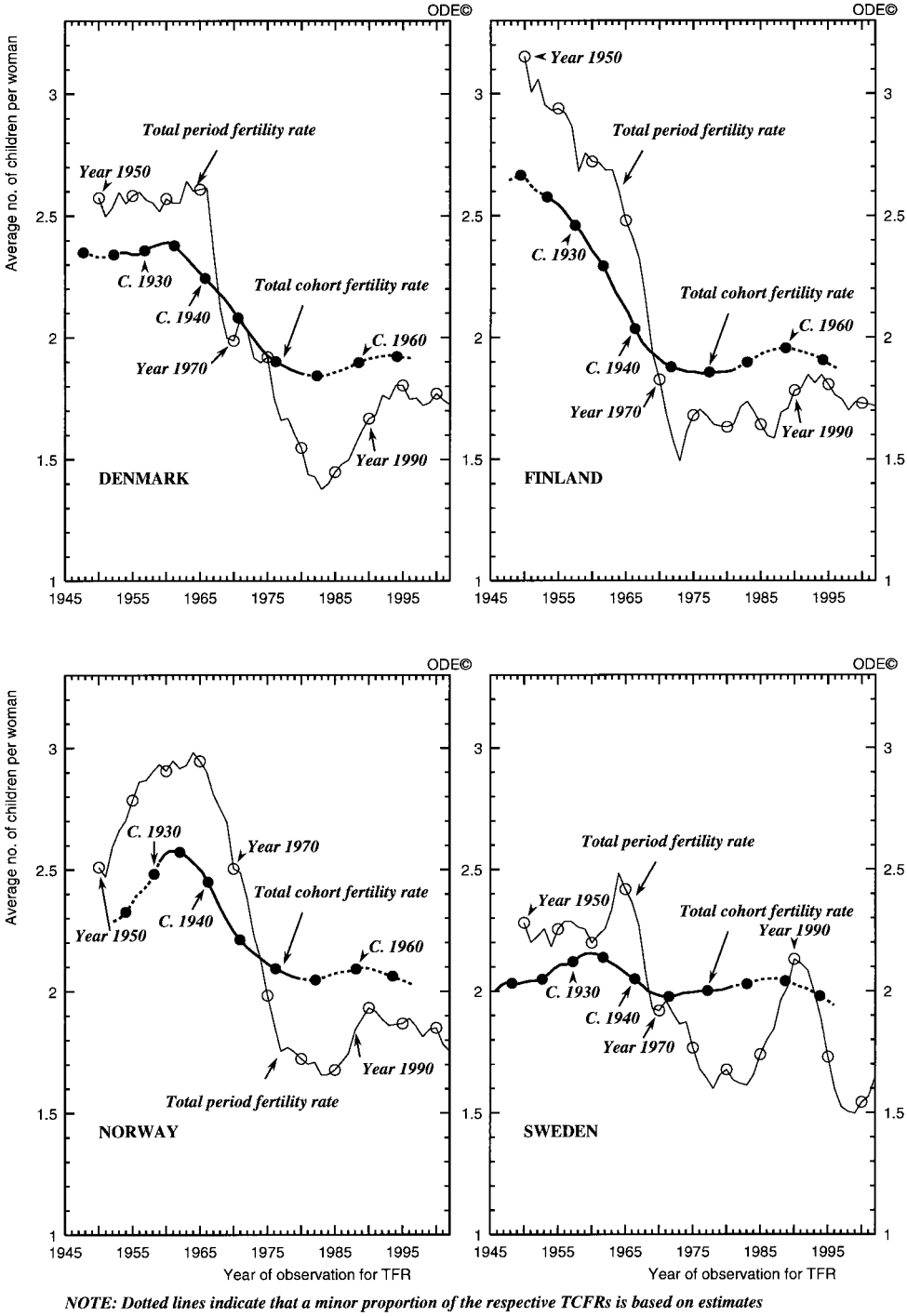
The analysis of cohort fertility levels and trends in the Nordic countries does not provide unambiguous results. In most of the other regions the likely trends of the near future are reasonably clear. Not so in this region. The experience of the past half century can be summarized as follows:

- Completed fertility of the cohorts concluding their childbearing at the end of the 20th century, those born around 1960, will be among the highest of the western low fertility countries;
- The TCFRs of the 1950s were stable; the decline which had started with the 1930s cohorts was discontinued;
- Throughout the second half of the 20th century age patterns of cohort fertility were undergoing significant changes; the cohorts born during the 1930s were advancing their childbearing into their 20s and at the same time reducing third and higher order births; cohorts of the 1940s were reducing childbearing in the principal ages of the fertile period; starting with the cohorts of the late 1940s young women were postponing births into their late 20s and 30s;
- Contrary to most other western countries, women of the 1950s cohorts in the Nordic countries were bearing all the children they had postponed when they were young;
- The cumulated fertility rates of young women in their early to mid-20s of the 1960s and 1970s cohorts were declining and these were generally at similar levels as in other western countries; this decline can be presumed to be a continuing propensity of young women to postpone births;
- The propensity to catch up, i.e. the propensity to bear postponed children when women are older, was weakening among the cohorts of the early 1960s;
- The 'two-child family' was most prevalent for the 1930s through the 1950s birth cohorts, but there were signs that the proportions of women of parity two were declining among cohorts born around 1960;
- The proportions of childless women among the cohorts of the 1950s and 1960s were relatively low, but they were increasing.

At the end of the 20th century, the reproductive behavior of the youngest cohorts, those born in the late 1960s and in the 1970s, resembled that of other western countries. Despite the favorable economic, health and social conditions, and despite the relative gender equalities and the family friendly policies in the Nordic countries, cohort fertility of these young generations, which are at the

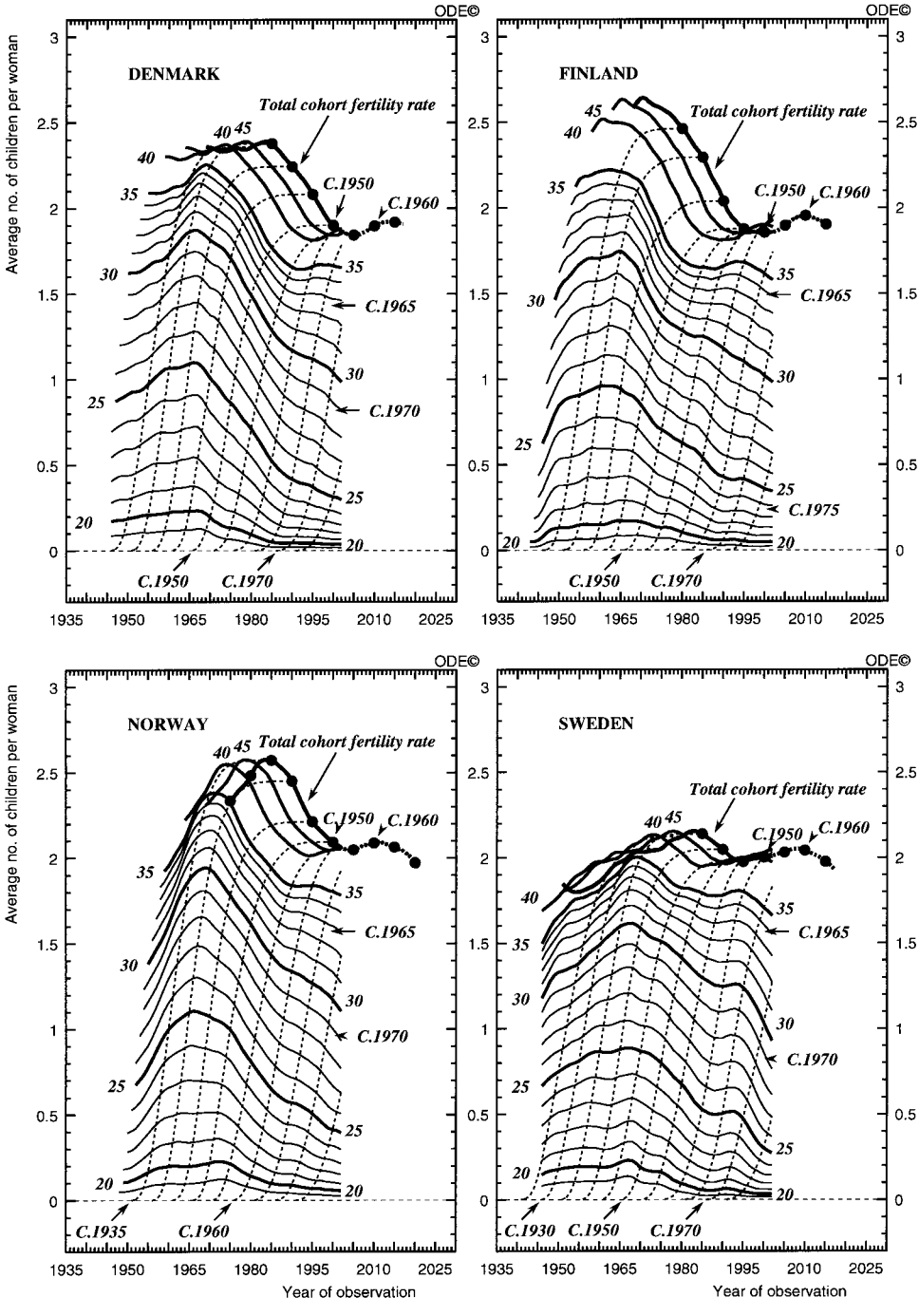
onset or in the middle of their reproductive periods was very low, i.e. considerably lower than in cohorts 10 to 15 years older. Since the propensity to catch up had weakened among the cohorts of the early 1960s, there is some lingering doubt whether, and how much of, the early fertility deficits of these generations in the Nordic countries will be made up later in life. The amount of fertility of the 1970s cohorts that would be required when in their 30s is larger than for any previous cohort.

**Figure NR-1 NORDIC REGION, 1950-2000**
**Total period fertility rate and total cohort fertility rate lagged by the average age at childbearing**




*NOTE: Dotted lines indicate that a minor proportion of the respective TCFRs is based on estimates*

**Figure NR-2 NORDIC REGION**
**Cumulated cohort fertility at specified ages, birth cohorts 1930-1975**




*NOTE: The part of the TCFR line which is dotted indicates that a minor proportion of the TCFR is based on estimates*

**Figure NR-3 NORDIC REGION**
**Age-specific fertility rates, birth cohorts 1930, 1940, 1950 and 1960**

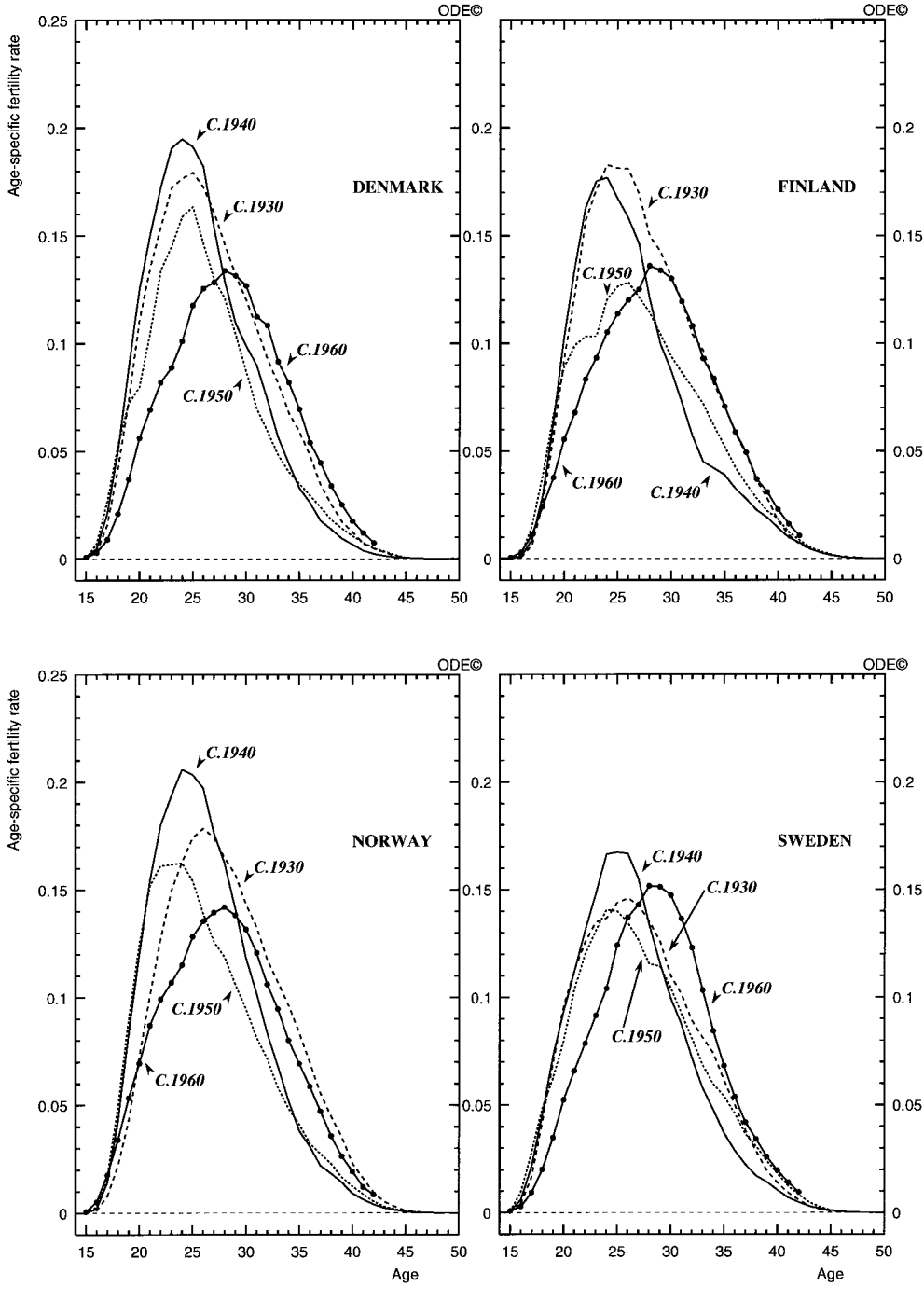
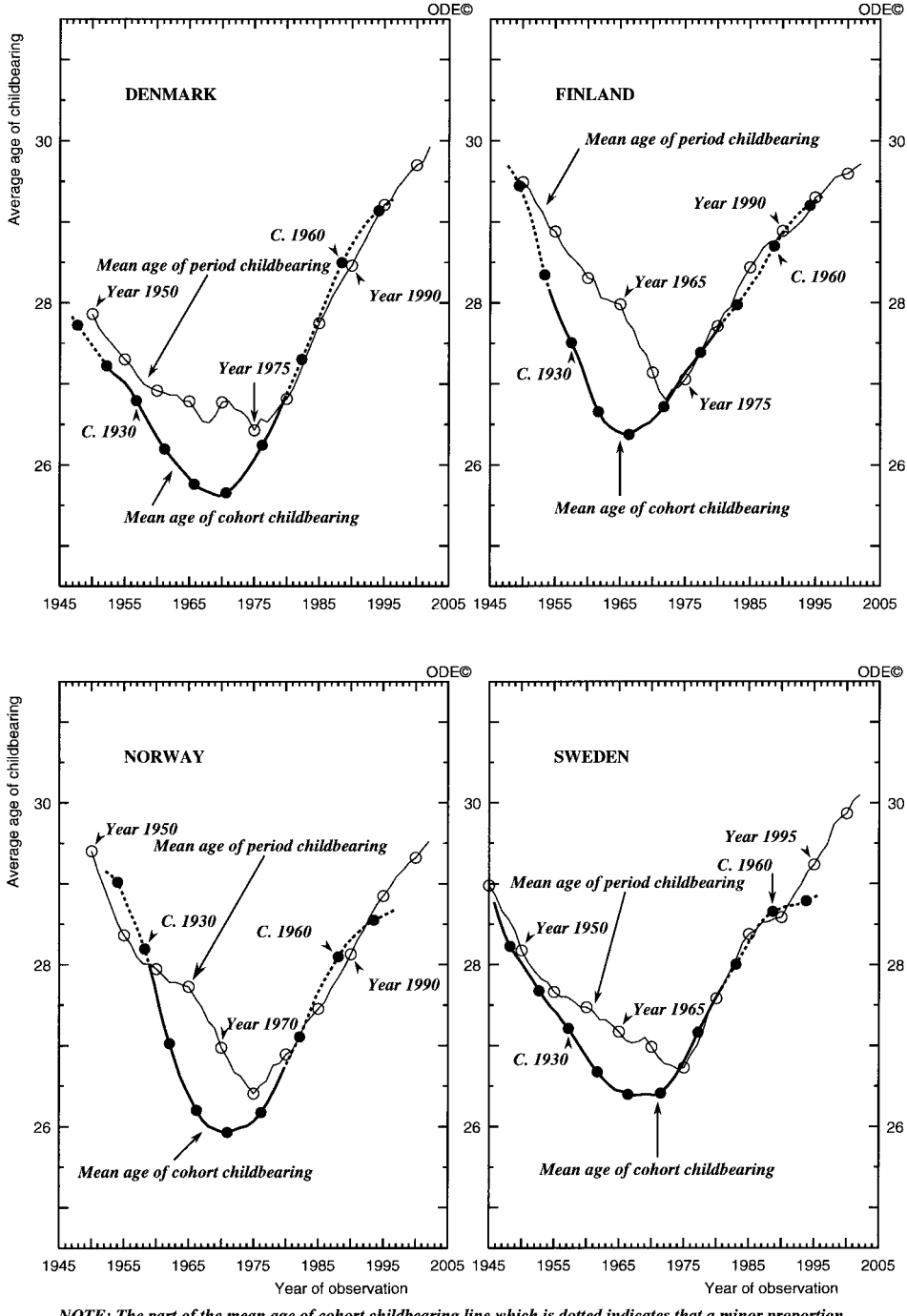


**Figure NR-4 NORDIC REGION, 1945-2000**
**Period average age of childbearing and cohort average age of childbearing lagged by the average age at childbearing**




*NOTE: The part of the mean age of cohort childbearing line which is dotted indicates that a minor proportion of the respective age-specific rates are based on estimates*

**Figure NR-5 NORDIC REGION**
**Age-specific fertility rates, birth cohorts 1960, 1965, 1970, 1975 and 1980**

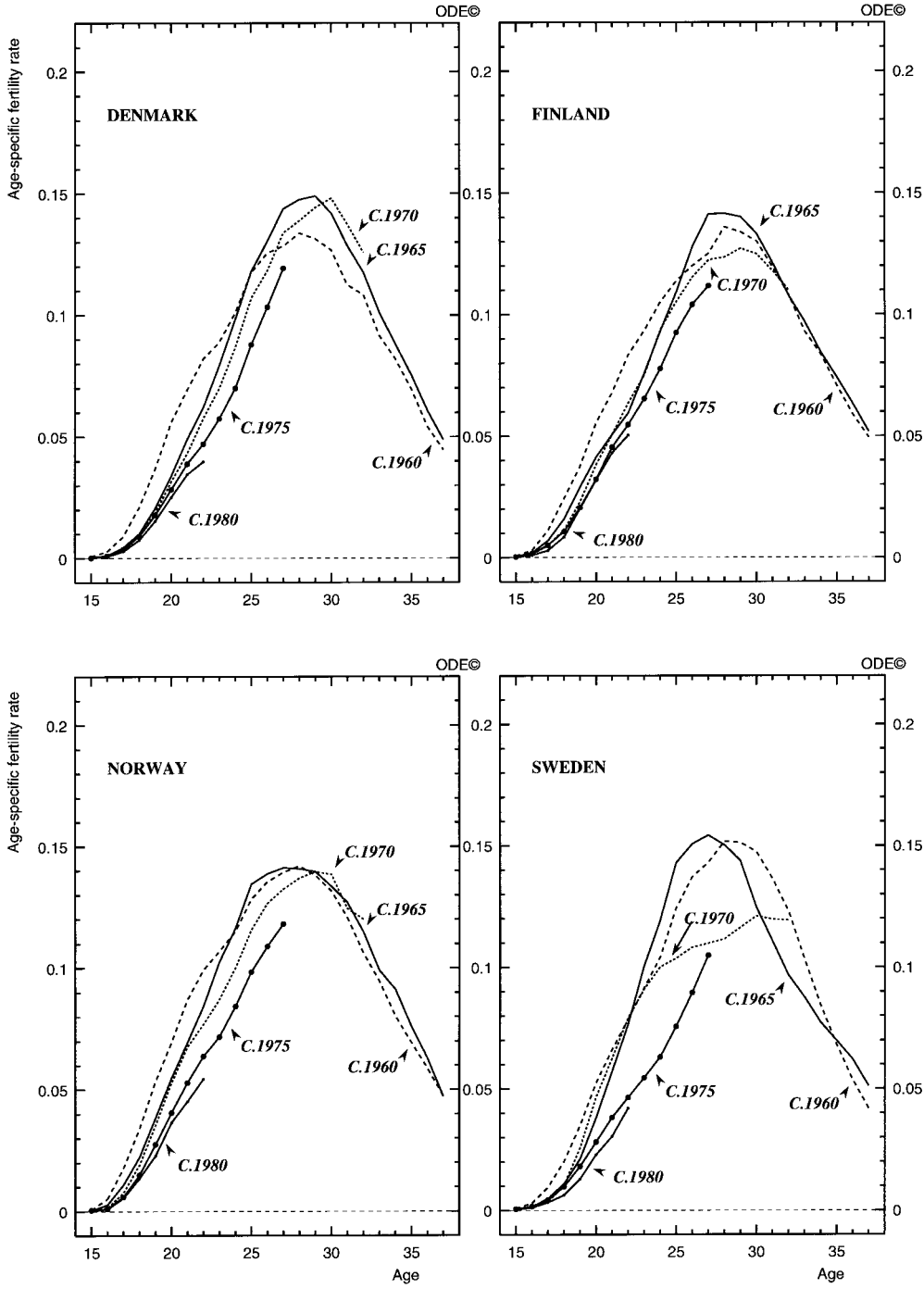


**Figure NR-6 NORDIC REGION**
**Differences in cumulative age-specific cohort fertility rates between base and subsequent cohorts, women born in 1950 (base), 1955, 1960, 1965, 1970, 1975 and 1980**

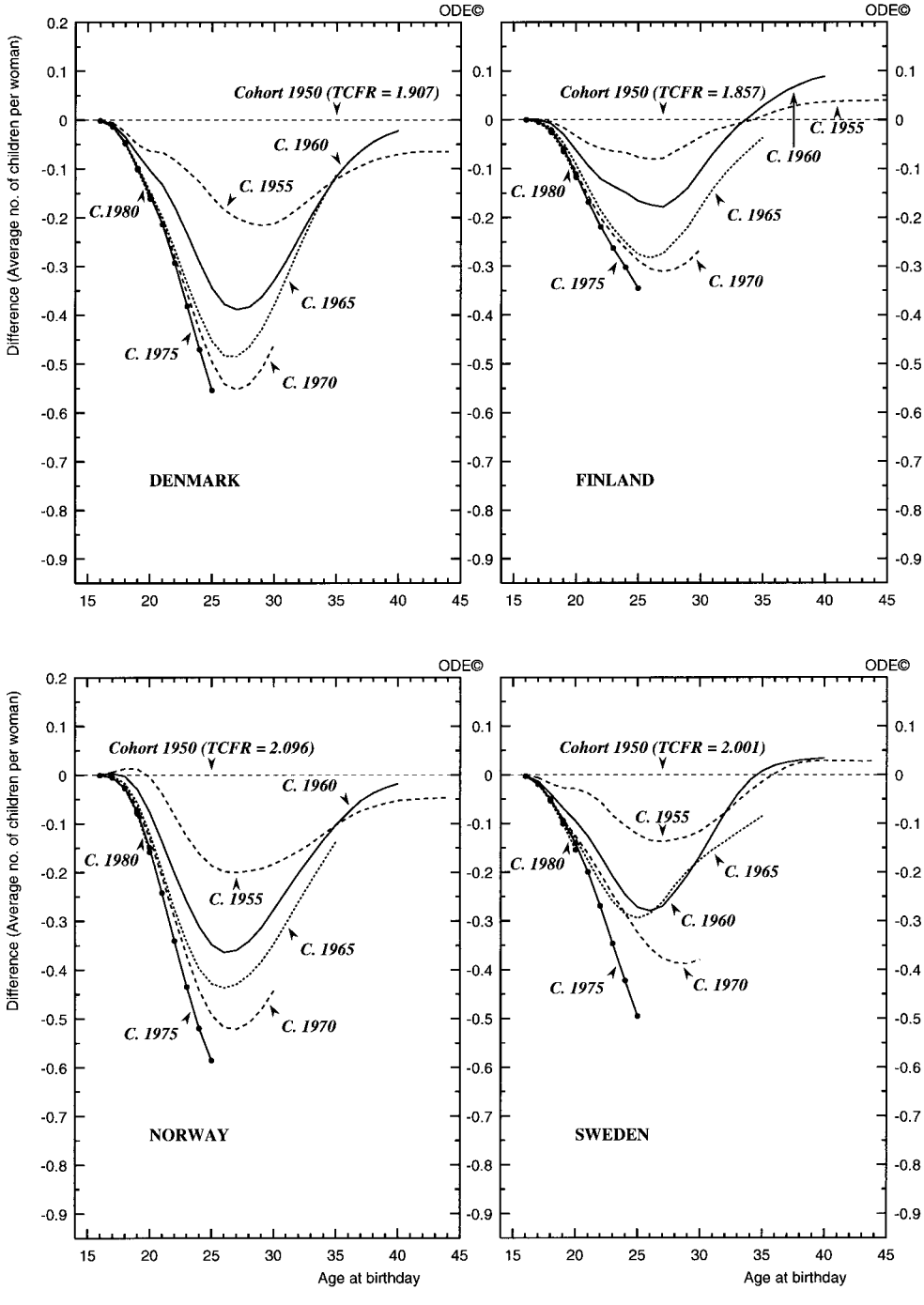


**Figure NR-7 NORDIC REGION**
**Total cohort fertility rates by biological birth order, birth cohorts 1926 to 1968**

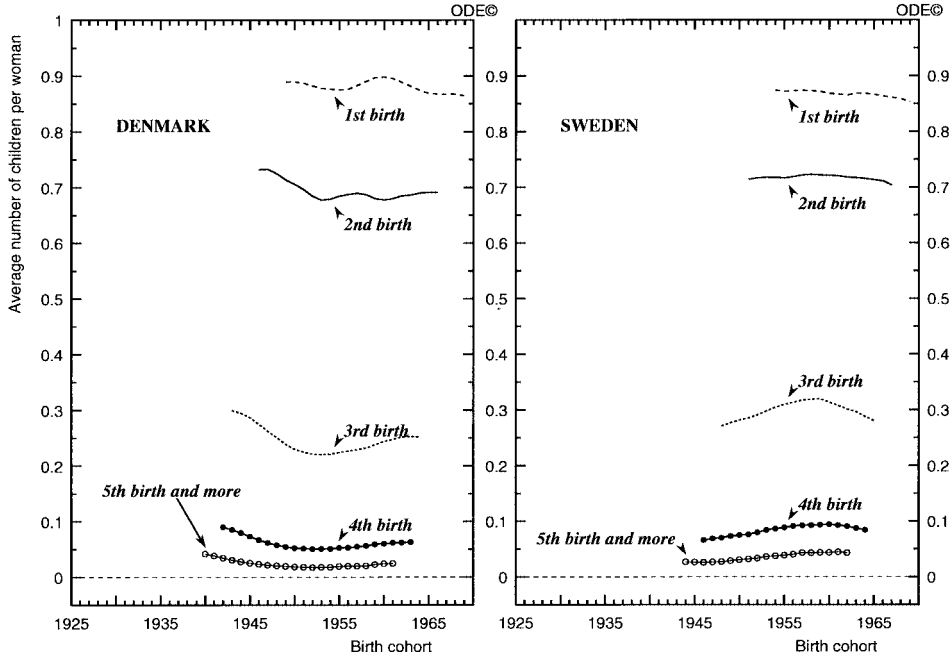



**Figure NR-8 NORDIC REGION**
**Parity progression ratios, birth cohorts 1926 to 1968**

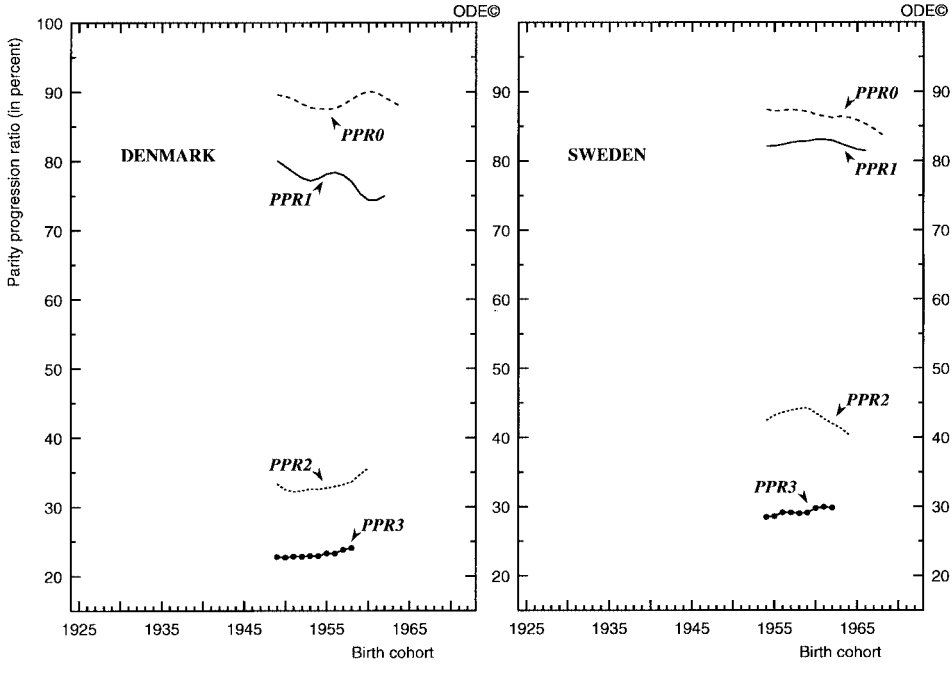


**Figure NR-9 NORDIC REGION**
**Parity distribution of completed fertility, birth cohorts 1926 to 1968 (in percent)**

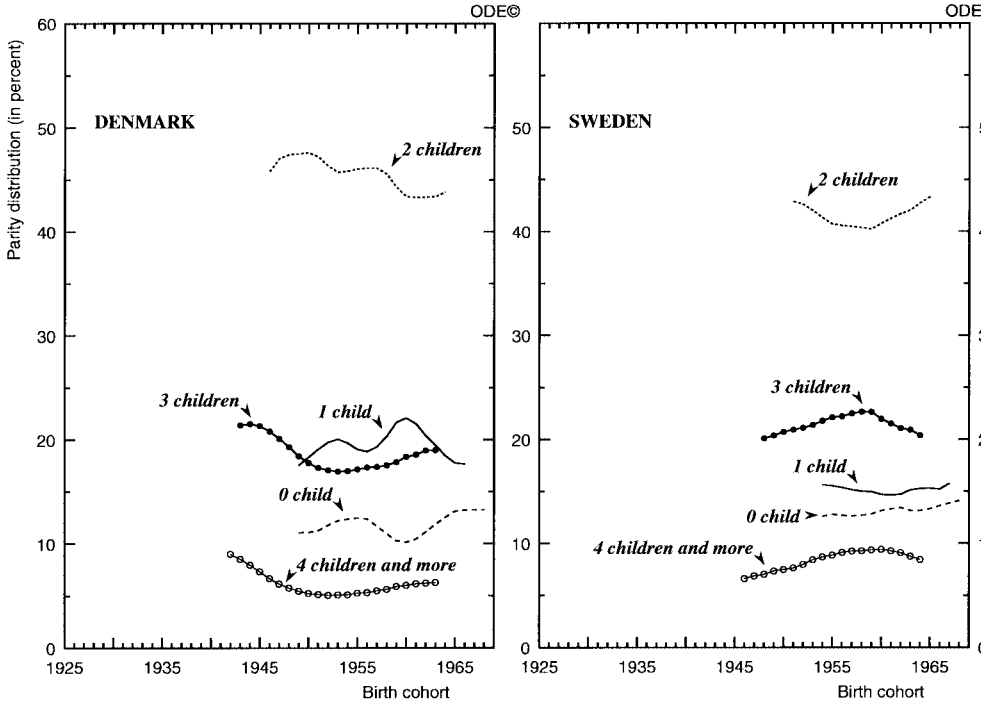
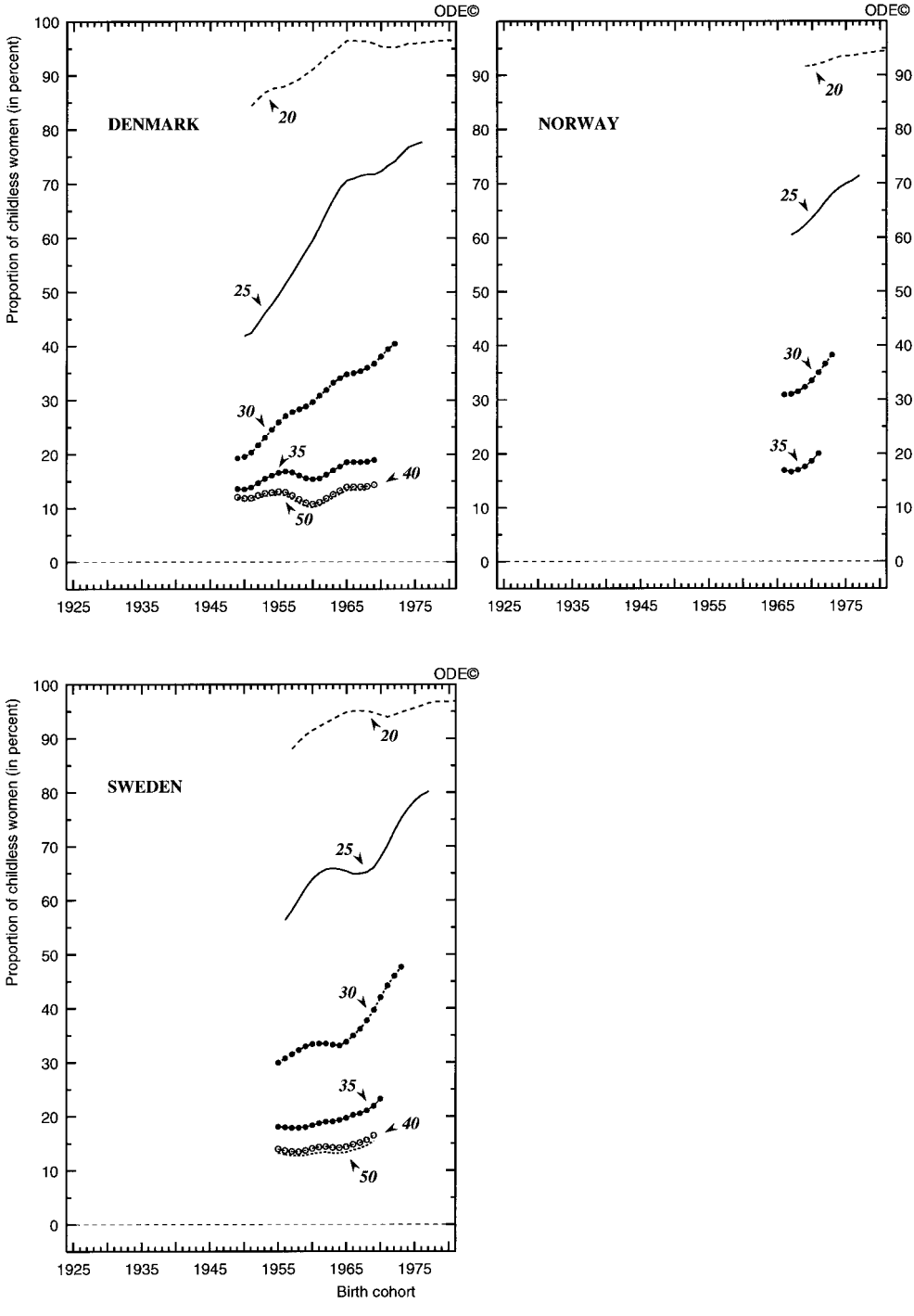


**Figure NR-10 NORDIC REGION**
**Proportions of childless women, selected ages, birth cohorts 1926 to 1980**



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# 4. Western Europe

In numerous ways the countries of this region —Belgium, England and Wales, France and the Netherlands— were homogeneous and, at the same time, heterogeneous in other ways. Their social and economic developments are representative of successful liberal western capitalist welfare states of the second half of the 20th century. Most of their populations were middle class with comfortable per capita gross national incomes of around $ 25,000 in purchasing power parity, which is among the highest in the world although a little less than in the Nordic or overseas developed countries. Their income distributions were moderately less equitable than the average for western countries, especially in England and Wales.[18] Their populations were well educated. Overall the citizenry enjoyed good levels of social protection.[19] In a number of general cultural aspects, notably with respect to languages, the region is less homogeneous than the other three West European ones (broadly defined), namely the Nordic Region, southern Europe and West central Europe (Austria, Germany, West and East and Switzerland).

As will become evident many aspects of fertility levels and trends during the second half of the 20th century were similar among the four countries. And many of these traits were common among most western populations. Two countries in the region were notable for special fertility related characteristics. France was the country with the longest tradition of pronatalist policies. Throughout the 19th century and up to the 1970s, the Netherlands not only had relatively high fertility, but Dutch women would bear children markedly later than in other countries.

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[18] In the 1990s Gini coefficients were 28.7, 36.8, 32.7 and 32.6 for Belgium, England and Wales, France and the Netherlands, respectively (World Bank 2002).

[19] Close to 30 per cent of their GDP were spent on social protection; on average over € 6,400 per capita in purchasing power standards; in 1999 over eight per cent of social benefits went towards expenditures for the family and children; surprisingly the percentage was considerably below average in the Netherlands (Abramovici 2002).

## 4.1 | Belgium

The initial fertility decline in Belgium began in the early 1870s from a total period fertility rate (TPFR) of 4.9 births per woman. It proceeded gradually during the late 19th century to reach 4.0 in the late 1890s. The major political and economic traumas of the first half of the 20th century —the two World Wars and the economic crisis of the 1930s— left visible marks on Belgian fertility trends (Chesnais 1992). Even during the 1920s fertility did not recover appreciably so that it was below replacement throughout the 1915 to 1945 period (Chesnais 1992 and Kirk 1946). The post-Second World War baby boom, which culminated in 1963-64 with a TPFR of 2.7, was not particularly strong. It was followed by a precipitous fertility decline to a TPFR of 1.7 in 1975 (Figure WE-1). During the last quarter of the 20th century period fertility was stable fluctuating between 1.5 and 1.7 births per woman.

The general social, economic and political developments typical for western Europe were shared by Belgian society. In the 1950s Belgium was among the six countries that founded what is presently the European Union. By the end of the 20th century Belgium became one of the richest service sector economies in the world. In 1990, 85 per cent of women and 60 per cent of men were working in the service sector (Lodewijckx 1999) and the gross national income in purchasing power parity per capita was $ 27,500 in 2000 (World Bank 2002). The educational profile of the population was continuously improving; according to the 1991 census over 14 per cent of women had acquired a higher education (Lodewijckx 1999). Increasingly women worked outside their homes and by the early 1990s the female labor force participation rate was over 55 per cent.

Historically ‘public opinion seems little concerned with population problems’ (Lohlé-Tart 1974). Belgium never had a formal population policy, however, for the past several decades social and family policies have been ‘child-friendly’. In the 1960s this was influenced by a commissioned report of the French demographer Alfred Sauvy. Family allowances were expanded so that they amounted to 3.2 per cent of the Gross National Product (Lohlé-Tart 1974). The Belgian government continued to promote family and child friendly policies into the 1990s —such as equal rights for informal unions, child care services, etcetera— while acknowledging that fertility is likely to remain below replacement (United Nations *et al*. 1994b). The proportion of the relatively large

social benefits spent on the family and children were above average for countries of the European Union in 1999 (Abramovici 2002).

Completed fertility of the cohorts born in the early 1930s was at 2.3 children per woman. The total cohort fertility rates (TCFRs) declined among the cohorts born between 1935 and 1950 (Figures WE-1 and WE-2). Estimated completed fertility then stabilized for the cohorts of the 1950s at about 1.8 births per woman.

While the decline of the TCFRs among the cohorts born between the early 1930s and the early 1950s was moderate and followed by stability up to the cohorts of the early 1960s, considerable changes in the age patterns of fertility were taking place. The cohorts born during the 1930s increasingly decided to have their children earlier in the reproductive period. Between the ages 19 to 24, the 1940 birth cohort in comparison to the 1930 cohort had about 30 per cent more children (Figure WE-3). When the women born in 1940 reached their 30s childbearing declined considerably compared to the older cohorts. Between the ages of 33 and 45, the 1940 compared to the 1930 birth cohort had between 40 and 60 per cent fewer children. The relatively modest decline of the TCFR between the cohorts born around 1930 and those around 1940 consisted of an increase of over 0.2 births per woman up to age 26 and a decline of almost 0.4 births per woman after that age (Table B-1). The peak of childbearing shifted from age 26 to 24 and the average age of childbearing declined from 28.0 to 26.4 (Figure WE-4).

Among the cohorts born during the 1940s the overall decline of completed fertility was mainly the result of women having fewer children during the prime years of childbearing. Large differences were quite evenly spread out between

*Table B-1. Fertility deficits and surpluses comparing birth cohorts, Belgium, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 27-49 | -0.362 | 22-37 | -0.356 | 17-25 | -0.196 |
| Surplus | 15-26[a] | +0.231 | 15-21 | +0.029 | 15-16 | +0.001 |
| | | | 38-49 | +0.001 | 26-49[b] | +0.202 |
| Total | | -0.131 | | -0.326 | | +0.007 |

Note: [a] Includes estimated data for ages 15-21 in the 1930 cohort, which were relatively small.
[b] Includes estimated data for ages 36-49 in the 1960 cohort, which were very small.

the ages of 23 to 32 when the age specific fertility rates were 16 to 27 per cent lower in the 1950 compared to the 1940 birth cohort (Figure WE-3). As the changes of fertility were centered on the principal ages of childbearing, there was only a slight change in the mean age of cohort childbearing (Figure WE-4).

The eventual TCFR of the 1960 birth cohort will most likely be identical to the 1950 one, but their age patterns of fertility differed significantly (Figures WE-1, WE-2 and WE-3). Women born in 1960 decided to have their children later than those born in 1950. Forty nine per cent of all children were born after the mother's 27th birthday in the 1960 cohort compared to 39 per cent among women born in 1950. The deficit of childbearing of young women was equal to the surplus of older ones (Table B-1). The peak of childbearing shifted from the ages 23-24 to age 26 and the mean age of childbearing increased from 26.2 to 27.3 (Figure WE-4).

The birth cohorts of the 1960s, which were in the middle of their childbearing during the 1990s, continued to have fewer children while young (Table B-2) and they were displaying a propensity to catch up with the level of fertility of the older cohorts (Figures WE-5 and WE-6). This was obvious for the cohorts born around 1965. After age 26 the age specific fertility rates for the 1965 cohort were above those of women born in 1960 (Figure WE-5). It also appears assured that the 1955 and the 1960 birth cohorts will catch up with the 1950 one (Figure WE-6). For the cohorts born around 1970 the lower fertility below age 25 was evident, however, as data were available only up to that age, it is not known whether, and what proportion of, the deficit will be made up when these women will be older. The cumulated cohort fertility rate of the young women born in 1975 was low, however almost equal to that of the 1970 cohort (Figures WE-5 and WE-6). Has the fertility decline run its course in Belgium?

*Table B-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Belgium, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility rate of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 35 | 1.702 | … | … | … | -1 | … | … | … |
| 30 | 1.319 | 1.179 | … | … | -9 | -15 | … | … |
| 25 | 0.642 | 0.485 | 0.399 | … | -23 | -35 | -38 | … |
| 20 | 0.112 | 0.072 | 0.055 | 0.052 | -26 | -52 | -51 | -28 |

## 4.2 | England and Wales

The total period fertility rate (TPFR) in England and Wales was around 4.9 births per woman from the second half of the 1850s through the 1870s. A gradual decline ensued and by the late 1910s/early 1920s the TPFR was 2.4, basically at replacement (Chesnais 1992).

As discussed in Chapter 2. Methods, the fertility decline, which started in the late 1870s, was generated by conscious parity-specific fertility control and until recently was generally accepted as the beginning of the fertility transition. British historical demographers have challenged the notion that the fertility transition began as late as the 1870s. Szreter and Garrett (2000) made a convincing case that deliberate fertility control on a mass basis started in England early in the 19th century. The principal proximate mechanism that brought about this earlier fertility decline was a considerable change in the nuptiality pattern, namely deliberate postponement of marriage. Between the 1810s and the 1840s the TPFR declined from over six to around five births per woman. According to Szreter and Garrett, "reproductive practices have been continually changing since the eighteenth century in response to the challenges and opportunities of the economic and social transpositions of industrialization" (p. 69). Some observers could say that for the present investigation this point is of limited relevance. We consider it important not only with respect to the issue of what were the mechanisms that were instrumental in bringing about the fertility transition and when, but also because, *inter alia*, it reinforces the belief that demographic and fertility behavior was and is interwoven with economic, social and political developments of societies.

During the major economic depression of the 1930s, the TPFR in England and Wales was among the lowest in Europe at 1.8 births per woman (Chesnais 1992 and Kirk 1946), considerably below replacement. It increased somewhat already towards the end of World War Two, and 1947 turned out to be an immediate post-war peak with a TPFR of 2.7. The main years of the baby boom were the late 1950s and the first half of the 1960s. The highest fertility was registered in 1963 to 1965, an average TPFR of 2.9 births per woman (Figure WE-1).

Hobcraft (1996) portrayed important factors that provide an interpretation of the baby boom. The following quotes do not convey the full story, but bring out the main features: "(t)he economic calculus of childbearing in the post-war period was surely altered by the welfare state, with universal free schooling, a free

National Health Service, and the introduction of child and maternity benefits" (p. 515). "The significant improvements in housing in the post-war period probably also played a role in enabling childbearing, perhaps particularly the growth of the Local Authority sector which provided an acceptable and accessible form of accommodation for early childbearers" (p. 515). "The separation of young people from the (usually depressed) home environment, provision of a regular income and extra support for married soldiers may all have played a role. …. The continuation of national service (up to 1963 in Britain) played a role in forcing young men into adulthood and breaking the nexus of parental control, with the consequence that setting up a home of their own became more imperative than in earlier times. Such a view might see this fundamental change in early socialization as a precipitating factor in the move towards earlier marriage, which the economic and institutional changes facilitated." (p. 516). Citing Lesthaeghe and Surkyn (1988), Hobcraft recognizes the impact of ideas and norms: "the baby boom corresponds therefore to the heyday of an older familial model whose achievement has been frustrated by depression and war, but spread thereafter to all social strata and even to those who did not become 'affluent workers'." … "(B)aby boom generators had … internalized values that were not so different from those of their parents" (pp. 514-515). Finally, Hobcraft indicates that the celebration of women's domestic role and the glorification of motherhood which were popular and widespread ideologies in the 1950s also played a part (p. 516).

High period fertility of the mid-1960s was followed by a precipitous decline of the TPFR from 2.9 in 1964 to 1.7 in 1977. For the last two decades of the 20th century the TPFR fluctuated in a narrow range around 1.7-1.8 children per woman (Figure WE-1).

Throughout the second half of the 20th century England and Wales enjoyed healthy economic growth even though at times interrupted by crises. By the end of the century its economy was transformed into one dominated by the service industry. Three quarters of its gross domestic product was generated by services and 80 per cent of the work force employed in that sector. General living standards were high and for the most part improving, comparable to the other countries of western Europe with a per capita gross national income in purchasing power parity in 2000 of $ 23,550 (This amount is for the UK; World Bank 2002). Levels of educational attainment were rising, especially for women, as was female labor force participation which reached 55 per cent in 1999.

"The United Kingdom Government [has not been pursuing] a population policy in the sense of actively trying to influence the overall size of the population, its age structure, or the components of change except in the field of immigration. … The current level of births has not been the cause of general anxiety" (United Nations *et al*. 1994f). The Government "encourages employers to adopt flexible working arrangements" in line with its commitment "to equality of opportunity." To "help balance work and domestic responsibilities" the Government encourages employers to provide childcare as well as "job sharing, part-time and term-time working, career brakes, and opportunities to work from home" (United Nations *et al*. 1994f). The Government also ensures "a full range of contraceptive services, including sterilization" … "freely available to all." .. "Current legislation permits abortions … if carried out in accordance with the criteria set out in the relevant act." … "The Government maintains a neutral stance on abortion" (United Nations *et al*. 1994f).

An illuminating description of the complex circumstances explaining the fertility decline and the maintenance of below replacement fertility during the last three and a half decades of the 20th century in England and Wales can again be found in Hobcraft (1996). The changing attitudes towards family formation and childbearing apparently have their roots in long-term economic changes. Hobcraft builds his case utilizing the findings of other scholars. First he turns to Lesthaeghe (1983): "… the historical transition and the most recent changes in nuptiality and fertility, took shape in the latter half of periods of rapid economic growth … rapid increases in real income fuel individual aspirations and the opening up of new employment opportunities creates an impression of lower economic vulnerability. This in turn allows individuals to be more self-reliant and more independent in the pursuit of their own goals, which ultimately stimulates self-orientation and greater aversion to long-term commitments." Hobcraft is further aided by Folbre (1994): "as long as male individualism is counterbalanced by female altruism, as long as rational economic man is taken care of by irrational, altruistic women, families play a particularly important (and unfair) role. But when women gain the freedom to act more like men, pursuing their rational self-interest, the price of caring labor goes up. More of it must be purchased in the market, provided by the state, or shared by men."

Numerous additional developments interacted to bring about the fertility decline of the late 1960s and 1970s. Men and women spent more time in attaining higher educational levels, larger proportions of women were gainfully employed, the security of employment decreased and it became increasingly

difficult to acquire affordable housing. Furthermore, a wider range and more effective means of fertility regulation became available, accessible, and were extensively used, mainly oral contraceptives and sterilization. In 1967 induced abortions were decriminalized.

We now turn to the analysis of the various aspects of cohort fertility. Completed fertility was on the increase among the cohorts born in the 1920s and early 1930s (Figures WE-1 and WE-2). A high plateau of total cohort fertility rates (TCFRs) was reached by women born between 1932 and 1939 — 2.4 births per woman. Among subsequent cohorts fertility declined steadily reaching replacement with women born in the mid-1940s and 1.9 in the cohorts of the early 1960s while still on a continuous descending slope.

The relatively stable TCFRs of the 1930s cohorts conceal major changes in the lifetime age patterns of fertility. Completed fertility of the women born in 1930 was almost the same as that of the 1940 cohort, 2.34 and 2.35 births per woman, respectively. Women of the 1930 cohort had relatively few children when they were young. Their fertility peaked at age 26 and tapered off moderately thereafter with 53 per cent of the eventual total number of children born after their 27$^{th}$ birthday (Figure WE-3). In contrast, women born in 1940 started to have children earlier with a fertility peak at age 24 and by their 27$^{th}$ birthday 62 per cent of their total number had been born. Between the ages of 15 and 27 the 1940 cohort had almost 0.4 more children than the 1930 cohort, whereas after that age their fertility was lower by the same amount (Table EW-1). The modified age pattern was also expressed in a considerable decline in the mean age of childbearing from age 27.9 to 26.2, in the respective cohorts (Figure WE-4).

*Table EW-1. Fertility deficits and surpluses comparing birth cohorts, England and Wales, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 28-49 | -0.352 | 21-31 | -0.440 | 16-26 | -0.251 |
| | | | | | 29 | -0.001 |
| Surplus | 15-27 | +0.356 | 15-20 | +0.075 | 15 | +0.001 |
| | | | 32-49 | +0.074 | 27-28 | +0.008 |
| | | | | | 30-49[a] | +0.147 |
| Total | | +0.004 | | -0.291 | | -0.096 |

Note: [a] Includes estimated data for ages 41-49 in the 1960 cohort, which were very small.

The shape of the lifetime fertility curve continued to change among the cohorts of the 1940s. The main difference between the 1940 and the 1950 birth cohorts was a considerable fertility decline in the prime ages of childbearing. Between the ages of 21 and 31 fertility was lower by more than 0.4 births in the latter cohort compared to the former one (Figure WE-3 and Table EW-1). At ages 24 and 25 the age-specific rates were 35 per cent lower in the 1950 cohort. Changes in the mean age of childbearing were small precisely because the major changes in the age pattern occurred in the central ages of the reproductive period (Figure WE-4). Nevertheless, the small increase from 26.2 to 26.5 years was significant because it signaled the beginning of the progression to delayed childbearing.

Women born during the 1950s decided to have fewer children when young, but they did bear more children later, especially in their 30s (Figure WE-3). Between the ages of 16 and 26 the 1960 cohort had 0.25 children less than the 1950 cohort, but in part this was compensated after age 30 by having 0.15 children more than the older women (Table EW-1). Correspondingly the mean age of childbearing increased to an estimated 27.8 years for the 1960 birth cohort (Figure WE-4).

The propensity to have fewer children when young for subsequent cohorts of women born during the 1960s and 1970s was evident but relatively mild in comparison to other western countries. It was mainly women in their 20s who were deciding to have fewer children (Figures WE-5 and WE-6, and Table EW-2). It was also obvious that these women were inclined to bear some of the foregone children later in their reproductive period. Note that the tail end of the curve of age specific fertility rates for the 1965 cohort was above that for 1960 in Figure WE-5 and that the differences in cumulative fertility rates get smaller after age 30 in Figure WE-6 as these curves turn upward.

*Table EW-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, England and Wales, cohorts 1960, 1965, 1970, 1975, 1980*

| Age | Cumulated fertility of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.729 | 1.622 | … | … | … | -9 | -11 | … | … | … |
| 30 | 1.292 | 1.173 | 1.083 | … | … | -16 | -17 | -16 | … | … |
| 25 | 0.666 | 0.589 | 0.566 | 0.517 | … | -27 | -23 | -15 | -12 | … |
| 20 | 0.156 | 0.132 | 0.152 | 0.147 | 0.154 | -34 | -38 | -2 | 11 | 1 |

There are signs that fertility may have ceased to decline at the younger ages. The fertility of teenagers has stabilized among the cohorts of the late 1960s and 1970s. Their childbearing was no longer declining (see last line in Table EW-2). Also, up to age 20 the curves in Figures WE-5 and WE-6 are close to each other.

Major changes have also taken place in the birth order of children born, in parity progression ratios and in parity distributions of cohorts.

One outstanding development is the trend in the proportion of women having first births and its complement, namely the proportion of childless women. Among the women born in the 1930s and early 1940s around 90 per cent had first births and ten per cent remained childless. With the cohorts born in the late 1940s the proportion of childless women started to increase and robust estimates for women born only 15 to 20 years later indicate that around 20 per cent or more may remain childless (Figures WE-7, WE-8 and WE-9).

Second order births peaked among the cohorts of the late 1930s and early 1940s. Over 75 per cent of women were having second births in these cohorts. In subsequent cohorts this proportion declined reaching about 65 per cent among women born in the early 1960s (Figure WE-7).

Third order births peaked among women born in the 1930s at about 40 per cent and declined to 30 per cent among the 1950s cohorts. The proportion of these births show signs of an increase in the cohorts of the late 1950s (Figure EW-7).

The proportions of women with fourth births had peaked with women born in the mid-1930s and those with fifth and higher order births with the cohorts of the early 1930s (Figure WE-7). In subsequent cohorts the proportions of fourth order births declined to about ten per cent and the fifth and higher order to five per cent. They apparently stabilized at these levels (Figure WE-7).

The parity progression ratios to the first birth (PPR0) were by definition the same as the proportions of first births. These were close to 90 per cent for the cohorts of the 1930s and thereafter they were diminishing (Figure WE-8). Among women born in the early 1960s the estimated PPR0s were below 80 per cent on a declining slope. The parity progression ratios from the first to the second birth were increasing among the cohorts born in the 1920s and reached 85 per cent for women born in the late 1930s. They remained at that high level ever since, although a moderate decline could be observed among the cohorts of

the 1950s. Around 55 per cent of women with second births decided to have at least a third one in the cohorts born in the late 1920s and early 1930s. This progression ratio declined to 40 per cent in subsequent cohorts, however among the women born in the 1950s an evident turnaround occurred so that the PPR2 for the 1950 cohort again came close to 50 per cent. Half of all women with three births went on to have fourth or higher order births among women born in the late 1920s and early 1930s. The PPR3 then diminished to around 35 per cent for women born in the late 1940s and remained at that level for subsequent cohorts (Figure WE-8).

It is difficult to detect a 'norm' of family size or numbers of children that women or couples were having. At best one can say that the most frequent number of children in families was two. Around 30 per cent of women born in the late 1920s had two children (Figure WE-9). This proportion increased to almost 45 per cent for women born in the late 1940s but decreased rapidly in subsequent cohorts. The proportion of families with three children was relatively stable. For the cohorts of the late 1930s slightly over a fifth of all women were at parity three. About one fifth of women of the late 1920s had only one child. The single child became even less popular in subsequent cohorts so that only about 11 per cent of women born in the early 1950s were of parity one with a slight increase thereafter. Among the cohorts of the 1930s a fifth of all women had four or more children. The percentage of these large families then declined and among the women born in the 1950s only about ten per cent were of this size. The most striking feature of the recent parity distribution of women in England and Wales was the rise in the proportion of women that may remain without any children among the cohorts of the 1950s and early 1960s (Figures WE-9 and WE-10).

## 4.3 | France

The first thing a student learns in an elementary demography course is that fertility was declining in France as early as in the late 18$^{th}$ century. The descent was gradual and in the middle of the 19$^{th}$ century fertility in France was considerably lower than in other European countries. In the 1860s the total period fertility rate (TPFR) in France was 3.5 births per woman, compared to 4.7 in Belgium, 5.0 in the Netherlands, 4.9 in England and Wales, 4.5 in Norway and Sweden (Chesnais 1992). France retained the distinction of lowest fertility in Europe at the beginning of the 20$^{th}$ century. It was joined by virtually all other

West European countries in reaching below replacement fertility in the 1920s and 1930s. Many of the other countries had lower fertility than France at that time (Kirk 1946).

France experienced a sustained strong post-war baby-boom, which lasted from 1946 through the mid-1960s and TPFRs were between 2.5 and 3.0 births per woman (Figure WE-1). This was followed by a pronounced fertility decline into the mid-1970s. Nevertheless, during the second half of the 20th century France was among the western countries with relatively high fertility. It was not until 1974 that its period fertility fell below replacement, but it never became very low. In 1976 the TPFR was 1.8 and throughout the last quarter of the century fluctuated between 1.7 and 1.9. As a matter of fact, from 1994 through 2000 the TPFR was on an upward slope increasing from 1.7 to 1.9 children per woman.

France is arguably the country in which population policies were introduced earlier than elsewhere and played a more central role than in most European countries throughout the 20th century. Bourgeois-Pichat (1974) elucidated three "sometimes conflicting movements of ideas" that were initiated late in the 19th century and molded French policies ever since: a 'movement' in favor of birth control advocated mainly as a means of liberating women, a 'movement' promoting social justice for families, and a 'movement' based on demographic concern, namely fear of the consequences of a fertility decline.

Contraception and induced abortion were legally severely restricted for the better part of the 20th century. It was not until 1967 that contraception was legalized and abortion was legalized under medical supervision in 1975.

The first measure intended to modify fertility and promote family justice was the introduction of family allowances for mailmen and telegraph operators adopted in the year 1900. In 1913 the measure was extended to the army and in 1916 to all civil servants. Family allowances were made universal by the adoption of the 'Family Code' in 1939. This 'action placed French legislation of the period ahead of all other legislation of this type' (Bourgeois-Pichat 1974). By 1945 a comprehensive set of family oriented measures was in place which was further extended over the years and continues to be in effect at the turn of the 21st century. The overall cost represented a meaningful proportion of the Gross National Income. In the 1960s it was four to five per cent compared to 3.3 per cent spent by the state on education. In 1999 expenditure on social protection in France was above the average for the European Union, although towards the

lower end of the wealthier countries at € 6,385 in purchasing power standards per capita. The social benefits expended for the family and children were also above average for the European Union (Abramovici 2002).

As indicated above, throughout the last three decades of the 20th century French fertility was one of the highest among the developed countries. Bourgeois-Pichat (1974) opined that "perhaps this is the result of the French policy on the family." Others, such as Sardon and Calot (1997), had no doubts that French population policies were effective in modifying fertility and provided international comparisons as proof thereof. Following the implementation of pronatalist policy measures in France after the Second World War, the gap between French total period fertility rates and those of another country increased when the level in France was higher than in the other country prior to the war. Conversely, the gap was narrowed when French fertility was below that of the other country prior to the war. For example, TPFRs in France and Belgium were about equal at approximately 2.0 births per woman during the mid-1930s, but in 1950 the TPFR in France was 2.9 compared to 2.4 in Belgium, a difference of 0.5 births.

The general trends of economic development in France were similar to those in the other West European countries. A difficult post-war recovery followed by robust growth during which the economy was transformed into one dominated by the service industry. In the early 1990s two thirds of the Gross National Product originated in this industry, with 60 and 80 per cent of men and women, respectively, employed therein. This required a well educated labor force. Close to 60 per cent of the younger generations toward the end of the century had acquired a full secondary education. Female labor force employment reached an all-time high of 79 per cent by 1994 (Toulemon and De Guibert-Lantoine 1998). The standard of living as measured by the Gross National Income per capita was among the best in Europe at purchasing power parity $ 24,470 in 2000 (World Bank 2002).

Completed fertility rose to a peak of 2.6 births per woman with the cohorts born around 1930 (Figures WE-1 and WE-2). Subsequently the total cohort fertility rate (TCFR) declined between the 1929 and the 1948 cohort from 2.6 to 2.1.

While the TCFR decline appeared to be proceeding smoothly the underlying life-time age patterns of cohort fertility were continuously changing. Fertility was declining among older women and increasing among women in the prime ages of childbearing in the cohorts born during the 1930s (Figure WE-3 and

Table F-1). After age 27, fertility was lower by 0.3 of a child in the 1940 compared to the 1930 cohort; between the ages of 34 and 45 age-specific fertility rates were 30 to 60 per cent lower. Among young women age 21 to 26 fertility was higher by 0.1 of a child. The peak of childbearing remained at age 24, but the mean age declined from 27.5 to 26.4 years (Figure WE-4).

The principal change among women of the cohorts born during the 1940s was a fertility decline in the central childbearing ages of between 22 and 34 with a decrease of 0.4 of a child between the 1940 and 1950 birth cohorts (Table F-1). This did not entail any change in the mean age of childbearing (Figure WE-4).

The TCFR remained constant at 2.1 births per woman for the cohorts born during the 1950s, but the age pattern continued to change. Women in the 1960 birth cohort were having their children later than those born in 1950. The peak age of childbearing shifted from 23 to 26 (Figure WE-3) and the estimated mean age of childbearing increased from 26.5 to 27.7 years (Figure WE-4).

The trend to have fewer children among women in their teens and 20s was continuing among women who were at the beginning or in the middle of their reproductive periods in the 1990s (Table F-2 and Figures WE-5 and WE-6). Also the propensity to delay or postpone some births is evident among the cohorts born during the 1950s and 1960s.

Each successive birth cohort born during the 1950s was having fewer children through age 26 or 27 than the older cohort, however, after age 27 the reverse was true. Consequently, the TCFRs of these cohorts were estimated to be roughly of the same order of magnitude, 2.1 children per woman (Figures WE-5

*Table F-1. Fertility deficits and surpluses comparing birth cohorts, France, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 15-20 | -0.013 | 22-34 | -0.367 | 15-24 | -0.228 |
| | 27-49 | -0.300 | 45-49 | -0.000 | | |
| Surplus | 21-26 | +0.094 | 15-21 | +0.031 | 25-49[a] | +0.224 |
| | | | 35-44 | +0.035 | | |
| Total | | -0.219 | | -0.301 | | -0.004 |

Note: [a] Includes estimated data for ages 40-49 in the 1960 cohort, which were very small.

*Table F-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, France, cohorts 1960, 1965, 1970 and 1975.*

| Age | Cumulated fertility rate of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 37 | 1.971 | … | … | … | -2 | … | … | … |
| 32 | 1.652 | 1.475 | … | … | -7 | -15 | … | … |
| 27 | 1.036 | 0.835 | 0.669 | … | -17 | -28 | -35 | … |
| 22 | 0.327 | 0.226 | 0.167 | 0.131 | -30 | -45 | -49 | -42 |

and WE-6). It is obvious that the eventual TCFR of the 1960 birth cohort will be roughly equal to that of the 1950 cohort, because almost all the delayed births had been born by age 40 of the mothers.

The cohorts born during the 1960s had similar traits. By age 27, for instance, the women born in 1970 had almost 0.4 fewer children than the 1960 birth cohort had by that age (Figure WE-6). In their late 20s and in their 30s the cohorts born in the 1960s were displaying a propensity to have more births than previous cohorts. Their age-specific rates were higher. The 1965 curve in Figure WE-5 was above the 1960 curve after age 29 and the 1970 curve rises above the 1965 and even above the 1960 curve before age 30. Both the 1965 and the 1970 curves in Figure WE-6 turn upward after age 27. The issue is whether, for instance, the 1970 cohort, which by age 27 had the shortfall of almost 0.4 of a child compared to the 1960 cohort, will make up the deficit, by the end of its reproductive period.

Data available for the cohorts born in the 1960s and early 1970s demonstrate the declining fertility of young women in these cohorts (Table F-2). By age 22 the CCFR of the 1970 cohort was 49 per cent below that of the cohort ten years older and by age 27 it was still 35 per cent lower. The fertility decline among young women might be slowing down. Among the cohorts born during the 1970s the differences of age specific fertility rates were smaller than between cohorts of the 1960s. The curves of the 1975 cohort in Figures WE-5 and WE-6 were quite close to those of the 1970 cohort and those of the 1980 cohort were almost indistinguishable from those of the 1975 cohort.

## 4.4 | Netherlands

Over the past one and a half centuries fertility in the Netherlands has often been different than in most other West European countries: it was relatively high and women had their children later than elsewhere so that they had a high age of mean childbearing. Already in the 1860s, the Netherlands had very high, if not the highest fertility in Europe west of the 'Hajnal line.' Throughout the last four decades of the 19th century its total period fertility rate (TPFR) was around five births per woman (Chesnais 1992). Its decline started in the 1880s and lasted into the 1930s essentially in parallel with other West European countries. Compared to these countries, fertility in the Netherlands distinguished itself by remaining considerably above the replacement level. Its average TPFR in the 1930s was 2.7 corresponding to a net reproduction rate of about 1.2, whereas practically all other West European countries had fertility below replacement, including, for instance, Denmark, Czechoslovakia, France and Latvia (Kirk 1946).

Following a period of reconstruction after World War Two, the Dutch economy and society prospered, especially during the 1960s. Unemployment was very low, educational levels increased, notably among women, whose employment also increased. The female labor force participation rate doubled compared to the 1950s to 46 per cent in 1990 (Latten and De Graaf 1997). An industrial economy was transformed into a service one. In the early 1990s over two thirds of the gross national product was produced in the service sector with 60 per cent of men and 84 per cent of women employed in this sector. The Dutch population was among the wealthiest in 2000 with a per capita gross national income in purchasing power parity of $ 26,170 (World Bank 2002).

The Government of the Netherlands has not had an 'official population policy, but other policy areas do implicitly relate to population issues.' Within the framework of 'equal opportunity' policy, 'men and women are provided with better opportunities for combining parenthood with other life-style options.' This policy includes 'public information campaigns, family planning facilities, maternal and child health care, child care, maternity and parental leave, child benefits and the like' (United Nations *et al.* 1994d). The government supports the availability of part-time work for women and promotes the involvement of men in sharing household and child care responsibilities. All modern methods of contraception are easily accessible and induced abortion is *de facto* available on request. As a result of comprehensive educational endeavors and reasonable

communication between generations, induced abortion rates were among the lowest in the world (Jones *et al*. 1989).

Relatively high fertility in the Netherlands persisted after the Second World War with a peak TPFR of 4.0 in 1946 and a vigorous baby boom through the mid-1960s with the TPFR continuously above 3.0. A precipitous fertility decline between the mid-1960s and mid-1970s followed. In 1975 the TPFR was 1.7 and for the last quarter of the 20th century it fluctuated between 1.5 and 1.7 children per woman. The most recent data for the years 1996 to 2000 indicate a moderate period fertility increase (Figure WE-1).

Dutch women born during the late 1920s had a total cohort fertility rate (TCFR) of 2.7 births per woman. Ever since then cohort fertility has descended (Figures WE-1 and WE-2). For almost 20 cohorts fertility declined rapidly and women born in the late 1940s reached a TCFR of 1.9. Among the cohorts of the 1950s the further descent was almost imperceptible, but a slight quickening of the pace of decline is estimated for the cohorts born during the early 1960s. Completed fertility for the 1965 birth cohort is estimated at slightly below 1.8 children per woman (Figures WE-1 and WE-2).

Altogether Dutch women were bearing their children late in the reproductive period. Only about 35 per cent of the children of the 1930 cohort, for instance, were born before mother's 27th birthday compared to between 40 and 56 per cent in the other West European countries (Table CO-3). The peak of childbearing for this cohort in the Netherlands was age 28 (Figure WE-3). The fertility decline among the cohorts of the 1930s was combined with major age pattern changes of childbearing, which shifted distinctly into the younger ages. Women born in 1940 had 0.7 fewer children than the 1930 cohort after their 27th birthday and 0.2 children more before that age (Table NL-1). The overall fertility decline continued among the cohorts born during the 1940s. The main change was in the middle of the reproductive period between the ages of 22 and 33, a loss of 0.4 of a child (Table NL-1). The negligible fertility decline among cohorts born during the 1950s was accompanied by a considerable delay of fertility. The peak of childbearing of age 26 in the 1950 birth cohort shifted to age 30 in the 1960 cohort. Comparing these two cohorts, almost 0.4 fewer children were born before mother's 29th birthday, and over 0.3 children more after that age (Table NL-1).

*Table NL-1. Fertility deficits and surpluses comparing birth cohorts, the Netherlands, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 27-49 | -0.689 | 22-33 | -0.416 | 15-28 | -0.372 |
| | | | 44-49 | -0.002 | | |
| Surplus | 15-26 | +0.234 | 15-21 | +0.042 | 29-49[a] | +0.333 |
| | | | 34-43 | +0.045 | | |
| Total | | -0.455 | | -0.331 | | -0.039 |

Note: [a] Includes estimated data for ages 41-49 in the 1960 cohort, which were very small.

Changes in the age patterns of fertility were reflected in the trend of the mean age of childbearing (Figure WE-4). The high average childbearing age of 29.2 of the 1930 cohort declined steeply to 27.1 among women born in 1940. Although fertility continued its decline, the mean age of the 1950 cohort was almost the same as in the 1940 one, because this descent was concentrated in the prime ages of childbearing. The subsequent shift to later childbearing of the birth cohorts born during the 1950s was reflected in a sharp rise of the average age. The 1960 cohort wound up essentially with the same mean age of childbearing as the 1930 cohort, namely 29.3.

In the process of shifting to later childbearing, the women born in 1960 also displayed a strong propensity to actually bear children later in life, which they decided to forego when in their teens and early to mid-20s. By age 28 the 1960 cohort had borne 0.36 fewer children than the 1950 one, but by age 39 the difference was only 0.08, and it was estimated that the 1960 TCFR would eventually be smaller by a mere 0.05 births (Figure WE-6).

These two trends appeared to be continuing among the cohorts that were in the middle of their childbearing in 2000, namely those born during the 1960s and early 1970s. One cohort after the next was having fewer children early in the reproductive period (Table NL-2), and each of these cohorts was displaying a propensity to compensate for this deficit later in life (Figures WE-5 and WE-6). In the Netherlands the turning point was around age 28 for those cohorts which reached that age by the year 2000. While there was the propensity to catch up with older cohorts, the deficits early in the reproductive period of successive cohorts were becoming larger in comparison, for instance, to the 1950 cohort, which already had fertility below the replacement level at 1.9 children per

*Table NL-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, the Netherlands, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.609 | 1.487 | … | … | … | -8 | -11 | … | … | … |
| 30 | 1.048 | 0.882 | 0.770 | … | … | -25 | -27 | -27 | … | … |
| 25 | 0.382 | 0.293 | 0.239 | 0.225 | … | -44 | -44 | -38 | -23 | … |
| 20 | 0.047 | 0.037 | 0.035 | 0.034 | 0.032 | -57 | -55 | -26 | -8 | -10 |

woman. The 1960 cohort, which will in all likelihood almost catch up with the 1950 one, had a deficit of 0.37 children by women's 29th birthday, but the 1970 cohort compared to the 1950 one had a deficit of 0.64 children by that age. This implies the need for high fertility for the 1970 cohort after that age, if it were to aim for a TCFR anywhere close to the 1.9 children per woman of the 1950 birth cohort.

Figure WE-5 illustrates the differences in age-specific fertility rates between the successive cohorts. The trend of ever lower early childbearing is obvious for the 1965, 1970 and even for the 1975 birth cohort. The cross-over to higher age-specific fertility appears to be shifting to the left. In the 1965 birth cohort starting with age 31 fertility exceeds that of the five years older cohort. In the 1970 cohort it is at age 30 that these women have relatively high fertility. In comparison to the older cohort, women of the 1975 one had slightly higher fertility at age 25, but it is not clear whether this trend will continue.

Trends of the proportion of women with first order births and its complement, women remaining childless, are of major interest when analyzing birth orders, parity and parity progression ratios. Among the cohorts of the late 1920s around 83 to 85 per cent of women had first births. This proportion increased to 89 per cent for women born in the late 1930s and early 1940s. Ever since there has been a gradual decline in this percentage. Estimates for the women born in the early 1960s indicated that over 80 per cent will have first births. Thus the complements —the proportions of childless women for these cohorts— went from initially 15-17 per cent to 11 and finally to close to 20 per cent for the mid-1960s birth cohorts. In modified form this phenomenon presents itself also as the parity progression ratio from zero to one child, and in parity/'family size' (Figures WE-7, WE-8, WE-9 and WE-10).

The proportions of women who had second births at first increased among the women born in the late 1920s from slightly over 70 per cent to reach a high plateau of almost 80 per cent among women born in the late 1930s. Among subsequent cohorts this proportion gradually declined to around 65 per cent for those born in the early 1960s. The percentages of women with third, fourth, fifth and higher order births declined considerably and stabilized among women of the cohorts born after the mid-1940s: around 15 per cent for third order, seven per cent for fourth order and below five per cent for fifth and higher order births (Figure WE-7).

The parity progression ratio from first to second birth, PPR1, declined gradually from the birth cohorts of the mid-1930s to those of the early 1960s, but was relatively high. It was still over 80 per cent for the latter (Figure WE-8). Proportions of women with second births going on to third births, PPR2, declined steeply from over 60 per cent for the cohorts born around 1930 to 30 per cent for those born in the late 1940s. Among the cohorts of the 1950s and early 1960s, PPR2 was between 30 and 40 per cent. The PPR3 also declined precipitously from over 50 to 25 per cent from the birth cohorts of the early 1930s to those of the late 1940s. For subsequent cohorts the PPR3 was quite stable around 27 per cent.

The main change in the parity distribution of women from the birth cohorts of the mid-1920s to those of the early 1960s was a switch from 'large' to small families (Figure WE-9). Among women born in the mid-1920s 30 per cent had four or more children and about 20 per cent had three children. Among women born 20 years later, in the mid-1940s, the proportion of those with four or more births had declined to around six per cent. The proportion of women with three children increased from the initial 20 per cent to 25 per cent in the birth cohorts of the late 1930s and then fell subsequently to between 16 and 18 per cent for the cohorts of the late 1940s through those of the early 1960s.

Women who had no more than two children, those of parity one and two, were a minority in the late 1920s cohorts. They constituted up to 35 per cent of the total (Figure WE-9). Women/couples who had two children grew from less than 25 per cent to over 50 per cent in the cohorts born in 1946 and 1947, but then declined to around 42 per cent among women born in the late 1950s and early 1960s. The proportion of women with only one child has always been small, yet it did gradually increase, from about ten per cent among women born in the 1930s to 16 per cent in the cohorts of the early 1960s.

As mentioned above, the proportion of childless women was on the increase starting with the cohorts of the early 1940s and constituted around 18 per cent among the cohorts born in the early 1960s. Judging from the trends among women who were in the middle of their childbearing in 2000, these percentages are not likely to rise much further (Figure WE-10). For instance, about 45 per cent of the 1945 birth cohort at age 25 was childless and this increased to around 80 per cent for the cohorts of the late 1960s, however, it appeared to have stabilized at that level. Similarly, the proportions childless at age 30 increased considerably from 20 per cent in the cohorts of the early 1940s to 50 per cent among the early 1960s cohorts, but again they appeared to be leveling off.

## 4.5 | Comparative perspective

In the early 1960s the TCFRs of the four countries were close to the average of western countries within a range of 1.8 to 2.1 children per woman (Table CO-2; Figure CO-1 and Appendix 1). Completed fertility had declined between the cohorts of 1930 through those of the early to mid-1960s by 21 to 24 per cent in Belgium, England and Wales and France; and almost 35 per cent in the Netherlands. The TCFR decline had slowed down among the cohorts of the 1950s and even leveled off altogether in Belgium and France, but it was estimated that a renewed moderate fertility descent set in among the cohorts of the early 1960s.

The changes of the age patterns of cohort fertility in this region were similar to those in other western countries. Among the cohorts of the 1930s childbearing was being advanced so that the proportion of births of women before the 27$^{th}$ birthday increased from about 50 per cent to 60 per cent in the cohorts born around 1940 (Tables CO-3, CO-4, CO-5 and CO-6). The Netherlands was an exception with considerably lower percentages. The proportions born by women before and after the 27$^{th}$ birthday hardly changed among the 1940s birth cohorts with fertility declining about evenly before and after that age. The cohorts of the late 1940s started postponing births and from there on the proportions of births to women in their late 20s and 30s of the 1950s and early 1960s birth cohorts were increasing. Women born in the early 1960s decided to have significantly fewer births early in the fertile period. In the Netherlands only about 28 per cent of all births of the 1965 cohort were born during the first half of the reproductive period and an estimated 72 per cent after the 27$^{th}$ birthday.

The advancing of childbearing among the 1930s cohorts differed from country to country. In England and Wales the increased childbearing of young women of

the cohorts born around 1940 was sufficient to offset the low fertility when these women were older. Not so in France and the Netherlands. Young women of the 1940s cohorts had only moderately elevated childbearing compared to ten years their elders. Only about a third of the fertility deficit when these women were older had been born when they were young (Table CO-6). In Belgium over 60 per cent of births were 'advanced' by the 1940 cohort.[20]

The cohorts of the 1950s in all the countries of the region were quite vigorous in compensating for the births that were being postponed when they were young (Table CO-6). In Belgium and France the whole deficits of young childbearing were offset when women were older. Women in the Netherlands were not far behind with about 90 per cent of the postponed births being born later in the fertile period. Only in England and Wales the 'catching-up' was weak with 60 per cent of the postponed births born when women were in their 30s.

The strong propensity to catch up was not continued by the cohorts of the early 1960s. In England and Wales none of the postponed births were born later. In France and the Netherlands only around one third of the birth deficits of the early 1960s birth cohorts were made up (Table CO-6).

Although the propensity of catching up was weakening among the cohorts of the early 1960s, the fertility decline among young women, the presumed postponement of births, was continuing among the cohorts of the 1960s (Table CO-7). In England and Wales the postponing of childbearing was continuing also among the cohorts of the early 1970s, but apparently not so in the Netherlands. Preliminary data for the cohorts of the early 1970s indicate continuing postponement of births in Belgium, but not in France (not evident in the tables).

Calculations in Table CO-8 illustrate that it would be more difficult in Belgium and France than in England and Wales or the Netherlands for the 1970 cohorts to catch up with the TCFRs of the 1960 cohorts. Childbearing of the 1970 birth cohorts after the mothers' 27$^{th}$ birthday would have to increase by 31 per cent in Belgium and by 34 per cent in France to equal the TCFRs of the 1960s cohorts. In England and Wales and the Netherlands 15 and 19 per cent higher fertility, respectively, would suffice to reach such goals. For the 1970 cohorts to reach replacement fertility the required increases in childbearing would be even larger (Table CO-8).

[20] This can be calculated from data in Table B-1, but does not appear in Table CO-6.

The decline in childbearing of very young women has been under way among almost 30 cohorts and appears to be leveling off among the cohorts of the late 1970s in all four countries.[21] Very few children, only about 0.1 births per woman, were being borne by women before their 22nd birthday in the 1975 birth cohort in Belgium, France and the Netherlands (Table CO-9). In England and Wales it was 0.3 births per woman.

Notable changes in birth order distributions, parity progression ratios and parity distributions occurred among the more than 30 cohorts under study in this region. The decline of the TCFRs in the cohorts of the 1930s and early 1940s was mostly brought about by the decline in the proportions of women with higher order births, which was more pronounced in the Netherlands than in England and Wales, the only two countries for which data were available (Figures WE-7 and WE-8). The subsequent fertility decline from the cohorts of the mid-1940s onward was driven by a decrease in the proportions of women with first and second order births. The proportion of women bearing first children was declining from around 90 per cent in the cohorts of the mid-1940s to around 80 per cent in the cohorts of the early 1960s. The reverse of this development was an increase in the proportions not having any children. In the Netherlands one-fifth of women may remain childless, in England and Wales it might be even higher in the cohorts of the 1960s (Table CO-4). The trends were exhibiting a more moderate increase in the Netherlands than in England and Wales.

In the parity distributions the 'two-child' family was the most prevalent. In the cohorts of the mid-1940s 40 to 50 per cent of women had two children. In the two countries for which data are available the two-child family was on the decline, although stabilizing in the Netherlands among cohorts of the late 1950s and early 1960s (Figure WE-9). Parity zero may become the second most prevalent among the cohorts of the 1960s.

## 4.6 | Conclusions

At the end of the 20th century total period fertility rates of populations in this region were around the average for western countries of 1.6 births per woman and the average completed fertility of the early 1960s birth cohorts was close to

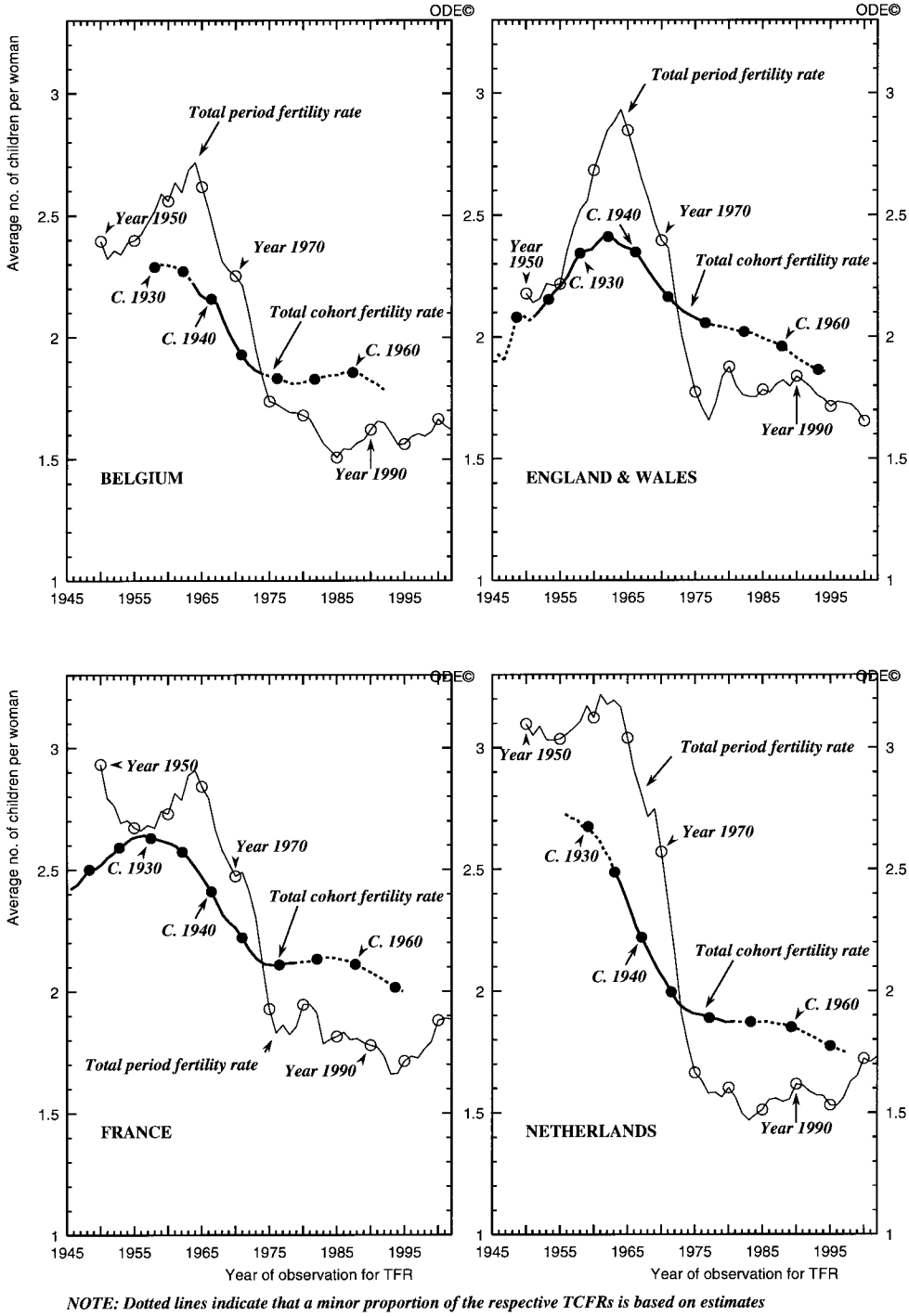
[21] Preliminary 1978 data for Belgium and France not shown in Table CO-9 corroborate this observation.

the average of 1.9 births per woman with France towards the high end. At the same time, the analysis of cohort fertility indicates that a further decline of fertility in this region can be expected. It appears certain that fertility will at least remain at current levels and the prospects for it to be raised to the replacement level in the near future are tenuous. Most probably a further decline of cohort fertility will occur in the foreseeable future, i.e. among the birth cohorts of the 1970s. This thesis is based on the following findings:

- Completed fertility of the cohorts that were towards the end of their fertile lives around 2000 was declining;
- Fertility of young women beginning with the cohorts of the late 1940s was continuously declining and the proportion of total childbearing in the second half of the reproductive period was steadily increasing;
- The cohorts of the 1950s by and large made up in the second half of their reproductive period the births they had earlier postponed, but the propensity to compensate for low fertility when women were young was fading among cohorts born in the early 1960s; in England and Wales there was no compensation at all;
- Childbearing after the 27$^{th}$ birthday would have to be 15 to 25 per cent higher in the 1970 compared to the 1960 cohorts for the younger cohorts to catch up with the older ones; fertility in the second half of the reproductive period would have to increase marginally more for the 1970 cohorts to attain replacement fertility;
- Proportions of women having first births were declining and estimates of the proportions of childless women reached around 20 per cent in the cohorts of the early 1960s;[22]
- The two-child family became the most prevalent among the cohorts of the mid-1940s and has been declining in subsequent cohorts;[23]
- Women with no children may become the second most frequent parity among cohorts of the early 1960s,[24] their proportion could conceivably continue to increase given the declining fertility among young women and the declining propensity to compensate with higher fertility when women reached their 30s.

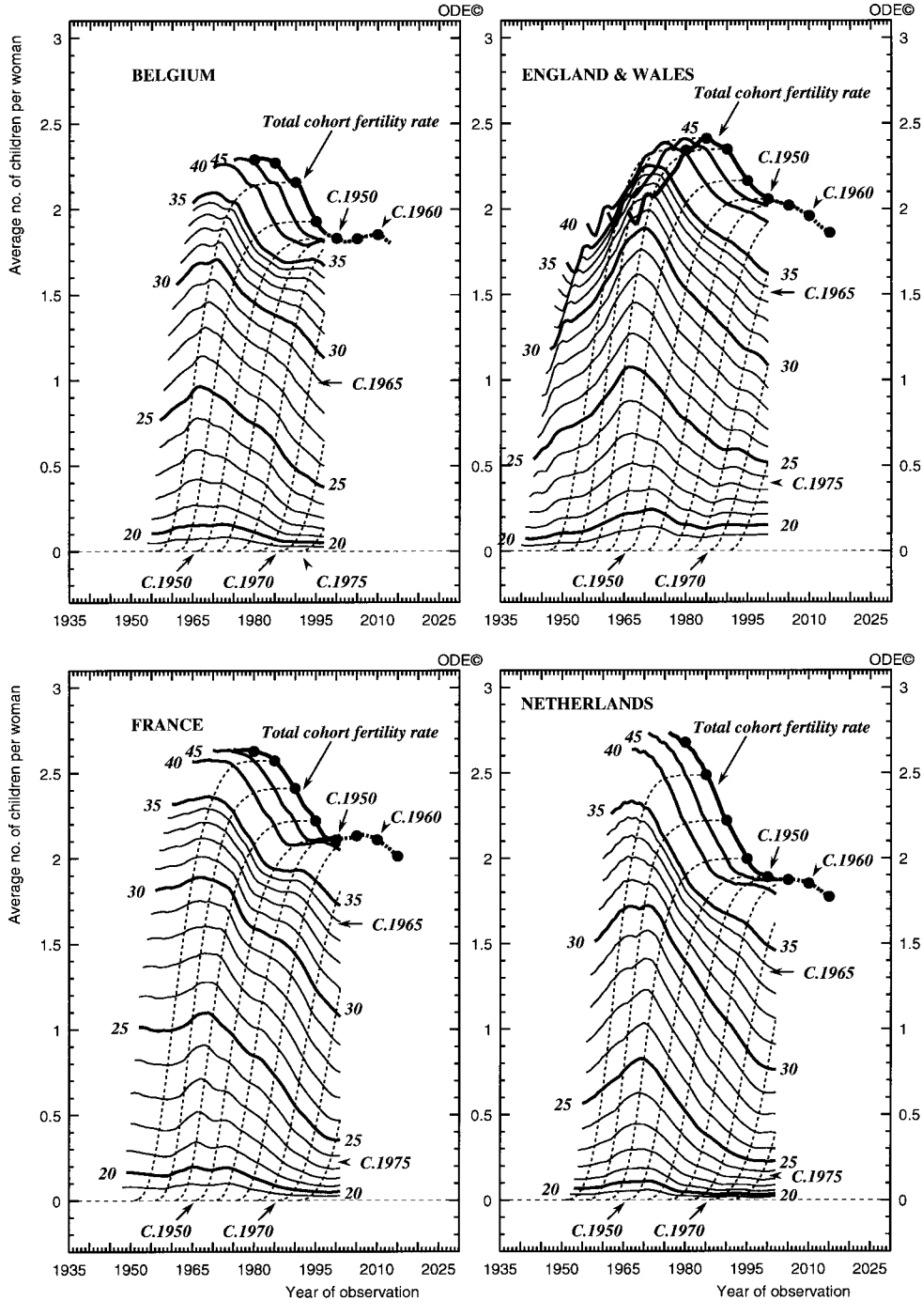
[22] Data were available only for England and Wales and the Netherlands.
[23] Data were available only for England and Wales and the Netherlands.
[24] Data were available only for England and Wales and the Netherlands.

**Figure WE-1 WESTERN EUROPE, 1950-2000**
**Total period fertility rate and total cohort fertility lagged by the average age at childbearing**




*NOTE: Dotted lines indicate that a minor proportion of the respective TCFRs is based on estimates*

**Figure WE-2 WESTERN EUROPE**
**Cumulated cohort fertility at specified ages, birth cohorts 1930-1975**




*NOTE: The part of the TCFR line which is dotted indicates that a minor proportion of the TCFR is based on estimates*

**Figure WE-3 WESTERN EUROPE**
**Age-specific fertility rates, birth cohorts 1930, 1940, 1950 and 1960**

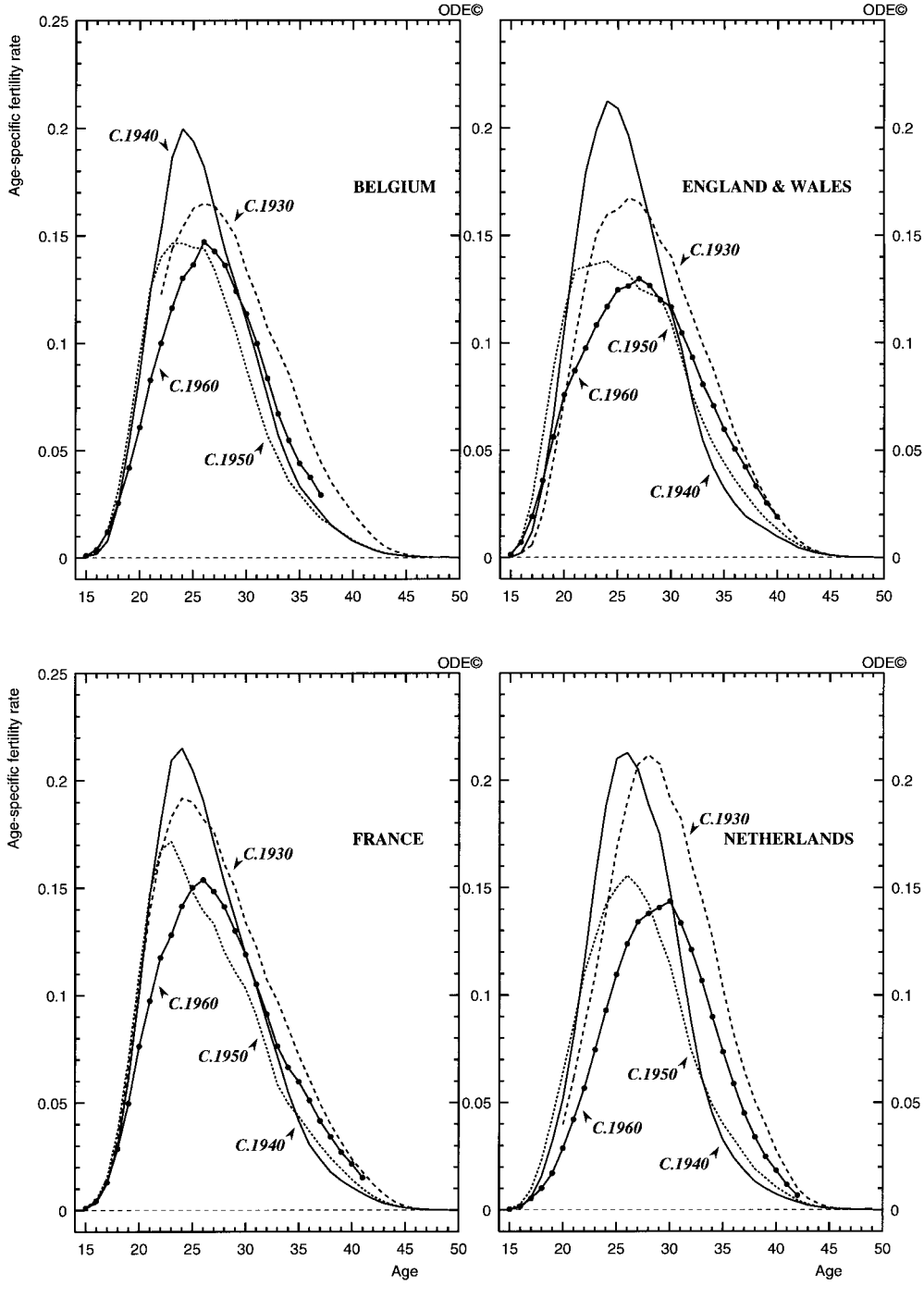
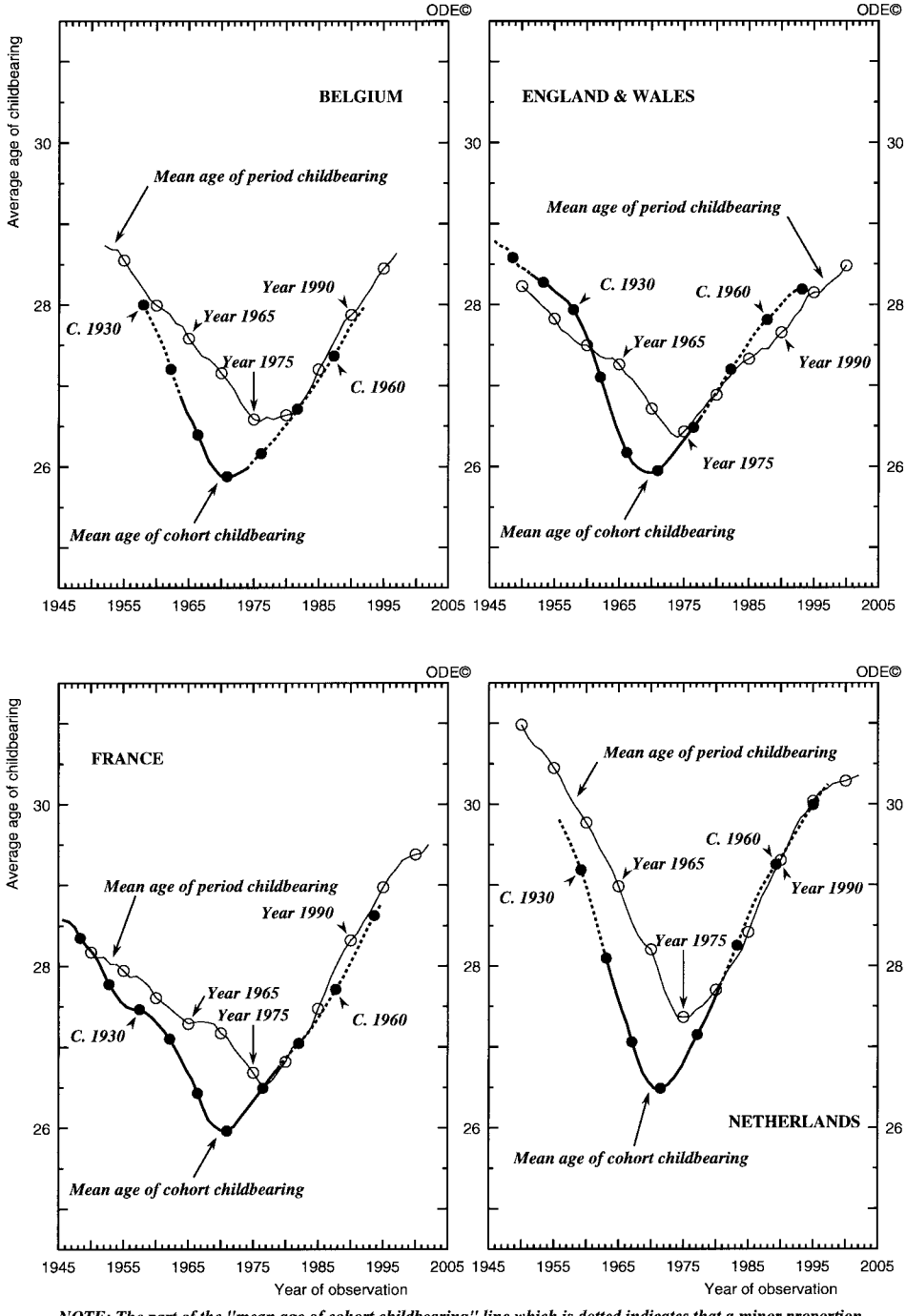


**Figure WE-4 WESTERN EUROPE, 1945-2000**
**Period average age of childbearing and cohort average age of childbearing lagged by the average age at childbearing**




*NOTE: The part of the "mean age of cohort childbearing" line which is dotted indicates that a minor proportion of the respective age-specific rates are based on estimates*

**Figure WE-5 WESTERN EUROPE**
**Age-specific fertility rates, birth cohorts 1960, 1965, 1970, 1975 and 1980**

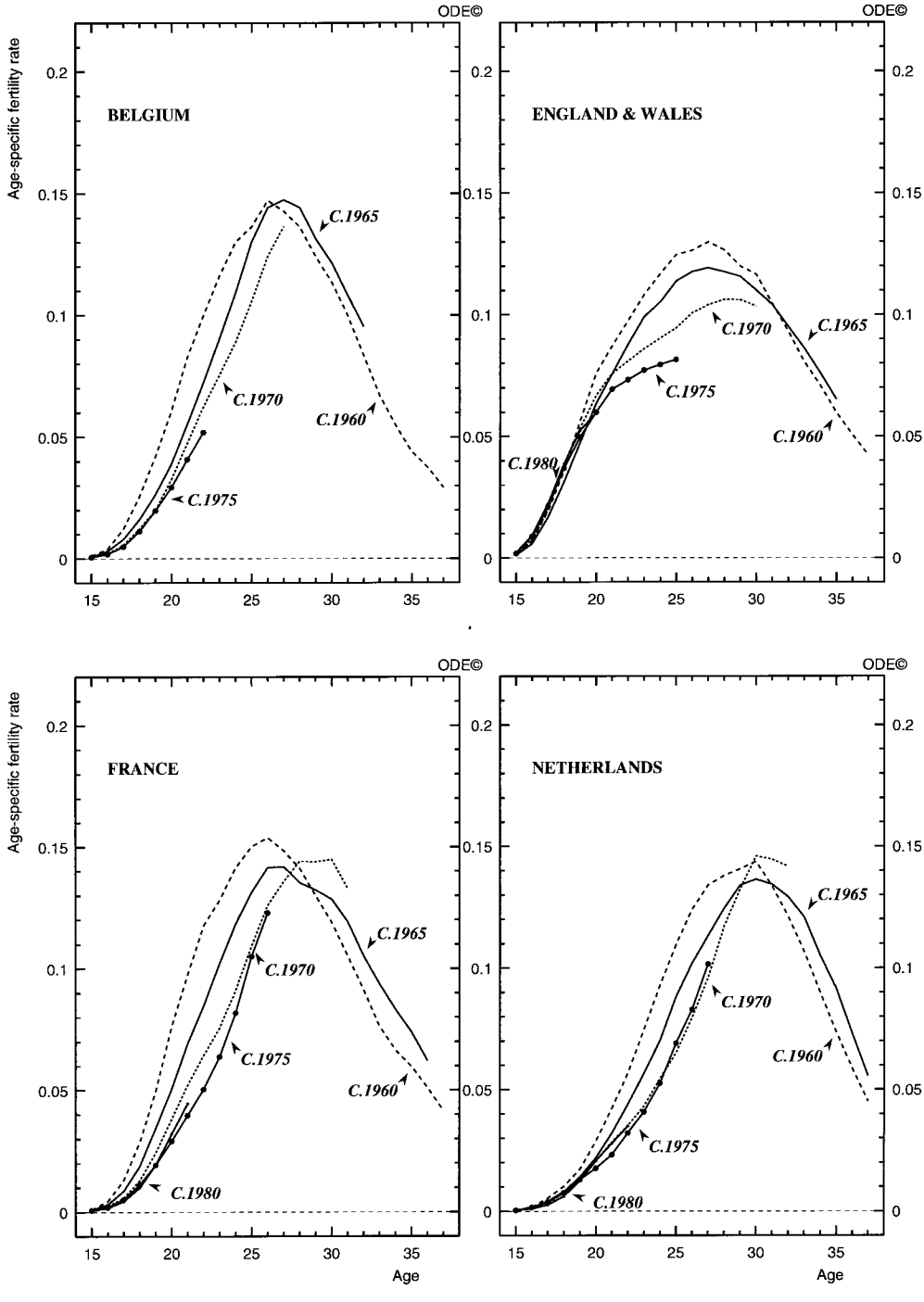


**Figure WE-6 WESTERN EUROPE**
**Differences in cumulative age-specific cohort fertility rates between base and subsequent cohorts, women born in 1950 (base), 1955, 1960, 1965, 1970, 1975 and 1980**

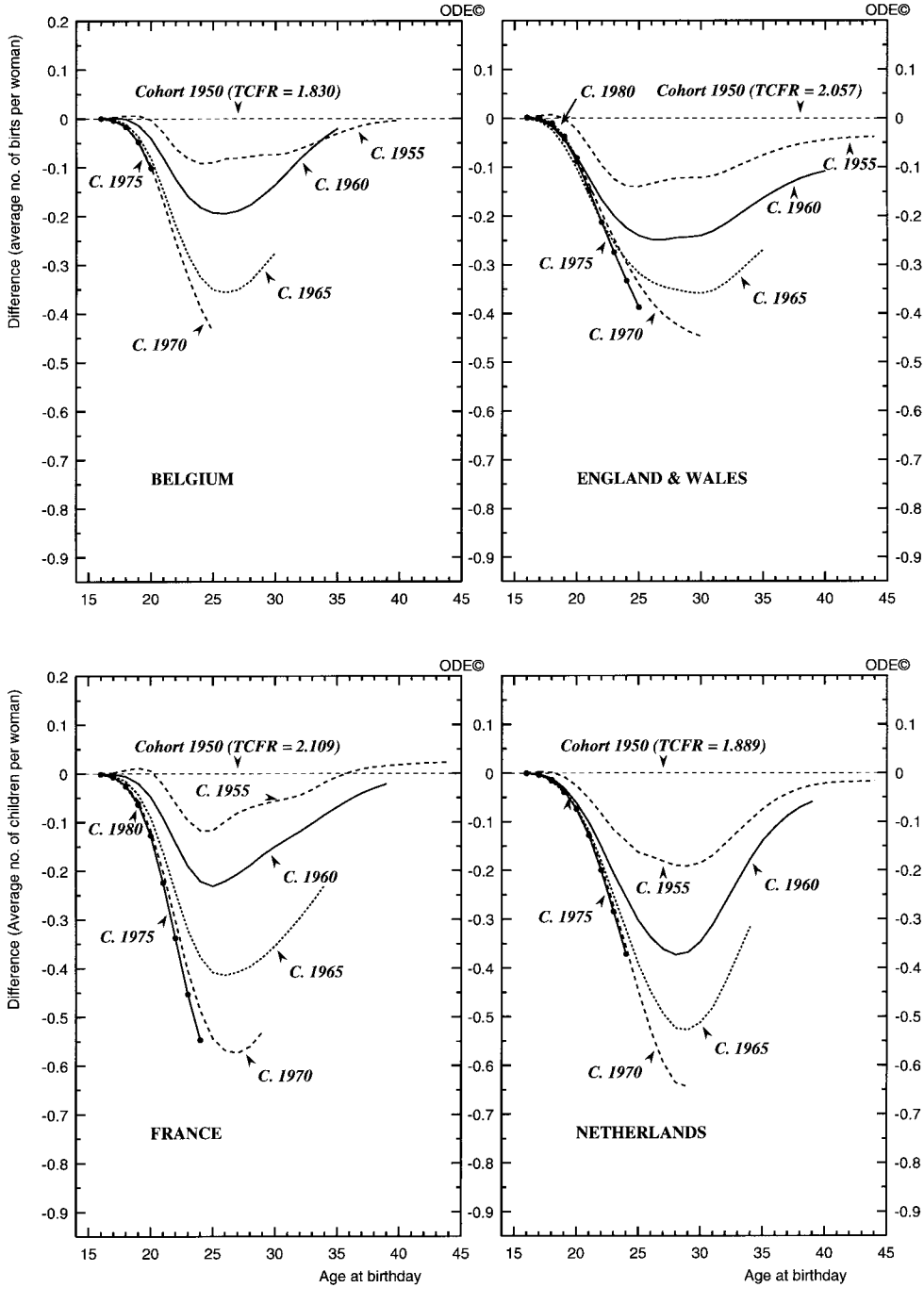


**Figure WE-7 WESTERN EUROPE**
**Total cohort fertility rates by biological birth order, birth cohorts 1926 to 1967**

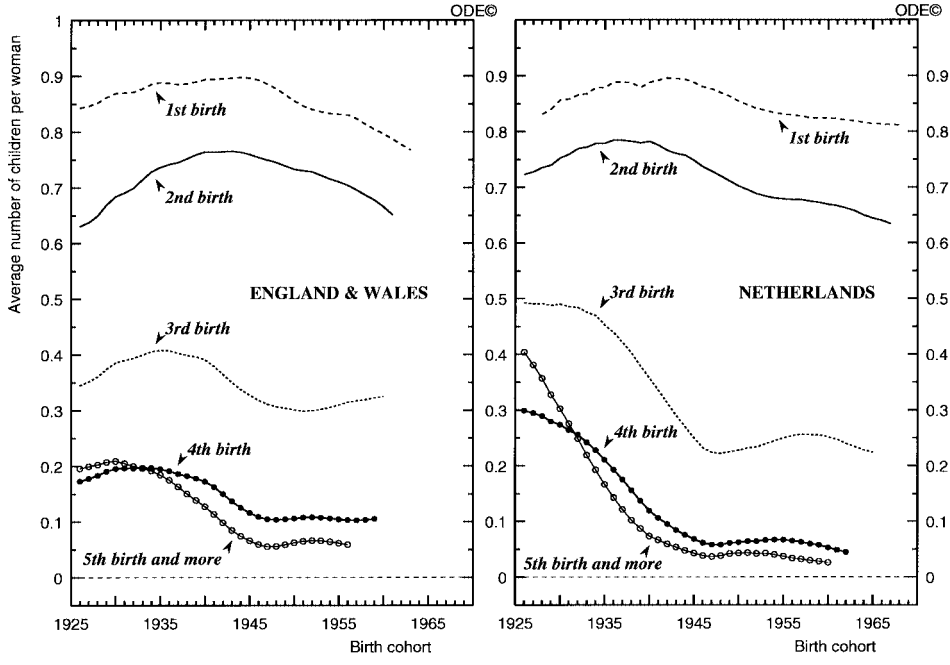



**Figure WE-8 WESTERN EUROPE**
**Parity progression ratios, birth cohorts 1926 to 1967**

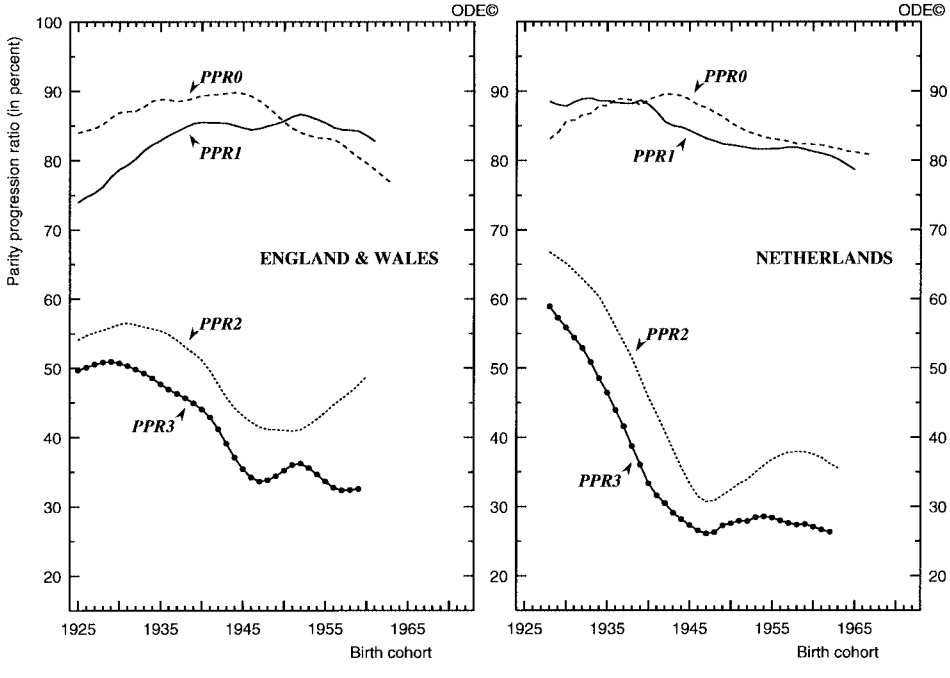


**Figure WE-9 WESTERN EUROPE**
**Parity distribution of completed fertility, birth cohorts 1926 to 1967 (in percent)**

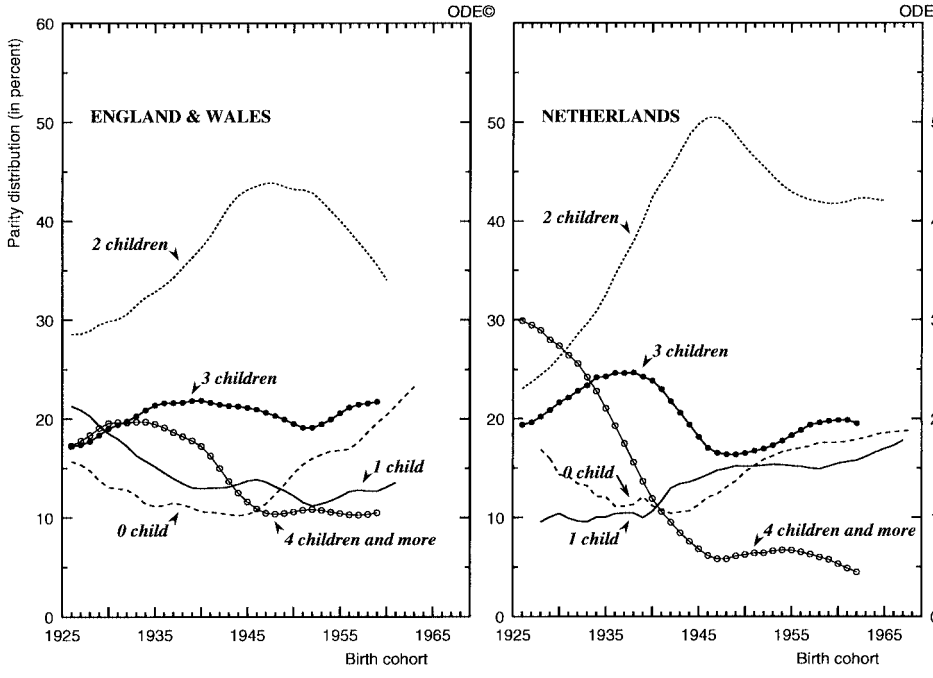
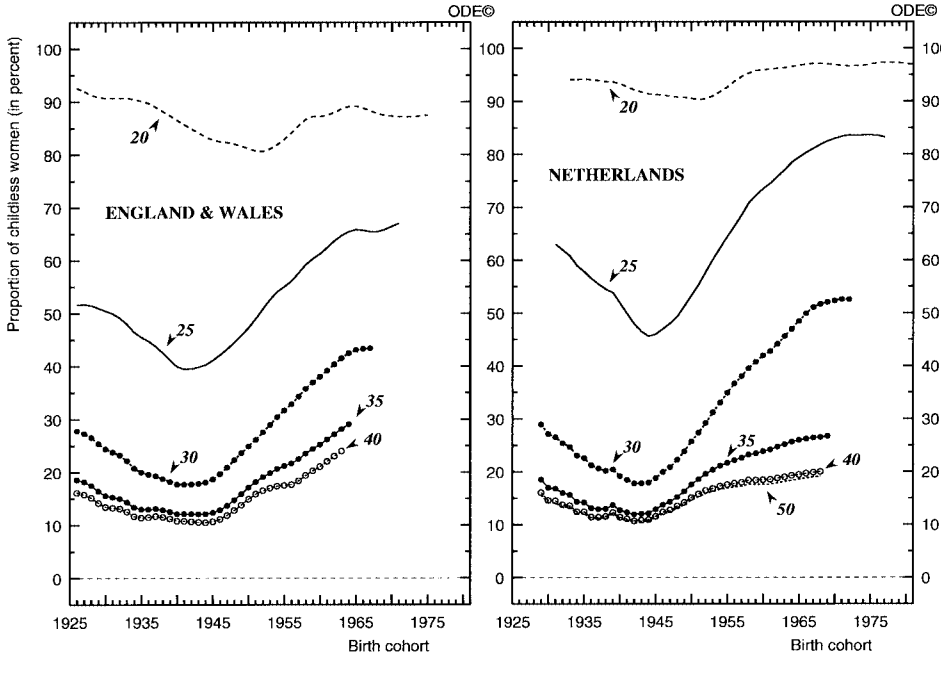



**Figure WE-10 WESTERN EUROPE**
**Proportions of childless women, selected ages, birth cohorts 1926 to 1980**



# 5. West Central Europe

Culturally the countries in this region —Austria, the former Federal Republic of Germany, the former German Democratic Republic and Switzerland— are quite homogeneous as the vast majority of people shares a similar heritage and speaks the same language, German. The homogeneity is not absolute as Switzerland also has its French and Italian populations and, in addition, all three countries have large immigrant populations, mainly from the Balkans, southern Europe and Turkey.

The homogeneity was also affected by political developments of the 20th century, at first by the reign of the Nazi regime in Germany and, more importantly, later Germany was divided into two countries with very different political, economic and social systems.

This posed a dilemma of how to organize the analysis for Germany. Given the fact that up to and including the Second World War Germany was one country and since 1990 it was again unified, the analysis could have been a joint one. On the other hand, for over 40 years there were two German republics with distinctly different political systems which determined differences in many other spheres of personal and societal life. Among them fertility behavior was subject to the many differences of the political, economic and social infrastructures of the two countries. Consequently, to conduct separate analyses would seem justified as well. Moreover, the analysis of the whole project focuses predominantly on the second half of the 20th century, and for most of this period Germany was divided. Our decision was to combine the two approaches, and to include the two 'country' studies in a single unit. One, this preserves the long-term framework. Two, useful insights can be gained by comparing the two populations not only during the periods when they were apart, but also in the aftermath when the influences of the different systems lingered on. Three, this will demonstrate the degree to which the two countries are again becoming demographically similar.

Following the Second World War, Austria and Germany were faced with the need to rebuild their economies. The Federal Republic of Germany and Austria with initial assistance from the Marshall Plan experienced remarkable economic growth and together with Switzerland joined the other western countries in building advanced capitalist welfare states. The German Democratic Republic supported by the Soviet Union became the most prosperous of the European socialist countries.

In the year 2000 the three countries were as wealthy as the West and North European countries with reasonable income distributions,[25] large middle classes and a minimum of poverty.[26] Almost a third of their Gross National Products were spent on social protection. Above average proportions of social benefits in Austria and Germany were spent on children and families, whereas Switzerland lagged in this respect.[27]

Demographically these countries stand out in that during the last quarter of the 20th century they had the lowest fertility of the populations in this study. For example, the population of the former Federal Republic experienced the lowest completed fertility rate of 1.55 births per woman among the 1962 cohorts and the population of the former German Democratic Republic had one of the lowest period fertility rates of 1.22 births per woman in 2000, up from a low of 0.77 in 1993 and 1994. During the last decade or so of the 20th century South European countries were 'catching up' and experiencing equally low fertility.

## 5.1 | Austria

Between the two World Wars, Austria distinguished itself by having the lowest fertility in Europe and in the world; Vienna had the lowest fertility among large cities. In 1933-34 Austria had a total period fertility rate (TPFR) of 1.6 and a net

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[25] Cross national income per capita in 2000 was $ 26,310, $ 25,010 and $ 24,970 in purchasing power parity and the Gini coefficients were 31.0, 30.0 and 33.1 in Austria, Germany and Switzerland, respectively (World Bank 2002).

[26] A proportion of the population in the former GDR suffered from economic deprivation after reunification.

[27] The proportions of social benefits spent on the family and children were over ten per cent of total social benefits in Austria and Germany, but only five per cent in Switzerland (Abramovici 2002).

reproduction rate (NRR) equal to 0.66; Vienna's TPFR was 0.6 and its NRR 0.25 (Kirk 1946: pp. 55-56).

