

**SOCIAL-DEMOGRAPHIC DIFFERENCES  
OF FERTILITY AND UNION FORMATION  
IN BULGARIA  
BEFORE AND AFTER THE START OF THE  
SOCIETAL TRANSITION**

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Inauguraldissertation zur Erlangung des akademischen Grades eines Doktors der  
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## Chapter 1

# Introduction

### 1.1 Fertility and family dynamics in a changing society

The political events in 1989 in the former socialist countries marked the start of huge transformations aiming to change from the centrally planned economy to market economy. The political and socio-economic reforms in the different countries started from different levels and developed with different speeds, and essential differences still persist in the cultural and political structures in these countries, as well as in the stages of their economic development, especially regarding the role of the public sector and quality of life (Holzer, 1995). Bulgaria belongs to the group of these countries in which the societal transition developed more slowly, faced more difficulties and was more painful (Heikkilä and Kuivalainen, 2003). The economic transition toward a market economy suffered from massive crises, the largest one in 1996/1997 with hyperinflation and the enormous loss of private and public capital. The political transition toward a modern democracy has seen large corruption crises and led to a strong loss of faith and legitimization of the political system among the population. The legal system has been subjected to massive reforms, in particular by the European Union, which Bulgaria hopes to enter in 2007. The profound economic crises, political instability, anomie and the drop in social integration all resulted in a lower quality of life, disenchantment, aggression and escapism (Genov, 1998).

All these changes also influenced the demographic development in Bulgaria. Before 1989, the demographic indicators of family and fertility behavior in Bulgaria were rather stable. Philipov (2001) characterized the fertility behavior of that era as one of “an early start and early end to childbearing, prevalence of the two-child family model, low extra-marital fertility”. Since 1989, the population of Bulgaria, which then numbered almost 9 million people, has diminished by almost one million (National Statistical Institute (NSI), 2001). A large part of this decrease is due to emigration and a negative population growth which had already started in the middle of the 1980s. The increase of mortality rates and the decrease in fertility rates had also

been observed before 1989, but these tendencies delved and developed with a higher tempo after the country started its transition toward a market economy. Regarding the development of fertility, the decrease is unprecedented. For the whole period after 1989 the total fertility rate has stayed well below replacement level, the country became one of the early members of the group of countries with “lowest-low fertility” (Kohler, Billari and Ortega, 2002). The lowest level of total fertility rate in the country was observed in 1997, when it reached the value of 1.09, which is one of the lowest levels ever observed in the world for an entire country.

The adjusted total fertility rate for first birth during the 1990s, however, stayed at a relatively constant level, around 0.9, which shows that childbearing is still a universal phenomenon in the country (Philipov and Kohler, 2001). Thus, many scholars believe that the considerable decline in total fertility is mainly due to a decrease in the higher order births, especially second order births. The observed total fertility rate for second births diminished from 0.68 in 1990 to 0.34 in 1997.

Of course, substantial changes also occurred with respect to family dynamics. The number of non-marital births has strongly increased, and in later years about 43 % of all the children were born out of wedlock (NSI, 2002). Scholars believe that this striking trend is due to the fact that more and more young people live in consensual unions without being officially married. This question has not been addressed in depth by empirical studies up to now, and thus one of our aims is a scrutiny of these new developments in family formation.

In general, the underlying causes of the changes in fertility and family behavior of the Bulgarian population are not yet sufficiently understood. The question of which of all these many societal changes after 1989 shape or determine people’s demographic behavior has not yet been answered in a satisfactory way, although it is eagerly discussed both in the public and in academia. Moreover, for the Bulgarian case one can easily gain the impression that theoretical deliberations are insufficiently grounded on empirical evidence. One of the aims of this dissertation is to study and investigate the trends in first and second birth, in marriage and in cohabitation in the context of the economic and cultural changes in Bulgaria. The main parts of the analyses include the study of the current demographic trends and the comparison of two decades – the 1980s and 1990s.

To further develop our theoretical understanding of the changes, this study makes use of two broad theoretical frameworks that have been successfully applied to

the explanation of demographic changes in other parts of the world: the economic framework in the tradition of the New Home Economics (Becker, 1991), and the sociological framework of the Second Demographic Transition in Europe (Lesthaeghe and van de Kaa, 1986). The former emphasizes the relevance of the increasing costs of children in modern societies for fertility decisions, particularly for women. The latter puts forth the argument of an increase in individual autonomy and liberal and individualistic values that changes people's attitudes and desires towards having children. Both of these theoretical models seem to offer plausible explanations applicable to the Bulgarian case.

Undoubtedly, the transition towards a market economy has brought a diversification and expansion of educational and occupational possibilities for women (but also for men) previously unknown to Bulgarians. Many young people, for whom such possibilities would have been excluded in communist times, can now choose to obtain higher education, study abroad, or freely change their subjects and places of training. The economic framework suggests that the perception of these possibilities may interfere with the long-term commitments of children and family and, in this way it reduces fertility and marriage rates. It is possible also that in Bulgaria the more highly educated strata of the population is the forerunner of this development, but given the lack of empirical evidence, one should handle these assumptions with care.

Similarly, the persuasiveness of the cultural arguments cannot simply be dismissed. It may be that there is a general 'westernization' of the Bulgarian society which moves the issues of starting and leading a family out of the traditional domain of normative pressure by parents, kin or neighbourhoods into the autonomy of individuals. If we look at other domains of the contemporary Bulgarian society, the relevance of the westernization process cannot be negated. With regard to consumption desires and behavior, the emergence of new trends and lifestyles, or media use and coverage, to give some examples, young Bulgarians from the cities do not differ from their Western counterparts of the same age in any respect. The question would then be, firstly, if this also applies to the personal behavior of marriage and family and, secondly, whether it applies to *all* young people, regardless of their cultural and ethnic background or their place of residence.