To arrive at such low numbers took only a few decades. Austria's fertility transition was comparatively fast. Throughout the 19th century the crude birth rate (CBR) was between 31 and 35 per thousand inhabitants (Gisser 1979).[28] During the last three decades of the century there was an almost imperceptible fertility decline, but basically the CBR was oscillating between 31 and 34 per thousand inhabitants. Even during the first decade of the 20th century the average CBR was still 29.1 (Statistik Austria 2001). A precipitous decline took place during the following two to three decades. The crude birth rate stood at 12.8 per thousand in 1938.

Austria was a relatively prosperous country for most of the 20th century, although the country suffered disproportionately as a consequence of the economic depression of the 1930s and the Second World War. Austria experienced a remarkable recovery during the second half of the century when its economic growth was above the West European average (Prinz *et al.* 1998). As a result, in the year 2000 Austrians were among the wealthiest people in the world with a per capita gross national income in purchasing power parity of $ 26,310 (World Bank 2002). Over 60 per cent of its GDP was produced in the service sector and an equal proportion of its workforce was employed in that sector.

Family policy developed since the 1960s into "an integrated component of Government social policy and of income policy" (United Nations *et al.* 1994a). "The Austrian Government is committed to a family policy which includes provisions for establishing conditions in which people can successfully combine the attainment of their basic living requirements with the desire to have children" (United Nations *et al.* 1994a). Expenditures on social protection in purchasing power standards (PPS) per capita are considerably above average in the European Union and 10.3 per cent of the of social benefits are spent on children and the family compared to an average 8.5 per cent (Abramovici 2002).

Austria experienced a vigorous baby-boom after the Second World War. Between 1951 and 1961-64 the TPFR increased from 2.0 to a peak of 2.8 births per woman (Figure WCE-1). A sharp drop in period fertility followed which

[28] All CBR data refer as best as possible to the present-day territory.

lasted until 1977 when the TPFR again reached 1.6 children per woman, namely the level of fertility of the early 1930s. During the 1980s and 1990s fertility continued to decline, unevenly and moderately. In the years 1998 to 2000 the TPFR was slightly above 1.3.

It was the cohorts born in the mid-1930s that had the most children, on average an estimated 2.45 per woman (Figure WCE-1). For about ten successive birth cohorts fertility declined sharply. The cohort born in 1944 had 1.95 children. Thereafter completed cohort fertility continued to decline steadily. The 1965 birth cohort is estimated to have had a fertility rate of 1.61 (Figure WCE-1 and WCE-2).

Impressive permutations of the age patterns of childbearing were underlying the trends of completed fertility, although the TCFRs of women born around 1940 were not much lower than of those born around 1930 (Figure WCE-3). The 1930 birth cohort had relatively few children when the women were in their teens and 20s, but quite high fertility when they were older. Its peak of childbearing was at age 26. In contrast, the 1940 birth cohort had a considerably larger proportion of its children when the women were young with a childbearing peak at ages 23 to 24. As fertility of successive cohorts born during the 1940s continued to decline, the shift of childbearing into the younger ages persisted. The highest age-specific fertility rate for the 1950 birth cohort was at age 21. The mean age of cohort childbearing declined from 28.0 to 26.0 and then to 25.4, in the 1930, 1940 and 1950 cohorts, respectively (Figure WCE-4).

Appendix A provides a detailed picture of these shifts. Altogether the 1940 cohort had 0.2 children less than the 1930 cohort, which was the result of increased fertility by 0.25 children by the time women born in 1940 reached age 26, however after that age they had 0.45 children less than the cohort ten years older. These structural changes continued in a modified form among the cohorts born during the 1940s. Between the ages of 15 and 21 women of the 1950 cohort had about 0.1 children more than the 1940 cohort, but at all ages after that fertility was lower among the women born in 1950. The largest relative declines of around 30 per cent were between the ages of 26 and 28 years.

Changes in the childbearing age patterns were then reversed in the cohorts born during the 1950s (Figure WCE-3). A steady tendency of delaying fertility set in.

*Table A-1. Fertility deficits and surpluses comparing birth cohorts, Austria, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 27-49 | -0.450 | 22-49 | -0.370 | 15-26 | -0.266 |
| Surplus | 15-26[a] | +0.251 | 15-21 | +0.116 | 27-49[b] | +0.083 |
| Total | | -0.199 | | -0.254 | | -0.183 |

Notes: [a] Includes estimated data for ages 15-20 in 1930 cohort the total of which was 9.1 per cent of TCFR

[b] Includes estimated data for ages 41-49 in 1960 cohort the total of which was 1.1 per cent of TCFR.

Up to age 26 women in the 1960 birth cohort had almost 0.3 children less than the 1950 cohort, but they did bear some of these children when they were older (Table A-1).

The indications that can be derived from the childbearing patterns of the cohorts born during the 1960s and 1970s, which were in the middle of their reproductive periods in the late 1990s, point in the direction of a further decline and delay in childbearing. At the younger ages each successive cohort had lower fertility than the previous one (Figures WCE-5 and WCE-6). The cumulative cohort fertility rates of the younger cohorts were consistently lower than those of the older ones (Table A-2). There was a weak propensity for these cohorts to catch up with previous cohorts once these women were older. For instance, the age-specific fertility rates (ASFRs) of women born in 1965 after age 26 were marginally higher than those of the 1960 birth cohort (Figure WCE-5). The ASFRs of the 1970 cohort might also supersede those of older cohorts, albeit at a later age. As of the year 2000, each successive younger cohort born during the 1960s and 1970s had lower cumulative fertility than the previous ones. When these reached their mid-20s a very moderate propensity to catch up with older cohorts could be discerned, but not a single cohort succeeded in reaching the cumulated fertility rates of previous ones (Figure WCE-6).

Reasonable estimates of cohort birth order and parity were available only for women born in the 1960s. These indicated that merely about 75 to 80 per cent of women born in the late 1960s were having first order births, and that possibly a full one quarter of these cohorts may remain childless (Figures WCE-7, WCE-8, WCE-9 and WCE-10). The preference for low parities/small families was

*Table A-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Austria, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.545 | 1.460 | … | … | … | -12 | -11 | … | … | … |
| 30 | 1.248 | 1.136 | 0.998 | … | … | -17 | -17 | -20 | … | … |
| 25 | 0.750 | 0.606 | 0.512 | 0.446 | … | -26 | -30 | -32 | -26 | … |
| 20 | 0.180 | 0.137 | 0.099 | 0.098 | 0.069 | -41 | -49 | -45 | -28 | -30 |

obvious. Only about five per cent of women were likely to have more than four children and less than 15 per cent three children. In addition to the possibly 25 per cent of women born in the late 1960s remaining childless there will most likely be between 35 and 37 per cent with two children and around 22 per cent with one child (Figure WCE-9).

## 5.2 | Germany

At the onset of the demographic transition fertility was relatively low. The total period fertility rate (TPFR) was around five births per woman during the last several decades of the 19th century and declining slowly (Schwarz 1991; Höhn 1991 and Dorbritz and Höhn 1999), even though Germany was undergoing profound economic and social transformations (Höhn 1991). In the early part of the 20th century the fertility descent accelerated sharply and by the 1920s period fertility was firmly below the replacement level. The fertility decline continued through 1934. Thereafter Nazi pronatalist policies brought about an increase which peaked in 1939. As will become clear later, it is important to add that there was a major fertility trough during the First World War and an extremely brief post-war fertility peak which interrupted the long-term trend.

After the Second World War when Germany was divided into the Federal Republic (FRG) and the German Democratic Republic (GDR) at first the paths of the TPFRs were quite similar. Both republics experienced a reasonable baby boom which lasted into the mid-1960s (Figure G-1, Panel A). The decline of period fertility in the early 1970s was also similar in both republics. More detailed analysis will reveal underlying differences. The TPFR trends departed in the late 1970s, at least in part due to the implementation of generous and comprehensive population policy measures in the GDR in 1976. Thereafter,

during the last quarter of the century, trends of period fertility differed considerably. TPFRs in the Federal Republic were reasonably stable at a level around 1.4 births per woman. In the Democratic Republic period fertility in the late 1970s and early 1980s was almost a third higher than in the FRG, but for the remainder of the 1980s it was on a decline. Following the demise of the GDR period fertility fell far below that in the FRG to unprecedented low levels and recovered only slightly by the late 1990s (Figure G-1, Panel A).

Also "cohort replacement fertility was reached as early as in the 20s of this century, never attaining replacement again" (Höhn 1991). The generations born in the 1930s and early 1940s experienced similar completed fertility in both German republics declining moderately from one cohort to the next (Figure G-1, Panel B), but again, the TCFRs of these generations are the result of differing underlying developments, which will be analyzed below.

The cohorts born in the late 1940s and 1950s drifted apart. In the FRG cohort fertility continued to decline slowly but surely with the 1965 birth cohort likely to have a completed fertility rate of 1.5 births per woman. In the GDR cohort fertility of the generations born in the late 1940s and the 1950s stabilized close to 1.8, which might have been in part brought about by the population policies of the mid-1970s. Starting with the 1960 birth cohort a sharp downturn occurred. It was estimated that the 1965 TCFR in the former GDR will be around 1.6 births per woman, not much higher than in the FRG for that cohort. This decline of cohort fertility in the GDR is likely to continue in the near future. We now turn to a more detailed analysis for the most part separately in the two parts of Germany.

### *5.2.1. Former Federal Republic of Germany*

The population of the Federal Republic of Germany was the first of any developed country to reach and to persist at very low period fertility, about one third below the replacement level, in the post-war period. In 1975 its total period fertility rate (TPFR) was 1.45 children per woman. It has remained at that level ever since oscillating within a band from 1.28 to 1.45. In 2000 it was 1.38 (Figure WCE-1). The net reproduction rate since the early 1970s has been between 0.6 and 0.7.

The birth cohorts of the early 1930s had the highest total cohort fertility rates (TCFRs) in the second half of the 20th century, around 2.2 children per woman. Successive generations since then have each had lower TCFRs than the previous one. Through the birth cohort of 1943 the decline was relatively steep, and from thereon the decline has been gradual (Figure WCE-1). Robust estimates for the cohorts of the early 1960s indicate that their TCFRs will be between 1.5 and 1.6 children per woman, among the lowest for all low fertility countries (Figures WCE-1 and WCE-2).

Basically, none of the post-war governments of the FRG pursued a population policy. It was perceived as a major political risk, given the "tragic abuse of population policy during the Nazi period" (Höhn 1996). Some social welfare measures intended to assist individuals with childrearing were adopted in the FRG, however, these were believed to have had a negligible fertility effect.

Successive administrations have been concerned with the different implications and consequences of low fertility for a number of years. Consequently they adopted a wide range of family policy measures. At the UN European Regional Population Meeting in December 1998 the government reported: "the general conditions for reconciliation of family life and economic activity have been improved in the last years. To this end, the federal government has introduced or further developed important legal measures such as the child-raising benefit and child-raising leave regulation, counting of child-raising and nursing times for relatives towards the pension insurance, enhanced release from work when a child has fallen ill, the Second Equal Rights Act, improvement of the Maternity Protection Act as well as the reform of employment promotion. … It has established a new structure of and increased the equalization of family burdens, with the result that its total volume has been increased by some 30 per cent from DM 37 billion (1995) to almost DM 50 billion (1997). The subsistence level of children is included in income taxation by a standardized child-raising benefit rising with the number of children for every child" (United Nations *et al.* 1999b).

While the declining trend of the TCFRs has been gradual, changes in the age patterns of childbearing from one birth cohort to another have been considerable. Among the birth cohorts of the 1930s, i. e. those that started their childbearing just after the Second World War, there was a meaningful rise in fertility while women were in their early 20s compared to older cohorts. Age-specific fertility rates at the peak childbearing ages of 22-24 were about 25 to 30

per cent higher in the 1940 compared to the 1930 birth cohort (Figure WCE-3 and Table FRG-1). Once these women reached their 30s and 40s their fertility was relatively low. Between the ages of 34 and 44 age-specific fertility rates of the 1940 birth cohort were 50 to 60 per cent lower than in the cohort ten years older. The increase in childbearing when the 1940 cohort was young, 0.2 children per woman, was outweighed by lower fertility, 0.4 children per woman, when they were older.

The generations of the 1940s started their childbearing early. Up to age 20 age-specific fertility rates were much higher in the 1950 compared to the 1940 birth cohort. The main change among the birth cohorts of the 1940s, however, was that when these women were in their 20s they were having considerably fewer children than the preceding cohorts. The age-specific fertility rates of women between the ages of 23 and 27 of the 1950 birth cohort were about 35 per cent lower than the respective rates in the 1940 birth cohort (Figure WCE-3). The relatively low fertility of the 1950 compared to the 1940 cohort between the ages of 21 to 31, 0.4 births per woman, overwhelmed the moderate increases of fertility of this cohort before and after these ages.

Among successive birth cohorts of the 1950s fertility was declining when women were in their teens and low 20s . Between the ages of 17 and 22 age-specific fertility rates were 30 to 55 per cent lower for individual ages in the 1960 compared to the 1950 cohort (Figure WCE-3). A postponement of fertility was under way. Women of the 1960 birth cohort had considerably higher fertility in their late 20s and especially during their 30s than the 1950 cohort.

*Table FRG-1. Fertility deficits and surpluses comparing birth cohorts, former Federal Republic of Germany, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 28-49 | -0.384 | 21-31 | -0.409 | 15-26 | -0.278 |
| Surplus | 15-27[a] | +0.207 | 15-20 | +0.098 | 27-49[b] | +0.181 |
| | | | 32-49 | +0.036 | | |
| Total | | -0.177 | | -0.275 | | -0.097 |

Notes: [a] Includes estimated data for ages 15-19 in 1930 cohort the total of which was 4.3 per cent of TCFR.

[b] Includes estimated data for ages 40-49 in 1960 cohort the total of which was 2.1 per cent of TCFR.

Age-specific fertility rates of women between the ages of 33 and 39 were 35 to 40 per cent higher in the 1960 compared to the 1950 birth cohort. Nonetheless, in absolute numbers women of the 1960 cohort after age 26 bore only two-thirds of the children that were postponed when they were young.

In sum, whatever the age patterns were, the deficits were always larger than the surpluses and thus completed cohort fertility was declining continuously since the 1933 birth cohort. No matter how big the relative fertility differentials in time, the absolute surpluses were never large enough to fully compensate for the deficits (Table FRG-1).

The shifts in the timing of births are also illustrated in trends of the average age of childbearing (Figure WCE-4). From the generations born around 1930 to those born in the mid-1940s the average age of childbearing was declining. From thereon there has been a steady considerable increase, from 25.6 of the 1945 and 1946 cohorts to over 28 years for women born in the early 1960s.

When turning to the analysis of fertility of the cohorts that are in the middle or at the onset of their childbearing, it is important to realize that in the former Federal Republic of Germany the cohorts born around 1950 had the lowest TCFRs of all the low fertility countries. The TCFR of the 1950 birth cohort was 1.69 births per woman. The cohorts born in the 1950s and 1960s while in their teens and 20s followed age pattern paths of fertility that were progressively lower than those of previous cohorts (Figures WCE-5 and WCE-6). When they reached their late 20s they display a propensity to catch up with the previous birth cohorts, but thus far no birth cohort of the 1950s or 1960s has managed to make up their full deficits accumulated when the generations were young. It appears that the 1955 and the 1960 birth cohorts will finish their childbearing with TCFRs of around 1.6 births per woman. The 1965 and the 1970 birth cohorts are likely to have TCFRs even lower (Figures WCE-5 and WCE-6 and Table FRG-2).

At the same time it is noteworthy that the 1970 and the 1975 birth cohorts were following age pattern paths of childbearing up to age 22 that were similar to the 1965 cohort (Figures WCE-5 and WCE-6). Starting with age 23, however, fertility of the 1970 cohort dipped below the previous ones. Consequently, by the time this cohort got into the mid-20s, the cumulated cohort fertility rate (CCFR) was lower than for previous cohorts (Table FRG-2). By age 27 the

*Table FRG-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, former FRG, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility rate of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 37 | 1.504 | … | … | … | -7 | … | … | … |
| 32 | 1.234 | 1.081 | … | … | -14 | -16 | … | … |
| 27 | 0.718 | 0.574 | 0.524 | … | -28 | -32 | -27 | … |
| 22 | 0.243 | 0.151 | 0.159 | 0.167 | -46 | -53 | -35 | 11 |

CCFR of the 1970 cohort was over 27 per cent below the 1960 cohort. Up to age 22 fertility of the 1975 cohort was above that of the previous cohorts. The CCFR was 11 per cent above that of the 1965 one. What the future age pattern of fertility of this cohort is going to be is unknown, but it is likely that its total eventual fertility is not going to be above 1.5 children per woman.

### *5.2.2. Former German Democratic Republic*

After the Second World War, especially from the mid-1950s through the mid-1970s, period fertility in the then German Democratic Republic went along a similar path as in the Federal Republic. Following the post-war baby boom, from a high of 2.5 the TPFR declined to 1.5 by 1974 and 1975 (Figure WCE-1). Thereafter, in contrast to the FRG, there was a rapid increase in the TPFR to 1.9 by 1977. Period fertility was maintained at that level for about five years but declined slowly throughout the 1980s. By 1990 it had again reached 1.5. As is well known, the TPFR declined sharply between 1990 and 1993 to 0.8 births per woman after the demise of the German Democratic Republic and then recovered somewhat during the late 1990s. It reached 1.22 in 2000.

The trends of completed fertility of the cohorts that started their childbearing after the war, namely the birth cohorts of the 1930s, was also very similar in both republics (Figure G-1). The cohorts born around 1930 had a total cohort fertility rate of 2.2 births per woman and this declined to 2.0 for those born in 1940 in both republics. The TCFR continued to fall among the cohorts of the 1940s to reach 1.8 for the 1950 cohort in the former GDR, which was a slower decrease than in the former FRG. All cohorts born in the 1950s in the former GDR maintained a TCFR of 1.8, while in the ex-FRG this rate continued its steady decline. Then came a turning point with the cohorts born around 1960

and the TCFRs declined sharply. The estimated TCFR for the cohorts born around 1965 in the GDR were around 1.5 to 1.6 births per woman (Figures WCE-1 and WCE-2). For the cohorts born in 1965 the TCFRs will apparently have similar values around 1.5 in the territories of both former republics.

The GDR considered itself to be a new state and society without any links to the Nazi past. As major concerns with low and declining fertility surfaced in the early 1970s, an extensive array of pronatalist measures which had been tested in Czechoslovakia and Hungary a few years earlier were implemented in 1976. These included:

- A family formation loan which was reduced by one third when a child was born;
- A birth grant;
- Monthly child allowances;
- A paid maternity leave of up to one year;
- Special privileges for unmarried mothers, such as priority placement of their children in crèches, and longer maternity leaves if no place was available;
- A system of child-caring facilities, such as crèches, kindergartens, full-day schools, and weekend and holiday camps.

Data presented have documented that these measures did affect not only period fertility rates, but also TCFRs of several cohorts of women, essentially the cohorts born in the 1940s and 1950s (Figure G-1). On the other hand, the policy measures had only a limited effect, because in reality women were faced with a double or triple burden, namely being employed, having to take care of the household and maintaining the main responsibility for childbearing and childraising. In addition, there was a lack of consumer goods and services and a chronic housing shortage.

The trend of the total cohort fertility rates was generated by changes in the age patterns of fertility of the various generations. Basically the peak of childbearing for the birth cohorts from 1930 to 1960 was between the ages of 21 and 23, and the bulk of childbearing was close to the peak (Figure WCE-3). The largest change took place among the cohorts of the 1930s. There was a marked tendency to have fewer children later in the reproductive period, namely in the late 20s and 30s among the cohorts of the 1930s. The 1940 birth cohort had 0.32 fewer children than the 1930 cohort after age 26 (Table GDR-1),

*Table GDR-1. Fertility deficits and surpluses comparing birth cohorts, former German Democratic Republic, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 27-49 | -0.315 | 22-32 | -0.302 | 15-21 | -0.058 |
| | | | 38-49 | -0.001 | 28-36 | -0.082 |
| Surplus | [15-26[a] | +0.099] | 15-21 | +0.105 | 22-27 | +0.133 |
| | | | 33-37 | +0.004 | 37-49[b] | +0.010 |
| Total | | -0.216 | | -0.194 | | +0.003 |

Notes: [a] Includes estimated data for ages 15-21 in 1930 cohort the total of which was 19.7 per cent of TCFR rendering this estimate unreliable.
[b] Includes estimated data for ages 40-49 in 1960 cohort the total of which was 0.8 per cent of TCFR.

mainly resulting from a decline in higher order births. Among the cohorts of the 1940s there was a further small increase in fertility of young women up to age 22, but the main trend was a moderate decrease of fertility when these women were in their 20s. Women between the ages of 22 and 32 had 0.3 fewer children in the 1950 compared to the 1940 birth cohort. Finally, the age patterns of fertility changed very little among the birth cohorts of the 1950s.

How insignificantly the age patterns of fertility changed among the birth cohorts of the 1950s can be observed also in Figure WCE-6. In this graph the curves for the 1955 and the 1960 cohorts are almost parallel to the base line of the 1950 birth cohort illustrating that there were only minor differences in the respective age patterns.

This is no longer the case for the younger cohorts. The cohorts that were in the middle or at the onset of their childbearing in the former GDR were proceeding along quite different paths of childbearing than the generations of the 1950s. By age 33 the 1965 cohort had almost 0.3 births per woman less than the 1950 cohort. The differences were even more pronounced for the youngest cohorts. By age 28 the 1970 birth cohort had more than 0.6 fewer births per woman than the 1950 cohort. The 1975 had an even larger difference already by age 23.

How acutely age patterns of fertility were changing from one generation to the next is illustrated also in Figure WCE-5. Thus far each successive birth cohort was proceeding along a fertility path distinctly below previous generations. The 1980 cohort while in its teens was the exception.

Several other features are revealed:

1. The generations that were in their prime childbearing years at the time of the demise of the GDR reacted sharply to that development. For instance, the 1965 cohort had much lower fertility at age 26 than would be expected under "normal" circumstances. Between the ages of 25 and 26 the age-specific fertility rate declined by 50 per cent — from 0.14 to 0.07 births per woman (Figure WCE-5). In the 1970 cohort the age-specific fertility rate at age 21 would have been expected to be considerably higher than at age 20, yet it was lower and continued to be so for several years thereafter. The 1975 birth cohort, which started out on its reproductive experience the year the regime changed, was having considerably lower fertility than any previous generation. By age 22, its cumulated cohort fertility rate was over 70 per cent lower than the generation ten years older (Table GDR-2).
2. The cohorts which initially reacted perceptibly to the political changes by apparently postponing or foregoing some births did have a proportion of these later in their reproductive period. Note in Figure WCE-5 that the fertility curve of the 1965 cohort flattened out after age 29 which is quite unusual; and that of the 1970 cohort turned up after age 24.

### *5.2.3. Comparison of the age patterns of fertility in the two republics*

A more detailed comparison of how age patterns of fertility changed in both republics is warranted if only because seemingly the levels and trends of the TCFRs were almost identical for the cohorts of the 1930s. Also the TCFRs of the cohorts in the mid 1960s were again at the same level in both republics.

*Table GDR-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, former GDR, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility rate of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 37 | 1.759 | … | … | … | 0 | … | … | … |
| 32 | 1.686 | 1.385 | … | … | 2 | -18 | … | … |
| 27 | 1.384 | 1.156 | 0.714 | … | 5 | -15 | -48 | … |
| 22 | 0.625 | 0.525 | 0.338 | 0.149 | -8 | -8 | -46 | -72 |

To begin with, the life-time paths of childbearing of the cohorts born around 1930 differ in the two republics. While the estimated TCFRs for 1930 were identical at 2.2 for both republics, women bore their children earlier in the former GDR than in the former FRG (Figure G-2). The peak ages of childbearing were 23 in the former and 27 in the latter. At age 22 the age-specific fertility rate (ASFR) was 50 per cent higher in the GDR compared to the FRG. Up to age 26 fertility was higher in the former, whereas from age 26 onward fertility was higher in the latter. While in their 30s ASFRs were by 20-40 per cent lower in the GDR and during their 40s 40-70 per cent lower. In sum, already the first postwar generation in the FRG had a later life-time track of childbearing than in the GDR. It would be interesting to explore whether similar differences in the childbearing patterns between the respective territories existed for earlier generations or whether it was mainly the impact of the divergent political and social systems that generated these contrasts.

As discussed above, the age patterns of childbearing of the cohorts born in the 1930s were changing from one cohort to the next in both republics, and the TCFRs declined moderately. In both republics TCFRs of 2.0 were reached in 1940. At the same time, similar differences in childbearing patterns between the republics persisted for the successive cohorts of the 1930s and early 1940s. In both republics the age patterns of fertility had shifted to the left and the peaks were higher than before, i.e. in both republics women were having their children somewhat earlier. Also, the differences of childbearing patterns between the two republics remained similar as illustrated by the graph for the 1940 cohort (Figure G-2). In this cohort the age from which fertility was higher in the FRG was also earlier, namely 24.

Starting with the birth cohorts of the early 1940s, TCFRs declined slower in the GDR and the differences and trends in the age patterns of fertility became more pronounced. The curve in the GDR maintained its early and high peak. In the FRG when women entered their 20s they were having considerably fewer children than previous cohorts (Figures WCE-3 and G-2). In the 1950 birth cohort, from age 18 through 23 the ASFRs were considerably higher in the GDR compared to the FRG. At ages 20 and 21 the difference was 65 to 70 per cent. Starting at age 28 women in the FRG were to some extent catching up and having more children than in the GDR. The completed cohort fertility was lower in the FRG for the 1950 cohort, 1.69 compared to 1.79 births per woman.

Among those born in the 1950s in the former FRG the propensity to postpone births intensified from one cohort to the next, whereas not much changed among these cohorts in the former GDR. The difference in the childbearing age patterns between the two republics became even larger. The peak of childbearing shifted distinctly to higher ages in the 1960 cohort in the West. The peak of childbearing in the East was at age 22. At ages 19-21 the ASFRs were almost twice as high in the former GDR compared to the former FRG. Here the peak was at age 28 and starting with age 26 fertility was considerably higher than in the former GDR (Figures WCE-3 and G-2).

As of 2002, the age patterns of fertility are known only up to age 29 for the 1970 cohorts. In the former GDR this cohort was moving along a much earlier path of childbearing up to age 22 compared to the same cohort in the former FRG, which had even lower fertility and was presumably postponing its births even more than previous cohorts (Figures WCE-5, WCE-6 and G-2). The change of the political system strongly affected fertility behavior of these women in the former GDR. At ages 21 to 23 they had considerably fewer children than would have been expected had there been no radical political metamorphosis. Starting with age 24, these women were pursuing a path similar to that of women in the former FRG (Figure G-2).

The age patterns of fertility of the cohorts which were born in the mid- to late 1970s and were at the onset of their childbearing during the 1990s were similar in the territories of both former republics (Figure G-2). It is, of course, too early to tell, but it is possible that starting with these young cohorts, the fertility behavior of women on the territories of the two former republics will no longer differ substantially. Note, however, that among the teenagers of the 1980 cohorts fertility was marginally higher in the former FRG.

Another measure can be used to illustrate changes in the age patterns of fertility. It is the proportion of a birth cohort's childbearing which is realized by the mother's 27$^{th}$ birthday. This simple measure tellingly complements the more detailed analysis. By definition, however, this measure can be applied only to cohorts that have completed their childbearing, and the full life-time range of fertility is known, or where most of a cohort's childbearing has been observed and the minor missing part can be estimated.

In the former FRG the 1930 cohort bore 47 per cent of its children before the mother's 27$^{th}$ birthday. There was a notable shift to earlier childbearing among

the cohorts born around 1940 with 61 per cent of its fertility realized by the 27th birthday. That did not change too much among the next ten cohorts. The cohorts of the 1950s again made a conspicuous shift to later childbearing. Forty five per cent of the children of the 1960 and 39 per cent of the 1965 cohorts were born before the 27th birthday. In the former GDR already the 1930 cohort had a larger proportion of their children before the 27th birthday. This proportion increased markedly among the birth cohorts of the 1930s so that in the 1940 cohort 72 per cent of children were born before the 27th birthday. This early pattern of childbearing remained typical for the following 25 cohorts in the former GDR. Apparently in the 1965 birth cohort the proportion of children born before the 27th birthday will be 74 per cent (Table CO-3).

A comparison with one neighboring country to the West and one to the East indicates that cohort fertility behavior in the former FRG resembled that, for instance, in Denmark and, in turn, cohort fertility behavior in the former GDR was almost identical to that in the Czech Republic during the second half of the 20th century. This finding is in line with our conclusions distinguishing cohort fertility behavior in the former socialist from that in the West European countries.

### *5.2.4. A comparison of parity distributions*

Long-term changes in the parity distributions of birth and marriage cohorts for the most part are in line with what one would expect. In addition to the data compiled by the Observatoire, which are based exclusively on vital registration, data from other sources were utilized. Therefore only certain aspects are analyzed below whereas others, such as parity progression ratios could not be explored.

Among *married women* the proportion of those with one or two children in the course of the century became predominant. Less than 30 per cent of women who married in the quinquennium 1900-04 had one or two children and this proportion increased to almost 70 per cent for the 1970-74 marriage cohort. Conversely, the proportion of married women with four or more children declined from almost one half in the 1900-04 cohort to a mere two per cent in the 1970-74 marriage cohort and almost disappeared (Figure G-3).

The trend and levels of the proportion of childless married women in Germany are noteworthy. In the first place, throughout the century the proportion of married women who remained childless has been comparatively high. Second, there were two peaks. The first was around the marriage cohort 1922-25, when 18 per cent of married women remained childless. The second peak was reached with the latest marriage cohort, i.e. the women married in 1970-74, with 19 per cent remaining childless (Figure G-3).

Data on the parity distribution of *birth cohorts* provide another illustration of the differences in reproductive behavior in the two republics. Taking the birth cohorts of 1940 through those of 1960 in the FRG, the proportion of childless women increased from 10 to 23 per cent while those with three or more children declined from 27 to 18 per cent (Figure G-4). The proportions of women with one or two children declined moderately. Changes in the parity distribution of women in the GDR were very different. The proportion of childless women at first declined from ten per cent among women born in 1940 to six per cent in the 1955 birth cohort. The 1960 cohort then had a larger proportion of childless women, almost 11 per cent, which was still less than half of that in the FRG. The proportion of women with only one child declined from one-third in the 1940 cohort to one-fifth in the 1960 cohort. It was not only the proportion of women with two children but also those with three and more children that increased between these cohorts 20 years apart (Figure G-4).

### *5.2.5. A brief epilogue*

The foremost contemporary scholars of the demographic state of affairs argue that 'there is no doubt that an increasing fertility trend in Germany cannot be expected, neither in the near future nor on a long-term basis.' (Dorbritz and Höhn 1999). They see two possible scenarios of future fertility trends. One which leads to the stabilization of the present situation with fluctuations of the TPFR between 1.2 and 1.6 births per woman. The second one involves the intensification of conditions leading to even lower fertility, namely increasing childlessness, the tradition of small families, a declining propensity to marry and postponement of family formation. This second scenario would involve a decline of the TFR to values between 0.8 and 1.2.

## 5.3 | Switzerland

Swiss fertility was low even before its transition in the last three decades of the 19th century. For most of these years its crude birth rate was between 27 and 30 per 1.000 and stable (Chesnais 1992). Its total period fertility rate (TPFR) was between 3.5 and 3.8, except for the mid- to late 1870s when it was above 4.0 (Calot 1998). A pronounced decline started at the beginning of the 20th century from a TPFR of 3.6 and by 1930 reached 2.0 which corresponded to a net reproduction rate of 0.86 (Kirk 1946).

Switzerland's political, economic and social developments during the 20th century were arguably more stable than in almost all other European countries. That Switzerland was not involved in the two World Wars of the 20th century undoubtedly played a role. Switzerland is in many ways more heterogeneous than other European countries as it has several ethnic/linguistic groups, as well as the largest proportion of foreign nationals living in the country; over 19 per cent in 1994. Since the Second World War through 1990 it enjoyed favorable economic conditions with unemployment rates below one per cent. By the early 1990s its economy was dominated by the service sector. Two thirds of its gross domestic product originated in that sector with almost 60 per cent of men and 80 per cent of women employed there. Altogether women's participation in the labor force had increased considerably so that by the mid-1990s two thirds of them were economically active, up from 37 per cent in 1950 (Gabadinho and Wanner 1999). In the year 2000 Switzerland was among the wealthiest nations in the world with a per capita gross national income in purchasing power parity of $ 24,970 (World Bank 2002).

In the mid-1990s, the Swiss Government did not have a coordinated population policy, however, "together with the cantons and communes the Confederation is pursuing an active family policy which takes into account the various forms of family, economic conditions and the changed conception of roles in the family" (United Nations *et al.* 1994e). "In the Government's view, measures aimed at having a direct influence on births cannot be reconciled with the rights of the individual and personal dignity." Nevertheless, the Government is concerned about the 'insufficient length of maternity leave,' that 'there is no legal entitlement to parental leave with the possibility of returning to the place of work,' and that the 'supply of places for child care outside the family cannot meet demand either qualitatively or quantitatively' (United Nations *et al.* 1994e).

Throughout the 1930s fertility was decidedly below the replacement level with a TPFR around 1.8 births per woman. In the early 1940s there was a considerable increase, so that by 1945 the TPFR reached 2.6, only to be followed by another full wave of a decline and increase within the next 20 years. A more considerable decline began in the mid-1960s, which lasted through the mid-1970s (Figure WCE-1). After that the TPFR settled at around 1.5 and remained there for the entire last quarter of the 20th century.

It is apparent that the period fertility decline and upswing between 1945 and 1965 were mainly caused by shifts in the timing of births (as will be demonstrated below) as well as by changes in the composition of birth orders, because the total cohort fertility rate (TCFR) for women born between about 1917 and 1937 was stable at about 2.2 births per woman (Figures WCE-1 and WCE-2). Completed fertility declined for subsequent cohorts and reached 1.8 with cohorts of women born around 1950. The next ten cohorts settled at that level, but fertility appeared to be declining again among those born during the 1960s. The estimated TCFR for women born in 1965 was estimated between 1.6 and 1.7 births per woman.

Cohort lifetime patterns of childbearing were changing quite considerably during the second half of the 20th century. Compared to the 1930 cohort, women born around 1940 had higher fertility when they were young, but fewer children when they were in their late 20s and 30s (Figure WCE-3). Between the ages of 15 and 26, the 1940 cohort had 0.3 more children than the 1930 cohort, and conversely, when above age 26 they had 0.4 children less. Thus, altogether the 1940 cohort had 0.1 fewer children than the 1930 cohort (Table CH-1). The average age of childbearing declined sharply from 28.7 to 26.9 years between these two cohorts (Figure WCE-4).

*Table CH-1. Fertility deficits and surpluses comparing birth cohorts, Switzerland, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 27-49 | -0.384 | 22-31 | -0.358 | 15-25 | -0.235 |
| Surplus | 15-26 | +0.286 | 15-21 | +0.035 | 26-49[a] | +0.215 |
| | | | 32-49 | +0.034 | | |
| Total | | -0.098 | | -0.289 | | -0.020 |

Note: [a] Includes estimated data for ages 41-49 in 1960 cohort which were very small.

The principal change in the age pattern of childbearing of cohorts born during the 1940s was a large fertility decline in the prime reproductive ages. At ages 24 to 26 the age-specific fertility rates of the 1950 cohort were over 30 per cent below those of the 1940 cohort (Figure WCE-3). Between age 22 and 31 the 1950 cohort had almost 0.4 fewer births than the women ten years older (Table CH-1). The trend in the average age of childbearing had changed from a decline to an increase, but the difference between the 1940 and the 1950 cohort was minor, 27.2 compared to 26.9 (Figure WCE-4).

The major change in the childbearing patterns of women born during the 1950s was that subsequent cohorts were having their children later in life than previous cohorts. The curve of age-specific fertility was shifting to the right (Figure WCE-3). In the 1960 cohort up to age 25 women had 0.2 fewer births than in the cohort ten years older, but a combination of registered and estimated data indicate that most, if not all, of these delayed children would be born after age 26 (Table CH-1). The average age of childbearing was increasing and was estimated to rise from 27.2 to 28.7 for the respective cohorts (Figure WCE-4).

The cohorts born in the 1960s and 1970s, which during the late 1990s were in the beginning or middle of their childbearing, were having fewer children than preceding cohorts as long as they were young (Figure WCE-5). For instance, women born in 1970 by age 30 had borne 0.8 children on average compared to 1.1 of the 1960 cohort by that age, namely 25 per cent less (Table CH-2). At the same time, Swiss women of these cohorts displayed a propensity to have children later during their reproductive years (Figure WCE-6). For the women born in the 1950s this propensity could be demonstrated by registered data. For instance, the 1960 cohort will catch up with the 1950 one and thus achieve a TCFR of 1.8 children per woman. Women born during the 1960s displayed a similar propensity (Figure WCE-6). The comparative fertility deficits accumulated early in their reproductive careers, however, were of such a magnitude that their fertility in the late 20s and 30s would have to be very high to catch up with older cohorts. The 1970 cohort by age 30 had almost 0.3 fewer children than the 1960 cohort and 0.5 fewer than the 1950 cohort. These deficits would have to be compensated by the 1970 cohort after age 30 in order to catch up and have a similar TCFR of 1.8. Up to age 24 women born in the mid-1970s were aiming even lower which implied an even larger need for late childbearing (Figure WCE-6 and Table CH-2).

## 5.4 | A comparative perspective

The completed fertility rates of 1.5 to 1.7 for the mid-1960s birth cohorts in these four populations were among the lowest in the western countries (Table CO-2 [Chapter 12]) and all four were poised to decline further among the cohorts of the late 1960s and 1970s. The estimated 1965 TCFRs were 25 to 30 per cent lower than in the cohorts of the early 1930s (Figure CO-1 and Appendix A).

Trends of the cohort fertility age patterns in Austria, the Federal Republic of Germany and Switzerland were typical for the western capitalist countries. The cohorts of the 1930s were advancing their childbearing and starting with the cohorts of the late 1940s women were postponing their births (Tables CO-3, CO-4, CO-5 and CO-6). Throughout the second half of the 20th century there were some differences between these three populations. Austrian women were having their children at comparatively young ages, whereas Swiss women were on the other extreme. Among the 1965 cohorts, for instance, well over half of all Austrian children were born before their mothers' 27th birthdays, in Switzerland only one third (Table CO-3). In the cohorts born around 1960 Swiss women were bearing almost all the children later in life which they had earlier postponed; in Austria only one third of such children were being born (Table CO-6).

Fertility of young women in their teens and early to mid-20s was continuing to decline quite forcefully in the three western populations among the cohorts of the 1960s and early 1970s (Table CO-7). By definition, childbearing of the 1970 birth cohorts, for instance, would have to be considerably higher than that of the 1960 cohorts when these women will be in their late 20s and 30s for the 1970

*Table CH-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Switzerland, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.564 | 1.416 | … | … | … | -5 | -10 | … | … | … |
| 30 | 1.094 | 0.930 | 0.816 | … | … | -15 | -19 | -25 | … | … |
| 25 | 0.439 | 0.331 | 0.290 | 0.267 | … | -34 | -36 | -34 | -19 | … |
| 20 | 0.052 | 0.037 | 0.031 | 0.030 | 0.029 | -52 | -58 | -40 | -19 | -7 |

cohorts to catch up with completed fertility rates of the 1960 cohorts. Late childbearing would have to be even higher if the 1970 cohorts were to attain replacement fertility, because the TCFRs of the 1960 birth cohorts were already below replacement. In Switzerland childbearing after the 27th birthday would have to be 50 per cent higher in the 1970 compared to the 1960 cohort, in the former FRG 80 per cent and in Austria 92 per cent higher (Table CO-8).

Trends of the cohort fertility age patterns in the former German Democratic Republic were typical of the formerly socialist countries of central and eastern Europe. The proportion of children borne by women prior to their 27th birthday was very high, over 70 per cent, and it was increasing from the cohorts of the mid-1930s through those of the early 1960s (Table CO-3). Cumulated cohort fertility up to the 27th birthday hardly changed and remained at the same level from the cohorts of the mid-1930s through those of around 1960 at about 1.4 births per woman. The CCFR up to the 27th birthday then declined abruptly among the cohorts of the 1960s. In the former GDR this descent was steeper than in any other formerly socialist country (Table CO-7). For the 1970 cohort in the former GDR to either catch up with the TCFR of the 1960 cohort or to attain replacement fertility its childbearing after the 27th birthday would have to be between 160 and 240 per cent higher than in the 1960 cohort (Table CO-8 [Chapter 12]).

Fertility among the youngest women, those in their teens and early 20s, declined in all four populations beginning with the cohorts born around 1950 (Table CO-9). In the former FRG this decline came to a halt among the birth cohorts of the 1970s and in Switzerland the rate of decline was low. On the other hand, the rate of decline of fertility of the youngest women was very fast in the former GDR.

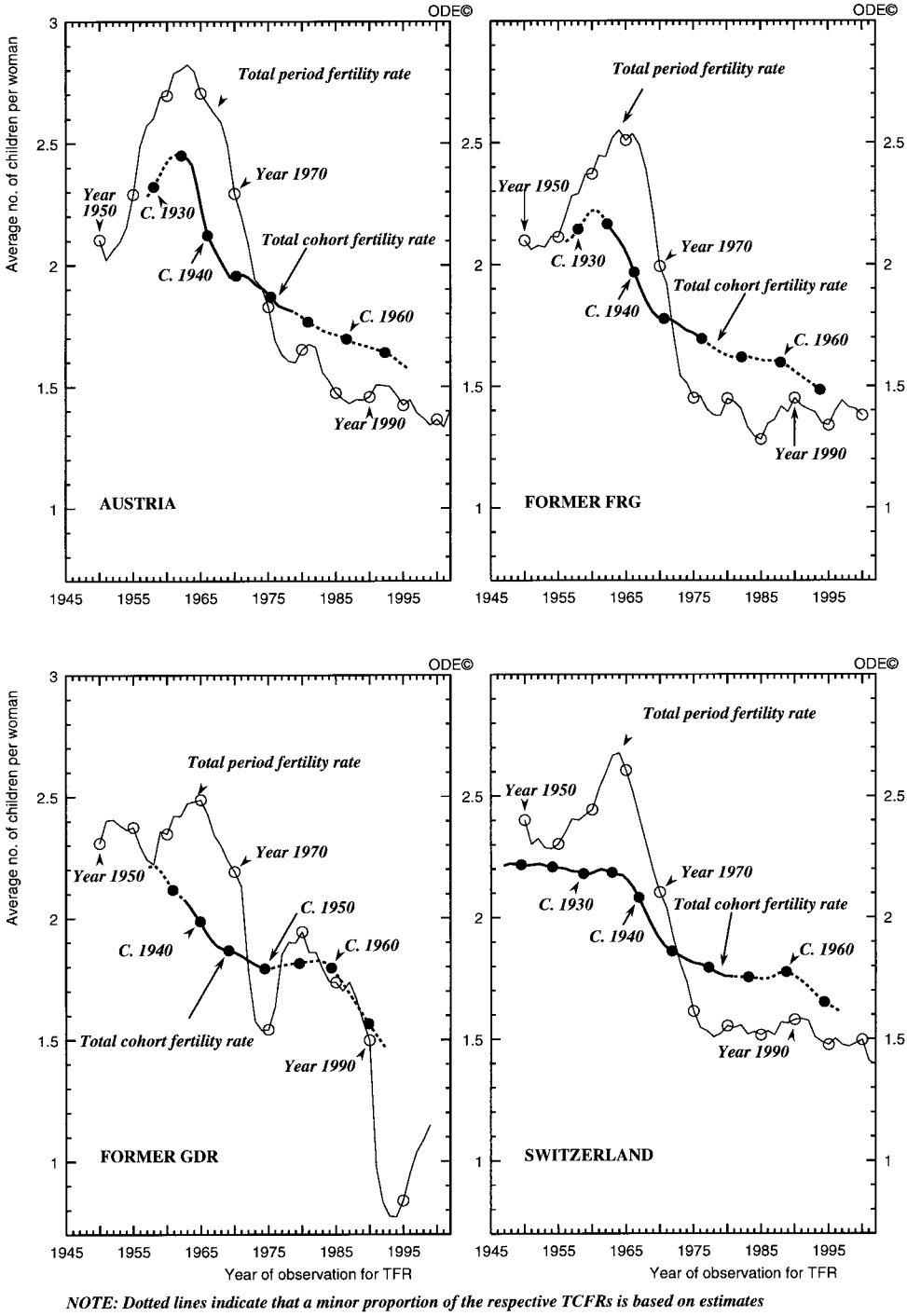
Women born in the early 1960s in Austria and the former FRG shared almost identical parity distributions. Most prevalent were women with two children, however, their proportion was below 40 per cent. Less than 20 per cent of women had three or more children and their proportion was declining. There were over 20 per cent of women with one child. Finally, the proportion of women with no children at all was also over 20 per cent and apparently on the increase (Figures WCE-9 WCE-10, G-4 and CO-4). In the former GDR in the birth cohorts of the mid-1950s the proportion of women of parity two was much larger than in Austria and the former FRG, namely about 50 per cent. The proportions with three or more children were marginally smaller in the former GDR, but it was mainly the proportions of childless women that were only about half as large in the East compared to the West.

## 5.5 | Conclusions

Fertility, period and cohort, in all the populations of this region was below the average of western countries. Completed fertility of the cohorts that were concluding their childbearing at the beginning of the 21st century was more than 20 per cent below the replacement level and will remain this low if not decline further in the foreseeable future. The following findings confirm this overall conclusion:

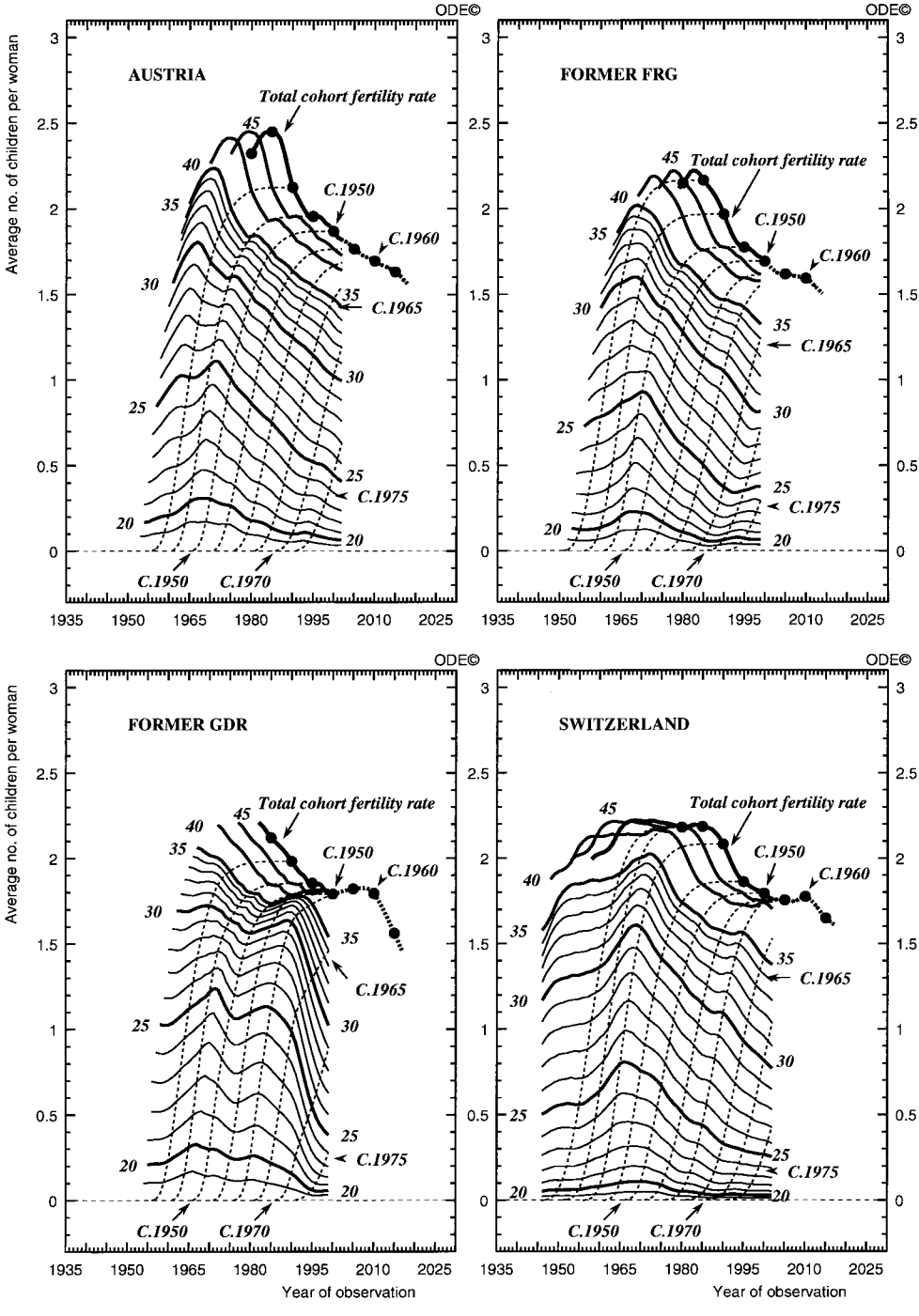
- Total cohort fertility rates of women born in the mid-1960s in the four populations were estimated at between 1.5 and 1.6 children per woman and were on the decline;
- Fertility of young women in their teens and early to mid-20s was declining, and the propensity to postpone childbearing evident among cohorts of the 1950s was apparently carried over into the cohorts of the 1960s in Austria, the former FRG and Switzerland;
- Fertility of young women in the former GDR had been relatively high and stable, but declined abruptly among the cohorts of the 1960s and early 1970s and was approaching the low levels of the other countries in the region;
- Only a fraction of the children that were presumably postponed by young women born in the 1950s and early 1960s in Austria and the former FRG were born when these women were older; in the former GDR childbearing was declining also among women in the later part of their reproductive period;
- To catch up with the TCFRs of women born around 1960 childbearing in the second half of the fertile period of the 1970 birth cohorts would have to be higher by 19 per cent in Switzerland, 22 per cent in the former FRG and 35 per cent in Austria; in the former GDR the increase would have to be over 160 per cent. To attain replacement fertility in the three western countries the increase would have to be between 50 and 92 per cent; in the former GDR almost 240 per cent;
- To the extent known, the proportions of first births were declining among the cohorts of the 1960s; fewer than 80 per cent of women in Austria and the former FRG were having first births;
- The proportions of women remaining without any children were increasing among the cohorts of the 1960s; in the former FRG and Austria around one fifth to possibly a quarter of women were remaining childless. In the former GDR the proportion of childless women was only one tenth of the total but increasing.

**Figure WCE-1 WEST CENTRAL EUROPE, 1950-2000**
**Total period fertility rate and total cohort fertility rate lagged by the average age at childbearing**




*NOTE: Dotted lines indicate that a minor proportion of the respective TCFRs is based on estimates*

**Figure WCE-2 WEST CENTRAL EUROPE**
**Cumulated cohort fertility at specified ages, birth cohorts 1930-1975**




*NOTE: The part of the TCFR line which is dotted indicates that a minor proportion of the TCFR is based on estimates*

**Figure WCE-3 WEST CENTRAL EUROPE**
**Age-specific fertility rates, birth cohorts 1930, 1940, 1950 and 1960**

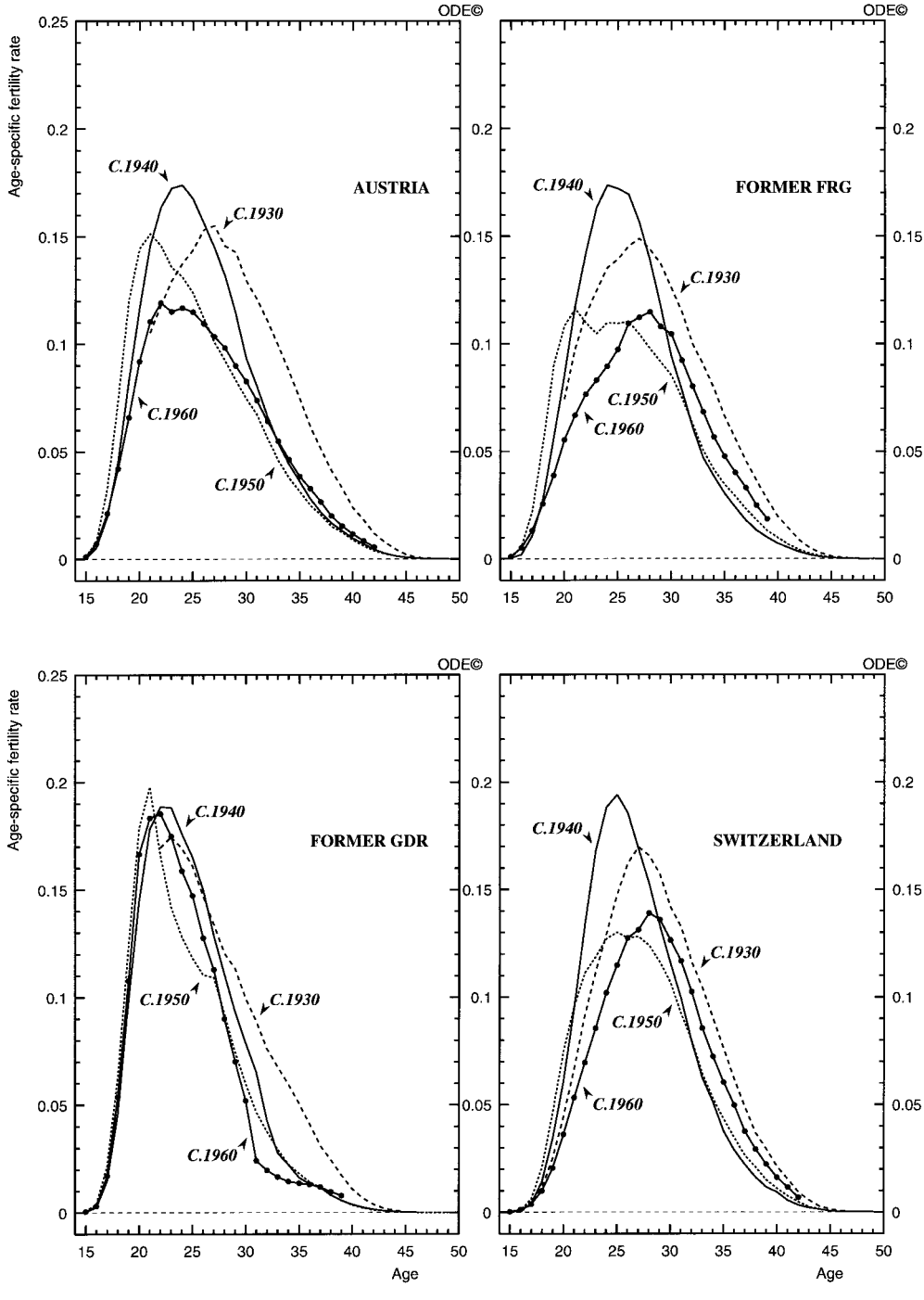
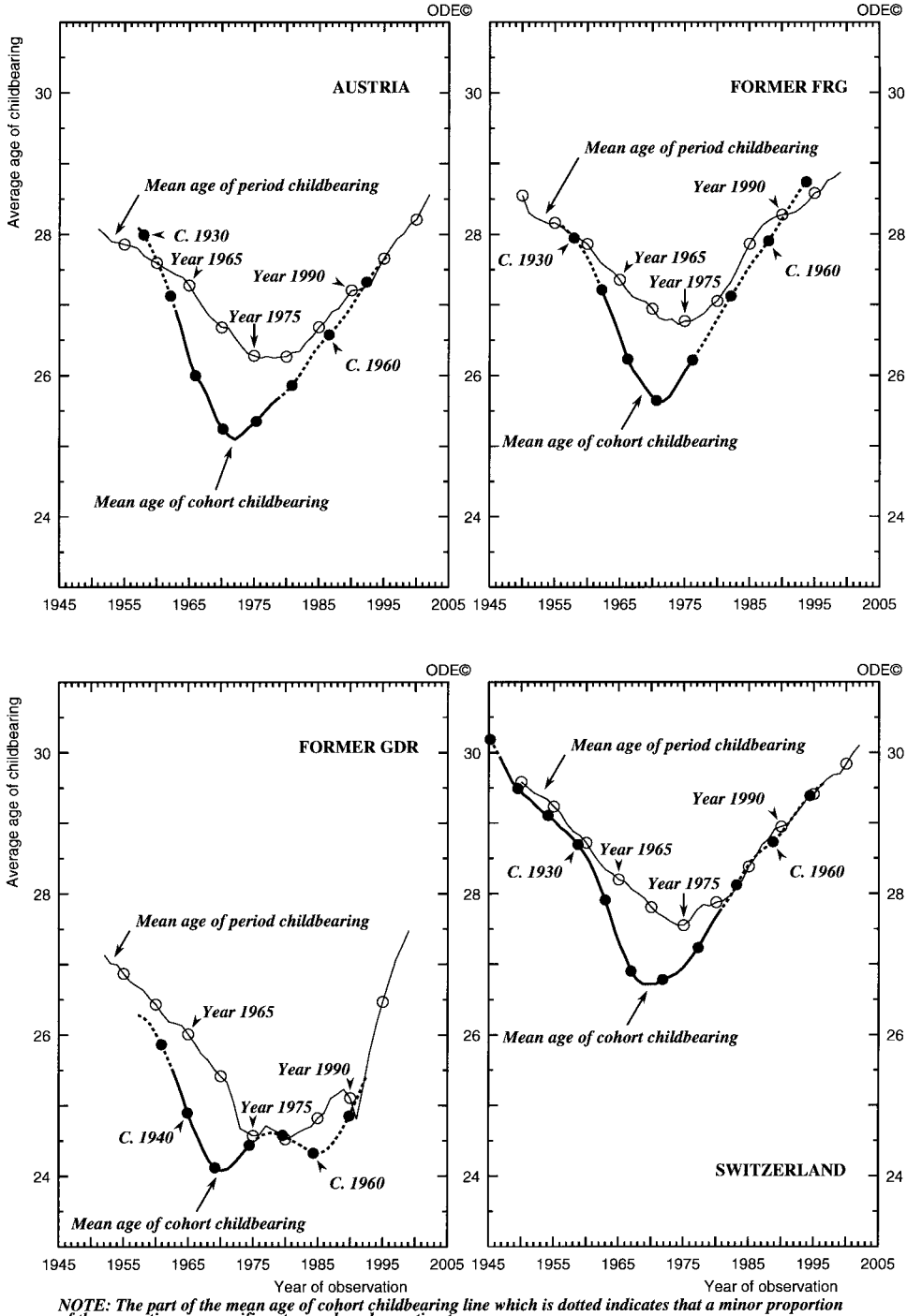


**Figure WCE-4 WEST CENTRAL EUROPE, 1950-2000**
**Period average age of childbearing and cohort average age of childbearing lagged by the average age at childbearing**




*NOTE: The part of the mean age of cohort childbearing line which is dotted indicates that a minor proportion of the respective age-specific rates are based on estimates*

**Figure WCE-5 WEST CENTRAL EUROPE**
**Age-specific fertility rates, birth cohorts 1960, 1965, 1970, 1975 and 1980**

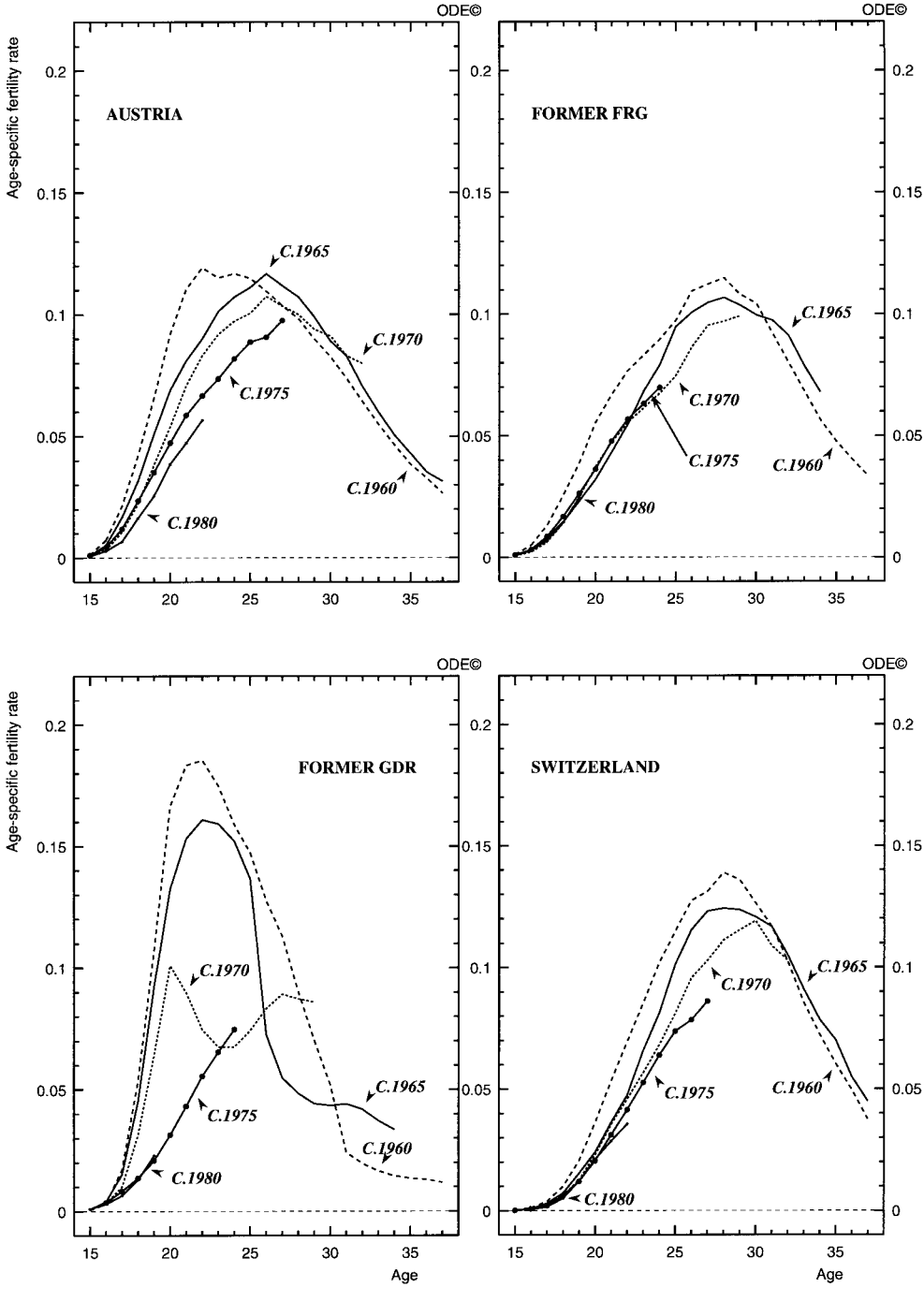


**Figure WCE-6 WEST CENTRAL EUROPE**
**Differences in cumulative age-specific cohort fertility rates between base and subsequent cohorts, women born in 1950 (base), 1955, 1960, 1965, 1970, 1975 and 1980**

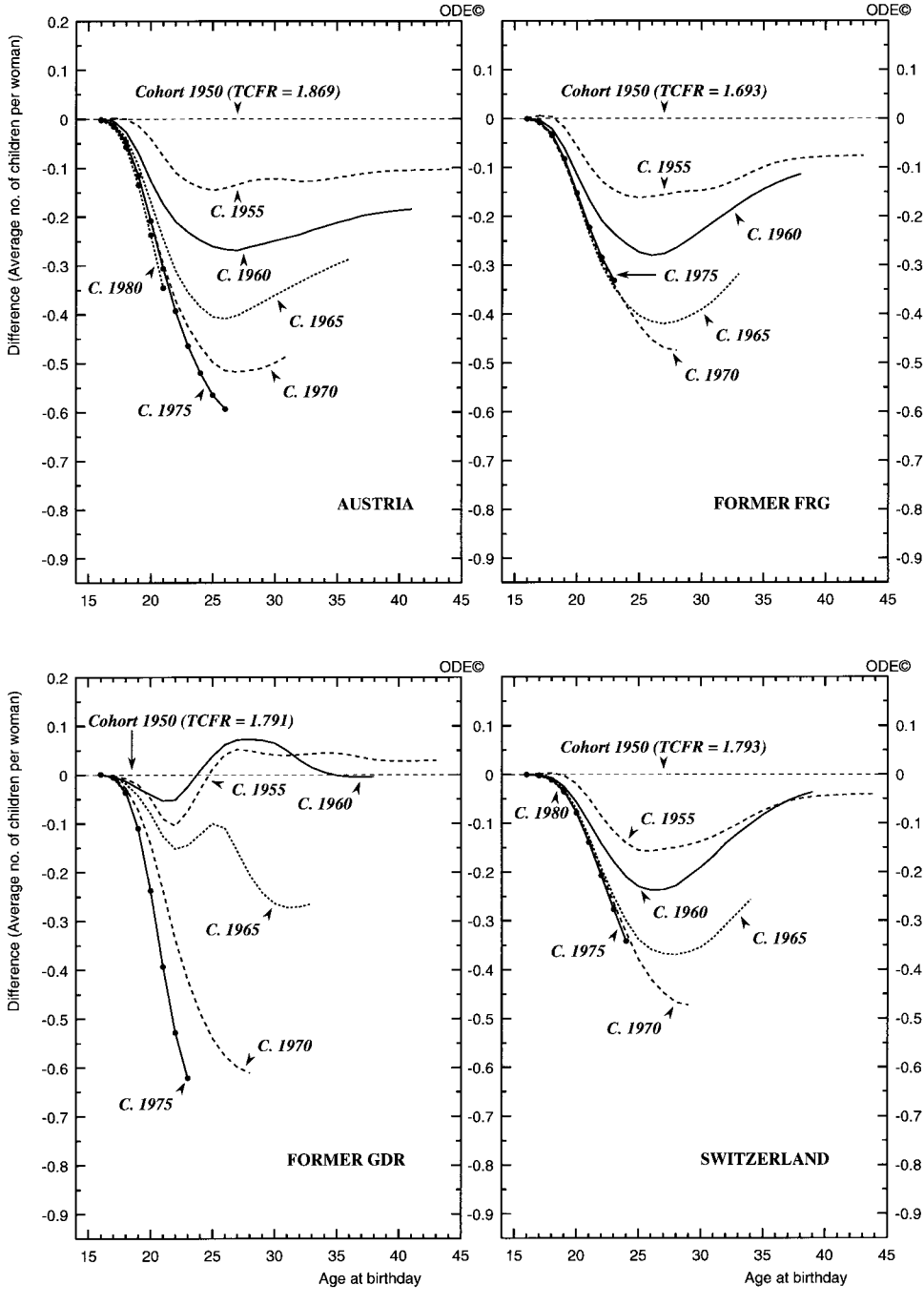


**Figure WCE-7 WEST CENTRAL EUROPE**
**Total cohort fertility rates by biological birth order, birth cohorts 1926 to 1969**

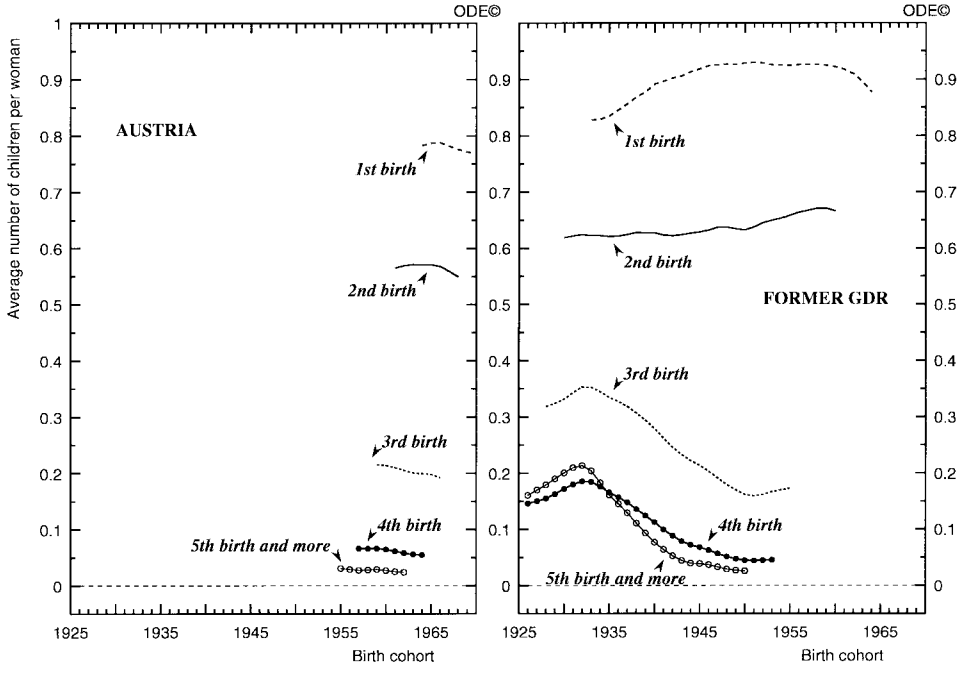



**Figure WCE-8 WEST CENTRAL EUROPE**
**Parity progression ratios, birth cohorts 1933 to 1972**

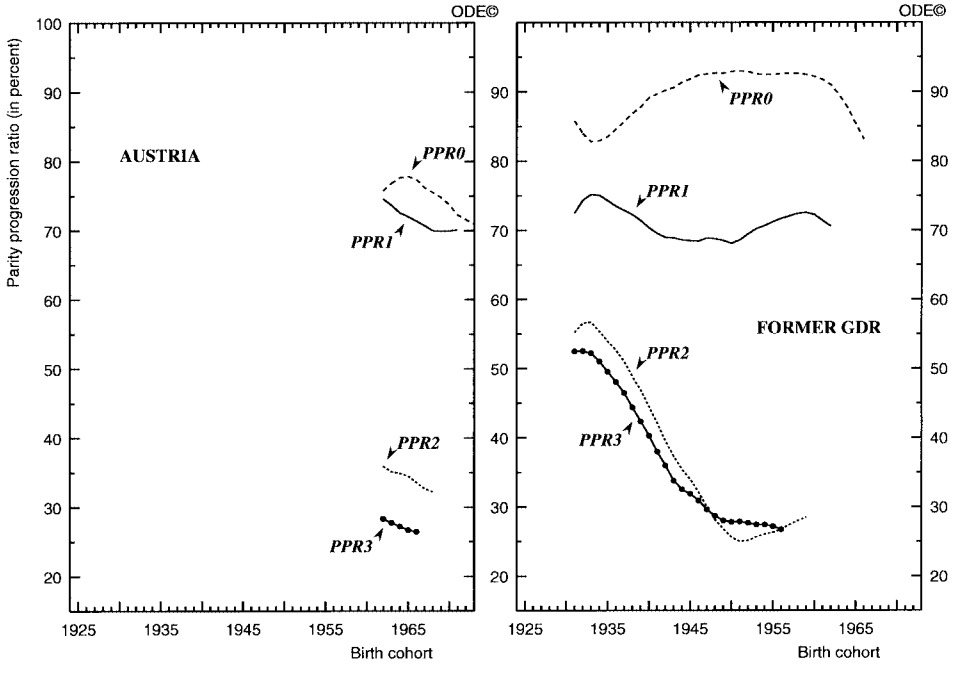


**Figure WCE-9 WEST CENTRAL EUROPE**
**Parity distribution of completed fertility, birth cohorts 1926 to 1968 (in percent)**

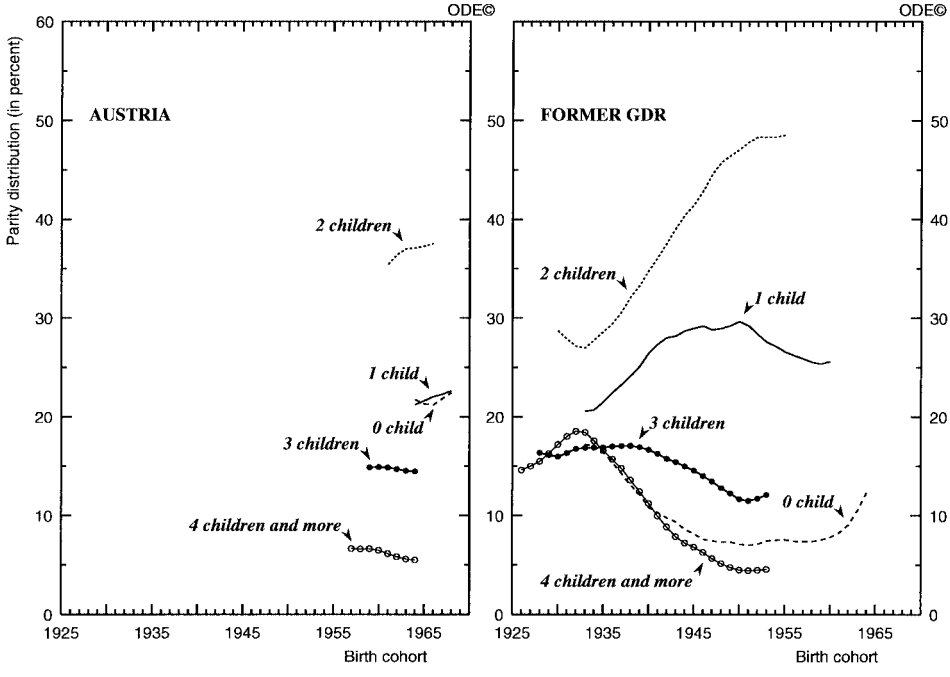



**Figure WCE-10 WEST CENTRAL EUROPE**
**Proportions of childless women, selected ages, birth cohorts 1934 to 1980**

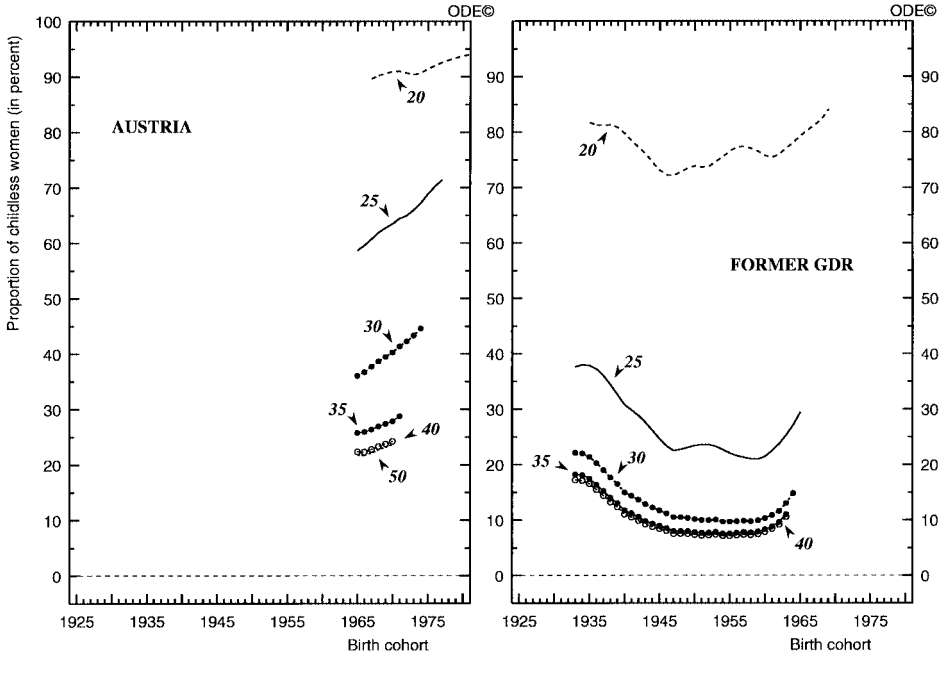
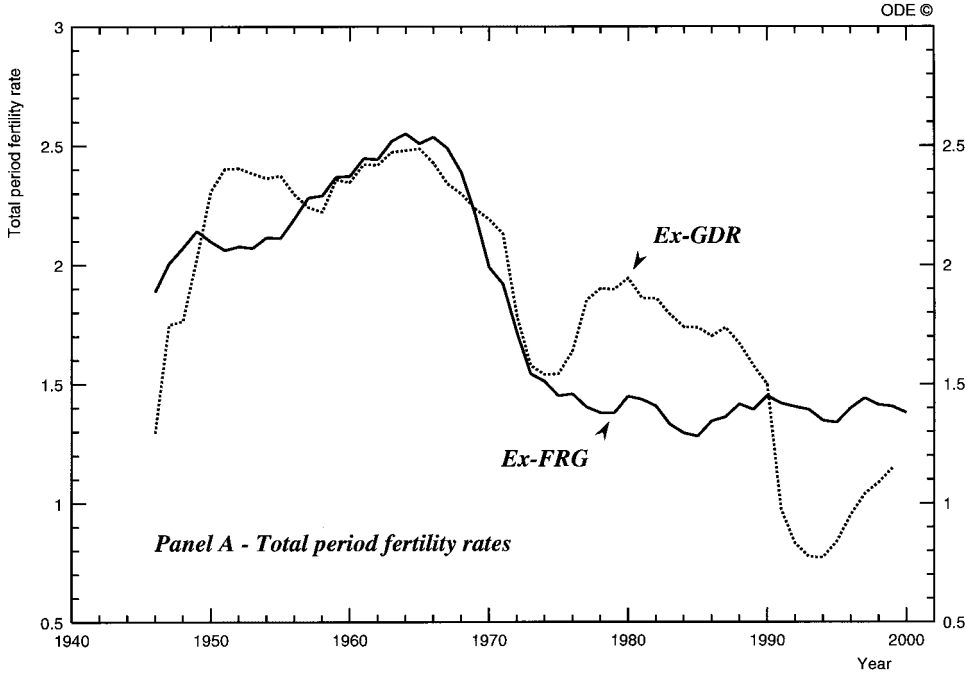


**Figure G-1 Total period fertility rates, 1947-1998**
**Total cohort fertility rates, birth cohorts, 1928-1965**
**Former Federal Republic of Germany and former German Democratic Republic**



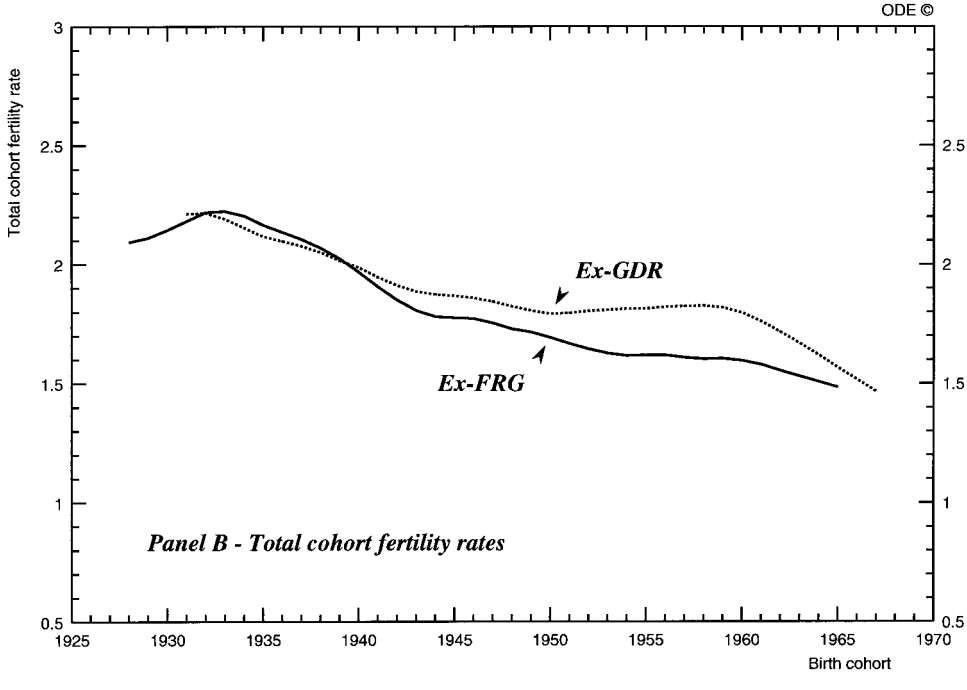



**Figure G-2 Age-specific fertility rates, ex-FRG and ex-GDR, birth cohorts : 1930, 1940, 1950, 1960, 1965, 1970, 1975 and 1980**

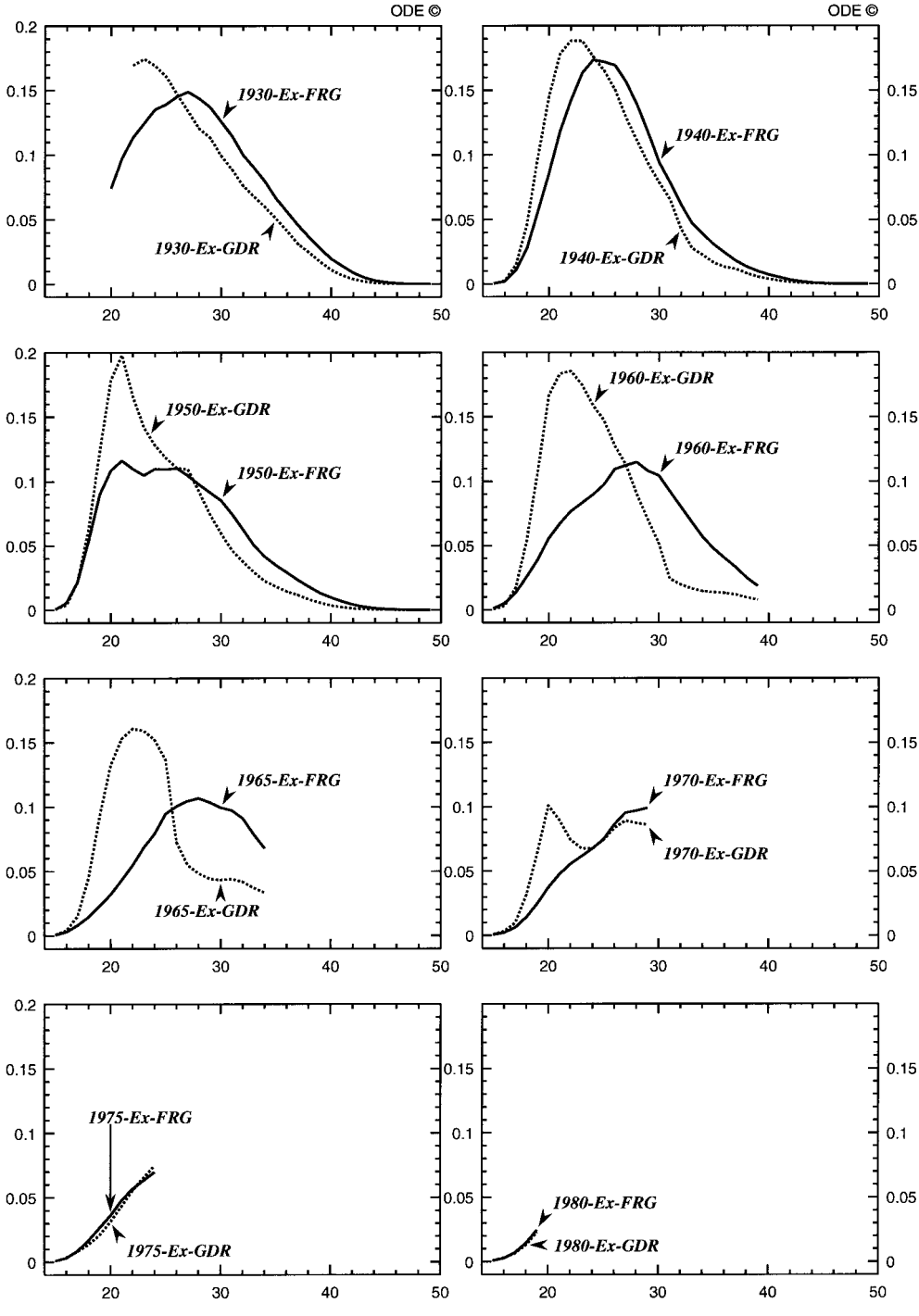


Figure G-3. Final Parity, Germany (FRG from 1949), marriage cohorts 1900-1974

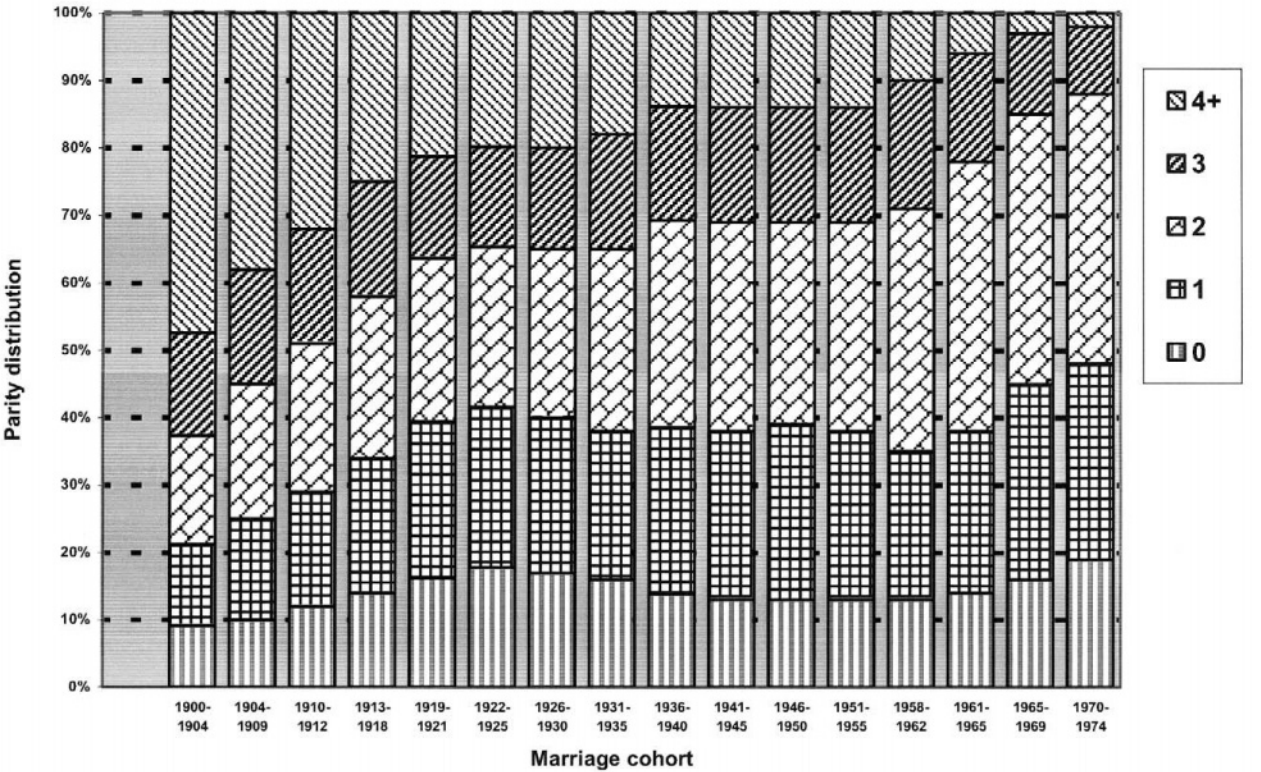
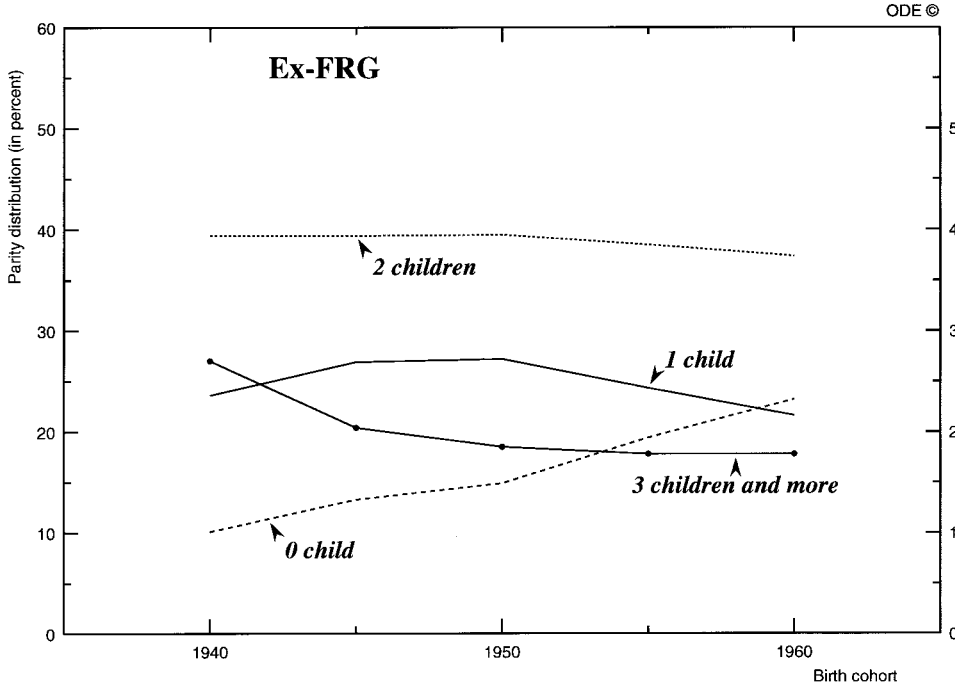
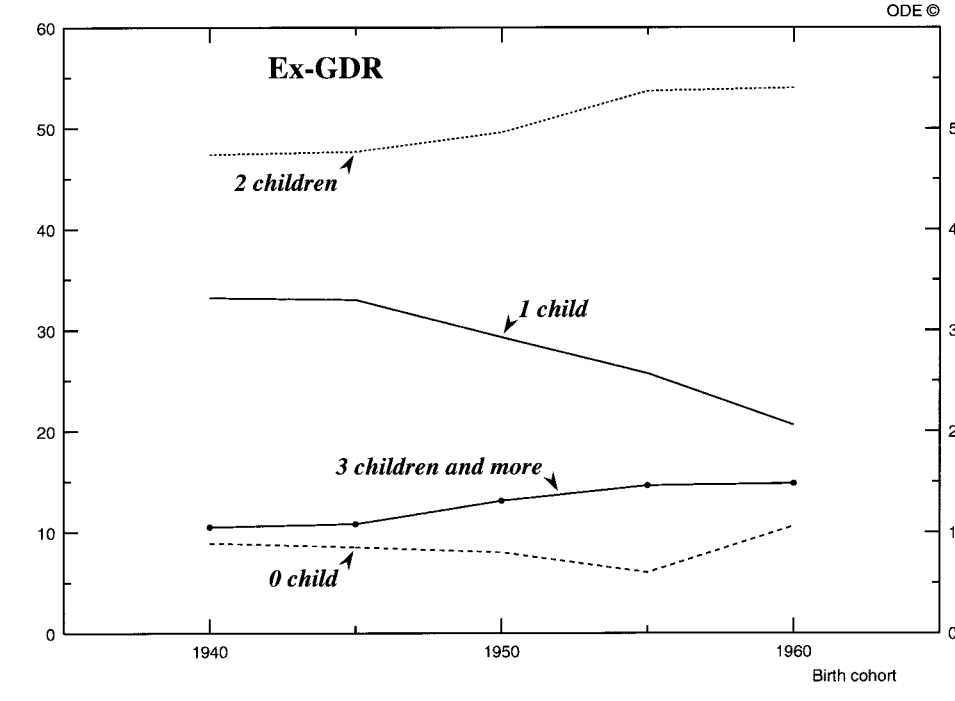


**Figure G-4 Final parity of birth cohorts, FRG, GDR, birth cohorts 1940-1960**



# 6. Southern Europe

The countries of this region —Greece, Italy, Portugal and Spain— are homogeneous in various aspects of fertility levels and trends. A number of the political, economic, social and cultural factors influencing fertility are also region-specific and distinguish it from other European regions. At the same time, there are many differences between the countries within the region.

Modern comprehensive industrial development took place later than in central, western and northern Europe. It was not until the 1960s that critical progress was initiated in Spain, Greece and Portugal; somewhat earlier in Italy. Right-wing authoritarian regimes were in power for several decades in the middle of the 20th century. The authority and extensive influence of the Roman Catholic and Greek Orthodox churches on societies and life in general was more intrusive than elsewhere in western countries. The transition to democratic political systems took place immediately after the Second World War in Italy, and not until the 1970s in Greece, Spain and Portugal. In such an environment conservative legislation regarding birth control was maintained into the 1970s. At the end of the 20th century, per capita income,[29] as well as expenditures on social protection,[30] were still the lowest among the countries of the European Union. Moreover, the proportion of social protection expenditures on the family and children[31] were much lower than in the other countries.

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[29] Gross national income in purchasing power parity in the year 2000 was $ 16,880 in Portugal, $ 16,940 in Greece, $ 19,180 in Spain and $ 23,370 in Italy, compared to $ 23,770 in Sweden, $ 25,010 in Germany, $ 27,500 in Belgium and $ 29,760 in Norway (World Bank 2002).

[30] Expenditures on social protection in purchasing power standards in 1999 were €3,416 in Spain, € 3,588 in Portugal, € 3,648 in Greece and € 5,507 in Italy, compared to € 6,573 in Belgium, € 6,633 in Germany, € 7,116 in Sweden and € 7,367 in Norway (Abramovici 2002).

[31] The proportions of total social benefits on the family and children were 2.1 per cent in Spain, 3.7 in Italy, 5.2 in Portugal and 7.6 in Greece, compared to 9.1 per cent in Belgium, 10.5 in Sweden and Germany and 13.2 per cent in Norway (Abramovici 2002).

Comparatively high period fertility was maintained into the 1970s, but has since declined abruptly and to lower levels than elsewhere (Sardon 2001a). The associated social and cultural mechanisms have a number of distinctive features. The institutions of the family and marriage have remained strong. Many youngsters when studying and often when initiating their working careers, frequently under conditions of high unemployment, were as a rule supported by their parental families, resided at home and increasingly tended to leave later than previous generations. Others remained at home by choice even though they had established themselves successfully in income generating occupations. When they did leave home, they married rather than live in informal unions. Each subsequent birth cohort, starting with women born in the 1930s, had fewer children than previous ones. The total cohort fertility rates of women born around 1960 were the lowest among the low fertility countries. Childbearing patterns of the cohorts born in the 1960s and early 1970s imply that fertility is going to continue to decline and remain considerably below replacement. Eventual total cohort fertility rates of these women may be as low as 1.2 to 1.3 births per woman in Italy and Spain, probably somewhat higher in Portugal and Greece.

## 6.1 | Greece

There is evidence pointing to low fertility already in the early-1920s; the crude birth rate (CBR) was around 20 per 1000 (Chesnais 1992). This might have been an aberration as in the late 1920s and for most of the 1930s the CBR was around 30. In the 1940s fertility was at first depressed during the Second World War and then slightly elevated in the post-war period. Chesnais (1992) lists a total period fertility rate (TPFR) for 1950 of 2.6 births per woman, but questions the reliability of the data (p. 125). Even though the accuracy of the statistics might be in doubt, fertility in Greece was the lowest among the large South European countries in the 1960s. In 1965 the TPFR was 2.3 in Greece, compared to 2.7 in Italy, 3.0 in Spain and 3.2 in Portugal (Council of Europe 2000). The TPFR rose to around 2.4 in Greece in the late 1960s. It then declined mildly during the 1970s, steeply during the 1980s, and stabilized between 1.3 and 1.4 in the 1990s (Figure SE-1).

Cohort fertility can be estimated starting with women born around 1940. Cohorts born during the 1940s already had fertility below the replacement level. The estimated total cohort fertility rate (TCFR) declined moderately between the

1950 and the 1960 birth cohorts from 2.04 to 1.93 children per woman (Figure SE-1 and SE-2). Among the cohorts born in the early 1960s the fertility decline was apparently faster and women born in 1965 may wind up with a TCFR of 1.7.

Changes of the age patterns of life-time cohort fertility can be followed beginning at least in part with the cohorts of the mid-1930s (Figure SE-3). The age-specific cohort fertility curve for women born in 1930 starts with the value for age 30. A comparison with the curve of the 1940 cohort illustrates that fertility decreased for women in their 30s. The decline was even more pronounced among women born during the 1940s. This was especially steep for women 28 to 34 years old — between 20 and 30 per cent.

The further changes of cohort fertility age patterns were quite complex. Among the cohorts born in the 1940s and 1950s the peak of childbearing shifted into the younger ages (Figure SE-3). While the TCFRs were declining moderately among cohorts of the 1950s, women were having more children when young. Once in their 20s, fertility was considerably lower among women of the 1960 cohort than in previous cohorts (Figures SE-2 and SE-3 and Table G-1). In addition, women of the 1960 cohort exhibited a weak propensity to delay childbearing into their 30s.

Fertility of the cohorts which during the 1990s were at the onset or in the middle of their childbearing was clearly declining from one cohort to the next (Figures SE-5 and SE-6 and Table G-2). By age 27 the 1970 cohort had 0.5 children less than the 1960 cohort — its cumulative cohort fertility rate had declined by 45

*Table G-1. Fertility deficits and surpluses comparing birth cohorts, Greece, cohorts 1940, 1950 and 1960*

| Fertility | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children |
| Deficit | 27-49 | -0.336 | 23-32 | -0.280 |
| Surplus | 15-26[a] | +0.267 | 15-22 | +0.138 |
| | | | 33-49[b] | +0.051 |
| Total | | -0.069 | | -0.091 |

Notes: [a] Includes estimated data for ages 15-19 in 1940 cohort the total of which was 3.2 per cent of TCFR.
[b] Includes estimated data for ages 40-49 of 1960 cohort the total of which was 1.7 per cent of TCFR.

*Table G-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Greece, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility rate of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 37 | 1.837 | … | … | … | -6 | … | … | … |
| 32 | 1.613 | 1.377 | … | … | -8 | -21 | … | … |
| 27 | 1.200 | 0.928 | 0.661 | … | -1 | -28 | -45 | … |
| 22 | 0.543 | 0.407 | 0.248 | 0.160 | 32 | -19 | -54 | -61 |

per cent. At the same time, the cohorts born during the 1960s were delaying some of their fertility until later. The 1965 cohort after age 26 had higher single year fertility rates than the cohort five years its senior, and its fertility peak —while comparatively low— was spread out between the ages 22 and 28.

In the cohorts born in the 1940s close to 90 per cent of women had a first birth, and few of them opted for fourth or higher order births (Figure SE-7). Even third births were not very common. Second order births started declining in the cohorts born in the mid-1940s. With a lapse of about ten cohorts, first births also started out on a declining trend. About 80-85 per cent of women in the cohorts of the early to mid-1960s were having first births.

Directly related is a notable trend of increasing childlessness (Figures SE-9 and SE-10). The proportion of women remaining without any child increased from below ten per cent in the cohorts born in the late 1940s to an estimated 15-20 per cent in the cohorts born in the 1960s. There are strong indications that this trend is likely to continue. Women born around 1970 are having considerably fewer children than previous cohorts, for instance, at age 30 (Figure SE-10), and so far the propensity to postpone births was not very strong in Greece.

The parity distribution was quite stable. The two-child family was by far the most prevalent for all the cohorts with available data, although it was slowly losing ground (Figure SE-9). There were 20 or less per cent with three children and among the cohorts of the 1960s barely five per cent of families had four or more children. The outstanding exception to the stability in the parity distribution was the increase in the proportion of women or couples that did not have any children.

## 6.2 | Italy

The secular fertility decline started in Italy "at the end of the nineteenth century, about a century later than in France, a few decades later than that of other western countries, and a few decades earlier than that of other Mediterranean populations. The timing of the decline is in agreement with the place and role of Italy in Europe and with her double soul, Continental and Mediterranean at the same time" (Livi-Bacci 1977: p. 3). At the national level, the fertility transition took about 60 years, ending in the early 1950s. It was marked by considerable regional variation. In the North and Center the decline started shortly after unification in 1861 and ended in the late 1940s. In the South, including Sicily and Sardinia, a clear and deliberate fertility control became evident only in the 1930s and fertility was still relatively high even in the 1970s (Livi-Bacci 1977: p. 108).

The fertility "transition in Italy was a gradual rather than an abrupt process" (Livi-Bacci 1977: p. 109). The total period fertility rate (TPFR) declined from a level of around five births per woman during the last decades of the 19$^{th}$ century to 3.0 during the 1930s and eventually to 2.3 in the 1950s. Contrary to other countries of central, western and northern Europe, Italy did not experience a baby-boom following the Second World War. There was only a moderate fertility increase in the early 1960s to a peak of 2.6 in 1964 (Figure SE-1). Apart from the relatively slow social and economic development, especially of Italy's South, the pronatalist policy of fascism and its after-effects might have delayed demographic change in the socially disadvantaged sectors of the population. Livi-Bacci (1977: p. 282) cites a number of features characterizing these after-effects: the survival of anti-liberal legislation concerning birth control; the survival of an anti-secular mentality in the public administration in matters concerning the family and fertility; the persistence of a very conservative mentality of the medical class; the long-lasting influence of the less enlightened sectors of the clergy and the timidity of private action in the field of family planning.

Period fertility rates started on their recent lasting decline from the 1964 peak, at first moderately through the mid-1970s and then more abruptly through the late 1980s. This decline continued, albeit slowly, during the 1990s. From 1994 through 2000 Italy was among the countries with the lowest total period fertility rate in the world, 1.2 births per woman.

The decline of total cohort fertility rates (TCFRs) has been smooth, but relatively steep compared to other European countries. The TCFR was at its peak, 2.3 births per woman, for the 1933 birth cohort and has since declined from one generation to the next. A robust estimate for the 1962 cohort puts the TCFR at 1.6 births per woman (Figures SE-1 and SE-2). As demonstrated below it appears as though this decline has not yet run its course and is likely to continue.

Several interacting factors contributed to the fertility decline in Italy. The legalization of contraceptives in 1971 and a 1978 liberal abortion regulation effectively granting induced abortion upon request during the first three months of pregnancy provided Italian women with options to regulate their fertility if they chose to do so. Also, progress in women's education and a rapid rise in female labor force participation throughout the 1970s and 1980s were among the many socioeconomic factors generating the fertility decline (Delgado and Livi-Bacci 1992).

The transition into adulthood in the Mediterranean differs from other European countries. The traditional long stay of adult children in the family home, longer than in many other countries, has been extended. Fewer women and men marry, and those who do, marry later (Billari *et al*. 2001 and Billari *et al*. 2002). Rates of consensual unions are relatively low. Women on average have their first children late, especially women with higher education (De Sandre, P. *et al*. 2000). The causal mechanisms underlying these developments are a matter of scientific and policy concern. Are the patterns "peculiar for the Mediterranean region the result of choice or constraint?" (Billari *et al*. 2002). Differences in economic conditions, unemployment levels and welfare state measures assisting young people might all be instrumental, but "culturally defined norms must also be recognized" (Billari *et al*. 2002).

The age patterns of childbearing have been changing from one generation to the next. The birth cohorts of the 1930s had a large proportion of their children while they were young. During the prime childbearing years of 22 to 25 age-specific fertility of the 1940 cohort was about 20 per cent above the 1930 one (Figure SE-3). These women when in their 30s and in particular in their 40s had much lower fertility than cohorts born earlier. Above age 40, for instance, at each age fertility was more than 60 per cent lower for the 1940 cohort compared to the 1930 one.

Among the cohorts of the 1940s there was a further fertility increase of young women up to age 22. However, fertility of these cohorts was considerably lower between the ages of 23 and 40. Especially around age 30 fertility was much lower than previously. Thirty year old women of the 1950 cohort had 30 per cent lower fertility than the cohort ten years older (Figure SE-3).

The cohorts of the 1950s had considerably lower fertility than previous generations when they were in their 20s. Between the ages of 21 and 26 the 1960 birth cohort had 25 to 35 per cent fewer children than the 1950 cohort. By age 30 the 1960 cohort had a cumulated cohort fertility rate (CCFR) of 1.07 compared to 1.37 of the 1950 cohort; the difference was 0.30 of a child, a decline of 22 per cent. The 1960 cohort delayed some of its childbearing (Figure SE-3). When these women were in their 30s their age-specific fertility rates were higher than those of the 1950 cohort; around the age of 35 by about 25 per cent. The surplus fertility of this cohort in their 30s was much smaller than the deficit when they were younger. For the cohorts with completed or almost completed fertility the surpluses of any cohort and at any age were never large enough to make up for the deficits incurred (Table I-1).

Fertility of the cohorts in the midst or at the onset of childbearing in the late 1990s was systematically lower than that for cohorts born earlier. At each age the age-specific fertility rates for each younger cohort was lower than for the cohorts born five years earlier (Figure SE-5). Measured by cumulated cohort fertility rates (CCFRs) and analyzing the differences between successive cohorts, the differences are of large magnitudes and there appears to be no

*Table I-1. Fertility deficits and surpluses comparing birth cohorts, Italy, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 29-49 | -0.304 | 24-41 | -0.362 | 19-29 | -0.335 |
| Surplus | 15-28[a] | +0.170 | 15-23 | +0.100 | 15-18 | +0.007 |
| | | | 42-49 | +0.004 | 30-49[b] | +0.111 |
| Total | | -0.134 | | -0.258 | | -0.217 |

Notes: [a] Includes estimated data for ages 15-21 of 1930 cohort the total of which was 7.8 per cent of TCFR.

[b] Includes estimated data for ages 40-49 of 1960 cohort the total of which was 6.7 per cent of TCFR.

indication thus far that there will be any meaningful compensation once these generations will be older. By age 32 fertility of the 1965 cohort was 28 per cent below the fertility of the cohort born ten years earlier (Figure SE-6 and Table I-2). At age 27 the relative difference between the 1970 and the 1960 cohort was even larger, it was 46 per cent or .36 of a birth. Also the youngest cohort for which some data were available, namely women born in 1975, fertility was considerably lower than among previous generations. At age 22 the difference with the cohort born ten years earlier was 53 per cent.

Note also that Italian women did not display a strong propensity for increased fertility when women reached their late 20s or 30s (Figures SE-3, SE-5 and SE-6).

Continuously declining fertility of young women combined with a weak inclination to bear children later in life implies a likely further decline of completed cohort fertility from the 1.6 births per woman of the cohorts born in the early 1960s.

Among the cohorts of the 1930s first and second order births were on the rise, whereas higher order births were already declining (Figure SE-7). Second order births started to descend in the cohorts of the late 1940s. These were then followed by an onset in the decline of first order births in the cohorts of the late 1950s. In the cohorts of the early 1960s only around 85 per cent of women were having first births and 15 per cent were estimated as remaining childless (Figures SE-7, SE-8 and SE-10). Judging from the ascent of childlessness in younger cohorts at lower ages, the proportion of women without children is likely to rise in the near future.

*Table I-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Italy, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility rate of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 37 | 1.540 | … | … | … | -13 | … | … | … |
| 32 | 1.244 | 1.027 | … | … | -19 | -28 | … | … |
| 27 | 0.768 | 0.558 | 0.412 | … | -26 | -42 | -46 | … |
| 22 | 0.273 | 0.167 | 0.112 | 0.078 | -14 | -54 | -59 | -53 |

The two-child family has become the most common and was holding its ground at over 40 per cent (Figure SE-9). Couples and/or women with one or no child were on the increase essentially starting with the cohorts of the mid-1940s and larger families especially those with four or more children were all but disappearing.

These developments confirm the conclusion that further fertility declines can be expected.

## 6.3 | Portugal

Literature and research on long-term fertility trends and their causes in Portugal compared to Spain and Italy is relatively scarce. Yet there is an adequate amount of basic fertility data. Portugal has a long continuous, apparently reasonably reliable, time series of fertility by single year of age of mother since 1941.

Portugal was among the least developed countries in Europe for about two thirds of the 20th century. Since the 1960s a fundamental economic, social and —since the mid-1970s— political transformation has been under way. In the middle of the century 95 per cent of the population had only an elementary education; by 1990 about 22 per cent had a secondary and seven per cent a higher education. A majority of the labor force was employed in the primary sector in 1950; by 1990, 45 per cent of men and 61 per cent of women were in the service sector (Carrilho and Magalhães 2000). The Salazar dictatorial regime was overthrown in 1974 and Portugal joined the European Community in 1985.

Portugal's society was very isolated even from its immediate neighbor, Spain (Livi-Bacci 1971). Its backwardness and isolation were reflected in its long-term fertility trends. Throughout the end of the 19th century and into the 1920s the crude birth rate was between 30 and 35 per 1.000 population (Chesnais 1992). A minor, erratic decline ensued during the 1930s. Period fertility stabilized during the next two to three decades. In distinction to practically all other European countries, the total period fertility rate remained around 3.0 through 1970 (Figure SE-1). As profound societal changes progressed, fertility started out on a steep decline. Between 1970 and 1995 the TPFR was cut by more than one half, from 3.0 to 1.4 births per woman.

The total cohort fertility rate was slightly below 3.0 for women born in the 1920s and early 1930s. It then began to decline quite steadily among subsequent cohorts. Apparently women born in the early 1960s will have a completed fertility rate of 1.9 and estimates for the subsequent cohorts indicate a continued mild decline (Figures SE-1 and SE-2).

Underlying the overall decline of the TCFRs were considerable changes in the age patterns of cohort life-time fertility. The cohorts born during the 1930s had more children than preceding cohorts while young, up to their late 20s. In their 30s and 40s they then curtailed childbearing (Figures SE-2 and SE-3 and Table P-1). Women born during the 1940s were limiting their childbearing considerably not only in their 30s and 40s, but also during their prime reproductive years. The fertility decline of women in their 20s and early 30s continued forcefully among the cohorts born during the 1950s (Figure SE-3 and Table P-1). These women had somewhat elevated fertility when young and they exhibited a minor propensity for delayed childbearing.

The major changes in the age patterns of cohort fertility were reflected in trends of the mean age of childbearing. This declined from 29.4 in the 1930 to 26.1 in the 1956 cohort (Figure SE-4). In subsequent cohorts it started to increase and was estimated at around 27.5 for women born in the mid-1960s.

The youngest generations, those born during the 1960s and early 1970s, were continuing on the path to lower fertility (Figures SE-5 and SE-6 and Table P-2). Thus far, successive cohorts were having fewer children than previous ones. For instance, women born in 1970 by age 30 had almost 0.4 fewer births than the cohort ten years older (Figure SE-6). While it is clear that these generations were

*Table P-1. Fertility deficits and surpluses comparing birth cohorts, Portugal, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 30-49 | -0.396 | 20-49 | -0.604 | 23-34 | -0.298 |
| Surplus | 15-29 | +0.118 | 15-19 | +0.017 | 15-22 | +0.096 |
| | | | | | 34-49[a] | +0.026 |
| Total | | -0.278 | | -0.587 | | -0.176 |

Note: [a] Includes estimated data for ages 40-49 of 1960 cohort the total of which was 2.3 per cent of TCFR.

*Table P-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Portugal, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.719 | 1.617 | … | … | … | -11 | -14 | … | … | … |
| 30 | 1.386 | 1.226 | 0.997 | … | … | -11 | -23 | -28 | … | … |
| 25 | 0.861 | 0.680 | 0.514 | 0.404 | … | 3 | -30 | -40 | -41 | … |
| 20 | 0.230 | 0.184 | 0.134 | 0.104 | 0.102 | 49 | 8 | -42 | -44 | -24 |

having fewer children when young, i.e. into their mid-20s, trends to date indicate the continuing moderate tendency to delay childbearing. Age-specific fertility rates of the 1965 birth cohort after age 26 were higher than those of the 1960 cohort (Figure SE-5). The 1970 cohort was aiming in the same direction.

Data on birth order, parity and childlessness were available only for a few cohorts born in the 1960s (Figures SE-7 to SE-10). Almost all women were having first births, however, clear signs of an incipient decline were evident. All other birth orders were also descending.

The two child family was the most widespread, but women with one child were on the rise as were the childless ones. Their proportion appears likely to increase further (Figure SE-10).

## 6.4 | Spain

The fertility transition as measured by the total period fertility rate was under way and proceeding smoothly at the beginning of the 20th century. It started out with a delay and from a lower level than in central and North European countries, for instance, Germany, the Netherlands and Belgium (Coale and Watkins 1986). It was subsequently modified by the civil war of the 1930s. During the 1940s, the basic trend of a gradual fertility decline was resumed, albeit with noteworthy oscillations. Between the late 1940s and the mid-1960s fertility increased from a TPFR of 2.5 to 3.0 births per woman (Figure SE-1). From the late 1950s through 1975 fertility was relatively high with the TPFR never falling below 2.7 births per woman. A rapid fertility decline can be detected since 1976. The TPFR declined from 2.7 to 1.2 by 1994 and remained at that level through the year 2000 (Figure SE-2).

Total cohort fertility rates (TCFRs) also declined starting with the cohorts born around 1930. Fernandez Cordon (1986) prepared the first TCFR estimates beginning with women born in 1901 and carried the series through to the 1961 birth cohort. The TCFR declined from 3.3 in the 1901 cohort to 2.5 in the cohorts born in the early 1920s. A slight rise followed, but with the cohorts of the early 1930s the decline resumed. Our calculations and estimates start with the cohorts of the 1920s (Figures SE-1 and SE-2). There is a minor difference between the two series, ours being slightly higher than those of Fernandez Cordon, but the overall trend is the same. The highest completed fertility rates were experienced by cohorts born in the early 1930s, almost 2.7 births per woman. The TCFRs then decreased moderately among the remaining cohorts of the 1930s, but starting with the cohorts born in the early 1940s fertility declined rapidly and continuously through those of the mid-1960s. The 1941 TCFR was 2.6 and those of the mid-1960s were around 1.6 births per woman (Figure SE-1). As will be analyzed below, a further decline of cohort fertility can be expected judging from the experience to date of women who were at the onset or in the midst of their reproductive periods at the turn of the century.

A complex set of circumstances influenced long-term fertility trends in Spain. In the European context, Spain lagged economically not only for the first half of the century but well into the 1960s. The civil war of the 1930s and the ensuing authoritarian rule of General Franco imposed numerous restrictions on political life and the State intervened strongly in spheres of private life and morality, essentially enforcing the Catholic conservative model. Traditional patterns of household and union formation prevailed and fertility was relatively high into the 1970s (Billari *et al.*, 2002).

Rapid economic development as well as political and social modernization began towards the end of the Franco regime and were accelerated after his demise. Almost one half of the work force was employed in agriculture in the 1950s and this declined to ten per cent by the 1990s. The industrial and mainly the service sectors expanded considerably. Services constituted over 60 per cent of the gross domestic product in the late 1990s with 50 per cent of men and 78 per cent of women employed in this sector in 1995. Per capita income and living conditions improved significantly. For instance, the number of dwellings nearly tripled between 1950 and 1990, while the population increased by only 37 per cent during the same period. Female labor force participation rates increased from about 10 to 50 per cent from the 1950s to the 1990s. Also the educational system and educational profile of the population were substantially transformed

(Delgado and Castro Martin 1999). Political and social modernization was consolidated with the comprehensive integration of Spain into the European Community in 1986.

Some aspects of the patterns of transition into adulthood and parenthood were changing while others remained stable. Young people were staying in parental homes much longer, but the connection between the departure from the parental home and marriage remained strong (Billari *et al*., 2002). In Spain changes in the transition to parenthood —later and fewer marriages, some increase in cohabitation— occurred abruptly. In particular, following Franco's death, the generation born between the mid-1960s and mid-1970s, which was socialized in democratic values, cultural modernity and gender equality ideals, exhibited such behavior (Billari *et al*., 2002). It was the increasing years spent on acquiring education and major efforts to initiate work careers, during which young people were dependent on their families for economic support. This was needed to cover costs of education, or to bridge likely streaks of unemployment and underemployment, and to deal with high costs of renting an apartment and buying a house. Such were the circumstances contributing to the prolonged stay in the parental home (Delgado and Livi-Bacci 1992).

The democratization process opened the door for the legalization of contraception in 1978 and of sterilization in 1983. These proved important in the Spanish context in facilitating an increase in contraceptive prevalence. Also, in 1985 conditions for induced abortions were reformed, even though the legalization was limited to broadly defined medical reasons. The increase in contraceptive prevalence was momentous, from 51 to 59 to 81 per cent of women of reproductive age married or living in unions, from one of the lowest in Europe in 1977, and still quite low in 1985, to among the highest in the mid-1990s. The incidence of induced abortion was and remained low, although it might have increased mildly (United Nations 2001; Delgado and Castro Martin 1999).

The continuous fertility decline which started among the cohorts of the 1930s was associated with momentous changes in lifetime strategies of childbearing. There was a sharp decline of childbearing when women were in their 30s and 40s between the cohorts born around 1930 and those born around 1950 (Figure SE-3). The 1940 birth cohort had 0.3 fewer children than the 1930 cohort after age 30. The decline in childbearing of women after age 27 was even larger among the cohorts born during the 1940s; these women in the 1950 cohort had

over 0.5 fewer children compared to the 1940 birth cohort (Table SP-1). There was also somewhat of a shift to having children earlier in life (Figure SE-3). The mean age of cohort childbearing declined from over 30 in the cohorts of the early 1930s to around 27.5 years among the birth cohorts of the late 1940s (Figure SE-4).

This was followed by a major decline of fertility when women were in their prime childbearing years among the cohorts of the 1950s. At ages 24 to 26, women born in 1960 were having about half as many births compared to the cohort ten years older. The peak of the age-specific cohort fertility rates disappeared, its summit spread out between the ages of 25 and 29, and the mean age of childbearing was moving upward beginning with the cohorts born in the mid-1950s (Figures SE-3 and SE-4). Basically, young women in the birth cohorts of the late 1950s were bearing considerably fewer children than previous generations and there was an indication that they were deciding to have marginally more children than previous generations when in their thirties (Figure SE-3 and Table SP-1). The process of postponing births had apparently started among the cohorts born around 1960.

This trend was continuing among the cohorts that were at the beginning or in the middle of their childbearing careers during the late 1990s (Figures SE-5 and SE-6). Age specific fertility rates and cumulated cohort fertility rates of women born during the 1960s and 1970s while in their teens and 20s were declining from one cohort to the next. The decline was considerable (Figures SE-5 and SE-6 and Table SP-2). The 1965 cohort, for example, bore 0.5 fewer children by age 32

*Table SP-1. Fertility deficits and surpluses comparing birth cohorts, Spain, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 30-49 | -0.298 | 27-49 | -0.533 | 21-31 | -0.542 |
| Surplus | 15-29 | + 0.201 | 15-26 | +0.120 | 15-20 | +0.102 |
| | | | | | 32-49[a] | +0.064 |
| Total | | -0.097 | | -0.413 | | -0.376 |

Note:[a] Includes estimated data for ages 41 - 49 of 1960 cohort the total of which was 1.5 per cent of TCFR.

*Table SP-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Spain, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility rate of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 37 | 1.643 | … | … | … | -21 | … | … | … |
| 32 | 1.340 | 1.086 | … | … | -26 | -31 | … | … |
| 27 | 0.814 | 0.581 | 0.373 | … | -28 | -44 | -54 | … |
| 22 | 0.286 | 0.201 | 0.134 | 0.080 | 23 | -35 | -53 | -60 |

than the cohort ten years older. There was an indication these women might be delaying some of their births until they will be older. The age-specific rates of the 1965 cohort after age 30 were higher than for the 1960 cohort and the younger cohorts were heading in that direction (Figure SE-5).

Data on birth order and parity are available only for a small number of cohorts. These indicate that starting with women born around 1950 all birth orders and cohort parity progression ratios were on the decline (Figures SE-7 and SE-8). Over 45 per cent of women had a two child family with one child families being on the rise (Figure SE-9). Childlessness was estimated to be increasing steadily and no change in that trend seemed to be in the making (Figure SE-10).

## 6.5 | A comparative perspective

The levels of completed cohort fertility of the early to mid-1960s birth cohorts of the four populations were within a narrow range of 1.5 to 1.8 births per woman (Figures SE-1 and CO-1 and Table CO-2 [Chapter 12]). These were among the lowest in the western countries. This was in contrast to the fertility levels of the early 1930s cohorts when Portugal and Spain had relatively high TCFRs. Consequently, these two populations experienced rapid cohort fertility declines, among the fastest in the western countries. At the same time, the levels and trends in the TCFRs demonstrate the differences between the populations of the region. TCFRs in Italy and Greece were already low among the cohorts of the 1930s and 1940s. In all four countries the TCFRs were on an obvious downward slope among the 1960s cohorts (Figures SE-1 and CO-1).

The populations of this region visibly differ in trends of the general age patterns of cohort fertility. Taking a crude measure of the proportion of cohort fertility

realized by age 27, in practically all the other western countries there was an increase in this percentage between the 1930 and the 1940 cohorts followed by a mild decline from the 1940 to the 1950 cohort and a considerable decline between the 1950 and the 1960 cohorts. In the South European countries there was a continuous and large increase of the percentage of fertility below age 27 basically for the first twenty cohorts, because fertility in the older ages was rapidly declining. The decrease in the proportion of fertility before age 27 did not occur until between the 1950 and the 1960 cohorts and then only in Italy and Spain. In Greece and Portugal these proportions still increased (Table CO-3). The pace of decline among the cohorts of the early 1960s greatly accelerated and was among the fastest. The shift of fertility into the older ages was well under way among the 1960s cohorts, but the proportion of children borne by younger women in Greece and Portugal was still 50 per cent or more in the 1965 cohort, considerably higher than elsewhere. Note again the diversity in the absolute levels and trends of the proportions between the countries of the region.

The process of advancing and subsequently postponing or delaying fertility into the older ages occurred later among the cohorts of southern Europe than in the other western countries (Table CO-4). The fertility postponement started in most western countries in the cohorts of the 1940s, in southern Europe this process commenced with the cohorts of the 1950s and even then rather weakly. Note in Figure SE-3 that age specific fertility rates in the 1960 cohort are above the 1950 cohort in the 30s in all four countries. In three of the four populations when comparing the 1960 to the 1950 cohort the cumulated difference after the 27$^{th}$ birthday was negative, i.e. there were fertility 'deficits' not only before but also after the 27$^{th}$ birthday (Table CO-6). It was only in Italy that the fertility 'surplus' of women when older was sufficiently large to compensate, at least in part, for the fertility 'deficit' in the younger ages and even there the compensation was smaller than in almost any of the other western countries. Italy made up 33 per cent of its pre-27 deficit and in the other South European countries fertility declined not only before age 27, but also after that age. Compensatory surpluses did show up in the cohorts of the early 1960s.

For the young cohorts that had not concluded their childbearing in the 1990s it was possible to observe and compare trends of cumulated fertility only before their 27$^{th}$ birthday. Data in Table CO-7 indicate that there was a continuing strong decline of fertility before age 27 among women born in the 1970s in the South European countries and that this decline was larger than in other western countries. The level of cumulated fertility by age 27 was very low in Italy and

Spain; in Greece and Portugal it was not much smaller than in the other countries. A fertility decline among young women. i.e. the process of presumably postponing childbearing into the older ages, appeared to be continuing in southern Europe. Only the future will tell whether any of the deficits generated by the young women of the cohorts born in the 1960s and 1970s will be compensated later in their reproductive life-spans.

Limited information is available for even younger cohorts, namely cumulated fertility rates up to the 22nd birthday (Table CO-9). The rates for the 1975 cohorts declined considerably compared to the 1970 cohorts for the South European countries and the absolute level was very low. This is an indication that apparently the most recent cohorts were continuing in the trends of declining fertility, however, a major proportion of their reproductive periods is still in the future and their propensity to procreate can be different from previous cohorts.

In this connection it is critically important to realize that because fertility of the cohorts of the 1960s and 1970s was low and declining when these women were young, their fertility when they will be older would have to be unusually high for their completed fertility to equal or surpass the fertility of the older cohorts.

Available data indicate that women who had two children were the most prevalent throughout southern Europe — between 40 and 50 per cent in the cohorts of the early1960s (Figure SE-9). Other western countries had similar levels of two-child families but were showing declining tendencies which were not yet perceptible in southern Europe. Large families, i.e. women with four or more children, were at low levels of about five per cent and declining.

The proportions of childless women were increasing in South European countries similarly as in other western countries (Figure CO-4). In the cohorts of the early 1960s around one fifth of all women did not have any children. Judging from the trends in incomplete fertility of younger women this trend is probably going to continue in the foreseeable future (Figure SE-10).

## 6.6 | Conclusions

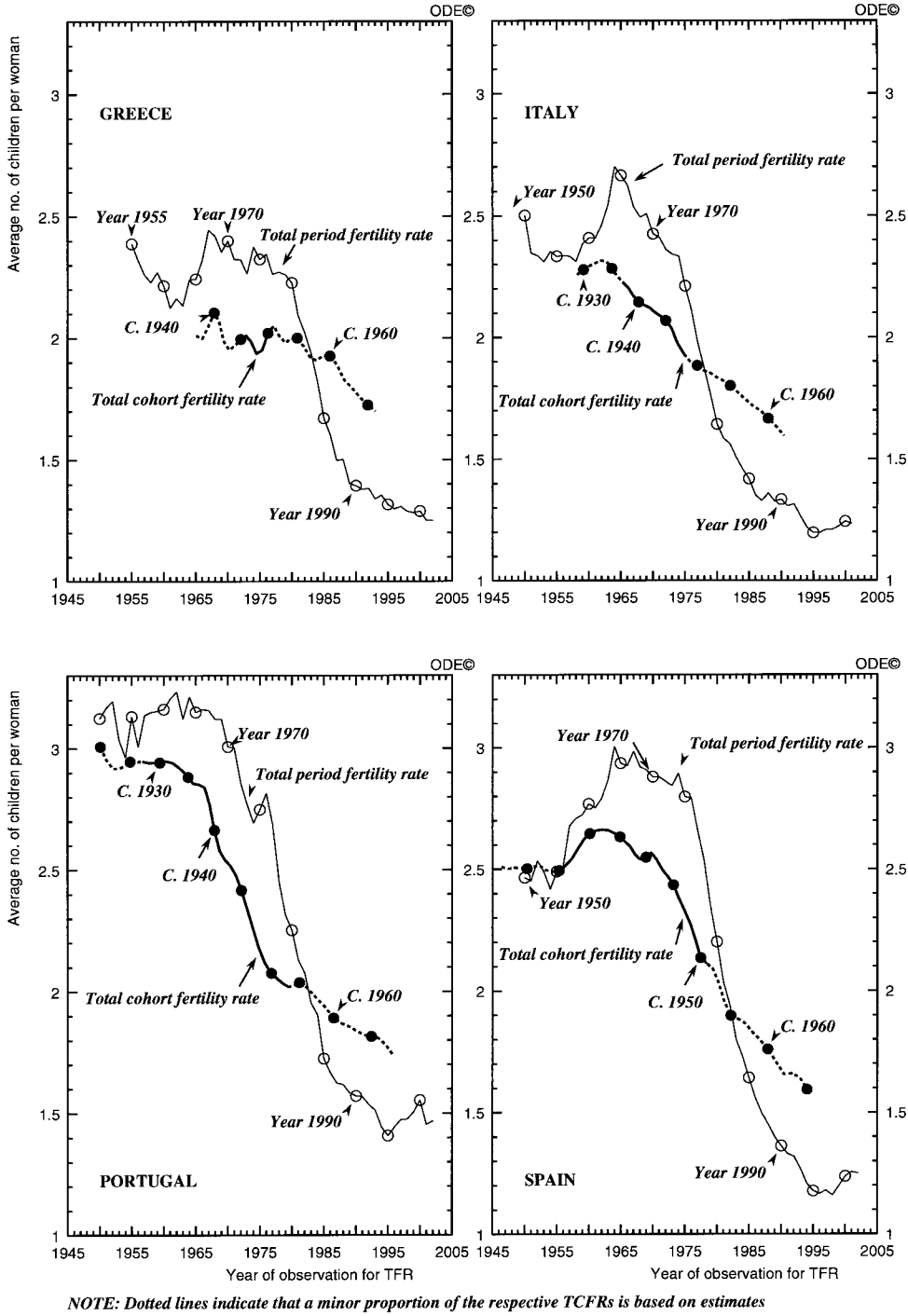
The overall conclusion of the analysis of cohort fertility levels and trends confirms that fertility is very low and declining in southern Europe. There is no

indication of a reversal in sight. To the contrary, further cohort fertility declines can be expected in the foreseeable future. More specifically:

- Among the cohorts concluding their childbearing at the end of the 20th century, those born around 1960, total cohort fertility rates will be among the lowest in the western countries;
- In southern Europe the process of delaying fertility into the older ages started later than elsewhere;
- The amount of fertility when women of the early 1960s cohorts became older was not sufficient to compensate for their low fertility when they were younger;
- In the cohorts that were at the onset or in the middle of their childbearing periods around the year 2000 fertility continued to decline while they were young. This was a common feature throughout the western countries. In distinction to other countries, in southern Europe there were very few signs of delayed fertility being recuperated by women when they reached their late 20s or 30s;
- The two child family was the most prevalent among the birth cohorts of the 1960s;
- Rates of childlessness were on the increase and, as far as the analysis can reach, there were no signs of stabilization.

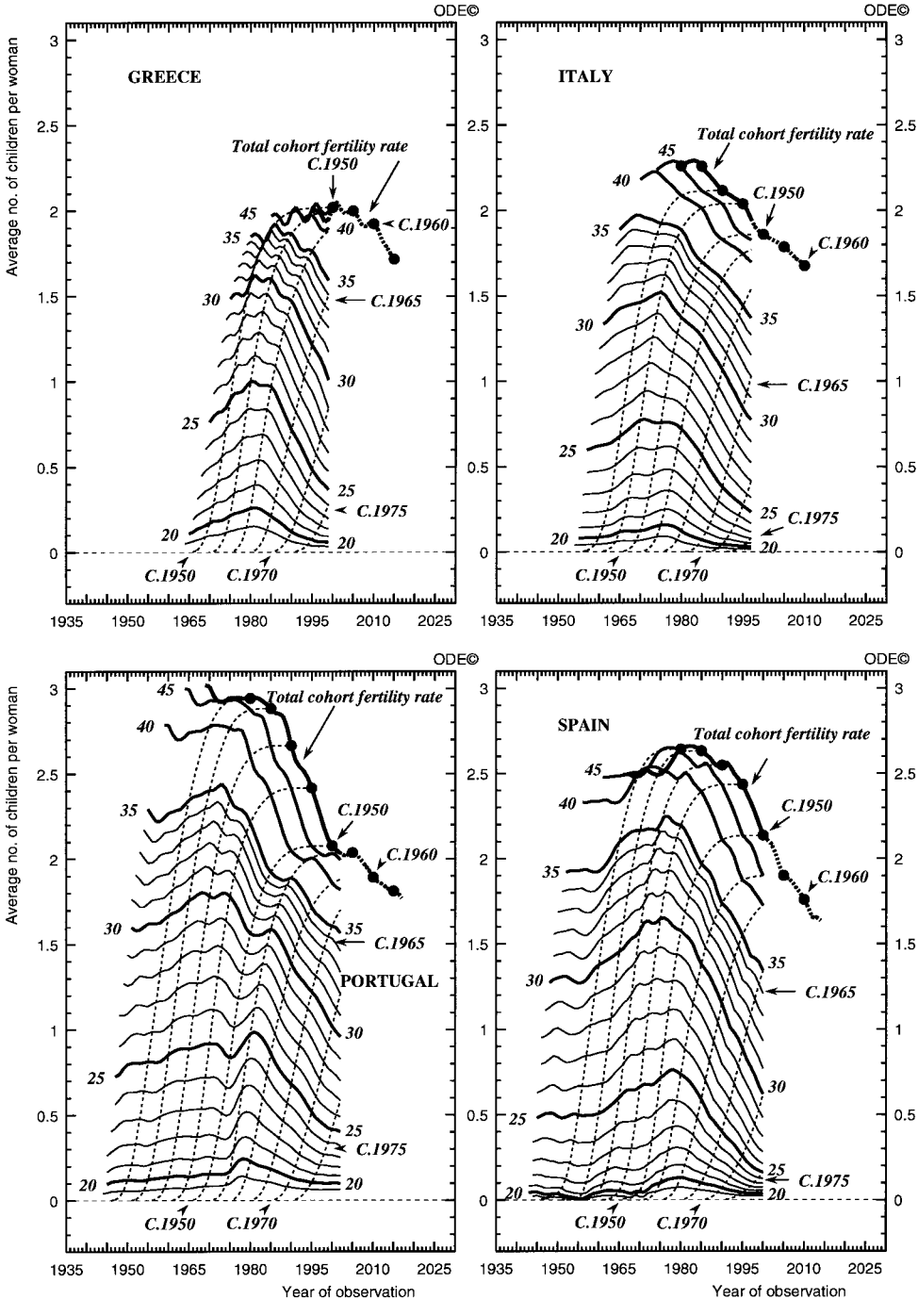
Given the low and declining fertility of young women combined with weak propensities for higher fertility of older women, total cohort fertility rates will in all likelihood continue to decline.

**Figure SE-1 SOUTHERN EUROPE, 1950-2000**
**Total period fertility rate and total cohort fertility rate lagged by the average age at childbearing**




*NOTE: Dotted lines indicate that a minor proportion of the respective TCFRs is based on estimates*

**Figure SE-2 SOUTHERN EUROPE**
**Cumulated cohort fertility at specified ages, birth cohorts 1930-1975**




*NOTE: The part of the TCFR line which is dotted indicates that a minor proportion of the TCFR is based on estimates*

**Figure SE-3 SOUTHERN EUROPE**
**Age-specific fertility rates, birth cohorts 1930, 1940, 1950 and 1960**

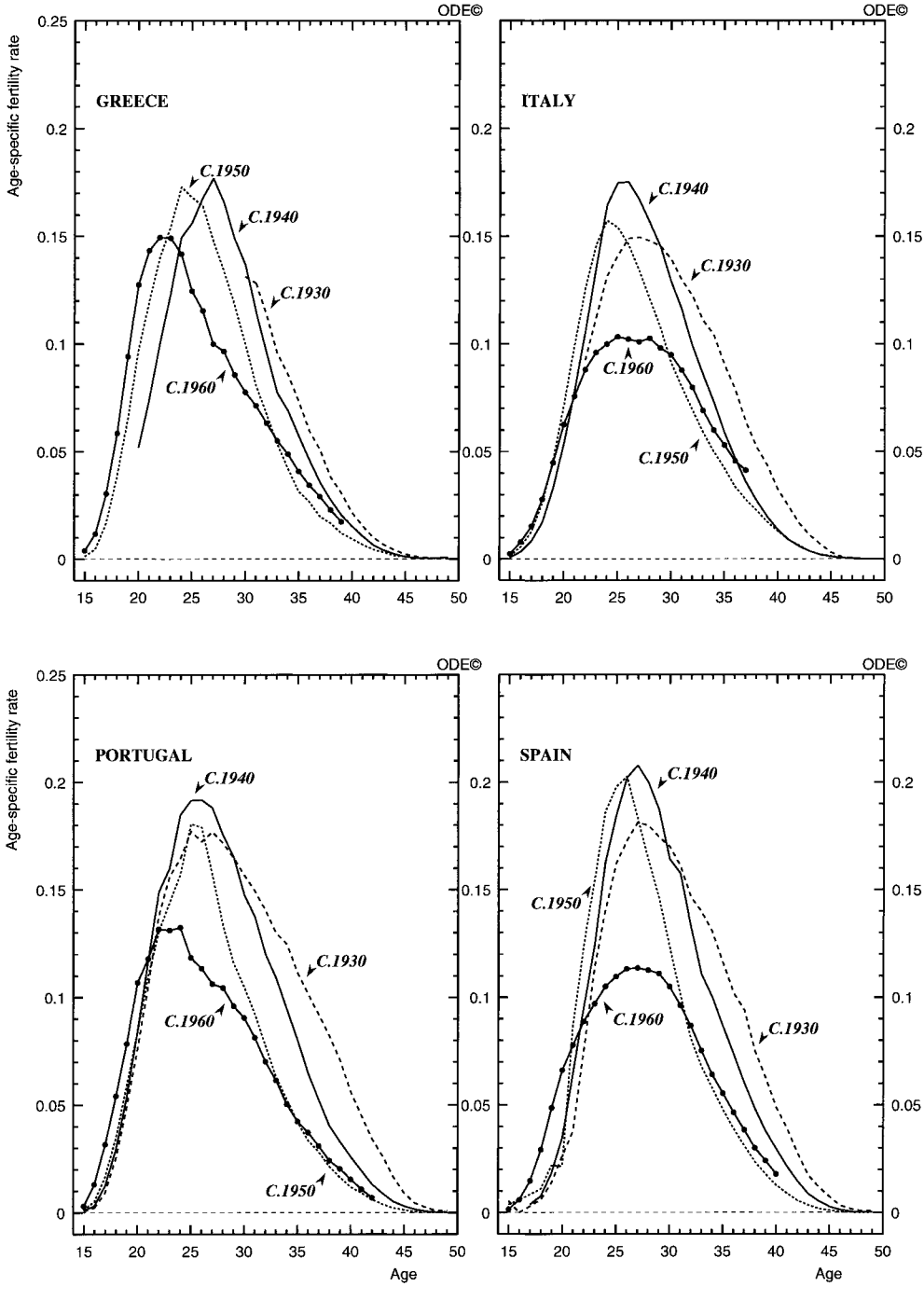
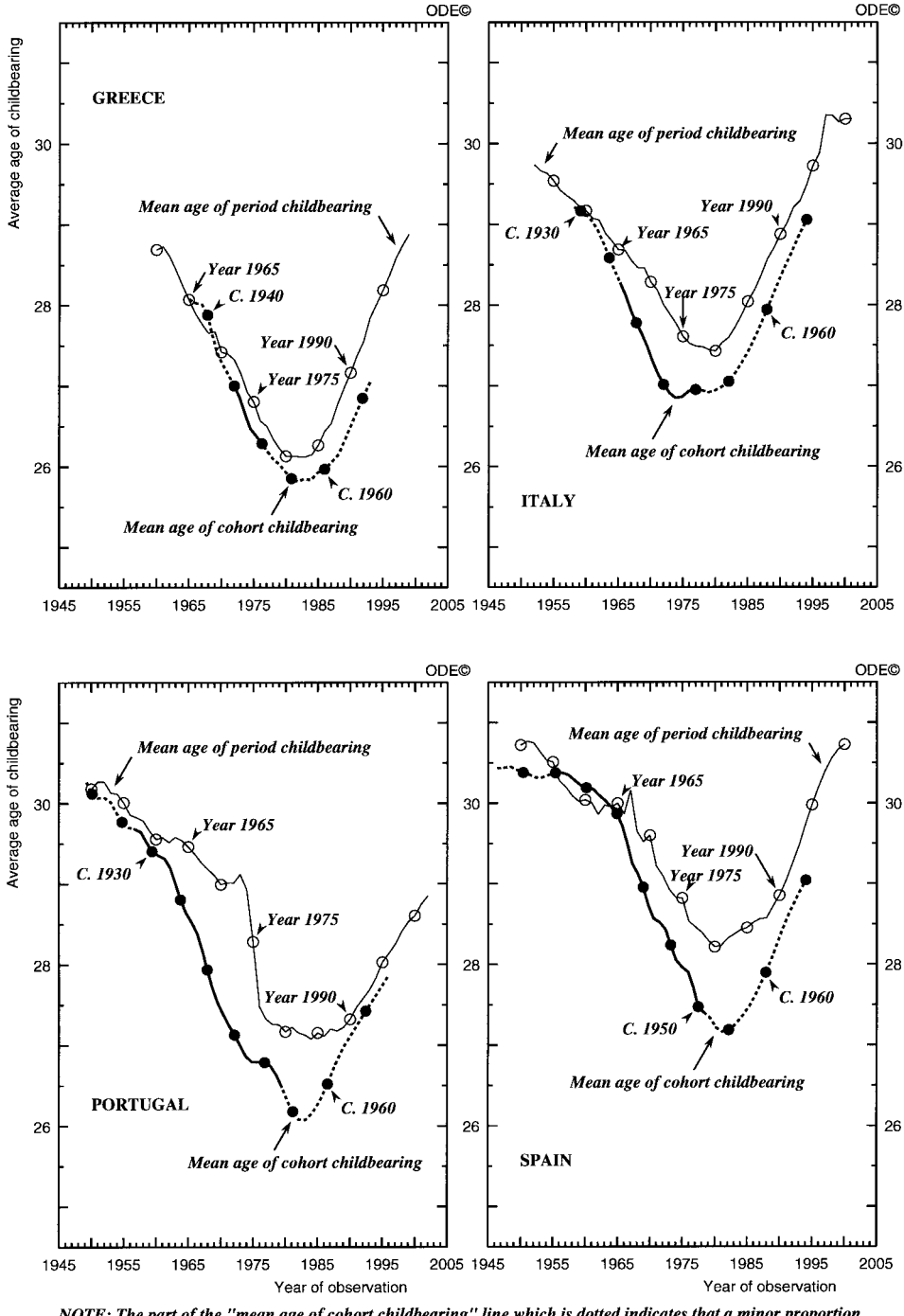


**Figure SE-4 SOUTHERN EUROPE, 1950-2000**
**Period average age of childbearing and cohort average age of childbearing lagged by the average age at childbearing**




*NOTE: The part of the "mean age of cohort childbearing" line which is dotted indicates that a minor proportion of the respective age-specific rates are based on estimates*

**Figure SE-5 SOUTHERN EUROPE**
**Age-specific fertility rates, birth cohorts 1960, 1965, 1970, 1975 and 1980**

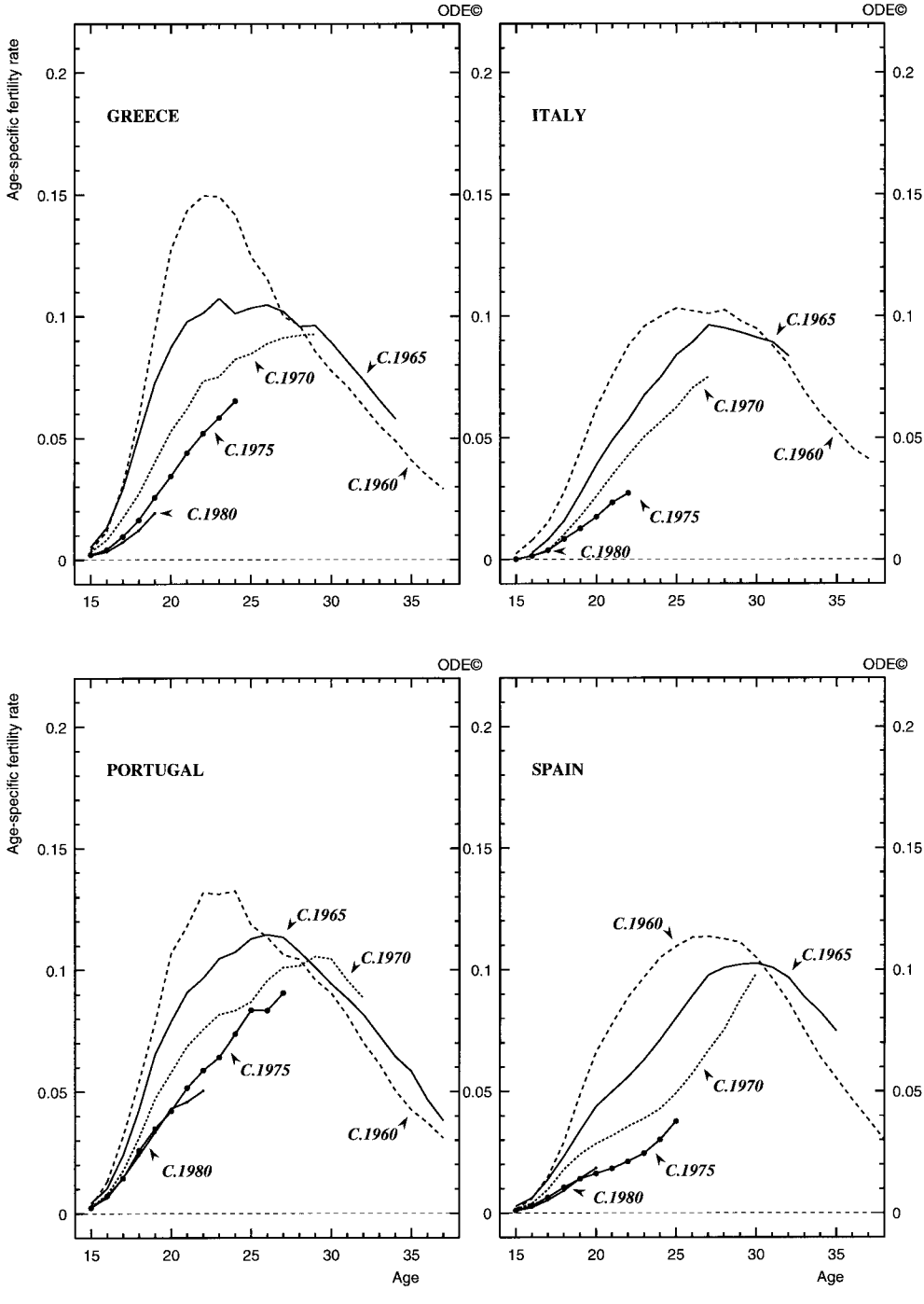


**Figure SE-6 SOUTHERN EUROPE**
**Differences in cumulative age-specific cohort fertility rates between base and subsequent cohorts, women born in 1950 (base), 1955, 1960, 1965, 1970, 1975 and 1980**

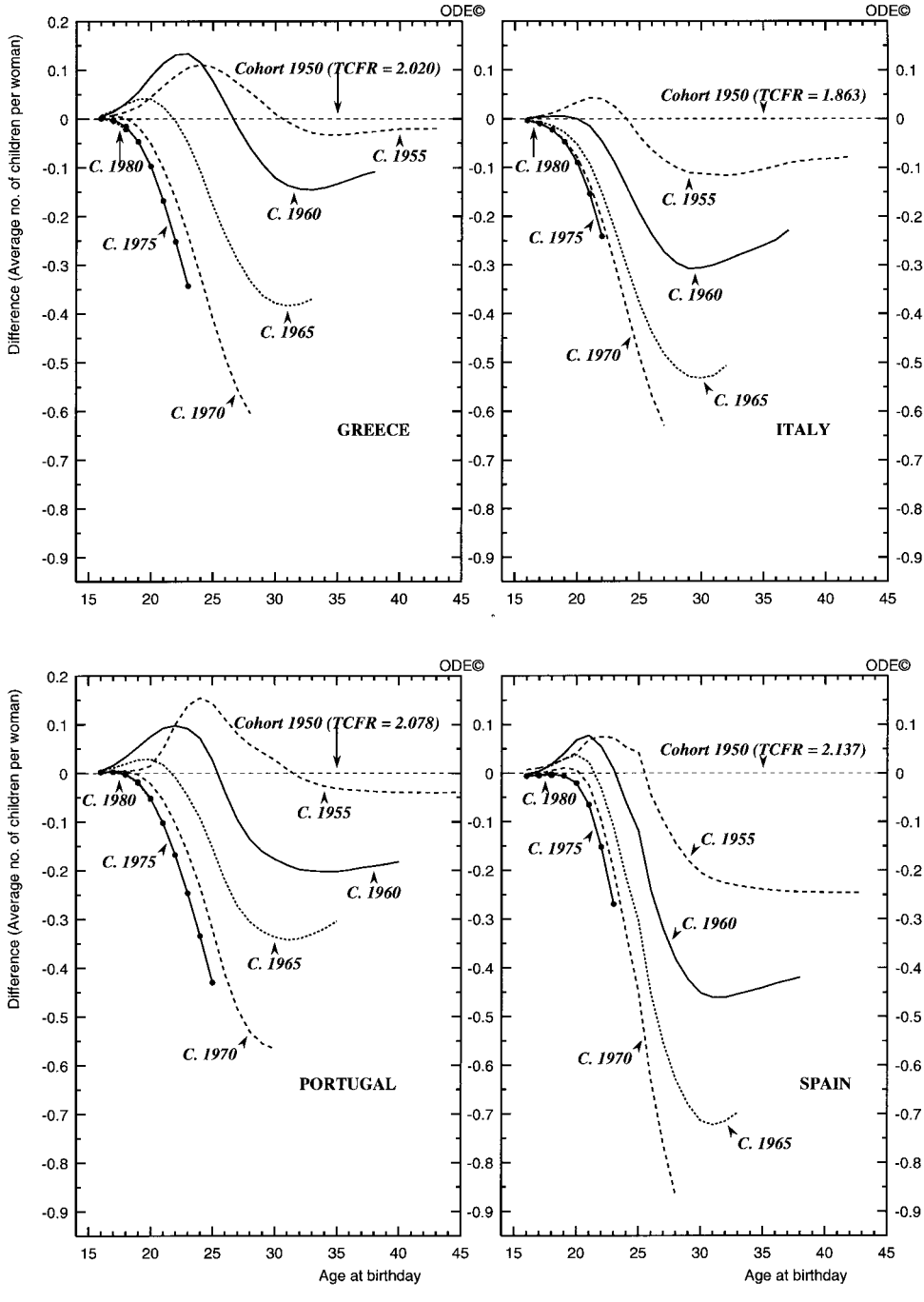


**Figure SE-7 SOUTHERN EUROPE**
**Total cohort fertility rates by biological birth order, birth cohorts 1926 to 1968**

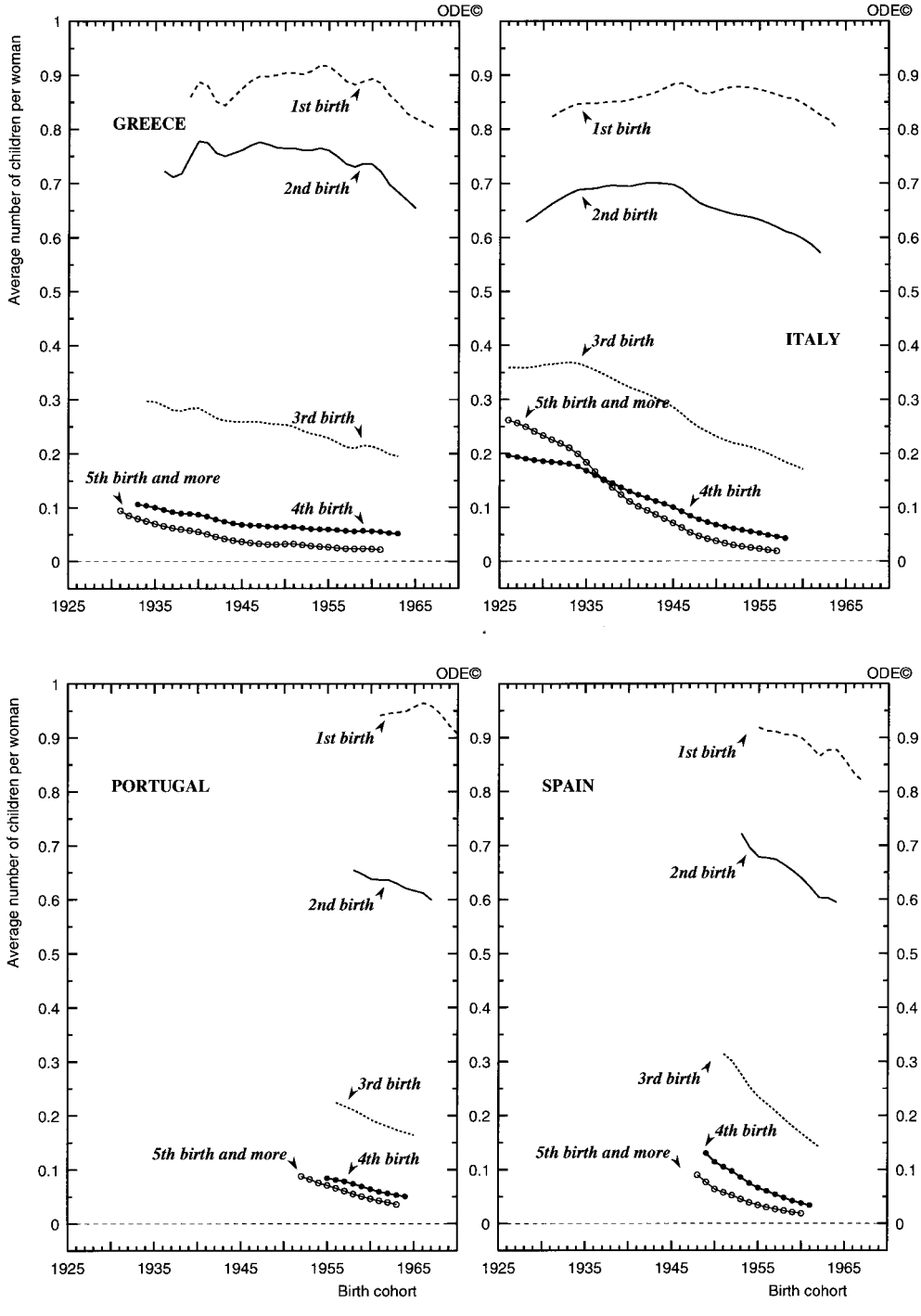


**Figure SE-8 SOUTHERN EUROPE**
**Parity progression ratios, birth cohorts 1930 to 1967**

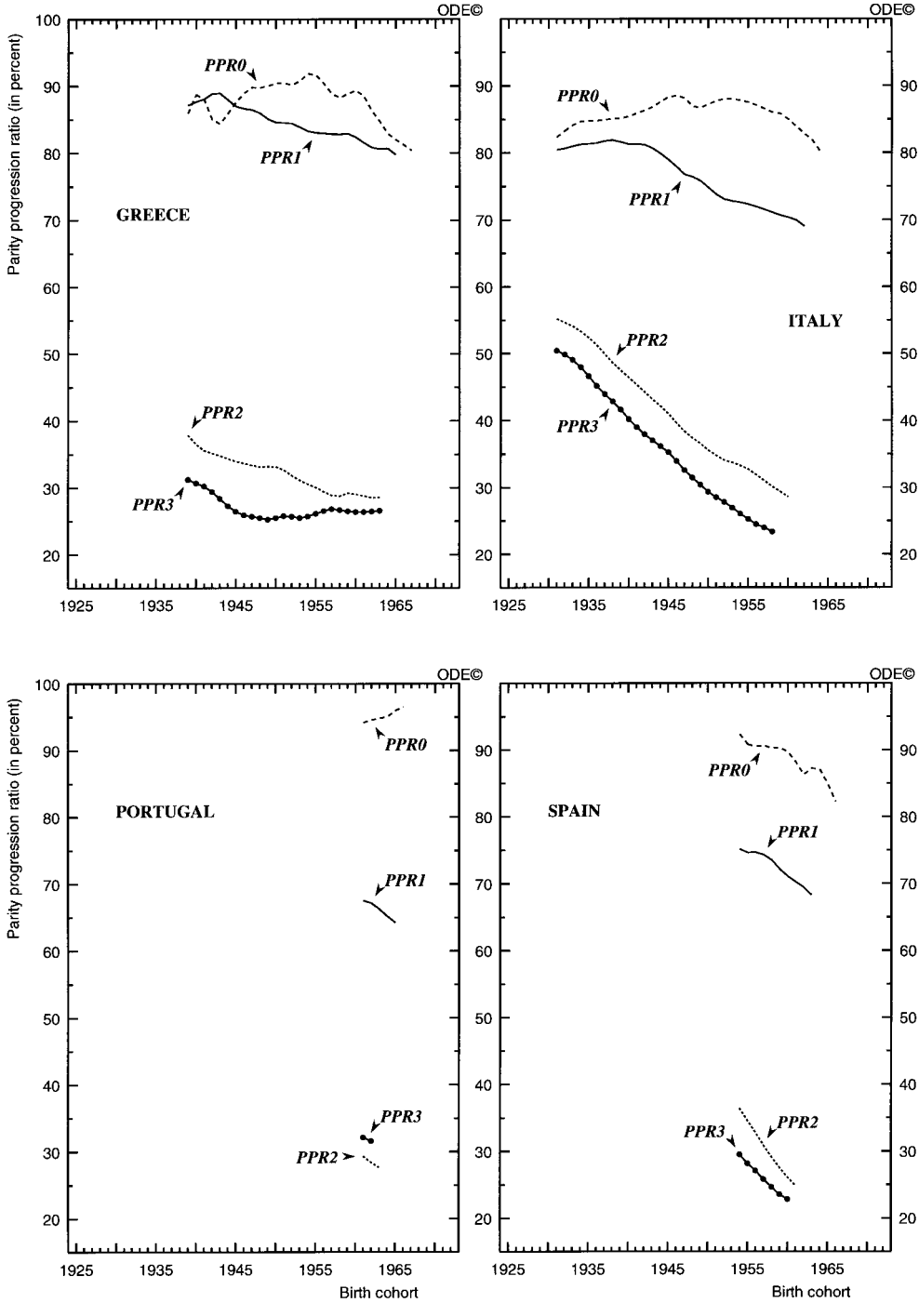


**Figure SE-9 SOUTHERN EUROPE**
**Parity distribution of completed fertility, birth cohorts 1926 to 1968 (in percent)**

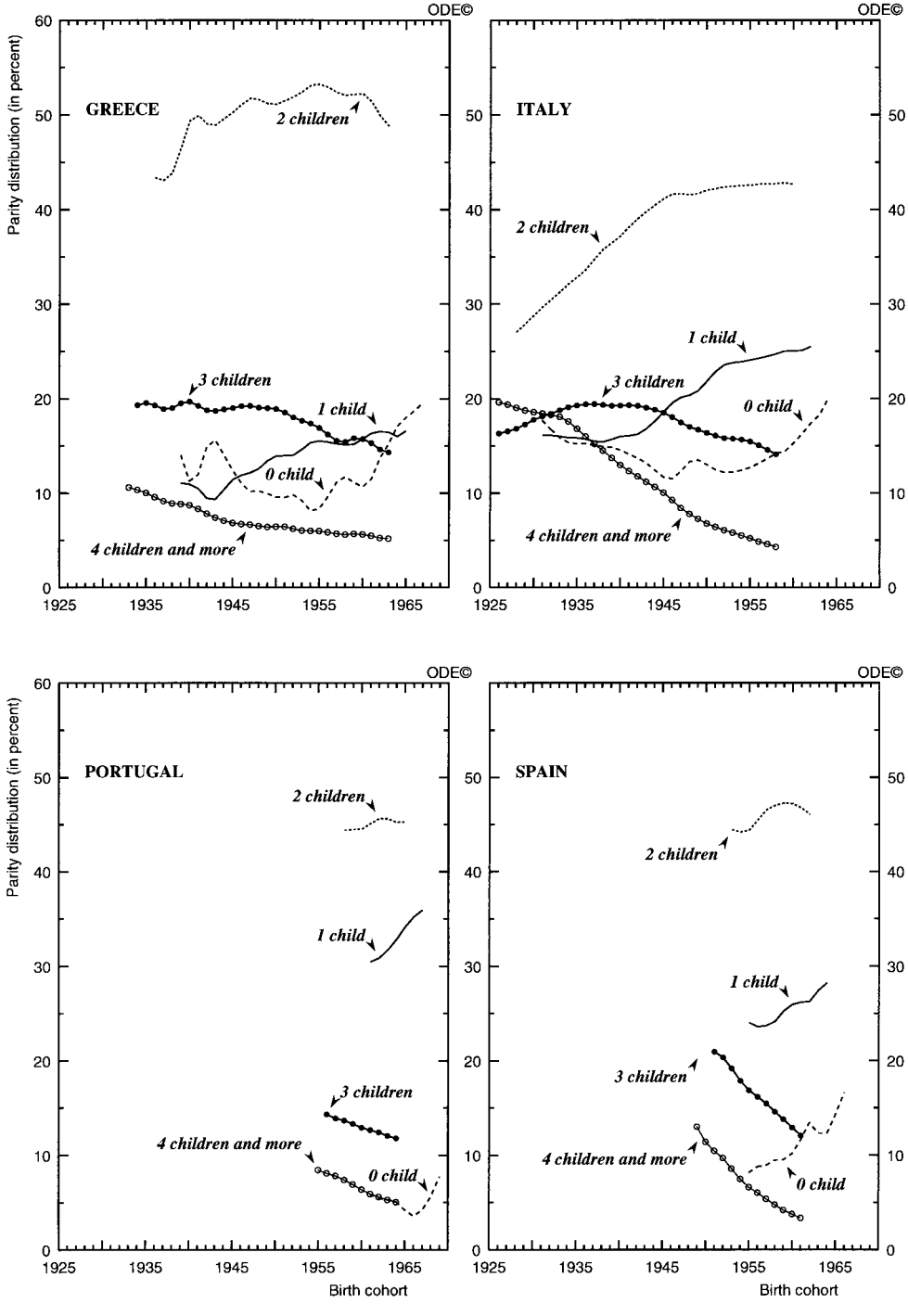
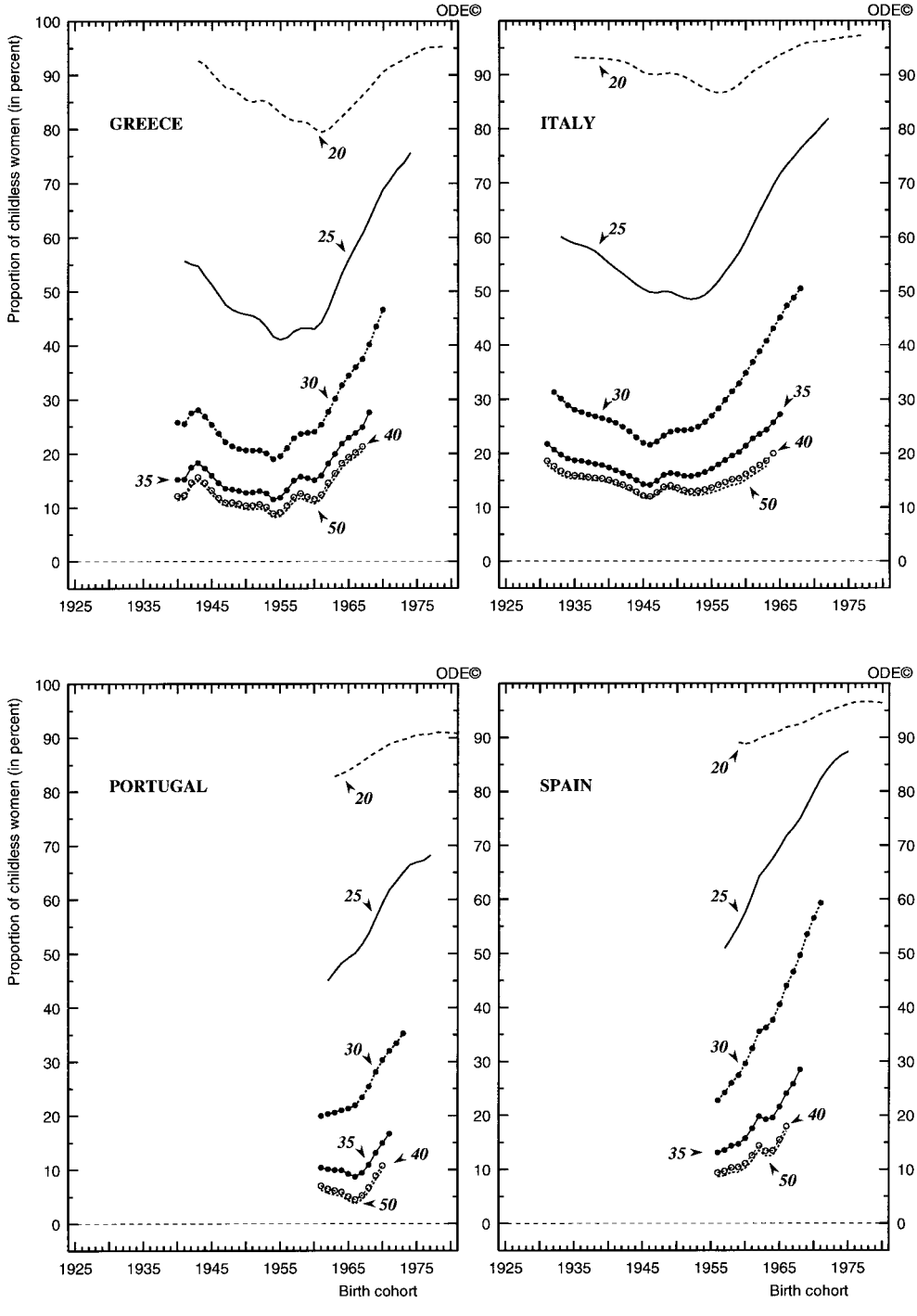


**Figure SE-10 SOUTHERN EUROPE**
**Proportions of childless women, selected ages, birth cohorts 1931 to 1980**



# 7. East Central Europe

The three countries of the region, the Czech Republic, the Slovak Republic and Hungary, share millennia of central European history, yet in numerous ways they differ from each other. In the 19th century they were constituent parts of the Austro-Hungarian monarchy. Between the World Wars the first two formed Czechoslovakia, and Hungary became an independent country, albeit with a considerably smaller territory and population than previously. Following the tumultuous years of the Second World War, these two states were reconstituted. After three years of democratic coalition governments from 1945 to 1948 they became full-fledged Soviet satellite states with centrally planned economies and authoritarian political systems. An apparently successful transformation to market economies and democratic governance has been in progress since 1990. The Czech and Slovak Republics emerged as a result of partition in early 1993.

The Czech Lands[32] were the engine of industrial development in the Austro-Hungarian monarchy, with Hungary and, even more so, Slovakia the agricultural hinterland. Czechoslovakia inherited this industrial capacity and was among the more developed countries in Europe in the inter-war period. Within Czechoslovakia the relative economic superiority of the Czech Lands was obvious. In the second half of the 20th century economic development was stifled by overly regulated socialist central planning. Under the circumstances Hungary was quite successful with marginal economic and political reforms. The transformations of the 1990s were painful and complex, particularly in Slovakia which had a disproportionate share of subsidized heavy industry. At the turn of the century the consequences of almost 50 years of totalitarianism and inefficiency were still being felt together with favorable fruits of the transformation processes. Per capita gross national income in purchasing power

[32] The Czech Lands consist of Bohemia, Moravia and the southern part of Silesia. At the present time they constitute the Czech Republic.

parity was barely half of what it was in the neighboring western countries, but about double compared to the East European countries.[33]

In the country studies that follow the fertility levels and trends will be examined as well as the extent to which these were modified by the social, economic and political conditions and developments of the second half of the 20th century. In general, policy measures that were intended to maintain relatively high fertility as well as influences on childbearing generated by other policies and by structural changes of the economic environment expressed themselves in uneven trends of period fertility. In contrast, cohort fertility trends were not only smooth but surprisingly even and in the long run maintained at a relatively high level. Fertility of the 1962 birth cohorts of the countries in this region were among the highest in the 35 country sample. Given recent developments, this is likely to change rapidly.

The three countries of the region had many similar features of fertility behavior in the cohorts born since the late 1920s, in particular among the younger ones of the 1960s and 1970s. The Slovak population did stand out with its relatively high fertility among the older cohorts born around 1930. Differences between Slovakia and the other two countries diminished over time as fertility declined continuously. The cohorts of the mid- to late 1970s were heading for completed fertility rates around 1.4 or possibly even lower, especially in the Czech Republic and Hungary.

## 7.1 | Czech Republic

The fertility transition in the then Czech Lands was initiated toward the end of the 19th century and proceeded rapidly during the first quarter of the 20th century. The total period fertility rate (TPFR) which throughout the second half of the 19th century was around five births per woman declined to a value of three by 1920 and 2.5 by 1925. Given the mortality conditions of the 1920s, this TPFR implied replacement level fertility (Pavlík 1964). From 1925 through the

[33] In 2000 gross national income in purchasing power parity was $ 13,610, $ 12,060, and $ 11,000 in the Czech Republic, Hungary and the Slovak Republic, respectively. In comparison, it was, for instance, $ 26,310 in Austria and $ 6,380 in Romania (World Bank 2002). Income distribution, as measured by the Gini index, was more egalitarian than in almost all other countries of our sample: 25.4, 24.2 and 19.5 in the Czech Republic, Hungary and the Slovak Republic, respectively (World Bank 2002).

late 1930s the net reproduction rate (NRR) was below unity and declining. It was at its lowest, 0.66, from 1935 to 1937. During the war fertility increased. In part this was a reaction to many years of very low fertility; in part it was caused by a peculiar political situation. The Czech Lands were occupied by the German Reich and there was no Czech army involved in wartime activities[34] so that men were at home. Furthermore, by getting married young men lessened the chances of being forced into slave labor (Srb 1967).

In the late 1940s a brief baby boom occurred. This evaporated very quickly. By the late 1950s fertility was again at the replacement level (Figure ECE-1). The TPFR declined from above three in 1946 and 1947 to 2.1 in the early 1960s. From that point to 1990 there were two fertility upswings and a trough, however, almost throughout the whole period and particularly in the late 1980s and in 1990 the TPFR was at most only 10-15 per cent below the replacement level at 1.8-1.9 births per woman. A rapid fertility decline occurred during the 1990s; by 1996 the TPFR was at 1.2 and in 1999-2000 at 1.1 births per woman.

The uneven period fertility trend of the 1960s and 1970s was arguably brought about by various government policy measures. Many of these, such as a range of social welfare measures, were intended to stimulate fertility. Other policies of a broader economic or social nature, such as promoting the development of heavy industries and advancing female employment (Frejka and Frejka 1965), were implemented for different reasons but also had fertility consequences. These depressed fertility. Measures concerning the liberalization of induced abortions were made mainly for public health reasons. Finally, occasional decisions to restrict the use of induced abortions were made because of their perceived excessive use by certain strata of the population and to reduce their impact on fertility decline.

The more intensive efforts to stimulate fertility occurred in 1968 and in the early 1970s. These were comprised of several raises of family allowances especially for second and third children, extending basic maternity leave, increasing the birth allowance, special maternity grants, low interest loans to newly wedded couples, and were topped off with tightened administrative regulations regarding induced abortions (Frejka 1980 and 1983). The increase in the TPFR from 1.8 in 1968 to 2.4 in 1974, a 33 per cent rise, was certainly affected by these measures.

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[34] The exception were relatively small Czechoslovak units which were incorporated in the armed forces of the Soviet Union and Great Britain.

A subsequent fertility decline ensued, it was effectively halted around 1980 and throughout the 1980s period fertility was quite stable and by European standards high, namely between 1.9 to 2.0 births per woman.

The trend of the total cohort fertility rate (TCFR) was rather stable with only minor variations (Figures ECE-1 and ECE-2). The cohorts born in the early 1930s had TCFRs of 2.14 which declined to 2.03 for the cohorts of 1942 to 1945. The following ones had slightly higher fertility, reaching its peak level with women born in 1950 and 1951 — 2.10 births per woman. The cohorts born in the early 1950s experienced slowly declining fertility, and starting with those of the late 1950s the decline accelerated. Our estimates indicate that the birth cohorts of the late 1960s are likely to wind up with a 1.8 TCFR compared to the 2.1 of the 1950 cohort, a 15 per cent decline. The trend of the 1960s cohorts is critical because, as analyzed below, it is almost certain the decline will continue thereafter.

The age patterns of cohort fertility for the generations from the 1930s till those of the early 1960s were also relatively stable, especially in comparison to western countries. Nevertheless, some minor changes did take place (Figures ECE-3, ECE-4 and Table CZ-1). Among the birth cohorts of the 1930s there was a shift of fertility into the younger ages. The 1940 cohort had higher teenage fertility than the 1930 cohort and the fertility peak was higher for the 1940 cohort (Figure ECE-3). On the other hand, these women had relatively few children when in their late 20s and later. The mean age of fertility declined from 25.4 in the 1930 to 25.0 in the 1940 cohort (Figure ECE-4).

*Table CZ-1. Fertility deficits and surpluses comparing birth cohorts, Czech Republic, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age Group | Number of children | Age Group | Number of children | Age group | Number of children |
| Deficit | 25-49 | -0.154 | 15-22 | -0.029 | 23-36 | -0.186 |
| | | | 30-49 | -0.077 | | |
| Surplus | 15-24[a] | +0.081 | 23-29 | +0.135 | 15-22 | +0.109 |
| | | | | | 37-49[b] | +0.006 |
| Total | | -0.073 | | +0.029 | | -0.071 |

Notes: [a] Includes estimated data for age 15 in 1930 cohort which was 0.03 per cent of TCFR.
[b] Includes estimated data for ages 41-49 in 1960 cohort the total of which was 0.4 per cent of TCFR.

Women born in 1950 had comparatively low fertility when they were young. Subsequently, when this generation of women was between the ages of 23 and 29 the pronatalist measures of the late 1960s and early 1970s had just been introduced and therefore they had more children than previous cohorts. So much so that it was the cohort with the highest fertility in recent history.

The fertility age patterns of the late 1950s cohorts and of those born around 1960 were also influenced by the pronatalist measures which induced relatively high teenage fertility and a further downward shift of the age of childbearing (Figures ECE-3, ECE-4 and Table CZ-1).

The age patterns of fertility of the cohorts that were at the onset or in the middle of their reproductive period during the 1990s provide revealing information (Figures ECE-5, ECE-6 and Table CZ-2). Every successive cohort had lower fertility than previous ones at comparable ages. Note that the lifetime childbearing pattern changed mainly around the age reached by the respective cohort in the early 1990s. It was the transformation of the political, economic and social systems that profoundly impacted on fertility behavior.

The age pattern of fertility of the 1965 cohort was still fairly similar to that of the 1960 cohort (Figure ECE-5). The change of the systems hardly influenced its childbearing as by the early 1990s around 80 per cent of its total number of children had already been born. Nevertheless, a slight indication of a propensity to postpone births and subsequently to catch up can be detected. This cohort when in its mid-30s had higher fertility than the 1960 cohort. Cumulated fertility by age 35 was, however, six per cent lower than in the 1960 birth cohort.

*Table CZ-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Czech Republic, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.953 | 1.835 | … | … | … | -4 | -8 | … | … | … |
| 30 | 1.768 | 1.651 | 1.433 | … | … | -4 | -9 | -19 | … | … |
| 25 | 1.246 | 1.164 | 1.012 | 0.593 | … | 2 | -10 | -19 | -49 | … |
| 20 | 0.293 | 0.265 | 0.253 | 0.164 | 0.072 | 25 | -1 | -14 | -38 | -72 |

The 1970 cohort pursued a slightly lower life-cycle fertility path than previous ones up to age 21. An abrupt departure from the anticipated pattern occurred at age 22 and age-specific fertility rates at ages 22 to 26 were 15 to 30 per cent lower than in the 1965 cohort (Figure ECE-5). Note, however, an emerging tendency to catch up in the turn of direction towards the end of the age pattern curve in Figure ECE-5.

The life-cycle fertility paths of the cohorts born in the mid- to late 1970s were of a totally different nature than that of any previous cohorts. The cumulated cohort fertility rate of the 1975 cohort by age 25 was 49 per cent below the experience of the 1965 cohort (Table CZ-2). Such fertility behavior is extraordinary by any measure. As illustrated in Figures ECE-3 and ECE-5, the peak of childbearing in previous cohorts was usually between the ages of 22 to 23. Almost 40 previous cohorts experienced peak single-year fertility of about 200 births per 1.000 women. The age specific fertility rate of women age 25 in the 1975 cohort was 96 births per 1.000 women and the trend appears to indicate a possible further increase after that age. Women in the 1975 cohort had very low fertility when young; childbearing was apparently being shifted into later ages and the propensity for some catching up when these women will be older may take place. At the same time, such a level and trend point to the conjecture that this and neighboring cohorts are likely to wind up with extremely low completed fertility, possibly in the order of 1.4 births per woman or less (Figure ECE-6).

Another aspect of the changes in the age patterns of fertility is depicted in Figure ECE-6. The generations of the 1950s and to some extent even those of the 1960s started out with relatively high fertility when in their teens and early 20s compared to the 1950 birth cohort, the baseline for the cumulated age-specific fertility in this graph. The accumulated surpluses in the young ages tended to diminish cohort after cohort, and each subsequent one had lower cumulated fertility at comparable ages. Thus far the gaps of the birth cohorts five years apart appear to be increasing. The curve of the 1975 birth cohort is almost vertical pointing toward an increasing deficit in the absolute number of children this cohort is likely to have compared to previous ones. The 1980 birth cohort has embarked on an even lower course.

Figure ECE-6 also reveals the strength or weakness of the propensity to catch up with fertility deficits at young ages. The 1965 cohort had 0.2 fewer children than the 1950 cohort by the time these women were in their early 30s. Despite the

fact that they displayed a propensity to catch up, this was so weak that it did not make a dent in the difference of cumulated fertility between cohorts.

The proportions of women who had one child tended to be very stable starting with the cohorts born around 1930 all the way to those born around 1960 (Figure ECE-7). A turning point was reached with the generations of the mid-1960s. In the birth cohorts of 1963 and 1964 around 93 per cent of all women had first children which was normal for over 40 previous cohorts (Figure ECE-7 and ECE-8). For the cohorts of the late 1960s our estimates indicate a notable decline in the proportions of women with first order births, definitely less than 90 per cent, possibly only around 85 per cent or less. The trend is indisputable, but the absolute level could be an overestimate.

Around 72 to 74 per cent of women born 1930s were having second children. This increased to around 80 per cent for the generations of the late 1940s and the 1950s (Figure ECE-7), at least in part a consequence of the policy measures of the late 1960s and early 1970s. A decline of second order children started with the generations of the late 1950s and apparently only around 70 per cent of women will be having second children in the generations of the late 1960s, a considerable decline between generations about ten years apart.

The proportion of women having third and higher order children has been declining starting with the generations of the late 1920s through those of the early 1940s (Figure ECE-7). There was a temporary levelling off and even a slight increase in third order births among women born in the late 1940s, again probably influenced by the government's policy measures. The decline was then resumed and apparently the generations of the early 1960s will have less than 0.3 third order births per woman.

The outstanding feature of the parity distribution was a rise in the proportion of the two child family from under 40 per cent of the total for the cohorts of the late 1920s to around 55 per cent in the cohorts of the 1950s and early 1960s (Figure ECE-9). Apparently the proportions of women without any children and those with one child have started to increase among the 1960s cohorts.

The proportions of women remaining childless were rather stable through many cohorts at all ages (Figure ECE-10). According to our estimates, starting with the cohorts of the mid-1960s the proportion of childless women started to increase. In the mid-1960s birth cohorts between seven and eight per cent of

women remained childless. In the cohorts of the early 1970s the estimated proportions of childless women had increased to over ten per cent with an outlook for a further rise. Taking only registration data, the proportions childless started to increase considerably among generations by age 20, 25 and are starting to increase among those of age 30. By age 25, when 85 per cent of all first order children had been born in the 1965 cohort, the proportion childless was 23 per cent; the proportion childless among women up to age 25 increased to 54 per cent in the 1975 birth cohort.

## 7.2 | Hungary

The fertility transition in Hungary proceeded smoothly from the late 19th century through the mid-1930s. The total period fertility rate (TPFR) was higher than five births per woman at the turn of the century and it was more than halved by the middle of the 1930s, at which time Hungary joined the roughly one half of European countries with below replacement fertility. Starting in 1936, the TPFR was below 2.5 which —given the level of mortality at the time— was below replacement (Kamarás 1996).

After the Second World War fertility was retained at the pre-war level. Contrary to many other European countries, Hungary did not experience an increase in fertility, a baby boom. The fertility peak of 1953-1955 was caused by a strict enforcement of a 1878 law according to which the interruption of pregnancy was considered a crime (Figure ECE-1). In 1955 this practice was abandoned and in 1956 induced abortion legislation was liberalized. A brief period of rapid fertility decline was already in progress. Between 1954 and 1962 the TPFR declined by 40 per cent, from 3.0 to 1.8 births per woman. Following that, during the period from 1962 to 1992, period fertility was stable within a range of moderately below replacement fertility, a TPFR between 1.8 to 2.1 births per woman. There was one exception of four years in the mid-1970s when —as a consequence of implementing an array of pronatalist population policy measures with a simultaneous restriction of legal induced abortions— total fertility rose above replacement with a peak value of 2.4 in 1975 (Figure ECE-1).

The 1990s witnessed an abrupt fertility descent. The TPFR declined from 1.9 in 1991 to 1.3 in 1998-2000, a drop of almost 30 per cent within seven years.
In contrast to the fluctuating trend of the TPFR, the trend of the total cohort fertility rate (TCFR) was remarkably smooth and almost horizontal (Figure

ECE-1). Cohorts born before 1930 were experiencing a gradual fertility decline and the birth cohorts of the 1930s, 1940s and 1950s were within a narrow range. They all had TCFRs between 1.9 and 2.1 births per woman. Our estimates indicate that completed fertility of the cohorts born after 1960 display a moderately declining trend (Figures ECE-1 and ECE-2). The 1967 and 1968 birth cohorts were estimated to have TCFRs around 1.9 births per woman.

The basic age patterns of fertility of the generations of the 1930s through those of the early 1960s are quite similar to each other (Figure ECE-3). The major proportion of fertility remains concentrated in the early 20s (Figure ECE-2) with mean ages of cohort fertility fluctuating only moderately between 25.6 and 24.9 years (Figure ECE-4).

Minor differences and unusual deviations from expected smooth patterns can be observed (Figure ECE-3):

- The age pattern of the 1930 cohort had a steep peak at age 24;
- The 1940 birth cohort had a slight bulge in the age pattern around age 34;
- The 1950 cohort had a visibly unusual and unexpected relatively high fertility for ages 24 and 25; and
- The 1960 birth cohort had much higher teenage fertility than previous generations —by age 20 its cumulated fertility was 24 per cent higher than that of the 1950 cohort. This cohort then had comparatively low fertility during its early 20s— by age 26 its cumulated fertility was even slightly lower than that of the 1950 cohort. Subsequently its fertility was relatively elevated when these women reached their 30s — between the ages of 31 to 35 their fertility was 25 to more than 40 per cent higher than that of the 1950 birth cohort.

The differences were not coincidental or accidental. Most of them were effects of population related policies of the respective period. Others were possibly expressions of changing fertility behavior due to social or economic developments. The fertility peak of the 1930 cohort —which is representative of neighboring cohorts— was due to the strict enforcement of the 1878 abortion law in 1953 and 1954.

The pronatalist population policy measures and the restrictions on legal induced abortions of the mid-1970s apparently had an effect on every cohort which was in the childbearing phase of its life cycle (Figure ECE-3 and Table H-1). The

impact is expressed in the minor increase in fertility of the 34 to 35 year old women of the 1940 cohort; in the relatively high fertility of the 1950 cohort when these women were around age 25; and in the high teenage fertility of the 1960 cohort.

The relatively low fertility of the 1960 generation when it was in its 20s and the elevated fertility when these women were in their thirties might have been a first sign of the tendency to postpone births from the 20s to the 30s.

We now turn to the cohorts which had not concluded their childbearing by the early 1990s. The childbearing levels and age patterns of the cohorts born in the early 1960s did not differ much from the previous cohorts, presumably because most of their childbearing occurred before the transformation of the political, economic and social systems. The 1965 cohort had lower teenage fertility than the 1960 one and had shifted its childbearing into the mid-20s, but the overall level of fertility was only slightly below that of the 1960 cohort (Figures ECE-5 and ECE-6). By age 35 its CCFR was 3.5 per cent lower than that of the 1960 cohort.

Beginning with the birth cohorts of the late 1960s and especially those of the 1970s the effects of the societal transformation on fertility became obvious. For each successive cohort fertility was lower than for the previous one. The cumulated fertility rate of the 1975 cohort by age 25, for instance, was 45 per cent below that of the cohort only ten years older (Figures ECE-5, ECE-6 and

*Table H-1. Fertility deficits and surpluses comparing birth cohorts, Hungary, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 21-27 | -0.205 | 15-18 | -0.012 | 21-27 | -0.108 |
| | 37-49 | -0.020 | 28-38 | -0.107 | | |
| Surplus | 15-20[a] | +0.045 | 19-27 | +0.146 | 15-20 | +0.083 |
| | 28-36 | +0.027 | 39-49 | +0.003 | 28-49[b] | +0.094 |
| Total | | -0.153 | | +0.030 | | -0.069 |

Notes: [a] Includes estimated data for ages 15-16 in 1930 cohort the total of which was 0.03 per cent of TCFR.

[b] Includes estimated data for ages 40-49 in 1960 cohort the total of which was 0.4 per cent of TCFR.

Table H-2). Completed fertility of this cohort could eventually be 1.4 births per woman or lower unless there will be a substantial tendency to catch up when these women will be in their late 20s and in their 30s. The 1980 cohort by age 20 was on an even lower trajectory.

Consistently from 90 to 92 per cent of women in the birth cohorts of the 1930s through those of the early 1960s had a first child (Figures ECE-7 and ECE-8). Starting with the birth cohorts of the mid-1960s the proportions of women having a first child were declining. According to our estimates the proportion of women with a first birth may continue to decline from 90 per cent of the 1965 cohort. The proportion of women having a second birth rose from around 65 per cent in the cohorts of the 1930s to close to 75 per cent in the cohorts of the late 1950s. In the 1960s cohorts this proportion has been declining to below the original 65 per cent. The proportions of women with third and higher order births were declining since the cohorts of the early 1930s through those of the mid-1940s.

The parity progression ratios to first births, PPR0, were by definition identical to the levels and trends in the proportions of women with first births. Parity progression ratios to second births increased from 70 per cent in the cohorts of the mid-1930s to almost 80 per cent for the cohorts of the 1950s and were again declining in the 1960s cohorts (Figure ECE-8). The probabilities of having a third and a fourth child, PPR2 and PPR3, were 30-40 per cent for the cohorts of the late 1930s. These PPRs declined and were around 30 per cent for the 1945 to 1955 cohorts and thereafter increased moderately among the cohorts of the late 1950s and then stabilized.

*Table H-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Hungary, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.913 | 1.847 | … | … | … | 3 | 0 | … | … | … |
| 30 | 1.664 | 1.599 | 1.379 | … | … | 0 | -1 | -17 | … | … |
| 25 | 1.110 | 1.024 | 0.877 | 0.563 | … | 0 | -10 | -21 | -45 | … |
| 20 | 0.350 | 0.279 | 0.224 | 0.161 | 0.126 | 30 | -4 | -36 | -42 | -44 |

About eight-ten per cent of the 1930s to the late 1950s cohorts remained childless. For each subsequent cohort of the 1960s apparently the proportions of childless women were increasing.

The estimates of childlessness for the cohorts of the 1960s are substantiated by data available from registration on proportions of childless women for birth cohorts at different ages (Figure ECE-10). The time series of the proportions childless were quite stable at all ages for the birth cohorts of the mid-1930s through about the 1960 cohort. Starting with the generations born around 1960 the proportions childless at selected ages began to increase. For age 30 the proportion childless in the 1960 cohort was 14 per cent and it increased to 26 per cent in the 1970 cohort. At age 25 the 1960 cohort had 32 per cent of childless women which increased to 63 per cent in the 1975 cohort.

The parity distribution was marked by an increase in the prevalence of the two-child family from around 40 per cent in the cohorts of the mid-1930s to reach a peak of over 50 per cent in the early 1950s cohorts. Among the cohorts of the 1960s women with two children appeared to be losing ground (Figure ECE-9). The proportion of women with only one child was above a quarter in the 1930s cohorts; it subsequently declined to one-fifth, but was again increasing in the cohorts of the 1960s. Interestingly, the proportion of women with three children was increasing from the cohorts of the late 1940s to those of the early 1960s. The proportion of women with no children was quite low through the cohorts of the early 1960s, but has since started to increase (Figure ECE-9).

## 7.3 | Slovak Republic

Slovak fertility was among the highest in Europe throughout the 20$^{th}$ century. To the superficial observer since the 1930s its fertility trends somewhat resembled the Czech ones, except that they were at a higher level. Originally much higher, and by the late 1990s the Czech and Slovak TPFR curves were closer than ever before. In reality the initial fertility transition, which in the Czech Lands occurred during the first decades of the century, for the majority of Slovakia's population took place later. In the early 1920s the TPFR was 4.6 births per woman (Srb 2002). By 1935-37 it declined to 2.8, which in combination with relatively high mortality was below the replacement level — the net reproduction rate was 0.97. The mid-1930s are considered the concluding years of the demographic transition in Slovakia (Vaňo *et al*. 2001).

In the middle of the century its period total fertility rate (TPFR) was around 3.5 births per woman. It then declined quite steadily, although with some irregularities to again reach replacement level fertility as late as around 1990 (Figure ECE-1). During the 1990s the fertility decline was even faster than before and by 2000 the TPFR was at 1.29 with a net reproduction rate of 0.63. The irregularities in the fertility trend from the 1950s through the 1980s were in part influenced by the policy measures of the Czechoslovak government as they were briefly discussed in the study on the Czech Republic (preferential development of primary industries, promotion of female employment, pronatalist social policies, and liberalization of abortion legislation interspersed with occasional restrictions).[35]

Slovakia's total cohort fertility rates (TCFRs) of the generations born around 1930 were higher than in practically all other European countries, including the formerly socialist ones, namely almost 2.9 births per woman (Figures ECE-1 and ECE-2). Thereafter cohort fertility declined from one generation to the next and our estimates indicate that the generations born in the mid-1960s will have TCFRs around 1.9 births per woman.

The main change in the life-time age patterns of fertility of women born after 1930 was a considerable curtailment of their child-bearing when they were in their late 20s, 30s and 40s (Figures ECE-2, ECE-3 and Table SL-1). Age-specific fertility rates of the 1940 birth cohort were lower by 20 to 30 per cent

*Table SL-1. Fertility deficits and surpluses comparing birth cohorts, Slovak Republic, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 24-39 | -0.415 | 15-23 | -0.120 | 23-36 | -0.198 |
| | | | 29-49 | -0.139 | 42-49[b] | -0.001 |
| Surplus | 15-23[a] | +0.096 | 24-28 | +0.023 | 15-22 | +0.066 |
| | | | | | 37-41 | +0.003 |
| Total | | -0.319 | | -0.236 | | -0.130 |

Notes: [a] Includes estimated data for age 15 of 1930 cohort which was 0.0 per cent of TCFR.
[b] Includes estimated data for ages 41-49 of 1960 cohort the total of which was 0.0 per cent of TCFR.

[35] For a general discussion see Chapter 1 (Introduction).

for individual ages of women in their late 20s and early 30s compared to the 1930 cohort, and by 50 to 70 per cent for women in their 40s. The main absolute difference between the 1930 and the 1940 cohorts was -0.42 births per woman between the ages of 24 and 39. To a lesser degree this process continued among subsequent cohorts so that, for instance, 30 to 35 year old women of the cohort born in 1960 had 40 to 60 per cent lower fertility at individual ages compared to the 1930 cohort.

The changing age patterns were in evidence in the changes of the average age of period as well as cohort fertility (Figure ECE-4). Between 1950 and 1990 the cross-sectional average age of child-bearing declined from above age 28 to 25; a steep increase has been occurring during the 1990s. The mean age of cohort childbearing declined from 27.7 for the 1925 cohort to 24.9 for the 1965 cohort.

The life-time age patterns of cohort fertility were continuing to change among the cohorts that had not yet completed their childbearing by the turn of the century. The transformation of the political, economic and social systems during the 1990s evidently had an additional strong effect.

The cohort fertility age pattern of women born in 1965 was not very different from the 1960 cohort, although the former had somewhat lower fertility throughout their 20s and early 30s (Figure ECE-5 and Table SL-2). Presumably the differences in the fertility age patterns of both cohorts were small because the 1965 cohort had completed most of its childbearing under the socialist system. The age-specific fertility rates of women born in 1970 still followed the earlier pattern during their teens, but there was a distinct break after age 21. Starting with age 22 through the late 20s, fertility was considerably lower than could be expected by earlier patterns. Each successive birth cohort of the mid-

*Table SL-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Slovak Republic, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 2.086 | 1.941 | … | … | … | -6 | -9 | … | … | … |
| 30 | 1.864 | 1.735 | 1.531 | … | … | -4 | -8 | -18 | … | … |
| 25 | 1.257 | 1.200 | 1.069 | 0.728 | … | 2 | -4 | -15 | -39 | … |
| 20 | 0.244 | 0.246 | 0.253 | 0.199 | 0.124 | 17 | 14 | 4 | -19 | -51 |

and late 1970s has lower fertility than the previous one. By age 25, for instance, the cumulative fertility rate of the 1975 cohort was 39 per cent lower than that of the 1965 cohort.

A different perspective of the changes in the age patterns of Slovak cohort fertility is depicted in Figure ECE-6. Compared to the base birth cohort of 1950 all subsequent generations started out with higher child-bearing when they were young. This surplus was dissipated by the time the cohorts born in the 1950s reached their late 20s. These cohorts then had a slight deficit compared to the base when in their 30s of no more than 0.1 child.

The birth cohorts of the 1960s lost their initial slender cumulated fertility surplus when they reached their mid-20s and the fertility deficit was widening with increasing age. The 1965 cohort had a cumulated deficit of 0.25 children by age 31; and the 1970 cohort had an even larger deficit of 0.4 children by age 30. The 1975 cohort was heading for even larger deficits — by age 25 it was 0.5 children on a declining slope (Figure ECE-6). It is, of course, possible that the youngest generations will have some of the children they presumably postponed and thus make up a smaller or larger proportion of their deficit in child-bearing which they accumulated in the early stages of their reproductive periods. Around the turn of the century, however, the propensity to offset childbearing deficits of younger ages when women are older appeared to be negligible in the Slovak Republic.

The gradual fertility decline from one generation to the next was also reflected in differential changes in birth order trends. Third and higher order births were still quite numerous among the cohorts born around 1930 and were declining steadily for the forty generations being traced (Figure ECE-7). The TCFR for fifth and higher order children was 0.4 among the cohorts of around 1930 and declined to below 0.1 among the cohorts of the early 1960s. On the other hand, up until the generations of the early 1960s the proportion of women who had a first birth, namely 90 per cent, was very stable. A decline of this proportion started with the cohorts of the early 1960s and an estimate for the cohorts born around 1970 was that only around 85 per cent of women will have a first birth. The proportion of women having a second birth was stable through the generations of the late 1950s. About 80 per cent were having a second child. Our estimates indicate that in the young generations, namely those born in the late 1960s, barely 70 per cent of women will have a second child (Figure ECE-7).

The parity progression rates to the second child among the cohorts of the 1930s and 1940s were almost as high as the PPR0s, close to 90 per cent (Figure ECE-8). These have been declining for the cohorts of the 1950s and 1960s.

The parity distribution was in a continuous flux (Figure ECE-9). Among the cohorts born in the late 1920s the majority of women/families had more than three children and about 30 per cent had two children. In the 1960 birth cohort the two child family was the most prevalent and proportions of women with one or no child were on the rise.

A significant change among the younger birth cohorts is precisely an increase in the proportions of women remaining childless. In Figure ECE-10 the data for the selected ages are almost all based entirely on registration, with the exception of the cohorts which have completed their childbearing where some estimation is involved for the youngest ones.

Among young women in their early and mid-20s the tendency towards increasing childlessness is clear. The proportion of childless women among those who were 25 years old in the 1965 birth cohort was about 30 per cent; in the 1975 cohort it was above 40 per cent. Even among thirty year old women the tendency towards an increase in childlessness was obvious, from 15 per cent for the 1965 cohort to 25 per cent for the 1972 one. Robust estimates indicate that overall childlessness is on the increase. An increase started with the cohorts born in the early 1960s. These had a proportion of childless women of about ten per cent and may increase to 15 per cent for the cohorts born in the early 1970s.

## 7.4 | A comparative perspective

The cohorts born in 1960 in the three countries of East central Europe had TCFRs in the 2.0 to 2.1 range, among the highest in the low fertility countries. In the Czech Republic and in Hungary these TCFRs were only slightly lower than among the cohorts born in 1930. Apparently the factors pushing in the direction of increasing or maintaining fertility levels, whether intentional or not, were strong enough to counteract any pressures to depress fertility. Similar levels and trends obtained in most of the other formerly socialist countries, such as Bulgaria and the Baltic countries (Table CO-2 and Figure CO-1 [Chapter 12]). In contrast, in most of the western countries the cohorts born around 1930 had relatively high fertility; these were central cohorts of the baby boom era.

The 1960 cohorts in the West experienced fertility lower than in East central Europe. — The Slovak population was different. Cohort fertility declined by 24 per cent between the 1930 and the 1960 cohorts. High fertility of its 1930 cohort, however, was a product of social and economic backwardness rather than the relative prosperity of the baby boom generations in the West.

The TCFRs of women born during the 1960s were declining in all three countries, similarly as in almost all other countries (Figure CO-1).

The lifetime fertility pattern was one of early childbearing already in the cohorts born around 1930. Between 60 and 70 per cent of children were born before mothers reached age 27. The pattern of early childbearing was maintained through the cohorts of the early 1960s. In the Czech Republic the proportion of early births increased moderately, in Slovakia it reached almost 80 per cent in the cohorts of the mid-1960s. Such levels and trends were typical for the populations of the formerly socialist countries, but were very different from the increasingly late childbearing patterns of western populations (Table CO-3).

In the Czech and especially in the Slovak Republic among the cohorts born between 1930 and 1965 fertility was declining throughout when women were in their late 1920s and in their 1930s, and frequently also when they were younger (Table CO-6). In the Czech Republic among the cohorts of the 1930s and 1940s there was an advancement of childbearing into the younger ages. In these countries the shifts in childbearing age patterns were similar to the other formerly socialist countries. In Hungary a certain shift of fertility into the late 20s and 30s can be detected, which was somewhat similar to western trends. In absolute dimensions the postponement was small.

In all three countries childbearing of young women, i.e. before they reached their 27$^{th}$ birthday, in the cohorts born between 1930 and 1960 was rather steady. On average women had between 1.4 and 1.7 children. Among the cohorts of the 1960s childbearing of young women declined to a range of 1.1 to 1.3 births per woman in the 1970 cohorts. The annual rates of decline of childbearing of young women accelerated sharply among the cohorts born in the early 1970s. Among the cohorts of the 1960s the rate of decline was about two per cent per year, in the cohorts of the early 1970s it ranged from six to over seven per cent per year (Table CO-7).

The absolute levels and trends of childbearing among young women were similar to the other formerly socialist countries and very different in comparison to western countries. For instance, women under 27 years of age in the 1973 cohorts in the formerly socialist countries had borne around one child, whereas in western countries it was between 0.4 in Switzerland and 0.7 in Austria (Table CO-7).

The analysis of childbearing of women before their 22nd birthday renders similar results. Only minor changes occurred up to the cohorts born around 1960. Most striking were the unprecedented annual declines of the cohorts born in the 1970s, between 7 and 17 per cent (Table CO-9).

The combination of traditionally early childbearing patterns with rapidly declining fertility of young women in the cohorts born in the late 1960s and in the 1970s were one of the indications that cohort fertility is likely to remain low and possibly decline further in countries of this region.

For the cohorts born in 1970 childbearing would have to increase inordinately when these will be in their late 20s and in their 30s in order to maintain completed fertility of the 1960 birth cohorts or to reach replacement fertility (Table CO-8). This increase would have to amount to between 40 and 60 per cent for these cohorts to eventually equal the TCFRs of the 1960 cohorts, and between 30 and 75 per cent to reach replacement fertility in the countries of this region (Table CO-8).

In all three countries the proportions of women/couples with two children were on the increase among the cohorts of the 1930s, 1940s and early 1950s. In the Czech and Slovak Republics their increase continued among the cohorts of the early 1960s, but their prevalence had definitely peaked in Hungary and possibly also in the other two countries at the expense of women/couples with one child or no children at all (Figure ECE-9). Starting with the cohorts born in the early 1960s childlessness was on the increase in all three countries.

## 7.5 | Conclusions

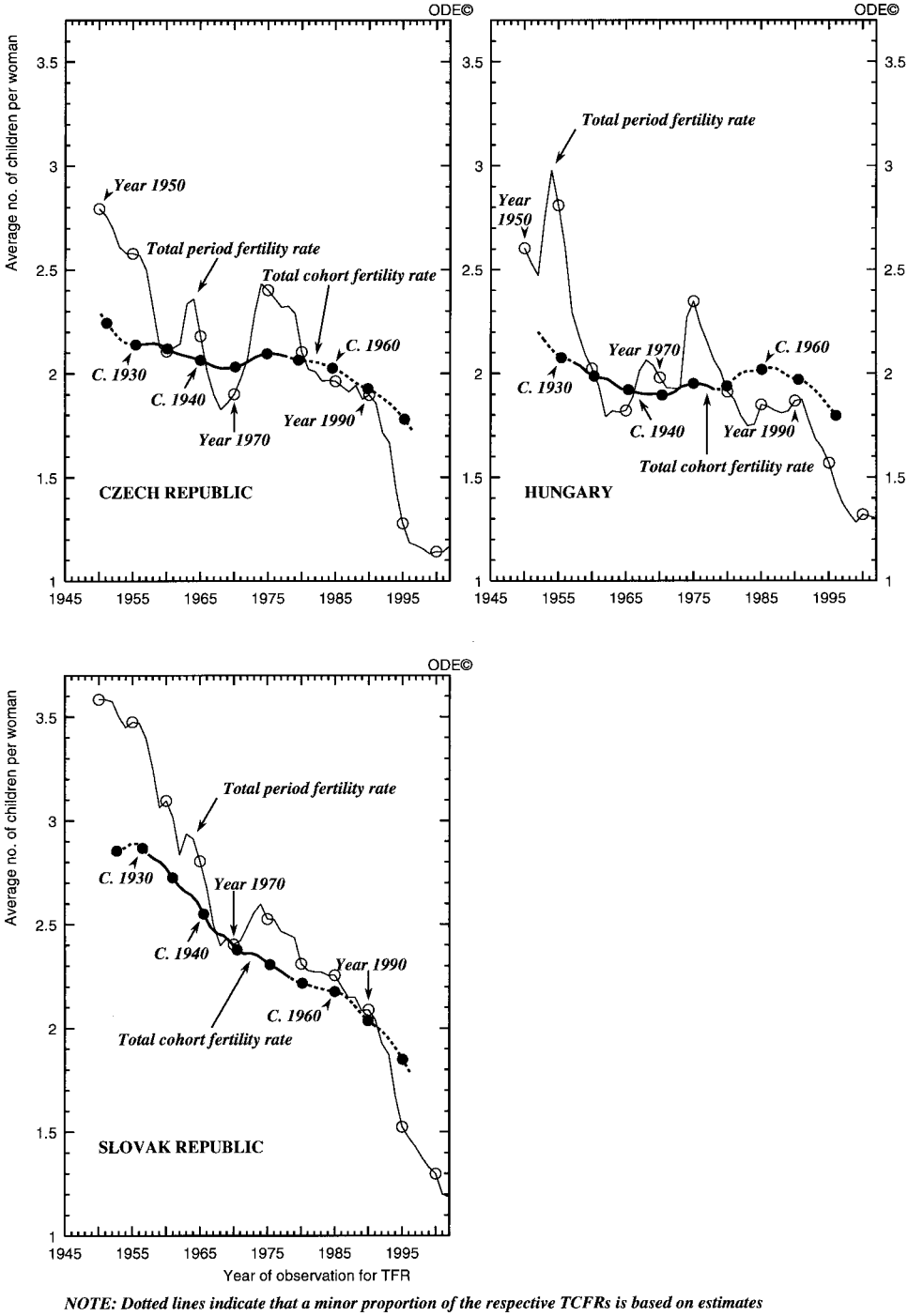
In 2000 the countries in East central Europe experienced very low period fertility, 1.1 to 1.3 births per woman, which was below the median for low fertility countries. Our analysis foreshadows the probability that period fertility

will remain very low in the foreseeable future and that completed fertility of the cohorts presently in the middle or at the onset of their childbearing careers, those born during the late 1960s will wind up with total cohort fertility rates around 1.7, and those born in the 1970s with TCFRs around 1.4 births per woman. The following more specific findings bear out this overall conclusion:

- Completed cohort fertility during the era of Soviet style socialism was essentially stable. Diverse economic and social factors creating conditions for generating and maintaining early and relatively high fertility were sufficiently powerful to offset those suppressing childbearing;
- Fertility of cohorts of the early 1960s that are completing their fertility at the beginning of the 21st century, those which bore the majority of their children under the socialist regime, is going to be comparatively high, between 2.0 and 2.1 births per woman. These rates are only marginally lower than TCFRs of the cohorts born around 1930;
- The majority, two-thirds to four-fifths, of all children in the cohorts of the mid-1960s were borne by women when young, i.e. before their 27th birthday;
- Cumulated fertility of young women before their 27th birthday in the 1973 birth cohort was high in comparison to western countries, between 0.9 and 1.1 births per woman, but fertility was declining at extremely rapid rates. The rate of decline between the 1970 and the 1973 cohorts was six to seven per cent per year;
- Cumulated fertility of women below age 22 in the 1978 birth cohorts was also relatively high, between 0.2 and 0.3 births per woman, however, fertility of these women was declining at unprecedented velocity. The rates of decline between the 1975 and the 1978 cohorts were between 7 and 17 per cent per year;
- The proportions of women having first births were declining among the cohorts born during the 1960s. Conversely, the proportions of women remaining childless were increasing;
- As fertility of young women in the cohorts of the 1970s was declining, it is not known whether the foregone births will be recuperated when these women will be in their late 20s and in their 30s. The cohorts born in the late 1960s displayed only very weak tendencies to have the postponed births;
- Women in the 1970 birth cohorts would have to have unusually high fertility after their 27th birthday, about 30 to 75 per cent higher than the 1960 cohorts, for their completed fertility to be equal to the 1960 TCFRs or to reach replacement fertility.

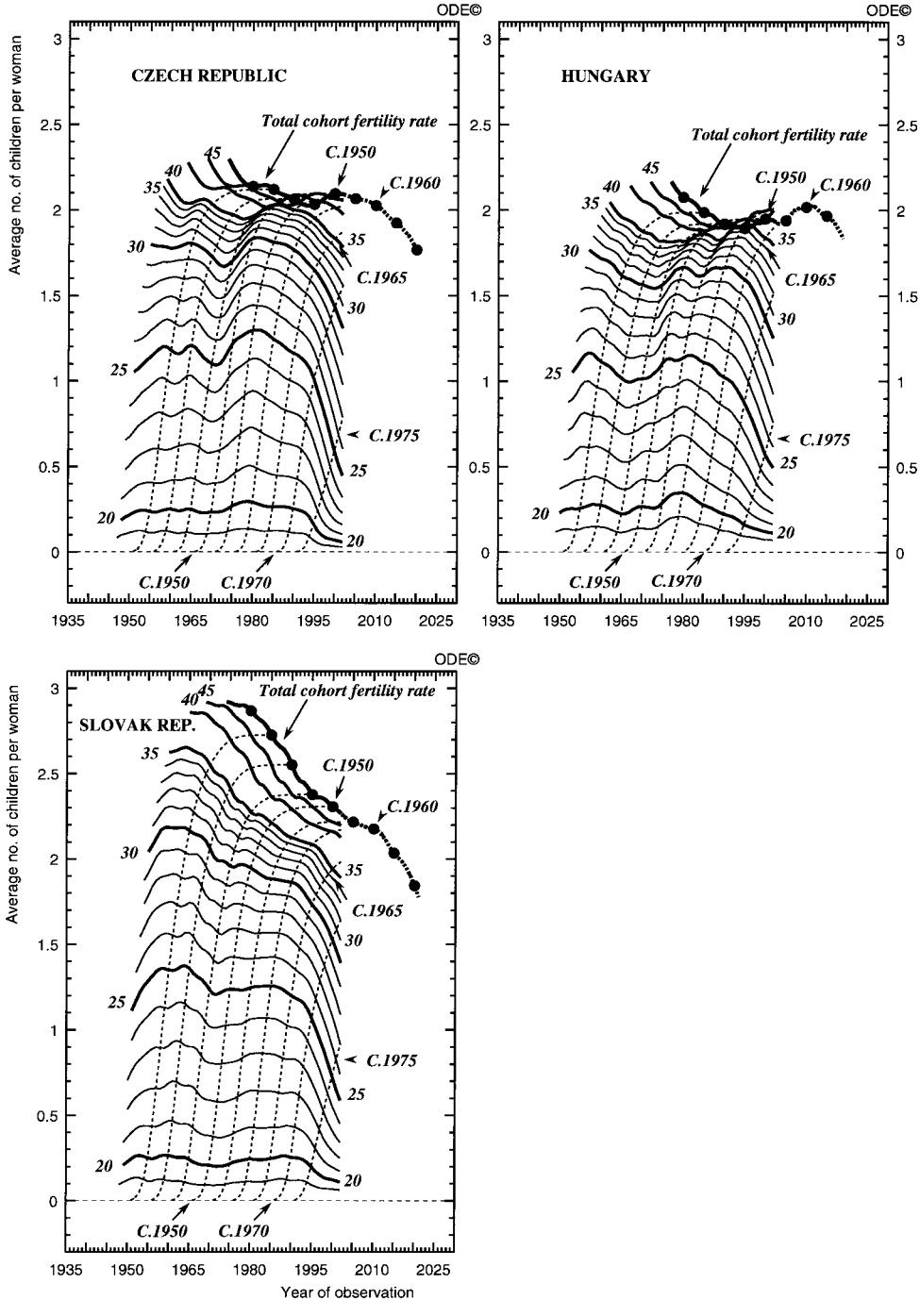
Completed fertility of women born in the 1960s in East central Europe was declining among successive cohorts. Cumulated fertility of the cohorts born in the 1970s indicates that their completed fertility will be considerably lower and is likely to eventually wind up on the low end of the spectrum of low-fertility countries.

**Figure ECE-1 EAST CENTRAL EUROPE, 1950-2000**
**Total period fertility rate and total cohort fertility rate lagged by the average age at childbearing**




*NOTE: Dotted lines indicate that a minor proportion of the respective TCFRs is based on estimates*

**Figure ECE-2 EAST CENTRAL EUROPE**
**Cumulated cohort fertility at specified ages, birth cohorts 1935-1975**




*NOTE: The part of the TCFR line which is dotted indicates that a minor proportion of the TCFR is based on estimates*

**Figure ECE-3 EAST CENTRAL EUROPE**
**Age-specific fertility rates, birth cohorts 1930, 1940, 1950 and 1960**

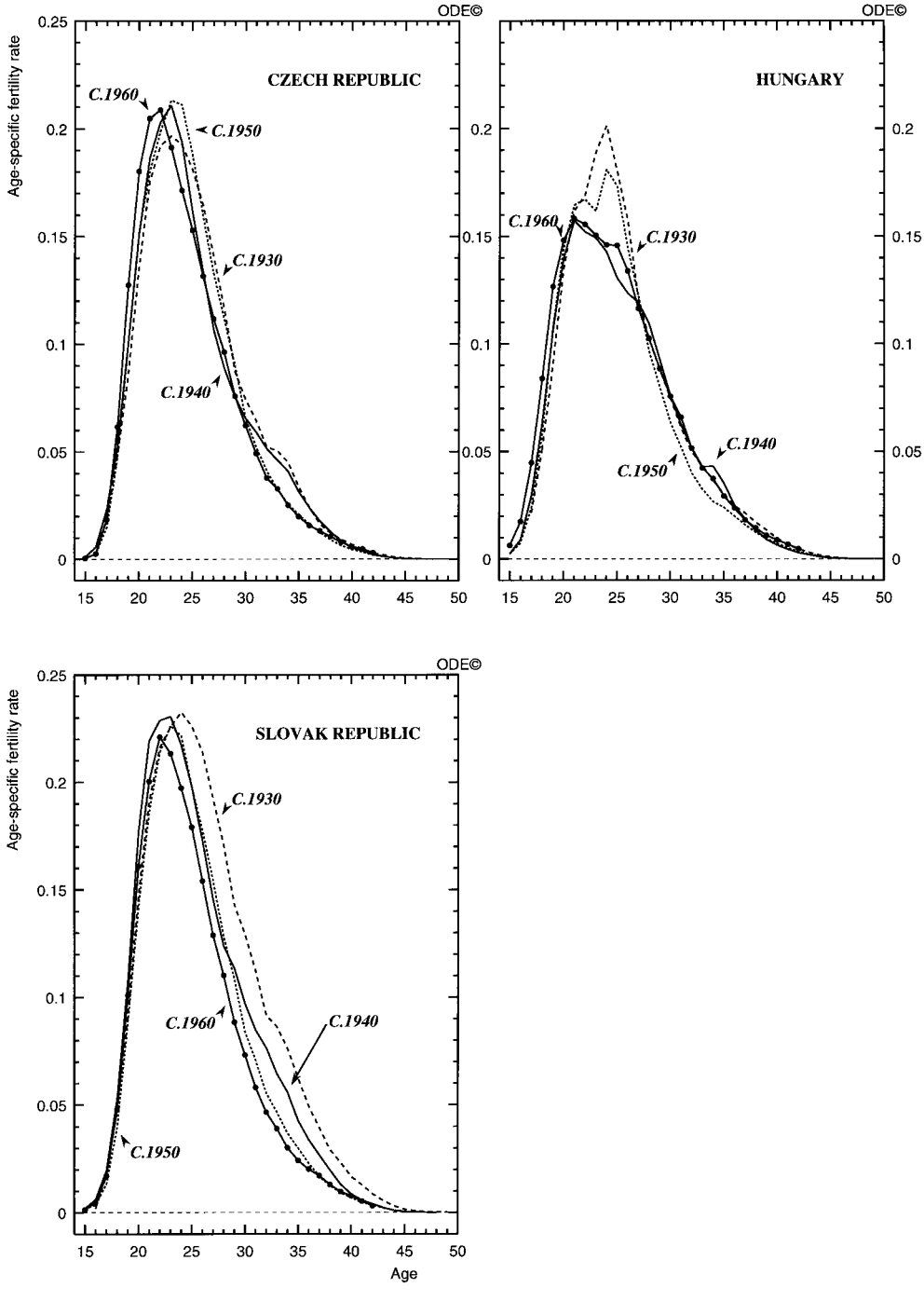
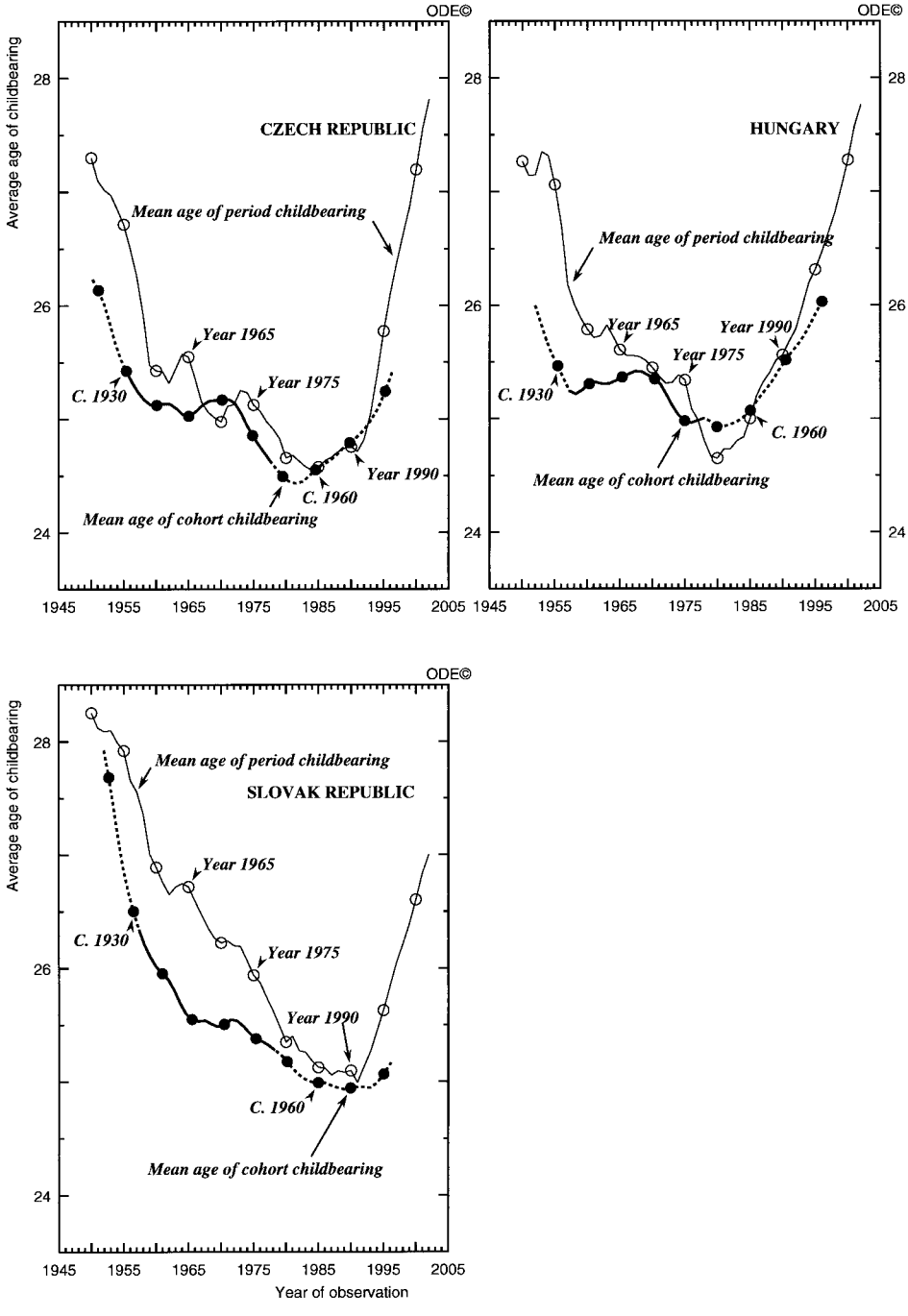


**Figure ECE-4 EAST CENTRAL EUROPE, 1945-2000**
**Period average age of childbearing and cohort average age of childbearing lagged by the average age at childbearing**




*NOTE: The part of the "mean age of cohort childbearing" line which is dotted indicates that a minor proportion of the respective age-specific rates are based on estimates*

**Figure ECE-5 EAST CENTRAL EUROPE**
**Age-specific fertility rates, birth cohorts 1960, 1965, 1970, 1975 and 1980**

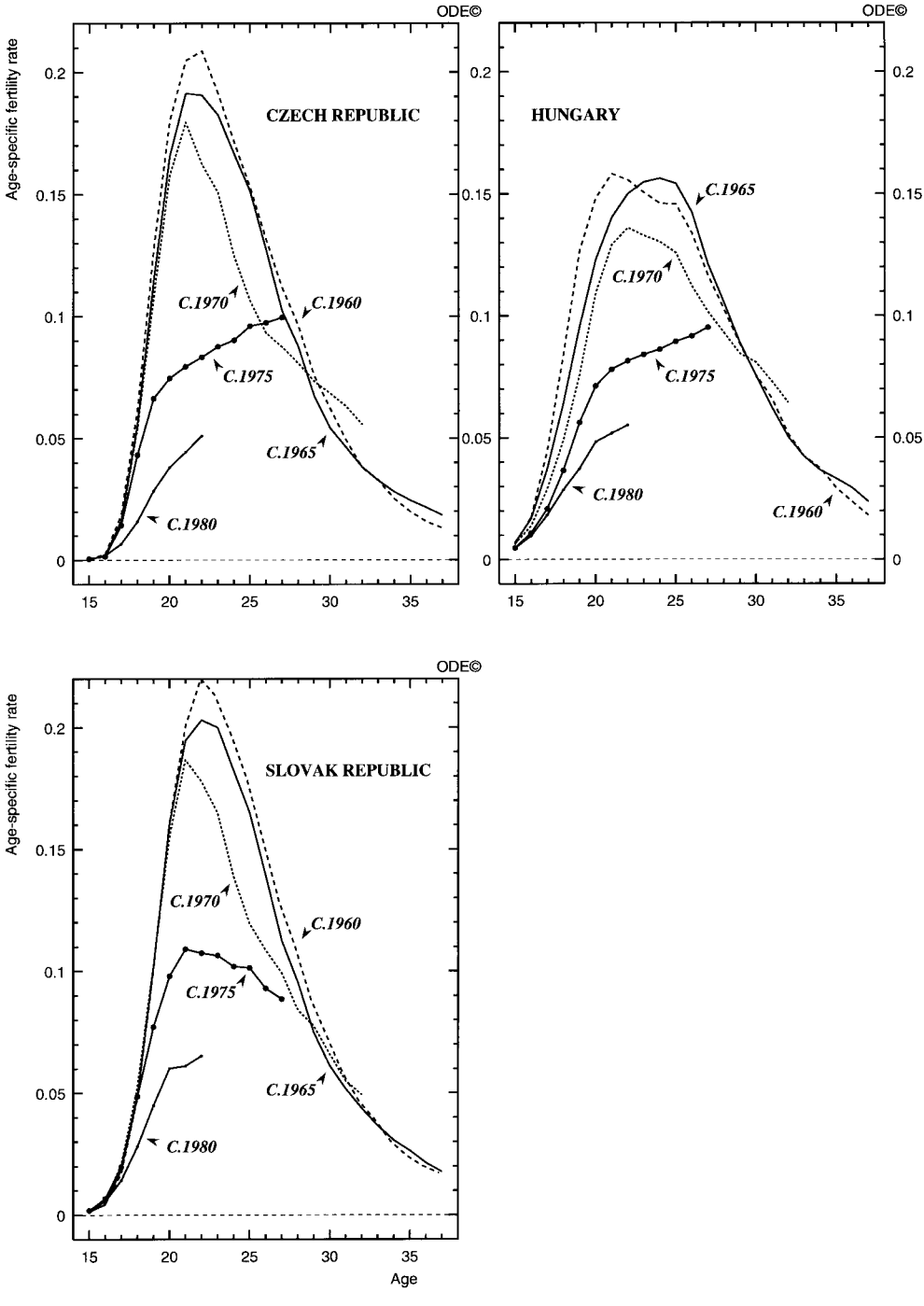


**Figure ECE-6 EAST CENTRAL EUROPE**
**Differences in cumulative age-specific cohort fertility rates between base and subsequent cohorts, women born in 1950 (base), 1955, 1960, 1965, 1970, 1975 and 1980**

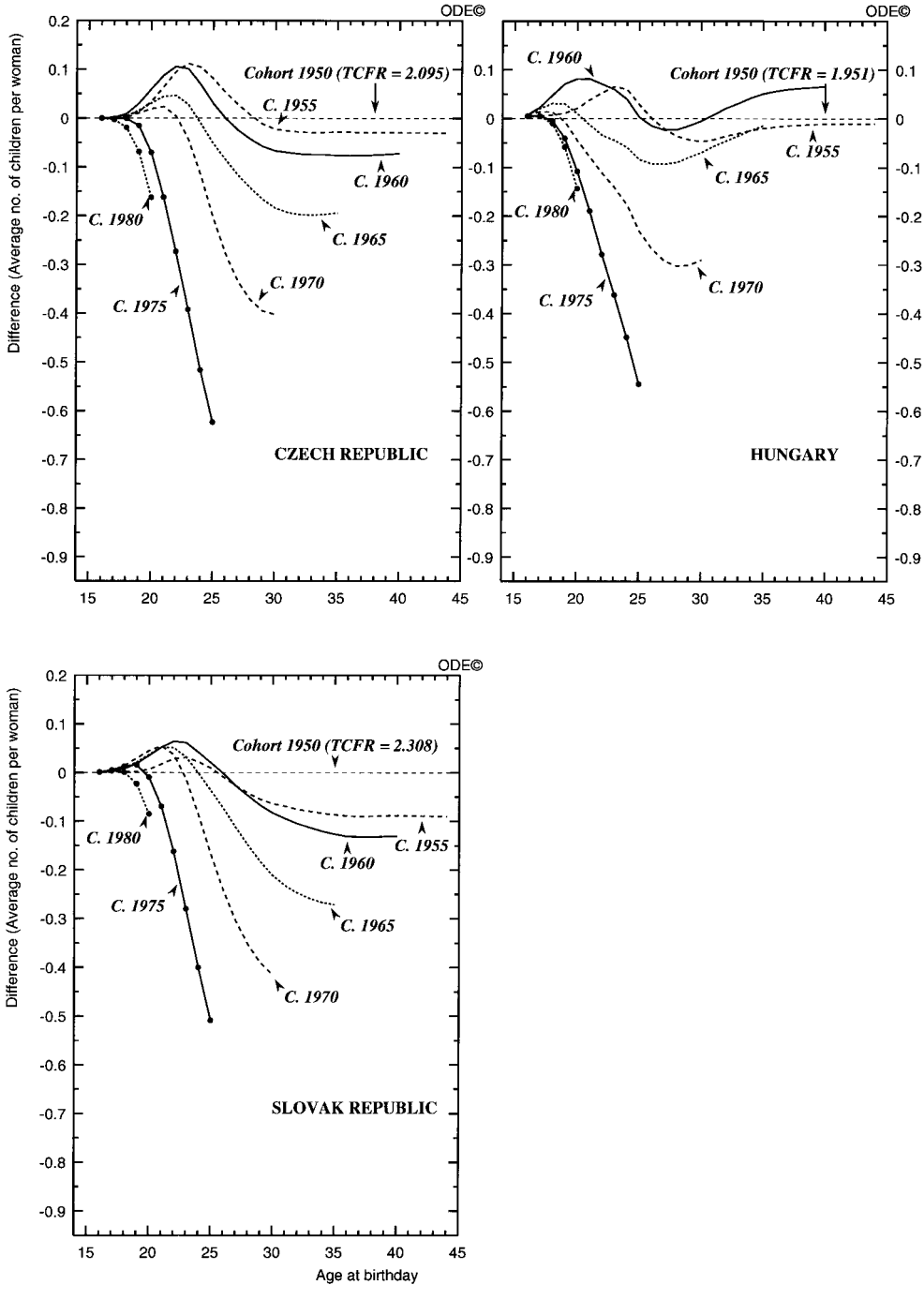


**Figure ECE-7 EAST CENTRAL EUROPE**
**Total cohort fertility rates by biological birth order, birth cohorts 1926 to 1972**

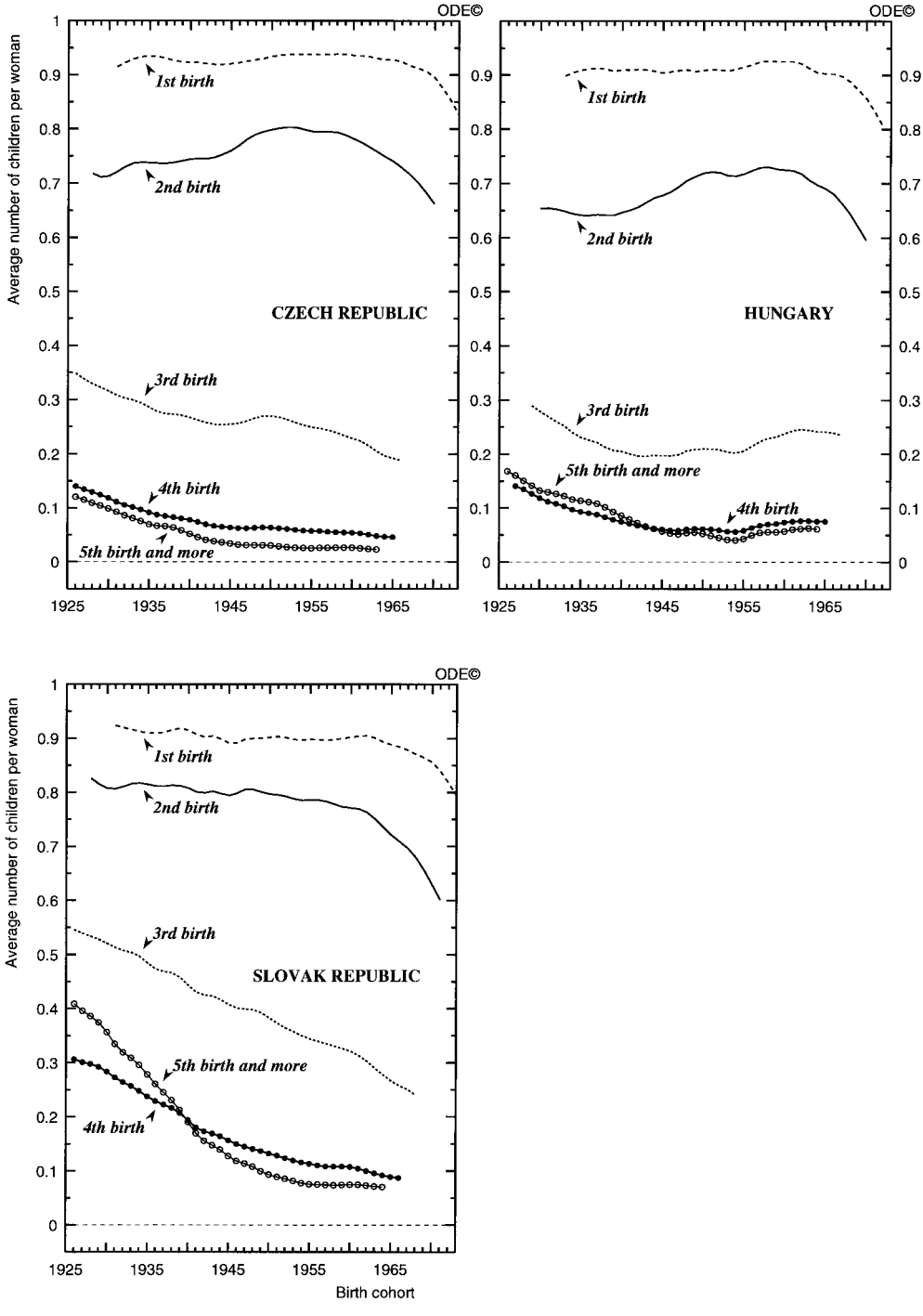


**Figure ECE-8 EAST CENTRAL EUROPE**
**Parity progression ratios, birth cohorts 1931 to 1973**

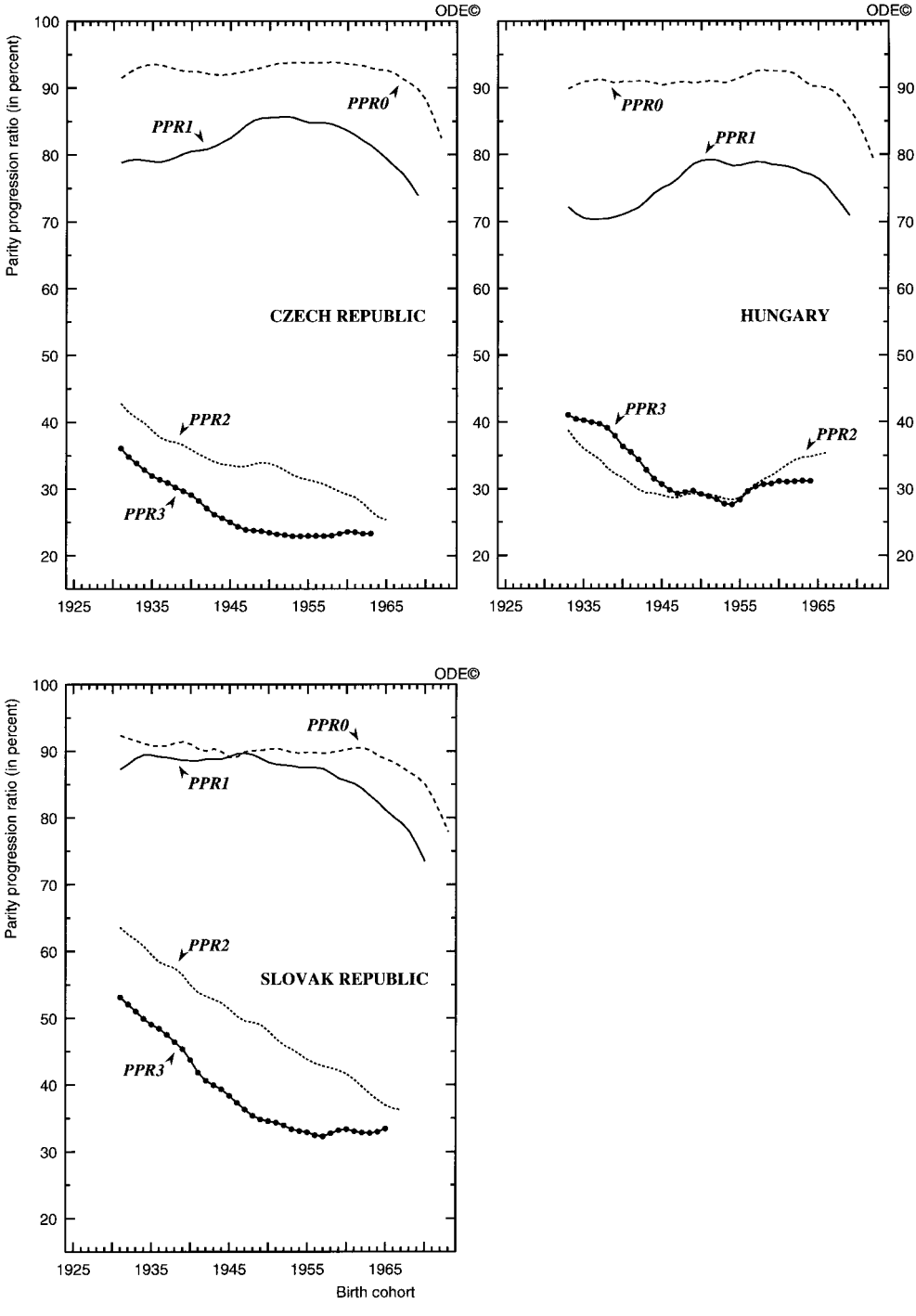


**Figure ECE-9 EAST CENTRAL EUROPE**
**Parity distribution of completed fertility, birth cohorts 1931 to 1972 (in percent)**

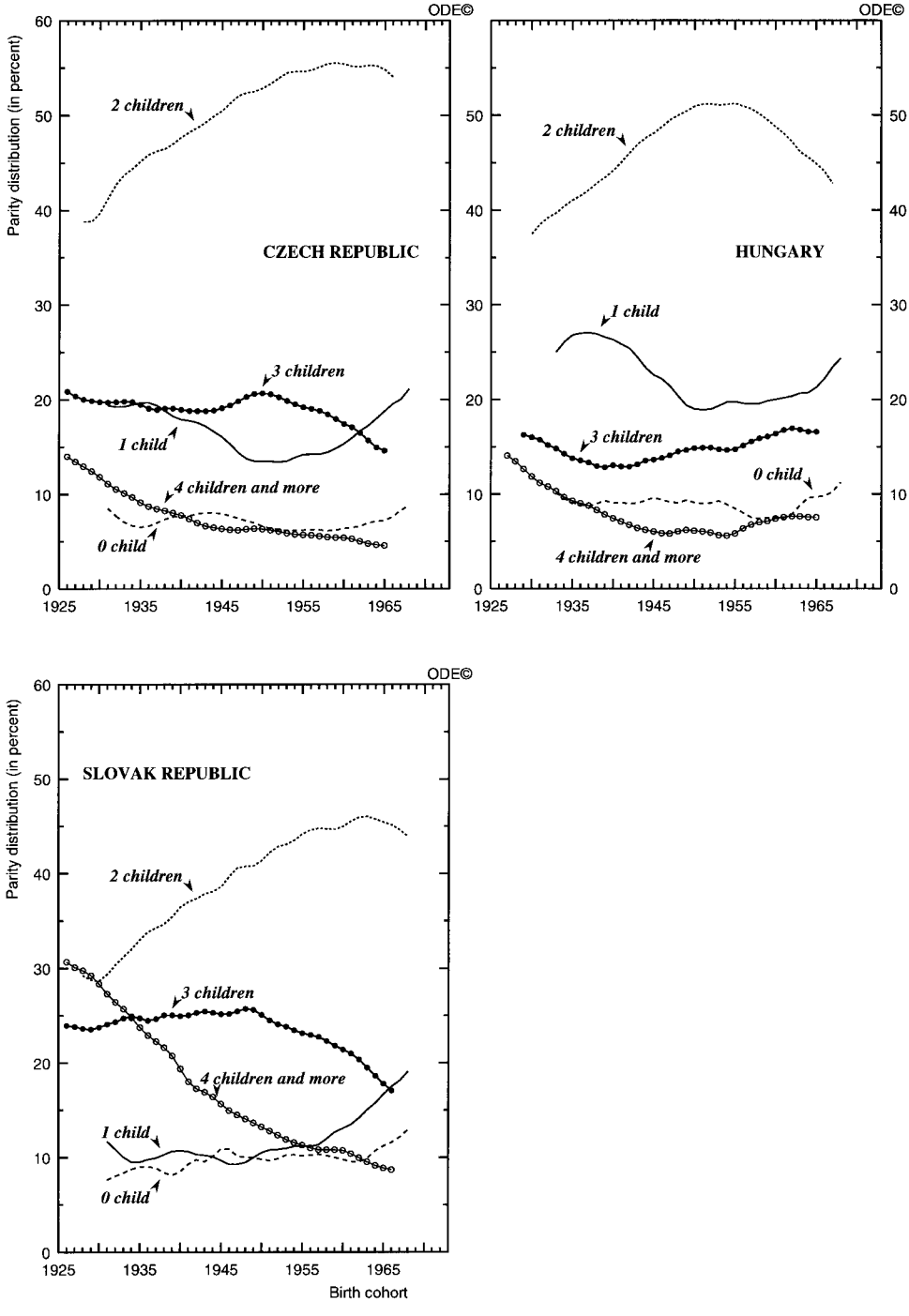
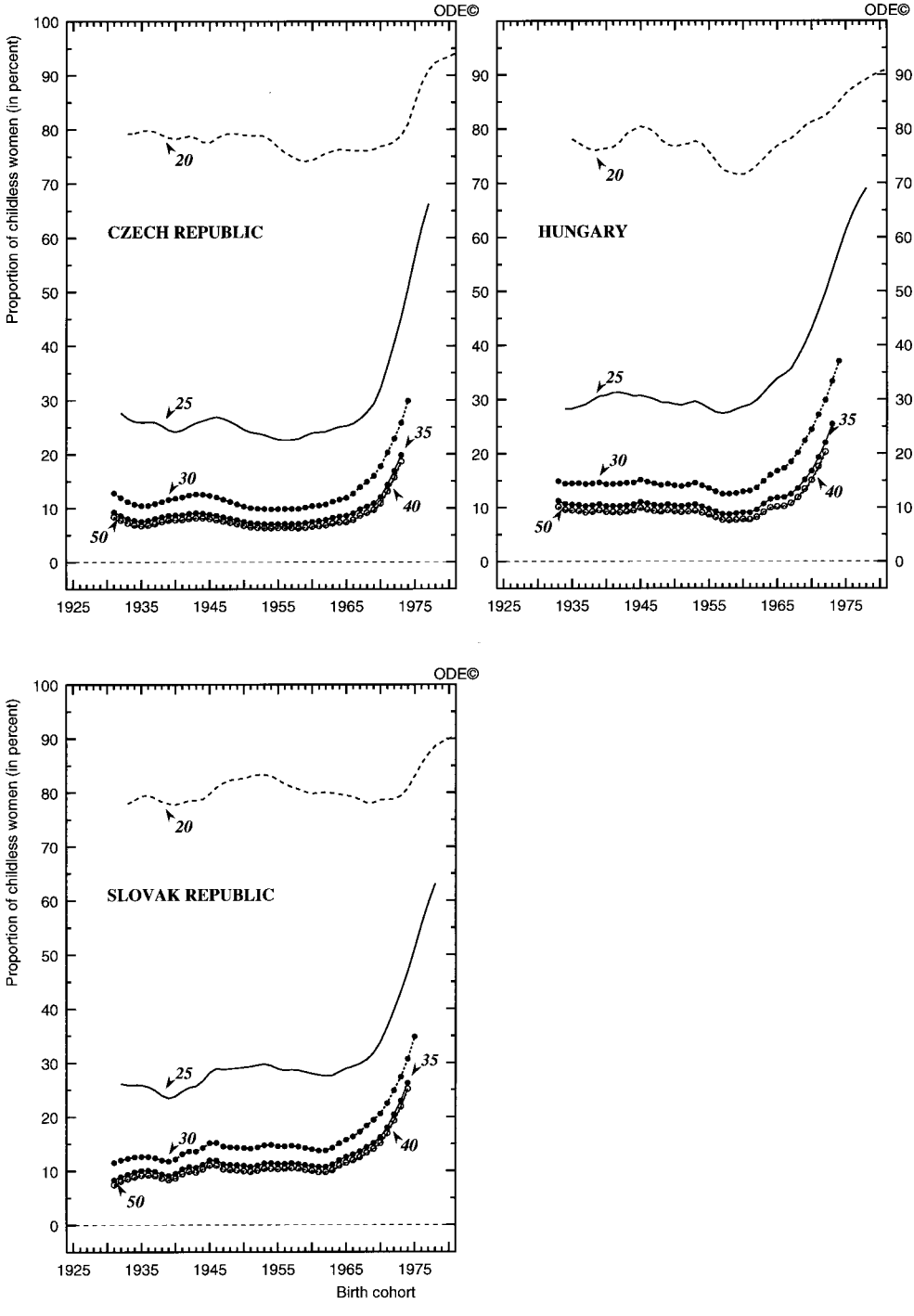


**Figure ECE-10 EAST CENTRAL EUROPE**
**Proportions of childless women, selected ages, birth cohorts 1931 to 1980**



# 8. Eastern Europe

The three countries of eastern Europe —Bulgaria, Romania and the Russian Federation— had rather divergent histories through the centuries. In addition to their geographical location, the rationale for grouping them into one region includes the fact that their political and thus social and economic systems were analogous during the second half of the 20th century.

The Russian state was consolidated in the 15th and 16th centuries. The first Romanov became czar in 1613 and this dynasty ruled Russia till 1917. Despite periods of significant reforms under Peter the Great (1689-1725), Catherine the Great (1762-1796) and Alexander II (1855-81), Russia was continuously less developed than central and western Europe economically as well as in other spheres of cultural and social import. After the First World War and following the revolution of 1917 and a civil war, the Soviet Union was officially proclaimed in 1922. Russia was the central and most powerful of 15 constituent republics. The Soviet Union was the first state to be based on Marxist socialism. The communist party controlled all levels of government and the economy. After the Second World War the Soviet Union gradually enlarged its sphere of domination to include countries of central and eastern Europe. By the 1980s, the intrinsic tensions and imbalances of the authoritarian political system and the rigidly centrally planned economy generated daunting economic as well as internal and international political problems. Gorbachev, who became general secretary of the communist party in 1985, attempted to resolve these problems and invigorate the Soviet system by the help of 'glasnost' (openness) and 'perestroika' (restructuring). Eventually this led to the dissolution of the Soviet Union and the end of Soviet-style authoritarian regimes in the former Soviet republics and in central and eastern Europe. It was mainly thanks to Gorbachev that such a major change of systems proceeded peacefully without bloodshed. The transformation to a modern democracy and a market economy was in progress during the 1990s. It was arguably more difficult and painful than in the central European formerly socialist countries, and was not complete at the turn of the centuries.

Romania gained full independence in 1878 following centuries of dominance by neighboring empires from the North, East, West or South. Bulgaria was an oppressed part of the Ottoman Empire for over six centuries and was established as an independent country as late as 1908. Political developments in both countries were unstable up until after the Second World War, and economic progress uneven and markedly behind central and western Europe. In the mid-1940s Romania and Bulgaria became increasingly dependent on the Soviet Union and developed economies based largely on heavy industry. Following the demise of the communist system, the transformation to western style democracies and economies has been more complex and strained than in central Europe.

As of the turn of the century the economic situation in all three countries appeared to have stabilized. In 2001 GDP real growth rates were 4.0, 4.8 and 5.2 per cent in Bulgaria, Romania and Russia, respectively. Nevertheless, these countries were among the poorest in Europe and considerable proportions of their populations were living under extremely difficult conditions.[36]

The fertility levels and trends analyzed in detail in the following country studies were modified by social and economic developments as well as by governmental policy interventions. In general, a young age pattern of fertility was sustained and continuously reinforced throughout the socialist era. Completed cohort fertility was maintained at a relatively stable and high level. Governmental policies caused variations in period fertility as well as irregularities in cohort fertility age patterns.

## 8.1 | Bulgaria

The fertility transition in Bulgaria commenced essentially only after the First World War (Chesnais 1992). With the exception of the war years the crude birth

[36] According to the World Bank (2002) per capita gross national income in purchasing power parity was $ 5,530, $ 6,380 and $ 8,030 in Bulgaria, Romania and Russia, respectively; this was approximately one-third to one-quarter of the income levels in the western countries and around a half compared to the Czech and Slovak Republics as well as Hungary. The income distribution (Gini index) was rather uneven, especially compared to the other formerly socialist countries; in the late 1990s it was 26.4, 31.1, and 48.7 in Bulgaria, Romania and Russia, respectively.

rate was around 40 into the early 1920s. The total period fertility rate at that time was around five births per woman. With some fluctuations it declined to a plateau of below three births per woman during the 1940s. These relatively high fertility rates were consistent with the fact that as late as the mid-1940s three-quarters of the population lived in villages (Meyerfeldt 1996).

Rapid and intrusive social and economic transformations occurred in the following decades. These were reflected in the trend of the total period fertility rate during the 1950s through the mid-1960s when it reached below replacement level fertility (Figure EE-1). According to Vassilev (1999), "[R]apid urbanization, forced agricultural collectivization, and industrialization contributed to this decline." Between the late 1960s and the late 1980s pronatalist policy measures coupled with restrictions to induced abortions generated occasional mild fertility increases but basically period fertility was stable around the replacement level. Increases were discernible in 1968 as well as in 1973-74. A sharp decline commenced in the late 1980s. The TPFR was around 2.0 between 1981 and 1988; by 1997-98 it was 1.1 births per woman; it increased to 1.3 in 2000.

Completed cohort fertility, which was apparently declining among the generations born early in the 20$^{th}$ century, reached a plateau with those born in the 1930s (Figure EE-1). For about 30 birth cohorts the TCFR was very stable around the replacement level. Policy measures had no evident effect on completed fertility of women which were targeted. Starting with the birth cohorts of the late 1950s the TCFRs began to decline. The estimated completed fertility rate for the 1970 cohort was 1.6 births per woman with likely prospects of a further decline (Figure EE-2).

The TCFRs of the generations born during the 1930s, 1940s and most of the 1950s were almost identical, however, age patterns of fertility were changing. Successive cohorts were shifting their child-bearing into early ages. Compared to the 1930 birth cohort women of the 1940 cohort had 0.13 more children between the ages of 15 and 22, but compensated for that later in their reproductive period (Table BU-1 and Figure EE-3). A similar trend was in effect for the birth cohorts of the 1940s. The comparison of the 1950 and 1960 birth cohorts reveals that fertility of the youngest women continued to increase, but when they reached their 20s child-bearing was curtailed more than before. The

*Table BU-1. Fertility deficits and surpluses comparing birth cohorts, Bulgaria, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 25-49 | -0.146 | 28-49 | -0.115 | 23-39 | -0.178 |
| Surplus | 15-22[a] | +0.130 | 15-27 | +0.098 | 15-22 | +0.063 |
| | | | | | 40-49[b] | +0.001 |
| Total | | -0.016 | | -0.017 | | -0.114 |

Notes: [a] Includes estimated data for ages 15-16 of 1930 cohort the total of which was 1.2 per cent of TCFR.
[b] Includes estimated data for ages 41-49 of 1960 cohort the total of which was 0.4 per cent of TCFR.

deficit after age 23, -0.18 births, was larger than the surplus up to that age, +0.06. In sum, between the cohorts born around 1930 and those born around 1960 the age pattern of child-bearing had shifted considerably into the young ages (Figure EE-3). The peak of child bearing had shifted from age 23 to age 21. In the individual ages under 20 fertility had increased at least by 30 per cent whereas above age 28 it had decreased by at least 30 per cent (Figure EE-3).

The effects of the pronatalist policy measures coupled with abortion restrictions can also be seen in some cohort age-structural peculiarities. The fertility peak in the 1950 cohort was stretched from age 21 through age 24, and in the 1940 birth cohort the age-specific fertility rate at age 28 as well as for subsequent ages were higher than they would have been otherwise (Figure EE-3).

There was also a continuous decrease in the average age of period as well as cohort child-bearing, from age 27 to below 24 and from 25.4 to 23.4, respectively (Figure EE-4).

Among the birth cohorts that were at the onset or in the middle of their childbearing periods around the year 2000, fertility declined at almost all ages from one generation to the next (Figures EE-5 and EE-6). The peak of child-bearing remained at age 21, however, for the generations born in the late 1960s and especially in the 1970s fertility declined to exceptionally low levels. The most striking changes thus far took place in the prime years of childbearing. For instance, the age-specific fertility rate at age 21 declined from 0.208 in the 1965 cohort to 0.100 in the 1975 cohort, a 52 per cent difference (Figure EE-5).

Furthermore, cumulated fertility rates of the young birth cohorts up to comparable ages were lower than ever before. The cumulated cohort fertility rate (CCFR) of the 1965 generation up to age 35 was 1.77 births per woman, 11 per cent lower than the cohort ten years older (Table BU-2). The CCFR of the 1970 birth cohort up to age 30 was 23 per cent lower than the ten years older generation. Finally, the CCFR of the 1975 cohort was 42 per cent below the ten years older generation at age 25 (Table BU-2).

Figure EE-6 depicts the peculiar changes in fertility age patterns of the recent Bulgarian birth cohorts. Compared to the 1950 birth cohort, the birth cohorts of the mid- to late 1950s remained close to the base cohort in their age pattern and cumulated fertility. At young ages, in their early teens, each successive cohort had higher fertility than the previous one. The age at which age specific and cumulated fertility turned lower than in previous cohorts was successively at a younger age. The younger birth cohorts were having considerably lower cumulated fertility rates: the 1975 birth cohort by age 25 had almost 0.6 fewer births per woman than the 1950 cohort as well as the generation ten years older, the 1960 cohort. The cohorts born in the mid-1970s were aiming for completed fertility rates of no more than 1.5 births per woman (Figure EE-6).

Among the more than 30 cohorts up to those born in the mid-1950s, fertility rates declined moderately for third and higher order births (Figure EE-7). The most notable change starting with the cohorts of the mid-1950s was a considerable decline in second order births rates with a corresponding decline in the progression ratio to the second birth order (Figure EE-8).

Bulgaria was the country with the highest prevalence of the 'two child family.' Among the cohorts of the 1950s around 60 per cent of all couples had two children (Figure EE-9). Among the cohorts born in the 1960s this proportion

*Table BU-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Bulgaria, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.904 | 1.773 | … | … | … | -5 | -11 | … | … | … |
| 30 | 1.777 | 1.650 | 1.371 | … | … | -4 | -9 | -23 | … | … |
| 25 | 1.324 | 1.304 | 1.049 | 0.755 | … | 0 | -4 | -21 | -42 | … |
| 20 | 0.396 | 0.403 | 0.370 | 0.298 | 0.233 | 11 | 11 | -7 | -26 | -37 |

was declining and the proportion of women with one child was increasing in its place. The proportion of women with no children was increasing, but was still low (Figure EE-10).

## 8.2 | Romania

Romania's population experienced one of the more unusual fertility trends in modern history, particularly during the second half of the 20th century. At the beginning of the century Romania was an overwhelmingly agrarian country with 80 per cent of the population living in rural areas. Its fertility transition started in the first two decades of the century at a slow pace. Around the First World War its crude birth rate was about 40, implying a total fertility rate of above five children per woman (Chesnais 1992). The pace of fertility decline picked up speed in the early 1930s when the crude birth rate declined to around 30 per thousand. Thereafter the annual fluctuations were considerable and especially the Second World War had a depressing effect. In the late 1940s fertility returned to its pre-war level.

During the period of authoritarian rule up to 1990, period fertility rates displayed fluctuations not seen in any other country. These were associated at first mainly with the rapid transformation of an agrarian country into a socialist industrial one, and subsequently with the idiosyncratic social and economic systems of the totalitarian socialist state as well as with the rigidly enforced pronatalist policy measures of the government (David 1999).

After the Second World War the total period fertility rate was between 2.9 and 3.2 births per woman until 1956. It then declined rapidly to reach below replacement fertility by the early 1960s and a value of 1.9 births per woman in 1966, a 35 per cent decrease within ten years (Figure EE-1). This decline "was associated with educational reforms providing more opportunities for women, forced industrialization, and agricultural policies that removed incentives to produce children for farm labor" (Baban 1999). At the same time, in 1957, abortion legislation was liberalized to permit induced abortion on request. More than in any other nation, Romanian women seized this opportunity. The total legal abortion rate increased from a level of under one abortion per woman in 1958 to almost eight abortions per woman in 1965-66 (Frejka 1983). The ratio of induced abortions to live births in 1965 was 4:1. Induced abortions had

become a socially accepted major method of fertility regulation (Muresan and Copil 1974).

The government viewed this situation with great concern and towards the end of 1966 reacted by implementing severe restrictions on abortions on request, including a revision of the Penal Code with penalties for providers of illegal abortions. Even self-induced abortions became punishable by imprisonment. These measures were accompanied by limited pronatalist incentives, such as increases in child allowances and maternity grants for third and higher order births (Baban 1999).

Since the population was taken by surprise and relying heavily on induced abortions as the main method of preventing unwanted births, the TPFR climbed to 3.7 in 1967. Two years were needed for the population to adjust to the new fertility regulation environment. Couples and women resorted to an extensive use of traditional methods of contraception backed up by legal and illegal abortions. According to a 1978 survey, 44 per cent of users were practicing withdrawal and 41 per cent the rhythm method (UN 2001). The total legal abortion rate, which in 1967 declined to about 1.4 abortions per woman, gradually climbed back to the order of three abortions per woman by the early 1980s. Interviews and investigations after 1990 revealed that many women were resorting to clandestine abortions and that physicians were performing abortions under diagnoses that did not require official notification. Also the high rate of maternal mortality related to abortions during the 1970s and 1980s, a multiple compared to other European countries, is indirect evidence that there was a high incidence of illegal abortions. Following the large increase in 1967, the TPFR at first declined sharply to around 2.5 in the mid 1970s, and subsequently to below replacement by the early 1980s (Figure EE-1).

Starting in 1984 the secret police and the Prosecutor's Office were employed for the next wave of rigorous enforcement of abortion restrictions (Kligman 1998). The total legal abortion rate was reduced to about one abortion per woman in the late 1980s and the TPFR increased temporarily to 2.4 in 1986 and 1987 (Figure EE-1).

The policy decisions and measures of 1966, 1973 and 1984 of the Romanian government, i.e. the severe restrictions on induced abortions coupled with limited social measures, affected women at all ages (Figure EE-2 and EE-3).

By the same token, these policy interventions also had an effect in shaping the age patterns of cohort fertility. Take, for instance, the birth cohort of 1940. Without the abrupt reversal of the induced abortion legislation in 1966 the age pattern would not have experienced the considerable increase in age-specific fertility between ages 26 and 27, a 77 per cent difference (Figure EE-3). Undoubtedly, also the age-specific fertility rates after that age would have been lower.

The 1930 cohort was already in its mid-30s when the 1966 abortion restrictions went into effect. In this cohort the age-specific fertility rate at age 37 was almost double that of age 36. Fertility of women during their late 30s and early 40s continued to be much higher than it would have been without the policy measures (Figure EE-3).

The age pattern of fertility of the 1950 cohort in and of itself appears to have a reasonably 'normal' shape. However, in comparison with the 1940 cohort it becomes evident that the 1950 cohort was also affected by the 1966 policy measures. Up to ages in the mid-20s fertility was considerably higher in the 1950 cohort than in the ten years older one (Figure EE-3). In absolute terms, the 1950 cohort had a surplus of almost 0.5 children during the first 12 years of child-bearing compared to the 1940 cohort (Table R-1). Because fertility of the 1940 cohort was relatively high after age 26 thus in comparison the 1950 cohort displayed a fertility deficit of 0.4 births which cancelled out the early surplus.

*Table R-1. Fertility deficits and surpluses comparing birth cohorts, Romania, cohorts 1940, 1950 and 1960*

| | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|
| Fertility | Age group | Number of children | Age group | Number of children |
| Deficit | 27-49 | -0.409 | 17-20 | -0.072 |
| | | | 23-49[b] | -0.253 |
| Surplus | 15-26[a] | +0.461 | 15-16 | +0.004 |
| | | | 21-22 | +0.003 |
| Total | | +0.052 | | -0.318 |

Notes: [a] Includes estimated data for age 15 of 1940 cohort the total of which was 0.02 per cent of TCFR.
[b] Includes estimated data for ages 41-49 of 1960 cohort the total of which was 0.6 per cent of TCFR.

The 1960 cohort had lower fertility compared to the 1950 one at almost all ages and wound up with a net deficit of 0.3 children per woman.

If one were to take the completed fertility rates of the cohorts born in the late 1930s and 1940s at face value, these appear to be stable at around 2.4 to 2.5 births per woman (Figures EE-1). It is important to realize that although they were stable, they would have been considerably lower without the forceful government interventions especially of the late 1960s, which were then perpetuated in subsequent years. As was already described above, fertility of the 1940 birth cohort, for instance, was profoundly affected after age 26. Without the policy interventions women born in 1940 would have had much lower fertility than the 1930 cohort. In reality between the ages of 27 and 36 their fertility at individual ages was 35 to 53 per cent above that of women born in 1930 (Figures EE-2 and EE-3). The government's policy measures kept completed fertility of the women born during the late 1930s and 1940s at this high level of 2.4 to 2.5 births per woman.

It is remarkable that starting with the cohorts born around 1950 the TCFRs commenced with a steady decline. Between the birth cohort of 1950 and 1965, the TCFR declined from 2.5 to an estimated 1.9 births per woman. Even though the cohorts of the 1950s and early 1960s entered, and lived through, their prime years of childbearing when major efforts were still under way to prevent couples from using effective methods of birth regulation, such as induced abortion and modern contraception, nevertheless their childbearing declined.

The birth cohorts which at the turn of the century were in the midst or at the onset of their child-bearing periods had successively lower fertility (Figures EE-5 and EE-6). The cumulated fertility rates of the birth cohorts of the 1950s were not much lower than those of the 1950 base cohort. The fertility declines of the cohorts born in the 1960s and early 1970s were much more pronounced. For instance, the 1970 birth cohort by age 30, by which age definitely over 80 per cent of its childbearing had been completed, had borne 0.7 fewer births per woman than the 1950 cohort (Figure EE-6). It is obvious that the cohorts of the mid-1970s were heading for even lower fertility. The cumulated fertility rates of the 1975 birth cohort at each age were lower than for any previous cohort. By completed age 25 its CCFR was 44 per cent below that of the cohort ten years older at the same age (Figure EE-6 and Table R-2). And the fertility decline was continuing among women born around 1980.

*Table R-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Romania, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 2.088 | 1.828 | … | … | … | -9 | -16 | … | … | … |
| 30 | 1.922 | 1.664 | 1.322 | … | … | -5 | -11 | -31 | … | … |
| 25 | 1.295 | 1.278 | 0.933 | 0.714 | … | -4 | -2 | -28 | -44 | … |
| 20 | 0.346 | 0.356 | 0.288 | 0.227 | 0.190 | -8 | 11 | -17 | -36 | -34 |

A more detailed examination of the cohort age patterns of fertility is also illuminative. Childbearing of the 1955 and even more so of the 1960 cohort started to be below that of the 1950 cohort after age 25 (Figure EE-6). It was the decline of fertility of women in their late 20s and 30s which brought about the declines of total cohort fertility rates of women born in the 1950s. Further, the childbearing patterns of the 1960 and the 1965 birth cohorts were almost identical up to age 23 (Figures EE-5 and EE-6). After this age, throughout the remainder of their 20s, the women born in 1965 decided to have considerably fewer children than the older cohort. Note that this marked propensity to lower fertility coincided with the collapse of the authoritarian regime in 1989/90.

The 1970 birth cohort had lower fertility than previous cohorts already while in their teens and into their 20s (Figures EE-5 and EE-6). Consequently, up to age 30 its cumulated fertility was, for instance, 31 per cent lower than that of the cohort ten years older (Table R-2).

At the same time, women born in 1965 and in 1970 displayed a tendency to realize some of the births they had postponed when they were young. Age-specific fertility rates after age 32 in the 1965 cohort were higher than in the 1960 cohort; and the 1970 cohort had higher fertility than the 1965 cohort after age 26 (Figure EE-5). Both these cohorts, however, are likely to realize only a minor proportion of the births they had earlier postponed, as they were already past their peak ages of childbearing and thus quite far along in their lifetime reproductive paths.

Births of all orders were declining among the cohorts of the 1950s (Figure EE-7). The decline accelerated for second order births in the cohorts born in the 1960s. Parity progression ratios to third and fourth births were high among the cohorts of the 1940s but declined among the cohorts of the 1950s and 1960s

(Figure EE-8). The largest PPR decline was to second order births; in the cohorts of the late 1960s only 60 per cent of all women with a first birth were having a second one.

In Romania large families of three or more children were still quite common among the cohorts of the 1930s and 1940s (Figure EE-9). Only about 35 to 40 per cent of women/couples had two children and even among the cohorts of the 1960s this proportion was hardly declining. As the proportions of the large families were diminishing among the cohorts of the 1960s, it was the proportion of women with a single child that was rapidly increasing; so much so that women with only one child were becoming the most prevalent of all parities. Also the proportions of women without any children, which previously had been negligible, were slowly increasing among the cohorts of the 1950s and 1960s (Figure EE-10).

## 8.3 | Russian Federation

The fertility transition in Russia started just prior to the beginning of the 20th century, later than in most other European countries. The total period fertility rate (TPFR) in Russia was about 7.5 children born per woman as estimated from the 1897 census and it declined to 2.1 by the mid-1960s. Some claim that Russia's fertility transition was marked by political, social and economic upheavals more frequently and more profoundly than in any other European country (Zakharov 1994).

There were three main periods in the course of the 20th century during which fertility would have maintained much smoother trends had it not been modified by war, revolution, hunger, authoritarian reforms and massive repression: 1915-1922 First World War, civil war, hunger), 1930-1936 (collectivization of agriculture, mass deportations, hunger) and 1941-1948 (Second World War, hunger). The number of births in 1917, for instance, was 39 per cent lower than in 1914; it was 37 per cent lower in 1933 compared to 1929; and 69 per cent lower in 1943 compared to 1941 (Blum and Zakharov 1997).

Reasonably reliable registration data indicate a continued rapid fertility decline in the late 1950s and 1960s. In 1958 the TPFR was above 2.6 and by 1968 it had declined to below 2.0 births per woman (Figure EE-1). Overall, period fertility was stable from the mid-1960s through the early 1990s in a band between 1.9

and 2.1 births per woman. The one exception was a fertility increase of about 15 per cent between 1980 and 1987 to a TPFR of 2.2 births per woman. Using parity-progression ratios Darsky (1994) demonstrated that the pronatalist measures adopted by the Soviet government in the 1980s did affect fertility.

A rapid fertility decline started in the late 1980s and continued throughout the 1990s: from a TPFR of 2.2 in 1987 to 1.2 in 1997, a 45 per cent decline within a decade. The TPFR remained around 1.2 births per woman through 2000.

In Russia, the time series of the total cohort fertility rates were similar to those of the total period fertility rates (of course, with the appropriate time lag). The TCFRs reached the end of their initial long-term decline with the cohorts born around 1945 at about 1.8 births per woman (Figures EE-1 and EE-2). With minor variations cohort fertility remained at that level for about 15 birth cohorts. Beginning with those born around 1960 successive cohorts display declining fertility; the 1967 birth cohort is likely to have a TCFR in the order of 1.6 children per woman.

Unfortunately, the number of complete cohorts for which data are available is smaller in Russia than in most other countries of the sample. For instance, data for the 1930 cohort start only with age 29. Nevertheless, these provide useful information on age pattern changes. Undoubtedly, the fertility decline of older women, i.e. when in their late 20s and beyond, contributed appreciably to the apparent decline of the TCFRs of the generations born in the 1930s and early 1940s (Figures EE-2 and EE-3). The declines in individual age-specific fertility rates between the 1930 and the 1940 birth cohorts for women over age 29 ranged from 20 to over 50 per cent.

While the TCFRs of the generations born during the 1940s and 1950s were quite stable, the age patterns of fertility continued to change. The 1940 and the 1950 birth cohorts had almost identical TCFRs, 1.94 and 1.88, respectively, however, the 1950 cohort had higher fertility when young, but lost this advantage later on (Figure EE-3). By age 22 the cumulated cohort fertility rate was 14 per cent higher in the 1950 cohort, but by age 30 there was no difference at all between the cumulated fertility of the two cohorts.

The shifting of fertility to the early years of childbearing continued among the cohorts born during the 1950s. In the 1960 birth cohort at ages 15 to 20 age-specific fertility rates were higher than among women ten years older by 30 to

85 per cent. This pattern of higher early childbearing continued when these women were in their 20s, albeit more moderately (Figure EE-3). When the birth cohort of 1960 reached the early thirties their fertility was much lower than in the 1950 cohort.

In sum, from the birth cohorts of the 1930s to those of the early 1960s, fertility had shifted considerably into the early years of childbearing with only a minor proportion of children to be born after women reached their late 20s. By age 30 the 1960 birth cohort had borne almost 90 per cent of the children they were going to have (Figures EE-2 and EE-3). Such major shifts in the age patterns of childbearing are reflected in the considerable decline of the mean age of period and cohort childbirth (Figure EE-4).

Despite the considerable shift to early childbearing among the cohorts of the 1940s, the 1950s and those of around 1960, the TCFRs were stable at around 1.8 to 1.9 births per woman. Whatever fertility surpluses were gained when the women were young, were lost by fertility deficits after these generations reached their late 20s (Table RU-1). Preliminary estimates indicate that TCFRs for the cohorts born during the 1960s were declining (Figures EE-1 and EE-2). The TCFRs of the cohorts born in the late 1960s could be as low as 1.6 births per woman or less.

Cumulated cohort fertility among women who were in the middle or at the onset of their childbearing periods at the end of the 1990s was declining, however the age patterns were quite peculiar (Table RU-2). Starting with the cohorts born

*Table RU-1. Fertility deficits and surpluses comparing birth cohorts, Russian Federation, cohorts 1940, 1950 and 1960*

| Fertility | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children |
| Deficit | 23-35 | -0.125 | 30-49[b] | -0.188 |
| | 39-49 | -0.009 | | |
| Surplus | 15-22[a] | +0.065 | 15-29 | +0.133 |
| | 36-38 | +0.008 | | |
| Total | | -0.061 | | -0.055 |

Notes: [a] Includes estimated data for ages 15-18 of 1940 cohort the total of which was 1.3 per cent of TCFR.
[b] Includes estimated data for ages 41-49 of 1960 cohort the total of which was 0.8 per cent of TCFR.

around 1960, compared to the 1950 birth cohort, as a rule, each cohort had relatively high fertility when young. Furthermore, each subsequent cohort commenced its childbearing not only higher than the 1950 base cohort but also higher than previous cohorts. Finally, each subsequent generation arrived at a turning point in their age pattern of fertility at a younger age than the previous cohort and thereafter had lower cumulated fertility than previous generations (Figures EE-5 and EE-6). For instance, in the 1970 cohort, by age 22 the cumulated cohort fertility rate was 13 per cent higher than in the 1960 cohort, but by age 27 it was 38 per cent lower (Table RU-2).

This pattern was changing among the cohorts born in the late 1970s, in which the fertility of teenagers was declining (Table RU-2). By their 20th birthday young women of the 1975 cohort had a CCFR of 0.24 births per woman, whereas in the 1979 cohort this CCFR was 0.18, a 25 per cent decline.

The principal fertility decline of the young cohorts born during the 1970s was in the prime ages of childbearing, in their early 20s. For instance, in the 1975 cohort the age-specific fertility rate at age 22 was 0.105 births per woman compared to 0.186 in the 1965 cohort, a difference of 44 per cent (Figure EE-5).

All the evidence points to the conclusion that the decline in the TCFRs which started with the birth cohorts born around 1960 will continue among the cohorts of the 1960s and 1970s.

Estimates regarding cohort birth order trends are available only for a few cohorts born during the 1960s (Figures EE-7 to EE-10). The major change was a decline in second order births and a decline in the progression ratios to second births. Progression ratios to higher order births were low and progression ratios to first order births were still around 90 per cent and so far these were not declining

*Table RU-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Russia, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 37 | 1.792 | … | … | … | -1 | … | … | … |
| 32 | 1.689 | 1.504 | … | … | -9 | -15 | … | … |
| 27 | 1.291 | 1.250 | 1.083 | … | -23 | -35 | -38 | … |
| 22 | 0.525 | 0.568 | 0.590 | 0.470 | 15 | 16 | 13 | -17 |

rapidly. Conversely, the proportions of women not having any children in the 1960s birth cohorts were around ten per cent and increasing only moderately.

In the 1960 birth cohort close to 50 per cent of all women had two children and their proportion was starting to decline (Figure EE-9). Close to 30 per cent of families had one child in this cohort, and among the cohorts of the 1960s the proportion of one child families was increasing. The proportions of families with three or more children were small and moderately declining.

## 8.4 | A comparative perspective

Fertility levels and trends of the countries in eastern Europe were generally less homogeneous than in other regions. There were, however, many features which they had in common arguably mainly due to the fact that for most of the second half of the 20th century economic developments were regulated through central planning reinforced by the authoritarian Soviet-style governments in power.

Among the cohorts born in the early 1960s completed fertility rates were relatively high in Romania (around 2.1), average in Bulgaria (1.9) and low in the Russian Federation (1.7-1.8). Despite these differences the TCFR trends from the cohorts of the 1930s through those of the 1950s were of the same nature as in the other formerly socialist countries, i.e. they were maintained in the same plane or declined moderately. The clearest trend was in Bulgaria where the TCFR was between 2.0 and 2.1 for a series of some 30 cohorts through those of the late 1950s (Figures EE-1 and CO-1 [Chapter 12]). For Russia only a shorter data series is available, but the picture was similar — the TCFRs were maintained at 1.8 to 2.0 from the cohorts of the late 1930s to those of the late 1950s. In Romania TCFRs were maintained at 2.4 to 2.5 births per woman from the cohorts of the mid-1930s to those of around 1950; estimates of the TCFRs for the 1950s and especially the 1960s cohorts displayed a notable decline. As in the other formerly socialist countries the factors suppressing fertility —such as, labor intensive economic development policies and high female employment rates— were offset by those that were exerting upward pressure: arrays of benefits favoring childbearing and restrictions on modern methods of birth control. This balance gradually eroded and broke down altogether with the change of the political, social and economic systems around 1990.

Consequently, there was a sharp TCFR decline among the 1960s birth cohorts in all three countries; TCFR estimates for the 1969 or 1970 cohorts were between 1.5 and 1.6 births per woman.

Young childbearing was the most conspicuous trait of fertility in these three countries. Similarly as in the other formerly socialist countries it was high and increasing from one cohort to the next, with populations in this region having the highest proportions of early childbearing. In the 1965 birth cohort 75 per cent of children in Russia, 78 per cent in Romania and 82 per cent in Bulgaria were born before women's 27$^{th}$ birthday (Table CO-3). Although completed fertility rates of the 1960s cohorts were declining, early childbearing was maintained. This was in sharp contrast to the western countries where typically around 40 per cent of children were born when women of the 1960s cohorts were young, i.e. prior to their 27$^{th}$ birthday. These proportions were also the highest among the formerly socialist countries.

In the cohorts of the 1930s and 1940s births were being advanced. Compared to older cohorts, childbearing was increasing at young ages and declining when women were in their late 20s and in their 30s. In the cohorts of the 1950s and 1960s childbearing was declining when women were young and when they were older, however, as a rule the declines were larger when they were older (Figures EE-3 and EE-5, and Tables CO-4, CO-5 and CO-6). Such shifts were typical for the formerly socialist countries and very distinct from the western ones.

The absolute level of childbearing of young women was maintained high through the cohorts of the late 1950s. In the 1960 cohort 1.6 children had been born per woman by their 27$^{th}$ birthday in Bulgaria and Romania; in Russia it was 1.3. The number declined to one birth per woman by the 1973 cohort which was similar to the other formerly socialist countries and close to double the numbers in the western countries (Table CO-7). The annual rates of decline of fertility among young women in the 1960s cohorts were between 1.8 and 3.6 per cent and accelerated to between 3.7 to 5.2 per cent in the cohorts of the early 1970s.

Taking into account that fertility of young women was rapidly declining and that around 80 per cent of childbearing was usually completed by the 27$^{th}$ birthday, childbearing of women in the 1970 birth cohorts when they will be older would have to be unusually high for these cohorts to have the same TCFRs as the 1960 cohorts or to attain replacement fertility. In Russia childbearing of women in the

1970 cohort when they will be in their late 20s and 30s would have to increase by 40 per cent compared to the 1960 cohort; in Bulgaria as well as in Romania childbearing of these older women would have to be almost twice as large as it was among women of the 1960 cohorts. In all three countries childbearing of the older women in the 1970 cohorts would have to be around double of what it was in the 1960 cohorts for them to reach replacement fertility (Table CO-8).

Levels and trends of childbearing of the youngest women, those before their 22nd birthday, differed distinctly from the western countries and to some extent also from the other formerly socialist ones. Basically, childbearing of these youngest women was increasing from the cohorts of the late 1930s through those of the 1950s, and in Russia even those of the 1960s cohorts. Early childbearing was on the decline among the cohorts of the 1960s and 1970s at rates that were in line with other countries. As a result, in the cohorts born around 1975 the youngest women in these countries had the highest cumulated fertility rates by their 22nd birthday of all countries in the sample, except for the United States. In eastern Europe the CCFRs were between 0.4 and 0.5 births per woman compared to 0.1-0.2 in practically all western countries and 0.3-0.4 in the formerly socialist countries.

The most distinct feature of change in the cohort parity distributions in eastern Europe was an increase in one child families among the cohorts born in the late 1950s and the early 1960s (Figure EE-9). Among these cohorts the proportions of one child families were higher than anywhere else. This was at the expense of all other parities, mainly parity two. The proportions of women who did not have any children were increasing moderately, even though they remained comparatively low, particularly in comparison to western countries.

## 8.5 | Conclusions

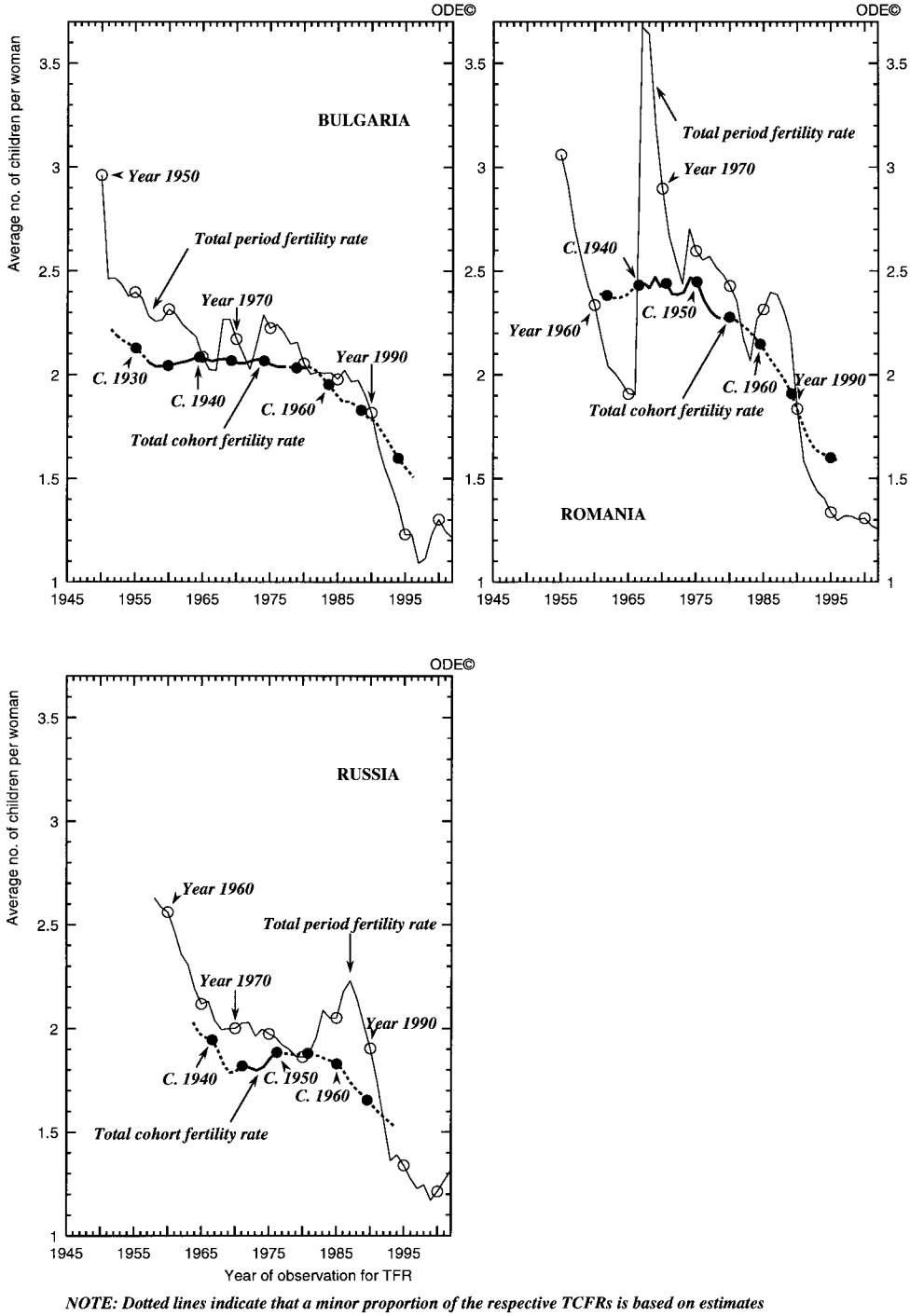
Completed cohort fertility rates of women born in the early 1960s in Bulgaria and Russia were relatively low even compared to other formerly socialist countries. The TCFR in Russia was 1.8 births per woman in the 1962 birth cohort; in Bulgaria it was 1.9 and in Romania 2.1. More importantly, TCFRs were unmistakably declining among the cohorts of the early 1960s. Further, there was a pronounced fertility decline among cohorts that were in the middle or at the onset of their reproductive years, i.e. in the cohorts born during the 1970s. These developments point in the direction of a continued descent of

completed cohort fertility in eastern Europe in the foreseeable future. The TCFRs of the women born in the mid-1970s are likely to be about 1.5-1.6 births per woman or less. The summary of findings below corroborates this basic conclusion:

- Completed cohort fertility hardly changed from the cohorts of the late 1930s through those of the late 1950s in Bulgaria and Russia, and through the early 1950s in Romania, apparently due to offsetting pressures stimulating and depressing fertility;
- The balance of factors influencing fertility eroded during the 1980s and broke down in the 1990s. The breakdown of the equilibrium was reflected in the fertility trends of all cohorts born since the early 1960s. Estimates of TCFRs among the cohorts of the 1960s display a considerable decline;
- Large proportions of children were born by women when they were young. In the cohorts born in the mid-1960s 75 to 82 per cent of children were born to mothers before their 27$^{th}$ birthday;
- Cumulative cohort fertility rates by the 27$^{th}$ birthday were still relatively high among the cohorts of the early 1970s, about one child per woman, but these were declining at rapid rates from one cohort to the next;
- CCFRs of the youngest women before their 22$^{nd}$ birthday were the highest in our sample (except for the US), 0.4-0.5 births per woman in the 1975 cohort. They were, however, rapidly declining at annual rates of three to seven per cent;
- There were only weak and scant signs that women born during the late 1960s and the 1970s had a propensity for relatively high fertility when older and thus to bear children they had foregone earlier in life. Their fertility would have to be extraordinarily high when in their late 20s and 30s to catch up with completed fertility of older cohorts or to attain replacement fertility.
- The proportions of one-child families in the cohorts of the late 1950s and the 1960s were high and increasing, and proportions of zero parity women were increasing moderately.

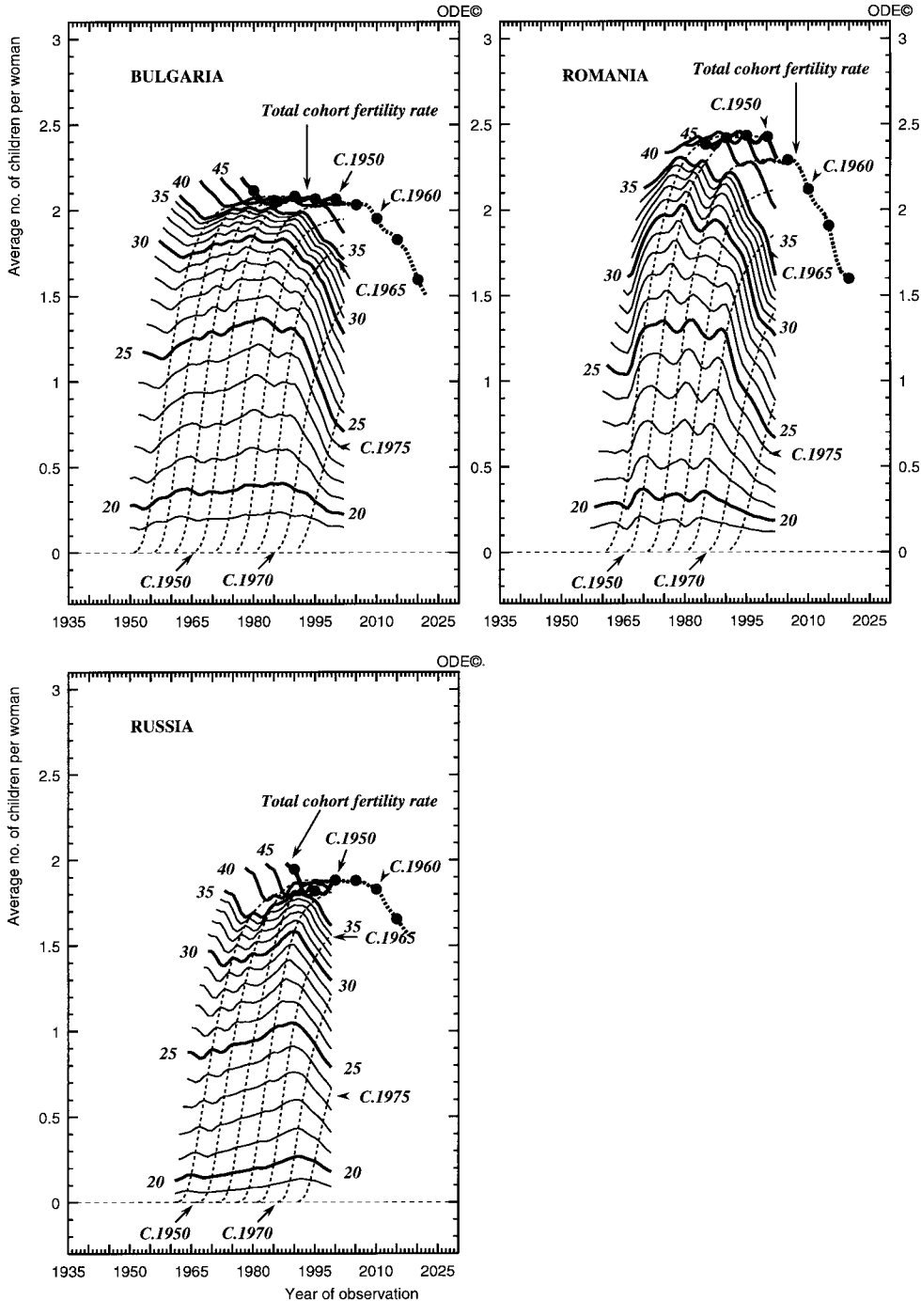
If the combination of patterns of early childbearing with declining fertility among young women in the cohorts at the onset or in the middle of their reproductive periods at the turn of the century in eastern Europe were to persist, which appears to be a likely scenario, completed fertility of these women will be around 1.5 births per woman or lower.

**Figure EE-1 EASTERN EUROPE, 1950-2000**
**Total period fertility rate and total cohort fertility rate lagged by the average age at childbearing**




*NOTE: Dotted lines indicate that a minor proportion of the respective TCFRs is based on estimates*

**Figure EE-2 EASTERN EUROPE**
**Cumulated cohort fertility at specified ages, birth cohorts 1935-1975**




*NOTE: The part of the TCFR line which is dotted indicates that a minor proportion of the TCFR is based on estimates*

**Figure EE-3 EASTERN EUROPE**
**Age-specific fertility rates, birth cohorts 1930, 1940, 1950 and 1960**

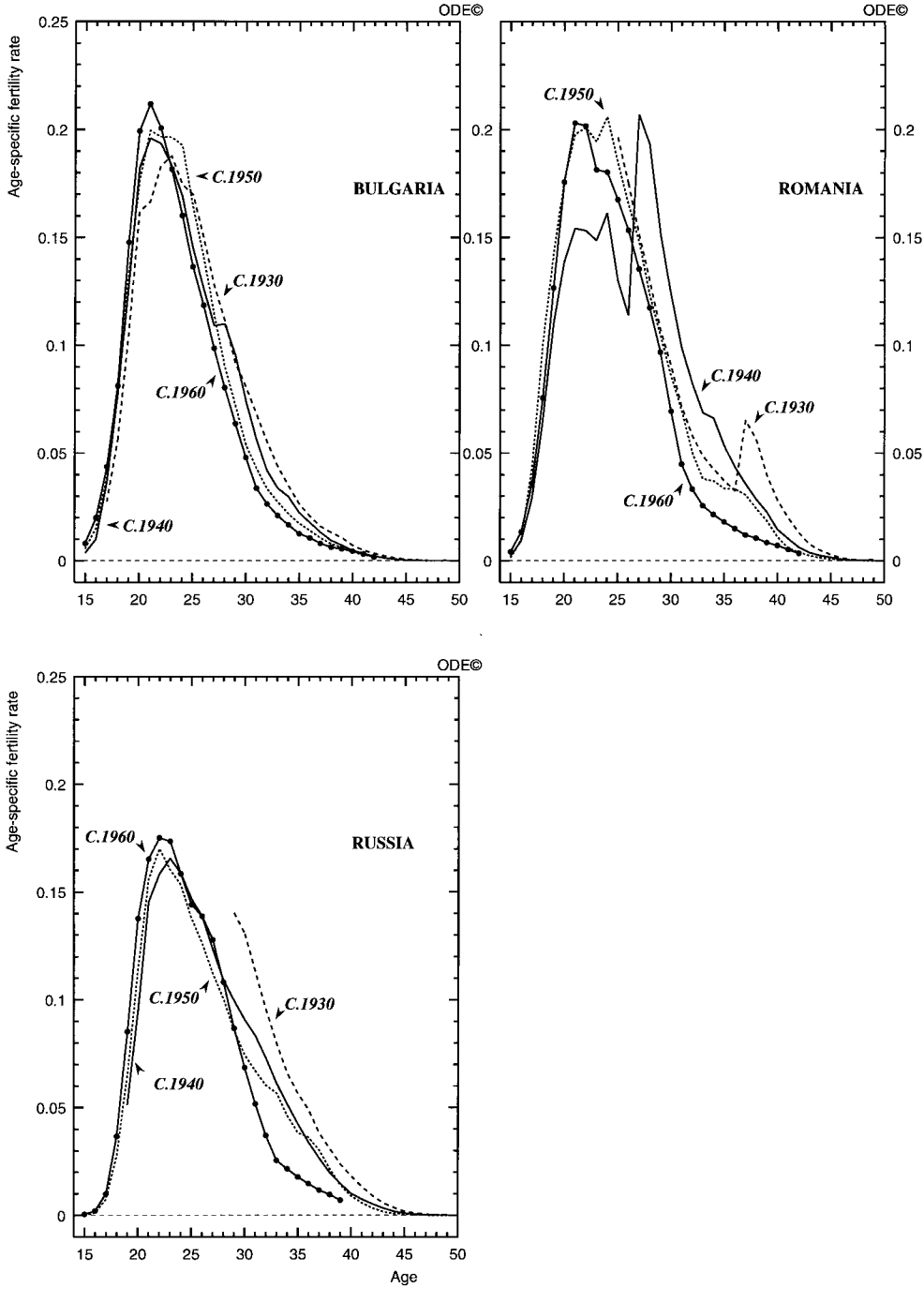
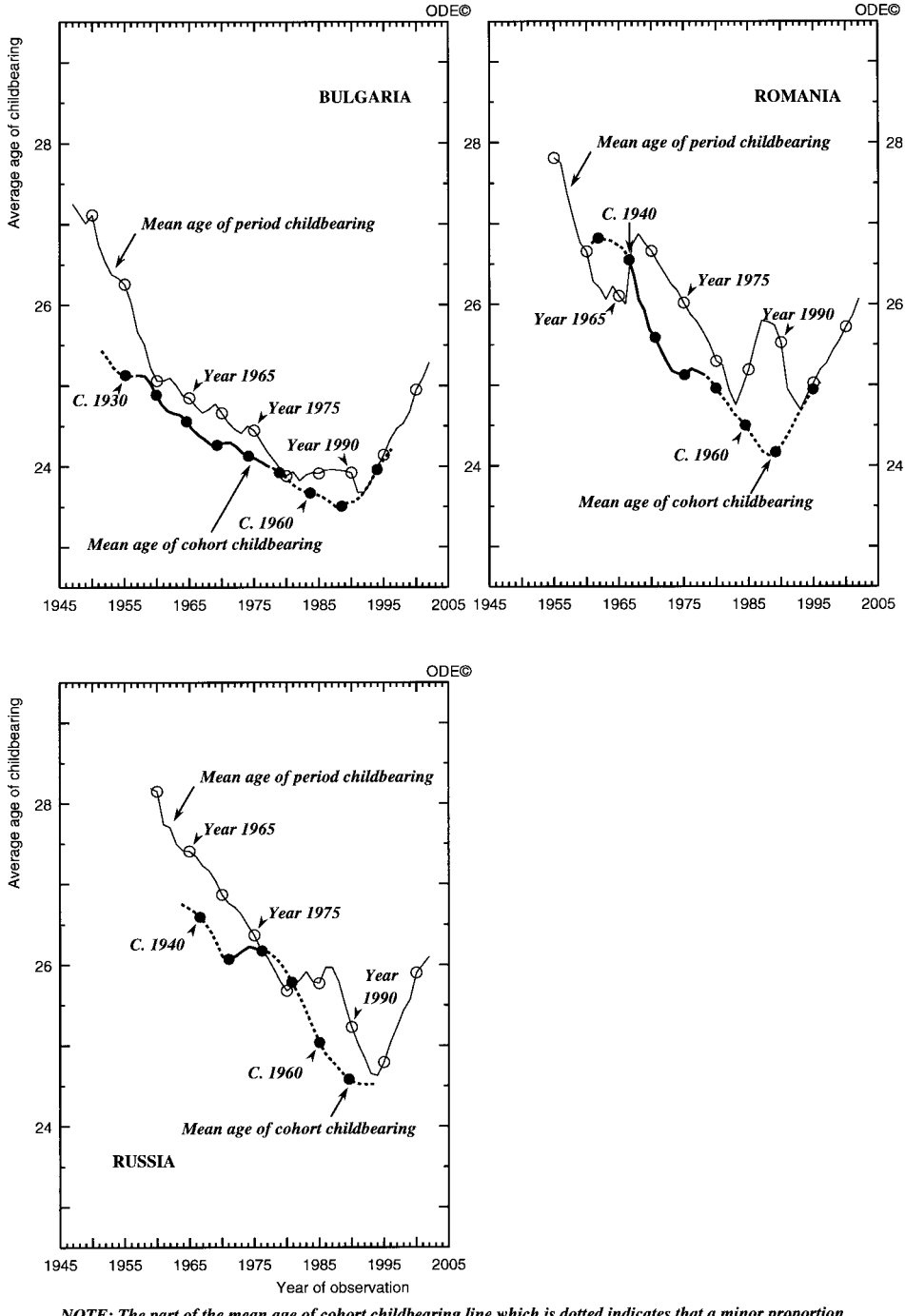


**Figure EE-4 EASTERN EUROPE, 1945-2000**
**Period average age of childbearing and cohort average age of childbearing lagged by the average age at childbearing**




*NOTE: The part of the mean age of cohort childbearing line which is dotted indicates that a minor proportion of the respective age-specific rates are based on estimates*

**Figure EE-5 EASTERN EUROPE**
**Age-specific fertility rates, birth cohorts 1960, 1965, 1970, 1975 and 1980**

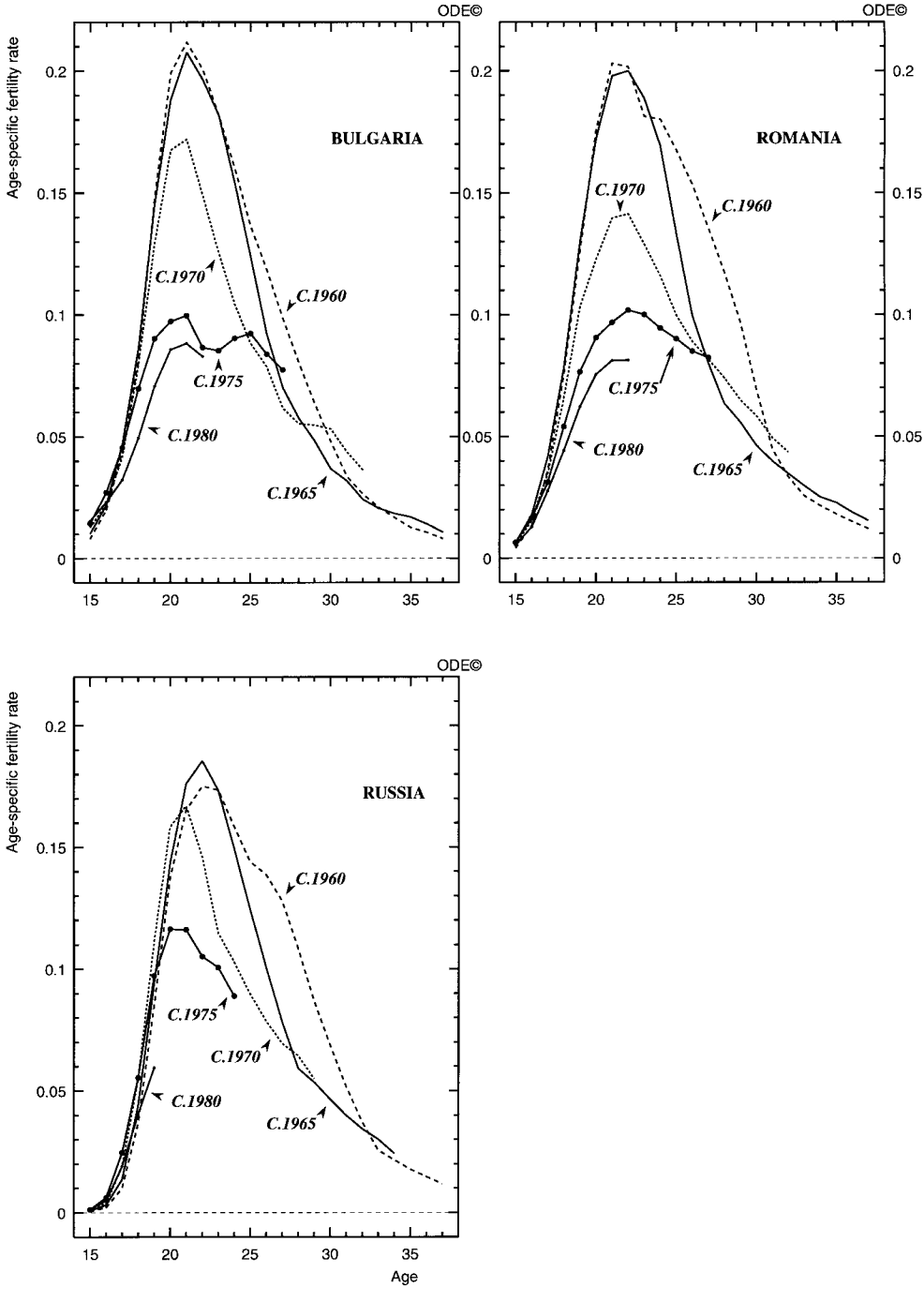


**Figure EE-6 EASTERN EUROPE**
**Differences in cumulative age-specific cohort fertility rates between base and subsequent cohorts, women born in 1950 (base), 1955, 1960, 1965, 1970, 1975 and 1980**

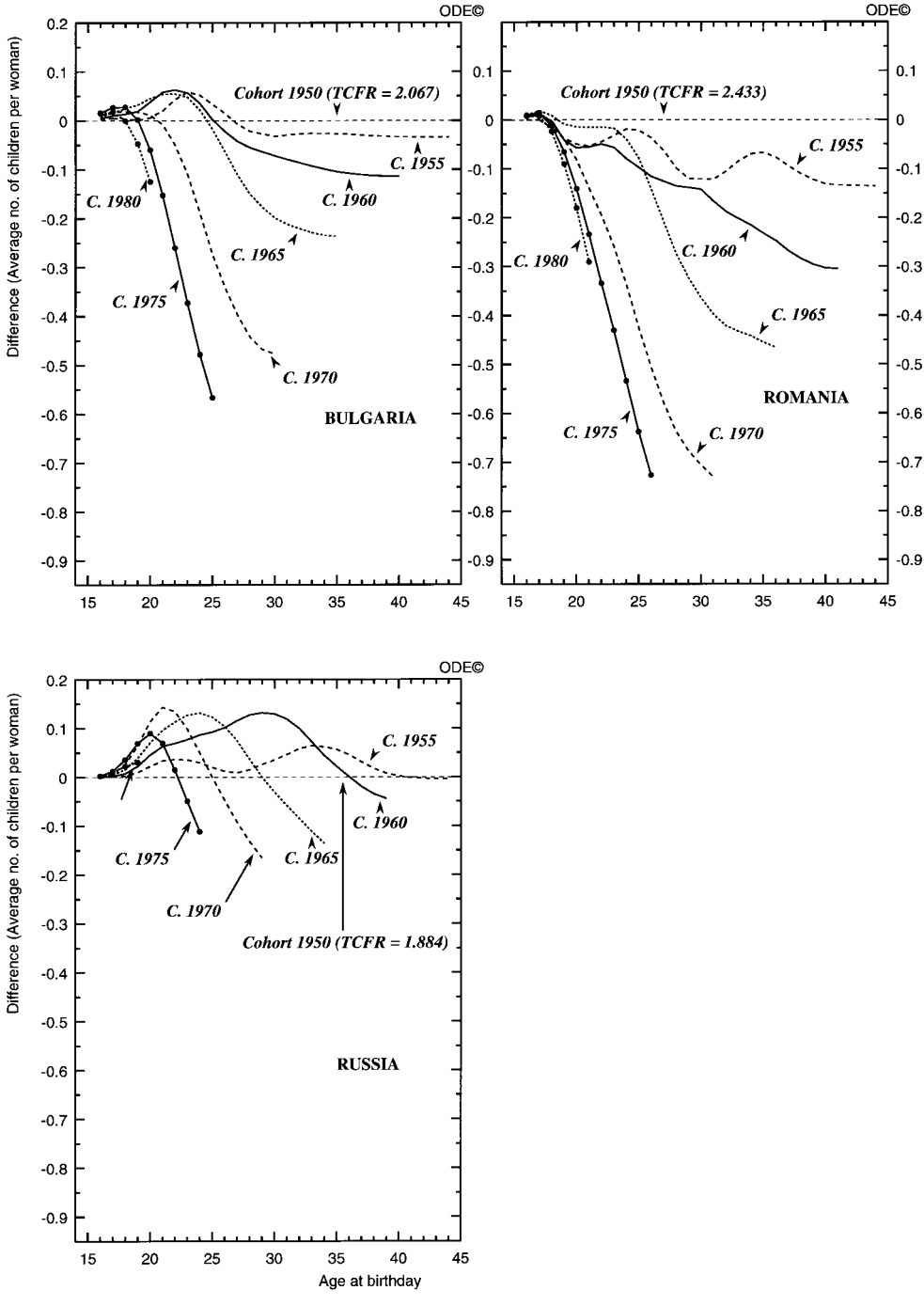


**Figure EE-7 EASTERN EUROPE**
**Total cohort fertility rates by biological birth order, birth cohorts 1928 to 1972**

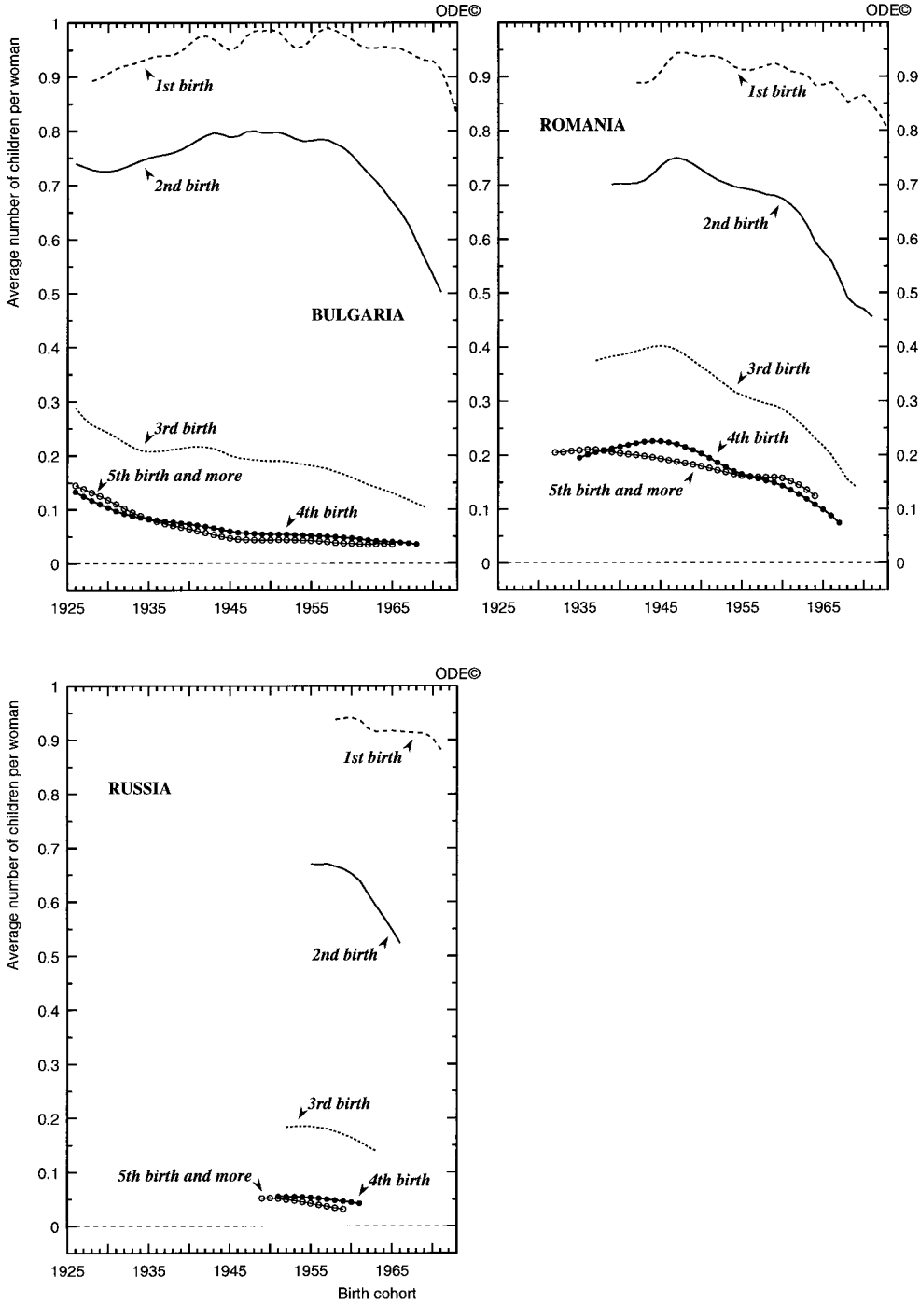


**Figure EE-8 EASTERN EUROPE**
**Parity progression ratios, birth cohorts 1928 to 1972**

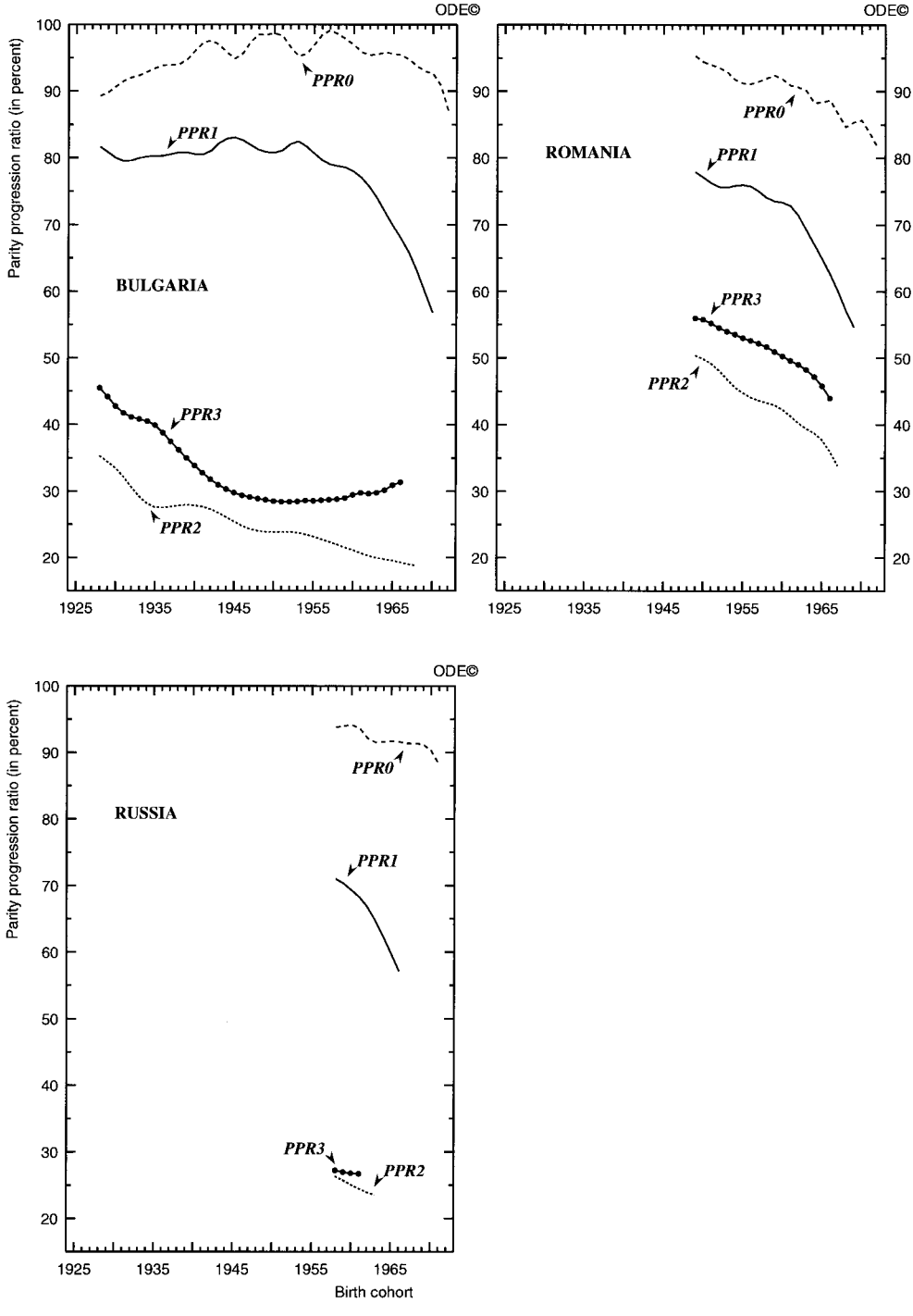


**Figure EE-9 EASTERN EUROPE**
**Parity distribution of completed fertility, birth cohorts 1926 to 1969 (in percent)**

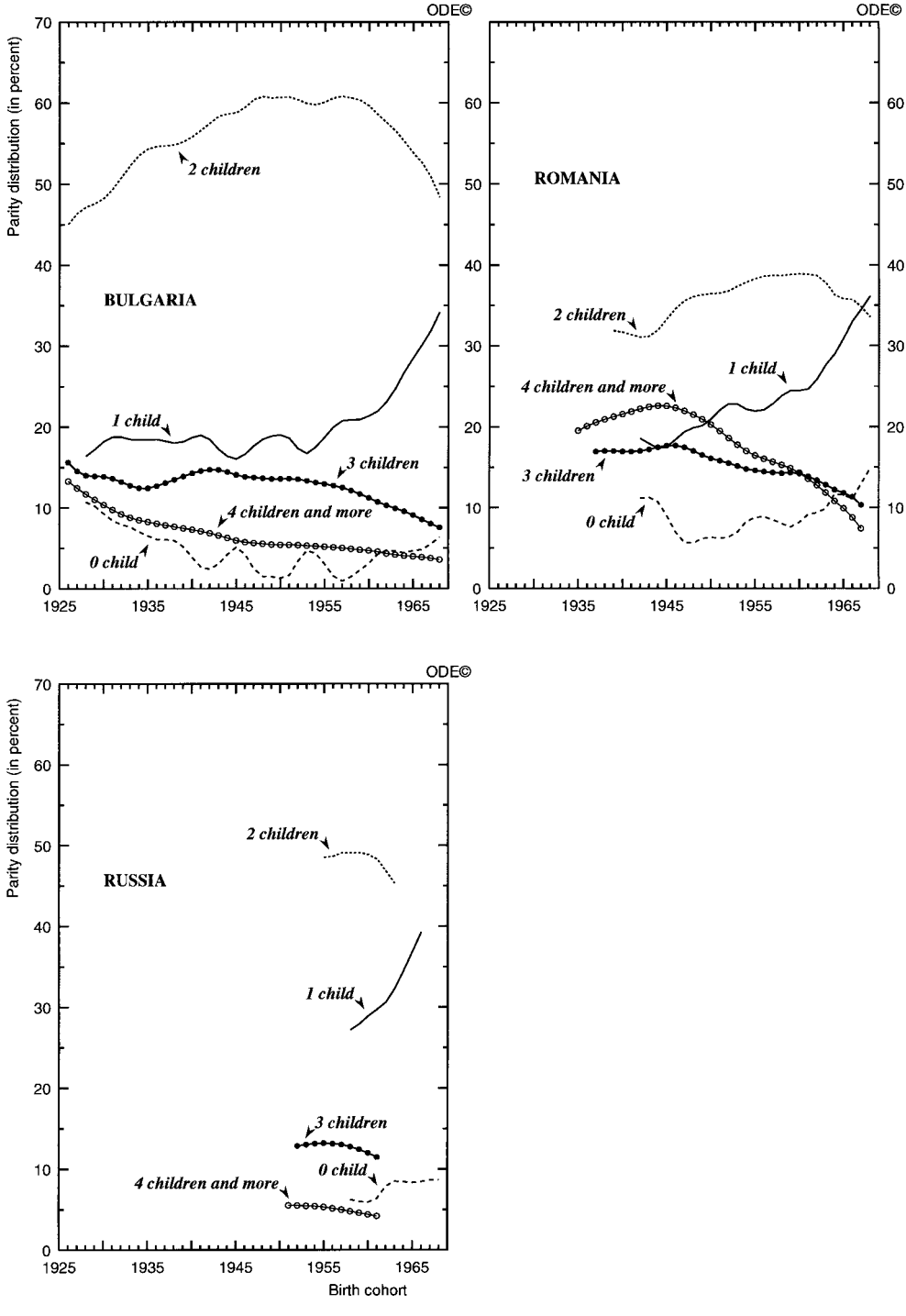
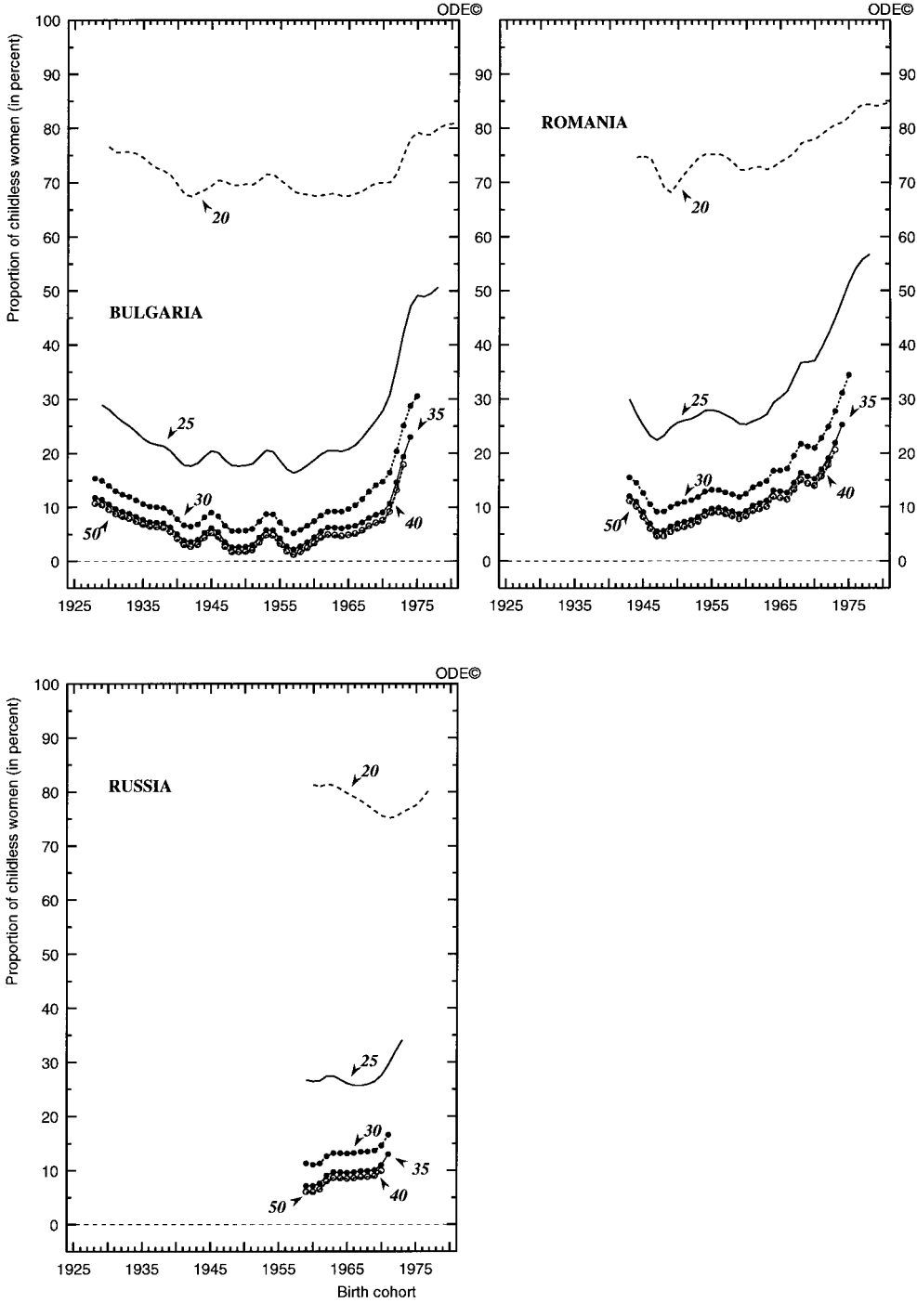


**Figure EE-10 EASTERN EUROPE**
**Proportions of childless women, selected ages, birth cohorts 1928 to 1980**



# 9. West Balkan region

This region, defined as the territory of the former Socialist Federal Republic of Yugoslavia, was a single political entity for most of the second half of the 20th century. At the same time, the region was, and continues to be, heterogeneous in terms of economic levels and trends, social institutions, religious beliefs and cultural background.

Five countries constitute the region: the Federal Republic of Yugoslavia, Croatia, Slovenia, Bosnia and Herzegovina and Macedonia. These are inhabited by the dominant nationalities together with significant minorities: Albanians, Hungarians, Turks, Slovaks, Romanians, Roms and Vlachs. Three major religions are present: Christian Orthodox, Catholics and Muslims. The region's past was marked as an area of contact between Christians and Muslims, European and middle eastern empires, most recently the Austro-Hungarian and the Ottoman empires. Consequently, its history was complex and differed from one country to the other. Also, its cultural diversity was greater than elsewhere.

Economic development was very unequal. By the end of the 20th century Slovenia was arguably at the high end of the spectrum[37] and economic conditions were the most difficult in Macedonia and Bosnia and Herzegovina where large proportions of the population were active in agriculture and unemployment rates were high.

With such a background it is understandable that after the end of Second World War there was a wide range of fertility levels within the region:[38]

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[37] In the year 2000 Slovenia had a per capita gross national income of $ 17,390 in purchasing power parity, Croatia $ 7,780 and Macedonia $ 4,960 (World Bank 2002). For the other countries data on income were not available.

[38] Ideally, a more detailed classification would be appropriate, especially for Yugoslavia because of the diverse fertility levels of its component populations. See discussion below in Section 9.5.

- Macedonia and Bosnia and Herzegovina, with a total period fertility rate (TPFR) of around 5.5 children per woman;
- Yugoslavia, its TPFR equal to 3.5;
- Croatia and Slovenia, with a TPFR under 3.0.

In the first group, the demographic transition was in its initial stages and the TPFR decreased quite evenly during the whole post-war period (Figure WBR-1). In this group, in the course of only 25-30 years, fertility came close to the level of the other countries where the demographic transition had been ongoing for a long time. In Yugoslavia fertility declined rapidly in the first half of the 1950s, from 3.5 in 1950 to 2.5 in 1957. Thereafter the decrease was very slow. Croatia and Slovenia[39] also experienced a considerable decline of the TPFR during the 1950s, essentially to replacement (Figure WBR-1).

Various facets of population-related policies were developed and implemented during the second half of the 20th century for the entire former Federation. They impacted on people's decisions regarding childbearing and birth-modifying behavior and were to some extent reflected in the country's demographic trends. Contrary to other countries of central and eastern Europe, however, pro-natalist and anti-natalist policies were perceived as undesirable intrusions on individual freedom of choice, so that the respective policies tended to be perceived and presented as social policies reflecting humanistic perspectives (Kapor-Stanulovic and David 1999). The Federal Government tended to decide on the general principles of a given policy and issues regarding family allowances, maternity leave, birth grants, induced abortions and contraceptives were usually left to the discretion of the constituent republics, autonomous provinces and local communities. A meaningful expression of this approach was the statement in the 1974 Federal Constitution —the first country in the world to do so— that "it is a human right to decide freely on childbirth."

In this spirit, a system of birth grants and family allowances for low-income families evolved together with universally free and accessible health care and a number of other measures. Relatively liberal induced abortion legislation to curb an estimated large number of harmful clandestine abortions was introduced as early as 1951. It was not until after 1960 —when the range of social conditions

[39] Slovenia seems to be part of another cultural group closer to central European countries, such as Austria with which, as indicated above, it shares quite a long history (Sardon 2001b).

justifying pregnancy termination was broadened— that induced abortions became more widely used. In Serbia, by 1968, there were more legally induced abortions than births. The ratio of live births to abortions increased to 1.3 by the late 1970s and remained at that level for over a decade. Such numbers were consistent with contraceptive practice based on *coitus interruptus* as the most widely used method (UN 2000). Modern methods of contraception became more readily available in the 1970s (Kapor-Stanulovic and David 1999), but were apparently used only by a minority of couples. Moreover, the relative cost of oral contraceptives and IUDs increased in the 1990s and withdrawal "remained the preferred method. It was considered natural, easy to use, and not injurious to health. Well-suited to a culture in which traditional beliefs and attitudes remained firmly interwoven, it supported the concept of an active male role and the passive-submissive role of the woman in intimate relationships" (Rasevic 1993, 1994 as cited in Kapor-Stanulovic and David 1999).

In this region, the fertility effects of the collapse of authoritarian regimes were not as prominent as in other former socialist countries (Sardon 2001c), presumably for two salient reasons. Power remained in the same hands and the economic system had been more open than elsewhere in central and eastern Europe. Thus, there was no increase in the rate of decline in the TPFRs during the 1990s. But the break-up of the former Yugoslavia was marked by a series of wars. In addition to the heavy loss of life, these conflicts caused massive population movements, voluntary and forced, the effects of which were still being felt at the turn of the century. The original significant heterogeneity of the population which was disappearing after the Second World War was further reduced as a result of wars and 'ethnic cleansing' carried out in the former Yugoslavia during the 1990s. Even so, the effects of war on fertility trends were not very strong, with the exception of Croatia where a temporary decline could be observed in 1991-1992.[40] In Yugoslavia the post-1991 wars and the economic blockade did not seem to have affected reproductive behavior, possibly because in this region any deterioration in economic conditions tends to be ameliorated by the support and cooperation provided within extended families.

A more detailed analysis of fertility in the individual countries follows.[41]

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[40] Information is not available for Bosnia and Herzegovina.

[41] Note that for all countries of former Yugoslavia the quality of data on birth orders is questionable. Frequently the published level of childlessness was too low and too close to the level of natural sterility, and the unusually wide fluctuations, especially in first order births and thus also in childlessness, are suspicious.

## 9.1 | Bosnia and Herzegovina

Shortly after the Second World War Bosnia and Herzegovina, like the other less developed European countries situated in the Balkan region, Albania and Macedonia, was still at the beginning of its demographic transition with a TPFR equal to 5.3 in 1952. Following a precipitous decrease to 3.9 in 1957, the TPFR declined rapidly to 1.9 in 1979 and then more slowly in the 1980s to reach 1.7 births per woman in 1990 (Figure WBR-1). Historically and in the recent past Bosnia and Herzegovina was one of the countries with the highest fertility in the region. At the end of the 20th century, however, its TPFRs were probably no higher than in neighboring countries, between 1.6 to 1.7 in the years 1996-1998 and around 1.3-1.4 in 2000. The recent data are estimates, because, unfortunately, no firm data have been available since 1990 due to the war. Demographic events were being registered by the civil registration system, and published for the whole country (Republica Srpska and the Croato-Muslim Federation) with the help of the European Union, by the Agency for Statistics of Bosnia and Herzegovina, but no estimate of the base population has been available since the war. A new census is one of the first requirements, but none has been planned as of the fall of 2002 because of political concerns.

Cohort fertility can be estimated starting with women born at the end of the 1920s. Estimated completed fertility for cohorts born through the mid-1930s was above three births per woman, it was declining rapidly from 3.6 for the 1930 birth cohort to 2.4 in the 1944 birth cohort. The descent was less pronounced among the cohorts of the 1950s, nevertheless the TCFR was under replacement and estimated at around 1.9 for the cohorts of the late 1950s (Figures WBR-1 and WBR-2).

The continuous fertility decline was accompanied by changes in the age patterns of cohort fertility (Figure WBR-3). These changes were typical of a population experiencing a rapid fertility transition.

In the cohorts of the 1930s and the 1940s childbearing of young women under the age of 22 was increasing, i.e. these women were bearing children somewhat earlier than previous generations. More importantly, there was a significant fertility decline among the cohorts of the 1930s and 1940s after 22 at all ages. The rate of decline was increasing with age. Comparing the 1940 with the 1930 cohort, fertility of women 22-29 years was lower by up to 30 per cent, among women in their 30s fertility was 30 to 60 per cent lower, and among women in

their 40s fertility was up to 80 per cent lower. The differences were of a similar nature among the cohorts of the 1940s (Figures WBR-2 and WBR-3 and Table BH-1) Correspondingly, the mean age of childbearing declined from 27.9 in the 1930 birth cohort to 25.6 in the cohorts of the late 1940s (Figure WBR-4). There was also a decline in the peak of childbearing from age 24 in the 1930 cohort to age 22 in women born in 1950.

Among the cohorts of the 1950s, fertility was declining at all ages for which data were known, i. e. up to age 30 in the 1960 birth cohort. The highest rates of decline were between the ages of 18 and 22, and the peak of childbearing was at ages 22 to 23. The general fertility decline and the decrease of age specific fertility rates up to age 25 were continuing among the cohorts of the mid-1960s (Figures WBR-5, WBR-6 and Table BH-2). By age 25, the 1965 cohort had 0.11 children less than the 1960 cohort. For the youngest cohort observed — women born in 1970— fertility under age 20 increased marginally, a sign that fertility might have ceased to decrease at young ages.

*Table BH-1. Fertility deficits and surpluses comparing birth cohorts, Bosnia and Herzegovina, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 22-49 | -0.891 | 22-49[b] | -0.632 | 15-30 | -0.248 |
| Surplus | 15-21[a] | +0.047 | 15-21 | +0.055 | 31-49[c] | n.a. |
| Total | | -0.844 | | -0.577 | | n.a. |

Notes: [a] Includes estimated data for ages 15-19 of 1930 cohort the total of which was 3.1 per cent of TCFR.
[b] Includes estimated data for ages 41-49 of 1950 cohort the total of which was 0.9 per cent of TCFR.
[c] Data for 1960 cohort not available.

*Table BH-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Bosnia and Herzegovina, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility of birth cohort | | | Change of CCFR compared to cohort ten years older (in per cent) | | |
|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1960 | 1965 | 1970 |
| 35 | … | … | … | … | … | … |
| 30 | 1.500 | … | … | -14 | … | … |
| 25 | 0.944 | 0.835 | … | -17 | -14 | … |
| 20 | 0.196 | 0.180 | 0.186 | -24 | -24 | -5 |

Unfortunately, no data were available for the cohorts which were at the onset or in the middle of their childbearing during the 1990s, those born during the 1970s.

Throughout the observed cohorts, the TCFRs of all birth orders were descending and the higher the birth order the greater the decline (Figure WBR-7). In the cohorts born around 1930 more than ten per cent of women had no children and nearly one half had at least a fourth birth. In the cohorts of the 1950s childlessness reached nearly 20 per cent while the proportion of women with a fourth birth dropped to ten per cent (Figure WBR-7). Parity progression to the first and second order births did not indicate further declines among the cohorts of the 1950s (Figure WBR-8), but the devastating political developments of the 1990s make any speculations about future change precarious. Parity progression ratios to higher order births were declining for all the observed cohorts and that trend was likely to continue.

Parity distributions changed markedly over all the observed cohorts. In the cohorts of the late 1920s, more than half of all families had four or more children; the proportion of such large families was less than ten per cent in the cohorts of the mid-1950s (Figure WBR-9). The proportions of women of all parities below four children increased during the whole post-war period. The proportion of women with two children increased from 15 per cent in the 1930 cohort to 45 per cent in the 1955 one and the two-child family became the norm. Also the proportions of women with a single child as well as childless women increased. The proportion of women with three children was decreasing moderately among women born in the 1950s.

Childlessness was increasing among the cohorts of the 1950s and reached 15 to 20 per cent (Figure WBR-10). The childbearing behavior of young women in the cohorts of the 1960s, however, did not indicate that further increases would be imminent.

## 9.2 | Croatia

After the Second World War, in Croatia similarly as in Slovenia, the fertility transition had been in progress for many years. The TPFR was at 2.9 children per woman in 1950. It declined below the replacement level in the first half of the 1960s and reached around 1.9 in 1970. This level was retained for over a

decade and a moderate descent was resumed in the second half of the 1980s. The war with the Yugoslav army in 1991-1992 precipitated a decline in fertility. It was only after Croatia recovered all its territory in 1995 that fertility increased temporarily, however, the magnitude of this recovery was apparently overestimated.[42] By 2000 the TPFR was at 1.4 births per woman.

Estimates of completed cohort fertility are available starting with women born in 1929. In this cohort completed fertility was already very low at 2.18 children per woman and, taking into consideration the level of mortality, was under the replacement threshold. A moderate decline among the cohorts of the early 1930s resulted in a TCFR under 2.0 in the 1936 birth cohort followed by a further descent to 1.8 around the 1945 cohort. Thereafter, completed fertility was quite stable, fluctuating between 1.8 and 2.0 (Figures WBR-1 and WBR-2). A closer scrutiny reveals an increase among the cohorts of the 1950s and a renewed moderate decline of the TCFRs among the cohorts of the 1960s. The estimated 1967 TCFR was 1.8 births per woman.

The relatively stable level of completed fertility from cohorts born in the early 1930s through those born around 1960 goes hand-in-hand with very few changes in the age patterns of life-time fertility. The most notable change was the reduction of fertility after 22 years of age and the shift to earlier ages of the peak of childbearing between the 1930 and the 1940 cohorts (Figure WBR-3 and Table CR-1). The age distribution of fertility rates was similar for women born in 1940, 1950 and 1960. Also the mean age of cohort childbearing was quite stable at around 26 years of age (Figure WBR-4). Nevertheless, in the 1960 cohort, there was a small change after age 30. Fertility, which had been declining from one cohort to the next, increased although no birth delays were evident when these women were young. Part of the increase, especially at ages 36 and 37, was due to the change in the definition of the reference population.

The breakdown of the former Yugoslavia affected the fertility behavior of Croatian women, especially those that were in the early stages of their childbearing.

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[42] In 1996 the reference population was converted from *de jure* to *de facto* without a corresponding change for the population in which births were registered. Thus a major part of the fertility increase in 1996-1997 could have been the result of the lag between these two changes.

*Table CR-1. Fertility deficits and surpluses comparing birth cohorts, Croatia, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 23-49 | -0.230 | 21-49 | -0.149 | 17-19 | -0.016 |
| | | | | | 29-32 | -0.011 |
| Surplus | 15-22[a] | +0.031 | 15-20 | +0.053 | 15-16 | +0.003 |
| | | | | | 20-28 | +0.070 |
| | | | | | 33-49[b] | +0.070 |
| Total | | -0.199 | | -0.096 | | +0.116 |

Notes: [a] Includes estimated data for ages 15-19 of 1930 cohort the total of which was 6.2 per cent of TCFR.
[b] Includes estimated data for ages 40-49 of 1960 cohort the total of which was 1.6 per cent of TCFR.

Note that the fertility age pattern of women born in 1965 was already lower than that of the 1960 cohort, even though these women were in the middle of their childbearing during the 1980s. These women also displayed a tendency towards delaying births. When they were in their early 30s their fertility was substantially higher than that of the 1960 cohort (Figure WBR-5).

It was, however, the fertility patterns of the cohorts born around 1970 and later that were conspicuously different from the older cohorts. Age-specific fertility rates between the ages of 21 and 24 were 25 to 35 per cent lower in the 1970 compared to the 1965 cohort (Figures WBR-5 and WBR-6). By age 26, women born in 1970 had had 0.4 fewer children than the cohort born ten years earlier (Table CR-2). By age 21, the fertility reduction between the 1965 and 1975 cohorts was even greater; it was almost cut in half.

*Table CR-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Croatia, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 36 | 1.861 | … | … | … | -1 | … | … | … |
| 31 | 1.643 | 1.497 | … | … | -9 | -15 | … | … |
| 26 | 1.168 | 1.029 | 0.781 | … | -23 | -35 | -38 | … |
| 21 | 0.383 | 0.317 | 0.252 | 0.176 | -2 | -22 | -34 | -44 |

During the whole observation period, the decline in total cohort fertility rates for birth orders higher or equal to three was offset by an increase in the two first birth orders. As the proportion of women with first births gradually increased from 87 per cent for women born during the 1930s to 93 per cent for those born in the 1960s its complement, childlessness, declined from around 13 to 7 per cent (Figure WBR-7).

The parity progression ratio to the second birth order, PPR1, was stable for the 1930s cohorts and the parity progression ratios to third and fourth order births were declining steadily from almost 50 to 25 per cent (Figure WBR-8). The combination of these trends with an increase in first order births resulted in a rapid increase of the two-child family, from less than a third in the cohorts of the late 1920s to more than a half of the total among women born in the mid-1950s (Figure WBR-9).

Childlessness was relatively low for all the observed cohorts with values around ten per cent among the cohorts born around 1960. Any observation regarding possible future developments in its trend is, of course, unreliable, but given the behavior of the younger cohorts, those born in the late 1960s, an appreciable increase does not appear likely (Figure WBR-10).

## 9.3 | Macedonia

After the Second World War, Macedonia was the country of the West Balkan Region with the highest level of fertility. In 1950, the total period fertility rate was 5.8 births per woman. Less developed than other parts of the region, Macedonia was only at the beginning of its fertility transition. Subsequently, during the 1950s and 1960s, fertility declined rapidly and the TPFR in 1970 was just below 3.0 births per woman. In the following 20 years the fertility decline continued at a more moderate pace to reach the replacement level at the very end of the 1980s.

After Macedonia attained independence and following the breakdown of former Yugoslavia, the TPFR increased temporarily during the early 1990s. The peak value of the TPFR, 2.2 in 1994, was affected by a change of the reference population from *de jure* to *de facto* without a corresponding change in the population among which demographic events were recorded (Figure WBR-1).

In the late 1990s the TPFR was fluctuating between 1.8 and 1.9 children per woman.

Completed fertility was estimated as 3.9 births per woman for the 1928 cohort. The TCFR then declined rapidly among the following 20 cohorts and was 2.4 in the 1950 birth cohort. Among the cohorts of the 1950s completed fertility was stable around 2.3 (Figures WBR-1 and WBR-2). A moderate decline of fertility could be observed among the cohorts born in the 1960s; the estimated TCFR for women born in 1969 was 2.1 births per woman.

Some of the changes in the age patterns of cohort fertility were unusual. Among all the cohorts up to the one of 1960 there was almost no change in fertility below 21 years of age. There was even a slight increase among the youngest women (Figure WBR-3 and Table MK-1). The fertility decline from the 1930 to the 1950 cohort was entirely due to changes in the childbearing patterns of women aged 22 and over. Women of the 1950 birth cohort above 22 years had 1.4 fewer children than women in the 1930 cohort. The shape of the fertility curve was flattened and the peak declined by one-third between the 1930 and 1950 cohorts (Figure WBR-3). Fertility remained stable among the cohorts of the 1950s and the lifetime patterns of childbearing hardly changed.

The fertility peak shifted from age 25 in the 1930 and 1940 cohorts to 24 in the 1950 and 23 in the 1960 cohort. The mean age of childbearing declined from 27.6 in the 1930 to 25.5 in the 1960 cohort (Figure WBR-4).

Fertility behavior of the cohorts born in the 1960s indicated that a further moderate fertility decline was under way (Figures WBR-5 and WBR-6 and Table MK-2). The fertility decline was even more pronounced among the cohorts born in the 1970s. The cumulated fertility rate of the 1975 cohort by age 25 was 16 per cent lower than that of the 1965 one. It was the women born in 1980 that introduced the most important change. The fertility level, which had been very stable for the youngest ages over nearly 50 cohorts, began to decline from age 17. At age 20, the cumulated fertility of the 1980 cohort was 30 per cent lower than in the cohort born ten years earlier (Figure WBR-5, WBR-6 and Table MK-2). This fertility reduction at young ages could be a sign of the delay in births until later in the reproductive period in this country.

*Table MK-1 Fertility deficits and surpluses comparing birth cohorts, Macedonia, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 22-49 | -0.726 | 21-49 | -0.733 | 24-49[b] | -0.102 |
| Surplus | 15-21[a] | +0.035 | 15-20 | +0.018 | 15-23 | +0.050 |
| Total | | -0.691 | | -0.715 | | -0.052 |

Notes: [a] Includes estimated data for ages 15-19 of 1930 cohort the total of which was 2.9 per cent of TCFR.

[b] Includes estimated data for ages 41-49 of 1960 cohort the total of which was 0.9 per cent of TCFR.

*Table MK-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Macedonia, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 2.184 | 2.089 | 1.975 | … | … | -2 | 17 | -10 | … | … |
| 30 | 1.886 | 1.794 | 1.688 | … | … | -1 | 12 | -10 | … | … |
| 25 | 1.178 | 1.101 | 1.041 | 0.923 | … | 4 | 0 | -12 | -16 | … |
| 20 | 0.250 | 0.241 | 0.231 | 0.226 | 0.161 | 14 | -4 | -7 | -6 | -30 |

In all the observed cohorts almost all women had a first birth. In Macedonia, as in other countries of former Yugoslavia, these data were not very reliable. In general, TCFRs declined appreciably for all birth orders (Figure WBR-7). For instance, in the cohorts of the late 1920s over 75 per cent of all women had a third order birth, whereas in the cohorts of the mid-1960s this was below 30 per cent. Less and less women opted to have a large family and the most important change occurred among women born in the 1930s and 1940s. Nevertheless, parity progression ratios for third and fourth order births were relatively high, over 30 per cent among the cohorts of the early 1960s (Figure WBR-8).

The two child family became the most prevalent with over 50 per cent of families being of that size among the cohorts of the 1960s, and the one-child family was still less frequent than the three-child family (Figure WBR-9). The proportion of childless women was unrealistically low for a number of cohorts of the 1930s and 1940s. It appeared to be stable among the cohorts of the 1960s around six to seven per cent (Figure WBR-10).

## 9.4 | Slovenia

Slovenia experienced its fertility transition during the first several decades of the 20th century. In the early 1920s its crude birth rate (CBR) was around 30 per thousand (State Statistical Office 2000). It then declined steadily to reach 22 per thousand in the late 1930s. The Second World War affected fertility profoundly so that in 1945 the CBR stood at 14 per thousand. A brief post-war recovery followed and by 1950 a CBR of 24.5 was reached, which corresponded to a total period fertility rate of 3.0 (Figure WBR-1).

In the 1950s, the TPFR decreased rapidly, losing 0.8 births between 1950 and 1958. During the first half of the 1960s it then increased temporarily from 2.2 in 1960 to 2.5 in 1966. Thereafter, in the space of three years, fertility reverted to its previous level and remained stable between 2.1 and 2.2 until the end of the 1970s, which marked the beginning of the most recent decline, namely, since 1979, the TPFR declined from 2.2 to 1.2-1.3 between 1992 and 2000, the lowest level in this region (Figure WBR-1).

Women born in 1929 had an estimated total cohort fertility rate of 2.1 births per woman which, taking into account the mortality level, was below the replacement level. Starting with the birth cohorts of the mid-1930s through those of the late 1950s, cohort fertility fluctuated around 1.9 births per woman. In the subsequent cohorts of the 1960s a moderate decline could be detected. The TCFRs of women born in the mid-1960s were around 1.7 births per woman (Figures WBR-1 and WBR-2), and, as will be analyzed below, it does not appear likely that cohort fertility will stabilize in the near future.

Even though completed fertility was rather stable among cohorts born in 1930 through 1960, the age patterns of fertility were changing (Figure WBR-3 and Table SV-1). Women had children at increasingly younger ages and fertility of women, at first from their late 20s and later even from their mid-20s, was declining. The fertility peak shifted from age 25 in the 1930 cohort to ages 21-22 in the 1960 cohort and the average age at childbearing declined by three years between the 1930 and 1957 cohorts, from 27.7 to 24.7 (Figure WBR-4). Teenage fertility increased considerably, especially for women born during the 1940s and 1950s. In short, Slovenia experienced an advancement of fertility over a span of 30 cohorts.

*Table SV-1. Fertility deficits and surpluses comparing birth cohorts, Slovenia, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 27-49 | -0.208 | 24-49 | -0.269 | 22-33 | -0.137 |
| Surplus | 15-26[a] | +0.112 | 15-23 | +0.158 | 15-21 | +0.106 |
| | | | | | 34-49[b] | +0.009 |
| Total | | -0.096 | | -0.111 | | -0.023 |

Notes: [a] Includes estimated data for ages 15-19 of 1930 cohort the total of which was 4.0 per cent of TCFR.
[b] Includes estimated data for ages 41-49 of 1960 cohort the total of which was 0.7 per cent of TCFR.

Such changes in the lifetime strategies of childbearing were unique. No other population, not only in this region, but among all the countries under study, experienced this type of fertility age pattern transformation. An investigation of the causes why this occurred could be useful.

Women born during the 1960s, even those born in the late 1950s, gradually adopted a new childbearing pattern. They discontinued the rejuvenation trend and started to delay births to older ages (Figure WBR-5). The postponement was evident in the 1965 cohort. After age 29, women gave birth to some of the children that had been delayed and age specific fertility rates were higher than those observed in the 1960 cohort. The propensity to postpone births was similarly apparent in the 1970 birth cohort. Among the cohorts born during the 1970s the pronounced decline of fertility at young ages was continuing. By age 25 the cumulated cohort fertility rate of women born in 1975 was lower by almost 0.7 births than that of the 1960 cohort. Thus far data indicate that only a small proportion of the delayed births are born later in the reproductive period. According to our estimates for the 1965 cohort only 37 per cent of the births delayed before age 27 were born later and the TCFR of these women will most likely be 1.8 births per woman. By the year 2000, cumulated fertility of each successive birth cohort of the late 1960s and the 1970s was distinctly lower than the previous one. Since only small proportions of delayed births were being born later, fertility is likely to remain low, well below replacement (Figure WBR-6 and Table SV-2). In sum, starting with the cohorts around 1960 the process of delaying childbearing was coupled with a fertility decline.

*Table SV-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Slovenia, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.777 | 1.646 | … | … | … | -2 | -12 | … | … | … |
| 30 | 1.571 | 1.386 | 1.157 | … | … | 0 | -17 | -26 | … | … |
| 25 | 1.080 | 0.904 | 0.652 | 0.425 | … | 8 | -22 | -40 | -53 | … |
| 20 | 0.294 | 0.218 | 0.145 | 0.077 | 0.039 | 39 | -21 | -51 | -65 | -73 |

It is obvious that data on birth order are not entirely reliable, as the apparent under-estimation of childlessness, especially in the cohorts of the 1950s, shows (Figures WBR-7 and WBR-8). Nevertheless, in all likelihood the trends of the time series and the orders of magnitude provide plausible information. No doubt there was a further decline of the already low levels of fourth and higher order births, which all but disappeared in the cohorts of the late 1950s (Figure WBR-7). It also appears credible that first and second order births were declining among the cohorts of the late 1950s and the 1960s.

The two-child family was the most frequent family size among all the observed cohorts. Its proportion of the total was increasing and reached 57 per cent in the 1955 cohort. Since then it has been declining mainly being replaced by women/couples who are not having any children (Figure WBR-9). The proportion of women without any children has been increasing rapidly among women born in the late 1950s and in the 1960s (Figure WBR-10). It was estimated that around one fifth of women born in the mid-1960s will remain childless. Judging by the trends among younger women, childlessness is likely to increase further in the foreseeable future.

## 9.5 | Yugoslavia[43]

Despite its turbulent and idiosyncratic history —long-term and recent— and despite its social, economic, cultural, ethnic and religious heterogeneity, most demographic and related trends have been smoother and subject to less variation

[43] The analysis in this section deals with the population of the Federal Republic of Yugoslavia (FRY) as it emerged following the crises of 1991 and 1992. It is comprised of Montenegro and Serbia, including the two autonomous regions Vojvodina and Kosovo-Metohija.

than in most other central and East European countries during the past four to five decades. There is no question that there have been major distinctions in the demographic profiles and behavior of different populations forming part of the FRY, the extremes being Vojvodina and Kosovo-Metohija.[44] This diversity has persisted into the late 1990s and is concealed in the data for the whole population. An examination of the overall data is nevertheless useful and provides a relevant picture of trends and issues.

There is a scarcity of data regarding the fertility transition during the first half of the 20th century of the population incorporated in the FRY as of the 1990s. Those that are available indicate that the transition did not get started until the first decades of the 20th century (Chesnais 1992). Following the Second World War, the total period fertility rate was above 3.5 births per woman and declined rapidly during the 1950s. It reached around 2.5 in 1957 and remained at that level for approximately a decade (Figure WBR-1). Since the mid-1960s, the TPFR has been declining almost imperceptibly, reaching replacement level fertility in the 1980s. Since the end of the 1980s the registered TPFR decreased more rapidly and was at 1.6-1.7 births per woman in 1998-2000. This recent trend was due almost exclusively to an apparent decline in Kosovo. The real dimensions of the fertility decline in Kosovo are not known. It began with the deterioration of relationships between Serb and Albanian communities and the end of autonomy of this province. With the eviction of all Kosovars of Albanian origin from the State administration and the advent of a new hidden social life, people no longer declared all demographic events to the civilian (Serbian) authorities. There is, therefore, an unquestionable under-estimation of demographic indicators.

After declining to 2.3 births per woman for the generations born in the mid-1930s, the total cohort fertility rate stabilized within a narrow range of between 2.2 and 2.4 for almost 30 birth cohorts (Figures WBR-1 and WBR-2). Among the cohorts born in the 1960s fertility started to decline. The TCFRs in the mid-1960s were estimated at around 2.1 births per woman.

Contrary to almost all other countries, there were only minor changes in the childbearing age patterns of the cohorts from the early 1930s to the early 1960s (Figures WBR-2 and WBR-3 and Table YU-1). The only exception was the

[44] There is reason to believe that the general fertility trends in Vojvodina were similar to those of Croatia and Slovenia, whereas the fertility trends in Kosovo were more like those observed in Macedonia and Bosnia and Herzegovina.

fertility decline at the peak ages between the 1930 and the 1940 cohorts. The stability of the fertility age patterns is reflected in the average age of childbearing which hardly changed and remained within a narrow range of 25.7 to 26.4 years for all the observed cohorts (Figure WBR-4).

It was in the cohorts which in the late 1990s were in the middle or at the onset of their childbearing that fertility patterns started to change perceptibly (Figures WBR-5 and WBR-6 and Table YU-2). Each successive generation had lower fertility at comparable ages. As a result cumulated cohort fertility rates (CCFRs) were lower than for older birth cohorts.[45] By age 25, for instance, the CCFR for women born in 1975 was 29 per cent below the 1965 cohort. Among the cohorts of the 1960s there appeared to be a very moderate propensity to postpone births. The age specific fertility rates after age 30 for the 1965 cohort were equal to the 1960 cohort although fertility under age 30 was lower (Figure WBR-5). It is premature to make any judgments regarding birth postponement for the younger cohorts.

Similarly as in the other countries that emerged from the former Socialist Federal Republic of Yugoslavia, data on fertility by birth order, especially childlessness, are not entirely reliable. Analogously to the other countries we assume that the trends and orders of magnitude are credible. In general, the total cohort fertility rates by biological birth order were rather stable for the forty

*Table YU-1. Fertility deficits and surpluses comparing birth cohorts, Yugoslavia, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 22-33 | -0.152 | 20-49 | -0.149 | 17-22 | -0.074 |
| | 38-49 | -0.014 | | | 37-49 | -0.006 |
| Surplus | 15-21 | +0.035 | 15-19 | +0.053 | 15-16 | +0.005 |
| | 34-37 | +0.007 | | | 23-36 | +0.074 |
| Total | | -0.124 | | -0.096 | | -0.001 |

Notes: [a] Includes estimated data for ages 15-19 of 1930 cohort the total of which was 7.0 per cent of TCFR.

[b] Includes estimated data for ages 40-49 of 1960 cohort the total of which was 0.9 per cent of TCFR.

[45] The extent to which these developments were fictitious due to the under-registration of births in Kosovo is unknown.

*Table YU-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Yugoslavia, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 2.130 | 1.985 | … | … | … | 0 | -6 | … | … | … |
| 30 | 1.799 | 1.659 | 1.471 | … | … | 0 | -8 | -18 | … | … |
| 25 | 1.115 | 1.031 | 0.904 | 0.735 | … | -4 | -10 | -19 | -29 | … |
| 20 | 0.281 | 0.246 | 0.226 | 0.176 | 0.132 | -14 | -19 | -20 | -29 | -42 |

cohorts observed, except for fifth order births and above, which declined among women born after the Second World War (Figure WBR-7). Also, a moderate decline of first and second order births began among the cohorts of the 1960s.

The probability of having a fourth birth was decreasing in the cohorts born after 1945, but it was somewhat compensated for by a slight increase in the parity progression ratio to the third birth, PPR2, in the cohorts of the 1960s (Figure WBR-8).

The two-child family became the norm. More than one woman/couple out of two among the women born in the 1950s had two children. Also, one-child and three-child families increased slightly in the 1950s and 1960s cohorts, thereby reducing the share of the two-child family (Figure WBR-9). Childlessness remained quite low (Figure WBR-10).

## 9.6 | A comparative perspective

Three characteristics distinguish this region.

1. At the beginning of the period on which the analysis is focused, that is in the middle of the 20th century, *the region comprised the two least developed countries* which were at the onset of their fertility transitions. In 1950, Bosnia and Herzegovina and Macedonia had total period fertility rates between five and six births per woman, and total fertility rates for the cohorts born around 1930 were between 3.5 and 4.0 births per woman. The only other country with comparably high cohort fertility at the time was New Zealand, but for the most part under rather different social and economic circumstances. A minority, the Maoris, were also at the onset of their fertility transition,

however, the majority of the New Zealand population had passed through its fertility transition during the first half of the 20th century and its powerful post-war baby boom was generated by similar societal developments as in the other western developed countries.

2. Closely related to the first distinction is the *diversity and heterogeneity of fertility levels and trends* in countries of the region. For example, there is no other region in which the differences between the values of the total cohort fertility rates for the women born around 1930 were as large (Figure CO-1). The TCFR for Macedonia at 3.9 births per woman was almost double the rate of 2.1 for Slovenia. Related to the initial difference in levels, cohort fertility declined rapidly from the 1930 to the 1960 cohorts in Macedonia and Bosnia and Herzegovina, whereas the decline of cohort fertility between these 30 cohorts in Croatia, Slovenia and Yugoslavia was almost imperceptible. Furthermore, even though the values of the TCFRs of the cohorts of the mid-1960s came closer to each other than ever before, the differences were still much larger than in any of the other regions with the exception of the non-European populations. In West central Europe (Austria, Germany, West and East and Switzerland) the range of the estimated TCFRs of the 1965 cohorts was 1.5 to 1.6, in East central Europe (Czech and Slovak Republics and Hungary) it was 1.9 to 2.0, in southern Europe it was 1.6 to 1.8, but in the West Balkan Region it was 1.8 to 2.2 births per woman. Diversity and heterogeneity persisted in the trends of many of the other fertility measures of populations in the region.
3. *Fertility levels and trends stand out as being idiosyncratic, sui generis, compared to any of the other regions*. Many of them were different from the formerly socialist countries of central and eastern Europe and from the capitalist countries of the West. Populations of each one of these larger groupings had a number of common features. For instance, the proportion of fertility of women below age 27 was continuously increasing in the formerly socialist countries from the 1930 through the 1960 cohorts, when they reached values of around 70 per cent or more. In contrast, in the capitalist countries there was an initial increase in this proportion between the 1930s and the 1940s cohorts but almost universally among the cohorts of the 1940s and 1950s the proportion was declining to values of around 35 to 50 per cent (Table CO-3). Among the populations of the West Balkan Region, those of Bosnia and Herzegovina, Macedonia and Slovenia appear akin to the formerly socialist countries, but in Croatia and especially in Yugoslavia there was a trend of reasonable stability not seen anywhere else. Also the succession of changes in the lifetime age patterns of fertility over cohorts in

the countries of the region was not similar either to the typical formerly socialist sequence or to the capitalist one.

Among the cohorts of the early 1960s, in comparison to all the regions in this project, average total cohort fertility of the West Balkan Region was among the highest with East central Europe, the Nordic Region, and the Non-European Countries (Table CO-2). Similarly as in almost all other countries the TCFRs were declining during the early and mid-1960s.

The main change in the age patterns of fertility in most countries of the region among the 30 cohorts since those born around 1930 was the decline of fertility when women were in their late 20s, 30s and 40s (Figure WBR-3). This was the case in Bosnia and Herzegovina, Macedonia and Slovenia, less so in Croatia. Such a sequence was different from most other countries, formerly socialist and western. Correspondingly, the mean age of childbearing declined markedly in the first three countries.

Fertility under age 27 tended to be relatively high among the observed cohorts. Even among those of the early 1970s the absolute levels of fertility were considerably higher than in the western countries, and not much different from those of the formerly socialist countries (Table CO-7).

Among most cohorts none, or only small proportions, of the declines in fertility when women were young were offset when they were older. There was one exception. In Yugoslavia a large proportion of the fertility deficit of the 1960 cohort was compensated for when the women were older, but the absolute dimensions were very small and the effect on completed fertility was negligible. In Croatia, Macedonia and Slovenia only small proportions of the "delayed" births of the 1965 cohort were recuperated when these women were older (Table CO-6). Also in this respect developments in the region were different from the formerly socialist and from the western countries. In none of the formerly socialist countries in the cohorts of the 1950s or early 1960s, except for Hungary, were any of the declines of fertility when women were young offset when they were older. In contrast, in these same cohorts in all of the capitalist countries of the West a part or the whole of the fertility deficits when women were young, were compensated for when they were older.

Calculations in Table CO-8 illustrate the variety of challenges 1970 birth cohorts would face if they were to aim to catch up with the TCFRs of the 1960 cohorts

or to reach the replacement threshold. In Yugoslavia and in Macedonia late childbearing would not have to be raised very much (for Bosnia no data were available for the 1990s). On the other hand, fertility after the 27th birthday would have to increase by 80 to 120 per cent in Slovenia and by 60 to 80 per cent in Croatia.

Childbearing amongst the very young women in the region has been declining beginning with women born in the 1960s and this decline accelerated in the 1970s cohorts. In the cohorts of the mid-1970s childbearing before the 22nd birthday of between 0.3 to 0.5 children in Yugoslavia and Macedonia resembled levels in the formerly socialist countries. The low levels of between 0.1 and 0.3 registered in Slovenia and Croatia were more similar to the western countries (Table CO-9).

Trends of the average age at childbearing were unusually stable in Croatia and Yugoslavia; and between the cohorts of the late 1940s and late 1960s also in Macedonia and Bosnia and Herzegovina. In Slovenia there was a long decline of the mean age of childbearing through the cohorts of the late 1950s followed by an increase, a pattern not seen anywhere else in the region. In sum, these trends are in line with the uniqueness of fertility developments of the region (Table CO-12).

Changes in the parity distributions in Bosnia and Herzegovina and Macedonia were more momentous than anywhere else. The proportions of women with four or more children declined over the 30 cohorts observed from over 50 per cent of the total to around ten per cent and, on the other hand, women/couples with two children became the norm. Developments in the other countries of the region were far less dramatic, but the rise in the proportions of the two-child family was similar (Figure WBR-9).

The rise in the proportions of childless women among the cohorts of the late 1950s and 1960s in Bosnia and Herzegovina and Slovenia was similar to a number of other countries. The relatively low levels of childlessness and the apparent prospects of no rapid increase in Croatia, Yugoslavia and Macedonia are again unusual (Figures WBR-9 and WBR-10).

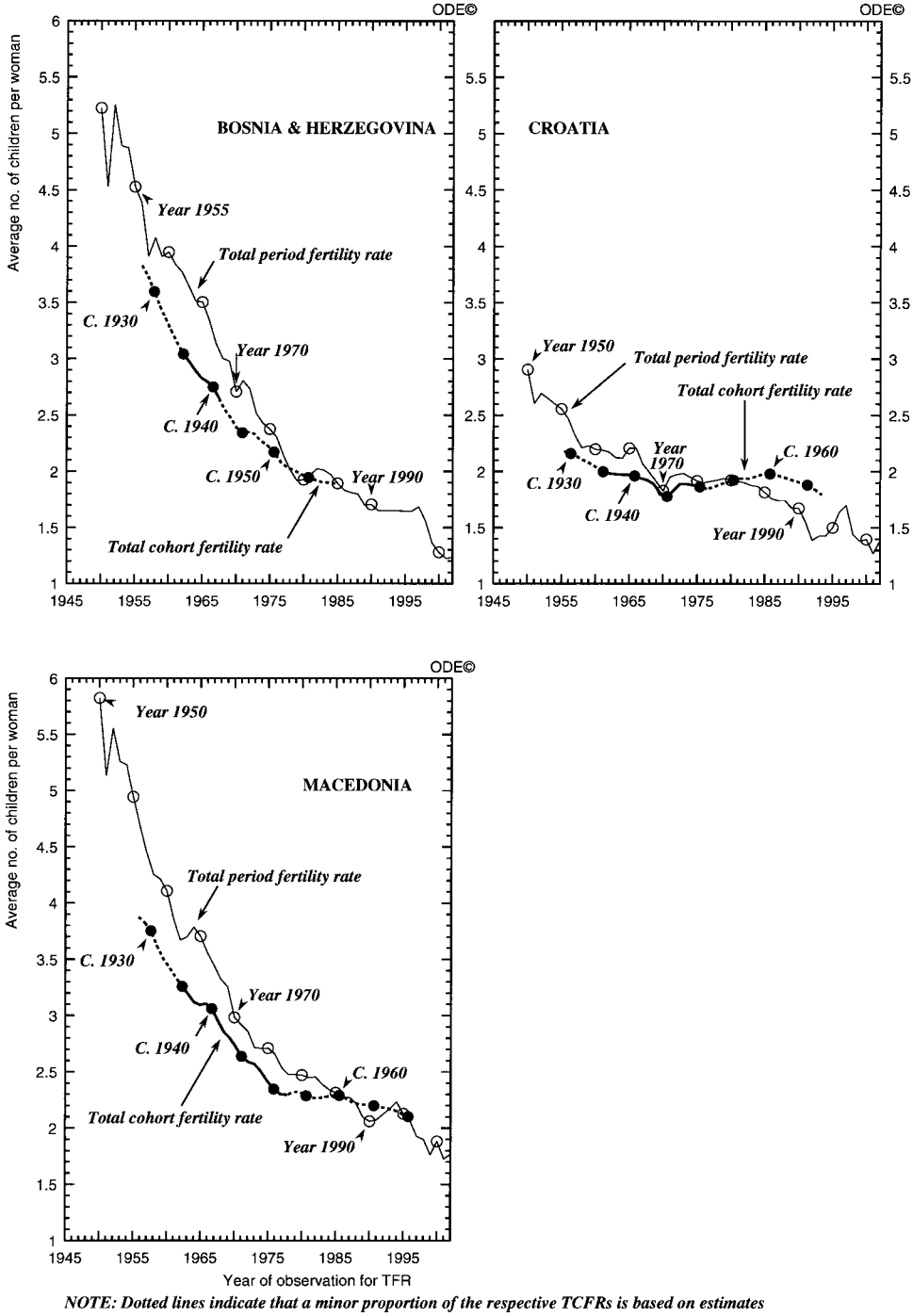
## 9.7 | Conclusions

The long-term fertility developments in the region did not fit the generally typical characteristics either of the formerly socialist countries or of the western capitalist ones. Despite these differences in the past, the outlook at the turn of the century was for a further cohort fertility decline just as in almost all other countries of this study. This general conclusion is based on the following:

- Total fertility rates of the early to mid-1960s cohorts were declining in all countries of the region. The rates for Macedonia and Yugoslavia were around the replacement level; in Croatia and Slovenia, and possibly also in Bosnia and Herzegovina the TCFRs were between 1.7 and 1.8, i.e. 15 to 20 per cent below replacement;
- Among the cohorts that were born in the late 1960s and the 1970s, which were at the onset or in the middle of their reproductive periods, cumulated fertility of young women was declining in successive cohorts in all countries of the region;
- Childbearing of young women born in the early 1960s was declining, however, only small proportions of the delayed births were being born when women were older. The propensity to catch up was weak;
- The two-child family was the most prevalent at around 50 per cent of the total;
- Childlessness among the cohorts of the late 1960s was relatively low in most countries of the region, but high and increasing in Slovenia.

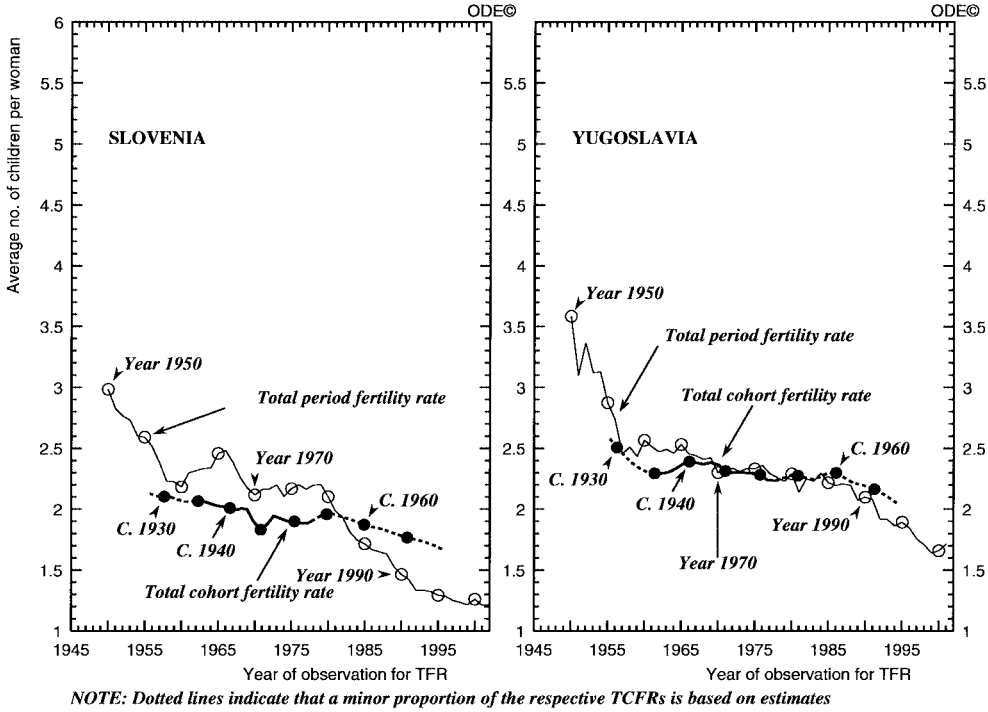
Judging from the fertility trends of the youngest cohorts it appears that the considerable diversity of fertility levels and trends in the region will continue in the near future. Conceivably the TCFRs for women born in the mid-1970s in Slovenia and Croatia could be as low 1.3 to 1.5 births per woman. On the other end of the spectrum, the fertility decline appeared slow in Macedonia so that for women born in the mid-1970s the TCFR could be around 2.0 births per woman.

**Figure WBR-1 WEST BALKAN REGION, 1950-2000**
**Total period fertility rate and total cohort fertility rate lagged by the average age at childbearing**



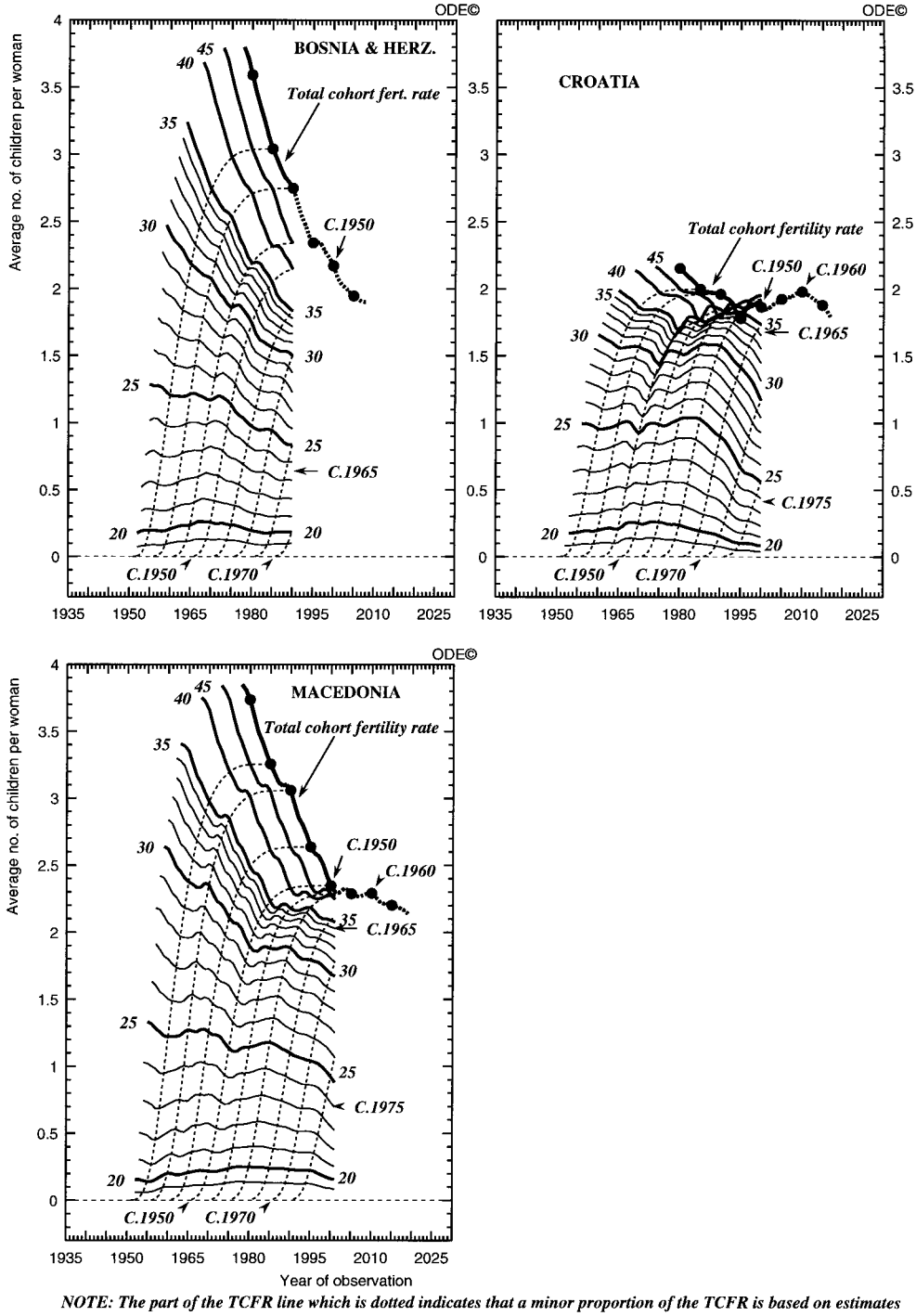

*NOTE: Dotted lines indicate that a minor proportion of the respective TCFRs is based on estimates*

**Figure WBR-1 (continued). WEST BALKAN REGION, 1950-2000**
**Total period fertility rate and total cohort fertility rate**
**lagged by the average age at childbearing**



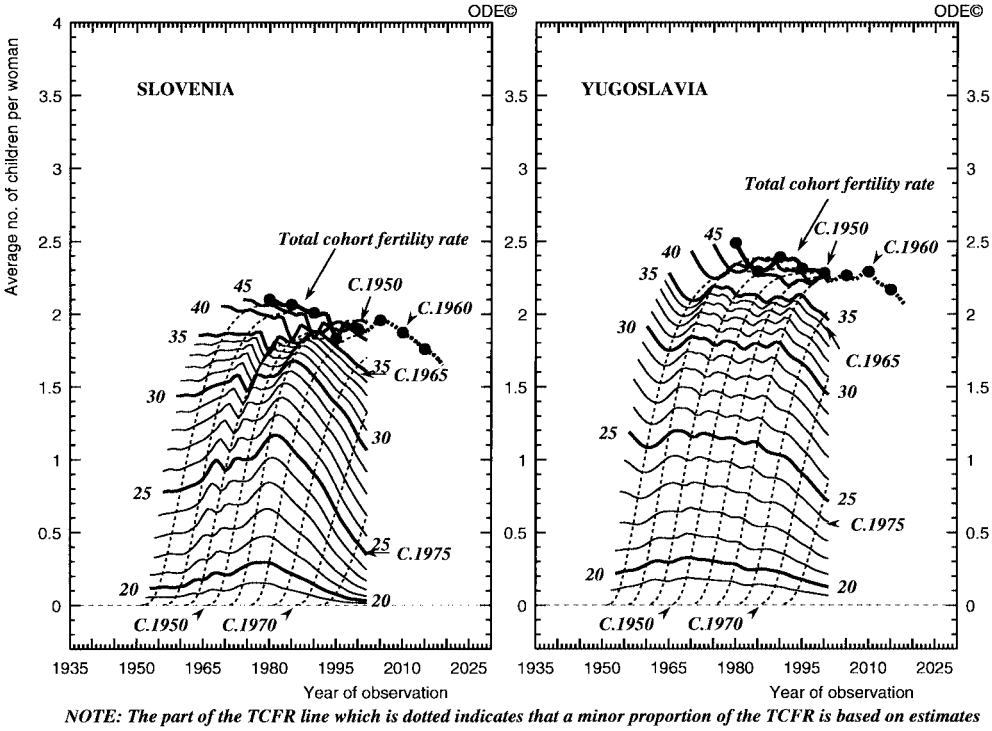

*NOTE: Dotted lines indicate that a minor proportion of the respective TCFRs is based on estimates*

**Figure WBR-2 WEST BALKAN REGION**
**Cumulated cohort fertility at specified ages, birth cohorts 1935-1975**




*NOTE: The part of the TCFR line which is dotted indicates that a minor proportion of the TCFR is based on estimates*

**Figure WBR-2 (continued). WEST BALKAN REGION**
**Cumulated cohort fertility at specified ages, birth cohorts 1935-1975**




*NOTE: The part of the TCFR line which is dotted indicates that a minor proportion of the TCFR is based on estimates*

**Figure WBR-3 WEST BALKAN REGION**
**Age-specific fertility rates, birth cohorts 1930, 1940, 1950 and 1960**

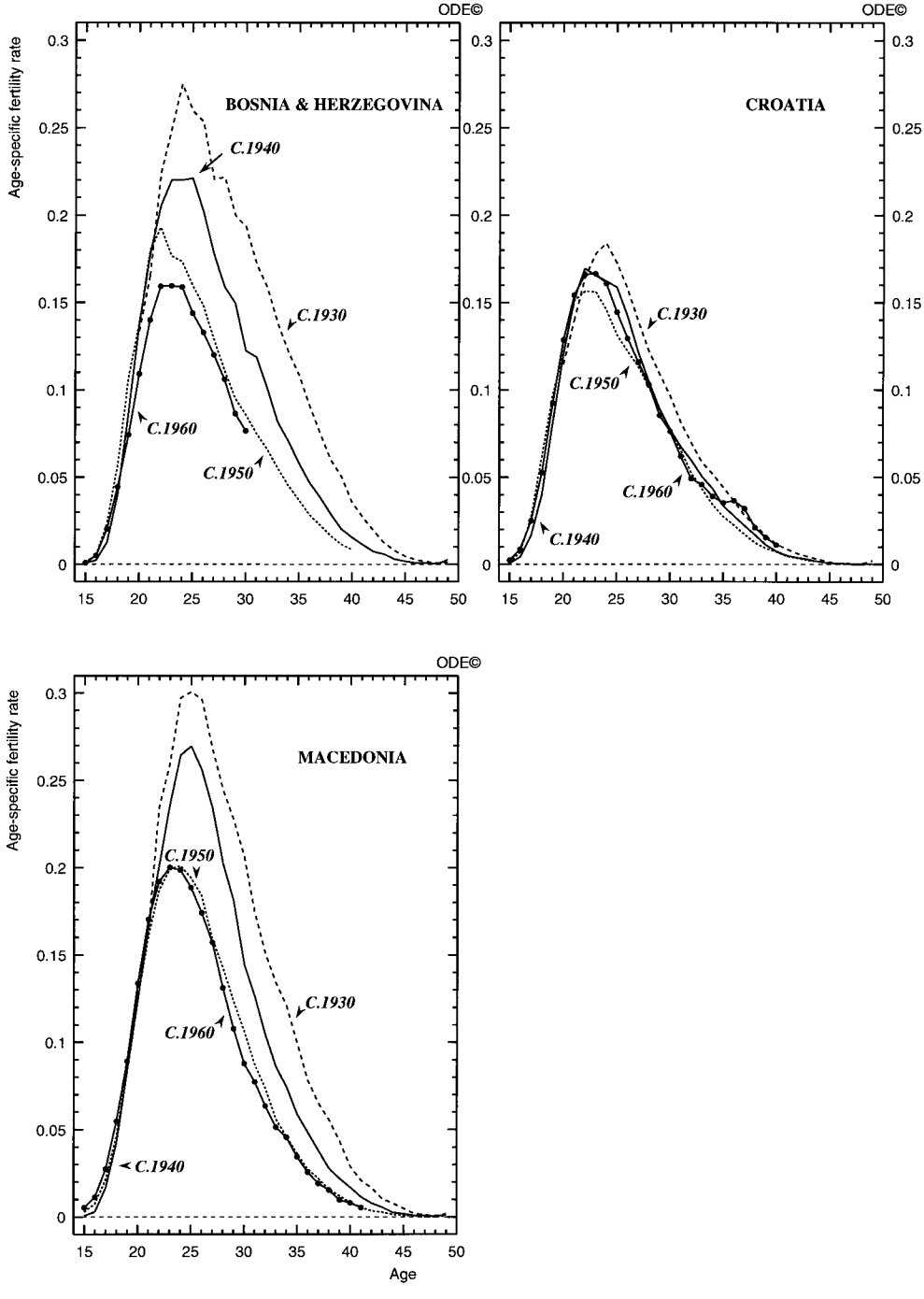


**Figure WBR-3 (continued). WEST BALKAN REGION**
**Age-specific fertility rates, birth cohorts 1930, 1940, 1950 and 1960**

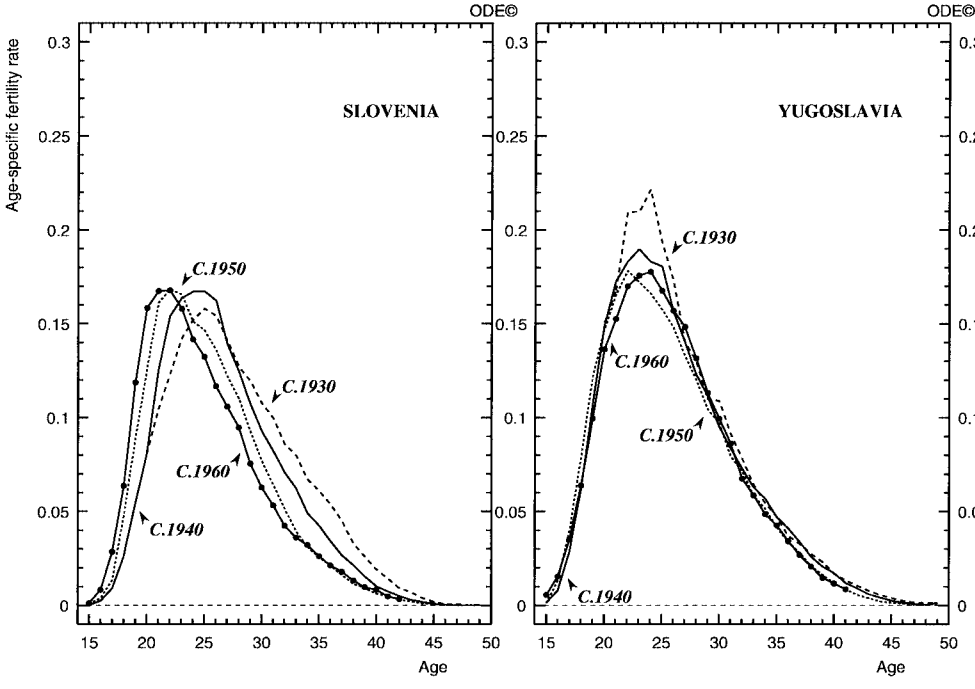
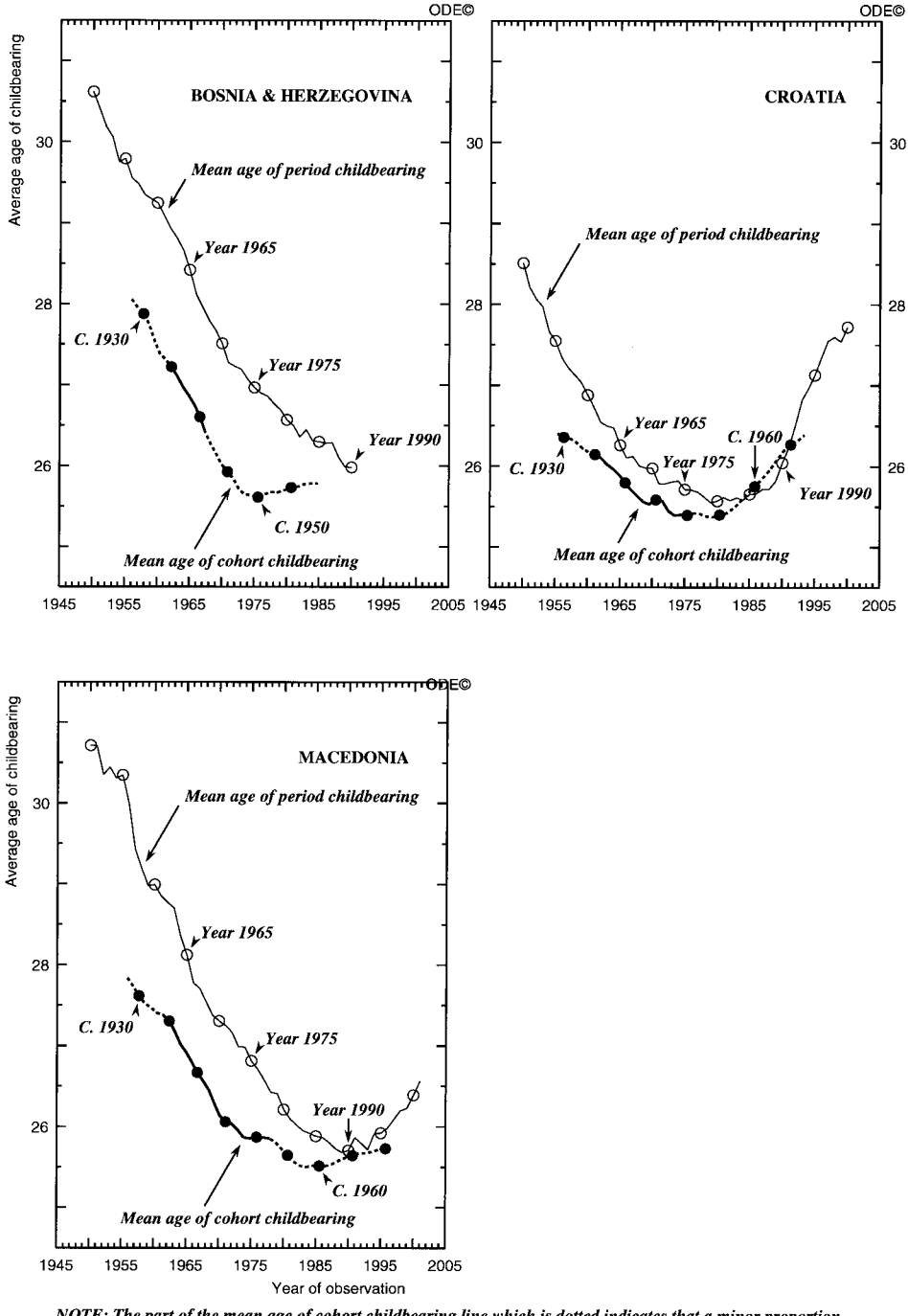
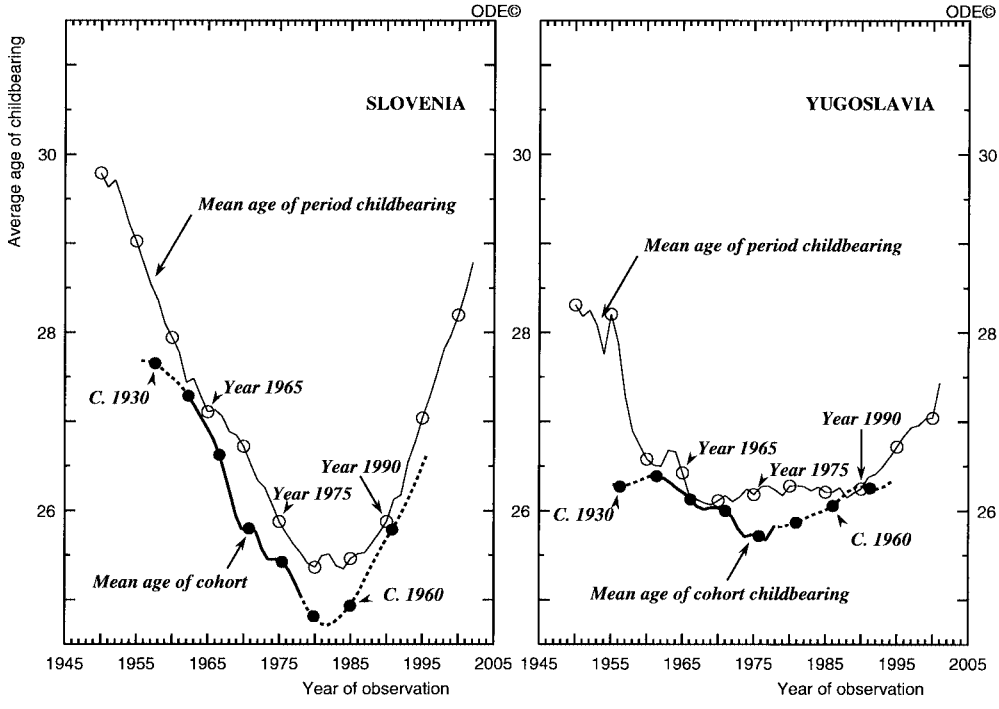


**Figure WBR-4 WEST BALKAN REGION, 1950-2000**
**Period average age of childbearing and cohort average age of childbearing lagged by the average age at childbearing**




*NOTE: The part of the mean age of cohort childbearing line which is dotted indicates that a minor proportion of the respective age-specific rates are based on estimates*

**Figure WBR-4 (continued). WEST BALKAN REGION, 1950-2000**
**Period average age of childbearing and cohort average age of childbearing lagged by the average age at childbearing**




*NOTE: The part of the mean age of cohort childbearing line which is dotted indicates that a minor proportion of the respective age-specific rates are based on estimates*

**Figure WBR-5 WEST BALKAN REGION**
**Age-specific fertility rates, birth cohorts 1960, 1965, 1970, 1975 and 1980**

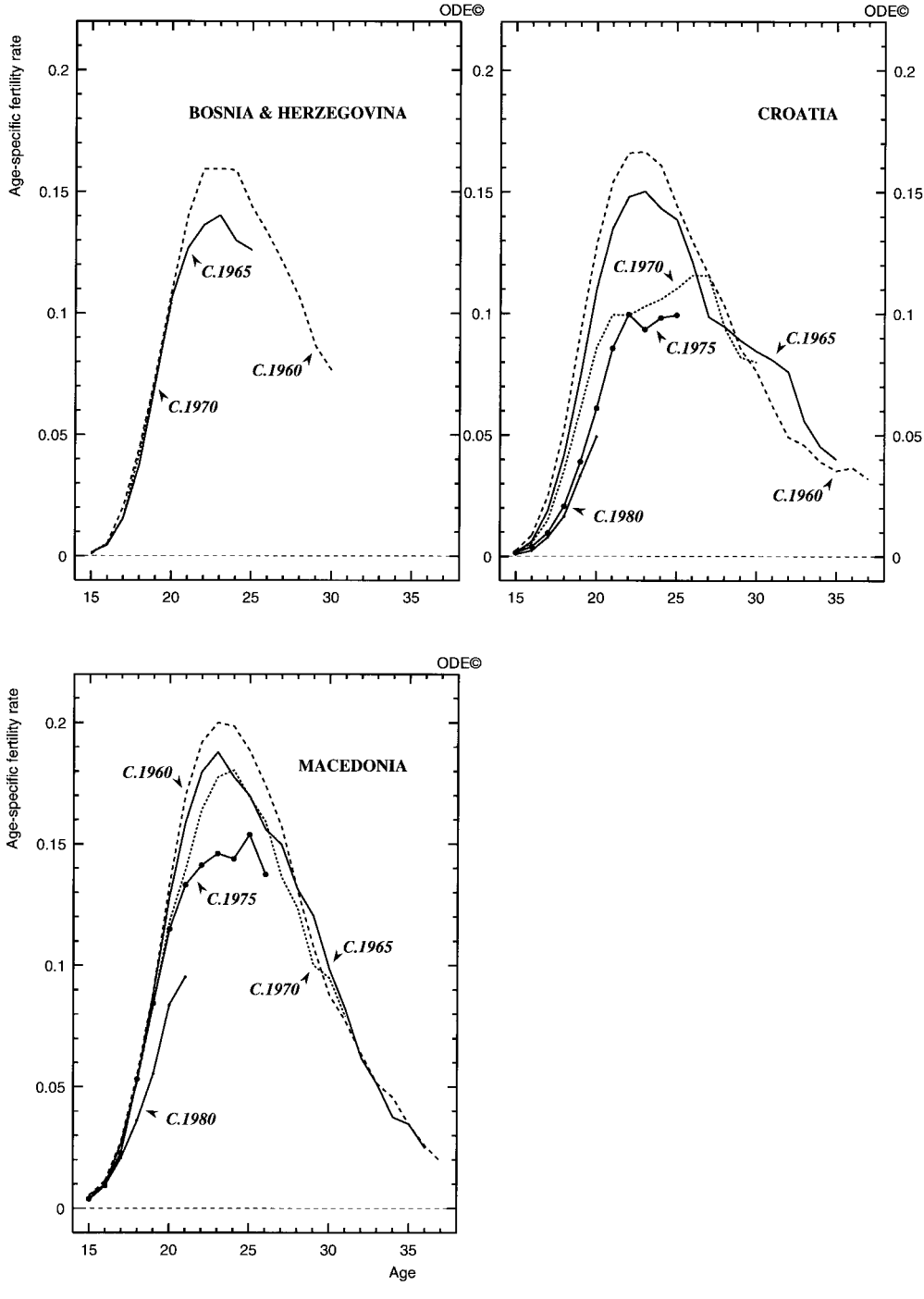


**Figure WBR-5 (continued). WEST BALKAN REGION**
**Age-specific fertility rates, birth cohorts 1960, 1965, 1970, 1975 and 1980**

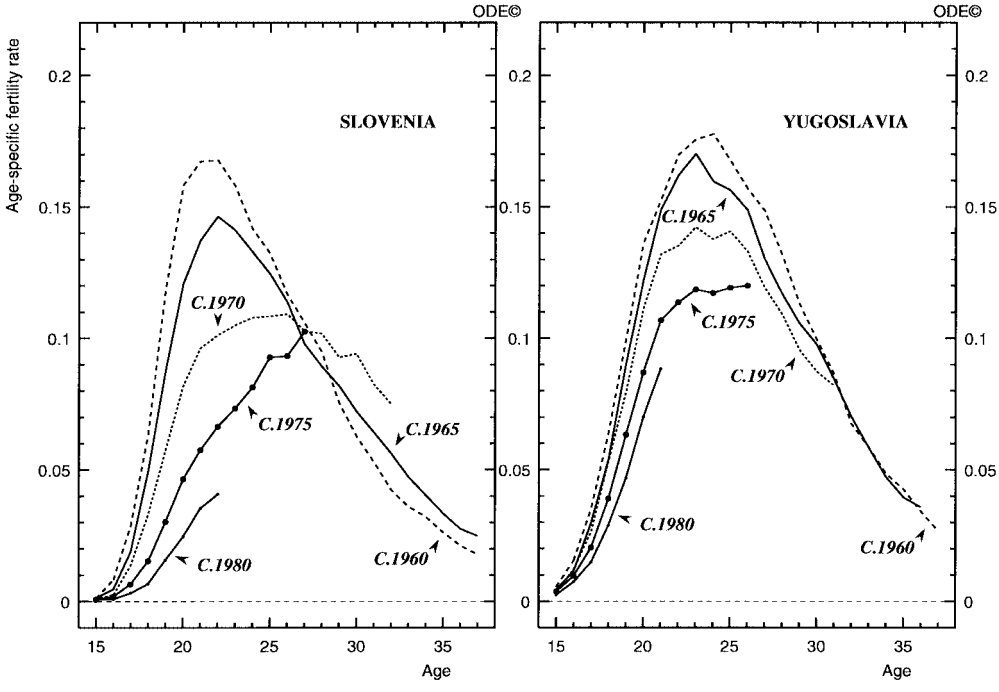


**Figure WBR-6 WEST BALKAN REGION**
**Differences in cumulative age-specific cohort fertility rates between base and subsequent cohorts, women born in 1950 (base), 1955, 1960, 1965, 1970, 1975 and 1980**

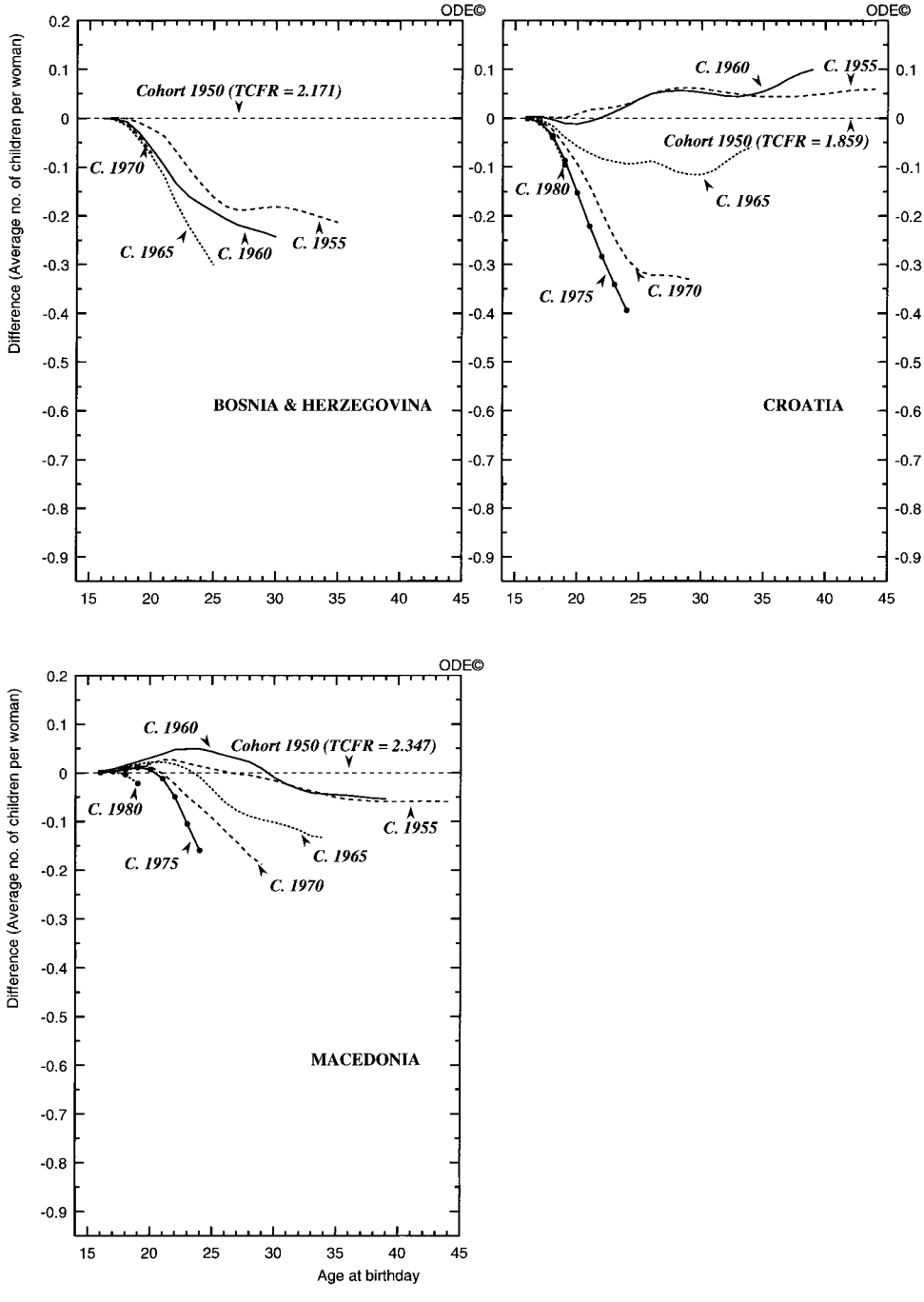


**Figure WBR-6 (continued). WEST BALKAN REGION**
**Differences in cumulative age-specific cohort fertility rates between base and subsequent cohorts, women born in 1950 (base), 1955, 1960, 1965, 1970, 1975 and 1980**

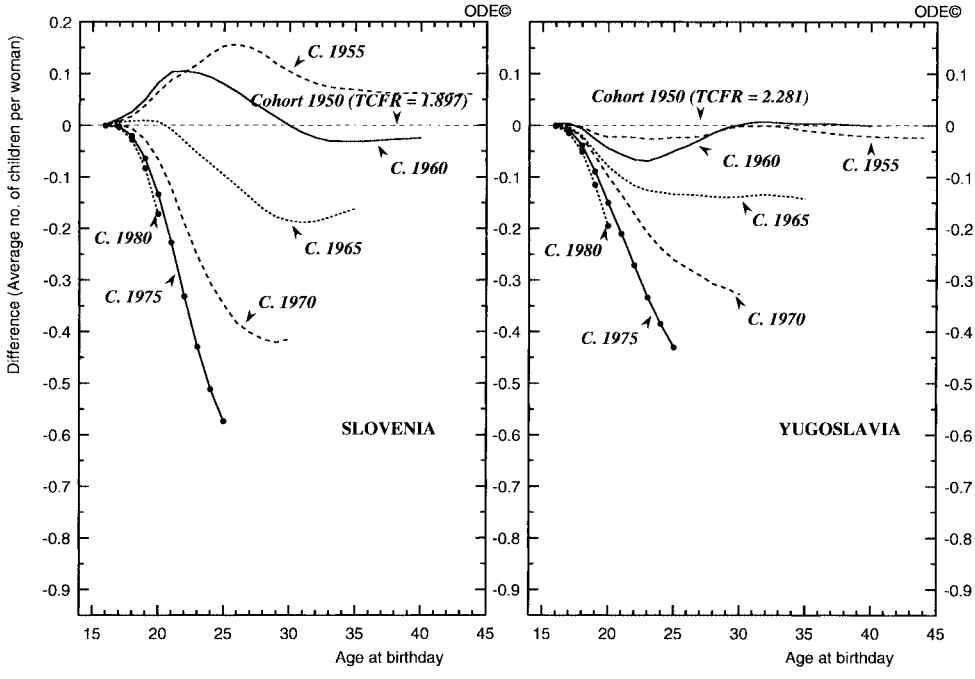


**Figure WBR-7 WEST BALKAN REGION**
**Total cohort fertility rates by biological birth order, birth cohorts 1926 to 1969**

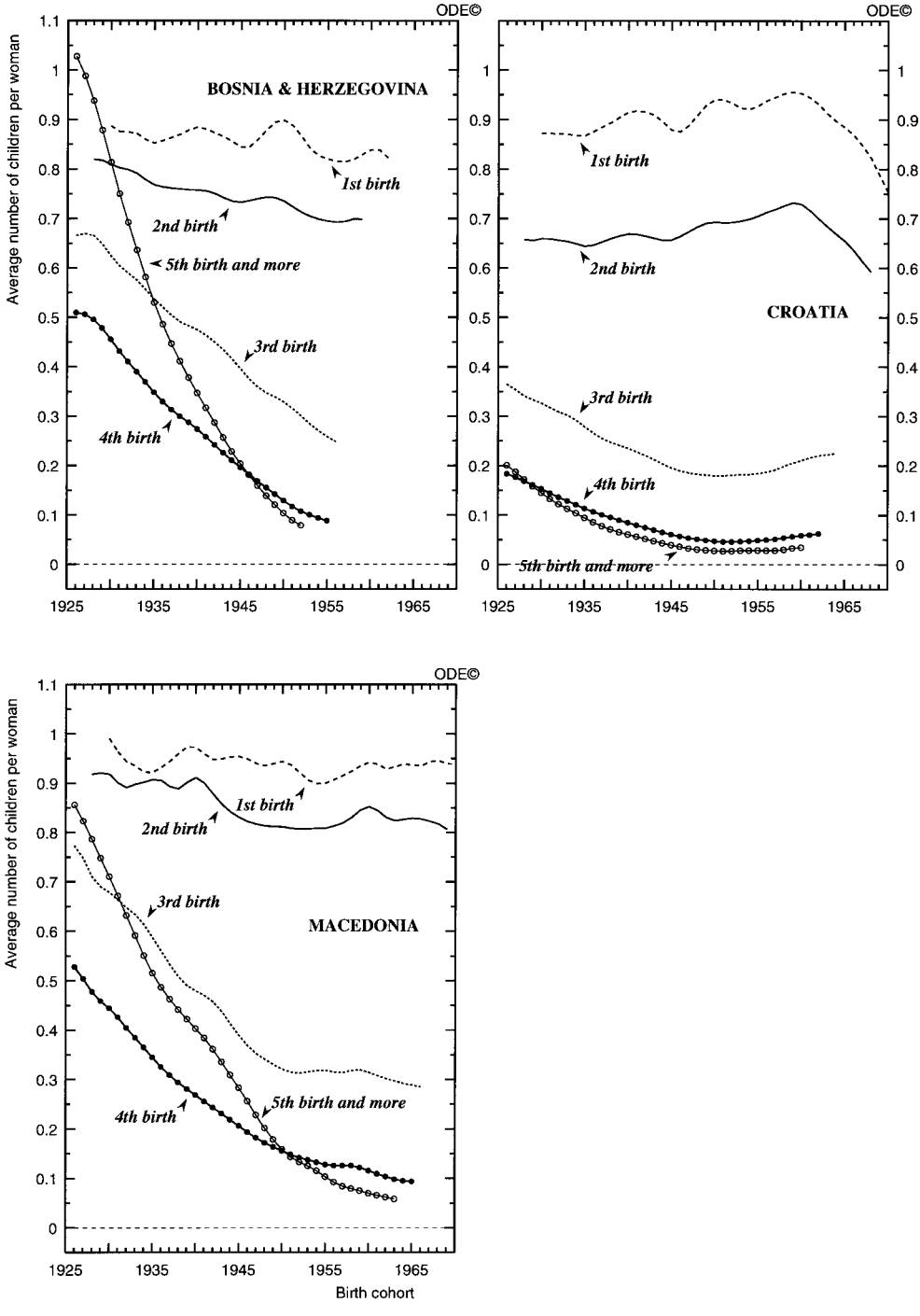


**Figure WBR-7 (continued). WEST BALKAN REGION**
**Total cohort fertility rates by biological birth order, birth cohorts 1926 to 1969**

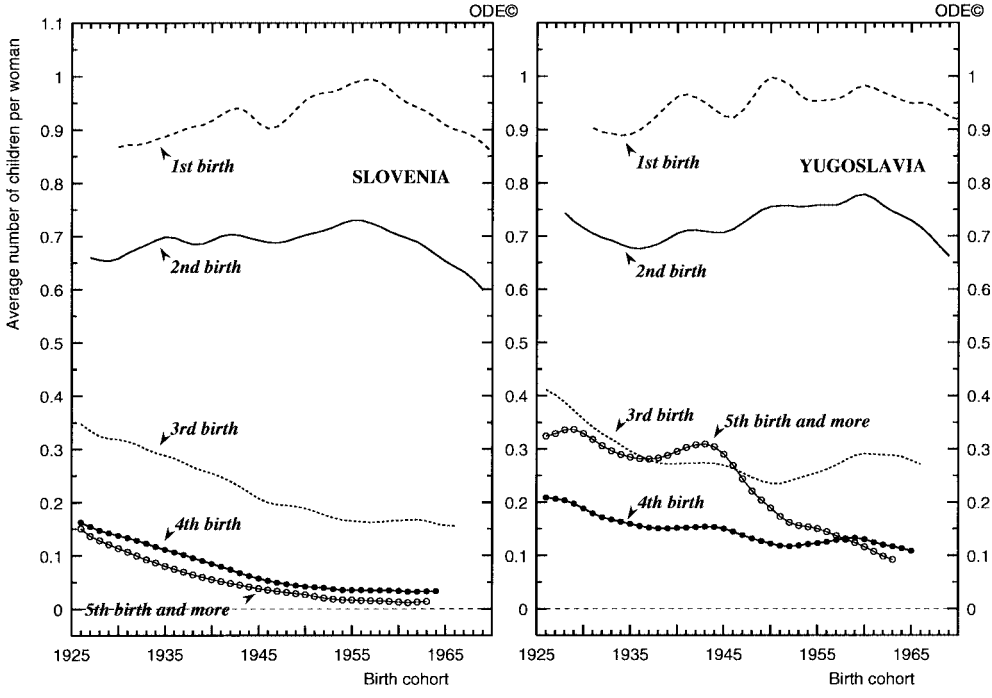


**Figure WBR-8 WEST BALKAN REGION**
**Parity progression ratios, birth cohorts 1930 to 1970**

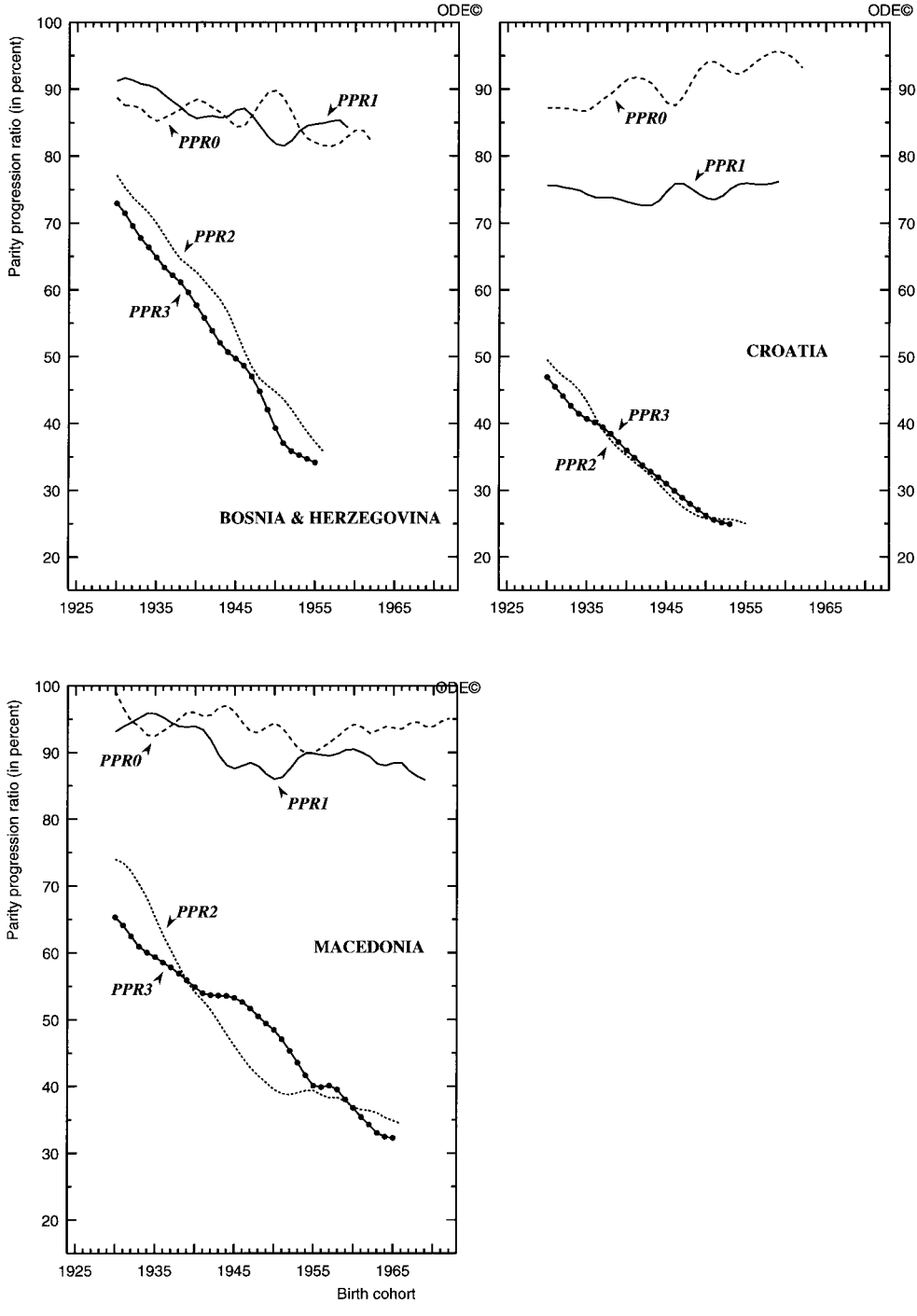


**Figure WBR-8 (continued). WEST BALKAN REGION**
**Parity progression ratios, birth cohorts 1930 to 1970**

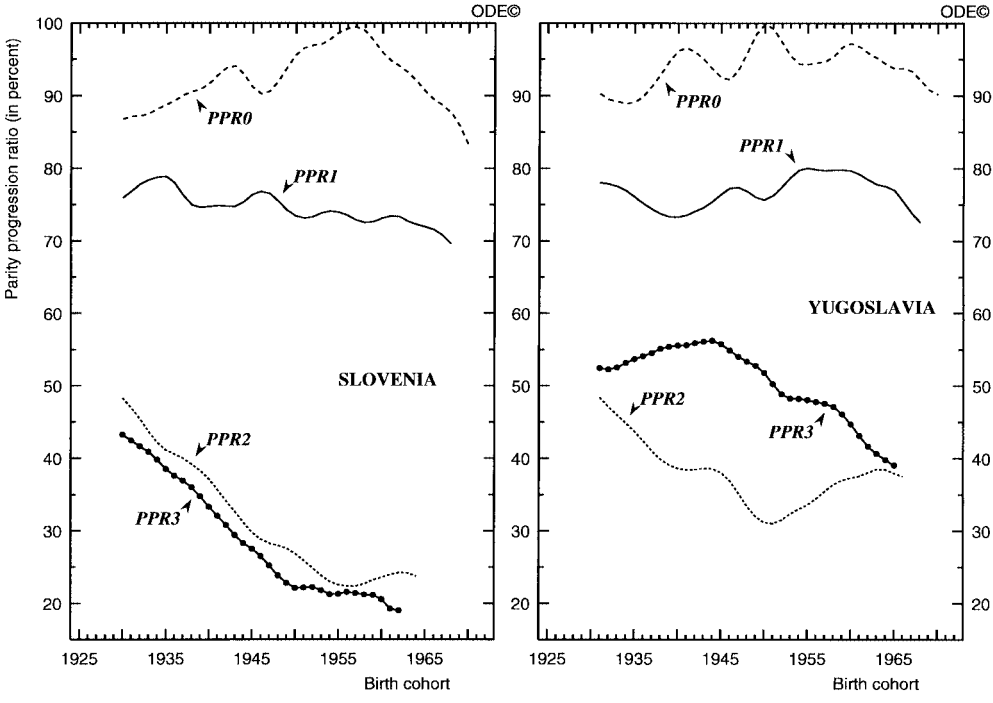


**Figure WBR-9 WEST BALKAN REGION**
**Parity distribution of completed fertility, birth cohorts 1926 to 1968 (in percent)**

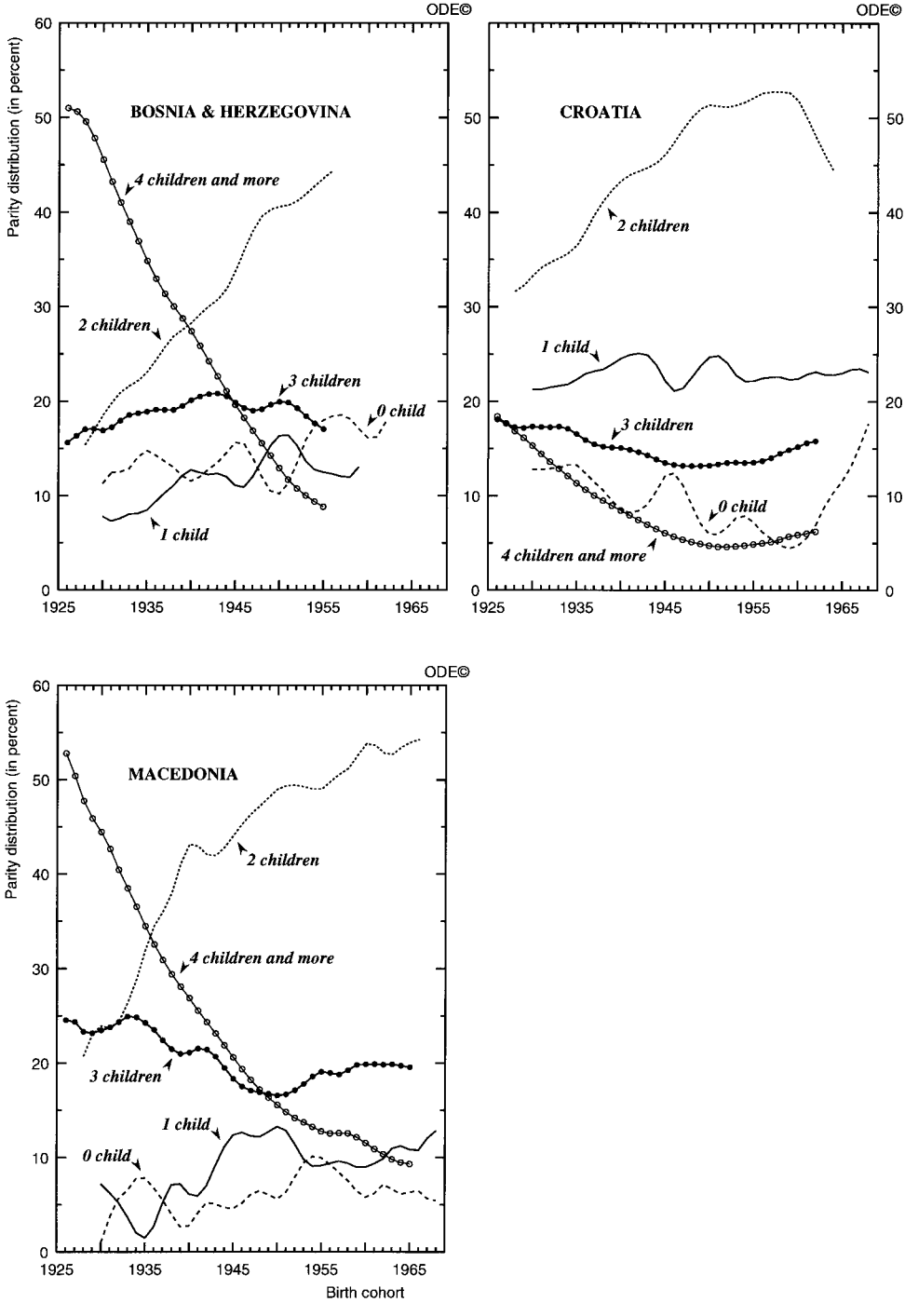


**Figure WBR-9 (continued). WEST BALKAN REGION**
**Parity distribution of completed fertility, birth cohorts 1926 to 1968 (in percent)**

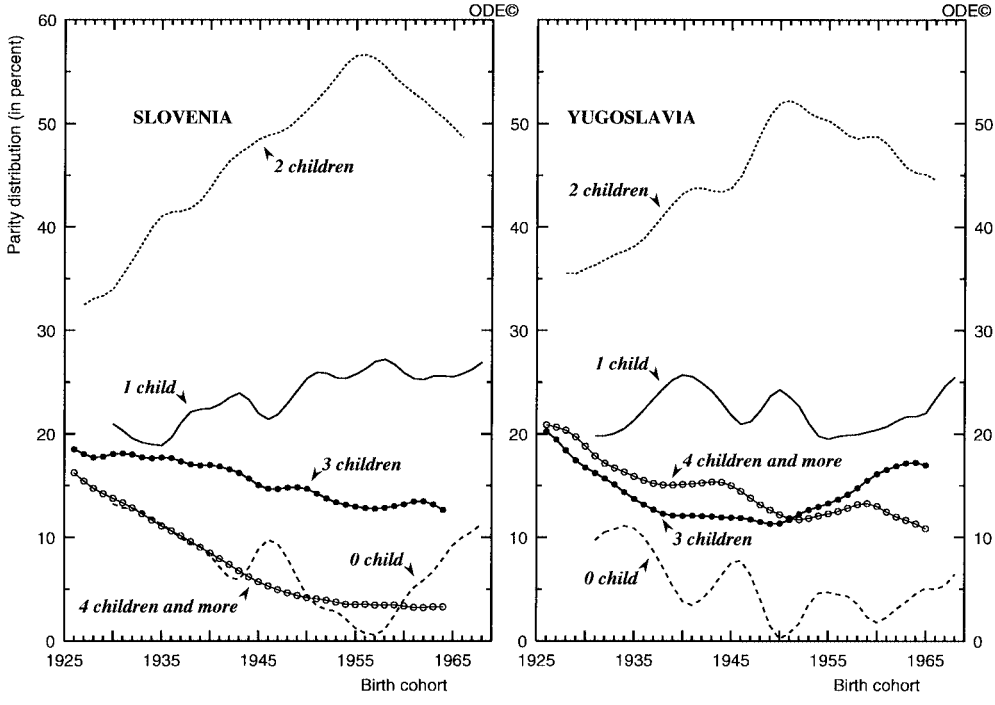


**Figure WBR-10 WEST BALKAN REGION**
**Proportions of childless women, selected ages, birth cohorts 1930 to 1980**

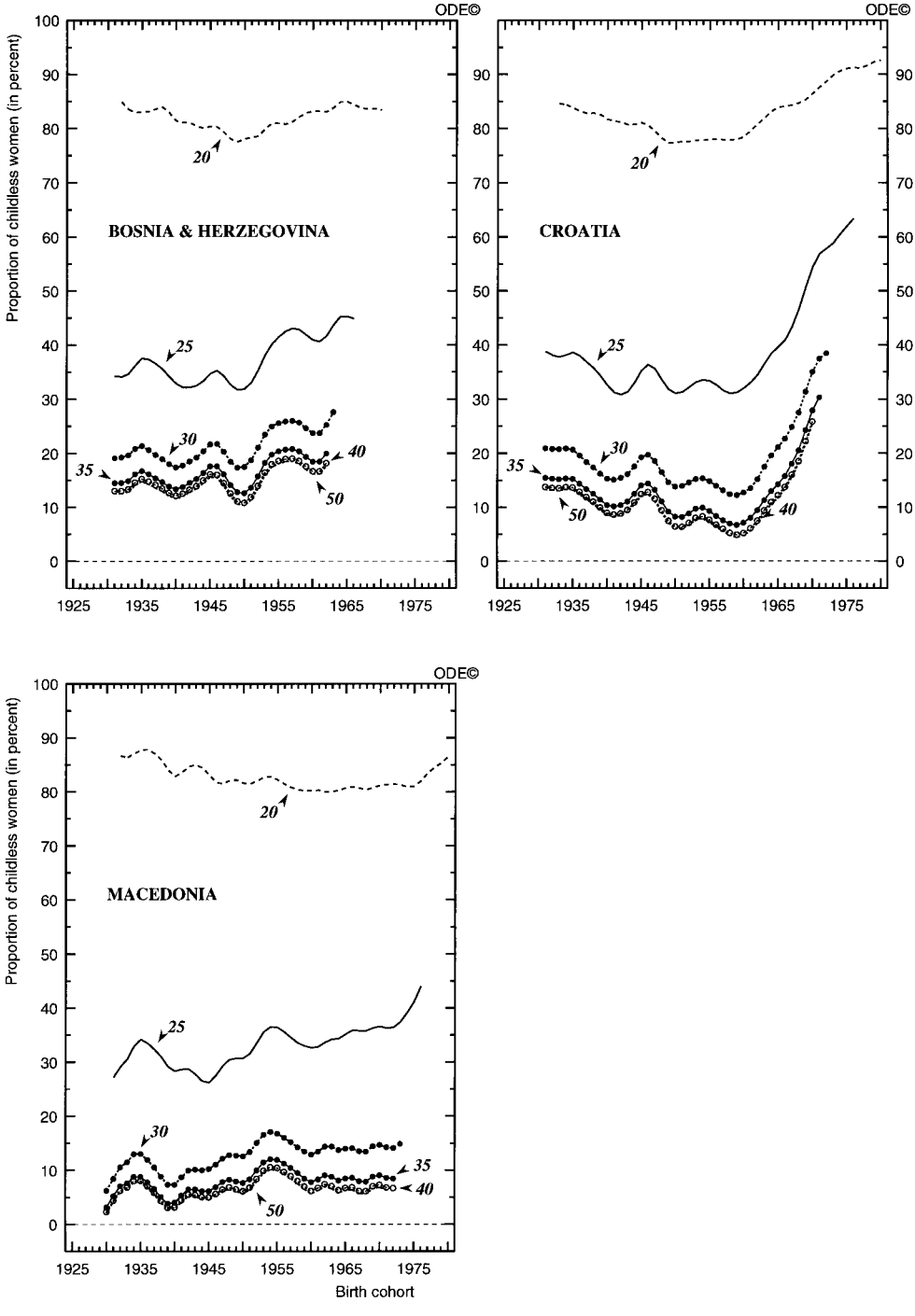
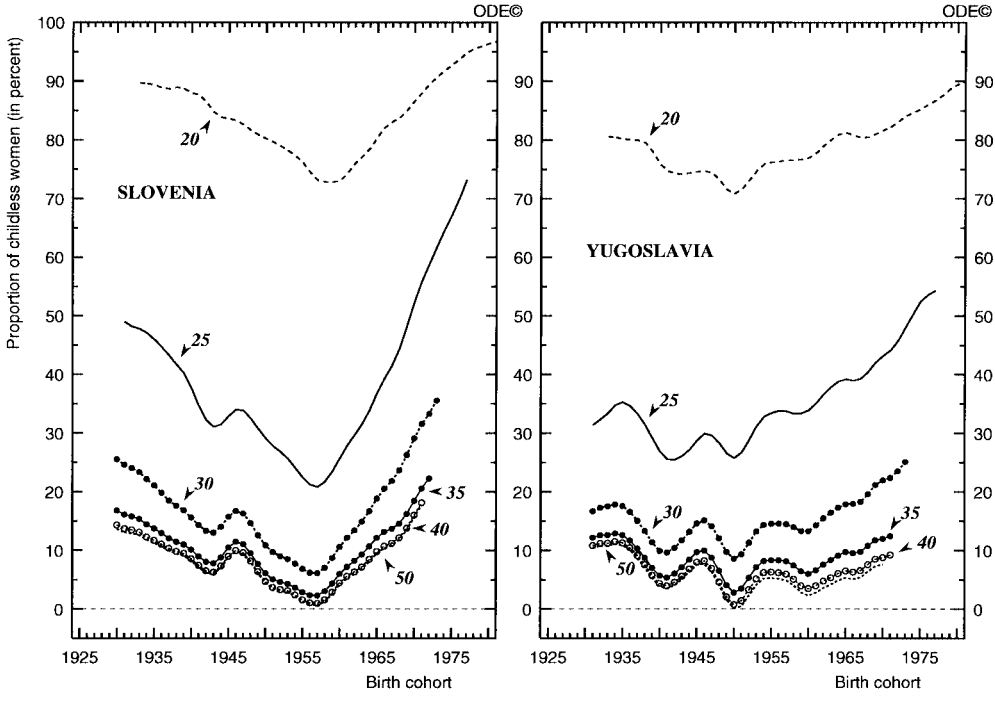


**Figure WBR-10 (continued). WEST BALKAN REGION**
**Proportions of childless women, selected ages, birth cohorts 1930 to 1980**



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# 10. Baltic region

## Co-authors[46]: Kalev Katus and W. Ward Kingkade

The structure of this chapter differs from the other ones. In distinction to the other chapters, the exposition and analysis for the three countries is combined in one study. The nature of the available source material —historical, political, social and economic as well as the available statistical data— justified such an approach.

### 10.1 | Background

There have been numerous periods in the history of nations when political developments have had a profound impact on demographic trends. Arguably more frequently than in other parts of the world that was the case during the years of the autocratic systems of the communist era in the 20th century in central and eastern Europe and in Asia. The demographic consequences of industrialization, collectivization and deportations in the Soviet Union during the 1930s and the effects of the Great Leap Forward in China in 1959-61 are among the well-known cases (Livi-Bacci 1993). That the populations of the Baltic countries were among the principal victims of Stalinist policies and the Soviet occupation, especially during the 1940s and 1950s, is not so well known. As this chapter deals primarily with population developments of the second half of the 20th century in the Baltic countries, these tragic times have to be taken into account. To put the fertility trends of this period into perspective, we start out with a thumbnail historical review of population developments.

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[46] Kalev Katus (Estonian Interuniversity Population Research Centre) and W. Ward Kingkade (US Bureau of the Census).

Ever since the Estonians settled by the Baltic Sea about 5,000 years ago and since the times when the Latvians as well as the Lithuanians followed later, namely around the 13th century, these nations have had a checkered history. For a while the Lithuanians established and maintained a large empire inhabited by Slavs to their East and South, but for the most part wars and subjugation to major powers prevailed. These apparently resulted in more frequent population crises than on average in other parts of Europe (Palli 1997).
Despite the travails of history the Baltic nations maintained a national identity and proved to be independent and distinct also in their demographic behavior. The Estonians and the Latvians were among the populations to adopt the West European nuptiality patterns of late marriage and low marital fertility (Hajnal 1965) already in the 19th century. The populations of Estonia and to some extent Latvia were among those with the lowest fertility in Europe in the late 19th and early 20th centuries (Katus 1994). Below replacement fertility was reached in Estonia during the 1920s and its population experienced the lowest fertility in Europe in the early 1930s together with Austria, Germany and Sweden, with net reproduction rates (NRRs) below 0.8 (Kirk 1946). Latvia was not far behind with a NRR equal to 0.82 (Kirk 1946). Estonia and Latvia were among the populations of Europe to experience the fertility transition early, with Lithuania following somewhat later, however, it did not reach below replacement fertility until the middle of the 20th century.

The Baltic countries were among those who gained political independence after the first world war which they enjoyed during the 1920s and 1930s. Their independence was short-lived and brought to an end by the first Soviet occupation in June of 1940 as a result of the Molotov-Ribbentrop Pact between Germany and the Soviet Union establishing their respective spheres of influence. During 1941 to 1944 the Baltic countries were under German occupation and subsequently in 1944 and 1945 the second Soviet occupation began which lasted for close to 50 years.

Already the first Soviet occupation entailed political terror, mass murders and deportations. The war and German occupation also brought about considerable suffering, population losses, including deportations, especially of citizens of Jewish origin. Following the war the Soviet government unilaterally established new boundaries transferring parts of Estonia and Latvia to the Russian Federation. The territory of Lithuania was expanded by the Vilnius region annexed from Poland. The Soviet regime intensified its grip by forcefully rearranging the entire societal organization and continued in the political terror

and deportations. To escape this fate, considerable segments of the population fled to the West. The net result was major losses of population. Apparently the political upheaval accompanied by mass deportations and the escape of people to the West contributed to the unusually low levels of fertility in Estonia and Latvia during the 1940s and 1950s.

The most blatant expressions of political oppression started to subside slowly following Stalin's death and a gradual process to more 'normal' societal and personal life styles evolved, albeit of an East European socialist model of a centrally planned economy and an autocratic political establishment. Eventually the liberalization of the Soviet regime under Gorbachev provided grounds for the restoration of independent statehood for the Baltic countries in 1991. However, having been in a state of occupation and dependence for half a century (Misiunas and Taagepera 1983) a difficult and complex period of transition to a western type democratic society and a market economy ensued during the 1990s.

## 10.2 | Demographic exposition and analysis

The analysis of post-war fertility developments in the Baltic countries has to be viewed in light of the political developments, namely the Soviet occupation and the extremely violent reorganization —sovietization— of the society. Contrary to practically any other country in Europe, there was no fertility increase following the Second World War. Estonia and Latvia did not have a baby-boom after the war. This was partly true also for Lithuania, however its population had not experienced fertility below the replacement level before the war either.

The absence of a post-war baby-boom in Estonia and Latvia was an exceptional feature of fertility trends among the forerunners of fertility transitions. Almost all such countries having experienced fertility below replacement during the 1920s-1930s, experienced a post-war baby-boom (Daguet 1996). In the western countries these fertility increases lasted for over a decade or more often up to the middle of the 1960s (Festy 1984 and Sardon and Calot 1997). The fertility increases were quite considerable, substantially above replacement. Estonian and Latvian period fertility, on the contrary, remained systematically below replacement for an additional 20 to 25 year period. From the late 1940s through the 1960s the populations of Estonia and Latvia had the lowest fertility in Europe and correspondingly in the world.

We now proceed to describe and analyze fertility starting with cohorts born since the early 1930s. Some of the data pertaining to the 1930s-1950s cohorts are preliminary estimates[47] and might be modified in the future.

The low fertility in Latvia and Estonia is reflected in the completed fertility rates of the cohorts which started their childbearing in the late 1940s and whose prime childbearing periods were in the 1950s. These were the cohorts born in the 1930s. The total cohort fertility rates (TCFRs) of women born in 1934 in Estonia and Latvia were below replacement. They were about 10 to 15 per cent below those of the Czech Republic and Hungary, for instance, and 25 to 30 per cent lower than the corresponding cohorts in Denmark, Finland and Norway (Tables BR-1 and CO-2).

From the cohorts of the 1930s to those born in 1960 total cohort fertility was increasing modestly in Estonia from about 1.8 children per woman to 2.0, and in Latvia from 1.8 to 1.9 (Table BR-1 and Figures BR-1 and BR-2). In Lithuania between the cohort of 1940 and that of 1960 there was a small decline. Possibly more important than the trends was the fact that in all three countries the TCFRs were continuously below replacement. Starting with the cohorts born around 1960 a decline in the TCFRs set in. Estimates of the TCFRs for the cohorts born in the mid-1960s were 1.8 for Estonia and Latvia and 1.7 for Lithuania.

With regard to trends there was a considerable difference between the Baltic and the Nordic countries. Relative stability in the former compared to a decline of completed cohort fertility in the latter, in particular from the cohorts born around

*Table BR-1. Total cohort fertility rates (TCFRs), Baltic countries, birth cohorts 1934, 1940, 1950, 1960 and 1965*

| Country | Total fertility rates of cohorts born in | | | | | Annual change of TCFRs between birth cohorts (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1934[a] | 1940[a] | 1950 | 1960 | 1965 | 1934-40 | 1940-50 | 1950-60 | 1960-65 |
| Estonia | 1.84 | 1.93 | 1.974 | 2.034 | 1.827 | 0.8 | 0.2 | 0.3 | -2.1 |
| Latvia | 1.78 | 1.76 | 1.870 | 1.940 | 1.757 | -0.2 | 0.6 | 0.4 | -2.0 |
| Lithuania | … | 1.97 | 2.008 | 1.880 | 1.695 | … | 0.2 | -0.7 | -2.1 |

Note: [a] Estimates.

[47] The estimates were computed by W. Kingkade based on incomplete time series of single-year data on births by age of mother, which have been compiled by the Estonian Interuniversity Population Research Centre under the leadership of K. Katus.

1930 to those born in 1950 (Table CO-2). The level of the TCFRs of the 1950s was within a very narrow range slightly below replacement in both groups of countries (Figures NR-1 and BR-1).

The levels and trends of the TCFRs in the formerly socialist countries of central and eastern Europe were quite similar to those in the Baltic countries (Figures ECE-1, EE-1 and BR-1). There were subtle differences. For instance, the TCFRs in the Russian Federation from the cohorts of the late 1930s to the 1960 cohort displayed a minor decline compared to the moderate increase in the Baltic countries. In the Czech Republic the long-term trend exhibited a moderate decline up to the cohorts of the late 1950s. But all told, both sets of countries had much in common, namely stable TCFRs moderately below the replacement level through the late 1950s and a decline in completed fertility among the cohorts of the 1960s.

Trends of completed fertility were accompanied with changing age patterns. To begin with, a comparison of the proportion of childbearing during the first half of the reproductive period with that of the second half provides a crude measure of the changing age patterns (Table BR-2).

The proportion of women having children early in the reproductive period was increasing from one generation to the next. The cohorts born around 1940 were having about one half of their children by the 27$^{th}$ birthday, whereas those born 20 to 25 years later realized around 70 per cent of their eventual TCFR by that age (Table BR-2). In the Nordic countries starting with the cohorts of the 1940s through those of the 1960s fertility was shifting from early in the reproductive period, i.e. when women were in their 10s and lower 20s, to later in their life when they reached their upper 20s and 30s. The 1960s cohorts in the

*Table BR-2. The proportion of total cohort fertility completed by 27$^{th}$ birthday, Baltic countries, birth cohorts 1940, 1950, 1960, 1965*

| Country | Proportion of total cohort fertility completed up to 27$^{th}$ birthday of cohort born in | | | | Annual change between birth cohorts (per cent) | | |
|---|---|---|---|---|---|---|---|
| | 1940[a] | 1950 | 1960 | 1965 | 1940-50 | 1950-60 | 1960-65 |
| Estonia | 54.6 | 62.5 | 68.8 | 71.4 | 1.4 | 1.0 | 0.7 |
| Latvia | 53.2 | 61.2 | 67.9 | 72.0 | 1.4 | 1.0 | 1.2 |
| Lithuania | 48.6 | 59.6 | 65.1 | 67.5 | 2.0 | 0.9 | 0.7 |

Note: [a] Estimates.

Nordic countries were having only about 40 per cent of their children during their 10s and early to mid-20s. In this respect women in the Baltic countries were behaving similarly as in the formerly socialist countries of central and East European countries (Table CO-3).

The differences between the fertility behavior of the 1950 and the 1960 cohorts demonstrate in greater detail what was taking place (Table BR-3). In the Baltic countries a comparison of the CCFR up to the 27th birthday of the 1960 cohort with that of the 1950 cohort indicates an increase in all three countries. This means that women of the 1960 cohort in the Baltic countries were bearing more children earlier in life; this can be perceived of as a surplus of children borne by these women when they were young. When the women of the 1960 cohorts in the Baltic countries became older, namely in their late 20s and in their 30s they decided to have fewer children than their ten years older compatriots; this can be labeled as a deficit in childbearing of these women. The shift ratio in the last column of Table BR-3 indicates that in all three Baltic countries women of the 1960 cohort had advanced their childbearing in comparison to the 1950 cohort. In Estonia and Latvia the surplus of childbearing when the women were young was larger than the deficit when they were older. In Lithuania the increase in childbearing when women were young represented only a small proportion, 18 per cent, of the deficit when they were older.

An even more detailed picture is gained by comparing age-specific fertility rates (Figure BR-3). In Estonia and Latvia the 1960 curve for women in their 20s was above that of the 1950 curve. The individual age-specific fertility rates were 10 to 30 per cent higher at ages 20 to 24 in the 1960 cohorts. Between the ages of 33 and 37 the age-specific fertility rates were 40 or more per cent lower in the

*Table BR-3. Cumulated cohort fertility rates, before and after the 27th birthday, and shift ratios[a], Baltic countries, birth cohorts 1950 and 1960*

| Country | CCFRs up to 27th birthday | | | CCFRs after 27th birthday | | | Shift ratio (Advancement in parentheses; postponement without parentheses) |
|---|---|---|---|---|---|---|---|
| | 1950 | 1960 | 1960 minus 1950 | 1950 | 1960 | 1960 minus 1950 | |
| Estonia | 1.235 | 1.400 | 0.165 | 0.740 | 0.635 | -0.105 | (157) |
| Latvia | 1.144 | 1.318 | 0.174 | 0.726 | 0.622 | -0.103 | (168) |
| Lithuania | 1.196 | 1.224 | 0.029 | 0.812 | 0.656 | -0.156 | (18) |

Note: [a] Ratio of childbearing surplus or deficit of women before and after 27th birthday.

1960 cohort. In Lithuania life-time age patterns of cohort fertility did not differ much between the 1950 and the 1960 cohorts.

In contrast to the Baltic countries, women of the 1960 cohorts in the Nordic countries were compensating later in their reproductive periods for the deficits incurred when they were young (Table CO-6 and Chapter 3).

In the central and East European countries age patterns of childbearing differed from one country to another. Women in the Russian Federation were behaving similarly to women in the Baltic countries. The 1960 cohort was bearing more children when young, but less after the 27$^{th}$ birthday (Table CO-6). In the Czech Republic fertility was declining in the 1960 cohort before and after the 27$^{th}$ birthday. In Hungary the fertility decline when women were young was very small compared to the increase when they were older. In numerical terms this appears as a large overcompensation in the last but one column of Table CO-6.

In absolute terms, in the Baltic countries young women were bearing considerably more children when in their teens and early to mid-20s than in the Nordic countries, and roughly equally as many as in the formerly socialist countries of central and eastern Europe. In the Baltic countries by the 27$^{th}$ birthday women of the 1965 cohorts had borne 1.1 to 1.3 children compared to 0.7 to 0.8 in the Nordic countries, a difference of 35 to 90 per cent.

There were numerous powerful motivations in the societal milieu of the formerly socialist countries for women and couples to marry early and to bear children when relatively young. To name but two of the more important ones. In all of the formerly socialist countries there was a shortage of housing and most of it was government owned, controlled and distributed. The prospect for obtaining an apartment for rent was infinitely better for those young people who were married and had a child or children.

There was one incentive for early marriage and childbearing in the Baltic republics of the former Soviet Union which was not present in the central European countries that were relatively less politically dependent on Moscow. Young men in the Baltic republics who were married and especially those with children were less likely to be drafted into the Soviet army. And many young Estonian, Latvian and Lithuanian men did all they could to avoid the obligation to serve for two to three years in the Soviet army.

The next step is to analyze fertility behavior of the cohorts which were in the middle or at the onset of their reproductive periods. In all three countries, starting with the cohorts of the mid-1930s through those born around 1960 fertility of young women up to their 27th birthday was increasing (Table BR-4). Among the cohorts of the 1960s childbearing of young women started to decline, and among the cohorts born in the early 1970s the rate of descent accelerated. Such declines of fertility were experienced also in many of the other countries under study. While the declines in childbearing among young women of the 1960s cohorts and even the rates of change were similar in most countries, the level of fertility continued to be higher in the Baltic countries compared, for instance, to the Nordic ones. In the 1973 cohorts 0.9 children were borne by young women before their 27th birthday in the Baltic countries, but only around 0.6 in the Nordic countries (Table CO-7).

The changes of reproductive behaviour among the cohorts of the 1960s were reflected in trends of the mean age of cohort childbearing (Figure BR-4 and Appendix B). It reached its lowest point in Estonia and Latvia at 25.3 years among the birth cohorts of the mid-1960s and thereafter started to increase. In Lithuania the mean age of cohort childbearing was still declining throughout the cohorts of the 1960s.

For the most part fertility of the youngest women up to their 22nd birthday was quite steady or even increasing among the cohorts of the 1960s (Table BR-5). Among the cohorts of the 1970s there was an evident decline of fertility among the youngest women. Childbearing was declining at a rapid rate among the cohorts of the early 1970s and the descent accelerated in the late 1970s.

In all three countries the age-specific fertility rates of women in the 1975 cohorts in their early 20s were much lower than in the 1970 cohorts (Figure BR-5) and cumulated fertility was declining from one cohort to the next not only among the cohorts of the 1970s, but already in the cohorts of the 1960s (Figure BR-6). In Estonia and Latvia the CCFR by age 30 in the 1970 cohorts was about 25 per cent lower than in the 1960 one; in Lithuania the difference between the two cohorts was 13 per cent.

Note the tendency towards a certain postponement of births in Figure BR-5. The tail ends of the curves for the 1965 and the 1970 cohorts were always above the

*Table BR-4. Cumulated cohort fertility rates (CCFRs) up to 27th birthday, Baltic countries, birth cohorts 1934, 1940, 1950, 1960, 1970 and 1973*

| Country | CCFRs up to 27th birthday | | | | | | Annual change between birth cohorts (per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1934[a] | 1940[a] | 1950 | 1960 | 1970 | 1973 | 1934-40 | 1940-50 | 1950-60 | 1960-70 | 1970-73 |
| Estonia | 0.953 | 1.032 | 1.235 | 1.400 | 1.050 | 0.911 | 1.3 | 1.8 | 1.3 | -2.9 | -4.7 |
| Latvia | 0.889 | 0.896 | 1.144 | 1.318 | 1.045 | 0.905 | 0.1 | 2.4 | 1.4 | -2.3 | -4.8 |
| Lithuania | … | 0.966 | 1.196 | 1.224 | 1.101 | 0.938 | … | 2.1 | 0.2 | -1.1 | -5.4 |

Note: [a] Estimates.

*Table BR-5. Cumulated cohort fertility rates (CCFRs) up to 22nd birthday, Baltic countries, birth cohorts 1934, 1940, 1950, 1960, 1970, 1975 and 1978*

| Country | CCFRs up to 22nd birthday | | | | | | | Annual change of CCFRs between birth cohorts (per cent) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1934[a] | 1940[a] | 1950[a] | 1960 | 1970 | 1975 | 1978 | 1934-40 | 1940-50 | 1950-60 | 1960-70 | 1970-75 | 1975-78 |
| Estonia | 0.288 | 0.334 | 0.433 | 0.558 | 0.530 | 0.392 | 0.314 | 2.5 | 2.6 | 2.5 | -0.5 | -6.0 | -7.4 |
| Latvia | 0.237 | 0.284 | 0.393 | 0.508 | 0.541 | 0.358 | 0.261 | 3.0 | 3.2 | 2.6 | 0.6 | -8.2 | -10.5 |
| Lithuania | … | … | 0.399 | 0.409 | 0.499 | 0.417 | 0.341 | … | … | 0.3 | 2.0 | -3.6 | -6.7 |

Note: [a] Estimates.

*Table BR-6. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Estonia, Latvia and Lithuania, cohorts 1960, 1965, 1970, 1975 and 1980*

*A. Estonia*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.934 | 1.706 | … | … | … | 6 | -10 | … | … | … |
| 30 | 1.726 | 1.504 | 1.264 | … | … | 13 | -5 | -27 | … | … |
| 25 | 1.114 | 1.084 | 0.877 | 0.663 | … | … | 7 | -21 | -39 | … |
| 20 | 0.214 | 0.192 | 0.218 | 0.203 | 0.141 | … | 8 | 2 | 6 | -35 |

*B. Latvia*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.841 | 1.644 | … | … | … | ... | -5 | … | … | … |
| 30 | 1.620 | 1.467 | 1.237 | … | … | ... | 4 | -24 | … | … |
| 25 | 1.031 | 1.036 | 0.889 | 0.616 | … | ... | 21 | -14 | -41 | … |
| 20 | 0.191 | 0.195 | 0.230 | 0.181 | 0.100 | ... | 41 | 20 | -7 | -56 |

*C. Lithuania*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 1.773 | 1.584 | … | … | … | -4 | -13 | … | … | … |
| 30 | 1.530 | 1.376 | 1.326 | … | … | 1 | -9 | -13 | … | … |
| 25 | 0.915 | 0.889 | 0.906 | 0.720 | … | 2 | 1 | -1 | -19 | … |
| 20 | 0.140 | 0.103 | 0.173 | 0.202 | 0.140 | 27 | -13 | 24 | 96 | -20 |

curves of the cohorts five years older. At the same time, there were no signs that fertility of women in the cohorts of the 1960s might be inclined to have significantly higher fertility when they will be in their 30s. The curves of cumulated fertility of the 1960 cohorts in all three countries in Figure BR-6 were on a downward slope when these women were in their early 30s and flat when in their late 30s. The curves of the 1965 cohorts were on declining slopes when women were in their early 30s similarly as the curves of the 1970 cohorts in their late 20s.

Given the low and declining fertility of young women born around 1970, it would be extremely difficult and rather unlikely for them to catch up with the completed fertility of the 1960 cohorts, which was between 1.9 and 2.0 births

per woman. An even more challenging goal would be to reach replacement fertility. For the 1970 cohorts to catch up with the TCFRs of the 1960 cohorts, childbearing of women in their late 20s and 30s would have to increase by 19, 44 and 55 per cent in Lithuania, Latvia and Estonia, respectively. To reach replacement fertility the increases in childbearing of older women would have to be 52, 70 and 65 per cent, in the respective countries (Table CO-8 [Chapter 12]).

Regarding parity distributions, only the estimates based on incomplete data were available. These calculations indicate remarkably steady parity distributions from the birth cohorts of the mid-1930s through those born around 1960. In Estonia almost 50 per cent of all women were having two children and in Latvia this proportion was a little less, namely between 40 and 45 per cent. The two-child family was the norm for all these cohorts. Not too far behind in both countries were women who were having one child — around 30 to 35 per cent. Childlessness among these cohorts was between five and ten per cent of all women.

Parity distributions were starting to change among the cohorts of the 1960s. In particular the proportions of women not having any children were apparently increasing among these cohorts. This was a major change and indicates that the stable parity distribution of the past was about to undergo significant changes.

## 10.3 | Conclusions

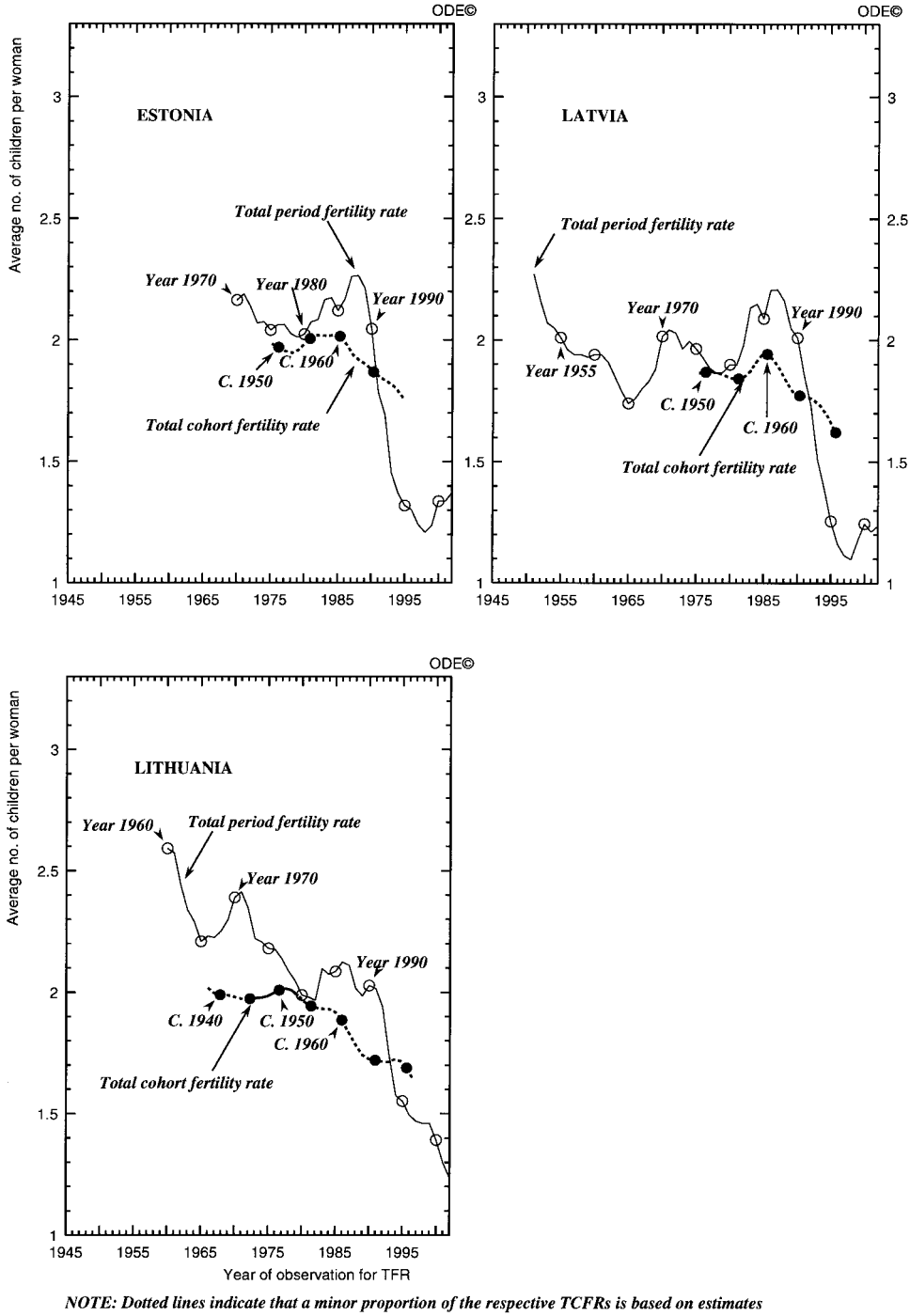
Since the early 1940s harsh political realities affected fertility behavior of the populations in the Baltic countries possibly more profoundly than elsewhere. Total cohort fertility rates of the cohorts born in the 1930s through the 1950s were among the lowest in Europe. The Baltic countries did not experience a post-war fertility increase presumably due to the Soviet oppression and mass deportations of the population. In general, fertility was relatively low yet moderately increasing from the cohorts of the mid-1930s through those of the late 1950s. National independence and the change of the political, economic and social systems initiated a new regime of fertility behavior. Powerful motivations for early childbearing disappeared in the 1990s and a new institutional and social environment for childbearing was emerging. At the turn of the century, cohort fertility was declining and appeared likely to remain low and probably continue to decrease in the foreseeable future.

The following specific developments corroborate this general conclusion:

- Subsequent to moderate increases for about 25 cohorts, completed fertility started to decline with the cohorts born in the 1960s;
- Most children, around 70 per cent, in the cohorts of the mid-1960s were still borne by young women;
- Childbearing of young women before their 27th birthday was increasing moderately up to the cohorts of the late 1950s. This trend was reversed by the 1960s cohorts, among which fertility started to decrease and the decline accelerated among the cohorts of the early 1970s;
- Childbearing of the youngest women before their 22nd birthday was increasing even among the cohorts of the 1960s, cohorts which still started to bear children under the socialist system. Subsequently, fertility of the youngest women fell rapidly among the cohorts of the early 1970s and the decline became even faster among the cohorts of the late 1970s;
- Parity distributions were stable from the cohorts of the 1930s through those of the early 1960s with the two-child norm prevailing. Childlessness was stable and low through the cohorts of the early 1960s, but began to increase among those of the late 1960s, an indication of imminent changes in the parity distributions.

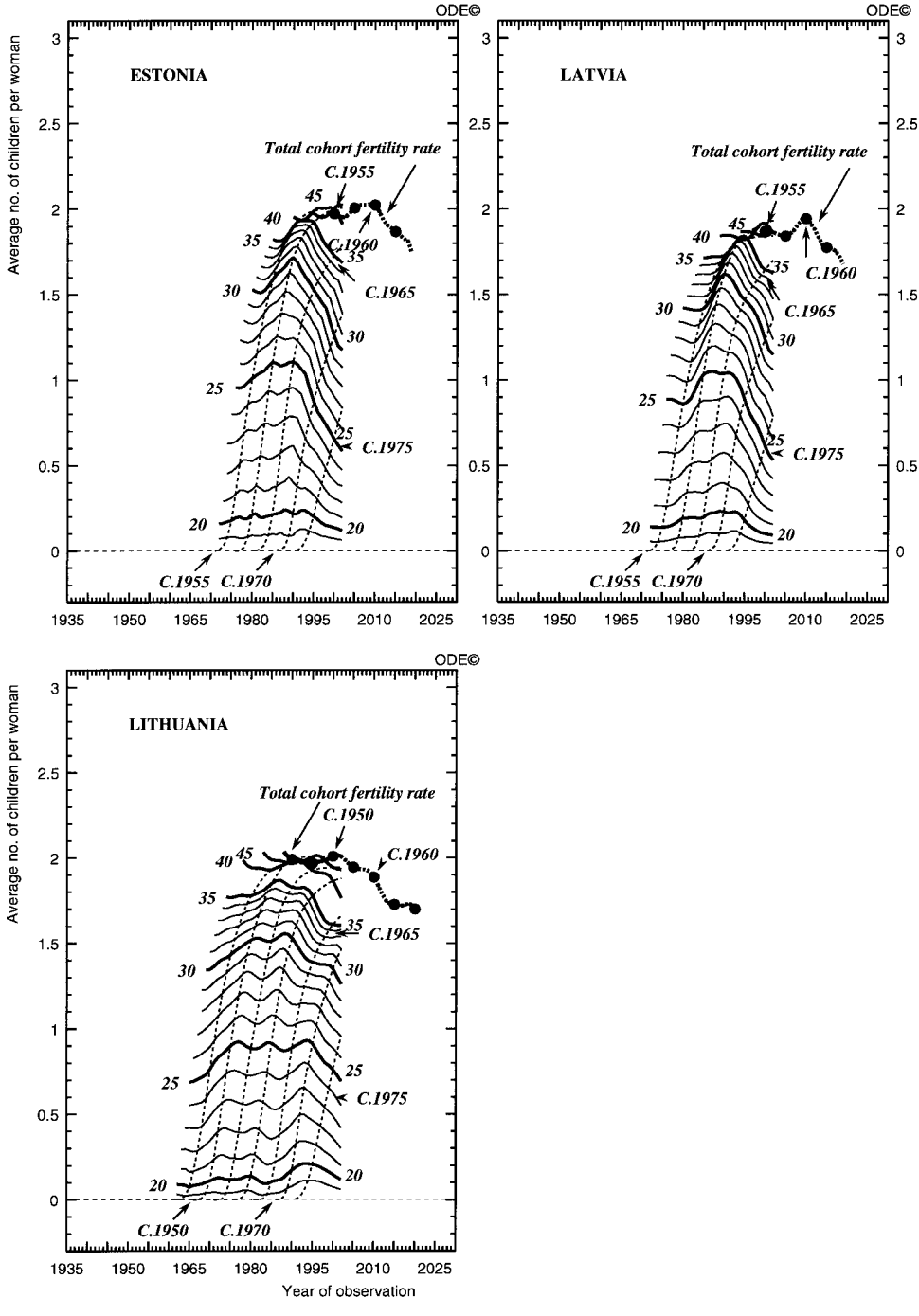
At the turn of the century new lifetime patterns of fertility were in the making. Women who were in their early 30s in 2000, those born in the late 1960s, are likely to wind up with total cohort fertility rates of no more than 1.7 births per woman. Fertility of women born in the 1970s was very low during their teens and early to mid-20s so that they would have to have extraordinarily high fertility during their 30s to catch up with older cohorts. Their completed fertility is likely to be lower, possibly 1.5 births per woman or less.

**Figure BR-1 BALTIC REGION, 1950-2000**
**Total period fertility rate and total cohort fertility rate lagged by the average age at childbearing**




*NOTE: Dotted lines indicate that a minor proportion of the respective TCFRs is based on estimates*

**Figure BR-2 BALTIC REGION**
**Cumulated cohort fertility at specified ages, birth cohorts 1945-1975**




*NOTE: The part of the TCFR line which is dotted indicates that a minor proportion of the TCFR is based on estimates*

**Figure BR-3 BALTIC REGION**
**Age-specific fertility rates, birth cohorts 1930, 1940, 1950 and 1960**

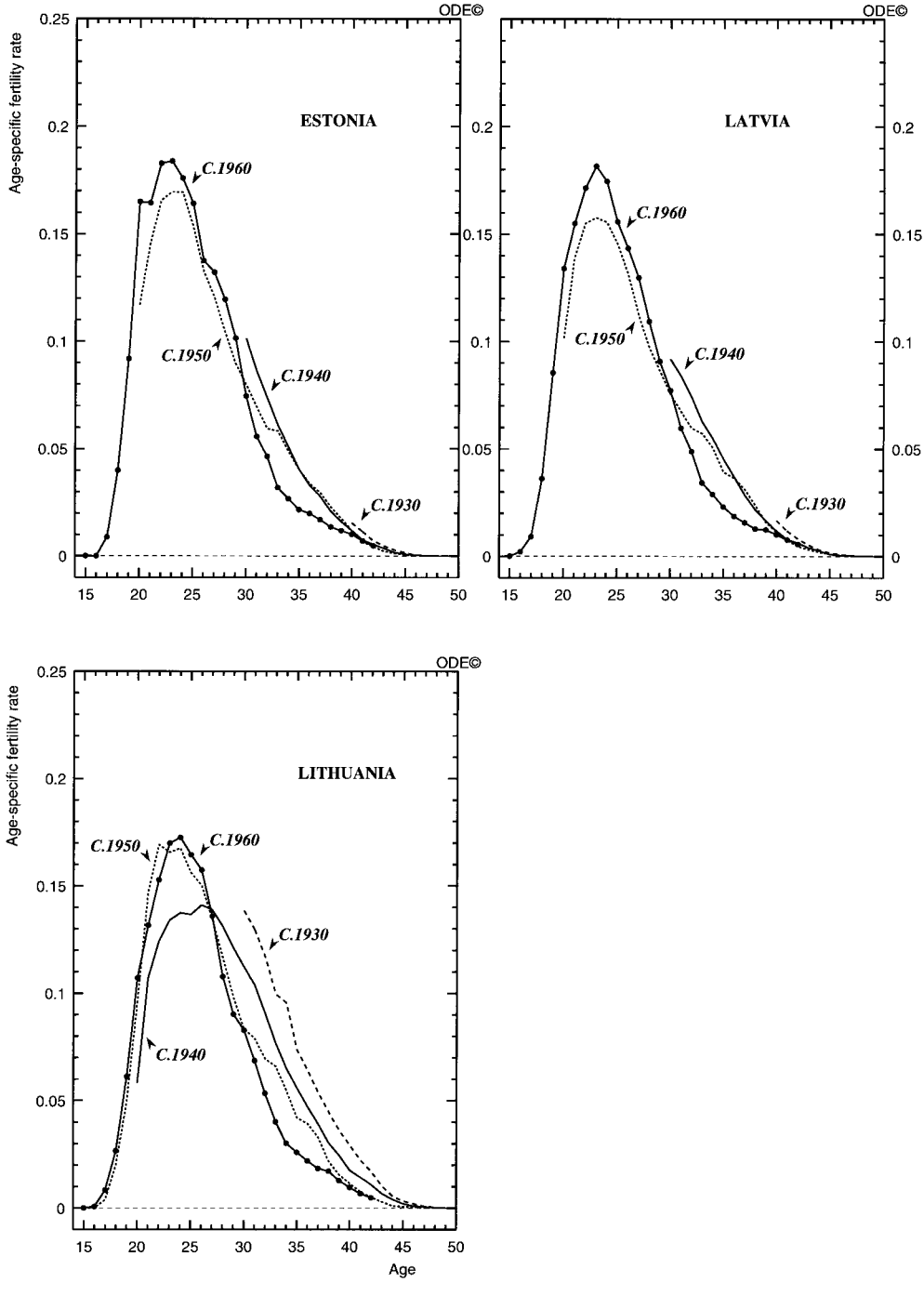
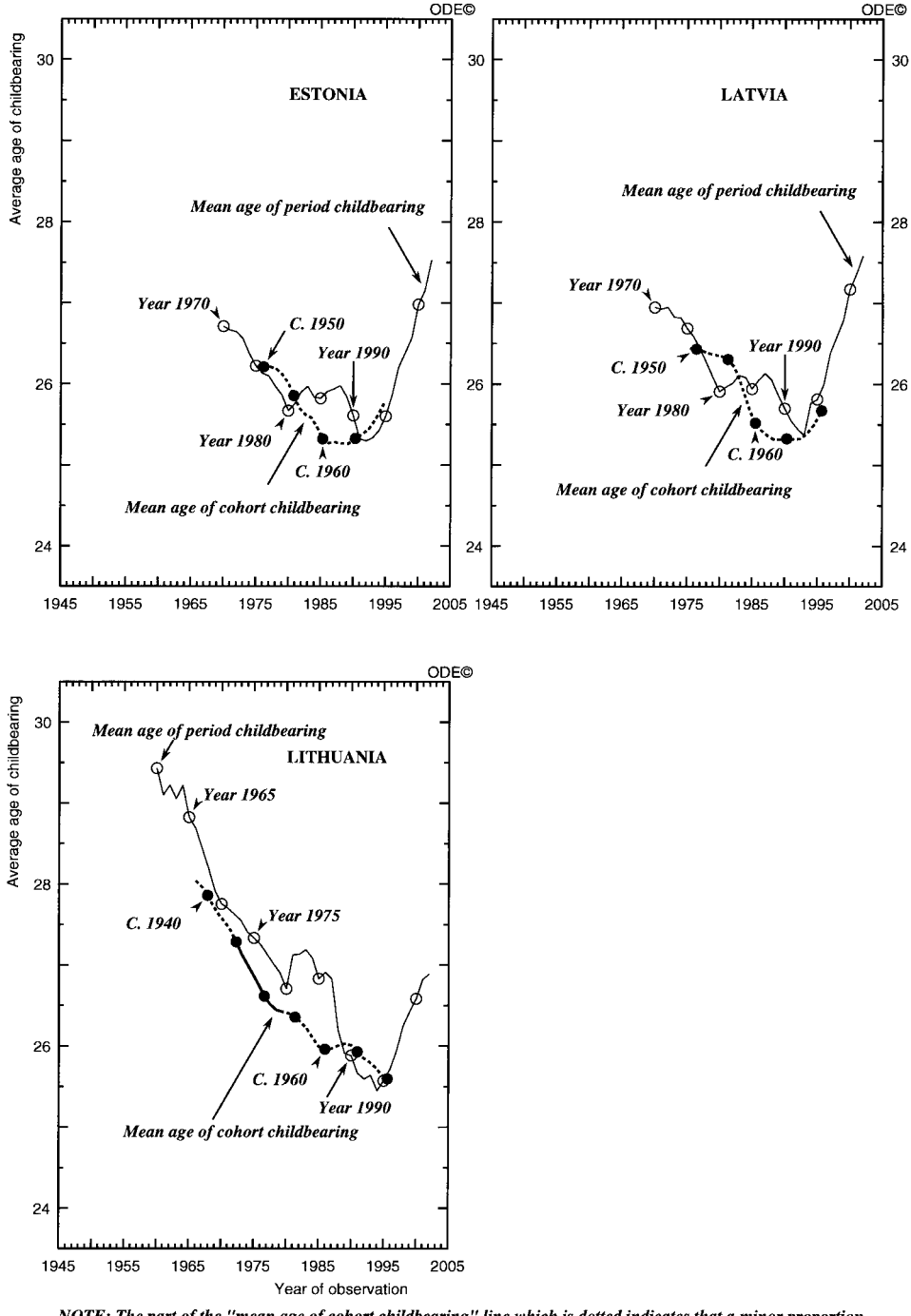


**Figure BR-4 BALTIC REGION, 1945-2000**
**Period average age of childbearing and cohort average age of childbearing lagged by the average age at childbearing**




*NOTE: The part of the "mean age of cohort childbearing" line which is dotted indicates that a minor proportion of the respective age-specific rates are based on estimates*

**Figure BR-5 BALTIC REGION**
**Age-specific fertility rates, birth cohorts 1960, 1965, 1970, 1975 and 1980**

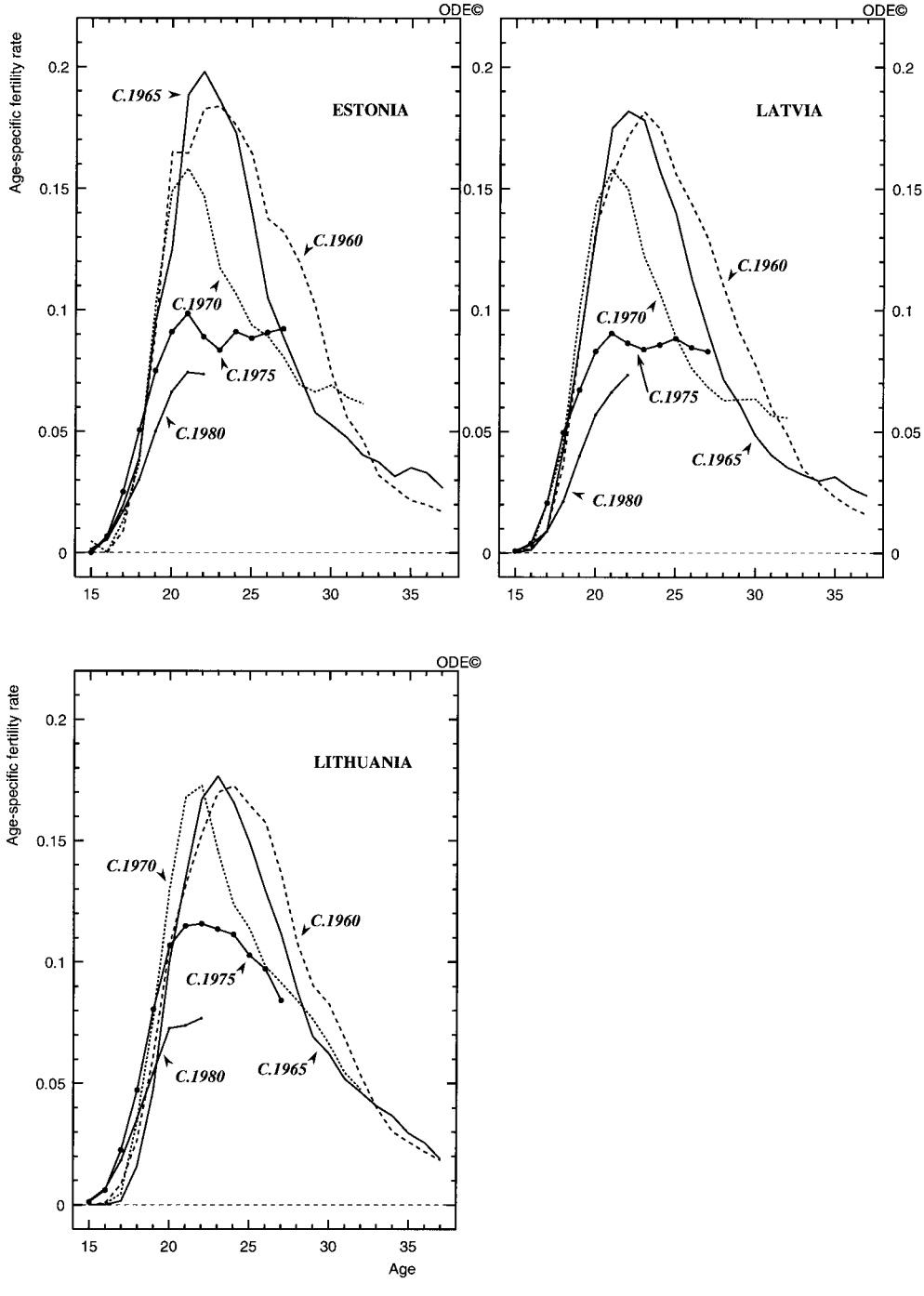
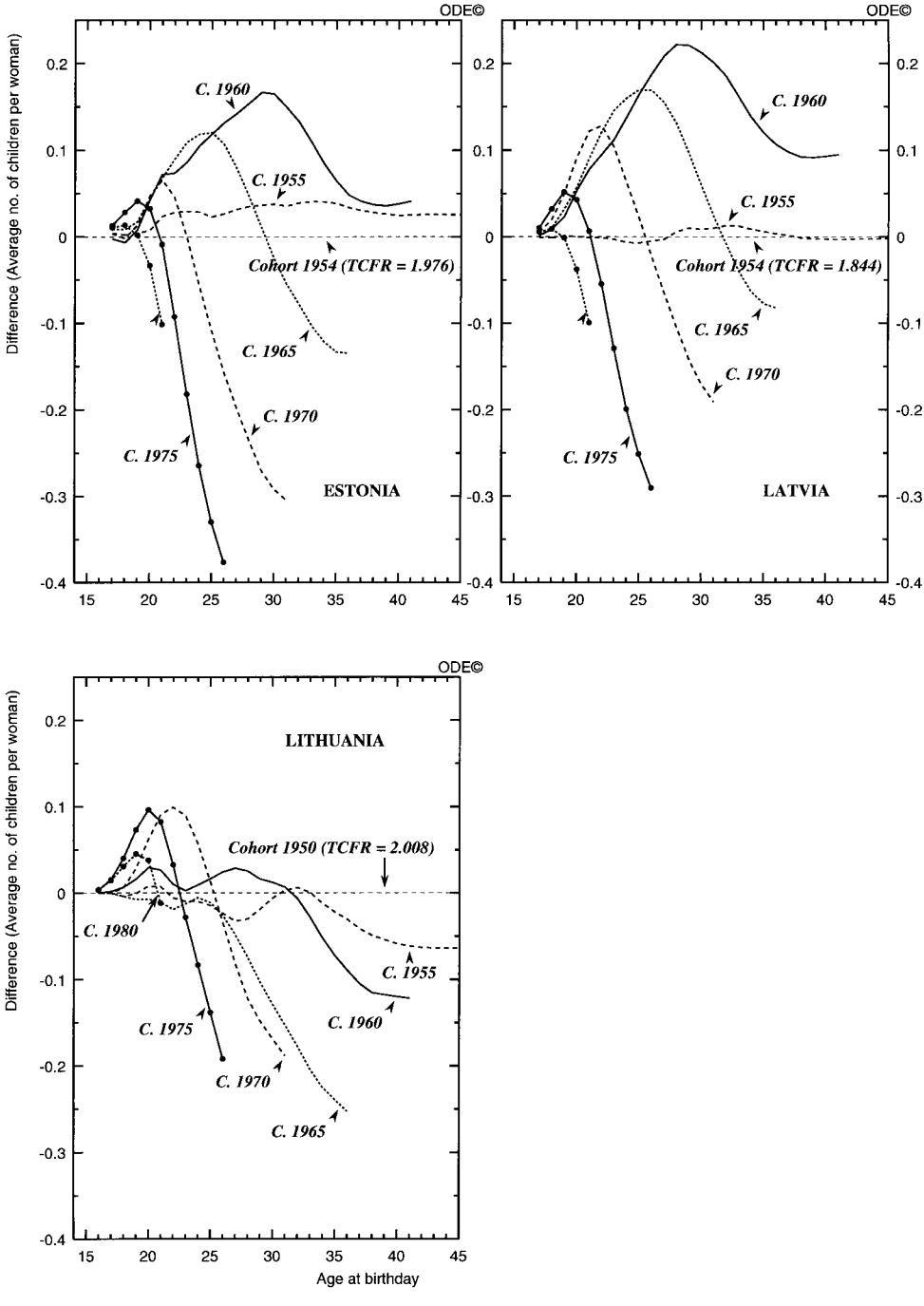


**Figure BR-6 BALTIC REGION**
**Differences in cumulative age-specific cohort fertility rates between base and subsequent cohorts, women born in 1950 (base), 1955, 1960, 1965, 1970, 1975 and 1980**



# 11. Non-European countries

In this chapter we are dealing with the four large overseas countries with populations predominantly of European origin —Australia, Canada, New Zealand and the United States of America— and with Japan.

When starting out on the project, the original intention was to have one chapter on the large English speaking overseas countries and another one on South and East Asian countries that were economically advanced, had low fertility at the end of the 20th century and had long enough series of appropriate fertility data. Such a chapter would have analyzed the developments in Hong Kong, Japan, Singapore and Taiwan. In the end we managed to obtain data only for Japan. Faced with the choice of a separate chapter for one country or including Japan with the other overseas countries, we decided on the latter. Consequently, the aimed for relative homogeneity of populations analyzed in individual chapters was to some extent violated. Japan fits into this chapter with regard to a number of institutional factors, such as economic history, wealth and educational profile, however, its cultural heritage and demographic history were rather different.

During the second half of the 20th century all five countries were among the most successful economies in the world, albeit with periodic interruptions of recessions. They were among the wealthiest countries in the world, with the exception of New Zealand which had a per capita GNI at the level of South European countries.[48] In general, they all developed as modern capitalist welfare states, although each with distinct characteristics. The redistribution of income by the state or through other mechanisms was more effective in Japan, New Zealand and Canada. These were also the countries with more equitable income

[48] Gross national income per capita in purchasing power parity in 2000 was $ 25,370 in Australia, $ 27,330 in Canada, $ 26,460 in Japan, $ 18,780 in New Zealand and $ 34,260 in the United States (World Bank 2002).

distributions as reflected in lower Gini coefficients.[49] Political affairs in the four English speaking countries were handled within the frameworks of traditional western style democratic institutions, which were gradually being adopted in Japan. All five countries had increasingly well educated populations. Major social changes were also under way. The civil rights movement in the United States significantly altered race relations, although many differences of educational attainment, income levels and living conditions persist. Gender relations changed in all the countries concerned, but if, for instance, North European standards are considered as desirable much remains to be achieved.

Fertility levels and trends in the overseas countries with predominantly European populations were as homogeneous as in a number of the other regions explored as will be described and analyzed in the country studies that follow.

## 11.1 | Australia

"Overall fertility declined continuously in Australia during the second half of the nineteenth century" mainly due to marriage postponement (Caldwell and Ruzicka 1978). The descent continued without interruption into the mid-1930s reaching a total period fertility rate of 2.1, i.e. below replacement, similarly as in many European countries (Chesnais 1992). An increase started in the mid-1930s which puts into question whether the term 'post-war baby boom' applies. Total period fertility rates above three births per woman persisted from the late 1940s through the early 1960s. The peak TPFR of 3.6 was reached in 1961. A rapid decline ensued during the next 15 years and in 1976 replacement level TPFR of 2.1 was attained. The descent continued through 1980 which was followed by a plateau around 1.9 that lasted till 1992. Since then another moderate decline has been in progress (Figure NEC-1). In 2000 the TPFR stood at 1.75.

The mid-century Australian baby boom and the subsequent long-term fertility decline took place within the context of profound changes in social, economic and cultural conditions without any intentional policy influences. Increasing proportions of women continued their education into their late teens or early 20s and then became employed. The proportion of households with both spouses

[49] Japan had a Gini coefficient of 24.9 in 1993 and Canada 31.5 in 1994; Australia's was 35.2 in 1994 and in the United States it was 40.8 in 1997; no data were available on this measure for New Zealand (World Bank 2002).

working grew. Real incomes increased and reached $ 25,370 in per capita gross national income in purchasing power parity in 2000 (World Bank 2002). Leisure opportunities expanded. In addition, improved contraceptive technology and easier access to induced abortion enabled more effective prevention or termination of unwanted pregnancies (Jain and McDonald 1997).

Major changes in cohort fertility occurred during the 20th century and these are likely to continue in the first decade of the 21st. Cohorts born around 1900 were those that brought about the end of the first fertility decline which resulted in below replacement period fertility in the 1930s (Caldwell and Ruzicka 1978). Completed fertility for cohorts born between 1902 and 1908 was 2.3 births per woman. Subsequent cohorts experienced a rapid fertility increase so that on average women born between 1927 and 1937 all had more than three children. Ever since fertility has been declining from one cohort to the next. At first the decline was relatively fast from 3.1 of the 1933 cohort to 2.4 in the 1947 cohort. For the following cohorts the descent was slower but continuous. Robust estimates indicate that the cohort born in 1961 will be the first to attain replacement level fertility, 2.1 births per woman, and apparently the TCFRs will continue descending (Figures NEC-1 and NEC-2).

Age patterns of childbearing changed from one cohort to the next during the second half of the 20th century as the TCFRs were decreasing (Figure NEC-3). Among women born during the 1930s childbearing was shifting into the younger ages; fertility was declining at all ages above 24 (Table AUS-1). It was particularly pronounced among women over 30. Comparing the 1940 cohort with that of 1930, fertility for all ages between 32 and 46 was from 30 to almost 60 per cent lower for the 1940 cohort. At the same time, fertility of young women was on the rise. The age-specific fertility rates for women under 20 increased between 30 and 90 per cent and the average age of childbearing declined from age 27.5 to 26.1 (Figure NEC-4).

The age pattern of childbearing started to be different with the cohorts born around 1940. It was mainly the cohorts born in the late 1940s that started to postpone part of their childbearing until they were older. The propensity to delay births was in its initial stage. Women in their 20s and early 30s had considerably fewer births than previous cohorts (Figure NEC-3 and Table AUS-1). For women between 21 and 30 fertility was 20 to 30 per cent lower in the 1950 cohort compared to the cohort ten years older. In relative terms, the

*Table AUS-1. Fertility deficits and surpluses comparing birth cohorts, Australia, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 25-49 | -0.450 | 19-32 | -0.526 | 16-28 | -0.430 |
| Surplus | 15-24 | +0.187 | 15-18 | +0.022 | 15 | +0.001 |
| | | | 33-49 | +0.041 | 29-49[a] | +0.218 |
| Total | | -0.263 | | -0.463 | | -0.211 |

Note: [a] Includes estimated data for ages 38-49 in 1960 cohort, which were very small.

increase of fertility between the ages of 39 and 44 compared to the 1940 cohort was considerable: from 30 to 40 per cent. However, as only few women have children at this age, in absolute terms the increased fertility did not make up the childbearing deficit which these women experienced when they were younger (Table AUS-1). The fertility delay was also evident in the increase of the mean age of childbearing: from 26.1 in the 1946 cohort to 26.4 in the 1950 cohort.

The shift of childbearing to higher ages continued forcefully among the birth cohorts of the 1950s. The age-specific fertility curve for the 1960 cohort clearly shifted to the right with a fertility peak between the ages of 26 and 29, whereas the peak fertility of the 1950 cohort was at age 24. At ages 18 to 23, women of the 1960 birth cohort had considerably lower fertility than the cohort ten years older. At ages 19 to 21 fertility of the 1960 cohort was about half the size of women only ten years older (Figure NEC-3). On the other hand, once these women were in their mid- to late 30s their fertility was 30 to 60 per cent above that of the 1950 cohort. Figure NEC-3 illustrates how pronounced the age shift was for the 1960 birth cohort. Despite the transfer of childbearing into the higher ages robust estimates of TCFRs for the early 1960s cohorts indicate that cohort fertility is likely to continue in its decline.

The increase in fertility of older women born during the late 1940s and 1950s was considerable but never large enough to make up the fertility deficits incurred when they were younger (Table AUS-1).

Data available for cohorts that had not completed their childbearing by the late 1990s illustrate that each successive cohort was experiencing lower fertility than the previous one (Figures NEC-5 and NEC-6 and Table AUS-2). By age 32, the

*Table AUS-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Australia, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility rate of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 37 | 1.999 | … | … | … | -11 | … | … | … |
| 32 | 1.603 | 1.436 | … | … | -19 | -19 | … | … |
| 27 | 0.937 | 0.783 | 0.661 | … | -31 | -31 | -29 | … |
| 22 | 0.306 | 0.253 | 0.214 | 0.201 | -42 | -42 | -30 | -20 |

1965 birth cohort had 19 per cent fewer children than the cohort ten years older, and by age 27 the 1970 cohort had 0.3, i.e. 29 per cent, fewer children than the 1960 cohort.

In sum, cohort fertility was on a descending trend with the 1961 birth cohort being the first one with below replacement fertility. In all probability this trend will continue at least for another 10-15 birth cohorts, judging from the fertility behavior of younger cohorts and the fact that despite a propensity for women to increase their childbearing when older so far they have never had sufficient births to catch up with previous cohorts. Among the cohorts of the 1950s about one half of the fertility deficit of women when they were young was offset when they were older (Tables AUS-1 and CO-6 [Chapter 12]). For the cohorts born in the early 1960s it was estimated that the fertility surplus of women when older will offset less than one tenth of the earlier deficit (Table CO-6).

## 11.2 | Canada

For several decades in the late 19th and early 20th centuries fertility in Canada was among the highest compared to the other overseas countries whose populations came mostly from Europe and particularly in comparison to west European countries (Chesnais 1992). Even though the total period fertility rate (TPFR) declined substantially during the early 20th century, from 4.8 in 1901-1905 to 2.7 in the late 1930s, it remained among the highest.

Period fertility was rising during the early 1940s and particularly after the war Canada experienced one of the most potent baby-booms in the western world. From 1954 to 1962 the TPFR was between 3.8 and 3.9 births per woman (Figure NEC-1). The peak was followed by one of the most precipitous fertility

declines from 3.9 in 1960 to 1.9 in 1973. The TPFR continued its descent thereafter, but at a slower pace, reaching 1.6 in the mid-1980s. After a slight increase to 1.7 in the early 1990s, the TPFR declined to 1.5 in the late 1990s.

As in the other overseas countries with populations of mostly European origin, the birth cohorts of the 1920s and early 1930s experienced completed fertility in excess of three births per woman (Figures NEC-1, NEC-2 and CO-1 [Chapter 12]). The highest total cohort fertility rate of 3.4 was reached by women born in 1930. All subsequent cohorts, one after another, had lower fertility. The decline was steep among those born during the 1930s and early 1940s. The TCFR of the cohorts born around 1945 was at the replacement level of 2.1 births per woman, a difference of 1.3 births per woman compared to the TCFR of the 1930 cohort. Among the cohorts of the late 1940s through those of the early 1960s the descent was milder but continuous and the estimates for the latter cohorts indicate TCFRs around 1.7 to 1.8 births per woman.

The fertility trends were intricately interrelated with the far-reaching economic and social transformations taking place during the second half of the 20$^{th}$ century. Canada became a technologically advanced economy with a highly educated and skilled labor force, of which three-quarters were employed in the service sector producing two-thirds of its GDP. Its population ranked among the more affluent with a per capita gross national income in purchasing power parity $ 27,330 (World Bank 2002). The Quebec 'quiet revolution' that began under Premier Jean Lesage during the 1960s and during which the Catholic Church lost much of its influence, especially in the educational system, ranked high among the social changes with a conceivable dampening fertility effect (Dickinson and Young 2000).

Canadian social scientists early on became concerned with the rapid fertility decline that started in the 1960s. In a profound analysis arguably continuing to be valid at the turn of the century, Romaniuc (1984) summarized his findings as follows:

> *"Fewer people are marrying and those who marry do so late in life, and divorce more frequently than in the past. Unintended births have been considerably reduced as a result of the availability of, and the willingness to use, the highly effective modern contraceptive procedures and therapeutic abortion. There are, however, deeper social transformations underlying the downward reappraisals of childbearing targets by couples. One such transformation has to do with the*

*expansion of the roles women play in society, beyond, and sometimes in place of, those traditionally connected with the home and children" (p. 114). And further: "... the decline in fertility has taken place, at least partly, over a period of high youth unemployment, rising inflation, spiraling housing costs, deteriorating relative income of young adults and a sharp rise in labour force participation of young women. .... [these] are ... indicative of the economic climate in which childbearing decisions have to be made" (p. 73).*

Bélanger and Ouellet (2002) almost two decades later in a study comparing United States and Canadian childbearing confirmed that a number of the above conclusions still apply. They emphasized the low incidence of unwanted pregnancies due to convenient access to modern contraception and the use of effective contraceptives in a user-friendly family planning system with a minimum of economic barriers (within the framework of the universal health care system), with contraceptive information available to all sexually active women, with a positive attitude to oral contraception, and birth control services functioning at high schools. Sterilization became by far the most widely used contraceptive method already in the 1970s with oral contraceptives used mainly to space births (Guibert-Lantoine 1990). Bélanger and Ouellet (2002) also pointed out the high unemployment rates of young people in Canada in the late 1980s and 1990s, and declining real earnings which created an atmosphere of economic insecurity with a presumed negative impact on childbearing. Finally, the relatively low level of religious practice as an indicator of secularism may have impacted on nuptiality patterns and contraceptive practice and thus influenced childbearing in Canada.

The changes in the total number of children borne by women of the various cohorts were accompanied by profound changes in the lifetime childbearing strategies, i.e. the age patterns of cohort fertility. Women born in 1940 compared to the 1930 cohort had higher fertility when young (Figure NEC-3). Between the ages of 16 and 22 the former had 0.2 births per woman more than the latter, but throughout the remainder of their reproductive period the 1940 cohort had considerably fewer births than the women ten years older, a full 1.0 fewer births (Table C-1). The fertility age pattern after the peak at age 23 in the 1940 cohort changed from an outward curving convex-like shape to an inward curving concave shape (Figure NEC-3). The relative differences were considerable. When the women born in 1940 were in their teens, fertility at individual ages was 35 to 80 per cent higher than in the 1930 birth cohort. The differences were

*Table C-1. Fertility deficits and surpluses comparing birth cohorts, Canada, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 23-48 | -0.965 | 16-30 | -0.752 | 17-27 | -0.246 |
| Surplus | 16-22 | +0.184 | 31-48 | +0.050 | 16 | +0.001 |
| | | | | | 29-49[a] | +0.151 |
| Total | | -0.781 | | -0.702 | | -0.094 |

Note: [a] Includes estimated data for ages 38-49 in 1960 cohort, which were very small.

likewise large in the other direction when the women were older. After age 26 the individual age-specific fertility rates were smaller by 30 to 70 per cent. The peak of fertility shifted from age 25 to 23 and the mean age of cohort childbearing declined from age 27.4 to 25.3 (Figure NEC-4). These changes were mainly due to the sharp decline in higher order births (Romaniuc 1984).

Radical changes in the lifetime childbearing strategies continued among women born during the 1940s. Between the ages of 16 and 30, the 1950 birth cohort had almost 0.8 fewer children compared to the 1940 cohort (Figure NEC-3 and Table C-1). Age-specific fertility rates for ages 21 and 22 were lower by more than 50 per cent and the peak of childbearing shifted from age 23 to 25-26, while the mean age started on an upward slope, namely from 25.3 to 26.5 (Figure NEC-4).

The decline of childbearing among young women continued in the cohorts born during the 1950s. By age 27 the 1960 cohort had 0.25 fewer births than the 1950 cohort, however, after age 27 the former cohort had 0.15 more children than the latter (Table C-1). A transformation to later childbearing was under way with the fertility peak shifting from age 26 to a string of years between the ages of 25 and 30, and the mean age of cohort childbearing increased from 26.5 to an estimated 27.8 (Figures NEC-3 and NEC-4).

There were indications that fertility might stabilize among the cohorts that at the end of the century were at the onset or in the middle of their childbearing periods. Fertility differentials between these cohorts were small. The curves of age specific fertility rates illustrating the early stages of the lifetime course of childbearing were quite similar to each other (Figure NEC-5). Differences in the cumulated cohort fertility rates were minor. At age 27 the difference between the 1970 and the 1960 cohort was 0.15 children (Figure NEC-6 and Table C-2).

If the recent past provides any hints about future childbearing of this cohort, it is possible that these women might strive for slightly higher fertility when they will be in their 30s. Also, fertility of the youngest women below age 22 stabilized in the cohorts of the late 1960s and early 1970s (Table C-2).

## 11.3 | Japan

Japan is the only Asian country with a long-standing secular fertility decline reaching into the 19th century (Chesnais, 1992 and Taueber 1958). In 1920 the total period fertility rate (TPFR) was 5.4 births per woman and fertility gradually declined during the remainder of the first half of the 20th century. There were two exceptions: a distinct trough due to the invasion of China in 1938-39 and another one around the end of the Second World War. This was followed by a brief post-war recovery which peaked in 1947 with a TPFR of 4.5. Then came the well known precipitous decline between 1947 and 1957 when Japanese women were among the first to take advantage of liberalized induced abortion legislation and Japan became one of the first countries in the world to reach replacement level fertility in the post-war period (Ogawa and Retherford 1993 and Frejka and Ross, 2001). From 1957 through 1973 the TPFR was quite stable moving within a narrow range of 1.9-2.2 births per woman. In the early 1970s a further slow decline set in and from 1993 to 2000 the TPFR was close to 1.4 (Figure NEC-1). In the late 1990s Japan was below the median among the more than 50 countries with below replacement fertility.

The total cohort fertility rate (TCFR) was extraordinarily stable for women born between 1931 and 1945 at about 2.0 births per woman, slightly below the replacement level. Cohorts born around 1946 experienced a dip as these were

*Table C-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Canada, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility rate of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 37 | 1.721 | … | … | … | -7 | … | … | … |
| 32 | 1.408 | 1.305 | … | … | -13 | -12 | … | … |
| 27 | 0.832 | 0.730 | 0.685 | … | -23 | -23 | -18 | … |
| 22 | 0.285 | 0.231 | 0.239 | 0.237 | -33 | -34 | -16 | 3 |

the women who were 20 years old in 1966, the Year of the Fire Horse traditionally considered an unlucky year to give birth to a girl (Ogawa and Retherford 1993). Cohort fertility then recovered almost to the previous level with women born in the late 1940s and early 1950s having a TCFR of around 1.9. An evident decline in cohort fertility started with women born in 1956. The TCFR of women born in 1962 will apparently be about 1.7 births born per woman, approximately 14 per cent lower than that of the women born five years earlier (Figures NEC-1 and NEC-2).

Japan underwent extraordinary economic and social changes following the Second World War. It became the second most powerful economy in the world with a strong manufacturing sector and by the end of the 20th century two-thirds of its labor force was employed in the service sector producing an equal proportion of its GDP. Despite persistent economic problems during the 1990s, its population had become one of the most affluent in the world with a per capita gross national income in purchasing power parity of $ 26,460 (World Bank 2002). Its population became highly educated and skillful. In 1955 five per cent of women of eligible age were enrolled in institutions of tertiary education as were 15 per cent of men (Ogawa and Retherford 1993). By 1992 these proportions increased to 41 and 37 per cent, for women and men, respectively, the enrollment ratio of women having surpassed that of men. The rising educational levels of women provided a base for their rapidly increasing full-time employment outside the home. Among married women aged 20-24 the proportion working outside the home as paid employees increased from 13 per cent in 1963 to 42 per cent in 1990 (Ogawa and Retherford 1993).

The social and economic developments were accompanied by value changes. Permanent celibacy and divorce became socially acceptable and many young Japanese women remained single. Perceptions regarding costs and benefits of children have undergone major changes. Children are no longer considered important for old-age security or to assist in the family business. Among the major concerns of Japanese parents are the real and perceived high costs of schooling (Ogawa and Retherford 1993). These are among the circumstances underlying declines in proportions married and decreasing marital fertility. Contributing to low fertility is the virtually universal use of contraception, although the Japanese rely extensively on condoms. Therapeutic abortions are easily available and are used as an effective back-up to contraception.

Even though the total cohort fertility rate had remained almost unchanged between the cohorts born around 1930 and those of the mid-1950s (Figure NEC-1) there were interesting changes in the life-time patterns of childbearing, different from all the other low fertility countries. These are difficult to detect in Figure NEC-3 but become clear in conjunction with Table J-1.

The decline of fertility of young women and the shift of some of this fertility into the late 20s and 30s occurred in Japan already among the cohorts of the 1930s. By age 24 the 1940 birth cohort had 0.19 fewer births than the 1930 cohort, and between the ages of 27 and 33 they had 0.13 more births (Table J-1). In virtually all the other western countries there was a notable shift of fertility into the younger ages.

Trends in the mean age of cohort childbearing reflected this peculiarity. In the other western countries the mean age typically declined in the cohorts of the 1930s. In Japan there was an increase of the mean age of childbearing from 27.1 in 1930 to 27.6 in 1935 and it remained at that level through 1940 (Figure NEC-4).

The fertility age patterns of the 1940 and the 1950 cohorts were quite similar except for the distinct interruption in the 1940 curve at age 26, the effect of the Year of the Horse, which was then compensated at age 27.

Changes in the life-time course of cohort fertility between the 1950 and the 1960 cohorts were in line with the other western countries — a considerable decline

*Table J-1. Fertility deficits and surpluses comparing birth cohorts, Japan, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| | 15-24[a] | -0.191 | 15-20 | -0.001 | 15 | -0.000 |
| Deficit | 26 | -0.030 | 25 | -0.004 | 18-29 | -0.342 |
| | 34-49 | -0.038 | 27-33 | -0.078 | | |
| | 25 | +0.021 | 21-24 | +0.028 | 16-17 | +0.000 |
| Surplus | 27-33 | +0.128 | 26 | +0.050 | 30-49[b] | +0.133 |
| | | | 34-49 | +0.041 | | |
| Total | | -0.110 | | +0.036 | | -0.209 |

Notes: [a] Includes estimated data for ages 15-16 which was 0.1 per cent of 1930 TCFR
[b] Includes estimated data for ages 37-49 which was 4.9 per cent of 1960 TCFR.

of fertility among young women and a shift of some of this childbearing into the 30s (Table J-1 and Figure NEC-3).

The concentration of fertility between the ages of 20 and 35 with a sharp peak in the mid-20s was another outstanding feature of the Japanese age pattern of cohort fertility across the board. Ninety five per cent of childbearing was concentrated in this age range. This started to change with the shift of fertility into the older ages among the cohorts of the 1950s.

Judging by the fertility behavior of cohorts in the midst or at the onset of childbearing in the late 1990s, the decline of fertility in Japan is likely to continue (Figures NEC-5 and NEC-6 and Table J-2). Each successive cohort was experiencing lower fertility than previous ones. By age 30 birth cohorts five years apart had 0.15 to 0.20 fewer births per woman than the previous one. There was a moderate propensity to make up for the lower fertility when women were in their 30s, but as far as the data reach never enough to catch up with the previous generation.

## 11.4 | New Zealand

In comparison to the other developed countries New Zealand had high fertility throughout the late 19th and especially in the 20th century. The total period fertility rate in the 1870s was estimated well above 6 with that of the non-Maori population at 6.9 and of the Maoris at 5.9 births per woman (Jackson *et al.* 1994). As in many other western countries there was a considerable fertility decline with a low point between the two world wars. This decline was driven by the non-Maori population, the absolute majority of which at that time were 'Pakeha,' i.e. of European origin. Maori fertility remained quite stable during

*Table J-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, Japan, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility rate of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 36 | 1.709 | … | … | … | -12 | … | … | … |
| 31 | 1.315 | 1.094 | … | … | -20 | -28 | … | … |
| 26 | 0.512 | 0.399 | 0.316 | … | -34 | -36 | -38 | … |
| 21 | 0.040 | 0.046 | 0.037 | 0.036 | -21 | -5 | -6 | -21 |

the same period. The baby boom of the 1940s and 1950s was the most powerful among the developed countries. For the 15 years between 1950 and 1965 the total period fertility rate was above 3.5, the peak being 4.3 in 1961 (Figure NEC-1). This again was driven by the Pakehas, however on top of high Maori fertility.

It was only in the 1960s that Maori fertility embarked on an appreciable decline. The above implies that, despite high rates of intermarriage, there were two different demographic transitions in New Zealand: a Maori and a Pakeha (Johnstone *et al.* 2001).[50] The former occurred only after the Second World War and was short, the latter started in the late 19th century and was similar to that in other developed countries.

In terms of fertility trends, New Zealand claims to hold a number of records, among them the rapid decline for the whole population from a TPFR of 4.3 births per woman in 1961 to replacement fertility in the late 1970s.

At the turn of the century, New Zealand belonged to the more prosperous countries in the world with a per capita gross national income in purchasing power parity of $ 18,780, nevertheless considerably below the average for the western countries (World Bank 2002). While obviously not without problems, its economy developed successfully with a doubling of the Gross Domestic Product between 1950 and 1991 and as of the latter year a majority of the population was employed in the service sector, 79 per cent of women and 53 per cent of men. Improvements in the educational level of the population were extraordinary. Between 1971 and 1996 the proportion of women with a tertiary education increased from two to 34 and that of men from five to 41 per cent. By 1996 a majority of women were in the labor force, 56 per cent, up from 28 per cent in 1951 (Johnstone *et al.* 2001).

New Zealand never had an explicit population policy, except that concerning immigration and the restriction of entry of foreign nationals. Nonetheless, the country "was among the earliest and most advanced welfare states, with the baseline legislation going back to the 1890s and the shift to almost cradle to grave welfare introduced in 1938" (Johnstone *et al*. 2001). An array of family

[50] In 1996 the population was composed of 14 per cent Maoris, 72 per cent Pakehas, five per cent Pacific Islanders and four per cent Asians. The latter two groups were relatively recent immigrants and furthermore their size was too small for macro-analysis and not enough is known about their fertility trends (Johnstone *et al*. 2001).

policies and laws introduced since the 1930s might have been expected to have a pronatalist effect. Above all it was the 'Capitalization of the Family Benefit' of the late 1950s which enabled mothers to take payments per child in a lump sum in advance and invest that in housing. In reality, the measure had no apparent impact on childbearing. Whatever the reasons may have been, fertility actually declined after its introduction. Official effective endorsement of family planning came in 1971 when the Department of Health gave permission for medical personnel to promote and discuss such matters. Induced abortion and access to contraceptive sterilization were legalized in 1977 (Johnstone *et al.* 2001).

Completed fertility was at its highest among the women born around 1930. The total cohort fertility rate fluctuated around 3.5 births per woman throughout the early 1930s. A significant change in reproductive outcome took place between the women born in 1935 and those born in the late 1940s (Figures NEC-1 and NEC-2). The TCFR declined from 3.5 to around 2.6 between these cohorts which were only slightly more than ten years apart in their birth dates. The cohort fertility decline with some fluctuations then continued at a more moderate pace among the cohorts of the 1950s and early 1960s. The estimated TCFR for the cohorts of the early to mid-1960s was 2.3 births per woman.

Trends in completed cohort fertility were accompanied by considerable changes in the age patterns of childbearing. At first there was a shift of fertility into the young ages. Compared to the women born around 1930, women of the 1940 birth cohort were having more children up to their mid-20s and much fewer children in their late 20s and in their 30s — between the ages of 25 and 49 the difference was more than -0.7 births per woman (Figure NEC-3 and Table NZ-1).

Women born during the 1940s decided to have substantially fewer children in the prime of their reproductive life. Between the ages of 20 and 34 the difference between the 1940 and the 1950 birth cohorts was -0.7 births per woman. Starting with the cohorts born during the 1950s, women decided to have considerably fewer children when they were young and to have quite a number of these children later in life, especially in their late 20s and in their 30s (Figure NEC-3 and Table NZ-1).

*Table NZ-1. Fertility deficits and surpluses comparing birth cohorts, New Zealand, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 25-49 | -0.728 | 20-34 | -0.676 | 17-27 | -0.558 |
| Surplus | 13-24 | +0.313 | 13-19 | +0.082 | 13-16 | +0.009 |
| | | | 35-49 | +0.023 | 28-49[a] | +0.340 |
| Total | | -0.415 | | -0.571 | | -0.209 |

Note: [a] Includes estimated data for ages 38-49 in the 1960 cohort, which were very small.

Trends in the mean age of cohort childbearing in Figure NEC-4 reflect the changes in lifetime childbearing strategies. Among the cohorts of the 1930s there was a major decline from the age of 27.7 in the 1930 birth cohort to 25.9 in the 1940 cohort. Among the cohorts of the 1940s there was very little change in the mean age of childbearing, because the main decline in fertility was in the center of the reproductive period. As fertility shifted into the later years of childbearing the average age rapidly increased from 25.7 in the 1950 birth cohort to an estimated 27.8 in the 1960 cohort.

Is the shift of childbearing into the second half of the reproductive period continuing among women who had not completed their childbearing by the year 2000? So far only a partial answer is possible. It is clear that young women in successive cohorts of the 1960s and 1970s were having fewer births (Figure NEC-5 and NEC-6 and Table NZ-2). The shape of the curves of the 1965 and 1970 cohorts indicate not only the fertility decline of these women up to their late 20s, but also a certain propensity to having somewhat higher fertility than previous cohorts when these women will be in their late 20s and in their 30s. Even the 1975 cohort was continuing in the trend of lower fertility when these

*Table NZ-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, New Zealand, cohorts 1960, 1965, 1970, 1975 and 1980*

| Age | Cumulated fertility rate of birth cohort | | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1960 | 1965 | 1970 | 1975 | 1980 |
| 35 | 2.093 | 1.996 | … | … | … | -12 | -8 | … | … | … |
| 30 | 1.538 | 1.423 | 1.231 | … | … | -25 | -18 | -20 | … | … |
| 25 | 0.794 | 0.682 | 0.639 | 0.545 | … | -38 | -33 | -20 | -20 | … |
| 20 | 0.223 | 0.167 | 0.166 | 0.157 | 0.161 | -31 | -47 | -26 | -6 | -3 |

women were in their early 20s, but it is not possible to make any judgement on whether these women will have relatively high fertility later in life.

## 11.5 | United States of America

A reasonably sustained fertility decline in the United States started already late in the 18th century (Chesnais 1992). At that time "birth rates were above 50 per 1,000 total population, and more than half the people were less than 16 years of age" (Taeuber 1967). "The birth rate had been perhaps 55 in 1820; in 1900 it was 32. Numbers of children below five years of age per 1,000 women aged 25 to 44 were 1295 in 1820; in 1900 they were 666" (Taeuber 1967).

Most of the 20th century was marked by considerable fertility fluctuations. During the first three decades a steep decline took place from a total period fertility rate of close to four births per woman around the year 1900 to a trough in the 1930s of about 2.2 births per woman in the early 1930s. Given the mortality conditions at the time, this was below replacement. The notorious baby-boom ensued. By the year 1957 its peak was reached with a TPFR almost as high as at the beginning of the century, 3.8 births per woman. As rapidly as fertility increased, the TPFR declined during the next 20 years and reached 1.8 by 1976 (Figure NEC-1).

During the last quarter of the 20th century United States fertility was remarkably stable. From 1975 to 1986 at around a TPFR of 1.8 followed by a moderate increase to 2.1 in 1990. Throughout the last decade of the century the TPFR was between 2.0 and 2.1 (Figure NEC-1).

During the second half of the 20th century the United States experienced numerous social, economic and political developments many of which interacted with the changes in family formation and fertility behavior. The economy was marked by essentially steady growth, with low unemployment, low inflation, and rapid advances in technology. At the turn of the century 80 per cent of GDP was produced in the service sector and the United States had the highest per capita gross national income of any large country — $ 34,260 in purchasing power parity (World Bank 2002). This wealth was by no means equally spread. The United States is among those low fertility countries which had the most unequal income distribution. Thirteen per cent of the population remained below the official poverty line. The lowest ten per cent of households

received 1.8 per cent and the highest ten per cent obtained 30.5 per cent of total income. Its Gini coefficient, 40.8, was the highest among the western countries (World Bank 2002).

The successes of the Civil Rights and of the Women's Liberation movements had a profound impact and were arguably the most notable among the social transformations. Regrettably minorities at the turn of the century still had significantly larger proportions of the poor and of the inadequately educated than Whites, which appears to have had demographic repercussions. The reshaping of the status of women from submissive home-maker housewife to well qualified employed worker was by no means universal, but presumably also had fertility effects.

Sizable flows of immigrants resulted in appreciable proportions of foreign born populations. Their percentage according to the 2000 census was as high as the highest rates at other times in United States history. The childbearing patterns of the foreign born also need to be taken into account in the context of analyzing overall United States fertility levels and trends (Bean *et al*. 1997 and Fix *et al*. 1994). Among women that were concluding their childbearing at the turn of the century, 14 per cent were foreign born and their fertility was 25 per cent higher than that of White non-Hispanic women and eight per cent above that of Black women[51] (Frejka and Kingkade 2003).

The United States government never had an official population policy. Nevertheless, there were frequent public discussions concerning population issues and numerous laws and regulations affected fertility behavior. The most notable official analysis of population issues was conducted by The Commission on Population Growth and the American Future which was appointed by President Nixon and Congress in 1969, and presented its findings and recommendations in a 1972 Report (Commission 1972). The comprehensive range of recommendations can be labeled as progressive. For instance, the Commission recommended "that sex education be available to all, and that it be presented in a responsible manner through community organizations, the media, and especially the schools;" and "that present state laws restricting abortion be liberalized along the lines of the New York statute, such abortion to be performed on request by duly licensed physicians under conditions of medical

[51] These comparisons are not exact, because the White non-Hispanic and the Black contain small proportions of foreign born women.

safety;" and "(T)o remove the occupational sources of racial polarization, the Commission recommends the development of more extensive human capital programs to equip black and other deprived minorities for fuller participation in economic life." There were also very specific recommendations to Congress to increase funding for family planning services for teenagers, and for research in reproductive biology. Undoubtedly the recommendations of this Commission as well as other public debates left their mark on legislation, on decisions of the United States Supreme Court, and more generally, but such impact is difficult to measure. The liberalization of induced abortion legislation by the United States Supreme Court in 1973 appears to be a case in point.

The majority of modern fertility regulating means —various types of hormonal contraception and advanced intra-uterine contraceptive devices (IUDs)— were developed and widely used in the United States during the past half century. Female and male sterilization became extensively applied and, as just mentioned, induced abortion legislation was liberalized in 1973. At the same time, United States fertility was the highest among the low fertility countries at the end of the 20$^{th}$ century. A proximate reason was high rates of unintended (unwanted and mistimed) pregnancies and births. It has been surmised that numerous complex circumstances contributed to this situation, such as the relatively cumbersome health and family planning system, restricted effective access to contraception and abortion for the poorer segments of the population, serious existential concerns for the poor of any ethnic group, and imperfect education of the poor (Frejka and Kingkade 2003).

Completed cohort fertility trends followed a similar path as period fertility, albeit at more moderate levels. Women born at the beginning of the century had on average about 2.5 births. The total cohort fertility rate was at its lowest for women born between 1905 and 1912 at 2.3 births per woman. It then increased steadily and the cohorts of the early 1930s bore on average 3.2 births per woman. Subsequently the TCFR declined to reach its lowest level ever at 2.0 with the 1950 cohort (Figures NEC-1, NEC-2 and CO-1 [Chapter 12]). The cohorts of the 1950s will remain at that level and so might the 1960s cohorts, as indicated by the analysis below.

Underlying the completed cohort fertility trends, whether declining or unchanging, were considerable changes in the age patterns of cohort fertility. As shown in Figure NEC-1, the TCFR declined between the 1930 and the 1940 cohorts from 3.2 to 2.7 births per woman. Fertility change was not identical at

all ages. Fertility of young women up to age 24 in the 1940 cohort was relatively high compared to the older cohort, but this gain was more than offset by relatively low fertility once these women were between the ages of 24 and 49 (Figure NEC-3 and Table US-1). In the 1940 cohort compared to the 1930 cohort, fertility of women in their late 20s was lower by more than 30 per cent and that of women in their 30s by 50 per cent. The fertility surplus early in the reproductive period of the 1940 cohort was outweighed by the fertility deficit later in life so that the net deficit was 0.5 of a birth (Table US-1). The average age of cohort childbearing declined from 26.2 to 24.7 (Figure NEC-4).

The fertility decline continued among the cohorts born during the 1940s from 2.7 in the 1940 to 2.0 in the 1950 cohort. The age structural changes for these two cohorts a decade apart were very different than between the previous two. Young women were curtailing and delaying childbearing. When in their teens and 20s, the 1950 cohort had almost 0.8 fewer births than women ten years older (Figure NEC-3 and Table US-1). In particular, fertility in the prime childbearing ages between 20 and 24 was more than 43 per cent lower. There was somewhat of a shift of fertility into the higher ages. When these women were in their 30s and 40s they had slightly more children than the cohort ten years older —0.1 of a birth—, by far not enough to catch up. Altogether, the average age of childbearing increased quite considerably from age 24.7 to 25.9 (Figure NEC-4).

Completed fertility did not continue to decline among the cohorts of the 1950s. The TCFR of the 1960 cohort was equal to that of the 1950 cohort at 2.0 births per woman, but the age structure did change (Figure NEC-3 and Table US-1) as did the average age of childbearing. When the women of the 1960 cohort were young their fertility was relatively low, mainly between the ages of 18 to 20. On the other hand, later in life mainly once they were in their 30s, their fertility

*Table US-1. Fertility deficits and surpluses comparing birth cohorts, United States, cohorts 1930, 1940, 1950 and 1960*

| Fertility | Cohort 1930 and 1940 | | Cohort 1940 and 1950 | | Cohort 1950 and 1960 | |
|---|---|---|---|---|---|---|
| | Age group | Number of children | Age group | Number of children | Age group | Number of children |
| Deficit | 24-49 | -0.647 | 15-31 | -0.788 | 17-27 | -0.166 |
| Surplus | 15-23 | +0.197 | 32-49 | +0.087 | 15-16 | +0.004 |
| | | | | | 28-49[a] | +0.150 |
| Total | | -0.450 | | -0.701 | | -0.012 |

Note: [a] Includes estimated data for ages 38- 49 in the 1960 cohort, which were very small.

was somewhat higher. The fertility increase of these cohorts of women when they were older was sufficient to compensate for their fertility deficit earlier in life, *ipso facto*, the TCFR remained the same. The average age at childbearing among the cohorts of the 1950s continued its increase from 25.9 to 26.9 (Figure NEC-4).

The cohorts born during the 1960s and 1970s, those that were at the onset or in the middle of their reproductive periods as of the late 1990s, appeared even more stable in their reproductive behavior than the older cohorts (Figures NEC-5 and NEC-6 and Table US-2). The age patterns of fertility of these cohorts differ very little from one another. This implies that fertility could remain roughly at the same level, i.e. around, or only slightly below, replacement in the United States in the foreseeable future. There is the possibility of a fertility increase, as cumulated fertility rates up to the known ages for the cohorts of the mid-1960s to the mid-1970s were consistently on a moderately increasing trend. And much will depend on fertility levels of these women when they will be in their 30s or the younger ones in their late 20s.

A detailed examination of cumulated fertility of cohorts born from 1950 through 1975 confirms the above. Figure NEC-6, which depicts only registered data, demonstrates that the 1960 compared to the 1950 cohort had accumulated a fertility deficit of about 0.14 births by age 27. After that age women of the 1960 cohort were having somewhat more births than the cohort born ten years earlier at the same ages. As a result by age 37 the former cohort had just about eliminated the deficit accumulated earlier in life and the cumulated cohort fertility rates of the two cohorts were almost identical. Adding the estimated age-specific fertility rates for women of the 1960 cohort when they will be in their late 30s and 40s results in identical total cohort fertility rates for these two cohorts ten years apart.

*Table US-2. Cumulated fertility rates at specified ages and relative changes compared to birth cohorts ten years older, United States, cohorts 1960, 1965, 1970 and 1975*

| Age | Cumulated fertility rate of birth cohort | | | | Change of CCFR compared to cohort ten years older (in per cent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1960 | 1965 | 1970 | 1975 |
| 37 | 1.893 | … | … | … | -2 | … | … | … |
| 32 | 1.584 | 1.590 | … | … | -7 | 0 | … | … |
| 27 | 1.062 | 1.059 | 1.067 | … | -13 | -5 | 0 | … |
| 22 | 0.493 | 0.471 | 0.507 | 0.531 | -20 | -8 | 3 | 13 |

The cohorts of the 1960s, exemplified by the 1965 cohort, follow the fertility age pattern of the 1960 cohort quite closely, albeit with minor deviations. Apparently the cohorts of the late 1960s and the early 1970s, as far in life as they have come up to the year of observation, are experiencing moderate increases in fertility compared to the 1965 birth cohort (Figure NEC-6).

We now turn our attention to the analysis of birth order. Comparing cohorts born in the early 1930s and those of the late 1940s, the proportion of women of all birth orders have declined (Figure NEC-7). Women with first births decreased from about 90 to 85 per cent, however, the most notable decline was in the high order births. Among women born in 1930 over one half had a fifth or higher order birth and this proportion declined to considerably below one tenth among those born in the 1950s (Figure NEC-7).

Parity progression ratios illustrate the across-the-board declines of the progressions to the first, second, third and fourth births between the cohorts born in the early 1930s to those born in the early 1950s (Figure NEC-8). Parity progression ratios of the cohorts born during the 1950s have been stable. The ratios from parity zero to parity one (PPR0), and from parity two to parity three (PPR2) even displayed moderate increases.

The parity distribution in the United States underwent a major change between the cohorts born in the early 1930s and those born around 1950. Among women (couples) of the 1930 birth cohort there was a clear preference for large families. Thirty seven per cent of women had four or more children and an additional 22 per cent had three, for a total of almost 60 per cent having more than three children (Table CO-11). In contrast, in the 1950 birth cohort only 30 per cent of all women had three or more children. The largest decline was for parity four or more, from 37 to 11 per cent (Figure NEC-9). Family size preferences had clearly changed. The proportion of women (couples) with two children had increased from 22 per cent in the 1930 cohort to 35 per cent among women born in the late 1940s. There was also a notable increase in the proportions of women with only one child and those remaining childless.

The parity distribution remained remarkably stable among the cohorts of the 1950s. The parity distribution of the 1950 and the 1960 birth cohorts were almost identical. Over one third of all women had two children, another third had three or more, and among the remaining one third those with only one child or no children were roughly evenly distributed (Figure NEC-9).

Intentional or voluntary childlessness has again become a subject of thorough inquiry as part of the concern with declining and low fertility in the developed countries (for instance, Dorbritz and Schwarz 1996; Foster 2000; Golini 1998 and Rowland 1998). In the United States women remaining childless represented around ten per cent of the cohorts born during the 1930s (Figure NEC-10). Among the cohorts of the late 1930s and the 1940s there was a perceptible increase of childless women, from nine per cent in the 1935 birth cohort to 17 per cent in the 1950 cohort. For subsequent cohorts the proportion of childless women remained stable.

As there is a common belief that United States fertility distinguishes itself from that of other developed countries in large part because of racial and ethnic fertility differentials, this avenue of exploration will now be pursued. This will be done only at the most general level, namely by White and non-White population. The analysis is based on the classic cohort fertility calculations prepared and published by R. L. Heuser[52] (1976) and an extension prepared in 2001 by W.W. Kingkade of the United States Census Bureau.

Throughout American history there was a considerable fertility differential by racial origin (Figure NEC-11). Among the cohorts of the early 1930s the White population had a TCFR of 3.1 compared to the non-White population with a TCFR of 3.8 births per woman, a difference of about 25 per cent. Subsequently, fertility of the two basic ethnic groups declined almost in parallel to reach 1.9 for the White population and 2.5 for the non-White population among the cohorts of the early 1950s. The differential had, however, increased to over 30 per cent. Among the cohorts of the 1950s and early 1960s, total cohort fertility for the Whites was essentially stable, but among the non-Whites cohort fertility was declining steadily.

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[52] The composition of the United States population changed over time and especially during the last two decades of the 20th century became more heterogeneous. In 1980, the non-White population constituted 14.3 per cent of the total and over 84 per cent of that were Blacks. In 2000 non-Whites constituted 17.5 per cent of the total, and the proportion of Blacks in this category declined to 74 per cent. Among the White population in 1980, 85.7 per cent of the total, the proportion of Hispanics was seven per cent, whereas in 2000, when Whites constituted 82.5 per cent of the total, it had increased to 11 per cent (http://eire.census.gov/popest/estimates.php; and the Census 2000 Summary file).

Underlying these trends were differing changes in the age patterns of fertility (Table US-3). At the same time, the changes of the fertility age patterns between cohorts of both the White and the non-White populations were in similar directions (Figures NEC-12a and NEC-12b).

The lifetime fertility pattern of the non-White population was much younger. By women's 27th birthday in the 1950 cohort, for example, 68 per cent of all children had been born in the non-White population, compared to 60 per cent in the White population. In both populations fertility shifted into the older ages, but the non-White childbearing age pattern continued to be significantly younger. In the 1960 cohort approximately 61 per cent of children in the non-White and 51 per cent in the White population were born before the 27th birthday (based on data in Table US-3).

Between the cohorts born around 1930 and the 1940 cohort there was a fertility increase early in the reproductive period in both populations and a considerable decline of fertility when the 1940 cohort was in its late 20s and 30s (Figures NEC-12a and NEC-12b). Among subsequent cohorts fertility was declining when women were young and increasing when they were older; the fertility increase at the older ages was more substantial in the White than in the non-White population.

Differences in the mean ages of childbearing for the respective populations were considerable and also illustrate that the directions of change were similar but not identical (Figure NEC-13). The shift of childbearing into older ages between the 1940 cohorts and those of the early 1960s was more pronounced among the White than among the non-White population. The difference in the mean age of childbearing between the two populations was about half a year in the 1940 cohort and over 1.5 years in the cohorts of the early 1960s.

*Table US-3. Cumulative cohort fertility rates (CCFRs) up to and after the 27th birthday, United States racial groups, birth cohorts 1950 and 1960*

| Racial group | CCFR of birth cohort up to the 27th birthday | | | CCFR of birth cohort after the 27th birthday | | | Measure of compensation of fertility after age the 27th birthday (in per cent) |
|---|---|---|---|---|---|---|---|
| | 1950 | 1960 | 1950-60 | 1950 | 1960 | 1950-60 | |
| US All Races | 1.224 | 1.062 | -0.162 | 0.804 | 0.952 | 0.148 | 91 |
| US White | 1.168 | 1.003 | -0.165 | 0.784 | 0.959 | 0.175 | 106 |
| US nonwhite | 1.728 | 1.432 | -0.296 | 0.819 | 0.906 | 0.086 | 29 |

There was a significant difference between the age patterns of fertility of the White and the non-White population comparing the 1950 and the 1960 cohorts. Among the Whites the shortfall or deficit of fertility when the cohorts were young was fully compensated when this cohort was older. Among the non-White population the corresponding deficit was compensated only to a minor degree (Table US-3). By the 27th birthday the White population had 0.165 fewer births than the 1950 cohort, but after the 27th birthday the 1960 cohort had 0.175 more births than the previous cohort. The 1960 cohort caught up fully and more (106 per cent) with the 1950 cohort despite low fertility early in the reproductive period. The non-White population experienced a decline of 0.296 births when young, but had only 0.086 births more when older; not even one third (29 per cent) of the deficit early in the reproductive period was compensated when these women were older (Table US-3).

The fertility differential between the White and the non-White population continued to be large among the cohorts of the 1960s and the 1970s when these were at the onset or in the middle of their childbearing period (Table US-4). By the 27th birthday the 1970 White cohort had on average borne 1.0 birth per woman, the non-White 1.4 births. The White versus non-White differential up to the 22nd birthday for the 1975 cohort was even larger. While there were some differences in the rates of fertility change by these birthdays, they were relatively small, especially when compared to other countries. The decline of the cumulated cohort fertility rates (CCFRs) up to the 27th birthday between the 1960 and 1970 cohorts was about -0.4 per cent per year for both United States populations.

The closeness of the curves in Figures NEC-14a and NEC-14b illustrates the relative stability of fertility among the cohorts born during the 1960s and early 1970s, in particular of the White population.

The curves in Figures NEC-15a and NEC-15b are the cumulative cohort fertility differences between the cohorts 1955 through 1975, and the base 1950 cohort. Figure NEC-15a illustrates the comparatively low fertility of the 1955 and the 1960 White cohorts when they were young and the catching up to the base cohort when they were in their late 20s and 30s. The relatively low fertility of the 1955 and 1960 non-White cohorts was more pronounced. By the 27th birthday the 1960 non-White cohort had borne 0.3 births per woman less than

*Table US-4. Cumulative cohort fertility rates (CCFRs) up to the 22nd and the 27th birthdays, United States racial groups, birth cohorts 1950, 1960, 1970 and 1975*

| Racial group | Cumulative cohort fertility rate | | | | Annual change between birth cohorts (per cent) | | |
|---|---|---|---|---|---|---|---|
| | 1950 | 1960 | 1970 | 1975 | 1950-60 | 1960-70 | 1970-75 |
| *By the 22nd birthday* | | | | | | | |
| US Total | 0.616 | 0.493 | 0.507 | 0.531 | -2.2 | 0.3 | 0.9 |
| US White | 0.561 | 0.431 | 0.414 | 0.453 | -2.6 | -0.4 | 1.8 |
| US Nonwhite | 1.065 | 0.818 | 0.765 | 0.738 | -2.6 | -0.7 | -0.7 |
| *By the 27th birthday* | | | | | | | |
| US Total | 1.224 | 1.062 | 1.067 | n.a. | -1.4 | 0.0 | n.a. |
| US White | 1.168 | 1.003 | 0.966 | n.a. | -1.5 | -0.4 | n.a. |
| US Nonwhite | 1.728 | 1.432 | 1.370 | n.a. | -1.9 | -0.4 | n.a. |

the 1950 cohort (Figure NEC-15b and Table US-3). As the 1955 and the 1960 non-White cohorts were aging, a tendency of catching up with previous, older cohorts could be observed, but it became apparent that it would be difficult for them to succeed.

The cumulative fertility of the 1960s and the 1970s cohorts, White and non-White appeared to be relatively stable. The 1970 cohorts by their 27th birthday displayed minor declines. The CCFR of the 1975 non-White cohort by the 22nd birthday declined slightly and the 1975 White cohort experienced an increase (Figures NEC-14a, NEC-14b, NEC-15a and NEC-15b and Table US-4).

Trends of the long-term parity distributions displayed in Figures NEC-16a and NEC-16b reveal changes that were probably unique among the developed countries. For the purposes of this study, however, we will draw attention mainly to recent developments.

The older White cohorts, including those of the 1940s had experienced major changes in the parity distribution (Figure NEC-16a). Starting with the cohorts born around 1950 stability not seen before was established. In the cohorts of the 1950s and early 1960s, around 35 per cent of all White women had two children, the proportions of women with one, or three children were between 15 and 20 per cent, as were those of childless women, and about ten per cent had four children or more.

The long-term parity distribution trends of the non-White population were quite extraordinary (Figure NEC-16b). A degree of stability could be observed among this population starting with the cohorts of the 1950s. There were around 32-33 per cent of non-White women with two children, between 16 and 24 per cent of women with one, three, or more than four children. The proportion of childless women even in the cohorts of the mid-1960s was under ten per cent, but it was on an increase.

The parity progression ratios of White women also displayed relative stability among cohorts born during the 1950s and early 1960s (Figure NEC-17a). About 82-83 per cent proceeded to have a first child and of these slightly under 80 per cent had a second child. Among non-White women, the progression to the first and to the second birth among the cohorts of the 1950s and early 1960s were on the decline (Figure NEC-17b). Over 90 per cent were having a first birth, however, of these only around 75 per cent were having a second birth. Progression ratios to third and fourth order births appeared to be stabilizing and were about ten percentage points higher than among White women.

## 11.6 | A comparative perspective

Given the unique features of Japan's population trends it will be treated in a separate section.

### *11.6.1. Overseas countries with populations of predominantly European origin*

The similarity of the levels and mainly trends in completed fertility rates of the 1930s and 1940s birth cohorts in Australia, Canada, New Zealand and the United States was remarkable (Figures NEC-1 and CO-1). The TCFRs of women born in the early 1930s were the highest among the western countries. Fundamental changes in fertility behavior took place among the cohorts of the 1930s through those of the 1960s. The TCFRs declined precipitously from a range of 3.1-3.6 births per woman in the 1930 cohorts to 1.9-2.6 in the 1950 cohorts. These declines were faster than in other western countries. The annual rate of decline between the 1940 and 1950 cohorts ranged from 1.8 in Australia to 3.3 per cent in Canada compared to a range of 1.0 to 1.6 in practically all the other western countries (Table CO-2 [Chapter 12]). The differences between the TCFR values of the 1930 and those of the 1950 cohorts were larger in the

overseas countries than elsewhere. They ranged from 0.8 in Australia to 1.5 in Canada compared to 0.8 births per woman in the Netherlands and Portugal which experienced the biggest descents in western Europe.

Among the cohorts of the 1950s and early 1960s completed fertility continued to decline albeit more moderately in Canada, Australia and New Zealand, and became stable in the United States.

Several features stand out among the cohorts of the mid-1960s. New Zealand was the only population with a TCFR above replacement. The TCFR in the United States was equal to that of the 1950 birth cohort — it had become stable. Finally, the range of the values among the overseas countries was larger than in any of the other western regions, from a low of 1.7 in Canada to 2.3 in New Zealand, a range of 0.6 births per woman. In all the other western regions the difference between countries was no more than 0.3 births per woman. This diversity of TCFRs among the overseas countries stands out considering the relative uniformity of levels and trends in the past.

Changes in the life-time strategies of childbearing expressed as changes in the age patterns of fertility from the cohorts of the early 1930s to those of the mid-1960s were almost identical in all four countries (Figures NEC-2 and NEC-3). The directions of the changes were the same in the four countries, but there was one notable difference. Throughout the whole period childbearing occurred at younger ages in the United States compared to the other countries. The proportion of births that occurred before the 27$^{th}$ birthday in the United States was consistently the largest in all cohorts. In the 1930 birth cohorts in Australia, Canada and New Zealand one half of all births were borne by women before the 27$^{th}$ birthday. In the United States it was almost 60 per cent (Table CO-3). Among the cohorts of the 1930s fertility moved into the younger ages. Women in their teens and early to mid-20s gave birth to between 60 to over 70 per cent of their eventual total numbers of children. From there on continuously smaller proportions of children were born when women were in their teens and early to mid-20s. In the 1965 cohort only about 40 per cent of children were born before women's 27$^{th}$ birthday in Australia, Canada and New Zealand; in the United States it was 52 per cent (Table CO-3).

The proportions of children borne by women when they were young were continually declining but the nature of the changes in the life-time strategies of

childbearing were different among the cohorts of the 1940s compared to the ones of the 1950s and those of the early 1960s differed from the previous ones.

The principal change between the cohorts of 1940 and those of 1950 was a substantial decline of fertility among women in their 20s, however the tendency to postpone births into the higher ages was only in its initial stage. Fertility was declining when women were young but it was hardly increasing when they were older. The descent of childbearing of young women continued among the cohorts of the 1950s and, in addition, many women did actually have the children when they were older. Significant proportions of the children that women were foregoing when young were born when they were in their late 20s and 30s. In Australia and Canada about half the children foregone by the 1960 cohort were born later in the reproductive period, in New Zealand it was 70 per cent, and in the United States almost all the postponed children were born (Figure NEC-3 and Table CO-6).

The difference in the cohort age patterns of childbearing between the United States and the other three countries became even more pronounced among the cohorts of the early and mid-1960s. Fertility continued to decline among young women in Australia, Canada and New Zealand, but stabilized in the US. Not only that. Practically none of the children foregone by young women in Australia and Canada in the 1965 cohorts were born later in life. In New Zealand 40 per cent of these children were born. In the United States fertility of the older women in the 1965 birth cohort was even slightly above that of the 1960 cohort (Table CO-6).

The differences in the childbearing patterns between the United States and the other three countries persisted among the cohorts of the 1960s and the early 1970s. Fertility of young women stabilized in the United States and continued to decline in the other three countries (Figures NEC-5 and NEC-6 and Tables CO-7 and CO-9). Consequently, there were differences in the absolute levels of fertility. In the United States in the 1970 cohort 1.1 children were born per woman before the 27$^{th}$ birthday, in Australia and Canada it was 0.7 and in New Zealand 0.9 births per woman. In the 1975 birth cohorts the relations between the countries were similar. By the 22$^{nd}$ birthday 0.5 births per woman were born in the US, 0.2 in Australia and Canada, and 0.3 in New Zealand. The fertility differentials among the 1975 cohorts could well change in the future given the small proportions of births that occur before the 22$^{nd}$ birthday.

Judging from the fertility behavior of young women in the 1970s cohorts, the United States population has the best potential among the low-fertility countries to maintain the level of childbearing of the 1960 cohort in the foreseeable future. It also appears to be the only one among the developed countries with a reasonably high probability of having fertility close to replacement in the near future. Provided the fertility of women in the 1970 cohort following their 27th birthday will be approximately equal to that of the 1960 cohort, the TCFR will remain stable (Figures NEC-5 and NEC-6 and Table CO-8).

Data on birth order and parity were available only for the United States which precludes a comparative analysis between the overseas countries. A comparison with the Netherlands and England and Wales reveals some of the United States idiosyncrasies. The TCFRs of first and second order births leveled off among the cohorts of the 1950s and early 1960s in the United States, but were on a declining slope in the other two countries. The same applies to the parity progression ratios to the first and second order births (Figures NEC-7, NEC-8, WE-7 and WE-8 and Table CO-10). The proportions of childless women were increasing among the cohorts of the 1950s and early 1960s in England and Wales and the Netherlands, but leveled off in the United States (Figures NEC-9, NEC-10, WE-9 and WE-10 and Table CO-11).

### *11.6.2. Japan*

Trends of completed fertility were rather different in Japan than elsewhere. The decline to below replacement cohort fertility took place earlier than in any other western country, from 2.6 in the 1924 cohort to 2.1 births per woman in the 1930 cohort (Figures NEC-1 and CO-1). Among the next 25 cohorts the TCFR remained stable at or slightly below 2.0 births per woman. Starting with the cohorts of the mid-1950s a renewed decline set in and its 1962 TCFR was among the lowest at 1.7 births per woman.

Life-time strategies of childbearing among the cohorts of the 1930s through those of the early 1950s were also different. The majority of women were bearing their children later in the reproductive period than in the other western countries. Similarities to the age pattern of childbearing with the western countries emerged among the cohorts born in the 1950s. There was a sharp decline of fertility among young women before the 27th birthday, some of whom were postponing their births until their 30s. The propensity to offset low

childbearing when women were young by higher fertility when they were older was relatively weak in Japan compared to the other western countries.

The substantial descent of fertility among young women continued in the cohorts of the 1960s. Given the apparent low propensity to compensate for early low childbearing later in life, there is an appreciable potential for further cohort fertility declines in Japan.

## 11.7 | Conclusions

Because of the unique nature of fertility developments in Japan this section will again have two parts.

### *11.7.1. Overseas countries with populations of predominantly European origin*

As of the late 1990s, cohort fertility in Australia and New Zealand was poised to decline further. The situation was similar in Canada, although there were some signs that its low TCFRs might not decline much in the near future. In contrast, in the United States any changes in fertility in the foreseeable future are likely to be very small. These general conclusions are the outcome of the specific following findings and conclusions:

- Completed fertility was declining starting with the cohorts of the 1930s. The rate of descent was steep among the cohorts of the 1930s and 1940s, abated among the cohorts of the 1950s and early 1960s nonetheless continued in Australia, Canada and New Zealand;
- Since the cohorts of the 1940s there was a comparatively wide range in the values of completed fertility. The 1962 TCFRs ranged from 2.3 births per woman in New Zealand, the highest among the low-fertility countries, to 2.1 in Australia to 1.8 in Canada which was among the lowest;
- A strong propensity for young women to postpone births was evident starting with the cohorts of the late 1940s in Australia and New Zealand. Among Canadian women this propensity was also evident but not as forceful. The proportions of children born before the 27$^{th}$ birthday were declining, as were cumulated fertility rates by that age, and the mean age of childbearing was increasing in these countries among the cohorts of the 1950s and early 1960s;

- The propensity for older women to offset relatively low fertility when they were young was weak in Australia, Canada and New Zealand among the cohorts of the 1950s and early 1960s;
- In the United States completed fertility was stable among the cohorts of the 1950s and early 1960s at around 2.0 births per woman; the rate of decline in the proportion of births before the 27th birthday was relatively low; the rate of decline of cumulated fertility before the 27th birthday was low in the 1950s cohorts and there was no decline among the cohorts of the early 1960s; the increase in the mean age of childbearing was small; the propensity to offset delayed childbearing when women were older was strong.

With the diversity of levels and trends the outlook differs for each country. United States fertility is likely to remain close to the replacement level in the foreseeable future. New Zealand's fertility still has the possibility to be close to replacement given that it's level was relatively high, but the direction of the various contemporary trends are working against that prospect; cohort fertility is likely to decline further. In Canada and, even more so in Australia, cohort fertility was heading for further declines.

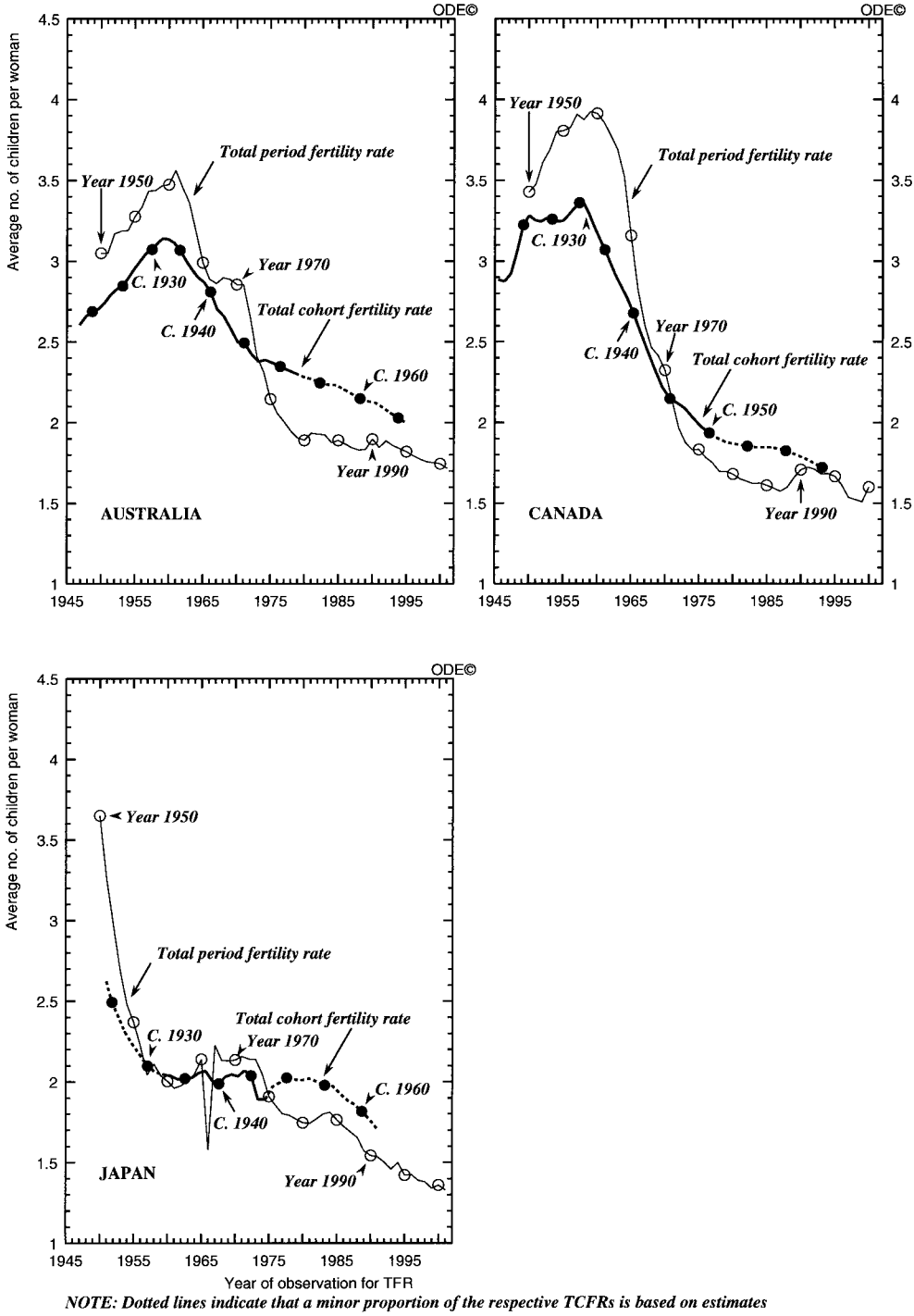
### *11.7.2. Japan*

Japan's cohort fertility was among the lowest in the early 1960s and has all the signs for a further decline:

- The TCFR was on a declining slope starting with the cohorts of the early 1950s;
- Japan has had a tradition of late childbearing and the proportion of children born after the 27th birthday was increasing rapidly among the cohorts of the 1950s;
- The value of cumulated cohort fertility before the 27th birthday was declining among the cohorts of the 1950s and early 1960s; and it was among the lowest in the developed countries;
- The propensity to delay births was strong among the cohorts of the 1950s and early 1960s, but only a small proportion of the delayed births were being born;
- The mean age of childbearing was high and continually increasing.

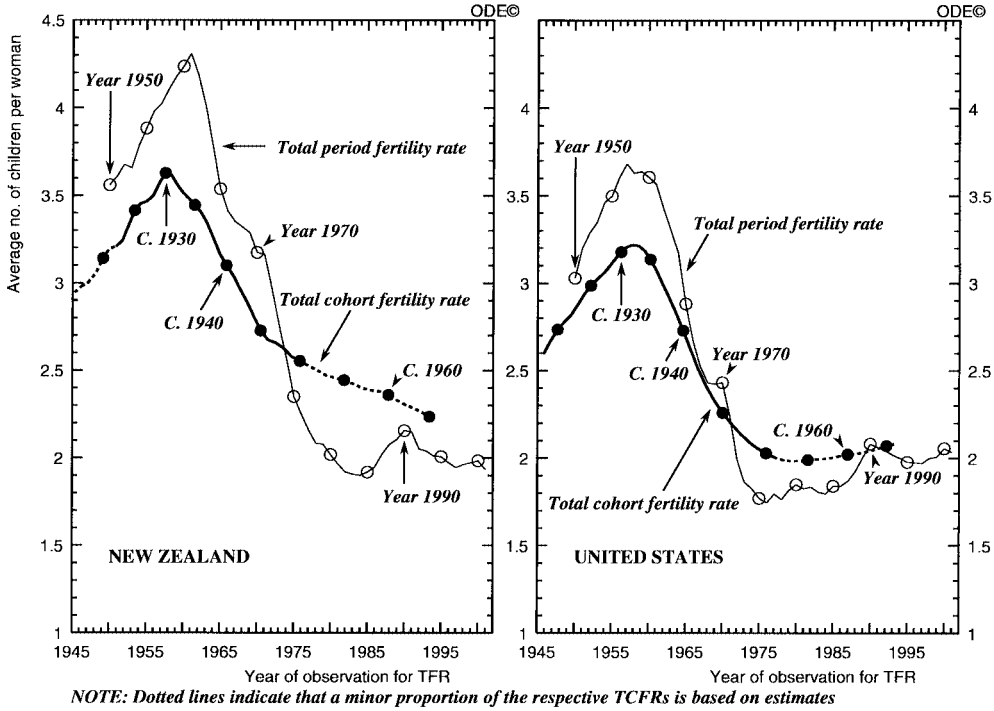
As of the late 1990s there was no indication that cohort fertility in Japan would be stabilizing. Although cohort fertility was already among the lowest, further declines can be expected in the near future.

**Figure NEC-1 NON EUROPEAN COUNTRIES, 1950-2000**
**Total period fertility rate and total cohort fertility rate**



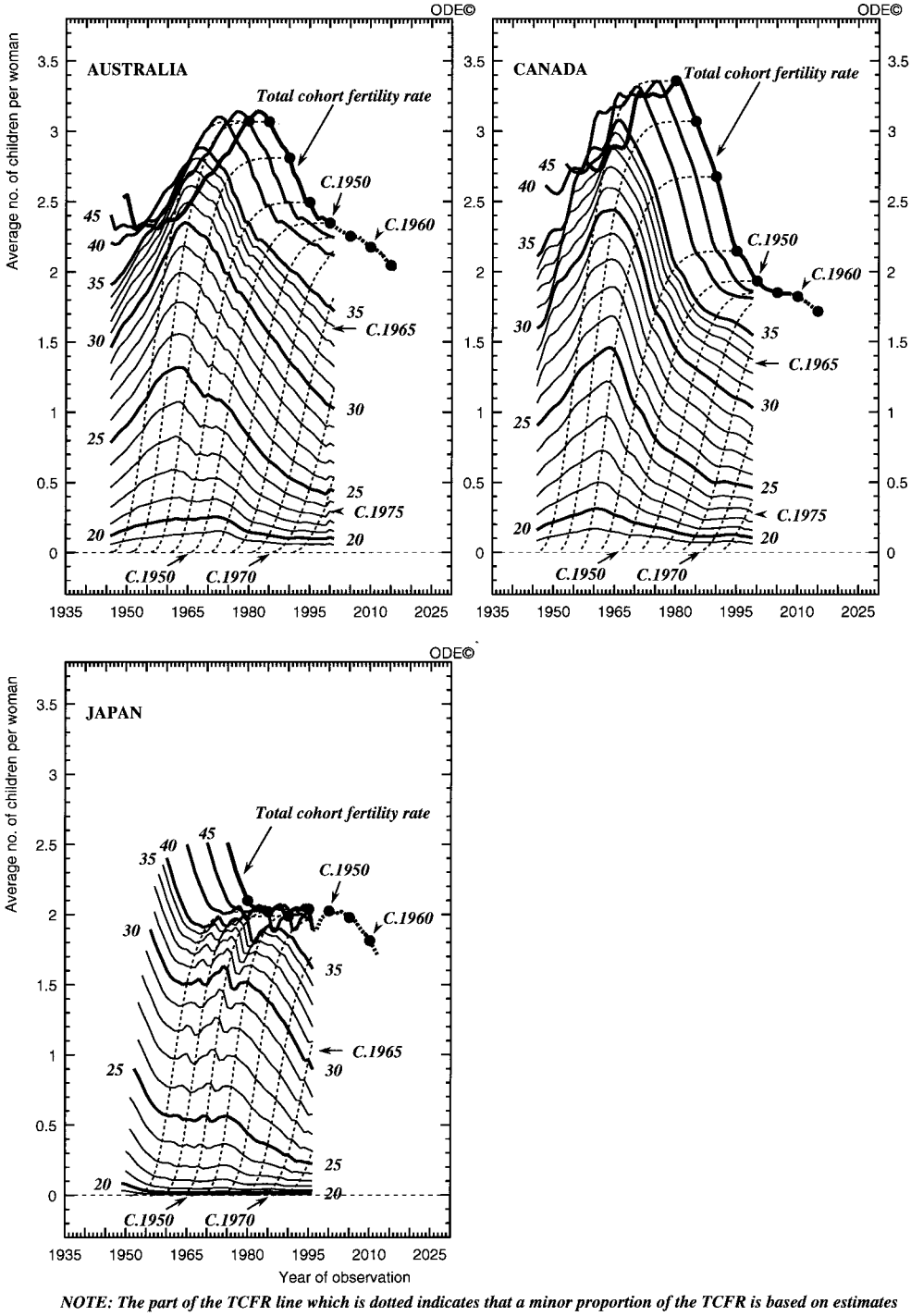

*NOTE: Dotted lines indicate that a minor proportion of the respective TCFRs is based on estimates*

**Figure NEC-1 (continued). NON EUROPEAN COUNTRIES, 1950-2000**
**Total period fertility rate and total cohort fertility rate**
**lagged by the average age at childbearing**



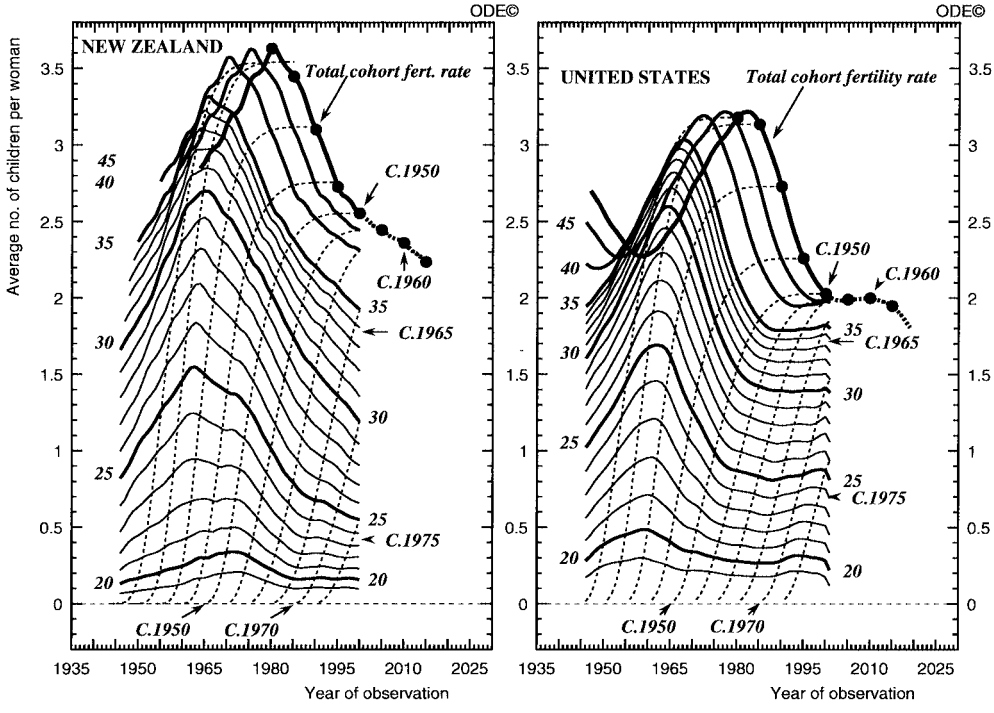

*NOTE: Dotted lines indicate that a minor proportion of the respective TCFRs is based on estimates*

**Figure NEC-2 NON EUROPEAN COUNTRIES**
**Cumulated cohort fertility at specified ages, birth cohorts 1930-1975**




*NOTE: The part of the TCFR line which is dotted indicates that a minor proportion of the TCFR is based on estimates*

**Figure NEC-2 (continued). NON EUROPEAN COUNTRIES**
**Cumulated cohort fertility at specified ages, birth cohorts 1930-1975**




*NOTE: The part of the TCFR line which is dotted indicates that a minor proportion of the TCFR is based on estimates*

**Figure NEC-3 NON EUROPEAN COUNTRIES**
**Age-specific fertility rates, birth cohorts 1930, 1940, 1950 and 1960**

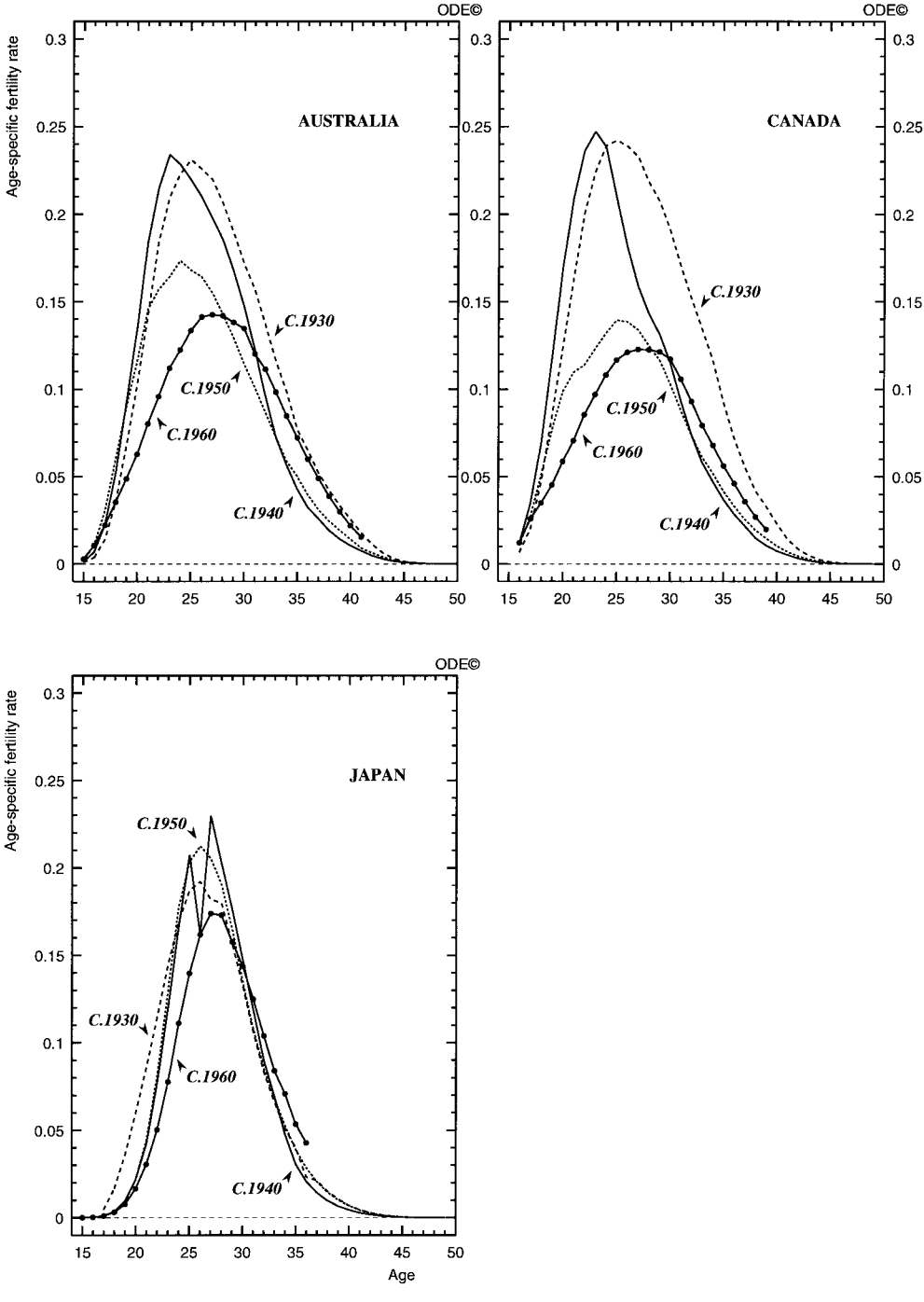


**Figure NEC-3 (continued). NON EUROPEAN COUNTRIES**
**Age-specific fertility rates, birth cohorts 1930, 1940, 1950 and 1960**

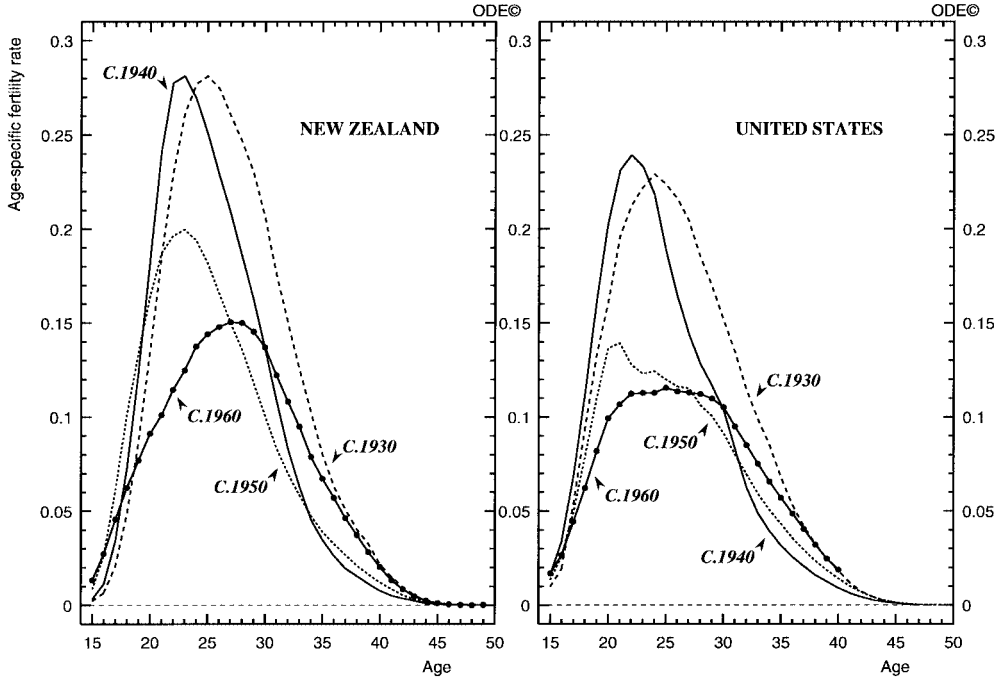
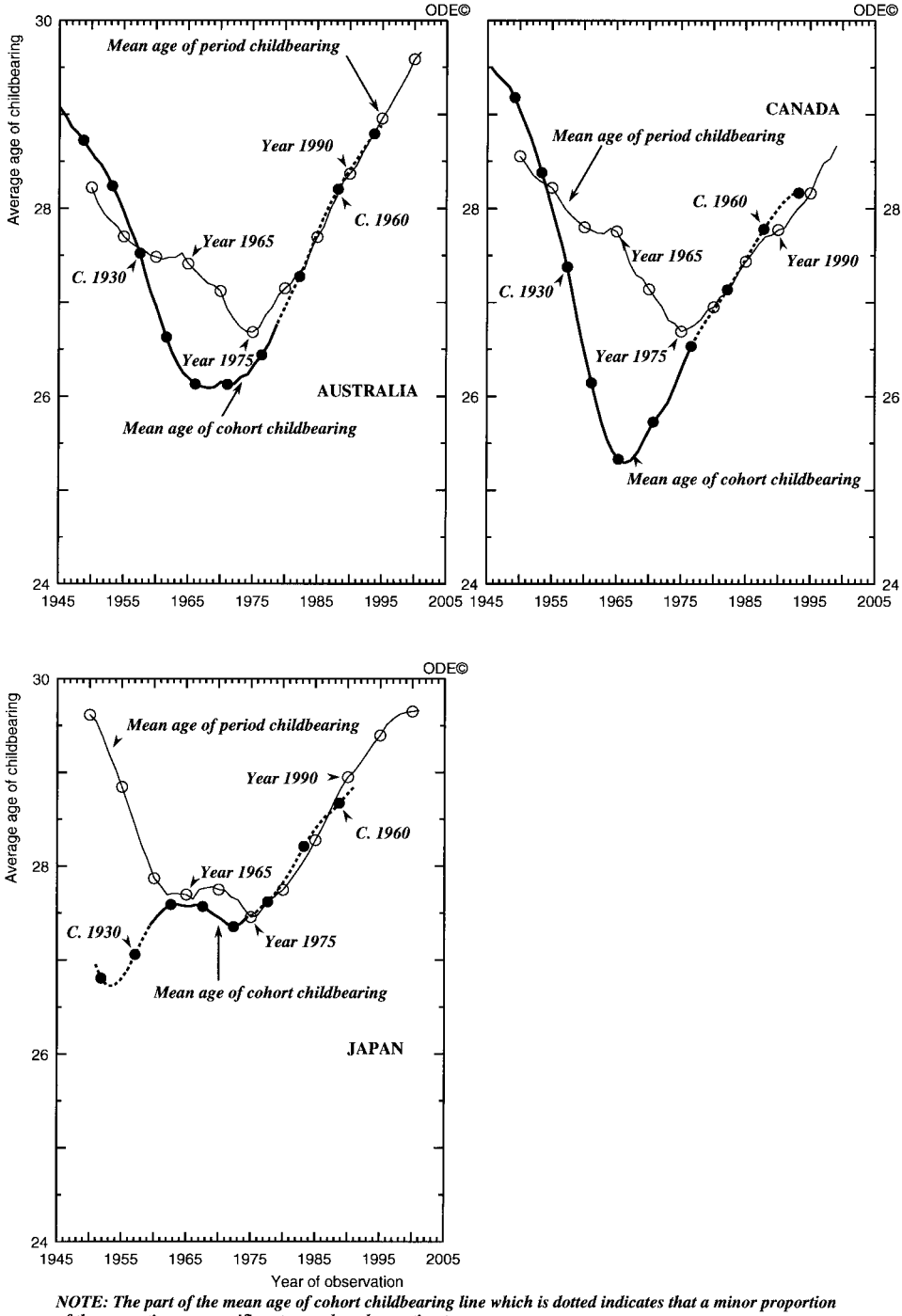
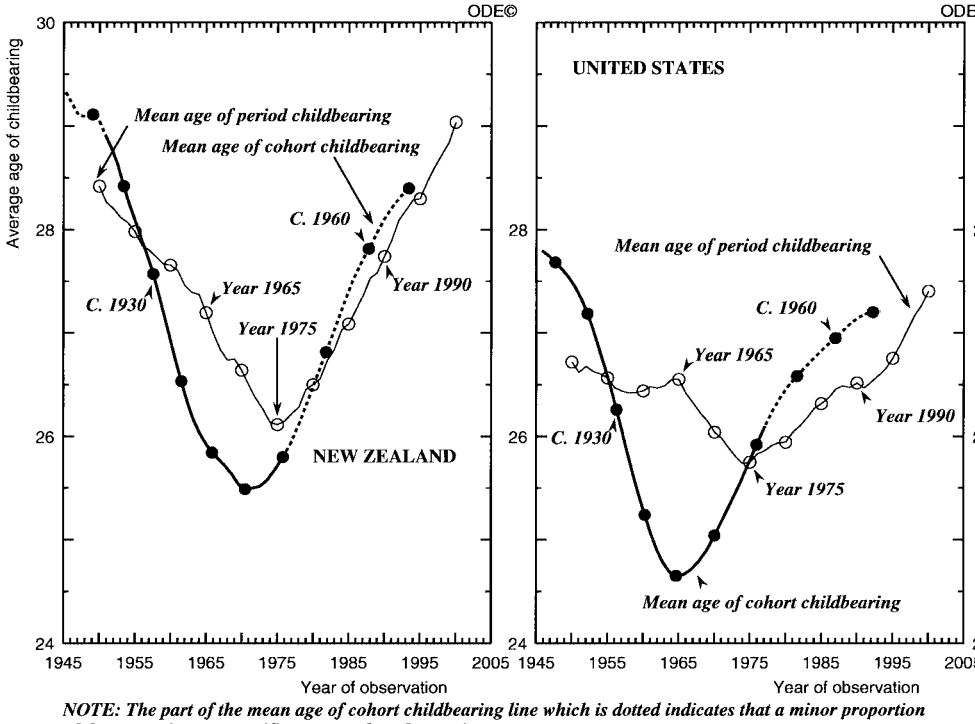


**Figure NEC-4 NON EUROPEAN COUNTRIES, 1945-2000**
**Period average age of childbearing and cohort average age of childbearing lagged by the average age at childbearing**




*NOTE: The part of the mean age of cohort childbearing line which is dotted indicates that a minor proportion of the respective age-specific rates are based on estimates*

**Figure NEC-4 (continued). NON EUROPEAN COUNTRIES, 1945-2000**
**Period average age of childbearing and cohort average age of childbearing lagged by the average age at childbearing**




*NOTE: The part of the mean age of cohort childbearing line which is dotted indicates that a minor proportion of the respective age-specific rates are based on estimates*

**Figure NEC-5 NON EUROPEAN COUNTRIES**
**Age-specific fertility rates, birth cohorts 1960, 1965, 1970, 1975 and 1980**

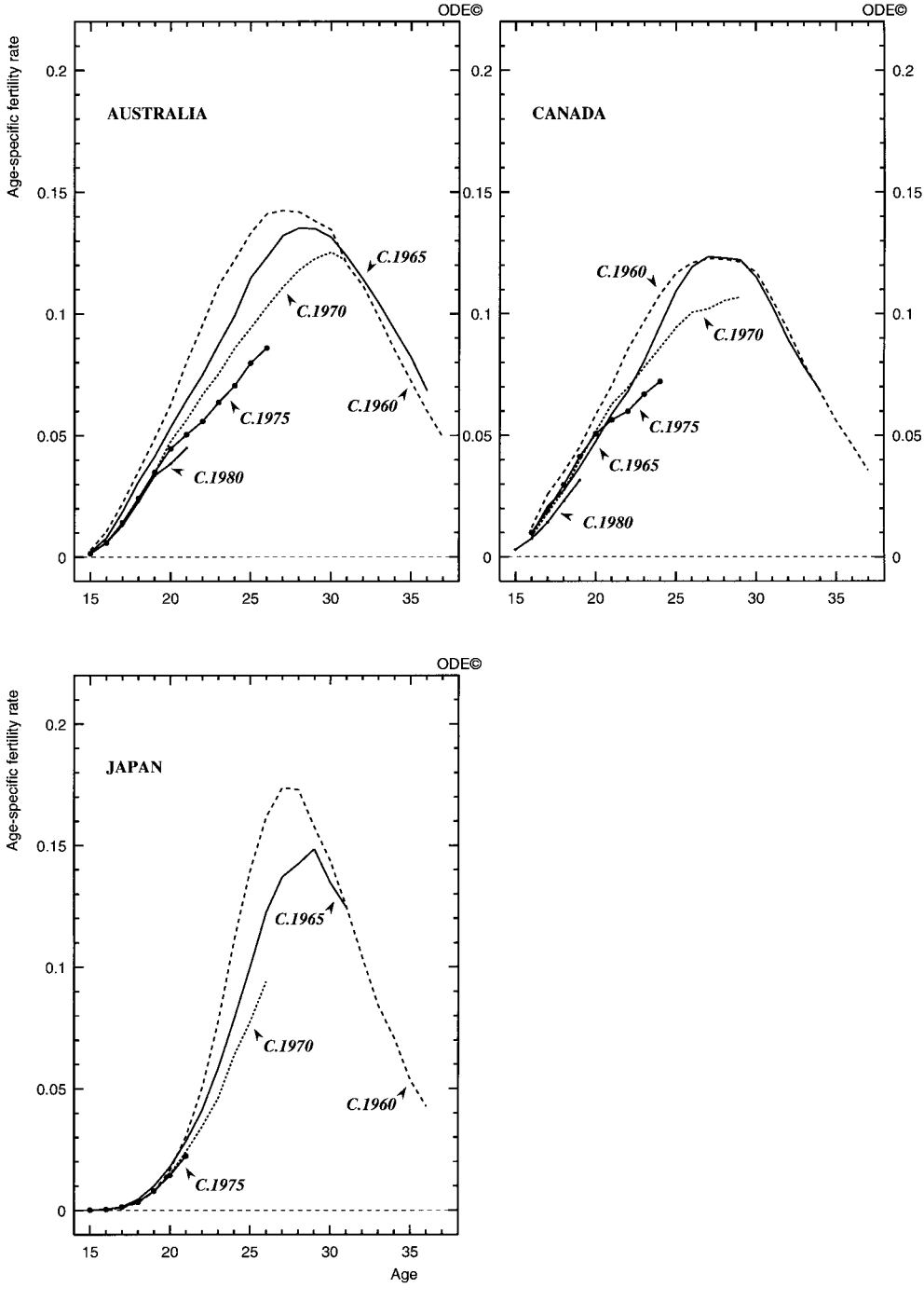


**Figure NEC-5 (continued). NON EUROPEAN COUNTRIES**
**Age-specific fertility rates, birth cohorts 1960, 1965, 1970, 1975 and 1980**

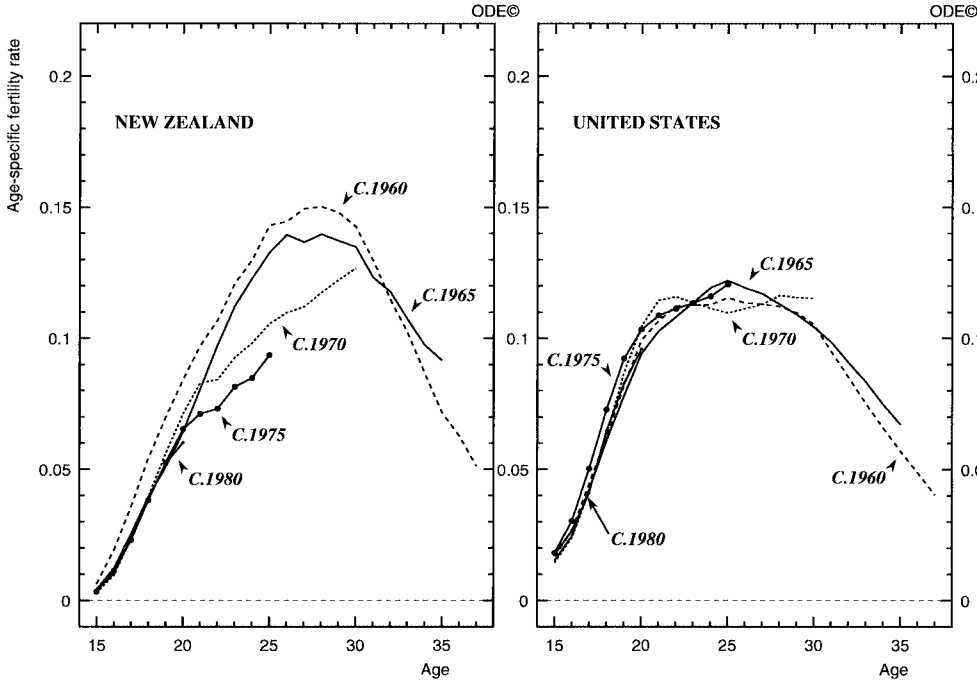


**Figure NEC-6 NON EUROPEAN COUNTRIES**
**Differences in cumulative age-specific cohort fertility rates between base and subsequent cohorts, women born in 1950 (base), 1955, 1960, 1965, 1970, 1975 and 1980**

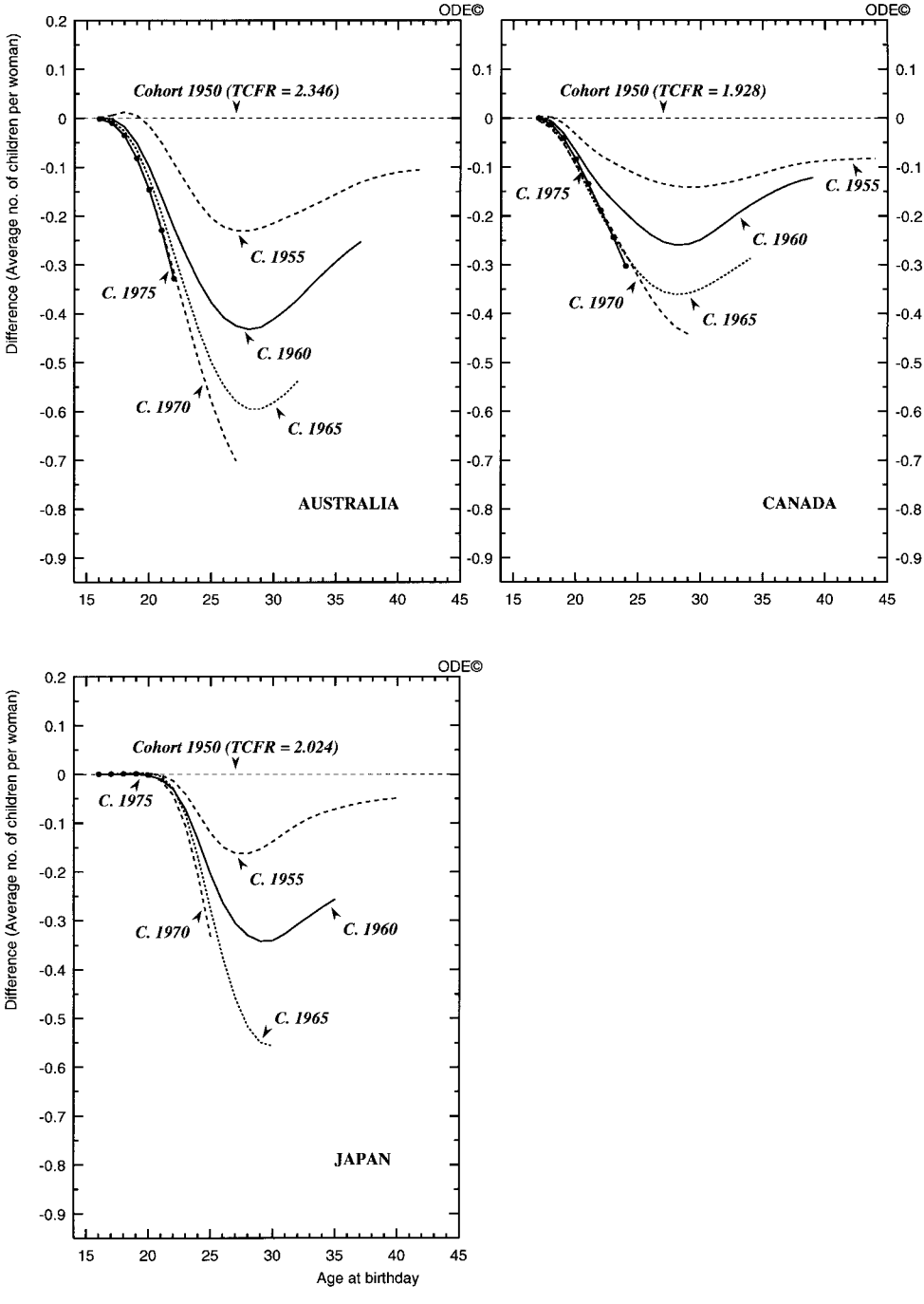
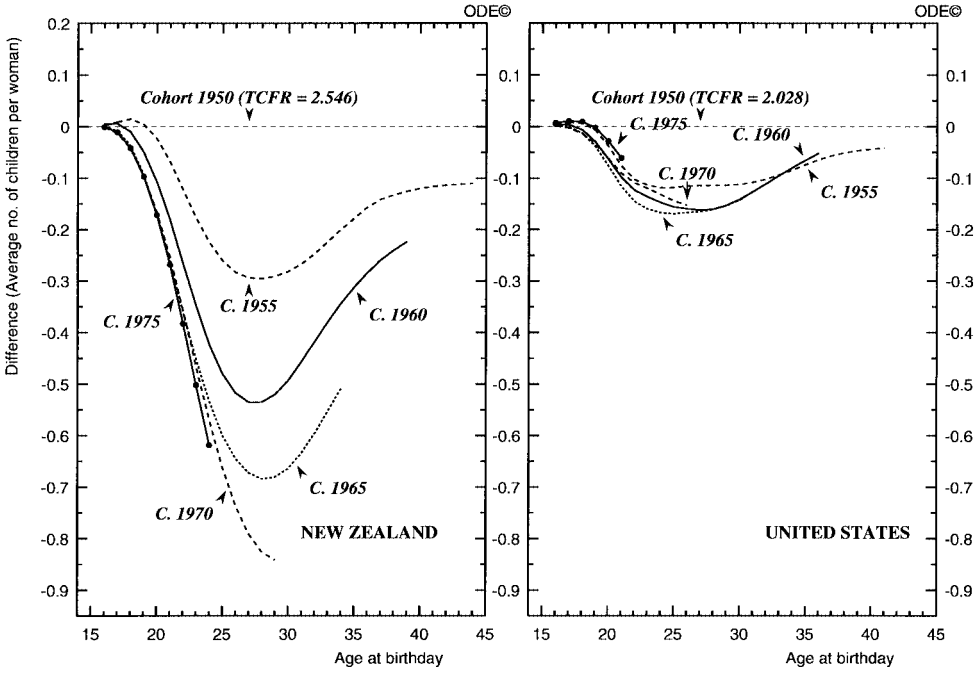
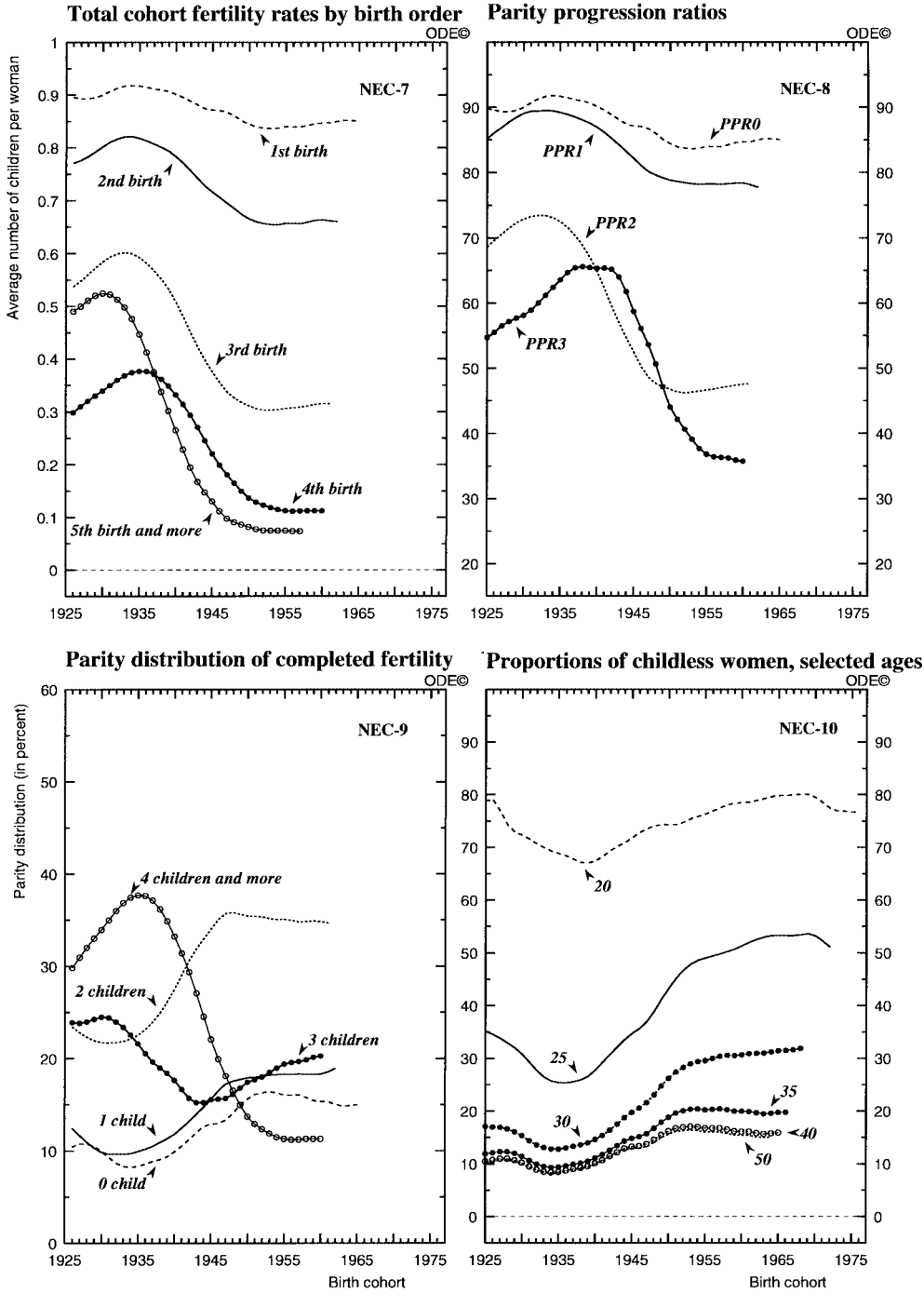


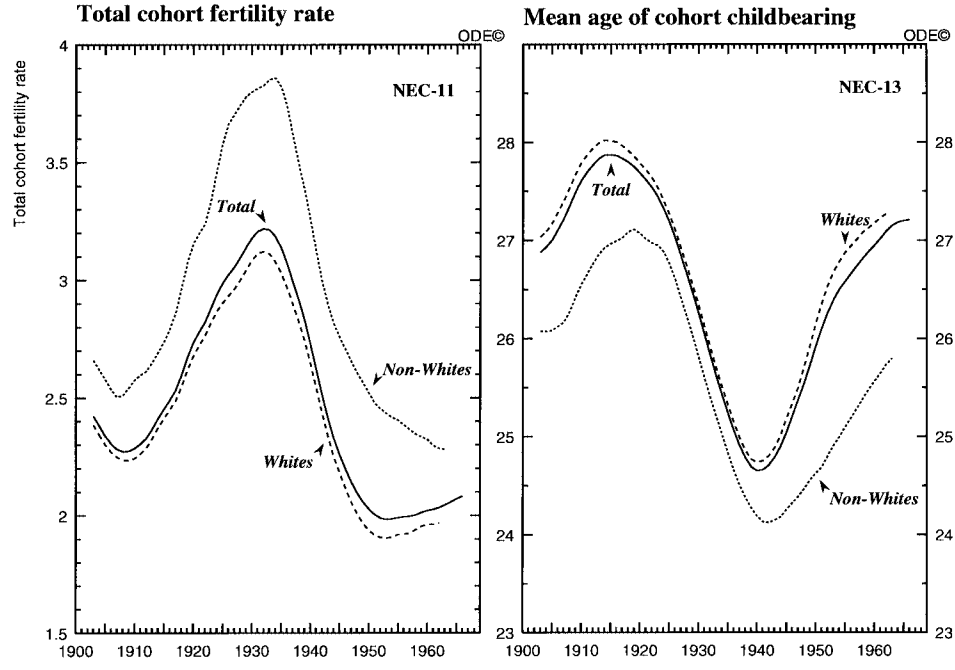
**Figure NEC-6 (continued). NON EUROPEAN COUNTRIES**
**Differences in cumulative age-specific cohort fertility rates between base and subsequent cohorts, women born in 1950 (base), 1955, 1960, 1965, 1970, 1975 and 1980**



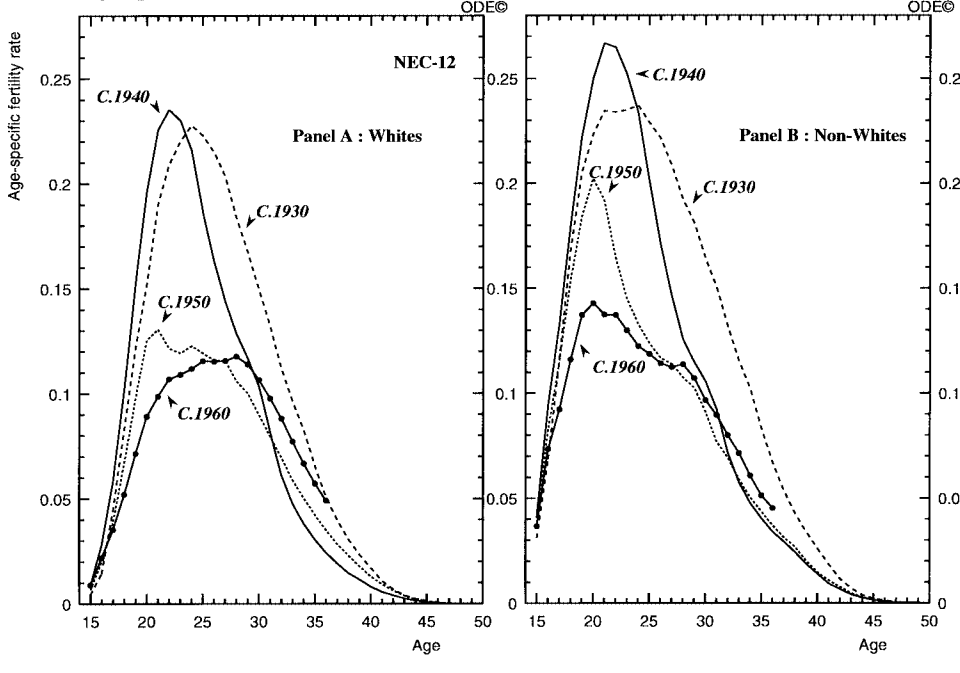
**Figures NEC-7, NEC-8, NEC-9, NEC-10. UNITED STATES**



**Figures NEC-11, NEC-12, NEC-13. UNITED STATES, White and Non-White population**

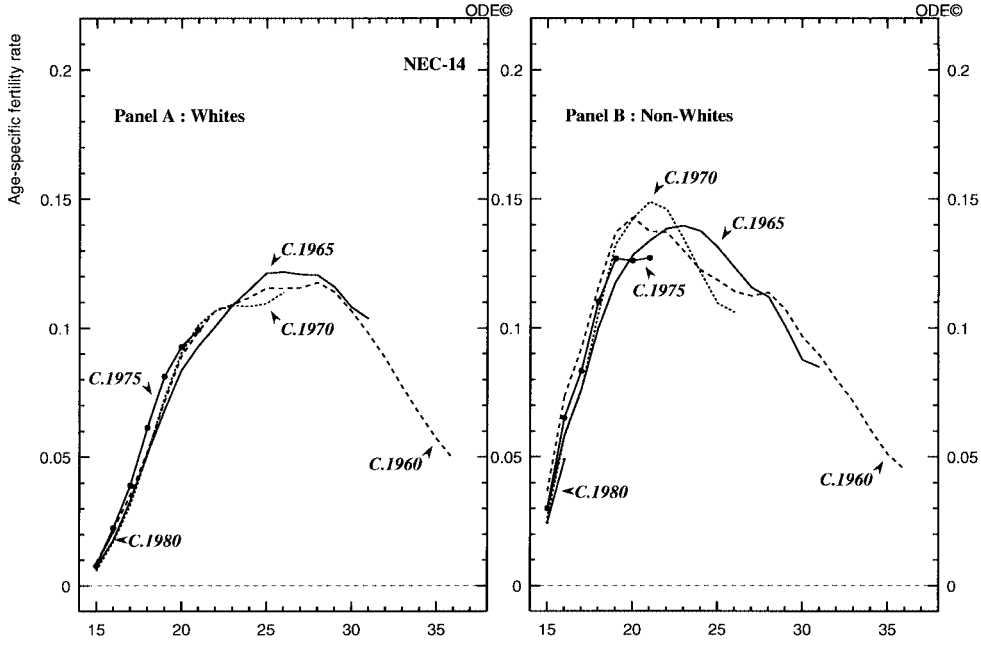



**Age-specific fertility rates, birth cohorts 1930, 1940, 1950 and 1960**

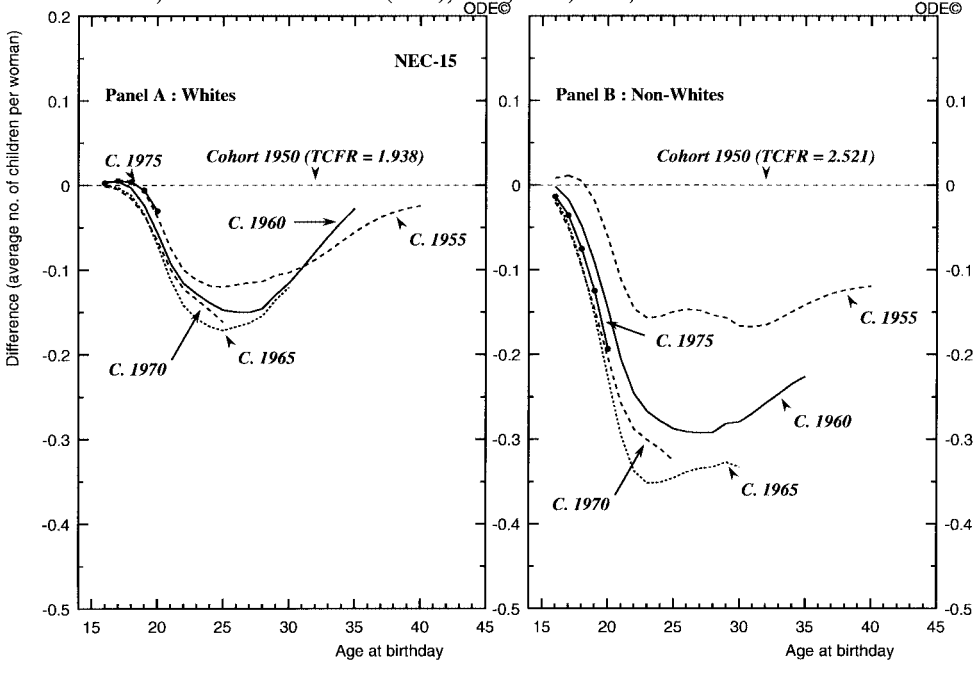


**Figures NEC-14, NEC-15. UNITED STATES**

**Age-specific fertility rates, birth cohorts 1960, 1965, 1970, 1975 and 1980**

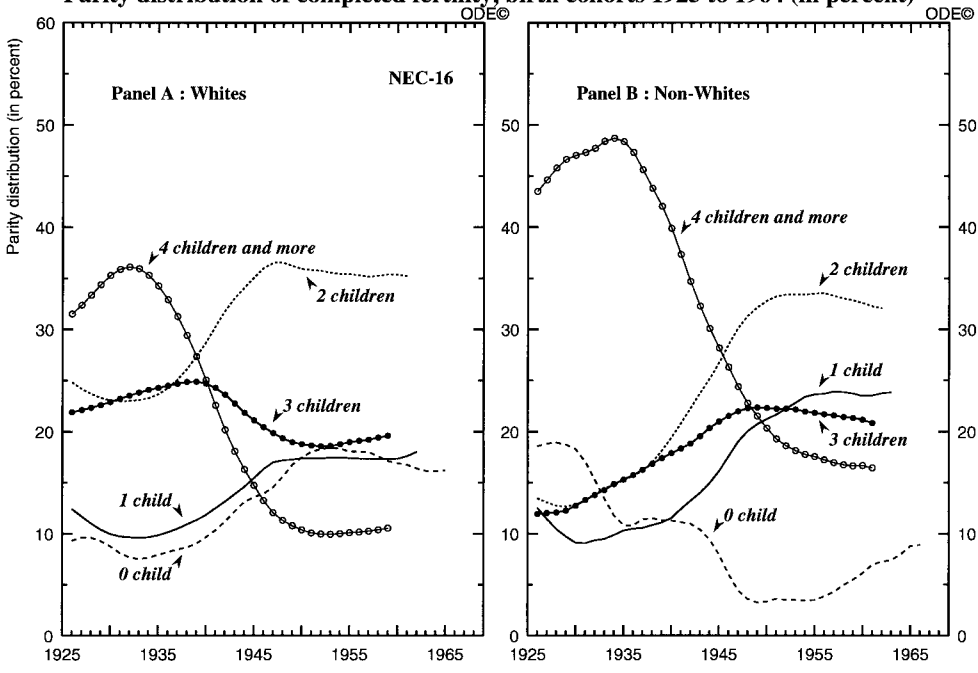



**Differences in cumulative age-specific cohort fertility rates between base and subsequent cohorts, women born in 1950 (base), 1955, 1960, 1965, 1970 and 1975**

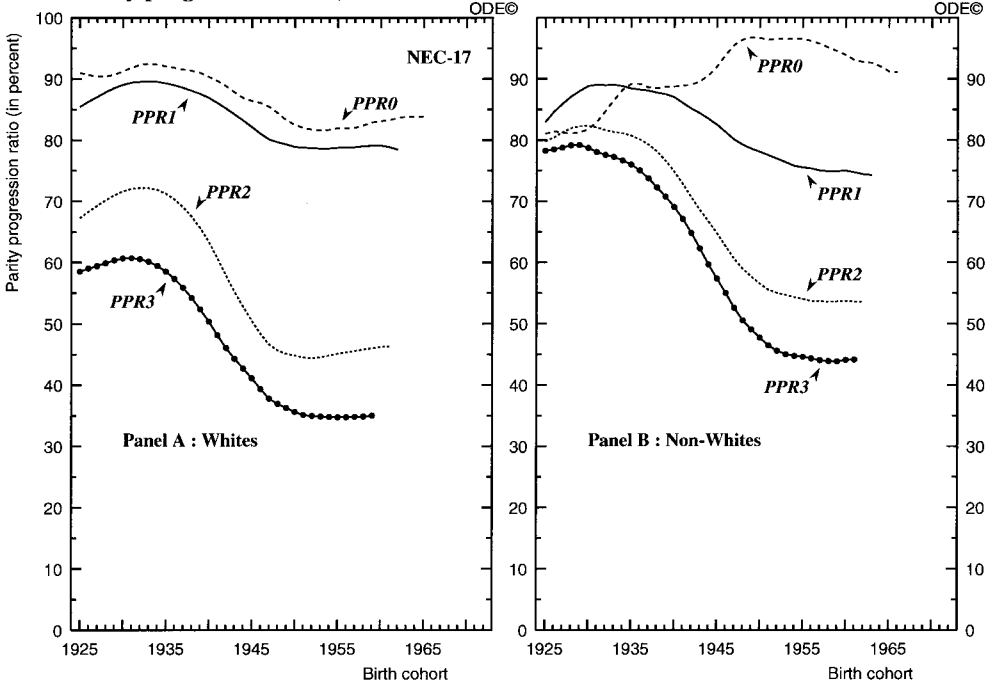


**Figures NEC-16, NEC-17. UNITED STATES**

**Parity distribution of completed fertility, birth cohorts 1925 to 1964 (in percent)**




**Parity progression ratios, birth cohorts 1925 to 1964**



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# 12. Comprehensive and comparative analysis

Having completed the country and regional studies an overall comparative analysis is needed before findings can be summarized and conclusions reached. In the country and regional studies the focus was on the respective unit. At the same time, a number of specific country or regional features were best identified by making various comparisons. In this chapter, while building on the knowledge emanating from the previous chapters, all countries and regions are examined as a whole and the comparative analysis aims to identify salient features of larger groupings of countries or regions.

The chapter analyzes trends in completed cohort fertility; age patterns of cohort fertility; the advancement and postponement of childbearing; trends in incomplete cohort fertility of women in the middle or at the onset of childbearing; the volume of fertility that would be required to reach 'desired' levels of completed cohort fertility of women in the middle of their reproductive periods; issues of birth order and parity; and, finally, trends in the mean age of childbearing.

## 12.1 | Completed fertility trends: 1930s to 1960s birth cohorts

Total cohort fertility has undoubtedly declined from the cohorts born around 1930 to those born in the early 1960s throughout the countries under investigation (Table CO-1 and Appendix A). There was not a single exception. The cohorts which started their childbearing after the Second World War and completed it in the 1970s, those born around 1930, had an average total cohort fertility rate decidedly above replacement at 2.6 births per woman. Those that were completing their childbearing during the 1990s, i.e. those born around 1946, had an average TCFR of replacement at 2.1, and robust estimates indicate that those who will conclude their childbearing around 2010, namely those born

during the early 1960s, will have an average TCFR of about 1.9 births per woman.

In the West European countries the fertility decline was the fastest among the cohorts of the 1940s. It slackened among the cohorts of the 1950s, especially in the Nordic countries, but was picking up speed among the cohorts of the early 1960s (Figure CO-1 and Table CO-2). In other words, the descent of fertility was still in progress among the cohorts completing their childbearing during the first decade of the 21st century.

In the overseas countries with populations of predominantly European origin, the fertility decline started from a higher level and was faster than in West European countries. It also slowed down among the 1950s cohorts. The decline is continuing in most of these countries among the cohorts of the early 1960s. The United States was an exception. Its cohort fertility decline was as fast as in the other overseas countries among the cohorts of the 1930s and 1940s, but in contrast to the other countries leveled off among the cohorts born in the 1950s and remains stable among the cohorts born in the early 1960s (Figure CO-1 and Table CO-2).

In the formerly socialist countries of central and eastern Europe the overall decline of cohort fertility concealed differing trends of two groups. In addition to the majority of populations with low and moderately declining cohort fertility after the Second World War, there were a few countries that had not yet experienced a fertility transition and had high 'traditional' fertility in the cohorts born in the early 1930s. The TCFRs of these cohorts in Macedonia and Bosnia and Herzegovina were close to four births per woman and declined rapidly. In the majority of the formerly socialist countries completed cohort fertility was rather stable and changed very little among the cohorts of the 1930s, 1940s and 1950s. In almost all these countries a notable decline set in with the cohorts born during the 1960s.

## 12.2 | Age patterns of cohort fertility in the second half of the 20th century

The country studies demonstrated that changes in the age patterns of fertility were an inherent part of the fertility trends following the Second World War (Figures 3 and 5 in the country studies). In the interest of comparability between countries and in time, throughout the analysis of several following sections the

27th birthday is taken as the dividing point between fertility of young and older women. The rationale for this decision is argued in Chapter 2.

### *12.2.1. The shifts of fertility between the younger and the older ages*

First we explore the distribution of total cohort fertility between younger and older women, we compare regions and countries and investigate changes between successive cohorts.

The proportions of the TCFR in Table CO-3 realized by the 27th birthday, irrespective of the absolute values of the TCFR, provide the following picture. Taking the example of Denmark, in the 1930 birth cohort 56 per cent of fertility was realized when this cohort was young, i.e. before these women reached their 27th birthday. The cohorts born during the late 1930s and early 1940s —represented by the 1940 birth cohort— advanced their childbearing even more than previous cohorts and thus contributed to the tail-end of the baby boom. Not only did these cohorts still have relatively high fertility, they also had a large proportion of their children early, 65 per cent before the 27th birthday.

Even though one cohort after another of those born during the 1940s had lower total fertility than the previous one, the pattern of early childbearing persisted. Women born in 1950 had 61 per cent of their children while in their teens and early to mid-20s. Subsequently, TCFRs remained stable at about 1.9 births per woman among the cohorts born during the 1950s and early 1960s, but a continuously smaller proportion of children were borne by young women; in the 1960 cohort only 41 per cent.

Similar changes occurred in most western countries, although at somewhat different levels (Table CO-3). In the Netherlands the proportions of children borne by young women were small for all cohorts concerned; their childbearing was relatively late in the reproductive period. In the 1965 cohort only 28 per cent of all children were borne by young women. In contrast, in the United States women tended to bear children early. Fifty-two per cent of children were borne by young women in the 1965 cohort. But the differences between successive birth cohorts were similar from country to country. Among the birth cohorts of the 1930s the proportion of children borne by young mothers was increasing. There was not much change among the cohorts of the 1940s, although the shift of fertility into older ages had already begun. Among the

cohorts of the 1950s and the early 1960s there was a notable increase in the proportion of children borne by older women in the western countries.

The levels and nature of the changes were quite different in the formerly socialist countries of central and eastern Europe and in the formerly socialist Baltic countries. Wherever data were available, childbearing was early already among the cohorts born around 1930. The proportions of children borne by young women among these cohorts were between 50 and 60 per cent, occasionally even larger. For the subsequent cohorts the proportions of early childbearing continued to increase. In the cohorts born in the early to mid-1960s in most of these countries the proportions of children born by the 27$^{th}$ birthday of mothers were 65 to 80 per cent or higher (Table CO-3).

In the West Balkan Region, trends in Bosnia and Herzegovina, Macedonia and Slovenia were similar to those in the formerly socialist countries, i.e. continuously increasing proportions of children borne by young women. Croatia and Yugoslavia were exceptions; childbearing was early but stable. Between 60 to 65 per cent of children were borne by young mothers among the roughly 35 cohorts concerned and there were few changes.

Changes in childbearing age patterns were unique in Japan. The changes were moderate from the cohorts born around 1930 to those born in the mid-1950s with an initial decline in the proportions of children borne by young women of the 1930s birth cohorts. Eventually, as in the western countries the proportion of childbearing of young women declined rapidly among the cohorts born since the mid-1950s.

The basic trends and levels of age patterns of childbearing were very different in the western market-economy countries compared to the formerly socialist ones. The contrast was at its height among the cohorts of the mid-1960s. In the West 60 to 70 per cent of children were borne by older women; in the former socialist countries 60 to 80 per cent by young women.

### *12.2.2. Life-time strategies of childbearing*

The changes indicated in Table CO-3 will now be analyzed in greater depth. The trends of fertility among women before and after their 27$^{th}$ birthday, the directions of shifts between the two groups and, in particular, trends of the

magnitudes of childbearing in the young and in the older age groups and their interrelations will be examined.

In practice three different types of shifts between the proportions of fertility of the younger and older women obtained:

1. When comparing cohorts in time, fertility increases when women are young and declines when they are in their late 20s and/or 30s, women are having their children earlier in the reproductive period: fertility is being'advanced' (labeled as '**A'** in Table CO-4);
2. Fertility declines both before and also following the 27th birthday: a continual decline (labeled as '**D'** in Table CO-4);
3. Finally, fertility declines before women reach their 27th birthday, and increases after that birthday: fertility is being postponed (labeled as '**P'** in Table CO-4).

There is a fourth possibility, but there was only a single such case when fertility increased before and after the 27th birthday (labeled as **I** in Table CO-4).

The overall picture was the following. *Advancement* of fertility occurred among the cohorts of the 1930s in the western countries and in many formerly socialist countries in the 1940s birth cohorts (Table CO-4).

The *continual decline* was typical for the cohorts born during the 1940s in the western countries, for countries of former Yugoslavia among cohorts of the 1930s and 1940s, and became prevalent in the formerly socialist countries in the cohorts born during the 1950s and especially the early 1960s.

The *postponement* of fertility occurred mainly in the western countries among the cohorts born in the 1950s and early 1960s. Some postponement of fertility has also become evident in the countries of former Yugoslavia in the early 1960s.

By analyzing the magnitudes of the trends and, especially the magnitudes of the shifts, a picture is gained about the contribution of cohort age structural changes to trends of the TCFRs and, by extension, to trends in period fertility. Much depends on the extent to which a shift is 'balanced,' i.e. the degree to which the absolute magnitude of the decline or increase in fertility of young women differed from that of older women. If and when the absolute magnitudes are

equal, even a major age-structural shift will have no effect on the trend of the TCFR. Frequently age-structural changes overlap with fertility quantum changes. Further, when a continual decline or increase is taking place it implies that age-structural effects tend to be small and that changes in the quantum of fertility are the main cause of ongoing TCFR trends.

### *12.2.3. Advancement of fertility*

Throughout the western world fertility was on the rise among young women of the 1930s birth cohorts. By their 27th birthday the 1940 cohorts in western Europe had borne between 1.2 and 1.5 children per woman and between 1.7 and 2.0 in the overseas English speaking countries (Table CO-5). In all the western countries, except for Japan and Finland, young women of the 1940 cohort compared to the 1930 cohort had experienced an increase —a 'surplus'— of between 0.1 and 0.4 births per woman (Table CO-6).

When the women of the 1930s cohorts became older, they restricted their fertility. The fertility declines —'deficits'— after the 27th birthday were mostly between 0.3 and 0.7 births per woman (Table CO-6). To a large extent the lower fertility, 'deficits,' at the older ages was due to the rapid decline in higher order births. The increases in fertility, 'surpluses,' when these women were young were more then offset when they were older.[53] There was only one population in which the increase in fertility of the young women equaled the decline in fertility when they were older, namely England and Wales. On the other hand, in one half of the populations for which data were available, advanced fertility covered less than 40 per cent of the fertility deficits when these women were older. Despite the increased fertility of the young women, total cohort fertility was declining.

At the same time total period fertility rates were increasing in many of the western countries during the 1950s, commonly labeled the 'baby boom' (Appendix C and regional Figure 1). The explanation lies in the fact that the peak fertility years of the cohorts born in the early 1930s usually between the

[53] A comparison of the surpluses and the deficits provides a ratio. In the case of fertility *advancement* the 'surplus' of fertility between cohorts before the 27th birthday is divided by the 'deficit' after the 27th birthday to demonstrate the extent to which fertility of the women when young offset in advance the lack of fertility when they were older. This is expressed in percentages and appears in parentheses in Table CO-6.

years of 22 to 28, which for the 1930 cohort was in 1952 to 1958 overlapped with the rising fertility of young women in the cohorts born during the 1930s and early 1940s.[54] The main increase for the 1940 cohort tended to be at the ages of between 15 and 21, corresponding to the years 1955 to 1961. In other words, the shift in the age pattern of cohort fertility, namely the advancement of fertility in the cohorts born around 1940 into the younger ages, contributed significantly to the baby boom (Regional Figures 2 and 3). In sum, the baby boom resulted from a combination of quantum increases in fertility and changes in the timing of childbearing.

In the formerly socialist countries the advancement of fertility was common, especially among the cohorts of the 1940s. In relative terms, frequently the increase in fertility of women when they were young offset their decreased fertility when they were older. The absolute size of the advancement tended to be much smaller than in the western countries. In the Czech Republic, for instance, the fertility surplus of the young women of the 1950 cohort was twice the size of the deficit when they were older. In Hungary, Bulgaria and Romania the surpluses roughly equaled the deficits. These were the apparent consequences of the intentional and unintentional pronatalist policies.

### *12.2.4. Continual fertility decline*

In the western countries continual fertility decline in the birth cohorts of the 1940s almost invariably followed the fertility advancement stage (Tables CO-4, CO-5 and CO-6). The usual pattern was that the decline of fertility among the women before their 27$^{th}$ birthday was more pronounced than the decline when they were older. This was the expression of two concomitant processes: a forceful quantum fertility decline in the prime ages of childbearing coupled with an initiation of fertility postponement into the older ages (Figure 3 in the country studies).

In the formerly socialist countries continual fertility decline occurred in the cohorts of the 1930s and 1940s, especially in populations that embarked on the fertility transition late, such as Macedonia, Bosnia and Hercegovina, and Slovakia. In western Europe, Portugal falls into this category.

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[54] The changes in fertility patterns were obviously associated with changes in marriage patterns.

Another type of continual fertility decline was evident in the formerly socialist countries among the birth cohorts of the 1950s and 1960s. This type is associated with the onset of the transition to democratic market economies and profound changes in lifetime childbearing strategies.

### *12.2.5. Postponement of fertility*

In the western countries postponing fertility into the late 20s or 30s has been in progress for over a quarter of a century. It started with cohorts born in the late 1940s and in most countries it has not yet run its course. In the formerly socialist countries there were signs that childbearing postponement started among the cohorts of the late 1960s and in the 1970s (Figure 5 in the country studies).

The way in which this process proceeds is of critical importance for present and future population growth and of great interest to scientists, public officials, politicians and to the general public. As long as childbearing deficits incurred when women were young are offset by surpluses when they are older, the total number of children borne by a cohort does not change. In the past several decades this was more the exception than the rule. If and when fertility deficits of young women are not offset by surpluses later in their life, a decline in total fertility results. What was the experience in the low fertility populations?

In the western countries, including the overseas ones, childbearing was being postponed among cohorts born in the 1950s and early 1960s. Fertility declined among women before their 27$^{th}$ birthday across the board. In the 1950 birth cohorts on average young women had borne at least about one child, and up to as many as 1.6 children (Table CO-5). In the 1960 birth cohorts in practically all western countries on average young women had borne less than one child. Fertility of young women had also declined in Australia and New Zealand, as well as in Japan. The fertility declines, the 'deficits,' were between 0.2 and 0.5 children (Table CO-6). On the other hand, in all of these populations fertility had increased when the women of the 1950s cohorts were in their late 20s and in their 30s. The increases, or fertility 'surpluses,' in the 1960 cohort compared to the 1950 one were in the order of 0.1 to 0.4 children.[55]

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[55] In the case of fertility *postponement* the 'surplus' of fertility between cohorts after the 27$^{th}$ birthday is divided by the 'deficit' before the 27$^{th}$ birthday to demonstrate the extent to which fertility of the women when older compensates the lack of fertility when they were younger. As a *general label* for advancement and postponement we have

In all the countries of northern Europe as well as in Belgium, France and the United States when in their late 20s and in their 30s women of the 1960 birth cohort actually bore all the children they did not have when they were young; the 'compensation index' was close to 100 per cent. In Finland they even overcompensated. In the majority of the western countries, however, only a fraction of the lower fertility of young women of the 1960 cohort was realized when they were in the second part of their reproductive period. In Austria and Japan it was only about a third (Table CO-6).

Among the cohorts of the early 1960s, i.e. when comparing the 1960 and the 1965 birth cohorts, there was only a single country, Denmark, in which the deficit of the young was fully offset later in life. In the United States the compensation was almost a 1,000 per cent, but that was due to the very low level/value of the deficit and of the subsequent surplus. In most countries a modest proportion of the deficit of young women was offset by their fertility when they were older. The catching up, or the compensation, was lower among the cohorts of the early 1960s than among those of the 1950s. Is this a trend?

That fertility postponement had started in the formerly socialist countries is not yet revealed in the data of Table CO-6 but can be detected in Figure 5 of the country studies. In almost every country the tail-end of the 1965 age-specific fertility curve was above the curve for the 1960 curve.

## 12.3 | Fertility patterns of young women

In the western countries cumulated cohort fertility rates (CCFRs) up to the 27$^{th}$ birthday were increasing among the 1930s birth cohorts, but started to decline in the cohorts of the 1940s (Table CO-7). For the most part this decline continued among the cohorts of the 1950s and 1960s. Wherever data were available, the descent did not stop among cohorts of the early 1970s. Frequently the rate of decline among the cohorts born in the 1970s was larger than in previous cohorts.

The difference of early childbearing between the cohorts born in 1940 and those born in 1970 was of major proportions. The CCFRs up to the 27$^{th}$ birthday declined between 45 and 60 per cent throughout the western world within the

employed the 'shift ratio,' in the context of postponement the shift ratio can be labeled more specifically as the 'compensation index.' It is expressed in percentages and these are NOT in parentheses in Table CO-6.

span of 30 cohorts. The decline was particularly pronounced, for instance, in Canada, Italy and the Netherlands. In Canada 0.7 and in the other two countries only about 0.4 of a child was born per woman by the time the women in the 1970 birth cohort reached their 27th birthday; down from 1.8, 1.0 and 1.2 in these three countries, respectively, in the 1940 cohort (Table CO-7). There was a single exception, the US, where fertility of young women no longer declined among the cohorts of the 1960s and settled at a level of 1.1 births per woman. In all other western countries fertility of young women among the cohorts of the early 1970s was between 0.4 and 0.7 births per woman.

For the most part fertility of young women in the formerly socialist countries did not change substantially from the cohorts of the 1930s to those of the 1950s (Table CO-7). A general decline became evident in the birth cohorts of the 1960s and accelerated sharply in the cohorts of the early 1970s. Within a span of 13 cohorts, from the 1960 to the 1973 cohort, fertility of young women in the regions of East central and eastern Europe as well as in Slovenia dropped by half a birth per woman. The CCFR up to the 27th birthday declined from a range of 1.3-1.6 to 0.7-1.1 births per woman. Despite this large decline, fertility of young women was still comparatively high, because these countries previously had a pattern of very young childbearing. In almost all the formerly socialist countries, young women of the 1973 cohort were still having around 0.9 to 1.0 births per woman by the time they reached their 27th birthday and their childbearing peak continued to be in the early 20s.

## 12.4 | The implications of declining childbearing of young women

A crucial question arises. Does the decline of fertility of young women in the birth cohorts of the 1960s and 1970s imply that they are postponing childbearing into their late 20s and 30s? If so, are they going to bear these children when they will be older?

Only the future will provide definitive answers to these questions. Valuable information is however available to make informed judgments regarding this issue. Considering, that

a. the cumulated fertility of the young women of the cohorts born around 1970 is known;

b. the proportions of childbearing before and after the 27th birthday are known for the 1960 birth cohorts; and, finally,
c. recent age patterns of cohort fertility are known, it is possible:

    1. to calculate the magnitude of childbearing of older women that would be needed for cohorts born, for example, in 1970 to attain the same TCFR as that of the 1960 birth cohorts, or to attain replacement level fertility (defined as a TCFR of 2.1); and
    2. to make reasonable judgments about whether it appears feasible for the older women to bear the children indicated by the above calculations.

These calculations and evaluations follow.

Take the example of Denmark:

1. The amount of children per woman that were already born by the 27th birthday of the 1970 cohort, namely 0.612 (col.3 in Table CO-8), is known. This implies that the 1970 birth cohort would need to bear another 1.283 children per woman (col.4 in Table CO-8) after the 27th birthday in order to achieve the 1960 TCFR. Such an amount is 15 per cent more than the number borne by the 1960 birth cohort following the 27th birthday (1.283[col.4]/1.119[col.2]=1.146, i.e. 15 per cent [col.6 in Table CO-8])
2. If analogous reasoning is applied, the 1970 birth cohort would need to bear another 1.488 children per woman (col.5 in Table CO-8) after the 27th birthday in order to attain a replacement TCFR of 2.1. Such an amount is 33 per cent more than the number borne by the 1960 birth cohort following the 27th birthday (1.488[col.5]/1.119[col.2]= 1.130, i.e. 33 per cent [col.7 in Table CO-8]).

### *12.4.1. A rough evaluation*

The results of the calculations show that in practically every country the proportion or amount of childbearing needed to attain the stipulated targets for the 1970 birth cohorts are larger, in many cases formidably so, than the respective amounts in the 1960 cohorts (Table CO-8). Considering that in most countries the TCFR of the 1960 birth cohort was below replacement, it would require even larger amounts of childbearing after the 27th birthday for the 1970 cohort to attain replacement fertility than to reach the 1960 TCFR (Table CO-8).

In order to be able to appraise this information, a criterion has to be defined so that relevant precise-quantitative or vague-qualitative evaluations can be made. Given the relatively general level of analysis in this section it appears difficult to devise the former. For the latter it is proposed to inquire whether it appears likely or unlikely for fertility to increase as much as indicated by the values in Table CO-8 among the cohorts under consideration when they will be in their late 20s and in their 30s.

As a first approximation one can say that as long as the values in the last two columns of Table CO-8 are relatively small, for instance, that less than a 35 per cent more childbearing would be required after the 27$^{th}$ birthday, it might be possible to achieve such an increase. Obviously, the larger the number the less likely such a development.

In the western countries the needed higher fertility was below, in many cases much lower than, the designated 35 per cent mark. Most countries of southern Europe, however, were above this point. The majority of the formerly socialist countries would have needed an increase in the childbearing of older women considerably larger than the 35 per cent.

This procedure does not lead to very satisfactory results and is vague. Nevertheless, it does indicate that it would be difficult, often extremely difficult, to achieve such large increases in the fertility of older women, especially in southern Europe and in the formerly socialist countries. Furthermore, considering that increases in fertility of women in their late 20s and early 30s in most western countries had diminished in the birth cohorts of the early 1960s, namely the catching up had slackened (last col. in Table CO-6), it is reasonable to be skeptical about whether fertility after the 27$^{th}$ birthday would rise sufficiently even in these countries.

### *12.4.2. A more detailed evaluation*

Taking the example of Denmark, instead of merely considering the overall ratio of needed increase, age-specific curves are plotted which illustrate scenarios of augmented fertility rates that would be needed to reach the desired elevated fertility after the 27$^{th}$ birthday. A visual inspection of Figure CO-2a illustrates that it would be possible for Danish women born in 1970 to decide to have the number of children in their late 20s and early 30s that would be needed to attain

the TCFR of the 1960 cohort, but rather unlikely to bear the numbers needed to reach a TCFR of replacement.

It is not out of the realm of the possible for the 1970 cohort to reach the target TCFRs. If, for instance, the elevated curves after the 27th birthday are compared with the real cohort fertility age trajectory of Swiss women born in 1930 who achieved a TCFR of 2.18 (Figure CO-2b), a reasonable similarity of the Danish and Swiss curves can be observed. Detailed calculations show that age-specific fertility rates needed to attain the TCFR of the 1960 cohort are somewhat higher than those of the 1930 Swiss cohort. To attain cohort replacement would obviously be more difficult. In such a scenario the estimated needed Danish age-specific fertility rates after age 30 are considerably higher than those of the 1930 cohort of Swiss women.

Data in Table CO-8 show that *Bulgarian* women born in 1970 would have to have about twice as many children after the 27th birthday than the women of the 1960 cohort to attain the 1960 TCFR or the TCFR of replacement. At first sight that appears implausible. An examination of Figure CO-3a illustrates scenarios of age-specific fertility behavior that would be needed to achieve these results. The peak of childbearing in Bulgaria for the 1970 birth cohort was at age 20. By the 27th birthday the majority of Bulgarian women of that cohort had completed their childbearing. Among the cohort of 1960 it was 80 per cent (Table CO-3). In their late 20s women of the 1970 cohort would have to have age-specific fertility rates almost as high as they had in their early 20s to attain the TCFR of the 1960 cohort. Such a reversal of the fertility age pattern is not likely to occur. This reflection leads to a conclusion that a major proportion of childbearing of the 1970 cohort has already occurred before age 27. It is unrealistic to expect that this cohort will reach either of the target cohort fertility rates.

Interesting reflections are generated by superimposing the age fertility trajectory of the Swiss 1930 birth cohort (Figure CO-3b). The difference between childbearing patterns of European countries stands out. The cohorts born around 1970 in the formerly socialist countries of central and eastern Europe still had a very young age pattern of fertility. These were cohorts which started their childbearing approximately five years before the collapse of the authoritarian systems in those countries. It is conceivable that the cohorts born more recently will adopt childbearing age patterns more similar to those of the western countries. The 1975 birth cohorts in Bulgaria, the Czech Republic and Hungary are showing signs of going in that direction (Figure 8 in the country studies).

## 12.5 | What do the childbearing age patterns of the youngest women indicate?

The cumulated cohort fertility rates (CCFRs) up to the 22nd birthday have been on the decline in practically all the western countries for at least 25 recent birth cohorts, starting with those born in 1950 through those born in 1975 and possibly 1978 (Table CO-9). The overall decline has been between 40 and 80 per cent in the majority of these countries (not shown in Table CO-9). The decline has been continuing among the youngest cohorts, namely those born during the 1970s. In some countries this descent has been faster than among the older cohorts and in others slower. In the 1975 cohorts the absolute levels of this fertility were, as a rule, very low, namely below 0.2 births per woman. The outstanding exception was the US, with a relatively stable CCFR over the 25 cohorts of about 0.5 births per woman.

Note that in some countries there were signs of the fertility decline coming to an end among the youngest women. That appeared to be so in the Netherlands and in Switzerland where the rates were low, as well as in England and Wales and New Zealand which had relatively high rates. In West Germany, the 1975 cohort even had a fertility rate higher than that of the 1970 cohort.

In the formerly socialist countries the trends as well as the absolute levels were different. The levels of childbearing of the youngest women were rather stable for the 40 cohorts from the ones born in the early 1930s to those born around 1970. For instance, in the Czech and Slovak Republics 0.6 births per woman was the norm, in Hungary a little less, in Bulgaria a little more. An onset of a decline can be detected among the cohorts of the 1960s. A descent of notable rapidity was experienced among the cohorts born in the 1970s (Table CO-9). Nevertheless, the level of incomplete fertility by the 22nd birthday in the 1975 cohorts in practically all the formerly socialist countries was still generally about twice as high as in the western countries.

The general CCFR trend of the youngest women under 22 years of age throughout the low fertility countries among the cohorts born in the 1970s was a continuing decline. This in turn implies changing lifetime reproductive patterns of continuing delays in childbearing.

## 12.6 | Birth order and parity

The above comparative analysis has dealt with the total numbers of births. We now turn to a more detailed analysis of trends in the composition of the TCFRs by birth order, of what proportions of women had a first birth and then proceeded to have further ones, what were the specific numbers of births per woman when they had completed their childbearing and the proportions that remained without ever having borne a child. Applying professional jargon, we will analyze birth order total cohort fertility rates, parity progression ratios, parity distributions and childlessness. These measures portray different perspectives of the same developments and thus are directly interdependent, however, each of them provides additional insights. Some of the measures overlap, for instance, the total cohort fertility rate for birth order one provides the same information as the parity progression ratio to the first birth order, and the proportion of childless women is the complement to each of these measures.

A number of issues of notable interest and importance can be addressed. What was the most frequent eventual number of children women had borne implying 'norms of family size'? Did it change? Was it the two-child family? If so, is it likely to persist? What were the proportions of women remaining childless?

Regrettably the universe of data available for these analyses is notably smaller than for the investigations of the total numbers of births. Many countries collect data on birth order within the current marriage rather than the biological birth order which is what is under investigation in connection with cohort fertility, the subject of this book. Thus we can conduct the following analyses only with a limited number of countries and in most cases for shorter spans of birth cohorts. This implies that any generalizations may not necessarily apply to countries for which data were not available.

### *12.6.1. Birth order total cohort fertility rates*

In the western countries a number of variations occurred in the levels and trends of biological birth order TCFRs, but we will focus only on those that stand out.

There was a notable decline of third and higher order births among the cohorts of the 1930s and 1940s. In most South European countries this descent continued among the 1950s cohorts. The result was that the numbers of fourth

and higher order births among the cohorts of the 1960s were insignificant, 0.1 births per woman or less, and thus these contributed only marginally to the overall TCFRs (Figure 7 in country studies). Third order births were about 0.2 to 0.3 births per woman among the younger cohorts born around 1960.

In the 1930s to 1950s birth cohorts the rates for first order births were quite steady at 0.85 to 0.90 per woman (Figure 7 in country studies). In the younger cohorts of the late 1950s and the early 1960s these rates tended to descend towards 0.80 births per woman, exceptionally even less. The rates for second order births were between 0.60 and 0.80 and these also had a tendency to decline among the younger cohorts.

In sum, in the western countries among the cohorts of the 1960s higher order TCFRs were insignificant and first as well as second order TCFRs were on the decline. The United States was the exception with stable and somewhat higher rates starting with the cohorts of the early 1950s.

In the formerly socialist countries third and higher order TCFRs tended to be low already among the cohorts of the 1930s and proceeded to decline mildly. In Macedonia, Bosnia and Herzegovina and to some extent in Slovakia the declines were more pronounced, but from a high beginning. The end result was very similar for all these countries. Fourth as well as fifth and higher order births contributed less than 0.1 births per woman each to the overall TCFRs. Third order births contributed about 0.1 to 0.2 births per woman.

First and second order birth rates were reasonably stable from the cohorts of the 1930s to those of the 1950s. First order births were generally at 0.90 per woman or higher, somewhat lower in the countries of former Yugoslavia. In most central and East European countries second order TCFRs were around 0.7 births per woman and had a tendency to increase moderately from the cohorts of the 1930s to those of the 1950s. An unmistakable turning point, a downturn, can be observed beginning with the cohorts of the late 1950s in the majority of the central and East European countries and in Slovenia at first in second order births and subsequently also in first order births.

To conclude, the resulting state was quite similar for most countries among the cohorts of the early to mid-1960s, but less evidence is available for the western than for the formerly socialist countries. First and second order births were

declining and fourth and higher order births became marginal. This generalization does not apply to all countries, especially not to the US.

### *12.6.2. Parity progression ratios*

In most western countries with available data the progression to parity 1 (PPR0) was in the order of 90 per cent for the cohorts of the 1930s and 1940s and then tended to decline to around 80 to 85 per cent for the cohorts born in the early 1960s (Table CO-10 and Figure 8 in the country studies). In the South European countries the turning point came later, however, PPR0s for the early 1960s cohorts were similar to the other countries.

Progression to the second birth was more varied. For the most part, PPR1s were declining. The descent was moderate and uneven in some countries, for instance, in England and Wales.

Parity progression ratios to third and fourth order births were significantly lower for the cohorts born in the late 1950s compared to those of the 1930s. The descent was more pronounced in southern Europe than elsewhere.

In the formerly socialist countries PPR0 were at or above 90 per cent and stable through the cohorts of the late 1950s in East central and in eastern Europe as well as in Slovenia (Table CO-10 and Figure 8 in the country studies). Among the more recent cohorts of the 1960s the PPR0s were declining. In the countries of former Yugoslavia progressions to the first birth order remained level even among the more recent cohorts of the 1960s.

Trends of progression to the second birth order were similar to the first birth order; stable and level in the countries of former Yugoslavia, declines in the countries of East central Europe among cohorts of the late 1950s and early 1960s. Of particular note are sharp declines of PPR1s among the cohorts born in the 1960s in eastern Europe to below 70 per cent (Table CO-10 and Figure 8 in the country studies). Increasingly smaller proportions of women with a first birth, which themselves were declining, were having second ones.

Progression ratios to third and fourth births declined in all the formerly socialist countries to levels when about one fifth to one third of women would continue

from the second to the third birth order and slightly less from the third to the fourth birth.

Some trends are common for almost all countries. Progressions to the first birth were declining among the cohorts born in the 1960s. And progression ratios to third and fourth births were considerably lower among the cohorts of the late 1950s than those of the 1930s, but the levels varied. They were on the high side in the Nordic countries and comparatively low in southern Europe.

The outstanding exception was the United States with stable and relatively high levels for all progression ratios starting with the cohorts born in the late 1940s.

### *12.6.3. Cohort parity distributions*

In the western countries there was a notable decline in women with three or more children between the cohorts born in the 1930s and those born during the 1950s (Table CO-11 and Figure 9 in the country studies). It might come as a surprise that even in the 1930s cohorts the 'big' family, namely women with three and four or more children, was less prevalent in Italy and Greece than elsewhere. The relatively smaller proportions of higher parity women in southern Europe continued to be the case in the cohorts born in the late 1950s and early 1960s. The proportions of women with three or more children were around 20 per cent in southern Europe and around 30 per cent in Norway, Sweden and in England and Wales.

In the cohorts born around 1960 the 'two child family' was the most prevalent. Between 40 and 50 per cent of all women were of parity two, but almost everywhere this percentage was declining. The proportions of women with one child were rising in a number of countries and were visibly higher in southern Europe than in other western countries, from below 20 to above 30 per cent.

Women with no children at all were increasing (Table CO-11, Figure CO-4 and Figure 10 in the country studies). In most western countries they were between 15 and 20 per cent in cohorts born in the early 1960s with a trend that implied continuing further increase.

In the majority of the formerly socialist countries even in the 1930s cohorts the proportions of women with three or more children were small, between 20 and

30 per cent (Table CO-11 and Figure 9 in the country studies). These proportions declined further and reached as low as ten to 15 per cent, for instance, in Slovenia and Bulgaria in the cohorts born around 1960.

The countries which were still predominantly agrarian in the middle of the 20th century, such as Macedonia, Romania and Slovakia, had large proportions of women with high order children in the birth cohorts of the 1930s. As these countries proceeded through major social and economic transformations, the proportions of women with three or more children declined rapidly.

Throughout the formerly socialist countries women with two children reached proportions larger than in the western countries, often between 50 and 60 per cent, in the cohorts of the 1950s. In many the peak had been reached and these proportions were on the decline in the more recent cohorts (Table CO-11 and Figure 9 in the country studies). Women with one child were well represented in a number of countries, such as Hungary, Bulgaria, Romania, Croatia and Slovenia, with proportions of about 20 per cent or more in the cohorts born around 1960.

The rise in the proportions of childless women started later in the formerly socialist countries compared to the West. The absolute values of the proportions of childless women in the cohorts of the 1960s might have been moderately overestimated, but the direction of the trend is indisputable. Like in the western countries, a further increase can be expected in the foreseeable future.

## 12.7 | Mean age of childbearing

The mean age of all rather than first births is explored. An investigation of the mean age of first births would have been preferable, if for no other reason than the argument made by Hobcraft and Kiernan (1995), that to conceive the first child is the most serious decision in a woman's or couple's life. But data on first births are available only for a limited number of countries and shorter time series, as already mentioned above. There are also demographic reasons why mean ages of first births would have been more desirable. The birth order distribution as well as the age patterns of childbearing within each birth order influence levels and trends of the mean age of the total number of births. Despite these complications the analysis of levels and trends of the average age of childbearing provides complementary knowledge.

In the western countries, including the overseas English speaking ones, among the cohorts of the 1930s when births were being advanced into the younger ages and the proportions of higher order births were declining, the mean age of childbearing was decreasing between one and two years for cohorts a decade apart (Table CO-12 and Figure CO-5). In southern Europe this was still happening among the cohorts of the 1940s.

The outstanding feature among the cohorts of the 1940s in the western countries was that a trough was reached in the mean age of childbearing. The mean age did not change much between the cohorts born around 1940 and those born around 1950 (Table CO-12), because there was a concomitant quantum decline of fertility centered on the prime ages of childbearing. In the United States and Canada the trough was evident in the cohorts born around 1940, in most South European countries it was the cohorts born in the mid-1950s (Figure CO-5).

The birth cohorts in which the mean age of fertility started to increase were those that started to postpone fertility from the young to the older ages. Increases in the mean ages of childbearing in the western countries were between one and two years for the cohorts of the 1950s that were ten years apart, and the increase among cohorts of the early 1960s is continuing. In southern Europe, in Italy and Spain, this process started among the cohorts of the 1950s, in Greece and Portugal this was happening among the cohorts of the early 1960s.

In all the formerly socialist countries the average age of childbearing was declining at a modest pace from the birth cohorts of the 1930s through those of the 1950s as the proportions of births born early in the reproductive period were increasing. The decline was faster in those countries that were initially less industrialized. Signs of a turnabout appeared among cohorts of the 1950s in the Czech Republic, Hungary and in the West Balkan region, elsewhere among the cohorts of the 1960s (Table CO-12 and Figure CO-5).

*Table CO-1. Number of countries in which women born in 1931, 1946 and 1962 experienced specified total cohort fertility rates and average TCFR in those three birth cohorts*

| Total cohort fertility rate | Birth cohort | | |
|---|---|---|---|
| | 1931 | 1946 | 1962 |
| Less than 1.60 | - | - | 1 |
| 1.60-1.79 | - | 1 | 9 |
| 1.80-1.99 | - | 13 | 13 |
| 2.00-2.19 | 9 | 10 | 8 |
| 2.20-2.39 | 6 | 5 | 3 |
| 2.40-2.59 | 3 | 3 | - |
| 2.60 and above | 11 | 1 | - |
| Total number of countries | 29 | 33 | 34 |
| *Average TCFR (unweighted)* | *2.57* | *2.10* | *1.91* |

*Table CO-2. Total cohort fertility rates, 35 low fertility countries, birth cohorts 1930, 1940, 1950, 1960 and 1965 (continued)*

| Country | Total cohort fertility rates of cohort born in | | | | | Annual change between birth cohorts (per cent) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1930 | 1940 | 1950 | 1960 | 1965 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 |
| Nordic Region | | | | | | | | | |
| Denmark | 2.357 | 2.241 | 1.908 | 1.898 | 1.922 | -0.5 | -1.6 | -0.1 | 0.3 |
| Finland | 2.460 | 2.039 | 1.857 | 1.956 | 1.907 | -1.9 | -0.9 | 0.5 | -0.5 |
| Norway | 2.483 | 2.450 | 2.095 | 2.092 | 2.063 | -0.1 | -1.6 | 0.0 | -0.3 |
| Sweden | 2.121 | 2.049 | 2.001 | 2.041 | 1.979 | -0.3 | -0.2 | 0.2 | -0.6 |
| Western Europe | | | | | | | | | |
| Belgium | ... | 2.157 | 1.830 | 1.855 | ... | ... | -1.6 | 0.1 | ... |
| England and Wales | 2.342 | 2.348 | 2.057 | 1.961 | 1.865 | 0.0 | -1.3 | -0.5 | -1.0 |
| France | 2.628 | 2.410 | 2.109 | 2.111 | 2.016 | -0.9 | -1.3 | 0.0 | -0.9 |
| Netherlands | 2.678 | 2.221 | 1.889 | 1.851 | 1.774 | -1.9 | -1.6 | -0.2 | -0.8 |
| West central Europe | | | | | | | | | |
| Austria | ... | 2.125 | 1.869 | 1.696 | 1.640 | ... | -1.3 | -1.0 | -0.7 |
| Former FRG | 2.150 | 1.968 | 1.693 | 1.596 | 1.484 | -0.9 | -1.5 | -0.6 | -1.5 |
| Former GDR | ... | 1.982 | 1.791 | 1.796 | 1.566 | ... | -1.0 | 0.0 | -2.7 |
| Switzerland | 2.181 | 2.082 | 1.793 | 1.776 | 1.652 | -0.5 | -1.5 | -0.1 | -1.4 |
| Southern Europe | | | | | | | | | |
| Greece | ... | 2.095 | 2.019 | 1.926 | 1.725 | ... | -0.4 | -0.5 | -2.2 |
| Italy | 2.260 | 2.115 | 1.863 | 1.663 | 1.485 | -0.7 | -1.3 | -1.1 | -2.3 |
| Portugal | 2.942 | 2.666 | 2.078 | 1.892 | 1.816 | -1.0 | -2.5 | -0.9 | -0.8 |
| Spain | 2.646 | 2.548 | 2.136 | 1.760 | 1.594 | 0.4 | -1.8 | -1.9 | -2.0 |
| East central Europe | | | | | | | | | |
| Czech Republic | 2.140 | 2.066 | 2.095 | 2.027 | 1.928 | -0.4 | 0.1 | -0.3 | -1.0 |
| Hungary | 2.075 | 1.921 | 1.951 | 2.018 | 1.970 | -0.8 | 0.2 | 0.3 | -0.5 |
| Slovak Republic | 2.864 | 2.545 | 2.308 | 2.176 | 2.035 | -1.2 | -1.0 | -0.6 | -1.3 |
| Eastern Europe | | | | | | | | | |
| Bulgaria | 2.104 | 2.083 | 2.067 | 1.952 | 1.830 | -0.1 | -0.1 | -0.6 | -1.3 |
| Romania | ... | 2.392 | 2.433 | 2.148 | 1.909 | ... | 0.2 | -1.2 | -2.4 |
| Russia | ... | 1.946 | 1.884 | 1.830 | 1.654 | ... | -0.3 | -0.3 | -2.0 |
| West Balkan Region | | | | | | | | | |
| Bosnia and Herzegovina | 3.588 | 2.747 | 2.171 | ... | ... | -2.7 | -2.4 | ... | ... |
| Croatia | 2.153 | 1.959 | 1.864 | 1.978 | 1.880 | -0.9 | -0.5 | 0.6 | -1.0 |
| Macedonia | 3.737 | 3.058 | 2.347 | 2.291 | 2.199 | -2.0 | -2.6 | -0.2 | -0.9 |
| Slovenia | 2.100 | 2.008 | 1.897 | 1.872 | 1.765 | -0.4 | -0.6 | -0.1 | -1.2 |
| Yugoslavia | 2.481 | 2.377 | 2.281 | 2.299 | 2.162 | -0.4 | -0.4 | 0.1 | -1.2 |
| Baltic Region | | | | | | | | | |
| Estonia | ... | ... | 1.974 | 2.014 | 1.868 | ... | ... | 0.2 | -1.5 |
| Latvia | ... | ... | 1.870 | 1.943 | 1.773 | ... | ... | 0.4 | -1.8 |
| Lithuania | ... | 1.989 | 2.008 | 1.885 | 1.720 | ... | 0.1 | -0.6 | -1.8 |

*Table CO-2. (end)*

| Country | Total cohort fertility rates of cohort born in | | | | | Annual change between birth cohorts (per cent) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1930 | 1940 | 1950 | 1960 | 1965 | 1930--1940 | 1940-1950 | 1950-1960 | 1960-1965 |
| Non-European Countries | | | | | | | | | |
| Australia | 3.073 | 2.810 | 2.346 | 2.148 | 2.028 | -0.9 | -1.8 | -0.9 | -1.1 |
| Canada | 3.359 | 2.671 | 1.928 | 1.825 | 1.721 | -2.3 | -3.3 | -0.6 | -1.2 |
| Japan | 2.098 | 1.988 | 2.024 | 1.815 | ... | -0.5 | 0.2 | -1.1 | ... |
| New Zealand | 3.631 | 3.100 | 2.553 | 2.362 | 2.246 | -1.6 | -1.9 | -0.8 | -1.0 |
| United States | 3.178 | 2.729 | 2.028 | 2.014 | 2.038 | -1.5 | -3.0 | -0.1 | 0.2 |

*Table CO-3. The proportion of total cohort fertility completed by 27th birthday, 35 low fertility countries, birth cohorts 1930, 1940, 1950, 1960 and 1965 (continued)*

| Country | Proportion of total cohort fertility completed up to 27th birthday of cohort born in | | | | | Annual change between birth cohorts (per cent) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1930 | 1940 | 1950 | 1960 | 1965 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 |
| Nordic Region | | | | | | | | | |
| Denmark | 55.9 | 64.8 | 61.0 | 40.9 | 35.5 | 1.5 | -0.6 | -4.0 | -2.8 |
| Finland | 51.3 | 61.7 | 51.5 | 39.8 | 36.0 | 1.8 | -1.8 | -2.6 | -2.0 |
| Norway | 45.4 | 60.7 | 61.1 | 44.1 | 41.2 | 2.9 | 0.1 | -3.3 | -1.4 |
| Sweden | 51.8 | 59.0 | 53.3 | 39.1 | 41.2 | 1.3 | -1.0 | -3.1 | 1.1 |
| Western Europe | | | | | | | | | |
| Belgium | ... | 60.2 | 61.2 | 50.8 | ... | ... | 0.2 | -1.9 | ... |
| England and Wales | 47.0 | 61.8 | 56.9 | 47.0 | 44.3 | 2.7 | -0.8 | -1.9 | -1.2 |
| France | 51.9 | 59.8 | 58.9 | 49.3 | 42.1 | 1.4 | -0.2 | -1.8 | -3.1 |
| Netherlands | 35.3 | 53.0 | 52.5 | 34.0 | 28.3 | 4.1 | -0.1 | -4.3 | -3.7 |
| West central Europe | | | | | | | | | |
| Austria | ... | 62.4 | 66.1 | 57.3 | 51.9 | ... | 0.6 | -1.4 | -2.0 |
| Former FRG | 46.6 | 61.0 | 58.7 | 45.0 | 38.8 | 2.7 | -0.4 | -2.7 | -3.0 |
| Former GDR | ... | 71.5 | 73.3 | 77.1 | 74.0 | ... | 0.2 | 0.5 | -0.8 |
| Switzerland | 40.4 | 56.0 | 51.7 | 38.9 | 34.0 | 3.3 | -0.8 | -2.8 | -2.7 |
| Southern Europe | | | | | | | | | |
| Greece | ... | 46.5 | 60.3 | 62.3 | 54.0 | ... | 2.6 | 0.3 | -2.9 |
| Italy | ... | 48.2 | 55.9 | 45.7 | ... | ... | 1.5 | -2.0 | ... |
| Portugal | 39.5 | 47.7 | 56.9 | 57.2 | 49.8 | 1.9 | 1.8 | 0.1 | -2.8 |
| Spain | 31.9 | 39.3 | 51.9 | 46.3 | 36.6 | 2.1 | 2.8 | -1.2 | -4.7 |
| East central Europe | | | | | | | | | |
| Czech Republic | 68.5 | 71.6 | 73.3 | 74.6 | 74.1 | 0.4 | 0.2 | 0.2 | -0.1 |
| Hungary | 68.8 | 65.9 | 71.7 | 68.2 | 66.7 | -0.4 | 0.8 | -0.5 | -0.4 |
| Slovak Republic | 59.7 | 66.7 | 69.0 | 71.9 | 78.9 | 1.1 | 0.3 | 0.4 | 1.9 |
| Eastern Europe | | | | | | | | | |
| Bulgaria | 68.9 | 72.3 | 77.5 | 79.8 | 81.5 | 0.5 | 0.7 | 0.3 | 0.4 |
| Romania | ... | 54.4 | 69.3 | 74.0 | 77.7 | ... | 2.4 | 0.7 | 1.0 |
| Russia | ... | 59.1 | 62.4 | 70.6 | 75.5 | ... | 0.5 | 1.2 | 1.3 |

*Table CO-3. (end)*

| Country | Proportion of total cohort fertility completed up to 27th birthday of cohort born in | | | | | Annual change between birth cohorts (per cent) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1930 | 1940 | 1950 | 1960 | 1965 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 |
| West Balkan Region | | | | | | | | | |
| Bosnia and Herzegovina | 49.6 | 58.8 | 65.8 | ... | ... | 1.7 | 1.1 | ... | ... |
| Croatia | 60.8 | 65.0 | 66.3 | 65.6 | 61.3 | 0.7 | 0.2 | -0.1 | -1.3 |
| Macedonia | 51.2 | 58.2 | 63.7 | 66.6 | 64.6 | 1.3 | 0.9 | 0.4 | -0.6 |
| Slovenia | 50.9 | 58.9 | 67.0 | 70.2 | 64.3 | 1.5 | 1.3 | 0.5 | -1.8 |
| Yugoslavia | 62.6 | 62.3 | 63.9 | 62.8 | 62.0 | -0.1 | 0.3 | -0.2 | -0.2 |
| Baltic Region | | | | | | | | | |
| Estonia | ... | ... | 62.5 | 68.8 | 71.4 | ... | ... | 1.0 | 0.7 |
| Latvia | ... | ... | 61.2 | 67.9 | 72.0 | ... | ... | 1.0 | 1.2 |
| Lithuania | ... | 48.6 | 59.6 | 65.1 | 67.5 | ... | 2.0 | 0.9 | 0.7 |
| Non-European Countries | | | | | | | | | |
| Australia | 50.6 | 60.6 | 58.1 | 43.9 | 39.3 | 1.8 | -0.4 | -2.8 | -2.2 |
| Canada | 50.8 | 67.4 | 56.2 | 45.8 | 42.4 | 2.8 | -1.8 | -2.0 | -1.5 |
| Japan | 52.7 | 46.8 | 48.8 | 37.7 | ... | -1.2 | 0.4 | -2.6 | ... |
| New Zealand | 49.1 | 63.8 | 64.2 | 45.8 | 42.2 | 2.6 | 0.1 | -3.4 | -1.7 |
| United States | 59.1 | 71.3 | 60.4 | 52.7 | 52.0 | 1.9 | -1.7 | -1.4 | -0.3 |

*Table CO-4 Characterization of shifts in childbearing between women up to and after the 27th birthday, 35 low fertility countries, birth cohorts 1930, 1940, 1950, 1960 and 1965 (continued)*

| Country | Shift ratio[1] between birth cohorts | | | |
|---|---|---|---|---|
| | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 |
| Nordic Region | | | | |
| Denmark | A | D | P | P |
| Finland | D | P | P | P |
| Norway | A | D | P | P |
| Sweden | A | P | P | A |
| Western Europe | | | | |
| Belgium | … | D | P | … |
| England and Wales | A | D | P | D |
| France | A | D | P | P |
| Netherlands | A | D | P | P |
| West central Europe | | | | |
| Austria | … | D | P | P |
| Former FRG | A | D | P | P |
| Former GDR | … | D | A | D |
| Switzerland | A | D | P | … |
| Southern Europe | | | | |
| Greece | … | A | D | P |
| Italy | … | A | P | … |
| Portugal | A | A | D | P |
| Spain | A | A | D | P |
| East central Europe | | | | |
| Czech Republic | A | A | D | D |
| Hungary | P | A | P | P |
| Slovak Republic | D | D | D | A |
| Eastern Europe | | | | |
| Bulgaria | A | A | D | D |
| Romania | … | A | D | D |
| Russia | … | A | A | D |
| West Balkan Region | | | | |
| Bosnia and Herzegovina | D | D | … | … |
| Croatia | D | D | I | P |
| Macedonia | D | D | A | P |
| Slovenia | A | A | A | P |
| Yugoslavia | D | D | P | D |
| Baltic Region | | | | |
| Estonia | … | … | A | D |
| Latvia | … | … | A | D |
| Lithuania | … | A | A | D |

*Table CO-4. (end)*

| Country | Shift ratio[a] between birth cohorts | | | |
|---|---|---|---|---|
| | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 |
| Non-European Countries | | | | |
| Australia | A | D | P | P |
| Canada | A | D | P | P |
| Japan | P | A | P | … |
| New Zealand | A | D | P | P |
| United States | A | P | P | P |

Note: [a] Ratio of childbearing surplus or deficit of women before and after 27th birthday (for details see text).

A = Advancement of fertility from after to before 27th birthday.

D = Decline of fertility before and after 27th birthday.

P = Postponement of fertility from before to after 27th birthday.

I = Increase of fertility before and after 27th birthday.

*Table CO-5 Cumulated cohort fertility rates (CCFRs), up to and after 27th birthday, 35 low fertility countries, birth cohorts 1930, 1940, 1950, 1960 and 1965 (continued)*

| Country | CCFRs up to 27th birthday | | | | | CCFRs after 27th birthday | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1930 | 1940 | 1950 | 1960 | 1965 | 1930 | 1940 | 1950 | 1960 | 1965 |
| Nordic Region | | | | | | | | | | |
| Denmark | 1.317 | 1.451 | 1.164 | 0.776 | 0.680 | 1.040 | 0.790 | 0.743 | 1.119 | 1.234 |
| Finland | 1.263 | 1.258 | 0.957 | 0.778 | 0.683 | 1.197 | 0.781 | 0.900 | 1.176 | 1.215 |
| Norway | 1.128 | 1.487 | 1.279 | 0.921 | 0.850 | 1.355 | 0.963 | 0.815 | 1.166 | 1.213 |
| Sweden | 1.100 | 1.209 | 1.066 | 0.796 | 0.805 | 1.021 | 0.840 | 0.935 | 1.241 | 1.147 |
| Western Europe | | | | | | | | | | |
| Belgium | … | 1.297 | 1.120 | 0.931 | 0.770 | ... | 0.859 | 0.710 | 0.902 | ... |
| England and Wales | 1.100 | 1.452 | 1.170 | 0.921 | 0.824 | 1.242 | 0.896 | 0.887 | 1.039 | 1.038 |
| France | 1.363 | 1.442 | 1.243 | 1.036 | 0.835 | 1.265 | 0.968 | 0.867 | 1.067 | 1.147 |
| Netherlands | 0.944 | 1.176 | 0.991 | 0.629 | 0.497 | 1.733 | 1.045 | 0.898 | 1.219 | 1.259 |
| West central Europe | | | | | | | | | | |
| Austria | … | 1.326 | 1.234 | 0.966 | 0.833 | … | 0.799 | 0.634 | 0.720 | 0.774 |
| Former FRG | 1.001 | 1.200 | 0.994 | 0.718 | 0.574 | 1.148 | 0.768 | 0.700 | 0.877 | 0.907 |
| Former GDR | … | 1.417 | 1.312 | 1.384 | 1.156 | … | 0.565 | 0.479 | 0.411 | 0.405 |
| Switzerland | 0.881 | 1.167 | 0.926 | 0.689 | 0.559 | 1.300 | 0.915 | 0.867 | 1.083 | 1.083 |
| Southern Europe | | | | | | | | | | |
| Greece | … | 0.975 | 1.218 | 1.200 | 0.928 | … | 1.120 | 0.801 | 0.725 | 0.790 |
| Italy | … | 1.018 | 1.041 | 0.768 | 0.558 | … | 1.097 | 0.822 | 0.912 | … |
| Portugal | 1.163 | 1.273 | 1.183 | 1.087 | 0.910 | 1.779 | 1.393 | 0.895 | 0.813 | 0.916 |
| Spain | 0.845 | 1.002 | 1.110 | 0.814 | 0.581 | 1.799 | 1.546 | 1.027 | 0.945 | 1.005 |
| East central Europe | | | | | | | | | | |
| Czech Republic | 1.467 | 1.479 | 1.535 | 1.510 | 1.418 | 0.674 | 0.587 | 0.560 | 0.514 | 0.495 |
| Hungary | 1.427 | 1.266 | 1.399 | 1.376 | 1.306 | 0.648 | 0.655 | 0.551 | 0.642 | 0.652 |
| Slovak Republic | 1.710 | 1.699 | 1.592 | 1.565 | 1.607 | 1.154 | 0.846 | 0.715 | 0.612 | 0.429 |

*Table CO-5. (end)*

| Country | CCFRs up to 27th birthday | | | | | CCFRs after 27th birthday | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1930 | 1940 | 1950 | 1960 | 1965 | 1930 | 1940 | 1950 | 1960 | 1965 |
| Eastern Europe | | | | | | | | | | |
| Bulgaria | 1.449 | 1.507 | 1.602 | 1.560 | 1.491 | 0.655 | 0.577 | 0.465 | 0.394 | 0.338 |
| Romania | … | 1.301 | 1.687 | 1.601 | 1.483 | … | 1.091 | 0.746 | 0.562 | 0.426 |
| Russia | … | 1.150 | 1.175 | 1.291 | 1.250 | … | 0.796 | 0.708 | 0.538 | 0.405 |
| West Balkan Region | | | | | | | | | | |
| Bosnia and Herzegovina | 1.779 | 1.616 | 1.428 | 1.209 | … | 1.809 | 1.131 | 0.742 | … | … |
| Croatia | 1.309 | 1.273 | 1.236 | 1.291 | 1.138 | 0.844 | 0.686 | 0.628 | 0.676 | 0.718 |
| Macedonia | 1.912 | 1.781 | 1.496 | 1.525 | 1.418 | 1.825 | 1.277 | 0.851 | 0.765 | 0.776 |
| Slovenia | 1.069 | 1.183 | 1.270 | 1.316 | 1.130 | 1.031 | 0.825 | 0.627 | 0.557 | 0.627 |
| Yugoslavia | 1.553 | 1.480 | 1.458 | 1.430 | 1.323 | 0.928 | 0.897 | 0.823 | 0.848 | 0.809 |
| Baltic Region | | | | | | | | | | |
| Estonia | … | … | 1.235 | 1.400 | 1.304 | … | … | 0.740 | 0.635 | 0.523 |
| Latvia | … | … | 1.144 | 1.318 | 1.264 | … | … | 0.726 | 0.622 | 0.493 |
| Lithuania | … | 0.966 | 1.196 | 1.224 | 1.143 | … | 1.023 | 0.812 | 0.656 | 0.551 |
| Non-European Countries | | | | | | | | | | |
| Australia | 1.553 | 1.701 | 1.362 | 0.937 | 0.783 | 1.519 | 1.108 | 0.984 | 1.198 | 1.211 |
| Canada | 1.707 | 1.801 | 1.083 | 0.832 | 0.730 | 1.652 | 0.870 | 0.845 | 0.986 | 0.993 |
| Japan | 1.105 | 0.930 | 0.989 | 0.683 | 0.531 | 0.993 | 1.058 | 1.036 | 1.129 | … |
| New Zealand | 1.738 | 1.988 | 1.635 | 1.091 | 0.974 | 1.799 | 1.130 | 0.911 | 1.289 | 1.335 |
| United States | 1.877 | 1.946 | 1.224 | 1.062 | 1.059 | 1.301 | 0.783 | 0.804 | 0.952 | 0.979 |

*Table CO-6 Differences in cumulated cohort fertility rates (CCFRs) between successive cohorts and shift ratios, up to and after 27th birthday, 35 low fertility countries, birth cohorts 1930, 1940, 1950, 1960 and 1965 (continued)*

| Country | Differences in CCFRs up to 27th birthday of successive cohorts | | | | Differences in CCFRs after 27th birthday of successive cohorts | | | | Shift ratios[a] (Advancement in parentheses; Postponement without parentheses) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 |
| Nordic Region | | | | | | | | | | | | |
| Denmark | 0.134 | -0.287 | -0.389 | -0.096 | -0.250 | -0.046 | 0.376 | 0.115 | (54) | D | 97 | 119 |
| Finland | -0.005 | -0.302 | -0.179 | -0.095 | -0.416 | 0.120 | 0.275 | 0.040 | D | 40 | 154 | 42 |
| Norway | 0.359 | -0.208 | -0.359 | -0.070 | -0.392 | -0.148 | 0.351 | 0.047 | (92) | D | 98 | 66 |
| Sweden | 0.110 | -0.143 | -0.270 | 0.009 | -0.182 | 0.095 | 0.306 | -0.093 | (60) | 67 | 113 | (9) |
| Western Europe | | | | | | | | | | | | |
| Belgium | … | -0.177 | -0.189 | -0.161 | … | -0.149 | 0.192 | … | … | D | 102 | … |
| England and Wales | 0.351 | -0.281 | -0.249 | -0.097 | -0.346 | -0.009 | 0.152 | -0.001 | (102) | D | 61 | D |
| France | 0.079 | -0.199 | -0.206 | -0.201 | -0.297 | -0.101 | 0.200 | 0.081 | (27) | D | 97 | 40 |
| Netherlands | 0.232 | -0.185 | -0.362 | -0.132 | -0.689 | -0.147 | 0.321 | 0.040 | (34) | D | 89 | 30 |
| West central Europe | | | | | | | | | | | | |
| Austria | … | -0.091 | -0.269 | -0.133 | … | -0.164 | 0.086 | 0.054 | … | D | 32 | 40 |
| Former FRG | 0.198 | -0.206 | -0.276 | -0.144 | -0.380 | -0.068 | 0.177 | 0.030 | (52) | D | 64 | 21 |
| Former GDR | … | -0.104 | 0.072 | -0.228 | … | -0.087 | -0.068 | -0.006 | … | D | (106) | D |
| Switzerland | 0.286 | -0.241 | -0.237 | -0.131 | -0.385 | -0.048 | 0.216 | … | (74) | D | 91 | … |
| Southern Europe | | | | | | | | | | | | |
| Greece | … | 0.243 | -0.018 | -0.272 | … | -0.319 | -0.077 | 0.065 | … | (76) | D | 24 |
| Italy | … | 0.023 | -0.273 | -0.210 | … | -0.274 | 0.090 | … | … | (8) | 33 | … |
| Portugal | 0.109 | -0.090 | -0.095 | -0.177 | -0.386 | -0.498 | -0.082 | 0.103 | (28) | D | D | 58 |
| Spain | 0.157 | 0.108 | -0.296 | -0.233 | -0.253 | -0.519 | -0.082 | 0.060 | (62) | (21) | D | 26 |

[a] See Table Co-4 and text.

*Table CO-6. (continued)*

| Country | Differences in CCFRs up to 27th birthday of successive cohorts | | | | Differences in CCFRs after 27th birthday of successive cohorts | | | | Shift ratios[a] (Advancement in parentheses; Postponement without parentheses) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 |
| East central Europe | | | | | | | | | | | | |
| Czech Republic | 0.012 | 0.056 | -0.025 | -0.092 | -0.087 | -0.027 | -0.046 | -0.019 | (14) | (209) | D | D |
| Hungary | -0.161 | 0.134 | -0.023 | -0.070 | 0.007 | -0.104 | 0.091 | 0.010 | 4 | (129) | 392 | 14 |
| Slovak Republic | -0.012 | -0.106 | -0.027 | 0.041 | -0.307 | -0.131 | -0.104 | -0.182 | D | D | D | (23) |
| Eastern Europe | | | | | | | | | | | | |
| Bulgaria | 0.058 | 0.095 | -0.042 | -0.069 | -0.078 | -0.112 | -0.071 | -0.055 | (74) | (85) | D | D |
| Romania | … | 0.386 | -0.086 | -0.118 | … | -0.345 | -0.184 | -0.136 | … | (112) | D | D |
| Russia | … | 0.025 | 0.116 | -0.041 | … | -0.088 | -0.170 | -0.133 | … | (29) | (68) | D |
| West Balkan Region | | | | | | | | | | | | |
| Bosnia and Herzegovina | -0.163 | -0.188 | -0.219 | … | -0.678 | -0.388 | … | … | D | D | … | … |
| Croatia | -0.035 | -0.038 | 0.055 | -0.152 | -0.158 | -0.058 | 0.048 | 0.041 | D | D | I | 27 |
| Macedonia | -0.131 | -0.285 | 0.029 | -0.107 | -0.548 | -0.426 | -0.086 | 0.012 | D | D | (34) | 11 |
| Slovenia | 0.114 | 0.087 | 0.046 | -0.187 | -0.206 | -0.199 | -0.069 | 0.069 | (55) | (44) | (67) | 37 |
| Yugoslavia | -0.073 | -0.022 | -0.028 | -0.108 | -0.031 | -0.074 | 0.025 | -0.038 | D | D | 89 | D |
| Baltic Region | | | | | | | | | | | | |
| Estonia | … | … | 0.165 | -0.095 | … | … | -0.105 | -0.112 | … | … | (157) | D |
| Latvia | … | … | 0.174 | -0.053 | … | … | -0.103 | -0.130 | … | … | (168) | D |
| Lithuania | … | 0.230 | 0.029 | -0.081 | … | -0.211 | -0.156 | -0.104 | … | (109) | (18) | D |

[a] See Table Co-4 and text.

*Table CO-6. (end)*

| Country | Differences in CCFRs up to 27th birthday of successive cohorts | | | | Differences in CCFRs after 27th birthday of successive cohorts | | | | Shift ratios[a] (Advancement in parentheses; Postponement without parentheses) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 |
| Non-European Countries | | | | | | | | | | | | |
| Australia | 0.148 | -0.339 | -0.425 | -0.154 | -0.411 | -0.124 | 0.214 | 0.013 | (36) | D | 50 | 8 |
| Canada | 0.094 | -0.718 | -0.251 | -0.102 | -0.782 | -0.025 | 0.141 | 0.007 | (12) | D | 56 | 7 |
| Japan | -0.175 | 0.059 | -0.305 | -0.153 | 0.065 | -0.023 | 0.093 | … | 37 | (261) | 31 | … |
| New Zealand | 0.250 | -0.353 | -0.544 | -0.117 | -0.669 | -0.219 | 0.378 | 0.046 | (37) | D | 69 | 40 |
| United States | 0.069 | -0.722 | -0.162 | -0.003 | -0.518 | 0.021 | 0.148 | 0.027 | (13) | 3 | 91 | 993 |

[a] See Table CO-4 and text.

*Table CO-7. Cumulated cohort fertility rates (CCFRs) up to 27th birthday, 35 low fertility countries, birth cohorts 1930, 1940, 1950, 1960, 1970 and 1973 (continued)*

| Country | CCFRs up to 27th birthday | | | | | | Annual change between birth cohorts (per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1930 | 1940 | 1950 | 1960 | 1970 | 1973 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1970 | 1970-1973 |
| Nordic Region | | | | | | | | | | | |
| Denmark | 1.317 | 1.451 | 1.164 | 0.776 | 0.612 | 0.551 | 1.0 | -2.2 | -4.1 | -2.4 | -3.5 |
| Finland | 1.263 | 1.258 | 0.957 | 0.778 | 0.645 | 0.596 | 0.0 | -2.7 | -2.1 | -1.9 | -2.7 |
| Norway | 1.128 | 1.487 | 1.279 | 0.921 | 0.758 | 0.670 | 2.8 | -1.5 | -3.3 | -1.9 | -4.1 |
| Sweden | 1.100 | 1.209 | 1.066 | 0.796 | 0.689 | 0.538 | 0.9 | -1.3 | -2.9 | -1.4 | -8.3 |
| Western Europe | | | | | | | | | | | |
| Belgium | ... | 1.297 | 1.120 | 0.931 | 0.649 | ... | ... | -1.5 | -1.8 | -3.6 | ... |
| England and Wales | 1.100 | 1.452 | 1.170 | 0.921 | 0.767 | 0.710 | 2.8 | -2.2 | -2.4 | -1.8 | -2.6 |
| France | 1.363 | 1.442 | 1.243 | 1.036 | 0.669 | ... | 0.6 | -1.5 | -1.8 | -4.4 | ... |
| Netherlands | 0.944 | 1.176 | 0.991 | 0.629 | 0.397 | 0.394 | 2.2 | -1.7 | -4.5 | -4.6 | -0.3 |
| West central Europe | | | | | | | | | | | |
| Austria | ... | 1.326 | 1.234 | 0.966 | 0.717 | 0.676 | ... | -0.7 | -2.5 | -3.0 | -2.0 |
| Former FRG | 1.001 | 1.200 | 0.994 | 0.718 | 0.524 | ... | 1.8 | -1.9 | -3.3 | -3.1 | ... |
| Former GDR | ... | 1.417 | 1.312 | 1.384 | 0.714 | ... | ... | -0.8 | 0.5 | -6.6 | ... |
| Switzerland | 0.881 | 1.167 | 0.926 | 0.689 | 0.479 | 0.447 | 2.8 | -2.3 | -3.0 | -3.6 | -2.3 |
| Southern Europe | | | | | | | | | | | |
| Greece | ... | 0.975 | 1.218 | 1.200 | 0.661 | ... | ... | 2.2 | -0.1 | -6.0 | ... |
| Italy | ... | 1.018 | 1.041 | 0.768 | 0.412 | ... | ... | 0.2 | -3.0 | -6.2 | ... |
| Portugal | 1.163 | 1.273 | 1.183 | 1.087 | 0.699 | 0.606 | 0.9 | -0.7 | -0.8 | -4.4 | -4.8 |
| Spain | 0.845 | 1.002 | 1.110 | 0.814 | 0.373 | 0.281 | 1.7 | 1.3 | -3.3 | -7.8 | -9.5 |

*Table CO-7. (end)*

| Country | CCFRs up to 27th birthday | | | | | | Annual change between birth cohorts (per cent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1930 | 1940 | 1950 | 1960 | 1970 | 1973 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1970 | 1970-1973 |
| East central Europe | | | | | | | | | | | |
| Czech Republic | 1.467 | 1.479 | 1.535 | 1.510 | 1.201 | 0.967 | 0.1 | 0.4 | -0.2 | -2.3 | -7.2 |
| Hungary | 1.427 | 1.266 | 1.399 | 1.376 | 1.108 | 0.890 | -1.2 | 1.0 | -0.2 | -2.2 | -7.3 |
| Slovak Republic | 1.710 | 1.699 | 1.592 | 1.565 | 1.287 | 1.084 | -0.1 | -0.6 | -0.2 | -2.0 | -5.7 |
| Eastern Europe | | | | | | | | | | | |
| Bulgaria | 1.449 | 1.507 | 1.602 | 1.560 | 1.205 | 1.032 | 0.4 | 0.6 | -0.3 | -2.6 | -5.2 |
| Romania | ... | 1.301 | 1.687 | 1.601 | 1.113 | 0.992 | ... | 2.6 | -0.5 | -3.6 | -3.8 |
| Russia | ... | 1.150 | 1.175 | 1.291 | 1.083 | 0.970 | ... | 0.2 | 0.9 | -1.8 | -3.7 |
| West Balkan Region | | | | | | | | | | | |
| Bosnia and Herzegovina | 1.779 | 1.616 | 1.428 | 1.209 | ... | ... | -1.0 | -1.2 | -1.7 | ... | ... |
| Croatia | 1.309 | 1.273 | 1.236 | 1.291 | 0.893 | ... | -0.3 | -0.3 | 0.4 | -3.7 | ... |
| Macedonia | 1.912 | 1.781 | 1.496 | 1.525 | 1.354 | 1.286 | -0.7 | -1.7 | 0.2 | -1.2 | -1.7 |
| Slovenia | 1.069 | 1.183 | 1.270 | 1.316 | 0.868 | 0.709 | 1.0 | 0.7 | 0.4 | -4.2 | -6.7 |
| Yugoslavia | 1.553 | 1.480 | 1.458 | 1.430 | 1.167 | 1.044 | -0.5 | -0.1 | -0.2 | -2.0 | -3.7 |
| Baltic Region | | | | | | | | | | | |
| Estonia | ... | ... | 1.235 | 1.400 | 1.050 | 0.911 | ... | ... | 1.3 | -2.9 | -4.7 |
| Latvia | ... | ... | 1.144 | 1.318 | 1.045 | 0.905 | ... | ... | 1.4 | -2.3 | -4.8 |
| Lithuania | ... | 0.966 | 1.196 | 1.224 | 1.101 | 0.938 | ... | 2.1 | 0.2 | -1.1 | -5.4 |
| Non-European Countries | | | | | | | | | | | |
| Australia | 1.553 | 1.701 | 1.362 | 0.937 | 0.661 | ... | 0.9 | -2.2 | -3.7 | -3.5 | ... |
| Canada | 1.707 | 1.801 | 1.083 | 0.832 | 0.685 | ... | 0.5 | -5.1 | -2.6 | -1.9 | ... |
| Japan | 1.105 | 0.930 | 0.989 | 0.683 | 0.416 | ... | -1.7 | 0.6 | -3.7 | -5.0 | ... |
| New Zealand | 1.738 | 1.988 | 1.635 | 1.091 | 0.864 | 0.778 | 1.3 | -2.0 | -4.0 | -2.3 | -3.5 |
| United States | 1.877 | 1.946 | 1.224 | 1.062 | 1.067 | ... | 0.4 | -4.6 | -1.4 | 0.0 | ... |

*Table CO-8. Childbearing (cumulated cohort fertility rate - CCFR) needed after 27th birthday for 1970 birth cohort to attain total cohort fertility rate of 1960 cohort or to attain replacement fertility, 35 low fertility countries (continued)*

| Country | Estimated total cohort fertility rate of 1960 cohort | Cumulated cohort fertility rate after 27th birthday in 1960 birth cohort | Cumulated cohort fertility rate up to 27th birthday in 1970 cohort | Cumulated cohort fertility rate needed after 27th birthday in the 1970 cohort to attain | | Relative difference (in %) between 1960 proportion and the one needed for 1970 to attain | |
|---|---|---|---|---|---|---|---|
| | | | | Total cohort fertility rate of 1960 | Replacement total cohort fertility rate=2.10 | Total cohort fertility rate of 1960 | Replacement total cohort fertility rate=2.10 |
| Nordic Region | | | | | | | |
| Denmark | 1.895 | 1.119 | 0.612 | 1.283 | 1.488 | 15 | 33 |
| Finland | 1.954 | 1.176 | 0.645 | 1.309 | 1.455 | 11 | 24 |
| Norway | 2.086 | 1.166 | 0.758 | 1.328 | 1.342 | 14 | 15 |
| Sweden | 2.037 | 1.241 | 0.689 | 1.348 | 1.411 | 9 | 14 |
| Western Europe | | | | | | | |
| Belgium | 1.834 | 0.902 | 0.649 | 1.185 | 1.451 | 31 | 61 |
| England and Wales | 1.960 | 1.039 | 0.767 | 1.193 | 1.333 | 15 | 28 |
| France | 2.103 | 1.067 | 0.669 | 1.434 | 1.431 | 34 | 34 |
| Netherlands | 1.849 | 1.219 | 0.397 | 1.452 | 1.703 | 19 | 40 |
| West central Europe | | | | | | | |
| Austria | 1.686 | 0.720 | 0.717 | 0.969 | 1.383 | 35 | 92 |
| Former FRG | 1.594 | 0.877 | 0.524 | 1.070 | 1.576 | 22 | 80 |
| Former GDR | 1.795 | 0.411 | 0.714 | 1.081 | 1.386 | 163 | 237 |
| Switzerland | 1.772 | 1.083 | 0.479 | 1.293 | 1.621 | 19 | 50 |

*Table CO-8. (continued)*

| Country | Estimated total cohort fertility rate of 1960 cohort | Cumulated cohort fertility rate after 27th birthday in 1960 birth cohort | Cumulated cohort fertility rate up to 27th birthday in 1970 cohort | Cumulated cohort fertility rate needed after 27th birthday in the 1970 cohort to attain | | Relative difference (in %) between 1960 proportion and the one needed for 1970 to attain | |
|---|---|---|---|---|---|---|---|
| | | | | Total cohort fertility rate of 1960 | Replacement total cohort fertility rate=2.10 | Total cohort fertility rate of 1960 | Replacement total cohort fertility rate=2.10 |
| Southern Europe | | | | | | | |
| Greece | 1.924 | 0.725 | 0.661 | 1.263 | 1.439 | 74 | 98 |
| Italy | 1.680 | 0.912 | 0.412 | 1.268 | 1.688 | 39 | 85 |
| Portugal | 1.900 | 0.813 | 0.699 | 1.201 | 1.401 | 48 | 72 |
| Spain | 1.759 | 0.945 | 0.373 | 1.386 | 1.727 | 47 | 83 |
| East central Europe | | | | | | | |
| Czech Republic | 2.025 | 0.514 | 1.201 | 0.824 | 0.899 | 60 | 75 |
| Hungary | 2.018 | 0.642 | 1.108 | 0.910 | 0.992 | 42 | 55 |
| Slovak Republic | 2.177 | 0.612 | 1.287 | 0.890 | 0.813 | 45 | 33 |
| Eastern Europe | | | | | | | |
| Bulgaria | 1.954 | 0.394 | 1.205 | 0.749 | 0.895 | 90 | 127 |
| Romania | 2.163 | 0.562 | 1.113 | 1.050 | 0.987 | 87 | 76 |
| Russia | 1.829 | 0.538 | 1.083 | 0.746 | 1.017 | 39 | 89 |
| West Balkan Region | | | | | | | |
| Bosnia and Herzegovina | ... | … | ... | ... | ... | ... | ... |
| Croatia | 1.967 | 0.676 | 0.893 | 1.074 | 1.207 | 59 | 79 |
| Macedonia | 2.290 | 0.765 | 1.354 | 0.936 | 0.746 | 22 | -2 |
| Slovenia | 1.874 | 0.557 | 0.868 | 1.006 | 1.232 | 81 | 121 |
| Yugoslavia | 2.278 | 0.848 | 1.167 | 1.111 | 0.933 | 31 | 10 |

*Table CO-8. (end)*

| Country | Estimated total cohort fertility rate of 1960 cohort | Cumulated cohort fertility rate after 27th birthday in 1960 birth cohort | Cumulated cohort fertility rate up to 27th birthday in 1970 cohort | Cumulated cohort fertility rate needed after 27th birthday in the 1970 cohort to attain | | Relative difference (in %) between 1960 proportion and the one needed for 1970 to attain | |
|---|---|---|---|---|---|---|---|
| | | | | Total cohort fertility rate of 1960 | Replacement total cohort fertility rate=2.10 | Total cohort fertility rate of 1960 | Replacement total cohort fertility rate=2.10 |
| Baltic Region | | | | | | | |
| Estonia | 2.034 | 0.635 | 1.050 | 0.984 | 1.050 | 55 | 65 |
| Latvia | 1.940 | 0.622 | 1.045 | 0.895 | 1.055 | 44 | 70 |
| Lithuania | 1.880 | 0.656 | 1.101 | 0.779 | 0.999 | 19 | 52 |
| Non-European Countries | | | | | | | |
| Australia | 2.136 | 1.198 | 0.661 | 1.475 | 1.439 | 23 | 20 |
| Canada | 1.818 | 0.986 | 0.685 | 1.133 | 1.415 | 15 | 44 |
| Japan | 1.812 | 1.129 | 0.416 | 1.396 | 1.684 | 24 | 49 |
| New Zealand | 2.380 | 1.289 | 0.864 | 1.516 | 1.236 | 18 | -4 |
| United States | 2.014 | 0.952 | 1.067 | 0.947 | 1.033 | -1 | 9 |

*Table CO-9 Cumulated cohort fertility rates (CCFRs) up to 22nd birthday, 35 low fertility countries, birth cohorts 1930, 1940, 1950, 1960, 1970, 1975 and 1978 (continued)*

| Country | CCFRs up to 22nd birthday | | | | | | | Annual change between birth cohorts (per cent) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1930 | 1940 | 1950 | 1960 | 1970 | 1975 | 1978 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1970 | 1970-1975 | 1975-1978 |
| Nordic Region | | | | | | | | | | | | | |
| Denmark | 0.455 | 0.525 | 0.414 | 0.235 | 0.134 | 0.121 | 0.108 | 1.4 | -2.4 | -5.7 | -5.6 | -2.1 | -3.7 |
| Finland | 0.381 | 0.421 | 0.362 | 0.241 | 0.161 | 0.143 | 0.136 | 1.0 | -1.5 | -4.1 | -4.0 | -2.3 | -1.7 |
| Norway | 0.309 | 0.504 | 0.515 | 0.315 | 0.223 | 0.174 | 0.163 | 4.9 | 0.2 | -4.9 | -3.5 | -4.9 | -2.3 |
| Sweden | 0.402 | 0.416 | 0.392 | 0.227 | 0.190 | 0.123 | 0.098 | 0.3 | -0.6 | -5.5 | -1.8 | -8.6 | -7.7 |
| Western Europe | | | | | | | | | | | | | |
| Belgium | ... | 0.373 | 0.400 | 0.277 | 0.150 | 0.132 | ... | ... | 0.7 | -3.7 | -6.1 | -2.6 | ... |
| England and Wales | 0.310 | 0.452 | 0.497 | 0.330 | 0.302 | 0.284 | 0.284 | 3.8 | 0.9 | -4.1 | -0.9 | -1.3 | 0.1 |
| France | 0.442 | 0.441 | 0.469 | 0.327 | 0.167 | 0.131 | ... | 0.0 | 0.6 | -3.6 | -6.7 | -4.8 | ... |
| Netherlands | ... | 0.241 | 0.282 | 0.131 | 0.091 | 0.082 | 0.083 | ... | 1.5 | -7.7 | -3.6 | -2.2 | 0.4 |
| West central Europe | | | | | | | | | | | | | |
| Austria | ... | 0.499 | 0.608 | 0.399 | 0.237 | 0.215 | 0.183 | ... | 2.0 | -4.2 | -5.2 | -2.0 | -5.3 |
| Former FRG | ... | 0.369 | 0.451 | 0.243 | 0.159 | 0.167 | ... | ... | 2.0 | -6.2 | -4.2 | 1.0 | ... |
| Former GDR | ... | 0.578 | 0.677 | 0.625 | 0.338 | 0.149 | ... | ... | 1.6 | -0.8 | -6.1 | -16.5 | ... |
| Switzerland | 0.197 | 0.274 | 0.301 | 0.159 | 0.101 | 0.093 | 0.091 | 3.3 | 0.9 | -6.4 | -4.5 | -1.8 | -0.7 |
| Southern Europe | | | | | | | | | | | | | |
| Greece | ... | 0.412 | 0.543 | 0.248 | 0.160 | 0.145 | ... | ... | 2.8 | -7.8 | -4.4 | -2.0 | ... |
| Italy | ... | 0.243 | 0.319 | 0.273 | 0.112 | 0.078 | ... | ... | 2.7 | -1.6 | -8.9 | -7.1 | ... |
| Portugal | 0.332 | 0.371 | 0.372 | 0.470 | 0.269 | 0.204 | 0.197 | 1.1 | 0.0 | 2.3 | -5.6 | -5.5 | -1.1 |
| Spain | 0.122 | 0.172 | 0.209 | 0.286 | 0.134 | 0.080 | 0.076 | 3.4 | 2.0 | 3.1 | -7.6 | -10.4 | -1.4 |

*Table CO-9. (end)*

| Country | CCFRs up to 22nd birthday | | | | | | | Annual change between birth cohorts (per cent) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1930 | 1940 | 1950 | 1960 | 1970 | 1975 | 1978 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1970 | 1970-1975 | 1975-1978 |
| East central Europe | | | | | | | | | | | | | |
| Czech Republic | 0.561 | 0.622 | 0.596 | 0.701 | 0.600 | 0.323 | 0.192 | 1.0 | -0.4 | 1.6 | -1.6 | -12.4 | -17.3 |
| Hungary | 0.547 | 0.584 | 0.593 | 0.663 | 0.481 | 0.315 | 0.254 | 0.6 | 0.2 | 1.1 | -3.2 | -8.5 | -7.1 |
| Slovak Republic | 0.603 | 0.690 | 0.580 | 0.644 | 0.616 | 0.417 | 0.295 | 1.3 | -1.7 | 1.1 | -0.4 | -7.8 | -11.6 |
| Eastern Europe | | | | | | | | | | | | | |
| Bulgaria | 0.608 | 0.731 | 0.752 | 0.815 | 0.703 | 0.492 | 0.425 | 1.8 | 0.3 | 0.8 | -1.5 | -7.1 | -4.9 |
| Romania | ... | 0.589 | 0.759 | 0.744 | 0.567 | 0.422 | 0.385 | ... | 2.5 | -0.2 | -2.7 | -5.9 | -3.1 |
| Russia | ... | 0.398 | 0.455 | 0.525 | 0.590 | 0.470 | ... | ... | 1.4 | 1.4 | 1.2 | -4.5 | ... |
| West Balkan Region | | | | | | | | | | | | | |
| Bosnia and Herzegovina | ... | 0.558 | 0.607 | 0.472 | ... | ... | ... | ... | 0.8 | -2.5 | ... | ... | ... |
| Croatia | ... | 0.498 | 0.544 | 0.546 | 0.353 | 0.266 | ... | ... | 0.9 | 0.0 | -4.4 | -5.6 | ... |
| Macedonia | ... | 0.531 | 0.539 | 0.587 | 0.516 | 0.490 | 0.400 | ... | 0.1 | 0.8 | -1.3 | -1.0 | -6.8 |
| Slovenia | ... | 0.373 | 0.525 | 0.629 | 0.335 | 0.193 | 0.131 | ... | 3.4 | 1.8 | -6.3 | -11.1 | -12.9 |
| Yugoslavia | ... | 0.615 | 0.657 | 0.590 | 0.485 | 0.385 | 0.328 | ... | 0.7 | -1.1 | -2.0 | -4.6 | -5.4 |
| Baltic Region | | | | | | | | | | | | | |
| Estonia | ... | ... | ... | 0.558 | 0.530 | 0.392 | 0.314 | ... | ... | ... | -0.5 | -6.0 | -7.4 |
| Latvia | ... | ... | ... | 0.508 | 0.541 | 0.358 | 0.261 | ... | ... | ... | 0.6 | -8.2 | -10.5 |
| Lithuania | ... | ... | 0.399 | 0.409 | 0.499 | 0.417 | 0.341 | ... | ... | 0.3 | 2.0 | -3.6 | -6.7 |
| Non European Countries | | | | | | | | | | | | | |
| Australia | 0.452 | 0.591 | 0.530 | 0.306 | 0.214 | 0.201 | ... | 2.7 | -1.1 | -5.5 | -3.5 | -1.3 | ... |
| Canada | 0.540 | 0.726 | 0.426 | 0.285 | 0.239 | 0.237 | ... | 3.0 | -5.3 | -4.0 | -1.8 | -0.2 | ... |
| Japan | 0.252 | 0.107 | 0.109 | 0.078 | 0.066 | 0.063 | ... | -8.5 | 0.2 | -3.3 | -1.6 | -0.9 | ... |
| New Zealand | 0.465 | 0.665 | 0.676 | 0.421 | 0.332 | 0.296 | 0.300 | 3.6 | 0.2 | -4.7 | -2.4 | -2.3 | 0.5 |
| United States | 0.771 | 0.944 | 0.616 | 0.493 | 0.507 | 0.531 | ... | 2.0 | -4.3 | -2.2 | 0.3 | 0.9 | ... |

*Table CO-10. Parity progression ratios (in per cent), 23 low fertility countries, birth cohorts 1930 – 1970 (continued)*

| Country | Cohort | Parity progression ratios | | | |
|---|---|---|---|---|---|
| | | *0→1* | *1→2* | *2→3* | *3→4* |
| Nordic Region | | | | | |
| Denmark | 1950 | 89.1 | 79.5 | 32.5 | 22.7 |
| | 1955 | 87.5 | 78.1 | 32.7 | 23.5 |
| | 1960 | 90.0 | 74.6 | | |
| Norway | 1935 | 90.4 | 88.5 | 62.0 | 44.8 |
| | 1940 | 90.5 | 88.8 | 58.1 | 37.7 |
| | 1945 | 91.0 | 87.0 | 47.6 | 30.0 |
| | 1950 | 90.6 | 85.3 | 41.3 | 26.3 |
| | 1953 | 89.6 | 83.7 | 41.2 | 25.6 |
| Sweden | 1955 | 86.7 | 82.7 | 43.2 | 28.5 |
| | 1960 | 86.7 | 83.1 | 43.5 | 29.8 |
| | 1965 | 85.8 | 81.6 | | |
| Western Europe | | | | | |
| England and Wales | 1930 | 86.9 | 78.7 | 56.3 | 50.7 |
| | 1935 | 88.8 | 82.9 | 55.4 | 47.7 |
| | 1940 | 89.4 | 85.5 | 51.1 | 44.1 |
| | 1945 | 89.6 | 84.7 | 43.1 | 35.5 |
| | 1950 | 85.5 | 85.7 | 41.0 | 35.2 |
| | 1955 | 83.1 | 85.4 | 43.6 | 33.7 |
| | 1960 | 79.5 | 83.5 | | |
| Netherlands | 1930 | 85.9 | 87.6 | 65.1 | 55.9 |
| | 1935 | 87.9 | 88.6 | 58.2 | 46.5 |
| | 1940 | 88.8 | 88.0 | 45.7 | 33.4 |
| | 1945 | 88.7 | 84.3 | 33.4 | 27.3 |
| | 1950 | 85.4 | 82.2 | 32.4 | 27.5 |
| | 1955 | 83.1 | 81.7 | 36.8 | 27.1 |
| | 1960 | 82.3 | 81.2 | 37.6 | 22.3 |
| | 1965 | 80.9 | | | |
| West central Europe | | | | | |
| Austria | 1965 | 77.3 | 72.3 | 34.5 | |
| Former GDR | 1935 | 83.6 | 74.3 | 53.9 | 49.5 |
| | 1940 | 89.0 | 70.4 | 44.5 | 40.3 |
| | 1945 | 91.6 | 68.3 | 33.9 | 31.8 |
| | 1950 | 92.7 | 68.3 | 25.7 | 28.0 |
| | 1955 | 92.9 | 71.0 | | |
| | 1960 | 92.2 | | | |

*Table CO-10. (continued)*

| Country | Cohort | Parity progression ratios | | | |
|---|---|---|---|---|---|
| | | *0→1* | *1→2* | *2→3* | *3→4* |
| Southern Europe | | | | | |
| Greece | 1940 | 88.6 | 87.6 | 36.5 | 30.7 |
| | 1945 | 87.5 | 87.0 | 34.0 | 26.5 |
| | 1950 | 90.3 | 84.7 | 33.2 | 25.5 |
| | 1955 | 91.6 | 83.0 | 30.1 | 26.1 |
| | 1960 | 89.3 | 82.2 | 29.0 | 26.5 |
| | 1965 | 81.5 | 79.6 | | |
| Italy | 1935 | 84.8 | 81.3 | 52.4 | 46.6 |
| | 1940 | 85.4 | 81.3 | 46.4 | 40.3 |
| | 1945 | 88.3 | 78.9 | 41.0 | 35.3 |
| | 1950 | 87.3 | 74.7 | 35.6 | 29.3 |
| | 1955 | 87.6 | 72.2 | 32.8 | 25.4 |
| | 1960 | 85.2 | 70.6 | | |
| Portugal | 1965 | 95.9 | 64.0 | | |
| Spain | 1955 | 91.9 | 73.9 | 34.6 | 28.1 |
| | 1960 | 89.8 | 71.1 | 26.1 | 22.5 |
| | 1965 | 85.5 | | | |
| East central Europe | | | | | |
| Czech republic | 1935 | 93.5 | 79.0 | 38.8 | 32.0 |
| | 1940 | 92.4 | 80.6 | 35.9 | 29.1 |
| | 1945 | 92.1 | 82.5 | 33.6 | 25.0 |
| | 1950 | 93.3 | 85.5 | 33.8 | 23.4 |
| | 1955 | 93.8 | 84.9 | 31.4 | 23.0 |
| | 1960 | 93.5 | 83.6 | 29.2 | 23.6 |
| | 1965 | 92.6 | 79.3 | 25.2 | |
| | 1970 | 88.0 | | | |
| Hungary | 1935 | 91.0 | 70.5 | 36.0 | 40.3 |
| | 1940 | 90.9 | 71.1 | 31.7 | 36.3 |
| | 1945 | 90.3 | 75.1 | 29.0 | 30.8 |
| | 1950 | 90.9 | 79.1 | 29.2 | 29.2 |
| | 1955 | 91.5 | 78.4 | 28.7 | 28.3 |
| | 1960 | 92.4 | 78.5 | 32.8 | 31.3 |
| | 1965 | 90.0 | 76.1 | 34.7 | |
| | 1970 | 84.0 | | | |

*Table CO-10. (continued)*

| Country | Cohort | Parity progression ratios | | | |
|---|---|---|---|---|---|
| | | *0→1* | *1→2* | *2→3* | *3→4* |
| Slovak Republic | 1935 | 90.8 | 89.4 | 59.5 | 49.1 |
| | 1940 | 91.0 | 88.6 | 55.0 | 43.7 |
| | 1945 | 89.1 | 89.2 | 51.3 | 38.4 |
| | 1950 | 90.2 | 88.3 | 48.0 | 34.6 |
| | 1955 | 89.8 | 87.5 | 43.8 | 32.9 |
| | 1960 | 90.2 | 85.5 | 41.7 | 33.3 |
| | 1965 | 88.7 | 81.3 | 37.0 | |
| | 1970 | 84.5 | | | |
| Eastern Europe | | | | | |
| Bulgaria | 1930 | 90.7 | 79.9 | 33.4 | 42.8 |
| | 1935 | 93.4 | 80.4 | 27.6 | 39.9 |
| | 1940 | 96.0 | 80.7 | 27.9 | 33.8 |
| | 1945 | 94.9 | 83.1 | 25.4 | 29.8 |
| | 1950 | 98.4 | 81.0 | 23.9 | 28.5 |
| | 1955 | 96.9 | 80.7 | 23.2 | 28.6 |
| | 1960 | 96.9 | 78.0 | 21.1 | 29.3 |
| | 1965 | 95.5 | 69.9 | 19.7 | 30.6 |
| | 1970 | 92.1 | | | |
| Romania | 1950 | 93.7 | 77.7 | 49.9 | 55.8 |
| | 1955 | 91.2 | 76.0 | 44.8 | 53.0 |
| | 1960 | 91.9 | 73.3 | 42.3 | 50.2 |
| | 1965 | 88.3 | 64.8 | 37.8 | 45.7 |
| | 1970 | 85.3 | | | |
| Russia | 1960 | 94.2 | 69.3 | 25.1 | 26.8 |
| | 1965 | 91.7 | 59.7 | | |
| | 1970 | 90.3 | | | |
| West Balkan Region | | | | | |
| Bosnia and Herzegovina | 1935 | 85.2 | 90.1 | 70.0 | 64.9 |
| | 1940 | 88.4 | 85.7 | 62.6 | 57.7 |
| | 1945 | 84.4 | 86.9 | 53.9 | 49.7 |
| | 1950 | 89.6 | 81.9 | 44.7 | 39.3 |
| | 1955 | 81.9 | 84.9 | 37.2 | |
| | 1960 | 83.9 | | | |
| Croatia | 1935 | 86.7 | 74.3 | 43.3 | 40.7 |
| | 1940 | 91.4 | 73.2 | 35.2 | 36.0 |
| | 1945 | 87.9 | 74.7 | 29.8 | 31.0 |
| | 1950 | 93.9 | 73.8 | 25.8 | 26.3 |

*Table CO-10. (end)*

| Country | Cohort | Parity progression ratios | | | |
|---|---|---|---|---|---|
| | | *0→1* | *1→2* | *2→3* | *3→4* |
| | 1955 | 92.9 | 75.9 | 24.8 | |
| | 1960 | 95.1 | | | |
| Macedonia | 1930 | 98.1 | 93.9 | 74.2 | 65.2 |
| | 1935 | 92.5 | 95.8 | 65.4 | 59.4 |
| | 1940 | 96.0 | 93.9 | 54.1 | 54.9 |
| | 1945 | 96.1 | 87.6 | 46.1 | 53.3 |
| | 1950 | 94.3 | 86.1 | 39.6 | 48.4 |
| | 1955 | 90.0 | 89.9 | 39.4 | 40.2 |
| | 1960 | 94.3 | 90.2 | 36.8 | 36.8 |
| | 1965 | 93.8 | 87.8 | 34.7 | |
| | 1970 | 93.2 | | | |
| Slovenia | 1930 | 86.4 | 76.4 | 48.2 | 43.3 |
| | 1935 | 88.7 | 78.8 | 41.2 | 38.5 |
| | 1940 | 91.7 | 74.7 | 37.2 | 33.3 |
| | 1945 | 91.2 | 76.3 | 29.8 | 27.5 |
| | 1950 | 95.6 | 73.5 | 26.8 | 22.2 |
| | 1955 | 98.6 | 73.9 | 22.4 | 20.8 |
| | 1960 | 95.3 | 72.4 | 22.5 | 19.1 |
| | 1965 | 87.5 | 67.7 | | |
| Yugoslavia | 1935 | 89.1 | 76.1 | 43.7 | 53.7 |
| | 1940 | 96.1 | 73.3 | 38.6 | 55.6 |
| | 1945 | 92.5 | 76.4 | 38.0 | 55.7 |
| | 1950 | 99.8 | 75.7 | 31.2 | 51.8 |
| | 1955 | 94.3 | 80.1 | 33.6 | 48.1 |
| | 1960 | 97.1 | 79.7 | 37.3 | 44.7 |
| | 1965 | 93.6 | 77.0 | 38.0 | |
| | 1970 | 89.7 | | | |
| Non-European Countries | | | | | |
| United States | 1930 | 90.0 | 89.1 | 72.9 | 58.1 |
| | 1935 | 91.7 | 89.2 | 72.5 | 63.6 |
| | 1940 | 90.1 | 86.9 | 64.9 | 65.3 |
| | 1945 | 87.1 | 82.2 | 52.5 | 58.7 |
| | 1950 | 84.4 | 78.8 | 46.8 | 44.0 |
| | 1955 | 84.0 | 78.2 | 46.6 | 36.8 |
| | 1960 | 84.6 | 78.3 | 47.5 | |

*Table CO-11 Parity distribution (in per cent), 21 low fertility countries, birth cohorts 1930 – 1960 (continued)*

| Country | Cohort | Parity 0 | 1 | 2 | 3 | 4 and more | Total cohort fertility rate |
|---|---|---|---|---|---|---|---|
| Nordic Region | | | | | | | |
| Denmark | 1950 | 10.9 | 18.3 | 47.8 | 17.8 | 5.2 | 1.91 |
| | 1955 | 12.5 | 19.1 | 46.0 | 17.1 | 5.3 | 1.84 |
| Norway | 1935 | 9.6 | 10.4 | 30.4 | 27.4 | 22.2 | 2.57 |
| | 1940 | 9.5 | 10.1 | 33.7 | 29.1 | 17.6 | 2.45 |
| | 1945 | 9.0 | 11.8 | 41.5 | 26.4 | 11.3 | 2.21 |
| | 1950 | 9.4 | 13.3 | 45.4 | 23.5 | 8.4 | 2.09 |
| | 1953 | 10.4 | 14.6 | 44.1 | 23.0 | 7.9 | 2.02 |
| Sweden | 1955 | 13.3 | 15.1 | 40.7 | 22.1 | 8.8 | 2.03 |
| | 1960 | 13.3 | 14.7 | 40.7 | 22.0 | 9.3 | 2.04 |
| Western Europe | | | | | | | |
| England and Wales | 1930 | 13.1 | 18.5 | 29.9 | 19.0 | 19.5 | 2.34 |
| | 1935 | 11.2 | 15.2 | 32.9 | 21.3 | 19.4 | 2.41 |
| | 1940 | 10.6 | 13.0 | 37.3 | 21.9 | 17.2 | 2.35 |
| | 1945 | 10.4 | 13.7 | 43.2 | 21.1 | 11.6 | 2.16 |
| | 1950 | 14.5 | 12.2 | 43.2 | 19.5 | 10.6 | 2.06 |
| | 1955 | 16.9 | 12.1 | 40.0 | 20.5 | 10.5 | 2.02 |
| Netherlands | 1930 | 14.1 | 10.6 | 26.3 | 21.6 | 27.4 | 2.67 |
| | 1935 | 12.1 | 10.0 | 32.6 | 24.2 | 21.1 | 2.49 |
| | 1940 | 11.2 | 10.6 | 42.5 | 23.8 | 11.9 | 2.22 |
| | 1945 | 11.3 | 13.9 | 49.8 | 18.2 | 6.8 | 2.00 |
| | 1950 | 14.6 | 15.2 | 47.5 | 16.5 | 6.2 | 1.89 |
| | 1955 | 16.9 | 15.2 | 42.9 | 18.2 | 6.8 | 1.87 |
| | 1960 | 17.7 | 15.5 | 41.7 | 19.5 | 5.6 | 1.85 |
| West central Europe | | | | | | | |
| Former GDR | 1935 | 16.4 | 21.5 | 28.6 | 16.9 | 16.6 | 2.12 |
| | 1940 | 11.0 | 26.4 | 34.8 | 16.6 | 11.2 | 1.99 |
| | 1945 | 8.4 | 29.0 | 41.4 | 14.5 | 6.7 | 1.87 |
| | 1950 | 7.3 | 29.4 | 47.1 | 11.7 | 4.5 | 1.79 |
| Southern Europe | | | | | | | |
| Greece | 1940 | 11.4 | 11.0 | 49.3 | 19.6 | 8.7 | 2.10 |
| | 1945 | 12.5 | 11.4 | 50.2 | 19.0 | 6.9 | 2.00 |
| | 1950 | 9.7 | 13.8 | 51.1 | 18.9 | 6.5 | 2.02 |
| | 1955 | 8.4 | 15.6 | 53.1 | 16.9 | 6.0 | 2.00 |
| | 1960 | 10.7 | 15.9 | 52.1 | 15.7 | 5.6 | 1.93 |

*Table CO-11. (continued)*

| Country | Cohort | Parity 0 | 1 | 2 | 3 | 4 and more | Total cohort fertility rate |
|---|---|---|---|---|---|---|---|
| Italy | 1935 | 15.3 | 15.8 | 32.8 | 19.3 | 16.8 | 2.28 |
| | 1940 | 14.5 | 16.0 | 37.2 | 19.3 | 13.0 | 2.14 |
| | 1945 | 11.7 | 18.6 | 41.1 | 18.5 | 10.1 | 2.07 |
| | 1950 | 12.7 | 22.1 | 42.0 | 16.4 | 6.8 | 1.89 |
| | 1955 | 12.4 | 24.3 | 42.5 | 15.5 | 5.3 | 1.80 |
| Spain | 1955 | 7.1 | 24.8 | 44.6 | 16.9 | 6.6 | 1.90 |
| | 1960 | 10.2 | 25.9 | 47.2 | 12.9 | 3.8 | 1.76 |
| East central Europe | | | | | | | |
| Czech Republic | 1935 | 6.5 | 19.6 | 45.2 | 19.5 | 9.2 | 2.12 |
| | 1940 | 7.6 | 18.0 | 47.7 | 18.9 | 7.8 | 2.07 |
| | 1945 | 8.1 | 16.6 | 49.9 | 18.9 | 6.5 | 2.03 |
| | 1950 | 6.7 | 13.5 | 52.8 | 20.7 | 6.3 | 2.10 |
| | 1955 | 6.3 | 14.2 | 54.6 | 19.2 | 5.7 | 2.07 |
| | 1960 | 6.5 | 15.4 | 55.3 | 17.4 | 5.4 | 2.03 |
| Hungary | 1935 | 9.0 | 26.9 | 41.0 | 13.8 | 9.3 | 1.99 |
| | 1940 | 9.1 | 26.2 | 44.2 | 13.0 | 7.5 | 1.92 |
| | 1945 | 9.7 | 22.5 | 48.1 | 13.6 | 6.1 | 1.90 |
| | 1950 | 9.1 | 19.0 | 50.9 | 14.9 | 6.1 | 1.95 |
| | 1955 | 8.5 | 19.7 | 51.2 | 14.8 | 5.8 | 1.94 |
| | 1960 | 7.6 | 19.9 | 48.8 | 16.3 | 7.4 | 2.02 |
| Slovak Republic | 1935 | 9.1 | 9.7 | 32.9 | 24.6 | 23.7 | 2.72 |
| | 1940 | 9.0 | 10.4 | 36.3 | 24.9 | 19.4 | 2.54 |
| | 1945 | 10.9 | 9.6 | 38.7 | 25.1 | 15.7 | 2.38 |
| | 1950 | 9.8 | 10.5 | 41.4 | 25.1 | 13.2 | 2.31 |
| | 1955 | 10.2 | 11.2 | 44.2 | 23.1 | 11.3 | 2.22 |
| | 1960 | 9.8 | 13.0 | 45.0 | 21.5 | 10.7 | 2.18 |
| Eastern Europe | | | | | | | |
| Bulgaria | 1930 | 9.3 | 18.2 | 48.2 | 13.9 | 10.4 | 2.10 |
| | 1935 | 6.6 | 18.3 | 54.3 | 12.5 | 8.3 | 2.04 |
| | 1940 | 4.0 | 18.6 | 55.9 | 14.2 | 7.3 | 2.08 |
| | 1945 | 5.0 | 16.1 | 58.8 | 14.1 | 6.0 | 2.07 |
| | 1950 | 1.6 | 18.7 | 60.7 | 13.6 | 5.4 | 2.07 |
| | 1955 | 3.1 | 18.7 | 60.1 | 12.9 | 5.2 | 2.03 |
| | 1960 | 3.1 | 21.3 | 59.6 | 11.3 | 4.7 | 1.95 |
| | 1965 | 4.5 | 28.8 | 53.6 | 9.1 | 4.0 | 1.83 |

*Table CO-11. (continued)*

| Country | Cohort | Parity 0 | 1 | 2 | 3 | 4 and more | Total cohort fertility rate |
|---|---|---|---|---|---|---|---|
| Romania | 1950 | 6.3 | 20.9 | 36.5 | 16.1 | 20.2 | 2.48 |
| | 1955 | 8.8 | 21.9 | 38.2 | 14.6 | 16.5 | 2.27 |
| | 1960 | 8.1 | 24.5 | 38.9 | 14.2 | 14.3 | 2.16 |
| | 1965 | 11.7 | 31.1 | 35.6 | 11.7 | 9.9 | 1.91 |
| Russia | 1960 | 5.8 | 28.9 | 48.9 | 12.0 | 4.4 | 1.83 |
| West Balkan Region | | | | | | | |
| Bosnia and Herzegovina | 1935 | 14.8 | 8.4 | 23.1 | 18.9 | 34.8 | 3.04 |
| | 1940 | 11.6 | 12.7 | 28.3 | 20.0 | 27.4 | 2.75 |
| | 1945 | 15.6 | 11.1 | 33.8 | 19.9 | 19.6 | 2.34 |
| | 1950 | 10.4 | 16.2 | 40.6 | 19.9 | 12.9 | 2.17 |
| Croatia | 1935 | 13.3 | 22.3 | 36.5 | 16.5 | 11.4 | 2.00 |
| | 1940 | 8.6 | 24.5 | 43.3 | 15.1 | 8.5 | 1.96 |
| | 1945 | 12.1 | 22.2 | 46.1 | 13.5 | 6.1 | 1.78 |
| | 1950 | 6.1 | 24.6 | 51.4 | 13.2 | 4.7 | 1.86 |
| Macedonia | 1930 | 1.9 | 6.0 | 23.8 | 23.7 | 44.6 | 3.75 |
| | 1935 | 7.5 | 3.9 | 30.7 | 23.5 | 34.4 | 3.26 |
| | 1940 | 4.0 | 5.9 | 41.3 | 22.0 | 26.8 | 3.06 |
| | 1945 | 3.9 | 11.9 | 45.4 | 18.1 | 20.7 | 2.64 |
| | 1950 | 5.7 | 13.1 | 49.1 | 16.6 | 15.5 | 2.35 |
| | 1955 | 10.0 | 9.1 | 49.1 | 19.0 | 12.8 | 2.29 |
| | 1960 | 5.7 | 9.2 | 53.8 | 19.8 | 11.5 | 2.29 |
| Slovenia | 1930 | 13.6 | 20.4 | 34.2 | 18.0 | 13.8 | 2.10 |
| | 1935 | 11.2 | 18.8 | 41.2 | 17.7 | 11.1 | 2.06 |
| | 1940 | 8.3 | 23.2 | 43.0 | 17.0 | 8.5 | 2.01 |
| | 1945 | 8.8 | 21.6 | 48.8 | 15.1 | 5.7 | 1.83 |
| | 1950 | 4.4 | 25.3 | 51.4 | 14.7 | 4.2 | 1.90 |
| | 1955 | 1.5 | 25.7 | 56.5 | 12.9 | 3.4 | 1.96 |
| | 1960 | 4.7 | 26.3 | 53.5 | 12.5 | 3.0 | 1.87 |
| Yugoslavia | 1935 | 10.9 | 21.3 | 38.2 | 13.7 | 15.9 | 2.33 |
| | 1940 | 3.9 | 25.7 | 43.2 | 12.1 | 15.1 | 2.38 |
| | 1945 | 7.5 | 21.8 | 43.8 | 11.9 | 15.0 | 2.33 |
| | 1950 | 0.2 | 24.3 | 52.0 | 11.3 | 12.2 | 2.28 |
| | 1955 | 5.7 | 18.8 | 50.1 | 13.2 | 12.2 | 2.26 |
| | 1960 | 2.9 | 19.7 | 48.5 | 16.0 | 12.9 | 2.28 |

*Table CO-11. (end)*

| Country | Cohort | Parity 0 | 1 | 2 | 3 | 4 and more | Total cohort fertility rate |
|---|---|---|---|---|---|---|---|
| Non-European Countries | | | | | | | |
| United States | 1930 | 10.0 | 9.9 | 21.7 | 24.5 | 33.9 | 3.18 |
| | 1935 | 8.3 | 9.9 | 22.5 | 21.6 | 37.7 | 3.14 |
| | 1940 | 9.9 | 11.8 | 27.5 | 17.6 | 33.2 | 2.73 |
| | 1945 | 12.9 | 15.5 | 34.0 | 15.5 | 22.1 | 2.26 |
| | 1950 | 15.6 | 17.9 | 35.4 | 17.4 | 13.7 | 2.03 |
| | 1955 | 16.0 | 18.3 | 35.1 | 19.3 | 11.3 | 1.99 |

*Table CO-12 Average age at childbearing, 35 low fertility countries, birth cohorts 1930, 1940, 1950, 1960 and 1965 (continued)*

| Country | Average age at childbearing, women born in | | | | | Annual change between birth cohorts (per cent) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1930 | 1940 | 1950 | 1960 | 1965 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 |
| Nordic Region | | | | | | | | | |
| Denmark | 26.8 | 25.7 | 26.2 | 28.5 | 29.1 | -0.4 | 0.2 | 0.8 | 0.4 |
| Finland | 27.5 | 26.4 | 27.4 | 28.7 | 29.2 | -0.4 | 0.4 | 0.5 | 0.3 |
| Norway | 28.2 | 26.2 | 26.2 | 28.1 | 28.5 | -0.7 | 0.0 | 0.7 | 0.3 |
| Sweden | 27.2 | 26.4 | 27.2 | 28.6 | 28.8 | -0.3 | 0.3 | 0.5 | 0.1 |
| Western Europe | | | | | | | | | |
| Belgium | 28.0 | 26.4 | 26.2 | 27.4 | ... | -0.6 | -0.1 | 0.4 | ... |
| England and Wales | 27.9 | 26.2 | 26.5 | 27.8 | 28.2 | -0.7 | 0.1 | 0.5 | 0.3 |
| France | 27.5 | 26.4 | 26.5 | 27.7 | 28.6 | -0.4 | 0.0 | 0.5 | 0.6 |
| Netherlands | 29.2 | 27.1 | 27.1 | 29.2 | 30.0 | -0.8 | 0.0 | 0.7 | 0.5 |
| West central Europe | | | | | | | | | |
| Austria | 28.0 | 26.0 | 25.4 | 26.6 | 27.3 | -0.7 | -0.3 | 0.5 | 0.6 |
| Former FRG | 27.9 | 26.2 | 26.2 | 27.9 | 28.7 | -0.6 | 0.0 | 0.6 | 0.6 |
| Former GDR | ... | 24.9 | 24.4 | 24.3 | 24.9 | ... | -0.2 | 0.0 | 0.4 |
| Switzerland | 28.7 | 26.9 | 27.2 | 28.7 | 29.4 | -0.6 | 0.1 | 0.7 | 0.1 |
| Southern Europe | | | | | | | | | |
| Greece | ... | 27.9 | 26.3 | 26.0 | 26.8 | ... | -0.6 | -0.1 | 0.7 |
| Italy | 29.2 | 27.8 | 27.0 | 28.0 | 29.1 | -0.5 | -0.3 | 0.4 | 0.8 |
| Portugal | 29.4 | 27.9 | 26.8 | 26.6 | 27.4 | -0.5 | -0.4 | -0.1 | 0.7 |
| Spain | 30.2 | 29.0 | 27.4 | 27.9 | 29.0 | -0.4 | -0.6 | 0.2 | 0.8 |
| East central Europe | | | | | | | | | |
| Czech Republic | 25.4 | 25.0 | 24.9 | 24.5 | 24.8 | -0.2 | -0.1 | -0.1 | 0.2 |
| Hungary | 25.5 | 25.4 | 25.0 | 25.1 | 25.5 | 0.0 | -0.2 | 0.0 | 0.4 |
| Slovak Republic | 26.5 | 25.6 | 25.4 | 25.0 | 24.9 | -0.4 | -0.1 | -0.2 | 0.0 |
| Eastern Europe | | | | | | | | | |
| Bulgaria | 25.2 | 24.6 | 24.1 | 23.7 | 23.5 | -0.3 | -0.2 | -0.2 | -0.1 |
| Romania | ... | 26.6 | 25.0 | 24.5 | 24.2 | ... | -0.6 | -0.2 | -0.3 |
| Russia | ... | 26.6 | 26.2 | 25.0 | 24.6 | ... | -0.2 | -0.4 | -0.4 |
| West Balkan Region | | | | | | | | | |
| Bosnia and Herzegovina | 27.9 | 26.6 | 25.6 | ... | ... | -0.5 | -0.4 | ... | ... |
| Croatia | 26.4 | 25.8 | 25.4 | 25.8 | 26.3 | -0.2 | -0.2 | 0.1 | 0.4 |
| Macedonia | 27.6 | 26.7 | 25.9 | 25.5 | 25.6 | -0.3 | -0.3 | -0.1 | 0.1 |
| Slovenia | 27.6 | 26.6 | 25.4 | 24.9 | 25.8 | -0.4 | -0.5 | -0.2 | 0.7 |
| Yugoslavia | 26.2 | 26.2 | 25.7 | 26.1 | 26.3 | 0.0 | -0.2 | 0.1 | 0.2 |
| Baltic Region | | | | | | | | | |
| Estonia | ... | ... | 26.2 | 25.3 | 25.3 | ... | ... | -0.3 | -0.0 |
| Latvia | ... | ... | 26.4 | 25.5 | 25.3 | ... | ... | -0.4 | -0.2 |
| Lithuania | ... | 27.9 | 26.6 | 26.0 | 25.9 | ... | -0.5 | -0.2 | 0.0 |

*Table CO-12. (end)*

| Country | Average age at childbearing, women born in | | | | | Annual change between birth cohorts (per cent) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1930 | 1940 | 1950 | 1960 | 1965 | 1930-1940 | 1940-1950 | 1950-1960 | 1960-1965 |
| Non-European Countries | | | | | | | | | |
| Australia | 27.5 | 26.1 | 26.4 | 28.2 | 28.8 | -0.5 | 0.1 | 0.6 | 0.4 |
| Canada | 27.4 | 25.3 | 26.5 | 27.8 | 28.2 | -0.8 | 0.5 | 0.5 | 0.3 |
| Japan | 27.1 | 27.6 | 27.6 | 28.7 | ... | 0.2 | 0.0 | 0.4 | ... |
| New Zealand | 27.6 | 25.8 | 25.8 | 27.8 | 28.4 | -0.6 | 0.0 | 0.8 | 0.4 |
| United States | 26.3 | 24.7 | 25.9 | 26.9 | 27.2 | -0.6 | 0.5 | 0.4 | 0.2 |

**Figure CO-1 Total cohort fertility rates in 35 countries under study**

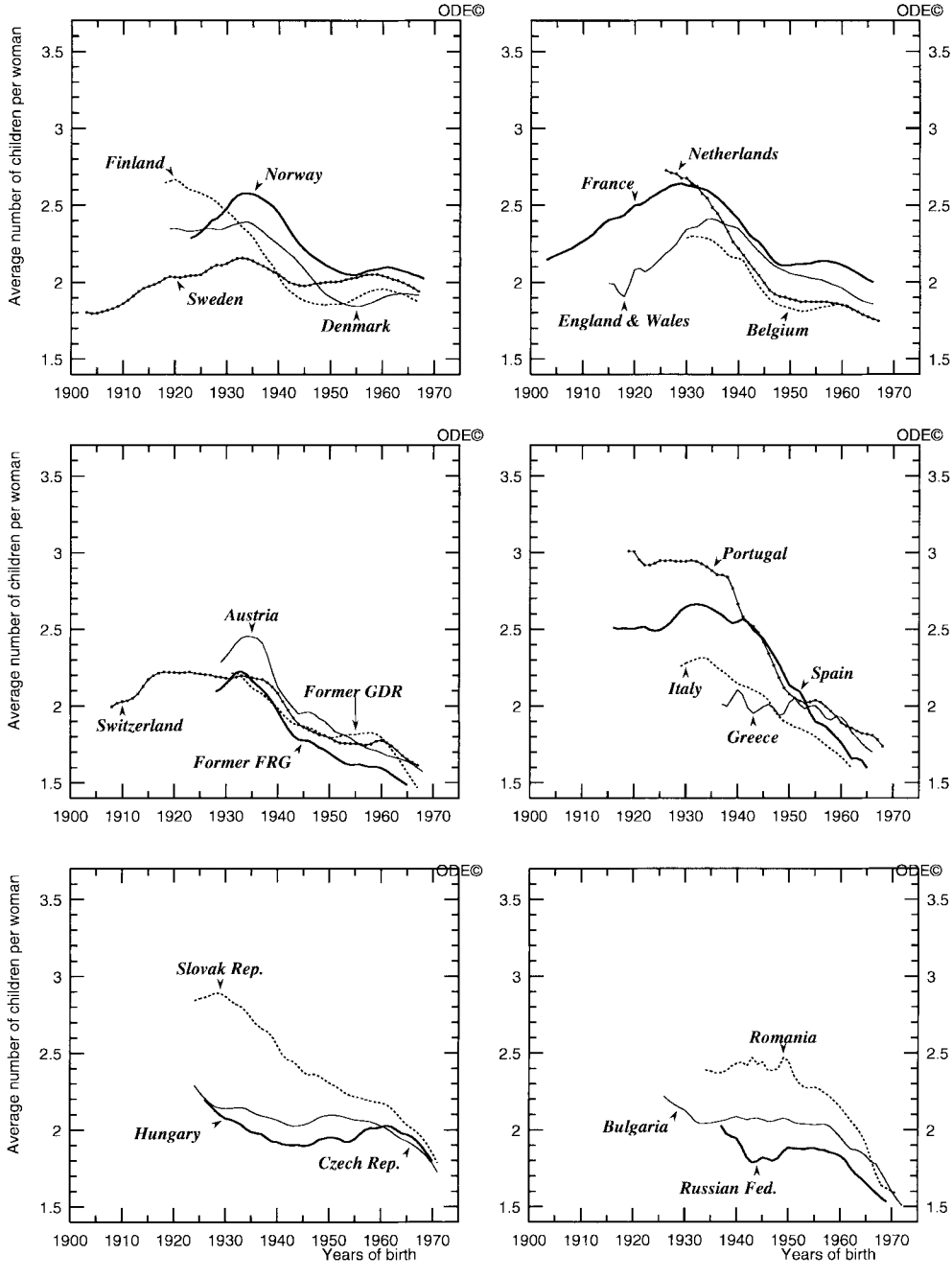
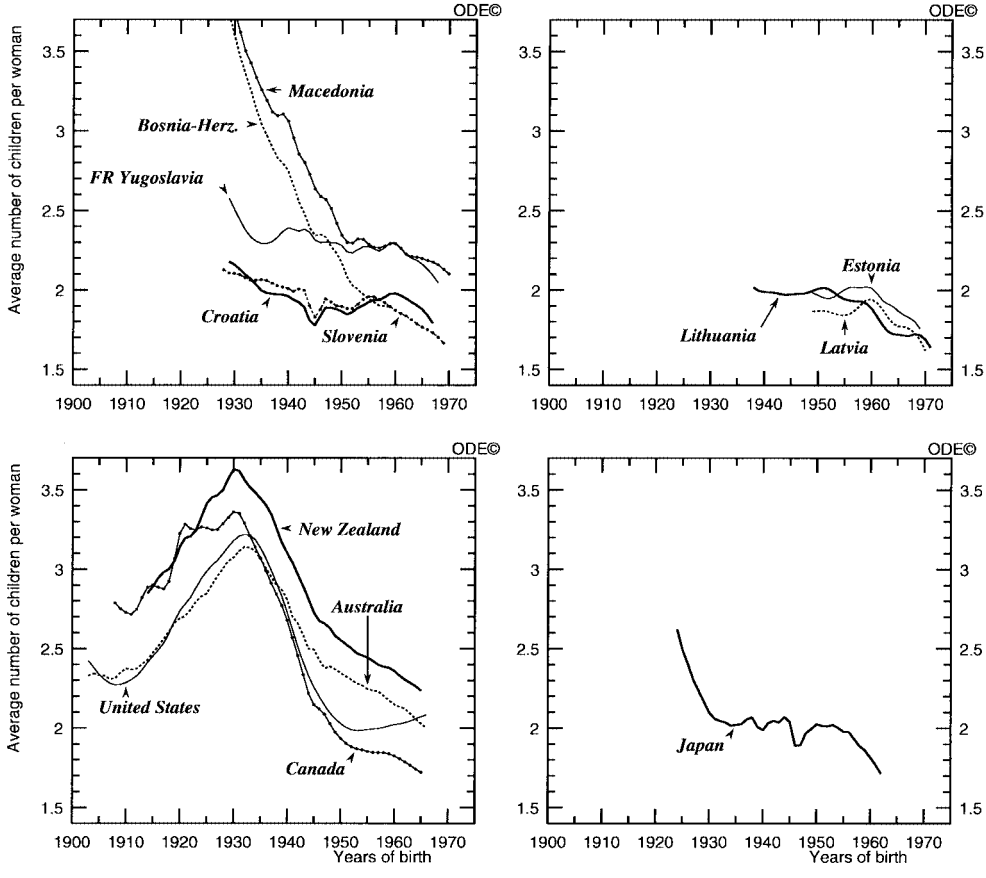
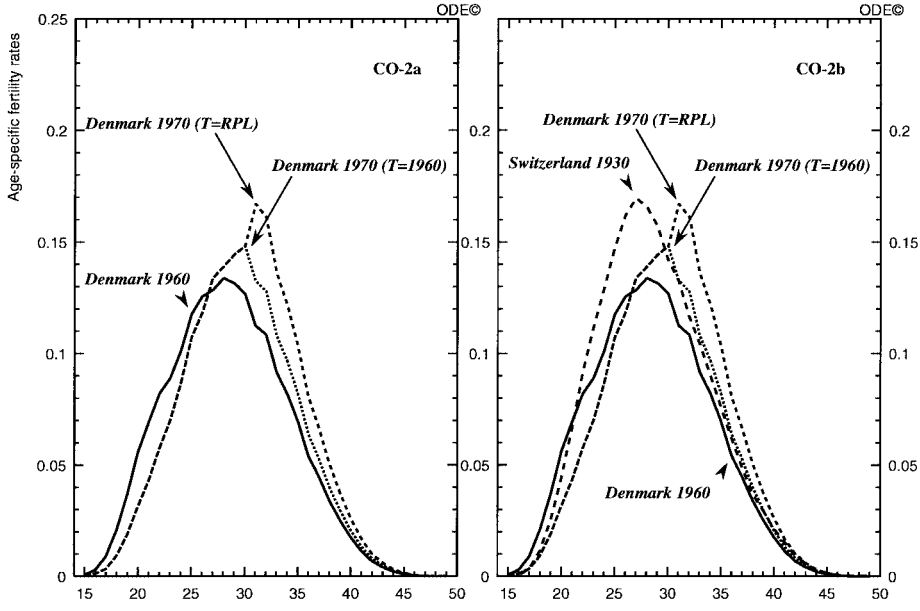


**Figure CO-1 (continued). Total cohort fertility rates in 35 countries under study**



**Figures CO-2, CO-3. Age-specific fertility rates, recorded and estimated**

**Denmark, birth cohorts 1960 and 1970** **Denmark & Switzerland, C1930, C1960 and C1970**




**Bulgaria, birth cohorts 1960 and 1970** **Bulgaria & Switzerland, C1930, C1960 and C1970**

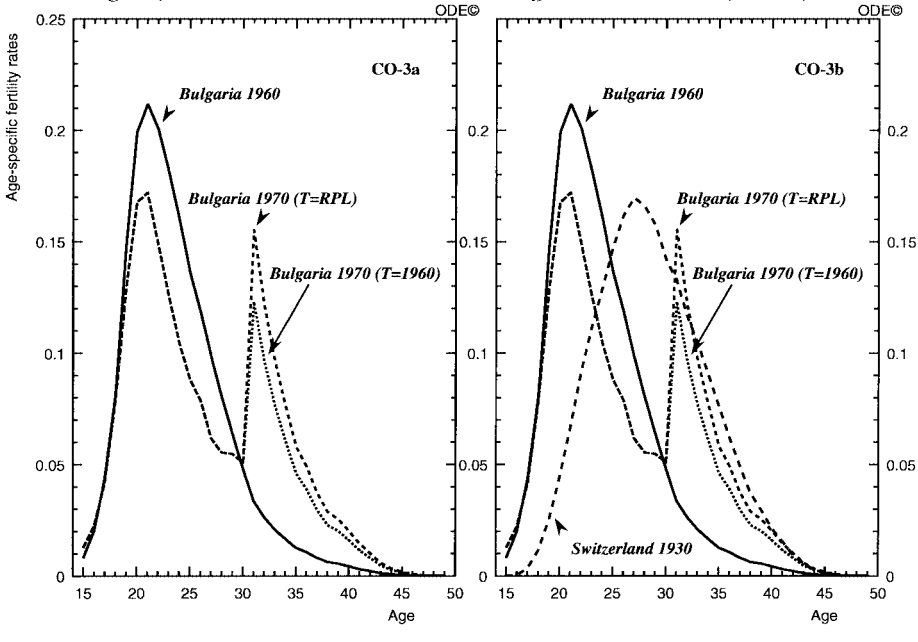


**Figure CO-4 Proportions of childless women in 23 countries under study**

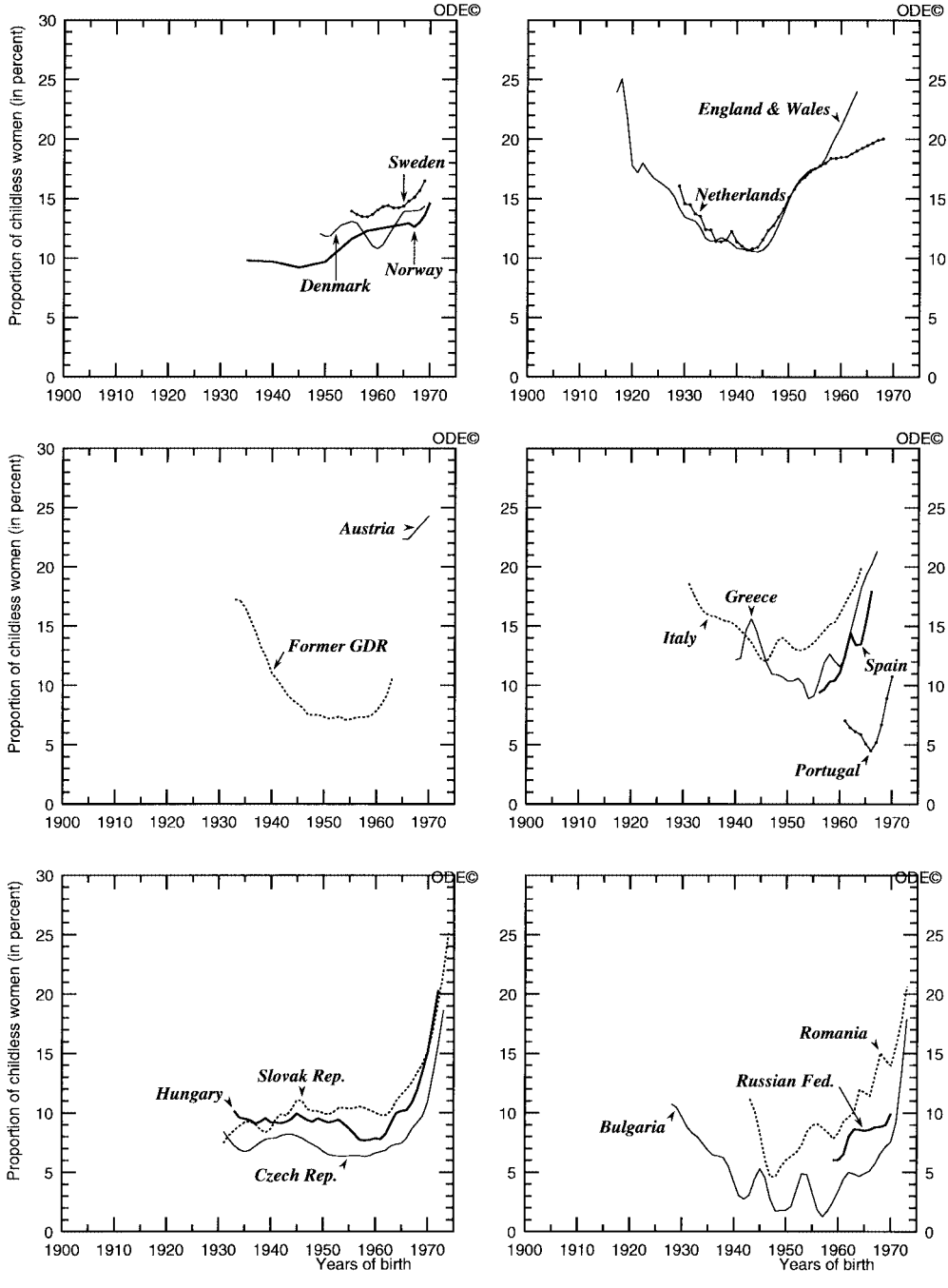


**Figure CO-4 (continued). Proportions of childless women in 23 countries under study**

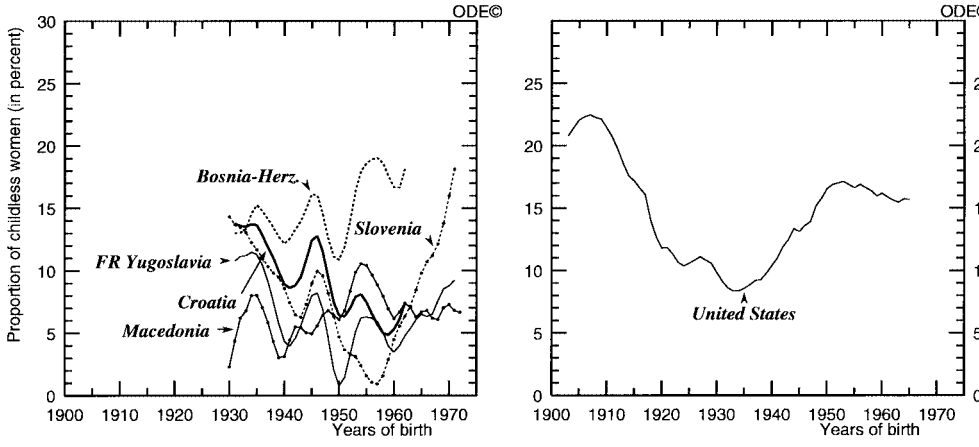


**Figure CO-5 Mean age of cohort childbirth in 35 countries under study**

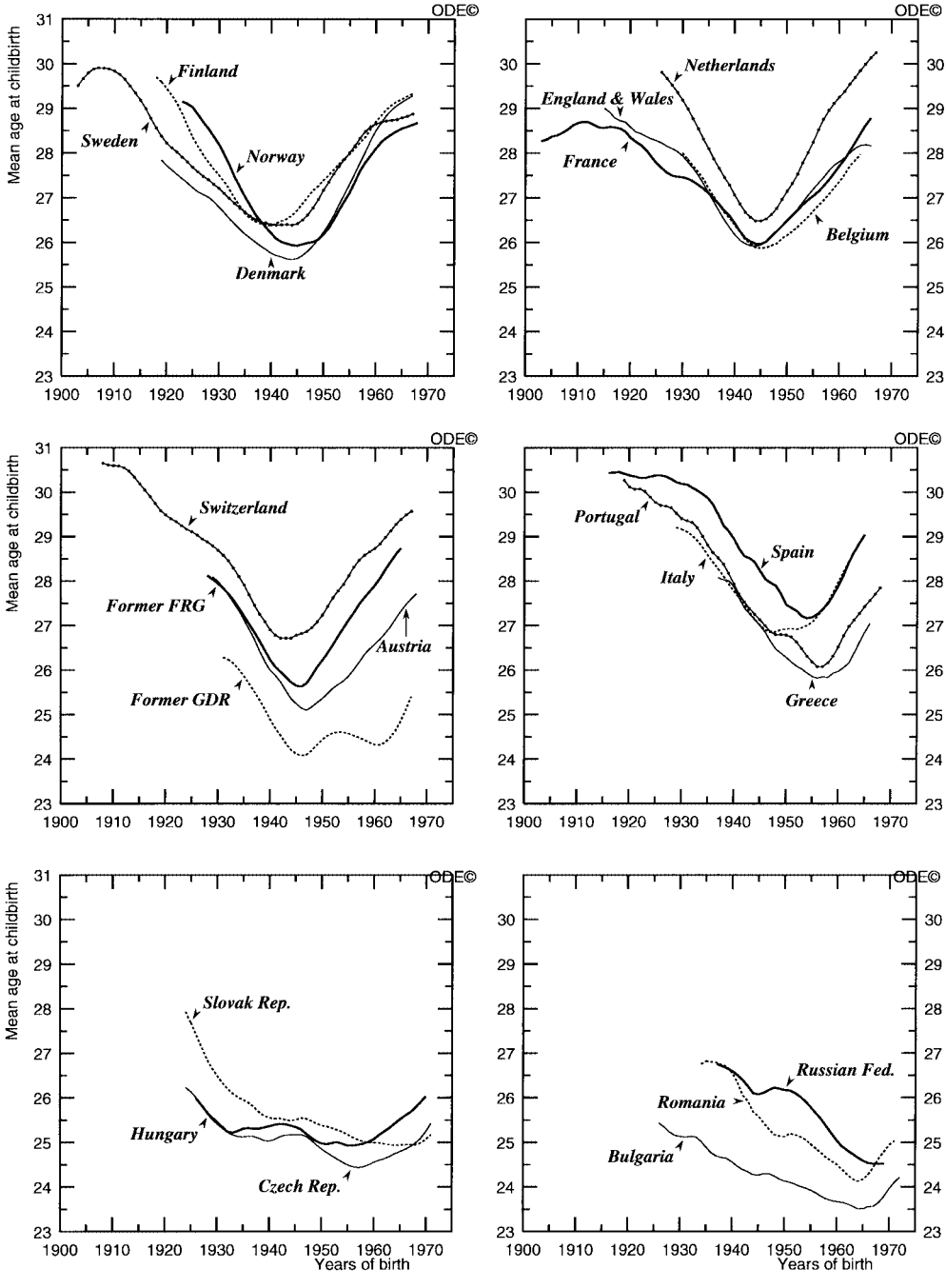
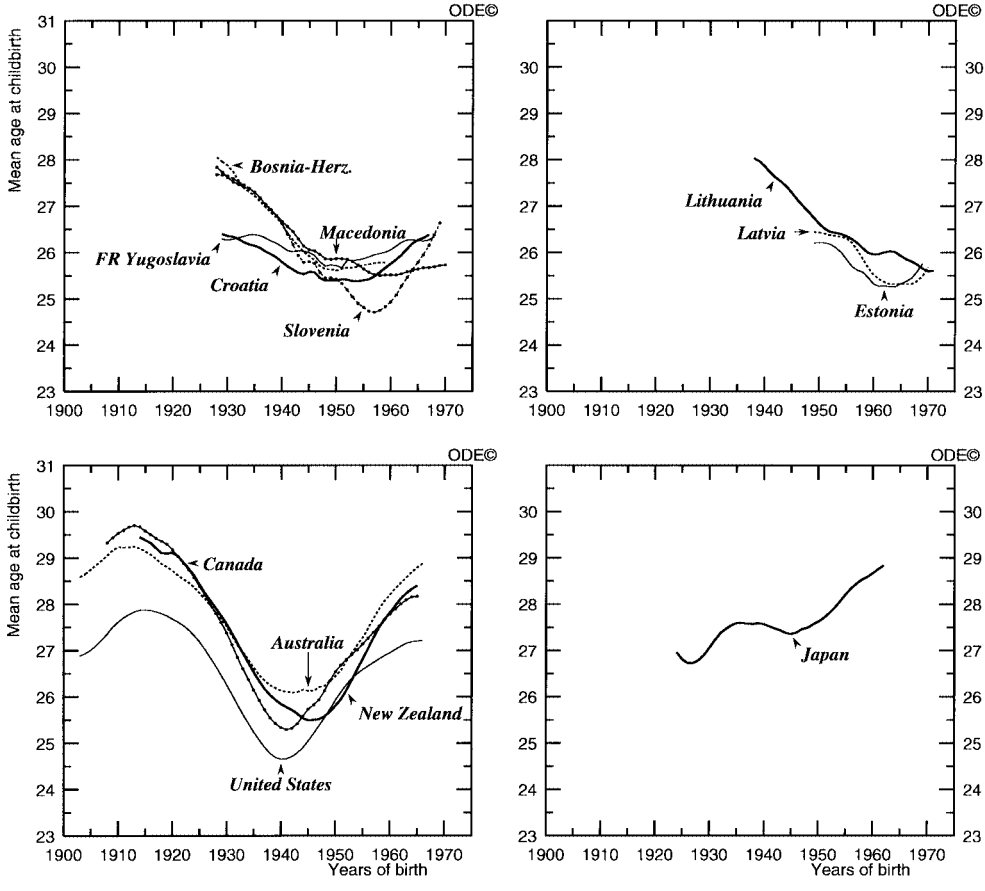


**Figure CO-5 (continued). Mean age of cohort childbirth in 35 countries under study**



# 13. Findings, implications and conclusions

Cohort fertility behavior in low-fertility countries during the 20th century has been charted, described and analyzed in this study. For most countries this includes the historical experience of 30 or more cohorts that concluded their childbearing by the turn of the century, and the as yet incomplete fertility experience of cohorts that were in the midst or at the onset of their reproductive periods. Some uncertainty remains regarding the eventual completed fertility of the latter cohorts. Nonetheless, the paths these cohorts have traveled to date, the prevailing contemporary political, economic, social and cultural conditions as well as lessons learned from historical experience, provide a reasonably solid base for making judgments about fertility levels and trends in the near future. The purpose of this chapter is to summarize the most important findings and conclusions of the analysis and to present some ideas regarding likely fertility levels and trends in the foreseeable future.

## 13.1 | Specific findings and conclusions

Throughout Europe, in the large English speaking overseas countries as well as in Japan, fertility —especially cohort fertility but possibly also period fertility— is almost certain to remain as low as it was at the turn of the century and it is likely to decline further in the first decade of the 21st century and perhaps even beyond. That is the principal conclusion of this book. The preliminary estimate of the average total fertility rate for cohorts born in 1975, cohorts that will be completing their childbearing around 2015, in the western market-economy countries as well as in the formerly socialist countries indicate a value in the order of 1.6 births per woman, about 15 per cent lower than the average completed fertility of the 1962 birth cohorts (cf. Table CO-1) and about 25 per cent below the level needed for long-term replacement of generations.

For this to happen, i.e. for the 1975 birth cohorts to emerge with an average completed fertility of 1.6 births per woman, there will have to be several countries with TCFRs below the average value. For a number of countries these estimates were specified in the respective chapters, namely 1.3-1.4 for Croatia and Slovenia, 1.4 for the Czech Republic and Hungary, 1.5 for Bulgaria and Russia. For other countries the estimates were not spelled out in the regional or country studies, but the values that went into the calculation of a 1.6 average were: Italy 1.2, Spain 1.2-1.3, Austria, Germany and Switzerland 1.3, Belgium and Greece 1.4, the Netherlands, Japan and Canada 1.5. Also in almost all low-fertility countries which will have 1975 total cohort fertility above the average of 1.6 births per woman the value will be lower than for previous cohorts. These are not predictions that the specific estimates will materialize, but an indication that the future direction of the trends is a further reduction of completed fertility as supported by a number of the findings and conclusions of the entire study summarized as follows:

- Completed fertility was declining from one cohort to the next in almost all the low fertility countries among the cohorts concluding their childbearing during the first decade of the 21st century (women born in the late 1950s and early 1960s). The exceptions were the United States and Denmark;
- There was a continuing decline of fertility among young women, namely in the cohorts that were in the midst or at the onset of their childbearing around the turn of the century, those born in the 1960s and in the 1970s in all low fertility countries. The single exception was the United States;
- In the western countries fertility was being postponed from the teens and early to mid-20s into the late 20s and 30s beginning slowly with the cohorts of the late 1940s and increasingly among the birth cohorts of the 1950s and 1960s;
- The declining fertility of young women, the postponement of fertility, in the western countries was being offset by increasing fertility when women reached their late 20s or 30s. In most countries, the amount of fertility when women were older was, however, not sufficient to fully offset the fertility deficits incurred earlier in life. Further, the degree of offsetting deficits was weaker for the cohorts of the early to mid-1960s than in those of the 1950s. Exceptionally, particularly among the cohorts of the 1950s, for instance in the Nordic region, fertility in the older ages was sufficient to compensate in full for the fertility deficits these women had incurred when they were young;

- Fertility was shifting continuously and forcefully into the late 20s and 30s in the western countries. This implies a potential danger for many women that conception may fail when they intend to become pregnant in their 30s;
- The continuous postponement of childbearing in the western countries is of critical importance on the aggregate level. It is already known that young women of the cohorts of the late 1960s and the 1970s had relatively few children, and that their older sisters did not bear a significant proportion of the children they had earlier 'postponed.' If the latter trend persists, cohort fertility will continue to decline and period fertility is likely to remain about as low as it was at the turn of the century. If both trends —a continued fertility decline of young women, i.e. a further postponement of childbearing, and the failure to bear many of the postponed births when these women get older— persist, cohort fertility will decline at a faster rate and period fertility is likely to decline further in the foreseeable future;
- The bulk of fertility in the formerly socialist countries was realized when women were in their teens and early to mid-20s and this proportion was increasing from the cohorts of the 1930s through those of the 1950s, in some countries even through the birth cohorts of the 1960s. Late childbearing when women were in their late 20s and 30s was rare.
- Starting with the cohorts of the 1950s fertility among young women in the formerly socialist countries has been declining and this descent was accelerating among the birth cohorts of the 1960s and 1970s;
- Among the cohorts that were in the midst or at the onset of their childbearing around the turn of the century (women born in the late 1960s and in the 1970s) completed fertility will almost certainly be lower than among the preceding ones (women born in the late 1950s and early 1960s). Their incomplete fertility to date was so low that in order to catch up with older generations, the magnitude of fertility in the later stages of their reproductive life would have to be unusually high. This applies in the western countries and even more so in the formerly socialist countries;
- There were incipient signs that fertility was being postponed into the older ages in the formerly socialist countries among the cohorts of the 1960s. In the West Balkan Region among cohorts of the 1960s fractions of the fertility deficits when women were young were being compensated. So far this was the exception;
- The project provides detailed evidence regarding the advancement of fertility in the western countries into the young ages of the cohorts born around 1940, which together with the high fertility of the 1930s birth cohorts generated the post-war baby-boom. In contrast, the subsequent rapid period

fertility decline in the 1960s and 1970s was brought about by the quantum decline mainly of women in their prime years of childbearing in the 1940s birth cohorts intensified by the postponement of childbearing of the 1950s birth cohorts;

- In the western countries typically the mean age of childbearing started to rise among the cohorts born in the 1940s and was still increasing among the cohorts of the 1960s. The increase in the mean age of childbearing was delayed by about ten cohorts in southern Europe;
- Trends in the mean age of childbearing were more diverse in the formerly socialist countries. For the most part, there were mild declines through the cohorts of the late 1950s and the 1960s, followed by moderate increases. In the Baltic countries and in Russia the declining trend appeared to be bottoming out among the cohorts of the late 1960s;
- Among the cohorts born in the 1930s and 1940s fertility was declining mainly due to reduced childbearing at higher birth orders. The more recent fertility declines in the cohorts of the 1950s and early 1960s were frequently due to declining proportions of lower order births, often of the first order. By definition this meant an increase in the proportion of women not bearing any children. Regrettably, data to corroborate these generalizations were not available for all countries in the study;
- Substantial changes in parity distributions took place from the cohorts of the 1930s through those of the 1960s. Among the cohorts completing their childbearing around the turn of the century the two-child family was the most prevalent. Proportions of parity two women in the cohorts born around 1960 were between 35 and 55 per cent. Women with four or more children were in very small proportions, and those with three, often even with two, children were declining. Proportions of women with a single child were increasing. Childlessness was increasing almost without exception. Our estimates indicate that in countries with appropriate data up to one fifth, occasionally even a higher proportion, of women in the cohorts of the 1960s will remain childless.

## 13.2 | General findings and conclusions

At the more general level, there was and continues to be a great deal of *dynamism, diversity* and at the same time there were numerous *common features* regarding cohort fertility behavior and trends in populations of countries and regions.

### *13.2.1. Dynamism*

There is hardly a cohort in time or space that had the same fertility patterns as another. The values of the total cohort fertility rates, of the cumulated cohort fertility rates, of the life course strategies of childbearing, the parity progression ratios, the parity distributions, the rates of childlessness, all keep on changing in one country after another. Thus far change was the rule, stability the exception. At the same time, there was a significant degree of continuity. Changes within populations tended to be gradual not abrupt, i.e. fertility behavior of birth cohorts a year or two apart were quite similar. Exceptionally even the year to year changes were considerable, such as the fertility declines in the formerly socialist countries among the young women of the 1970s birth cohorts. In any event, the gradual changes could, and often did, add up to major differences when comparing cohorts five, ten or more years apart.

### *13.2.2. Diversity*

During the period of observation, the main distinction was between the market-economy countries of the West and the formerly socialist countries. Even though over the past decade or so, approximately since 1990, the latter were basically adopting the political, social and economic principles and structures of the former, there was a considerable momentum, to the extent that notable differences persisted in the cohort fertility behavior of the two groups of countries. Within these two groups there were regions in which the populations had many common features as well as such that differed from each other. Some of these regions (the Nordic countries, Baltic countries, southern Europe) were more homogeneous than others, but none completely. No two populations were alike. The population of each country had and continues to have its idiosyncrasies.

### *13.2.3. Common features*

There were features in cohort fertility behavior that were similar in all or in almost all countries, there were many common features within each of the two main groups —the western market-economy countries and the formerly socialist ones— and there were common features within regions. The following examples provide an illustration.

The decline of total cohort fertility rates of the women born during the late 1950s and the first half of the 1960s was taking place in almost all countries included in the study. Similarly, the fertility decline among young women that were at the onset or in the middle of their childbearing at the turn of the century, the women born during the 1960s and the 1970s, was almost universal.

The long-term trends of the total cohort fertility rates and of the life-time strategies of childbearing tended to be of a common nature in the western market-economy countries as well as in the formerly socialist countries, but each differed significantly from the other grouping. In the West, TCFRs tended to decline from the birth cohorts of the early 1930s through those of the 1960s, often with a lesser or no decline among the 1950s cohorts. In the formerly socialist countries the TCFRs were relatively stable from the 1930s cohorts through those of the late 1950s and started to decline in subsequent cohorts. In most western countries childbearing was advanced in the cohorts of the 1930s, was reduced among women in their prime reproductive years in the cohorts of the 1940s and starting with the cohorts born in the late 1940s there was a strong propensity to postpone births, with varying proportions of the delayed births being born when women were older. In the formerly socialist countries the majority of children were born when women were young, in their teens to mid-20s, and the proportions of children borne by young women tended to increase from the cohorts of the 1930s to those of the late 1950s.

In the western countries populations within regions often had conspicuous common features. In the Nordic region TCFRs of the early 1960s cohorts were relatively high, close to replacement between 1.9 and 2.1 births per woman; and among the cohorts of the 1950s, even though many births were postponed, all of them were born when women were older. In West central Europe (Austria, Germany and Switzerland) TCFRs of women born in the 1960s were low, 1.5-1.6 births per woman, and were declining from one cohort to the next quite rapidly. In southern Europe the typical fertility trends and patterns were delayed by about a decade of birth cohorts. In the non-European countries (excluding Japan) the cohorts of the early 1930s had TCFRs considerably higher than other countries, between 3.1 and 3.5 births per woman, which subsequently declined rapidly so that the TCFRs of the early 1960s cohorts were roughly in line with the other western countries. In the formerly socialist countries there were fewer features distinguishing one region from another. The basic trends, patterns and levels of cohort fertility were reasonably similar for most countries in the larger grouping. The one exception was the West Balkan region (former Federal

Republic of Yugoslavia). Some of the trends and patterns of cohort fertility were relatively weak or they even differed from the other formerly socialist countries. For instance, early childbearing was also prevalent for most of the cohorts of the study, but the proportions of children borne by young women tended to be lower and more stable; in Yugoslavia proper these were the same from the birth cohorts of around 1930 through those of the early 1960s.

## 13.3 | Concluding observations

The significant differences in fertility behavior between the formerly socialist and the western market-economy countries described and analyzed in the book validate the fact that economic and social systems modify levels and trends of fertility. Similarly, although to a lesser extent, the authoritarian regimes which lasted into the 1960s in Spain and Portugal, for instance, affected fertility behavior.

To disentangle the specific mechanisms that influence fertility levels and trends in regions and countries profound detailed analyses are called for. Simplistic explanations do not provide satisfactory answers. For instance, the predominantly German speaking countries of central Europe were equally wealthy as the Nordic countries, yet the TCFRs of the 1962 birth cohorts of the former were low ranging from 1.6 to 1.7 and of the latter were relatively high ranging from 1.9 to 2.1 births per woman.

Hobcraft and Kiernan (1995) as well as Kohler with his colleagues (2002) discussed, examined and substantiated numerous factors and mechanisms generating trends of present fertility behavior, in particular the decline and the postponement of fertility, described and analyzed in our study. The wide range of conditions that influenced fertility during the last decades of the 20$^{th}$ century included increasing female employment, profound changes in the status of women, incentives to accumulate human capital, the need to establish oneself in a career, tight labor markets, the spread in the use of modern means of birth prevention, the weakening of the welfare state, a shortage of affordable housing options for young adults and various modalities of uncertainty in young adulthood, such as high youth unemployment, general economic uncertainty mainly in the former socialist countries, and changing patterns of partnership. Moreover, social interaction and norms also played significant roles in modifying fertility behavior. We come back full circle to the principal

conclusion of our investigation which points in the direction of continued low and possibly further declining fertility. Significant profound changes would have to take place in the array of social, economic, and political forces which are exerting downward pressure on fertility for any measurable turnabout in the levels of childbearing to occur. These could be economic, social or political structural changes, or the desire to increase fertility would have to attain high priority among policy goals backed up by political will.

As is well known, contemporary low fertility in the developed countries, especially if it were to continue to decline, would have momentous consequences. Age structures with never previously experienced high proportions of elderly people requiring support would be generated. Consequently, many social and economic institutions, such as the health care and social security systems, taxation schemes, migration laws and regulations, among others, would have to be fundamentally reconstructed. If such major restructurings are to be avoided or ameliorated, effective conditions to increase fertility would have to be created. Measures applied towards this end in the past have usually had only partial and limited success, if any at all. Far reaching and comprehensive changes in the conditions under which young people are educated and acquiring needed skills, entering gainful employment, procuring housing, establishing partnerships and running households would be required to make childbearing inherently attractive and compatible with modern life styles. That is a tall order, but unless leaders in government, business and in other public and private organizations rise to the occasion, fertility will continue to be low.

# Appendices

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*Appendix A. Total cohort fertility rate, 35 low fertility countries, cohorts born in 1915-1970 (continued)*

| | Nordic Region | | | | Western Europe | | | | West central Europe | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cohort | Denmark | Finland | Norway | Sweden | Belgium | England and Wales | France | Netherlands | Austria | Former FRG | Former GDR | Switzerland |
| 1915 | | | | 1.97 | | 1.99 | 2.40 | | | | | 2.17 |
| 1916 | | | | 1.98 | | 1.99 | 2.42 | | | | | 2.20 |
| 1917 | | | | 2.00 | | 1.93 | 2.42 | | | | | 2.21 |
| 1918 | | 2.64 | | 2.02 | | 1.91 | 2.44 | | | | | 2.22 |
| 1919 | 2.35 | 2.65 | | 2.04 | | 1.99 | 2.47 | | | | | 2.22 |
| 1920 | 2.35 | 2.66 | | 2.03 | | 2.08 | 2.50 | | | | | 2.22 |
| 1921 | 2.34 | 2.65 | | 2.03 | | 2.09 | 2.50 | | | | | 2.21 |
| 1922 | 2.33 | 2.62 | | 2.04 | | 2.07 | 2.52 | | | | | 2.22 |
| 1923 | 2.33 | 2.60 | 2.29 | 2.04 | | 2.09 | 2.55 | | | | | 2.22 |
| 1924 | 2.33 | 2.59 | 2.30 | 2.04 | | 2.12 | 2.57 | | | | | 2.21 |
| 1925 | 2.34 | 2.58 | 2.33 | 2.05 | | 2.15 | 2.59 | | | | | 2.21 |
| 1926 | 2.35 | 2.56 | 2.36 | 2.07 | | 2.19 | 2.61 | 2.73 | | | | 2.20 |
| 1927 | 2.35 | 2.55 | 2.40 | 2.09 | | 2.21 | 2.63 | 2.71 | | | | 2.20 |
| 1928 | 2.34 | 2.52 | 2.41 | 2.11 | | 2.25 | 2.64 | 2.70 | | 2.09 | | 2.19 |
| 1929 | 2.34 | 2.49 | 2.44 | 2.11 | | 2.30 | 2.64 | 2.68 | 2.28 | 2.11 | | 2.19 |
| 1930 | 2.36 | 2.46 | 2.48 | 2.12 | 2.29 | 2.34 | 2.63 | 2.67 | 2.32 | 2.14 | | 2.18 |
| 1931 | 2.37 | 2.43 | 2.53 | 2.14 | 2.30 | 2.35 | 2.62 | 2.64 | 2.37 | 2.18 | 2.21 | 2.18 |
| 1932 | 2.38 | 2.39 | 2.56 | 2.15 | 2.30 | 2.36 | 2.62 | 2.62 | 2.41 | 2.22 | 2.22 | 2.19 |
| 1933 | 2.39 | 2.36 | 2.58 | 2.16 | 2.29 | 2.39 | 2.61 | 2.58 | 2.44 | 2.22 | 2.19 | 2.20 |
| 1934 | 2.39 | 2.33 | 2.58 | 2.15 | 2.28 | 2.41 | 2.60 | 2.55 | 2.45 | 2.20 | 2.15 | 2.19 |
| 1935 | 2.38 | 2.29 | 2.57 | 2.14 | 2.27 | 2.41 | 2.57 | 2.49 | 2.45 | 2.17 | 2.12 | 2.18 |
| 1936 | 2.35 | 2.24 | 2.56 | 2.12 | 2.25 | 2.40 | 2.55 | 2.45 | 2.44 | 2.14 | 2.10 | 2.18 |
| 1937 | 2.32 | 2.19 | 2.54 | 2.11 | 2.21 | 2.38 | 2.52 | 2.39 | 2.41 | 2.11 | 2.08 | 2.17 |
| 1938 | 2.30 | 2.15 | 2.52 | 2.09 | 2.18 | 2.37 | 2.48 | 2.33 | 2.33 | 2.07 | 2.05 | 2.15 |
| 1939 | 2.27 | 2.10 | 2.49 | 2.07 | 2.16 | 2.36 | 2.44 | 2.26 | 2.22 | 2.02 | 2.02 | 2.12 |
| 1940 | 2.24 | 2.04 | 2.45 | 2.05 | 2.16 | 2.35 | 2.41 | 2.22 | 2.12 | 1.97 | 1.99 | 2.08 |
| 1941 | 2.21 | 1.98 | 2.40 | 2.03 | 2.14 | 2.31 | 2.36 | 2.18 | 2.07 | 1.91 | 1.95 | 2.03 |
| 1942 | 2.17 | 1.95 | 2.34 | 2.00 | 2.08 | 2.27 | 2.31 | 2.13 | 2.03 | 1.85 | 1.91 | 1.97 |
| 1943 | 2.14 | 1.92 | 2.29 | 1.99 | 2.02 | 2.23 | 2.28 | 2.08 | 1.99 | 1.81 | 1.89 | 1.92 |
| 1944 | 2.10 | 1.90 | 2.25 | 1.98 | 1.97 | 2.20 | 2.26 | 2.04 | 1.95 | 1.78 | 1.87 | 1.88 |
| 1945 | 2.06 | 1.88 | 2.21 | 1.98 | 1.93 | 2.16 | 2.22 | 2.00 | 1.96 | 1.78 | 1.87 | 1.86 |
| 1946 | 2.03 | 1.87 | 2.18 | 1.98 | 1.89 | 2.13 | 2.17 | 1.95 | 1.96 | 1.77 | 1.86 | 1.84 |
| 1947 | 2.00 | 1.86 | 2.16 | 1.99 | 1.86 | 2.11 | 2.13 | 1.92 | 1.95 | 1.75 | 1.84 | 1.83 |
| 1948 | 1.97 | 1.86 | 2.14 | 1.99 | 1.85 | 2.09 | 2.11 | 1.91 | 1.92 | 1.73 | 1.82 | 1.81 |
| 1949 | 1.94 | 1.85 | 2.11 | 2.00 | 1.84 | 2.07 | 2.11 | 1.90 | 1.90 | 1.72 | 1.81 | 1.81 |
| 1950 | 1.91 | 1.86 | 2.09 | 2.00 | 1.83 | 2.06 | 2.11 | 1.89 | 1.87 | 1.69 | 1.79 | 1.79 |

*Appendix A (continued)*

| Cohort | Nordic Region | | | | Western Europe | | | | West central Europe | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Denmark | Finland | Norway | Sweden | Belgium | England and Wales | France | Netherlands | Austria | Former FRG | Former GDR | Switzerland |
| 1951 | 1.89 | 1.86 | 2.08 | 2.00 | 1.82 | 2.05 | 2.12 | 1.88 | 1.83 | 1.67 | 1.80 | 1.77 |
| 1952 | 1.87 | 1.86 | 2.06 | 2.01 | 1.81 | 2.04 | 2.12 | 1.87 | 1.82 | 1.64 | 1.80 | 1.76 |
| 1953 | 1.85 | 1.86 | 2.05 | 2.02 | 1.81 | 2.03 | 2.12 | 1.87 | 1.81 | 1.63 | 1.81 | 1.76 |
| 1954 | 1.85 | 1.88 | 2.05 | 2.03 | 1.82 | 2.03 | 2.12 | 1.87 | 1.79 | 1.62 | 1.81 | 1.75 |
| 1955 | 1.84 | 1.90 | 2.05 | 2.03 | 1.83 | 2.02 | 2.13 | 1.87 | 1.76 | 1.62 | 1.81 | 1.75 |
| 1956 | 1.84 | 1.91 | 2.06 | 2.04 | 1.84 | 2.02 | 2.14 | 1.87 | 1.75 | 1.62 | 1.82 | 1.75 |
| 1957 | 1.86 | 1.93 | 2.07 | 2.05 | 1.84 | 2.00 | 2.14 | 1.87 | 1.73 | 1.61 | 1.82 | 1.75 |
| 1958 | 1.87 | 1.94 | 2.08 | 2.05 | 1.85 | 1.99 | 2.13 | 1.86 | 1.72 | 1.60 | 1.83 | 1.75 |
| 1959 | 1.88 | 1.95 | 2.08 | 2.05 | 1.86 | 1.98 | 2.13 | 1.86 | 1.71 | 1.60 | 1.82 | 1.77 |
| 1960 | 1.90 | 1.95 | 2.09 | 2.04 | 1.86 | 1.96 | 2.11 | 1.85 | 1.70 | 1.60 | 1.80 | 1.77 |
| 1961 | 1.91 | 1.95 | 2.10 | 2.03 | 1.85 | 1.94 | 2.10 | 1.84 | 1.68 | 1.58 | 1.76 | 1.76 |
| 1962 | 1.92 | 1.94 | 2.09 | 2.01 | 1.82 | 1.91 | 2.08 | 1.82 | 1.67 | 1.55 | 1.72 | 1.74 |
| 1963 | 1.92 | 1.93 | 2.08 | 2.00 | 1.81 | 1.89 | 2.06 | 1.81 | 1.66 | 1.53 | 1.67 | 1.71 |
| 1964 | 1.93 | 1.92 | 2.07 | 2.00 | 1.79 | 1.88 | 2.04 | 1.79 | 1.65 | 1.51 | 1.62 | 1.68 |
| 1965 | 1.92 | 1.91 | 2.06 | 1.98 | | 1.87 | 2.02 | 1.77 | 1.64 | 1.48 | 1.57 | 1.65 |
| 1966 | 1.92 | 1.89 | 2.05 | 1.96 | | 1.86 | 2.00 | 1.76 | 1.62 | | 1.52 | 1.63 |
| 1967 | 1.92 | 1.87 | 2.04 | 1.94 | | | | 1.75 | 1.60 | | 1.47 | 1.61 |
| 1968 | | | 2.02 | | | | | | 1.57 | | | |
| 1969 | | | | | | | | | | | | |
| 1970 | | | | | | | | | | | | |

*Appendix A (continued)*

| Cohort | Southern Europe | | | | East central Europe | | | Eastern Europe | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Greece | Italy | Portugal | Spain | Czech Republic | Hungary | Slovak Republic | Bulgaria | Romania | Russia |
| 1915 | | | | | | | | | | |
| 1916 | | | | 2.51 | | | | | | |
| 1917 | | | | 2.50 | | | | | | |
| 1918 | | | | 2.51 | | | | | | |
| 1919 | | | 3.01 | 2.50 | | | | | | |
| 1920 | | | 3.01 | 2.50 | | | | | | |
| 1921 | | | 2.95 | 2.51 | | | | | | |
| 1922 | | | 2.92 | 2.51 | | | | | | |
| 1923 | | | 2.92 | 2.50 | | | | | | |
| 1924 | | | 2.93 | 2.49 | | | 2.84 | | | |
| 1925 | | | 2.95 | 2.49 | 2.24 | | 2.85 | | | |
| 1926 | | | 2.95 | 2.51 | 2.21 | 2.20 | 2.86 | 2.22 | | |
| 1927 | | | 2.95 | 2.54 | 2.17 | 2.16 | 2.87 | 2.17 | | |
| 1928 | | | 2.94 | 2.58 | 2.15 | 2.13 | 2.89 | 2.13 | | |
| 1929 | | 2.26 | 2.94 | 2.62 | 2.14 | 2.10 | 2.89 | 2.11 | | |
| 1930 | | 2.28 | 2.94 | 2.65 | 2.14 | 2.07 | 2.86 | 2.10 | | |
| 1931 | | 2.29 | 2.95 | 2.66 | 2.14 | 2.07 | 2.83 | 2.09 | | |
| 1932 | | 2.30 | 2.94 | 2.66 | 2.14 | 2.05 | 2.81 | 2.08 | | |
| 1933 | | 2.32 | 2.93 | 2.66 | 2.15 | 2.04 | 2.79 | 2.08 | | |
| 1934 | | 2.31 | 2.91 | 2.65 | 2.14 | 2.00 | 2.76 | 2.06 | | |
| 1935 | | 2.28 | 2.88 | 2.63 | 2.12 | 1.99 | 2.72 | 2.04 | 2.38 | |
| 1936 | | 2.25 | 2.86 | 2.61 | 2.10 | 1.98 | 2.68 | 2.05 | 2.38 | |
| 1937 | 2.01 | 2.23 | 2.85 | 2.59 | 2.09 | 1.97 | 2.65 | 2.06 | 2.39 | 2.03 |
| 1938 | 2.00 | 2.20 | 2.84 | 2.56 | 2.09 | 1.95 | 2.63 | 2.06 | 2.41 | 1.98 |
| 1939 | 2.05 | 2.17 | 2.77 | 2.54 | 2.08 | 1.93 | 2.60 | 2.08 | 2.44 | 1.96 |
| 1940 | 2.10 | 2.14 | 2.66 | 2.55 | 2.07 | 1.92 | 2.54 | 2.08 | 2.42 | 1.94 |
| 1941 | 2.07 | 2.13 | 2.58 | 2.57 | 2.05 | 1.91 | 2.48 | 2.08 | 2.39 | 1.89 |
| 1942 | 1.98 | 2.12 | 2.54 | 2.54 | 2.03 | 1.90 | 2.45 | 2.06 | 2.34 | 1.82 |
| 1943 | 1.95 | 2.10 | 2.52 | 2.50 | 2.03 | 1.90 | 2.45 | 2.07 | 2.41 | 1.79 |
| 1944 | 1.97 | 2.09 | 2.48 | 2.47 | 2.03 | 1.90 | 2.42 | 2.08 | 2.38 | 1.79 |
| 1945 | 2.00 | 2.07 | 2.42 | 2.43 | 2.03 | 1.90 | 2.38 | 2.07 | 2.43 | 1.82 |
| 1946 | 2.01 | 2.04 | 2.34 | 2.38 | 2.04 | 1.90 | 2.36 | 2.06 | 2.41 | 1.81 |
| 1947 | 1.99 | 1.98 | 2.27 | 2.33 | 2.06 | 1.91 | 2.36 | 2.06 | 2.43 | 1.80 |
| 1948 | 1.94 | 1.93 | 2.18 | 2.27 | 2.08 | 1.93 | 2.35 | 2.07 | 2.45 | 1.81 |
| 1949 | 1.95 | 1.90 | 2.12 | 2.20 | 2.09 | 1.94 | 2.33 | 2.07 | 2.52 | 1.86 |
| 1950 | 2.02 | 1.89 | 2.08 | 2.14 | 2.10 | 1.95 | 2.31 | 2.07 | 2.48 | 1.88 |

*Appendix A (continued)*

| Cohort | Southern Europe | | | | East central Europe | | | Eastern Europe | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Greece | Italy | Portugal | Spain | Czech Republic | Hungary | Slovak Republic | Bulgaria | Romania | Russia |
| 1951 | 2.05 | 1.86 | 2.05 | 2.11 | 2.10 | 1.95 | 2.29 | 2.05 | 2.36 | 1.88 |
| 1952 | 2.01 | 1.85 | 2.03 | 2.09 | 2.09 | 1.94 | 2.27 | 2.04 | 2.31 | 1.88 |
| 1953 | 1.98 | 1.83 | 2.02 | 2.03 | 2.08 | 1.92 | 2.24 | 2.04 | 2.28 | 1.87 |
| 1954 | 2.00 | 1.82 | 2.03 | 1.95 | 2.07 | 1.92 | 2.23 | 2.04 | 2.27 | 1.88 |
| 1955 | 2.00 | 1.80 | 2.04 | 1.90 | 2.07 | 1.94 | 2.22 | 2.03 | 2.27 | 1.88 |
| 1956 | 1.97 | 1.77 | 2.03 | 1.88 | 2.06 | 1.97 | 2.21 | 2.04 | 2.25 | 1.87 |
| 1957 | 1.92 | 1.74 | 2.00 | 1.87 | 2.06 | 2.00 | 2.20 | 2.04 | 2.23 | 1.87 |
| 1958 | 1.91 | 1.71 | 1.97 | 1.83 | 2.05 | 2.01 | 2.19 | 2.02 | 2.22 | 1.85 |
| 1959 | 1.93 | 1.69 | 1.94 | 1.80 | 2.04 | 2.01 | 2.18 | 1.99 | 2.19 | 1.84 |
| 1960 | 1.93 | 1.66 | 1.90 | 1.76 | 2.03 | 2.02 | 2.18 | 1.95 | 2.16 | 1.83 |
| 1961 | 1.89 | 1.63 | 1.88 | 1.71 | 2.01 | 2.03 | 2.17 | 1.91 | 2.10 | 1.80 |
| 1962 | 1.83 | 1.60 | 1.86 | 1.66 | 1.99 | 2.02 | 2.14 | 1.87 | 2.06 | 1.75 |
| 1963 | 1.80 | 1.57 | 1.84 | 1.66 | 1.96 | 2.00 | 2.11 | 1.87 | 2.02 | 1.71 |
| 1964 | 1.76 | 1.52 | 1.82 | 1.64 | 1.94 | 1.98 | 2.07 | 1.86 | 1.97 | 1.68 |
| 1965 | 1.72 | 1.49 | 1.82 | 1.59 | 1.93 | 1.97 | 2.04 | 1.83 | 1.91 | 1.65 |
| 1966 | 1.70 | | 1.81 | | 1.91 | 1.96 | 2.01 | 1.79 | 1.81 | 1.62 |
| 1967 | | | 1.78 | | 1.88 | 1.93 | 1.99 | 1.77 | 1.71 | 1.59 |
| 1968 | | | 1.74 | | 1.86 | 1.89 | 1.95 | 1.72 | 1.64 | 1.56 |
| 1969 | | | | | 1.82 | 1.84 | 1.91 | 1.66 | 1.62 | 1.53 |
| 1970 | | | | | 1.78 | 1.80 | 1.85 | 1.60 | 1.60 | |
| 1971 | | | | | 1.73 | | 1.79 | 1.55 | 1.59 | |
| 1972 | | | | | | | | 1.51 | | |

*Appendix A (continued)*

| Cohort | West Balkan Region | | | | | Baltic Region | | | Non-European Countries | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bosnia and Herzegovina | Croatia | Macedonia | Slovenia | Yugoslavia | Estonia | Latvia | Lithuania | Australia | Canada | Japan | New Zealand | United States |
| 1915 | | | | | | | | | 2.47 | 2.89 | | | 2.45 |
| 1916 | | | | | | | | | 2.51 | 2.88 | | | 2.49 |
| 1917 | | | | | | | | | 2.56 | 2.87 | | | 2.53 |
| 1918 | | | | | | | | | 2.61 | 2.92 | | | 2.59 |
| 1919 | | | | | | | | | 2.66 | 3.06 | | | 2.67 |
| 1920 | | | | | | | | | 2.69 | 3.22 | | | 2.73 |
| 1921 | | | | | | | | | 2.70 | 3.28 | | | 2.78 |
| 1922 | | | | | | | | | 2.74 | 3.25 | | | 2.82 |
| 1923 | | | | | | | | | 2.79 | 3.24 | | | 2.88 |
| 1924 | | | | | | | | | 2.83 | 3.26 | 2.62 | | 2.94 |
| 1925 | | | | | | | | | 2.85 | 3.26 | 2.49 | | 2.99 |
| 1926 | | | | | | | | | 2.90 | 3.25 | 2.41 | | 3.02 |
| 1927 | | | | | | | | | 2.96 | 3.25 | 2.31 | | 3.06 |
| 1928 | 3.82 | | 3.87 | 2.13 | | | | | 3.00 | 3.29 | 2.24 | | 3.10 |
| 1929 | 3.73 | 2.18 | 3.82 | 2.11 | 2.57 | | | | 3.05 | 3.33 | 2.17 | | 3.14 |
| 1930 | 3.59 | 2.16 | 3.75 | 2.10 | 2.50 | | | | 3.07 | 3.36 | 2.10 | 3.63 | 3.18 |
| 1931 | 3.46 | 2.13 | 3.62 | 2.10 | 2.44 | | | | 3.11 | 3.35 | 2.06 | 3.62 | 3.21 |
| 1932 | 3.36 | 2.10 | 3.50 | 2.08 | 2.39 | | | | 3.14 | 3.29 | 2.05 | 3.56 | 3.22 |
| 1933 | 3.26 | 2.07 | 3.43 | 2.06 | 2.36 | | | | 3.14 | 3.21 | 2.04 | 3.52 | 3.21 |
| 1934 | 3.14 | 2.03 | 3.34 | 2.06 | 2.34 | | | | 3.11 | 3.14 | 2.02 | 3.48 | 3.19 |
| 1935 | 3.04 | 2.00 | 3.26 | 2.06 | 2.33 | | | | 3.07 | 3.07 | 2.02 | 3.45 | 3.14 |
| 1936 | 2.97 | 1.98 | 3.19 | 2.06 | 2.31 | | | | 3.01 | 2.99 | 2.02 | 3.41 | 3.07 |
| 1937 | 2.89 | 1.98 | 3.12 | 2.04 | 2.31 | | | | 2.95 | 2.91 | 2.05 | 3.35 | 2.99 |
| 1938 | 2.83 | 1.97 | 3.09 | 2.03 | 2.32 | | | 2.01 | 2.90 | 2.84 | 2.07 | 3.26 | 2.91 |
| 1939 | 2.79 | 1.97 | 3.10 | 2.02 | 2.36 | | | 1.98 | 2.87 | 2.77 | 2.01 | 3.16 | 2.83 |
| 1940 | 2.75 | 1.96 | 3.06 | 2.01 | 2.38 | | | 1.97 | 2.81 | 2.67 | 1.99 | 3.10 | 2.73 |
| 1941 | 2.65 | 1.94 | 2.95 | 1.99 | 2.37 | | | 1.98 | 2.70 | 2.56 | 2.03 | 3.04 | 2.62 |
| 1942 | 2.55 | 1.92 | 2.85 | 2.01 | 2.36 | | | 1.99 | 2.66 | 2.45 | 2.05 | 2.96 | 2.51 |
| 1943 | 2.48 | 1.89 | 2.80 | 2.00 | 2.40 | | | 1.99 | 2.58 | 2.33 | 2.04 | 2.89 | 2.41 |
| 1944 | 2.39 | 1.81 | 2.73 | 1.90 | 2.39 | | | 1.99 | 2.50 | 2.21 | 2.07 | 2.81 | 2.33 |
| 1945 | 2.34 | 1.78 | 2.64 | 1.83 | 2.33 | | | 1.98 | 2.49 | 2.14 | 2.04 | 2.73 | 2.26 |
| 1946 | 2.35 | 1.83 | 2.59 | 1.88 | 2.30 | | | 1.97 | 2.43 | 2.11 | 1.89 | 2.67 | 2.20 |
| 1947 | 2.33 | 1.89 | 2.57 | 1.94 | 2.31 | | | 1.97 | 2.38 | 2.08 | 1.89 | 2.66 | 2.14 |
| 1948 | 2.27 | 1.89 | 2.51 | 1.92 | 2.31 | 1.96 | | 1.98 | 2.39 | 2.02 | 1.97 | 2.63 | 2.10 |
| 1949 | 2.23 | 1.88 | 2.42 | 1.90 | 2.30 | 1.98 | 1.87 | 2.00 | 2.37 | 1.97 | 1.99 | 2.58 | 2.06 |
| 1950 | 2.17 | 1.86 | 2.35 | 1.90 | 2.28 | 1.97 | 1.87 | 2.01 | 2.35 | 1.93 | 2.02 | 2.55 | 2.03 |

*Appendix A (end)*

| Cohort | West Balkan Region | | | | | Baltic Region | | | Non-European Countries | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bosnia and Herzegovina | Croatia | Macedonia | Slovenia | Yugoslavia | Estonia | Latvia | Lithuania | Australia | Canada | Japan | New Zealand | United States |
| 1951 | 2.08 | 1.85 | 2.30 | 1.88 | 2.24 | 1.95 | 1.87 | 2.01 | 2.32 | 1.90 | 2.01 | 2.53 | 2.00 |
| 1952 | 2.03 | 1.86 | 2.29 | 1.88 | 2.23 | 1.95 | 1.86 | 2.01 | 2.30 | 1.88 | 2.01 | 2.50 | 1.99 |
| 1953 | 2.01 | 1.89 | 2.32 | 1.91 | 2.25 | 1.96 | 1.85 | 1.99 | 2.28 | 1.86 | 2.02 | 2.47 | 1.98 |
| 1954 | 1.97 | 1.90 | 2.32 | 1.94 | 2.27 | 1.98 | 1.84 | 1.96 | 2.27 | 1.86 | 2.00 | 2.46 | 1.98 |
| 1955 | 1.95 | 1.92 | 2.29 | 1.96 | 2.27 | 2.00 | 1.84 | 1.94 | 2.24 | 1.85 | 1.98 | 2.44 | 1.99 |
| 1956 | 1.92 | 1.94 | 2.27 | 1.96 | 2.26 | 2.02 | 1.85 | 1.94 | 2.23 | 1.85 | 1.97 | 2.42 | 1.99 |
| 1957 | 1.90 | 1.94 | 2.27 | 1.94 | 2.24 | 2.02 | 1.87 | 1.94 | 2.23 | 1.85 | 1.93 | 2.40 | 1.99 |
| 1958 | 1.90 | 1.96 | 2.28 | 1.92 | 2.27 | 2.02 | 1.91 | 1.93 | 2.20 | 1.85 | 1.89 | 2.39 | 2.00 |
| 1959 | 1.89 | 1.98 | 2.29 | 1.90 | 2.30 | 2.02 | 1.94 | 1.92 | 2.17 | 1.84 | 1.86 | 2.38 | 2.01 |
| 1960 | | 1.98 | 2.29 | 1.87 | 2.30 | 2.01 | 1.94 | 1.88 | 2.15 | 1.83 | 1.82 | 2.36 | 2.02 |
| 1961 | | 1.97 | 2.26 | 1.85 | 2.26 | 1.98 | 1.92 | 1.82 | 2.13 | 1.81 | 1.77 | 2.33 | 2.03 |
| 1962 | | 1.95 | 2.22 | 1.84 | 2.22 | 1.94 | 1.88 | 1.78 | 2.12 | 1.79 | 1.71 | 2.31 | 2.03 |
| 1963 | | 1.92 | 2.21 | 1.81 | 2.20 | 1.91 | 1.83 | 1.74 | 2.09 | 1.77 | | 2.29 | 2.04 |
| 1964 | | 1.90 | 2.21 | 1.79 | 2.19 | 1.90 | 1.79 | 1.72 | 2.06 | 1.74 | | 2.27 | 2.06 |
| 1965 | | 1.88 | 2.20 | 1.77 | 2.16 | 1.87 | 1.77 | 1.72 | 2.03 | 1.72 | | 2.25 | 2.07 |
| 1966 | | 1.84 | 2.19 | 1.75 | 2.13 | 1.84 | 1.77 | 1.71 | 2.00 | | | | 2.08 |
| 1967 | | 1.79 | 2.18 | 1.73 | 2.09 | 1.83 | 1.76 | 1.71 | | | | | |
| 1968 | | | 2.16 | 1.70 | 2.05 | 1.80 | 1.73 | 1.72 | | | | | |
| 1969 | | | 2.13 | 1.67 | | 1.76 | 1.69 | 1.72 | | | | | |
| 1970 | | | 2.10 | | | | 1.62 | 1.69 | | | | | |
| 1971 | | | | | | | | 1.64 | | | | | |

*Appendix B. Cohort mean age at childbearing, 35 low fertility countries, cohorts born in 1915-1970 (continued)*

| | Nordic Region | | | | Western Europe | | | | West central Europe | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cohort | Denmark | Finland | Norway | Sweden | Belgium | England and Wales | France | Netherlands | Austria | Former FRG | Former GDR | Switzerland |
| 1915 | | | | 29.2 | | 29.0 | 28.6 | | | | | 30.2 |
| 1916 | | | | 29.0 | | 28.9 | 28.6 | | | | | 30.0 |
| 1917 | | | | 28.8 | | 28.8 | 28.6 | | | | | 29.9 |
| 1918 | | 29.7 | | 28.6 | | 28.7 | 28.6 | | | | | 29.7 |
| 1919 | 27.8 | 29.6 | | 28.4 | | 28.7 | 28.5 | | | | | 29.6 |
| 1920 | 27.7 | 29.4 | | 28.2 | | 28.6 | 28.3 | | | | | 29.5 |
| 1921 | 27.6 | 29.3 | | 28.1 | | 28.5 | 28.3 | | | | | 29.4 |
| 1922 | 27.5 | 29.1 | | 28.0 | | 28.4 | 28.2 | | | | | 29.3 |
| 1923 | 27.4 | 28.9 | 29.2 | 27.9 | | 28.4 | 28.1 | | | | | 29.2 |
| 1924 | 27.3 | 28.6 | 29.1 | 27.8 | | 28.3 | 27.9 | | | | | 29.2 |
| 1925 | 27.2 | 28.3 | 29.0 | 27.7 | | 28.3 | 27.8 | | | | | 29.1 |
| 1926 | 27.1 | 28.1 | 28.9 | 27.6 | | 28.2 | 27.7 | 29.8 | | | | 29.0 |
| 1927 | 27.1 | 28.0 | 28.7 | 27.5 | | 28.2 | 27.6 | 29.7 | | | | 28.9 |
| 1928 | 27.0 | 27.8 | 28.5 | 27.4 | | 28.1 | 27.5 | 29.5 | | 28.1 | | 28.9 |
| 1929 | 26.9 | 27.6 | 28.4 | 27.3 | | 28.0 | 27.5 | 29.4 | 28.1 | 28.0 | | 28.8 |
| 1930 | 26.8 | 27.5 | 28.2 | 27.2 | 28.0 | 27.9 | 27.5 | 29.2 | 28.0 | 27.9 | | 28.7 |
| 1931 | 26.7 | 27.4 | 28.0 | 27.1 | 27.9 | 27.8 | 27.4 | 29.0 | 27.9 | 27.8 | 26.3 | 28.6 |
| 1932 | 26.5 | 27.2 | 27.7 | 27.0 | 27.7 | 27.7 | 27.4 | 28.8 | 27.7 | 27.7 | 26.2 | 28.5 |
| 1933 | 26.4 | 27.0 | 27.5 | 26.9 | 27.6 | 27.5 | 27.3 | 28.5 | 27.5 | 27.6 | 26.1 | 28.3 |
| 1934 | 26.3 | 26.8 | 27.2 | 26.8 | 27.4 | 27.3 | 27.2 | 28.3 | 27.3 | 27.4 | 26.0 | 28.1 |
| 1935 | 26.2 | 26.7 | 27.0 | 26.7 | 27.2 | 27.1 | 27.1 | 28.1 | 27.1 | 27.2 | 25.9 | 27.9 |
| 1936 | 26.1 | 26.5 | 26.8 | 26.6 | 27.0 | 26.9 | 27.0 | 27.9 | 26.9 | 27.0 | 25.7 | 27.7 |
| 1937 | 26.0 | 26.5 | 26.6 | 26.5 | 26.8 | 26.7 | 26.8 | 27.7 | 26.7 | 26.8 | 25.5 | 27.5 |
| 1938 | 25.9 | 26.4 | 26.5 | 26.5 | 26.7 | 26.5 | 26.7 | 27.5 | 26.4 | 26.7 | 25.3 | 27.3 |
| 1939 | 25.8 | 26.4 | 26.3 | 26.4 | 26.6 | 26.3 | 26.6 | 27.3 | 26.2 | 26.4 | 25.1 | 27.1 |
| 1940 | 25.7 | 26.4 | 26.2 | 26.4 | 26.4 | 26.2 | 26.4 | 27.1 | 26.0 | 26.2 | 24.9 | 26.9 |
| 1941 | 25.7 | 26.4 | 26.1 | 26.4 | 26.2 | 26.0 | 26.3 | 26.9 | 25.9 | 26.1 | 24.7 | 26.8 |
| 1942 | 25.6 | 26.5 | 26.0 | 26.4 | 26.1 | 26.0 | 26.1 | 26.7 | 25.7 | 26.0 | 24.5 | 26.7 |
| 1943 | 25.6 | 26.5 | 26.0 | 26.4 | 26.0 | 25.9 | 26.0 | 26.6 | 25.5 | 25.8 | 24.4 | 26.7 |
| 1944 | 25.6 | 26.6 | 25.9 | 26.4 | 25.9 | 25.9 | 26.0 | 26.5 | 25.4 | 25.7 | 24.2 | 26.7 |
| 1945 | 25.6 | 26.7 | 25.9 | 26.4 | 25.9 | 25.9 | 26.0 | 26.5 | 25.2 | 25.6 | 24.1 | 26.8 |
| 1946 | 25.7 | 26.9 | 26.0 | 26.5 | 25.9 | 26.0 | 26.0 | 26.5 | 25.1 | 25.6 | 24.1 | 26.8 |
| 1947 | 25.8 | 27.0 | 26.0 | 26.6 | 25.9 | 26.1 | 26.1 | 26.6 | 25.1 | 25.7 | 24.1 | 26.9 |
| 1948 | 25.9 | 27.2 | 26.0 | 26.8 | 26.0 | 26.3 | 26.3 | 26.8 | 25.2 | 25.9 | 24.2 | 27.0 |
| 1949 | 26.0 | 27.3 | 26.1 | 27.0 | 26.1 | 26.4 | 26.4 | 27.0 | 25.3 | 26.1 | 24.3 | 27.1 |
| 1950 | 26.2 | 27.4 | 26.2 | 27.2 | 26.2 | 26.5 | 26.5 | 27.1 | 25.4 | 26.2 | 24.4 | 27.2 |

*Appendix B (continued)*

| Cohort | Nordic Region | | | | Western Europe | | | | West central Europe | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Denmark | Finland | Norway | Sweden | Belgium | England and Wales | France | Netherlands | Austria | Former FRG | Former GDR | Switzerland |
| 1951 | 26.4 | 27.5 | 26.3 | 27.3 | 26.3 | 26.6 | 26.6 | 27.3 | 25.5 | 26.4 | 24.5 | 27.4 |
| 1952 | 26.6 | 27.6 | 26.5 | 27.5 | 26.3 | 26.8 | 26.7 | 27.5 | 25.6 | 26.6 | 24.6 | 27.6 |
| 1953 | 26.8 | 27.8 | 26.7 | 27.7 | 26.5 | 26.9 | 26.9 | 27.8 | 25.7 | 26.8 | 24.6 | 27.8 |
| 1954 | 27.1 | 27.9 | 26.9 | 27.9 | 26.6 | 27.1 | 27.0 | 28.0 | 25.7 | 26.9 | 24.6 | 27.9 |
| 1955 | 27.3 | 28.0 | 27.1 | 28.0 | 26.7 | 27.2 | 27.0 | 28.2 | 25.9 | 27.1 | 24.6 | 28.1 |
| 1956 | 27.5 | 28.1 | 27.3 | 28.2 | 26.8 | 27.3 | 27.1 | 28.5 | 26.0 | 27.3 | 24.5 | 28.3 |
| 1957 | 27.8 | 28.2 | 27.6 | 28.3 | 26.9 | 27.5 | 27.3 | 28.8 | 26.2 | 27.5 | 24.5 | 28.5 |
| 1958 | 28.0 | 28.4 | 27.8 | 28.5 | 27.0 | 27.6 | 27.4 | 29.0 | 26.3 | 27.6 | 24.4 | 28.6 |
| 1959 | 28.3 | 28.5 | 27.9 | 28.6 | 27.2 | 27.7 | 27.5 | 29.1 | 26.5 | 27.8 | 24.4 | 28.6 |
| 1960 | 28.5 | 28.7 | 28.1 | 28.6 | 27.4 | 27.8 | 27.7 | 29.2 | 26.6 | 27.9 | 24.3 | 28.7 |
| 1961 | 28.7 | 28.8 | 28.2 | 28.7 | 27.5 | 27.9 | 27.9 | 29.4 | 26.7 | 28.1 | 24.3 | 28.8 |
| 1962 | 28.8 | 29.0 | 28.3 | 28.7 | 27.7 | 28.0 | 28.0 | 29.5 | 26.8 | 28.3 | 24.4 | 29.0 |
| 1963 | 29.0 | 29.1 | 28.4 | 28.7 | 27.8 | 28.1 | 28.2 | 29.7 | 27.0 | 28.4 | 24.5 | 29.1 |
| 1964 | 29.1 | 29.2 | 28.5 | 28.7 | 28.0 | 28.2 | 28.4 | 29.9 | 27.2 | 28.6 | 24.6 | 29.3 |
| 1965 | 29.1 | 29.2 | 28.5 | 28.8 | | 28.2 | 28.6 | 30.0 | 27.3 | 28.7 | 24.9 | 29.4 |
| 1966 | 29.2 | 29.3 | 28.6 | 28.8 | | 28.2 | 27.8 | 30.1 | 27.5 | | 25.1 | 29.5 |
| 1967 | 29.3 | 29.3 | 28.6 | 28.9 | | | | 30.2 | 27.6 | | 25.4 | 29.6 |
| 1968 | | | 28.7 | | | | | | 27.7 | | | |
| 1969 | | | | | | | | | | | | |
| 1970 | | | | | | | | | | | | |

*Appendix B (continued)*

| Cohort | Southern Europe | | | | East central Europe | | | Eastern Europe | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Greece | Italy | Portugal | Spain | Czech Republic | Hungary | Slovak Republic | Bulgaria | Romania | Russia |
| 1915 | | | | | | | | | | |
| 1916 | | | | | | | | | | |
| 1917 | | | | | | | | | | |
| 1918 | | | | | | | | | | |
| 1919 | | | 30.3 | | | | | | | |
| 1920 | | | 30.1 | | | | | | | |
| 1921 | | | 30.1 | | | | | | | |
| 1922 | | | 30.1 | | | | | | | |
| 1923 | | | 30.0 | | | | | | | |
| 1924 | | | 29.9 | | | | 27.9 | | | |
| 1925 | | | 29.8 | | 26.1 | | 27.7 | | | |
| 1926 | | | 29.7 | | 26.0 | 26.0 | 27.4 | 25.4 | | |
| 1927 | | | 29.7 | | 25.8 | 25.9 | 27.1 | 25.4 | | |
| 1928 | | | 29.6 | | 25.7 | 25.7 | 26.9 | 25.3 | | |
| 1929 | | 29.2 | 29.5 | | 25.5 | 25.6 | 26.7 | 25.3 | | |
| 1930 | | 29.2 | 29.4 | 30.2 | 25.4 | 25.5 | 26.5 | 25.2 | | |
| 1931 | | 29.1 | 29.4 | 30.2 | 25.3 | 25.4 | 26.3 | 25.1 | | |
| 1932 | | 29.0 | 29.3 | 30.1 | 25.2 | 25.3 | 26.2 | 25.0 | | |
| 1933 | | 28.9 | 29.2 | 30.0 | 25.2 | 25.2 | 26.1 | 25.0 | | |
| 1934 | | 28.8 | 29.0 | 30.0 | 25.1 | 25.3 | 26.0 | 24.9 | | |
| 1935 | | 28.6 | 28.8 | 29.9 | 25.1 | 25.3 | 26.0 | 24.9 | 26.8 | |
| 1936 | | 28.4 | 28.6 | 29.7 | 25.1 | 25.3 | 25.9 | 24.8 | 26.8 | |
| 1937 | 28.1 | 28.3 | 28.5 | 29.5 | 25.1 | 25.3 | 25.8 | 24.7 | 26.8 | 26.8 |
| 1938 | 28.0 | 28.1 | 28.4 | 29.3 | 25.1 | 25.3 | 25.7 | 24.7 | 26.8 | 26.7 |
| 1939 | 28.0 | 27.9 | 28.2 | 29.1 | 25.0 | 25.3 | 25.6 | 24.6 | 26.7 | 26.7 |
| 1940 | 27.9 | 27.8 | 27.9 | 29.0 | 25.0 | 25.4 | 25.6 | 24.6 | 26.6 | 26.6 |
| 1941 | 27.6 | 27.6 | 27.7 | 28.7 | 25.1 | 25.4 | 25.5 | 24.5 | 26.4 | 26.5 |
| 1942 | 27.4 | 27.5 | 27.5 | 28.6 | 25.1 | 25.4 | 25.5 | 24.4 | 26.1 | 26.4 |
| 1943 | 27.3 | 27.3 | 27.4 | 28.5 | 25.2 | 25.4 | 25.5 | 24.3 | 26.0 | 26.3 |
| 1944 | 27.1 | 27.1 | 27.3 | 28.4 | 25.2 | 25.4 | 25.5 | 24.3 | 25.7 | 26.1 |
| 1945 | 27.0 | 27.0 | 27.1 | 28.2 | 25.2 | 25.3 | 25.5 | 24.3 | 25.5 | 26.1 |
| 1946 | 26.9 | 26.9 | 27.0 | 28.0 | 25.2 | 25.3 | 25.5 | 24.3 | 25.3 | 26.1 |
| 1947 | 26.7 | 26.9 | 26.9 | 27.9 | 25.1 | 25.2 | 25.5 | 24.3 | 25.2 | 26.2 |
| 1948 | 26.5 | 26.9 | 26.8 | 27.8 | 25.1 | 25.1 | 25.5 | 24.2 | 25.1 | 26.2 |
| 1949 | 26.4 | 26.9 | 26.8 | 27.6 | 24.9 | 25.0 | 25.4 | 24.2 | 25.0 | 26.2 |
| 1950 | 26.3 | 27.0 | 26.8 | 27.4 | 24.9 | 25.0 | 25.4 | 24.1 | 25.0 | 26.2 |

*Appendix B (continued)*

| Cohort | Southern Europe | | | | East central Europe | | | Eastern Europe | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Greece | Italy | Portugal | Spain | Czech Republic | Hungary | Slovak Republic | Bulgaria | Romania | Russia |
| 1951 | 26.2 | 27.0 | 26.7 | 27.3 | 24.8 | 25.0 | 25.4 | 24.1 | 25.2 | 26.2 |
| 1952 | 26.1 | 26.9 | 26.6 | 27.3 | 24.7 | 25.0 | 25.3 | 24.1 | 25.2 | 26.1 |
| 1953 | 26.0 | 27.0 | 26.5 | 27.2 | 24.6 | 25.0 | 25.3 | 24.0 | 25.1 | 26.0 |
| 1954 | 25.9 | 27.0 | 26.3 | 27.1 | 24.6 | 25.0 | 25.2 | 24.0 | 25.1 | 25.9 |
| 1955 | 25.9 | 27.1 | 26.2 | 27.1 | 24.5 | 24.9 | 25.2 | 23.9 | 24.9 | 25.8 |
| 1956 | 25.8 | 27.2 | 26.1 | 27.2 | 24.5 | 24.9 | 25.1 | 23.9 | 24.8 | 25.7 |
| 1957 | 25.8 | 27.4 | 26.1 | 27.4 | 24.4 | 25.0 | 25.1 | 23.8 | 24.8 | 25.5 |
| 1958 | 25.8 | 27.6 | 26.2 | 27.5 | 24.4 | 25.0 | 25.0 | 23.7 | 24.7 | 25.4 |
| 1959 | 25.9 | 27.8 | 26.3 | 27.7 | 24.5 | 25.0 | 25.0 | 23.7 | 24.6 | 25.2 |
| 1960 | 26.0 | 28.0 | 26.6 | 27.9 | 24.5 | 25.1 | 25.0 | 23.7 | 24.5 | 25.0 |
| 1961 | 26.1 | 28.2 | 26.8 | 28.1 | 24.6 | 25.2 | 25.0 | 23.7 | 24.4 | 24.9 |
| 1962 | 26.2 | 28.4 | 27.0 | 28.4 | 24.6 | 25.2 | 25.0 | 23.6 | 24.3 | 24.8 |
| 1963 | 26.4 | 28.6 | 27.1 | 28.7 | 24.7 | 25.3 | 24.9 | 23.6 | 24.2 | 24.7 |
| 1964 | 26.6 | 28.9 | 27.3 | 28.9 | 24.7 | 25.4 | 24.9 | 23.5 | 24.1 | 24.7 |
| 1965 | 26.8 | 29.1 | 27.4 | 29.0 | 24.8 | 25.5 | 24.9 | 23.5 | 24.2 | 24.6 |
| 1966 | 27.1 | | 27.6 | | 24.8 | 25.6 | 25.0 | 23.6 | 24.3 | 24.5 |
| 1967 | | | 27.7 | | 24.9 | 25.7 | 25.0 | 23.6 | 24.4 | 24.5 |
| 1968 | | | 27.9 | | 25.0 | 25.8 | 24.9 | 23.6 | 24.6 | 24.5 |
| 1969 | | | | | 25.1 | 25.9 | 25.0 | 23.8 | 24.8 | 24.5 |
| 1970 | | | | | 25.2 | 26.0 | 25.1 | 24.0 | 24.9 | |
| 1971 | | | | | 25.4 | | 25.2 | 24.1 | 25.0 | |
| 1972 | | | | | | | | 24.2 | | |

*Appendix B (continued)*

| Cohort | West Balkan Region | | | | | Baltic Region | | | Non-European Countries | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bosnia and Herzegovina | Croatia | Macedonia | Slovenia | Yugoslavia | Estonia | Latvia | Lithuania | Australia | Canada | Japan | New Zealand | United States |
| 1915 | | | | | | | | | 29.1 | 29.6 | | | 27.9 |
| 1916 | | | | | | | | | 29.1 | 29.5 | | | 27.9 |
| 1917 | | | | | | | | | 29.0 | 29.4 | | | 27.8 |
| 1918 | | | | | | | | | 28.9 | 29.4 | | | 27.8 |
| 1919 | | | | | | | | | 28.8 | 29.3 | | | 27.7 |
| 1920 | | | | | | | | | 28.7 | 29.2 | | | 27.7 |
| 1921 | | | | | | | | | 28.6 | 29.0 | | | 27.6 |
| 1922 | | | | | | | | | 28.5 | 28.9 | | | 27.5 |
| 1923 | | | | | | | | | 28.5 | 28.8 | | | 27.4 |
| 1924 | | | | | | | | | 28.4 | 28.6 | 27.0 | | 27.3 |
| 1925 | | | | | | | | | 28.2 | 28.4 | 26.8 | | 27.2 |
| 1926 | | | | | | | | | 28.1 | 28.2 | 26.7 | | 27.0 |
| 1927 | | | | | | | | | 28.0 | 28.0 | 26.7 | | 26.8 |
| 1928 | 28.0 | | 27.8 | 27.7 | | | | | 27.8 | 27.8 | 26.8 | | 26.7 |
| 1929 | 27.9 | 26.4 | 27.7 | 27.7 | 26.2 | | | | 27.7 | 27.6 | 26.9 | | 26.5 |
| 1930 | 27.9 | 26.4 | 27.6 | 27.6 | 26.2 | | | | 27.5 | 27.4 | 27.1 | 27.6 | 26.3 |
| 1931 | 27.7 | 26.3 | 27.5 | 27.6 | 26.3 | | | | 27.3 | 27.1 | 27.2 | 27.4 | 26.0 |
| 1932 | 27.6 | 26.3 | 27.5 | 27.5 | 26.3 | | | | 27.1 | 26.8 | 27.4 | 27.2 | 25.8 |
| 1933 | 27.4 | 26.2 | 27.4 | 27.5 | 26.3 | | | | 27.0 | 26.6 | 27.5 | 26.9 | 25.6 |
| 1934 | 27.3 | 26.2 | 27.4 | 27.4 | 26.4 | | | | 26.8 | 26.4 | 27.5 | 26.7 | 25.4 |
| 1935 | 27.2 | 26.1 | 27.3 | 27.3 | 26.4 | | | | 26.6 | 26.1 | 27.6 | 26.5 | 25.2 |
| 1936 | 27.1 | 26.1 | 27.2 | 27.2 | 26.4 | | | | 26.5 | 25.9 | 27.6 | 26.3 | 25.1 |
| 1937 | 27.0 | 26.0 | 27.0 | 27.0 | 26.3 | | | | 26.3 | 25.7 | 27.6 | 26.2 | 24.9 |
| 1938 | 26.9 | 26.0 | 26.9 | 26.9 | 26.3 | | | 28.0 | 26.2 | 25.5 | 27.6 | 26.0 | 24.8 |
| 1939 | 26.7 | 25.9 | 26.8 | 26.8 | 26.2 | | | 28.0 | 26.2 | 25.4 | 27.6 | 25.9 | 24.7 |
| 1940 | 26.6 | 25.8 | 26.7 | 26.6 | 26.2 | | | 27.9 | 26.1 | 25.3 | 27.6 | 25.8 | 24.7 |
| 1941 | 26.4 | 25.7 | 26.6 | 26.4 | 26.1 | | | 27.7 | 26.1 | 25.3 | 27.5 | 25.8 | 24.7 |
| 1942 | 26.3 | 25.6 | 26.5 | 26.2 | 26.0 | | | 27.6 | 26.1 | 25.3 | 27.5 | 25.7 | 24.7 |
| 1943 | 26.2 | 25.6 | 26.3 | 25.9 | 26.0 | | | 27.5 | 26.1 | 25.4 | 27.4 | 25.6 | 24.8 |
| 1944 | 26.0 | 25.5 | 26.1 | 25.8 | 26.0 | | | 27.4 | 26.2 | 25.6 | 27.4 | 25.5 | 24.9 |
| 1945 | 25.9 | 25.6 | 26.1 | 25.8 | 26.0 | | | 27.3 | 26.1 | 25.7 | 27.4 | 25.5 | 25.0 |
| 1946 | 25.8 | 25.6 | 26.0 | 25.8 | 25.9 | | | 27.2 | 26.1 | 25.8 | 27.4 | 25.5 | 25.2 |
| 1947 | 25.7 | 25.5 | 26.0 | 25.6 | 25.8 | | | 27.0 | 26.2 | 25.9 | 27.5 | 25.5 | 25.4 |
| 1948 | 25.6 | 25.4 | 25.9 | 25.4 | 25.7 | 26.2 | 26.4 | 26.9 | 26.2 | 26.1 | 27.5 | 25.6 | 25.5 |
| 1949 | 25.6 | 25.4 | 25.9 | 25.5 | 25.7 | 26.2 | 26.4 | 26.7 | 26.3 | 26.4 | 27.6 | 25.7 | 25.7 |
| 1950 | 25.6 | 25.4 | 25.9 | 25.4 | 25.7 | 26.2 | 26.4 | 26.6 | 26.4 | 26.5 | 27.6 | 25.8 | 25.9 |

*Appendix B (end)*

| Cohort | West Balkan Region | | | | | Baltic Region | | | Non European Countries | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bosnia and Herzegovina | Croatia | Macedonia | Slovenia | Yugoslavia | Estonia | Latvia | Lithuania | Australia | Canada | Japan | New Zealand | United States |
| 1951 | 25.6 | 25.4 | 25.9 | 25.3 | 25.7 | 26.2 | 26.4 | 26.5 | 26.6 | 26.7 | 27.7 | 25.9 | 26.1 |
| 1952 | 25.7 | 25.4 | 25.8 | 25.2 | 25.8 | 26.2 | 26.4 | 26.4 | 26.8 | 26.8 | 27.8 | 26.1 | 26.3 |
| 1953 | 25.7 | 25.4 | 25.8 | 25.0 | 25.8 | 26.1 | 26.4 | 26.4 | 26.9 | 26.9 | 27.9 | 26.4 | 26.4 |
| 1954 | 25.7 | 25.4 | 25.7 | 24.9 | 25.8 | 26.0 | 26.3 | 26.4 | 27.1 | 27.0 | 28.1 | 26.6 | 26.5 |
| 1955 | 25.7 | 25.4 | 25.6 | 24.8 | 25.9 | 25.8 | 26.3 | 26.4 | 27.3 | 27.1 | 28.2 | 26.8 | 26.6 |
| 1956 | 25.7 | 25.4 | 25.6 | 24.7 | 25.9 | 25.7 | 26.2 | 26.3 | 27.5 | 27.3 | 28.3 | 27.0 | 26.6 |
| 1957 | 25.8 | 25.5 | 25.5 | 24.7 | 25.9 | 25.7 | 26.1 | 26.2 | 27.7 | 27.4 | 28.4 | 27.3 | 26.7 |
| 1958 | 25.8 | 25.6 | 25.5 | 24.7 | 26.0 | 25.6 | 25.9 | 26.1 | 27.9 | 27.5 | 28.5 | 27.5 | 26.8 |
| 1959 | 25.8 | 25.7 | 25.5 | 24.8 | 26.0 | 25.5 | 25.7 | 26.0 | 28.1 | 27.7 | 28.6 | 27.7 | 26.9 |
| 1960 | | 25.8 | 25.5 | 24.9 | 26.1 | 25.3 | 25.5 | 26.0 | 28.2 | 27.8 | 28.7 | 27.8 | 26.9 |
| 1961 | | 25.8 | 25.5 | 25.1 | 26.1 | 25.3 | 25.4 | 26.0 | 28.3 | 27.9 | 28.8 | 28.0 | 27.0 |
| 1962 | | 25.9 | 25.5 | 25.3 | 26.2 | 25.3 | 25.4 | 26.0 | 28.5 | 28.0 | 28.8 | 28.1 | 27.1 |
| 1963 | | 26.1 | 25.6 | 25.5 | 26.3 | 25.3 | 25.3 | 26.0 | 28.6 | 28.1 | | 28.2 | 27.1 |
| 1964 | | 26.2 | 25.6 | 25.6 | 26.3 | 25.3 | 25.3 | 26.0 | 28.7 | 28.2 | | 28.3 | 27.2 |
| 1965 | | 26.3 | 25.6 | 25.8 | 26.3 | 25.3 | 25.3 | 25.9 | 28.8 | 28.2 | | 28.4 | 27.2 |
| 1966 | | 26.3 | 25.7 | 26.0 | 26.2 | 25.4 | 25.3 | 25.9 | 28.9 | | | | 27.2 |
| 1967 | | 26.4 | 25.7 | 26.2 | 26.3 | 25.4 | 25.3 | 25.8 | | | | | |
| 1968 | | | 25.7 | 26.4 | 26.3 | 25.6 | 25.4 | 25.7 | | | | | |
| 1969 | | | 25.7 | 26.6 | | 25.8 | 25.5 | 25.7 | | | | | |
| 1970 | | | 25.7 | | | | 25.7 | 25.6 | | | | | |
| 1971 | | | | | | | | 25.6 | | | | | |

*Appendix C. Total period fertility rate, 35 low fertility countries, 1945-2000 (continued)*

| | Nordic Region | | | | Western Europe | | | | West central Europe | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cohort | Denmark | Finland | Norway | Sweden | Belgium | England and Wales | France | Netherlands | Austria | Former FRG | Former GDR | Switzerland |
| 1945 | 2.97 | 3.08 | 2.39 | 2.59 | 2.21 | 2.04 | 2.28 | 2.96 | 1.85 | | | 2.60 |
| 1946 | 3.01 | 3.40 | 2.76 | 2.54 | 2.57 | 2.47 | 2.99 | 3.99 | 2.04 | 1.89 | 1.30 | 2.62 |
| 1947 | 2.89 | 3.46 | 2.66 | 2.48 | 2.50 | 2.68 | 3.02 | 3.72 | 2.39 | 2.01 | 1.75 | 2.56 |
| 1948 | 2.70 | 3.45 | 2.60 | 2.46 | 2.48 | 2.39 | 3.01 | 3.40 | 2.34 | 2.07 | 1.76 | 2.54 |
| 1949 | 2.57 | 3.32 | 2.51 | 2.37 | 2.44 | 2.26 | 2.99 | 3.21 | 2.17 | 2.14 | 2.03 | 2.44 |
| 1950 | 2.57 | 3.15 | 2.51 | 2.28 | 2.39 | 2.18 | 2.93 | 3.10 | 2.10 | 2.10 | 2.31 | 2.40 |
| 1951 | 2.50 | 3.01 | 2.47 | 2.20 | 2.32 | 2.14 | 2.79 | 3.05 | 2.02 | 2.06 | 2.40 | 2.30 |
| 1952 | 2.53 | 3.06 | 2.59 | 2.23 | 2.36 | 2.16 | 2.77 | 3.09 | 2.06 | 2.08 | 2.41 | 2.32 |
| 1953 | 2.60 | 2.95 | 2.66 | 2.26 | 2.34 | 2.22 | 2.69 | 3.03 | 2.09 | 2.07 | 2.38 | 2.29 |
| 1954 | 2.55 | 2.93 | 2.70 | 2.18 | 2.39 | 2.21 | 2.70 | 3.03 | 2.16 | 2.12 | 2.36 | 2.28 |
| 1955 | 2.58 | 2.94 | 2.79 | 2.25 | 2.40 | 2.22 | 2.67 | 3.04 | 2.29 | 2.11 | 2.37 | 2.30 |
| 1956 | 2.60 | 2.92 | 2.86 | 2.29 | 2.42 | 2.35 | 2.66 | 3.06 | 2.49 | 2.19 | 2.30 | 2.35 |
| 1957 | 2.57 | 2.87 | 2.87 | 2.29 | 2.47 | 2.45 | 2.68 | 3.08 | 2.57 | 2.28 | 2.24 | 2.41 |
| 1958 | 2.55 | 2.68 | 2.90 | 2.26 | 2.52 | 2.52 | 2.67 | 3.11 | 2.60 | 2.29 | 2.22 | 2.40 |
| 1959 | 2.52 | 2.76 | 2.93 | 2.25 | 2.59 | 2.56 | 2.74 | 3.17 | 2.69 | 2.37 | 2.36 | 2.42 |
| 1960 | 2.57 | 2.72 | 2.91 | 2.20 | 2.56 | 2.68 | 2.73 | 3.12 | 2.70 | 2.37 | 2.35 | 2.44 |
| 1961 | 2.55 | 2.72 | 2.95 | 2.23 | 2.64 | 2.77 | 2.81 | 3.22 | 2.79 | 2.45 | 2.42 | 2.53 |
| 1962 | 2.55 | 2.69 | 2.92 | 2.26 | 2.60 | 2.85 | 2.79 | 3.18 | 2.80 | 2.44 | 2.42 | 2.60 |
| 1963 | 2.64 | 2.69 | 2.93 | 2.34 | 2.69 | 2.88 | 2.89 | 3.19 | 2.82 | 2.52 | 2.47 | 2.67 |
| 1964 | 2.60 | 2.60 | 2.98 | 2.48 | 2.72 | 2.93 | 2.91 | 3.17 | 2.80 | 2.55 | 2.48 | 2.68 |
| 1965 | 2.61 | 2.48 | 2.95 | 2.42 | 2.62 | 2.85 | 2.84 | 3.04 | 2.71 | 2.51 | 2.49 | 2.61 |
| 1966 | 2.61 | 2.41 | 2.90 | 2.36 | 2.52 | 2.75 | 2.79 | 2.90 | 2.66 | 2.54 | 2.43 | 2.52 |
| 1967 | 2.35 | 2.32 | 2.81 | 2.27 | 2.41 | 2.65 | 2.66 | 2.81 | 2.62 | 2.49 | 2.34 | 2.41 |
| 1968 | 2.12 | 2.14 | 2.75 | 2.07 | 2.31 | 2.57 | 2.58 | 2.72 | 2.59 | 2.39 | 2.30 | 2.30 |
| 1969 | 2.00 | 1.93 | 2.70 | 1.93 | 2.28 | 2.47 | 2.53 | 2.75 | 2.49 | 2.21 | 2.24 | 2.19 |
| 1970 | 1.99 | 1.83 | 2.50 | 1.92 | 2.25 | 2.40 | 2.47 | 2.57 | 2.29 | 1.99 | 2.19 | 2.10 |
| 1971 | 2.08 | 1.68 | 2.49 | 1.96 | 2.21 | 2.37 | 2.49 | 2.36 | 2.20 | 1.92 | 2.13 | 2.04 |
| 1972 | 2.03 | 1.58 | 2.38 | 1.91 | 2.09 | 2.17 | 2.41 | 2.15 | 2.09 | 1.72 | 1.79 | 1.91 |
| 1973 | 1.92 | 1.49 | 2.23 | 1.86 | 1.95 | 2.00 | 2.30 | 1.90 | 1.94 | 1.54 | 1.58 | 1.81 |
| 1974 | 1.90 | 1.61 | 2.13 | 1.87 | 1.83 | 1.89 | 2.11 | 1.77 | 1.91 | 1.51 | 1.54 | 1.73 |
| 1975 | 1.92 | 1.68 | 1.98 | 1.77 | 1.74 | 1.77 | 1.93 | 1.66 | 1.83 | 1.45 | 1.54 | 1.61 |
| 1976 | 1.75 | 1.70 | 1.86 | 1.68 | 1.73 | 1.71 | 1.83 | 1.63 | 1.69 | 1.46 | 1.64 | 1.55 |
| 1977 | 1.66 | 1.68 | 1.75 | 1.64 | 1.71 | 1.66 | 1.86 | 1.58 | 1.63 | 1.40 | 1.85 | 1.53 |
| 1978 | 1.67 | 1.64 | 1.77 | 1.60 | 1.69 | 1.73 | 1.82 | 1.58 | 1.61 | 1.38 | 1.90 | 1.51 |
| 1979 | 1.60 | 1.64 | 1.75 | 1.66 | 1.69 | 1.84 | 1.86 | 1.56 | 1.60 | 1.38 | 1.90 | 1.52 |
| 1980 | 1.55 | 1.63 | 1.72 | 1.68 | 1.68 | 1.88 | 1.95 | 1.60 | 1.65 | 1.45 | 1.94 | 1.55 |

*AppendixC (continued)*

| Cohort | Nordic Region | | | | Western Europe | | | | West central Europe | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Denmark | Finland | Norway | Sweden | Belgium | England and Wales | France | Netherlands | Austria | Former FRG | Former GDR | Switzerland |
| 1981 | 1.44 | 1.64 | 1.70 | 1.63 | 1.66 | 1.80 | 1.95 | 1.56 | 1.67 | 1.43 | 1.86 | 1.55 |
| 1982 | 1.43 | 1.72 | 1.71 | 1.62 | 1.61 | 1.76 | 1.91 | 1.50 | 1.66 | 1.41 | 1.86 | 1.56 |
| 1983 | 1.38 | 1.74 | 1.66 | 1.61 | 1.56 | 1.75 | 1.78 | 1.47 | 1.56 | 1.33 | 1.79 | 1.52 |
| 1984 | 1.40 | 1.69 | 1.66 | 1.66 | 1.54 | 1.75 | 1.80 | 1.49 | 1.52 | 1.29 | 1.74 | 1.53 |
| 1985 | 1.45 | 1.64 | 1.68 | 1.74 | 1.51 | 1.78 | 1.81 | 1.51 | 1.47 | 1.28 | 1.74 | 1.52 |
| 1986 | 1.48 | 1.60 | 1.71 | 1.80 | 1.54 | 1.77 | 1.83 | 1.55 | 1.45 | 1.34 | 1.70 | 1.53 |
| 1987 | 1.50 | 1.59 | 1.75 | 1.84 | 1.54 | 1.81 | 1.80 | 1.56 | 1.43 | 1.36 | 1.74 | 1.52 |
| 1988 | 1.56 | 1.69 | 1.84 | 1.96 | 1.57 | 1.82 | 1.81 | 1.55 | 1.45 | 1.42 | 1.67 | 1.57 |
| 1989 | 1.62 | 1.71 | 1.89 | 2.01 | 1.58 | 1.80 | 1.79 | 1.55 | 1.45 | 1.39 | 1.58 | 1.56 |
| 1990 | 1.67 | 1.78 | 1.93 | 2.13 | 1.62 | 1.84 | 1.78 | 1.62 | 1.46 | 1.45 | 1.50 | 1.58 |
| 1991 | 1.68 | 1.79 | 1.92 | 2.11 | 1.66 | 1.82 | 1.77 | 1.61 | 1.51 | 1.42 | 0.98 | 1.58 |
| 1992 | 1.76 | 1.85 | 1.88 | 2.09 | 1.65 | 1.80 | 1.73 | 1.59 | 1.51 | 1.40 | 0.83 | 1.58 |
| 1993 | 1.75 | 1.81 | 1.86 | 1.99 | 1.61 | 1.76 | 1.66 | 1.57 | 1.50 | 1.39 | 0.77 | 1.51 |
| 1994 | 1.81 | 1.85 | 1.86 | 1.88 | 1.56 | 1.75 | 1.66 | 1.57 | 1.47 | 1.35 | 0.77 | 1.49 |
| 1995 | 1.80 | 1.81 | 1.87 | 1.73 | 1.55 | 1.71 | 1.71 | 1.53 | 1.42 | 1.34 | 0.84 | 1.48 |
| 1996 | 1.75 | 1.76 | 1.89 | 1.60 | 1.59 | 1.73 | 1.73 | 1.53 | 1.45 | 1.40 | 0.95 | 1.50 |
| 1997 | 1.75 | 1.75 | 1.86 | 1.52 | 1.60 | 1.73 | 1.73 | 1.56 | 1.39 | 1.44 | 1.04 | 1.48 |
| 1998 | 1.72 | 1.70 | 1.81 | 1.50 | 1.59 | 1.72 | 1.76 | 1.63 | 1.37 | 1.41 | 1.09 | 1.47 |
| 1999 | 1.73 | 1.74 | 1.84 | 1.50 | 1.61 | 1.70 | 1.79 | 1.65 | 1.34 | 1.41 | 1.15 | 1.48 |
| 2000 | 1.77 | 1.73 | 1.85 | 1.54 | 1.66 | 1.65 | 1.88 | 1.72 | 1.36 | 1.38 | 1.22 | 1.50 |
| 2001 | 1.74 | 1.73 | 1.78 | 1.57 | 1.64 | | 1.89 | 1.71 | 1.33 | | | 1.41 |
| 2002 | 1.72 | 1.72 | 1.75 | 1.65 | 1.62 | | 1.89 | 1.73 | 1.40 | | | 1.40 |

*Appendix C. (continued)*

| Cohort | Southern Europe | | | | East central Europe | | | Eastern Europe | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Greece | Italy | Portugal | Spain | Czech Republic | Hungary | Slovak Republic | Bulgaria | Romania | Russia |
| 1945 | | 2.38 | 3.33 | 2.86 | 3.21 | 2.33 | 3.17 | | | |
| 1946 | | 2.98 | 3.23 | 2.66 | 3.37 | 2.31 | 3.09 | | | |
| 1947 | | 2.88 | 3.11 | 2.64 | 3.11 | 2.54 | 3.21 | 2.85 | | |
| 1948 | | 2.83 | 3.40 | 2.86 | 2.90 | 2.58 | 3.24 | 2.89 | | |
| 1949 | | 2.61 | 3.24 | 2.65 | 2.73 | 2.54 | 3.28 | 2 89 | | |
| 1950 | | 2.50 | 3.12 | 2.47 | 2.79 | 2.60 | 3.58 | 2.96 | | |
| 1951 | | 2.35 | 3.17 | 2.45 | 2.76 | 2.53 | 3.58 | 2.46 | | |
| 1952 | | 2.34 | 3.19 | 2.53 | 2.70 | 2.47 | 3.57 | 2.47 | | |
| 1953 | | 2.31 | 3.04 | 2.49 | 2.61 | 2.76 | 3.50 | 2.44 | | |
| 1954 | | 2.35 | 2.96 | 2.42 | 2.58 | 2.98 | 3.45 | 2.38 | | |
| 1955 | 2.39 | 2.33 | 3.13 | 2.49 | 2.58 | 2.81 | 3.47 | 2.40 | 3.06 | |
| 1956 | 2.32 | 2.34 | 3.01 | 2.51 | 2.57 | 2.60 | 3.47 | 2.37 | 2.92 | |
| 1957 | 2.26 | 2.33 | 3.14 | 2.68 | 2.50 | 2.30 | 3.40 | 2.28 | 2.71 | |
| 1958 | 2.23 | 2.31 | 3.15 | 2.71 | 2.31 | 2.19 | 3.25 | 2.26 | 2.56 | 2.63 |
| 1959 | 2.27 | 2.38 | 3.15 | 2.72 | 2.13 | 2.09 | 3.06 | 2.27 | 2.43 | 2.58 |
| 1960 | 2.21 | 2.41 | 3.16 | 2.77 | 2.11 | 2.02 | 3.10 | 2.32 | 2.34 | 2.56 |
| 1961 | 2.12 | 2.41 | 3.20 | 2.75 | 2.12 | 1.94 | 3.01 | 2.29 | 2.18 | 2.47 |
| 1962 | 2.16 | 2.46 | 3.23 | 2.79 | 2.14 | 1.79 | 2.84 | 2.24 | 2.04 | 2.36 |
| 1963 | 2.13 | 2.55 | 3.12 | 2.87 | 2.34 | 1.82 | 2.94 | 2.21 | 2.01 | 2.31 |
| 1964 | 2.24 | 2.70 | 3.21 | 3.00 | 2.36 | 1.82 | 2.91 | 2.18 | 1.96 | 2.19 |
| 1965 | 2.24 | 2.66 | 3.15 | 2.94 | 2.18 | 1.82 | 2.80 | 2.09 | 1.91 | 2.12 |
| 1966 | 2.32 | 2.63 | 3.16 | 2.93 | 2.01 | 1.89 | 2.68 | 2.02 | 1.90 | 2.13 |
| 1967 | 2.45 | 2.53 | 3.16 | 2.98 | 1.90 | 2.01 | 2.50 | 2.02 | 3.67 | 2.04 |
| 1968 | 2.42 | 2.49 | 3.12 | 2.92 | 1.83 | 2.07 | 2.40 | 2.27 | 3.64 | 1.99 |
| 1969 | 2.35 | 2.51 | 3.12 | 2.91 | 1.86 | 2.04 | 2.43 | 2.27 | 3.20 | 2.00 |
| 1970 | 2.40 | 2.43 | 3.01 | 2.89 | 1.90 | 1.98 | 2.40 | 2.17 | 2.90 | 2.00 |
| 1971 | 2.32 | 2.41 | 3.00 | 2.88 | 1.98 | 1.93 | 2.42 | 2.10 | 2.67 | 2.03 |
| 1972 | 2.32 | 2.36 | 2.86 | 2.86 | 2.07 | 1.93 | 2.49 | 2.03 | 2.55 | 2.03 |
| 1973 | 2.26 | 2.34 | 2.77 | 2.84 | 2.29 | 1.93 | 2.56 | 2.15 | 2.44 | 1.96 |
| 1974 | 2.37 | 2.33 | 2.69 | 2.89 | 2.43 | 2.27 | 2.60 | 2.29 | 2.70 | 2.00 |
| 1975 | 2.32 | 2.21 | 2.75 | 2.80 | 2.40 | 2.35 | 2.53 | 2.22 | 2.60 | 1.97 |
| 1976 | 2.35 | 2.11 | 2.82 | 2.79 | 2.36 | 2.23 | 2.52 | 2.24 | 2.55 | 1.96 |
| 1977 | 2.26 | 1.98 | 2.69 | 2.66 | 2.32 | 2.15 | 2.47 | 2.21 | 2.57 | 1.92 |
| 1978 | 2.27 | 1.87 | 2.45 | 2.53 | 2.33 | 2.06 | 2.45 | 2.15 | 2.52 | 1.90 |
| 1979 | 2.26 | 1.76 | 2.32 | 2.31 | 2.29 | 2.01 | 2.44 | 2.16 | 2.48 | 1.87 |
| 1980 | 2.23 | 1.64 | 2.25 | 2.20 | 2.10 | 1.91 | 2.31 | 2.05 | 2.43 | 1.86 |

*Appendix C (continued)*

| Cohort | Southern Europe | | | | East central Europe | | | Eastern Europe | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Greece | Italy | Portugal | Spain | Czech Republic | Hungary | Slovak Republic | Bulgaria | Romania | Russia |
| 1981 | 2.09 | 1.59 | 2.13 | 2.04 | 2.02 | 1.88 | 2.28 | 2.00 | 2.36 | 1.88 |
| 1982 | 2.02 | 1.56 | 2.08 | 1.94 | 2.01 | 1.80 | 2.27 | 2.01 | 2.17 | 1.96 |
| 1983 | 1.94 | 1.51 | 1.95 | 1.80 | 1.96 | 1.75 | 2.27 | 2.01 | 2.07 | 2.09 |
| 1984 | 1.82 | 1.46 | 1.90 | 1.73 | 1.97 | 1.76 | 2.25 | 2.01 | 2.27 | 2.05 |
| 1985 | 1.67 | 1.42 | 1.72 | 1.64 | 1.96 | 1.85 | 2.26 | 1.98 | 2.31 | 2.05 |
| 1986 | 1.60 | 1.35 | 1.67 | 1.56 | 1.94 | 1.84 | 2.20 | 2.02 | 2.40 | 2.18 |
| 1987 | 1.50 | 1.33 | 1.63 | 1.50 | 1.91 | 1.82 | 2.15 | 1.97 | 2.39 | 2.23 |
| 1988 | 1.50 | 1.36 | 1.62 | 1.45 | 1.94 | 1.81 | 2.15 | 1.97 | 2.31 | 2.14 |
| 1989 | 1.40 | 1.33 | 1.58 | 1.40 | 1.88 | 1.82 | 2.08 | 1.91 | 2.20 | 2.02 |
| 1990 | 1.39 | 1.33 | 1.57 | 1.36 | 1.90 | 1.87 | 2.09 | 1.82 | 1.84 | 1.90 |
| 1991 | 1.38 | 1.31 | 1.57 | 1.33 | 1.86 | 1.88 | 2.04 | 1.66 | 1.58 | 1.75 |
| 1992 | 1.38 | 1.31 | 1.53 | 1.32 | 1.72 | 1.78 | 1.93 | 1.55 | 1.50 | 1.56 |
| 1993 | 1.34 | 1.27 | 1.50 | 1.27 | 1.67 | 1.69 | 1.87 | 1.46 | 1.44 | 1.36 |
| 1994 | 1.35 | 1.22 | 1.43 | 1.21 | 1.44 | 1.64 | 1.67 | 1.37 | 1.41 | 1.39 |
| 1995 | 1.32 | 1.20 | 1.40 | 1.18 | 1.28 | 1.57 | 1.52 | 1.23 | 1.34 | 1.34 |
| 1996 | 1.30 | 1.19 | 1.43 | 1.17 | 1.18 | 1.46 | 1.47 | 1.23 | 1.30 | 1.28 |
| 1997 | 1.31 | 1.20 | 1.46 | 1.18 | 1.17 | 1.38 | 1.43 | 1.09 | 1.32 | 1.23 |
| 1998 | 1.29 | 1.21 | 1.47 | 1.16 | 1.16 | 1.32 | 1.37 | 1.11 | 1.32 | 1.25 |
| 1999 | 1.28 | 1.22 | 1.50 | 1.20 | 1.13 | 1.28 | 1.33 | 1.23 | 1.30 | 1.17 |
| 2000 | 1.29 | 1.24 | 1.55 | 1.24 | 1.14 | 1.32 | 1.30 | 1.30 | 1.31 | 1.21 |
| 2001 | 1.25 | 1.25 | 1.45 | 1.26 | 1.14 | 1.31 | 1.20 | 1.24 | 1.27 | 1.25 |
| 2002 | 1.25 | 1.26 | 1.47 | 1.25 | 1.17 | 1.30 | 1.19 | 1.21 | 1.26 | 1.32 |

*Appendix C (continued)*

| Cohort | West Balkan Region | | | | | Baltic Region | | | Non-European Countries | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bosnia and Herzegovina | Croatia | Macedonia | Slovenia | Yugoslavia | Estonia | Latvia | Lithuania | Australia | Canada | Japan | New Zealand | United States |
| 1945 | | | | 1.88 | | | | | 2.73 | 3.00 | | 3.09 | 2.42 |
| 1946 | | | | 2.63 | | | | | 2.98 | 3.36 | | 3.44 | 2.86 |
| 1947 | | 2.70 | 5.23 | 2.82 | | | | | 3.06 | 3.58 | 4.54 | 3.62 | 3.18 |
| 1948 | | 2.79 | 5.97 | 2.75 | | | | | 2.97 | 3.42 | 4.40 | 3.56 | 3.03 |
| 1949 | | 3.01 | 5.77 | 2.90 | | | | | 2.97 | 3.44 | 4.32 | 3.53 | 3.04 |
| 1950 | 5.23 | 2.91 | 5.82 | 2.98 | 3.58 | | | | 3.05 | 3.43 | 3.65 | 3.56 | 3.03 |
| 1951 | 4.53 | 2.60 | 5.14 | 2.83 | 3.10 | | 2.27 | | 3.05 | 3.47 | 3.26 | 3.61 | 3.20 |
| 1952 | 5.25 | 2.69 | 5.56 | 2.76 | 3.37 | | 2.16 | | 3.17 | 3.61 | 2.98 | 3.68 | 3.29 |
| 1953 | 4.89 | 2.65 | 5.26 | 2.74 | 3.12 | | 2.07 | | 3.19 | 3.69 | 2.69 | 3.66 | 3.35 |
| 1954 | 4.87 | 2.60 | 5.23 | 2.60 | 3.13 | | 2.05 | | 3.19 | 3.80 | 2.48 | 3.79 | 3.46 |
| 1955 | 4.53 | 2.56 | 4.94 | 2.59 | 2.87 | | 2.01 | | 3.28 | 3.81 | 2.37 | 3.88 | 3.50 |
| 1956 | 4.38 | 2.47 | 4.69 | 2.52 | 2.73 | | 1.96 | | 3.33 | 3.82 | 2.22 | 3.98 | 3.60 |
| 1957 | 3.91 | 2.32 | 4.45 | 2.38 | 2.46 | | 1.94 | | 3.43 | 3.91 | 2.04 | 4.02 | 3.68 |
| 1958 | 4.08 | 2.21 | 4.26 | 2.23 | 2.51 | | 1.94 | | 3.44 | 3.87 | 2.11 | 4.11 | 3.63 |
| 1959 | 3.91 | 2.23 | 4.21 | 2.22 | 2.43 | | 1.93 | | 3.47 | 3.92 | 2.04 | 4.18 | 3.64 |
| 1960 | 3.95 | 2.20 | 4.11 | 2.18 | 2.57 | 1.96 | 1.94 | 2.59 | 3.47 | 3.91 | 2.00 | 4.24 | 3.61 |
| 1961 | 3.84 | 2.19 | 3.86 | 2.30 | 2.51 | 1.97 | 1.94 | 2.57 | 3.56 | 3.86 | 1.96 | 4.31 | 3.56 |
| 1962 | 3.77 | 2.17 | 3.67 | 2.32 | 2.47 | 1.96 | 1.91 | 2.44 | 3.46 | 3.78 | 1.98 | 4.19 | 3.42 |
| 1963 | 3.64 | 2.12 | 3.70 | 2.33 | 2.49 | 1.94 | 1.85 | 2.34 | 3.36 | 3.69 | 2.00 | 4.01 | 3.30 |
| 1964 | 3.51 | 2.12 | 3.79 | 2.34 | 2.46 | 1.94 | 1.79 | 2.29 | 3.18 | 3.52 | 2.05 | 3.78 | 3.17 |
| 1965 | 3.50 | 2.21 | 3.71 | 2.46 | 2.53 | 1.93 | 1.74 | 2.21 | 2.99 | 3.16 | 2.14 | 3.54 | 2.88 |
| 1966 | 3.34 | 2.21 | 3.56 | 2.48 | 2.46 | 1.92 | 1.76 | 2.23 | 2.89 | 2.82 | 1.58 | 3.41 | 2.67 |
| 1967 | 3.14 | 2.07 | 3.44 | 2.39 | 2.44 | 1.95 | 1.80 | 2.23 | 2.86 | 2.60 | 2.23 | 3.35 | 2.53 |
| 1968 | 3.00 | 1.99 | 3.32 | 2.26 | 2.41 | 2.03 | 1.83 | 2.25 | 2.90 | 2.46 | 2.13 | 3.32 | 2.43 |
| 1969 | 2.98 | 1.91 | 3.26 | 2.17 | 2.42 | 2.11 | 1.88 | 2.30 | 2.89 | 2.41 | 2.13 | 3.29 | 2.42 |
| 1970 | 2.71 | 1.83 | 2.98 | 2.12 | 2.30 | 2.16 | 2.02 | 2.39 | 2.86 | 2.32 | 2.13 | 3.17 | 2.43 |
| 1971 | 2.80 | 1.95 | 2.92 | 2.16 | 2.33 | 2.19 | 2.04 | 2.41 | 2.85 | 2.15 | 2.16 | 3.16 | 2.25 |
| 1972 | 2.73 | 1.97 | 2.86 | 2.17 | 2.33 | 2.14 | 2.03 | 2.35 | 2.65 | 1.97 | 2.14 | 2.96 | 1.99 |
| 1973 | 2.51 | 1.98 | 2.72 | 2.20 | 2.31 | 2.07 | 1.96 | 2.22 | 2.41 | 1.88 | 2.14 | 2.76 | 1.86 |
| 1974 | 2.43 | 1.95 | 2.71 | 2.10 | 2.34 | 2.07 | 2.00 | 2.21 | 2.31 | 1.83 | 2.05 | 2.57 | 1.82 |
| 1975 | 2.38 | 1.92 | 2.71 | 2.17 | 2.33 | 2.04 | 1.97 | 2.18 | 2.15 | 1.83 | 1.91 | 2.35 | 1.77 |
| 1976 | 2.31 | 1.90 | 2.66 | 2.20 | 2.36 | 2.06 | 1.93 | 2.18 | 2.06 | 1.78 | 1.85 | 2.25 | 1.74 |
| 1977 | 2.14 | 1.91 | 2.54 | 2.16 | 2.29 | 2.06 | 1.89 | 2.14 | 2.01 | 1.75 | 1.80 | 2.16 | 1.80 |
| 1978 | 2.01 | 1.92 | 2.48 | 2.19 | 2.26 | 2.02 | 1.87 | 2.09 | 1.95 | 1.70 | 1.79 | 2.08 | 1.76 |
| 1979 | 1.92 | 1.94 | 2.48 | 2.20 | 2.23 | 2.01 | 1.87 | 2.05 | 1.91 | 1.70 | 1.77 | 2.08 | 1.82 |
| 1980 | 1.93 | 1.92 | 2.47 | 2.10 | 2.29 | 2.02 | 1.90 | 1.99 | 1.89 | 1.68 | 1.75 | 2.02 | 1.85 |

*Appendix C (end)*

| Year | West Balkan Region | | | | | Baltic Region | | | Non European Countries | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bosnia and Herzegovina | Croatia | Macedonia | Slovenia | Yugoslavia | Estonia | Latvia | Lithuania | Australia | Canada | Japan | New Zealand | United States |
| 1981 | 1.97 | 1.91 | 2.45 | 1.98 | 2.14 | 2.07 | 1.90 | 1.98 | 1.94 | 1.65 | 1.74 | 1.96 | 1.83 |
| 1982 | 2.02 | 1.90 | 2.45 | 1.93 | 2.25 | 2.08 | 1.98 | 1.97 | 1.93 | 1.64 | 1.77 | 1.92 | 1.83 |
| 1983 | 2.01 | 1.88 | 2.39 | 1.81 | 2.23 | 2.16 | 2.13 | 2.10 | 1.92 | 1.62 | 1.80 | 1.91 | 1.81 |
| 1984 | 1.97 | 1.87 | 2.34 | 1.74 | 2.29 | 2.17 | 2.15 | 2.07 | 1.88 | 1.62 | 1.81 | 1.90 | 1.80 |
| 1985 | 1.89 | 1.81 | 2.31 | 1.71 | 2.22 | 2.12 | 2.09 | 2.09 | 1.89 | 1.61 | 1.76 | 1.92 | 1.84 |
| 1986 | 1.83 | 1.76 | 2.27 | 1.67 | 2.19 | 2.17 | 2.21 | 2.12 | 1.87 | 1.59 | 1.72 | 1.95 | 1.84 |
| 1987 | 1.81 | 1.74 | 2.27 | 1.65 | 2.21 | 2.26 | 2.21 | 2.11 | 1.84 | 1.57 | 1.69 | 2.02 | 1.87 |
| 1988 | 1.80 | 1.74 | 2.22 | 1.63 | 2.20 | 2.26 | 2.16 | 2.02 | 1.86 | 1.60 | 1.66 | 2.08 | 1.93 |
| 1989 | 1.70 | 1.67 | 2.10 | 1.52 | 2.07 | 2.21 | 2.05 | 1.98 | 1.83 | 1.66 | 1.57 | 2.11 | 2.01 |
| 1990 | 1.71 | 1.67 | 2.06 | 1.46 | 2.10 | 2.04 | 2.01 | 2.03 | 1.90 | 1.71 | 1.54 | 2.16 | 2.08 |
| 1991 | 1.65 | 1.55 | 2.07 | 1.42 | 2.08 | 1.79 | 1.86 | 2.01 | 1.86 | 1.72 | 1.53 | 2.15 | 2.06 |
| 1992 | | 1.39 | 2.12 | 1.33 | 1.92 | 1.69 | 1.73 | 1.94 | 1.89 | 1.71 | 1.50 | 2.05 | 2.05 |
| 1993 | | 1.43 | 2.17 | 1.33 | 1.91 | 1.45 | 1.51 | 1.74 | 1.86 | 1.68 | 1.46 | 2.04 | 2.02 |
| 1994 | | 1.43 | 2.23 | 1.32 | 1.86 | 1.37 | 1.39 | 1.57 | 1.84 | 1.68 | 1.50 | 2.01 | 2.00 |
| 1995 | | 1.50 | 2.13 | 1.29 | 1.89 | 1.32 | 1.26 | 1.55 | 1.82 | 1.67 | 1.42 | 2.01 | 1.98 |
| 1996 | | 1.64 | 2.06 | 1.28 | 1.84 | 1.30 | 1.16 | 1.49 | 1.79 | 1.61 | 1.43 | 1.97 | 1.98 |
| 1997 | | 1.69 | 1.93 | 1.25 | 1.75 | 1.24 | 1.11 | 1.47 | 1.77 | 1.54 | 1.39 | 1.95 | 1.97 |
| 1998 | | 1.45 | 1.90 | 1.23 | 1.71 | 1.21 | 1.10 | 1.46 | 1.76 | 1.52 | 1.38 | 1.96 | 2.00 |
| 1999 | | 1.38 | 1.76 | 1.21 | 1.64 | 1.24 | 1.18 | 1.46 | 1.75 | 1.51 | 1.34 | 1.97 | 2.01 |
| 2000 | | 1.40 | 1.88 | 1.26 | 1.66 | 1.34 | 1.24 | 1.39 | 1.74 | 1.60 | 1.36 | 1.98 | 2.06 |
| 2001 | | 1.27 | 1.73 | 1.21 | 1.71 | 1.34 | 1.21 | 1.30 | 1.72 | | 1.33 | 1.93 | 2.03 |
| 2002 | | 1.38 | 1.77 | 1.21 | | 1.37 | 1.24 | 1.24 | | | | | |

# *Appendix D. Methodological Issues*

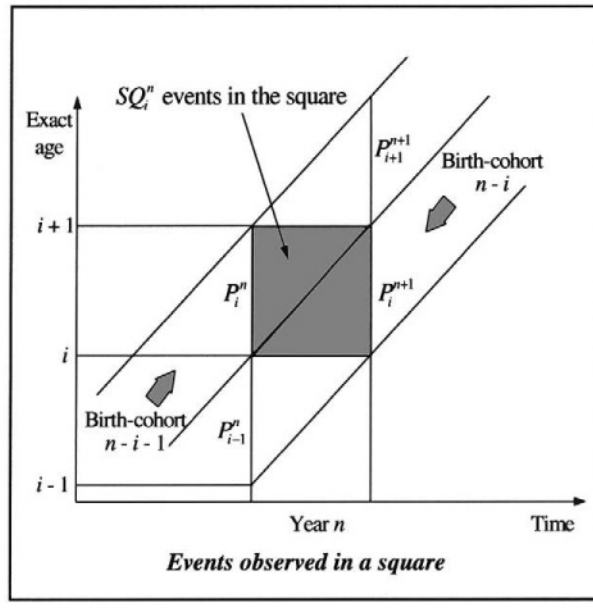
Basic data used in this project are live births by age of mother and birth order, and annual estimates of female population by age. Optimal comparability of data had to be guaranteed as a prerequisite to executing a valid international comparative study. The database of the European Demographic Observatory (Observatoire Démographique Européen-ODE) is ideally suited for this purpose. The ODE compiles demographic data for all European countries and guarantees comparability by appropriately adjusting 'raw' data received from the national statistical offices (NSO). The issues involved to ensure international comparability and the ways data are processed at the ODE are described below.

## D.1. Age of mother when giving birth

The principal issue to be resolved regarding international comparability of data was the definition of age of the mother at the birth of a child. The age of a resident[56] woman at a given date is straightforward. The breakdown by age is obtained by classifying women by completed years of age on the date concerned. Difficulties arise when the age variable involves measuring age at the time of occurrence of a birth (or of any other event) during a given calendar year.

Some countries use the common language definition, i.e. the age in completed years at the time of the birth, also called age at last birthday. Other countries use the age reached during the calendar year of the birth, i.e. the difference between the year in which the birth occurred and the year of birth of the mother concerned, also called age in completed years on 31 December of the calendar year of the birth. The former case is denoted as 'age completed' and the latter 'age reached.' A third category of countries combine the two definitions. These countries use age in completed years on 31 December of the calendar year of the birth, but make a distinction based on whether the birth occurred before or after the birthday of the mother concerned during the calendar year of the birth.

[56] For the majority of countries the *de facto* resident female population (not the *de jure* population) is considered the population at risk. There are a few cases where countries provide estimates based only on the *de jure* population.



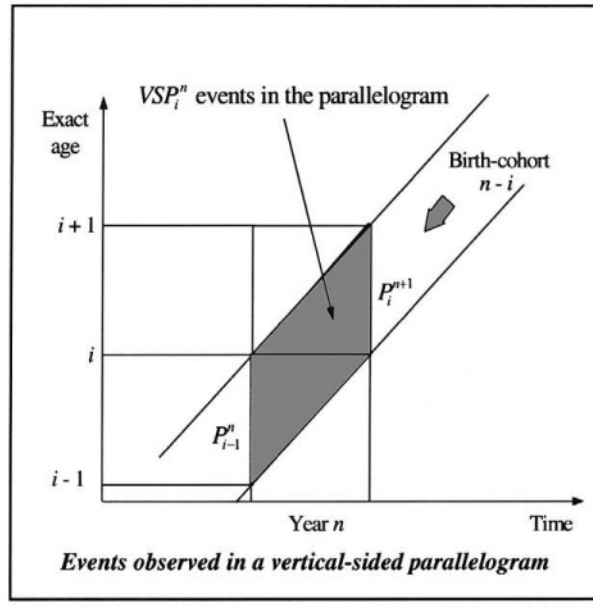




*Figure 1. Absolute numbers of events and cohorts subject to the risk*

In the Lexis diagram (*Figure 1*), births which occur in a given calendar year and correspond to the same 'completed age' are located in the same square (bottom panel), while those corresponding to the same 'reached age' occupy a parallelogram with vertical sides (top panel), and those resulting from the above-mentioned double classification are found in triangles.

On average, and for the same age *i*, women whose age is in completed years are half a year older than women whose age is in years reached. This difference may seem negligible, but it is sometimes important to specify which definition of age of the mother at the time of birth is being used. For instance, this is the reason why fertility of adolescents frequently differs by more than a quarter, depending on whether it is measured at less than 20 years of age completed or at less than 20 years of age reached. International comparisons can be seriously distorted if this difference is not taken into account.

To ensure international comparability, one of the two conventions concerning the age of the mother at the time of birth has to be adopted. To select the convention of age reached is preferable. On the one hand, the cumulated rates by age reached provide indicators which relate to a unique year of birth and, furthermore, the biases to be discussed below are less pronounced when rates by age reached are concerned rather than rates by completed age.

If data for a country are available only by completed age (*Table 1*), these have to be converted into age reached. The European Demographic Observatory has developed a methodology for the construction of tables for first marriage, fertility and mortality, with both definitions of age. In this way, the two systems of rates —by completed age and by age reached— are calculated, and the absolute numbers of events are estimated using the triangles of the Lexis diagram when the basic data are observed only by completed age or only by age reached.

The methodology has two additional applications. It provides a mechanism to smooth time series of the rates; and a mechanism to correct rates affected by significant statistical biases, which may exceed ten per cent due to historical accidents, such as the two world wars, in particular the first one. Potential biases result from exceptional seasonal patterns of the birth rate during years marked by the respective historical accidents. The rates, if left uncorrected, at all ages of

*Table 1. Definition of age of the mother at the time of birth, by region and country*

| Region | Completed age | Age reached | Double classification |
|---|---|---|---|
| Nordic Region | Denmark, Finland | | Denmark (since 1972), Finland (since 1975), Norway, Sweden (since 1968) |
| Western Europe | England and Wales | | Belgium, France, Netherlands |
| West central Europe | | Former FRG, Former GDR | Austria, Switzerland |
| Southern Europe | Greece, Portugal, Spain | Italy | Greece (since 1991), Italy (since 1980), Portugal (since 1988), Spain (since 1975) |
| Central Europe | Czech Republic, Slovak Republic | | Czech Republic (since 1993), Hungary, Slovak Republic (since 1996) |
| Eastern Europe | Bulgaria, Russian Federation | Romania | Bulgaria (since 1978), Romania (since 1980) |
| West Balkan Region | Bosnia-Herzegovina, Croatia, Macedonia, Slovenia, Yugoslavia | | Croatia (since 1999), Macedonia (since 1998), Slovenia (since 1995), Yugoslavia (since 2000) |
| Baltic Region | Estonia, Latvia, Lithuania | | Estonia (since 1995), Lithuania (since 1998) |
| Non-European countries[a] | Australia, Canada, Japan, New Zealand, United States | | |

Note: [a] Data as obtained for the present study.

the cohorts born during those years would be biased. The relative value of the bias for the same cohort varies little with the age and the studied phenomenon. Uncorrected longitudinal measures for these cohorts would be undermined by a bias that the adopted method eliminates satisfactorily (Details of the correction procedure are described in the following section). On the other hand, cross-sectional measures are relatively unaffected: the correction made to a total rate or to a mean cross-sectional age is generally minor.

To apply the method, knowledge of the monthly distribution of births over a long period of time, or the distribution observed in a census of the population by year and month of birth, is desirable. If such information is not available, it is assumed that births do not vary during the respective year, i.e. the number of births per day is considered constant and the numbers per month depend on the number of days in each month. This provides a means of improving estimates of rates compared to results of a classic simple calculation (uncorrected and unsmoothed rates).

In the graphs and tables throughout the study, rates for individual years of age of the mother were presented for age reached (vertical side parallelogram). The cumulated rates were calculated up to an exact age, i.e. the respective birthday (horizontal side parallelogram). In both cases the same criteria were applied for all countries thus ensuring comparability.

Finally, for the non-European countries, Australia, Canada, Japan, New Zealand and the United States, only rates and not the basic data on live births and female population by age were available for the study. Therefore the information from these countries could not be treated precisely according to the same procedures.

## D.2 Computing and correcting rates

Consider a group of women simultaneously and independently exposed, during the same period, to the risk of a birth occurring. Suppose that the intensity of the risk is identical from one woman to another and invariable from one moment to another during the exposure period. The rate of occurrence of the birth within the group is, by definition, the ratio between the number of births observed and the sum of the durations of exposure to risk, i.e. the ratio between the number of births observed and the product of the number of women multiplied by the exposure time common to each of those women.

Now consider all women resident in a country exposed during calendar year $n$ to the risk of having a baby. The risk varies with women's age. Let us assume that for women of the same age it does not vary from one moment to another in year $n$ (no seasonal variation) or from one person to another. We observe, for example, the number $N_i^n$ of events in a square of the Lexis diagram, i.e. in this instance the number of live births in year $n$ to mothers whose exact age was between $i$ and $i$+1 at the time of the birth.

As the intensity of the risk varies with age, what we want to estimate is the mean value[57] of this risk between the exact ages *i* and *i*+1. But the duration of risk exposure varies from one woman to another, not only because of international migrations and deaths during year *n*, but also with the woman's date of birth: women born at the beginning of year *n-i*-1 or at the end of year *n-i* are exposed for a duration close to zero, while women born towards the end of year *n-i*-1 or the beginning of year *n-i* are exposed for a period verging on one year. It must be assumed that the distribution of birthdays within the group made up of two consecutive cohorts of women, that born in *n-i*-1 and that born in *n-i*, is virtually uniform in order to consider that half the sum of women of completed age *i* on 1 January and on 31 December of year *n*, which we shall call $P_i^n$ and $P_i^{n+1}$ provides a satisfactory estimate of the number of person-years of exposure to the risk. If we accept this assumption, the fertility rate at completed age *i* for calendar year *n* is the ratio between the number $N_i^n$ of live births observed in the square and half the sum of the populations $P_i^n$ and $P_i^{n+1}$.

However, when the birth rate varied considerably in the years *n-i*-1 and *n- i* as, for example, during the two world wars, this assumption may be far from valid and cause a substantial bias when calculating rates. The bias exceeded ten per cent, for example, in the case of the cohorts born in Belgium and in France in 1915 and 1916 or in the case of the cohorts born in Romania in 1966 and 1967; it was eight per cent in the case of the cohorts born in Finland in 1944 and 1945. The bias affecting the rates established in squares is shown to be practically constant in relative value for the same pair of consecutive cohorts, whatever the age and the phenomenon considered (fertility, marriage rate or death rate).

The corresponding bias is far smaller for events in the vertical-sided parallelograms of the Lexis diagram, as the risk exposure periods are exactly one year for all units subjected to the risk, if we ignore international migration and mortality. This is the reason why it is preferable to observe events in the course of the year in the vertical-sided parallelograms rather than in squares, the ideal solution being to observe them in the triangles. Furthermore, it is particularly advisable to correct any biases when calculating cumulated cohort

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57 If *f(x)* is the risk function at exact age *x,* what we want to estimate is exactly:

$\int_i^{i+1} f(x)\,\mathrm{d}x$ if one considers the rate by completed age, between the $i^{\text{th}}$ and the $(i+1)^{\text{th}}$ birthdays·

or, taking the vertical-sided parallelograms:

$\int_{i-0,5}^{i+0,5} f(x)\,\mathrm{d}x$ if one considers the rate by age reached, centred on the $i^{\text{th}}$ birthday

measures, as the rates for a given cohort are affected by the same bias throughout its life cycle. It can be demonstrated, on the other hand, that biases affecting rates for the same year of observation more or less balance each other out. Aggregate measures (as well as cross-sectional mean ages) are scarcely affected by these biases, unlike age-specific rates or partial sums thereof by age groups.

The ODE's software estimates fertility and first marriage rates, as well as probabilities of death, in all three possible configurations: by completed age and year of observation, by age reached and year of observation, by completed age and year of birth (straddling two consecutive years of observation), irrespective of the area in the Lexis diagram the events were observed in (squares, vertical-sided parallelograms or triangles). To estimate these rates, the ODE uses series of monthly numbers of live births over a long period or the distribution of resident persons by month of birth observed in a census when this information is available. Failing this, the above-mentioned assumption of a uniform distribution is applied[58].

## D.3 Estimating annual data from five-year age groups

Another issue is the size of the age group used in classifications of births or of the population at risk. Data for single years of age and single calendar years were a prerequisite for the presentation of data and for the analysis in this study. The majority of statistical offices provide classifications by single years of age and by single calendar year. There are, however, cases when only five-year age group classifications, or a combination of single year and quinquennial age groups, are available.

The question then arises how to estimate births by single year of age if the number of births are available only for quinquennial age groups of mothers (a case in point are, for example, births by age of the mother in Spain prior to 1971). Similarly, how does one disaggregate five-year age groups of population into single years of age?

[58] For more details see Calot and Sardon, forthcoming (2003), *Short-term demographic analysis: Methodology for the calculation of demographic indicators*, Eurostat.

The population at risk may be available in two alternative classifications:

age classifications are available for 1 January of each calendar year by single year of age over the entire range of the ages concerned regarding the respective events (births, etc.) considered;
age classifications are available for 1 January of each calendar year only by five year age groups.

*a. Age classifications available for 1 January by single year of age*

First, five-year fertility rates are computed from quinquennial data:

$$t_n^{x,x+5} = \frac{E_n^{x,x+5}}{\sum_x^{x+5} \overline{P}_n^x}.$$

These five-year rates are then converted into annual rates by applying the Gompertz law and making the total of the annual rates equal to that of the observed five-year rates.

Finally, the estimated absolute numbers of events (births) by single year of age are calculated by multiplying the average population for the respective year with the single year of age rates that were adjusted applying the Gompertz law:

$$E_n''^x = \overline{P_n^x} * t_n''^{x,x+1}.$$

The estimated absolute numbers by single year of age are then treated as if they were observed events.

*b. Age classifications available for 1 January only by five-year age groups*

When the age classifications are not available by single year of age but only by quinquennial age groups, the procedure is the same. It is, however, not possible to derive the estimated absolute annual numbers of births from the estimated rates by single year of age, because the average populations for the respective years are not available.

The estimated annual fertility rates are used to supplement the information available for each of the cohorts and to make up for the absence, whether

partial or total, of data by single year of birth or single year of age in computing cumulated measures.

## D.4 Conversion of age distributions of the resident population from a date other than 1 January into distributions on 1 January

Most European countries provide estimates of the age distribution of the resident population by sex and year of age as of 1 January of each year. Some countries, for instance, the United Kingdom and Ireland, do so for a different date, namely 1 July in the United Kingdom and 15 April in Ireland. In such cases a conversion is required. The ODE has developed procedures to convert age distributions from any date during the year to 1 January to ensure international comparability.

There are two possibilities depending on whether series of recorded births by month of occurrence are available.

The first type of conversion made by the ODE software program Syscodem is based on the availability of recorded live births by months. Let us consider a year *n*. The number of residents on date *a* of year *n* (*a* being measured as a fraction of year from 1 January *n*) with age revolved *i* is expressed as $P_i^{n,a}$. The size of the cohort at birth, those born between date *a* of year *n*-*i*-1 and date *a* of year *n*-i, is estimated as $N_{n-i-1,a \text{ ---> } n-i,a}$ on the basis of the recorded monthly series of live births of the respective period. The survival ratio of this cohort between birth and the age revolved *i* is $P_i^{n,a} / N_{n-i-1,a \text{ ---> } n-i,a}$. The size of the cohort *n*-*i*-1 on 1 January *n* is expressed as $P_i^n$ while at birth it was $N_{n-i-1}$. The survival ratio, $a_s / N_{n-i-1}$, can be estimated by linear interpolation between two observed survival ratios[59], which gives the desired cohort $P_i^n$ when $N_{n-i-1}$ is known.

In the case of Ireland, for example, the age classification on 1 January 1990 is calculated according to this method based on the age classifications on 15 April 1989 and 15 April 1990 by linear interpolation. It is also possible to make a provisional estimate of the age classification on 1 January 1991 by linear extrapolation based on the previous age classifications. This estimate

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[59] The ratio $P_{i-1}^{n,a} / N_{n-i-1,a \text{ ---> } n-i,a}$ refers to the date *n*-*i*-1+*a*, the ratio $P_{i-1}^{n,a} / N_{n-i,a \text{ ---> } n-i+1,a}$ to the date *n*-*i*+*a* and the ratio $P_{i-1}^{n} / N_{n-i}$ to the date *n*-*i*.

must be revised when the classification of 15 April 1991 becomes available, and the extrapolation can be replaced by an interpolation.

If the births by month of occurrence are not available for certain cohorts, it is assumed that there was no seasonal variation of births by month. The linear interpolations and extrapolations are then based on this assumption of a uniform seasonality of births.

The systematic conversion of all age-sex distributions to 1 January provides the basis for using the same software applications when providing required measures and tables for all countries and all years as well as the option to aggregate cohorts by sex and age across countries or regions.

Whatever method is used to calculate the basic information concerning cohorts of residents by sex and age (distributions as of 1 January or any other date of the year) and the annual flows of live births by age of mother (by age reached, by completed age or both at the same time), the measures and tables will be directly comparable in time and space.

In addition, fertility rates can be calculated by year of birth and completed age straddling two years of observation (horizontal-sided parallelograms in the Lexis diagram). Such calculations when cumulated enable comparisons of cohorts at the time of birthdays (for example, the proportions of children born between the 25$^{th}$ and 30$^{th}$ mothers' birthdays).

## D.5 The cumulation of rates: cohort measures

A set of fertility rates by age reached and year of observation, i.e. for the same year of birth, provides data, age-specific fertility rates, for the cohort born in the respective year. Cohort data can be summarised in the same way as cross-sectional, period data. The sum of the cohort age-specific fertility rates for all ages in the reproductive period is the 'total cohort fertility rate' or 'completed cohort fertility rate,' and the cohort mean age at childbirth is calculated by using the age-specific fertility rates as weights.

The summary measures can be determined accurately only if it was possible to observe all the rates for the cohort concerned, i.e. if the cohort reached or passed the age of 49 in the last year for which data were available. Robust estimates of the summary measures for a number of younger cohorts can be obtained under

specified conditions. In these younger cohorts it is possible to estimate the missing rates for older women in the reproductive age group, which tend to be low in developed countries. The ODE software estimates rates for older women by replacing them with rates observed at the same age during the last year for which these were available.[60] The principal restriction in estimating summary measures is that the sum of the replaced rates represents less than 15 per cent of the total for all ages of the respective cohort. In the majority of estimates the proportion of the replaced rates is significantly below 15 per cent. Given the import of these estimates this issue is discussed in the main body of Chapter 2. Methods.

## D.6 Live births by birth-order

The analysis in the present study is limited to countries where live births were available by biological order, i.e. according to the order of birth by the same mother. Such statistics were not available for all countries. Statistics in some countries still cover only legitimate births within the current marriage. Given developments in cohabitation patterns, the frequency of divorce, and the proportions of births out of wedlock during the past several decades, such a classification lacks relevance.

As a rule, when analyzing developments by biological birth order official country statistics were used. An exception was made for England and Wales where the Office of National Statistics reclassified data with the help of a survey.

[60] Other methods to estimate fertility rates of older women could be devised. As already mentioned, because the size of the estimated rates tends to be only a small fraction of the completed fertility rate, any simple method to estimate these provides satisfactory results.

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