These brief illustrations may suffice to indicate the contemporary questions which this study refers to. We aim to contribute to a better description and

explanation of the trends in marriage and fertility behavior that have occurred. Here are some of the features of the following analyses.

We devote a large part of our study to the union formation behavior of women in Bulgaria. We compare the marriage trends before the start of the transition in the country and afterwards. Additionally, we investigate the emergence of a new form of union formation, namely cohabitation. We are able to identify which strata of the population accepts more readily the new trends and put the theories of ideational change to empirical test.

The section on first birth contains analyses not only of the postponement of childbearing especially for young women, but also examines the birth of a child as a process dependent on other events in the women's life course. It is considered theoretically that childbearing is related to finishing education, and entering a marriage is often regarded as a prerequisite for the birth of a child. Here, our analyses extend traditional approaches and include the parallel study of these processes and their consequences. Special attention is paid to the interrelated processes of birth of a first child and entry into first union. The aim is to analyze in what sequence the three most important demographic transitions in family formation occur, namely marriage, conception, and birth. These trends are described in their time aspect and the observed changes are followed through the years.

The aim of the analyses of second births is to describe what kind of women nowadays are more prone to have a second child and what specific characteristics they possess. Nowadays the standard two-child family model in Bulgaria is on the way to becoming history (Philipov, 2001) as more and more women finish their childbearing with the birth of the first child. We also take into account the changing interval between the first and second birth (what has been termed the *spacing* of childbearing) as well as correlation with marital status and the level of education of the woman. In this analysis we take into account the same personal characteristics of women as in the study of first births and we compare their influence on the willingness to have a second child.

As a last introductory remark, we would like to note some features of the data we use. Our data stems from two recent sources. The first one is a special data set linking information from the Bulgarian population census conducted in March 2001 to a sample survey for studying the fertility and reproductive behavior of the population, carried out on a sub-sample of the census at the same time. The linkage of

these two data sets gives rich information on an individual level regarding the fertility trends in Bulgaria. The second data set comes from a “Social Capital Survey” carried out in the second half of 2002. This study is directed towards younger cohorts, namely the ones who were at a very important threshold in their lives when the societal changes in the country began. This additional data set gives us the opportunity to study in details the changes in the demographic behavior since 1990, including the role of cohabitation in the timing of union formation.

## 1.2 Outline of the study

In **Chapter 2** (“Demographic changes and theories for their explanation”) we describe the main demographic processes for the 1980s and 1990s in Bulgaria. We put more emphasis on the fertility and family indicators from the available vital statistics. Additionally, we outline the main theories that are used to explain similar trends in Western countries. We describe the economic and cultural changes in the country and subsequently apply the existing theories to the Bulgarian reality. At the end of the chapter, we outline our main research questions.

The next chapter (**Chapter 3**) includes a thorough description of the data sets we use. We explain the cleaning procedure of the data and the construction of each of the variables included later in the analyses. The main distributions of our samples are given in table format. Additionally, we describe the notion of the life course study and the method we use in the analyses of the fertility and family behavior in Bulgaria. We conclude the chapter with a detailed description of our hypotheses.

Chapters 4, 5 and 6 are empirical chapters and they present the results of our model estimates. They follow a common structure. In each chapter the first part is descriptive and outlines the findings, and the second part aims at giving interpretation for each of the trends observed. Please note that the interpretations are reserved for the end of each chapter, after all of the descriptions have first been given.

The results from the analyses of transition to first marriage and union formation are presented in **Chapter 4**. We first study the transition to first marriage and follow the changes during the 1970s, 1980s and 1990s. After that we concentrate on the trends in the 1990s and we study both forms of union formation, namely direct marriage and cohabitation, as well as marriage after cohabitation. We conclude the

chapter with a discussion of the results and interpretation of the trends according to our theoretical concepts.

The transition to first union formation is closely connected with the transition to first conception. In **Chapter 5** we make a thorough analysis of the process of becoming a mother in Bulgaria and discuss the results in the context of our theoretical concepts. Here we introduce an additional modeling procedure and estimate union formation and first conception as parallel processes, that is, as competing risks. This model gives us the opportunity to see how strong the connection between two processes is and to see whether a pregnancy is a driving force for union formation in the Bulgarian society.

We continue the analysis of fertility in **Chapter 6**, where we present the results of the study of the transition to second conception. Additionally, we consider the possible selectivity processes in our sample and we introduce an additional model to deal with this issue. We estimate the model for second conception and take into account the transition to first birth. After that we compare the results of our different models and discuss the advantages of controlling for selectivity in the sample.

The comparisons between the results from each transition and the general interpretation in view of our theoretical concepts are presented in **Chapter 7**. We complete the dissertation with a general conclusion.

## Chapter 2

# Demographic developments and theoretical approaches to their explanation

### 2.1 Changes in the demographic situation in Bulgaria after 1989

Bulgaria is situated in South Eastern Europe on the Balkan Peninsula, bordering Romania, Serbia and Montenegro, Macedonia, Greece, and Turkey, as well as the Black Sea to the east (see Figure 2.1).

**Figure 2.1:** Location of Bulgaria in South Eastern Europe

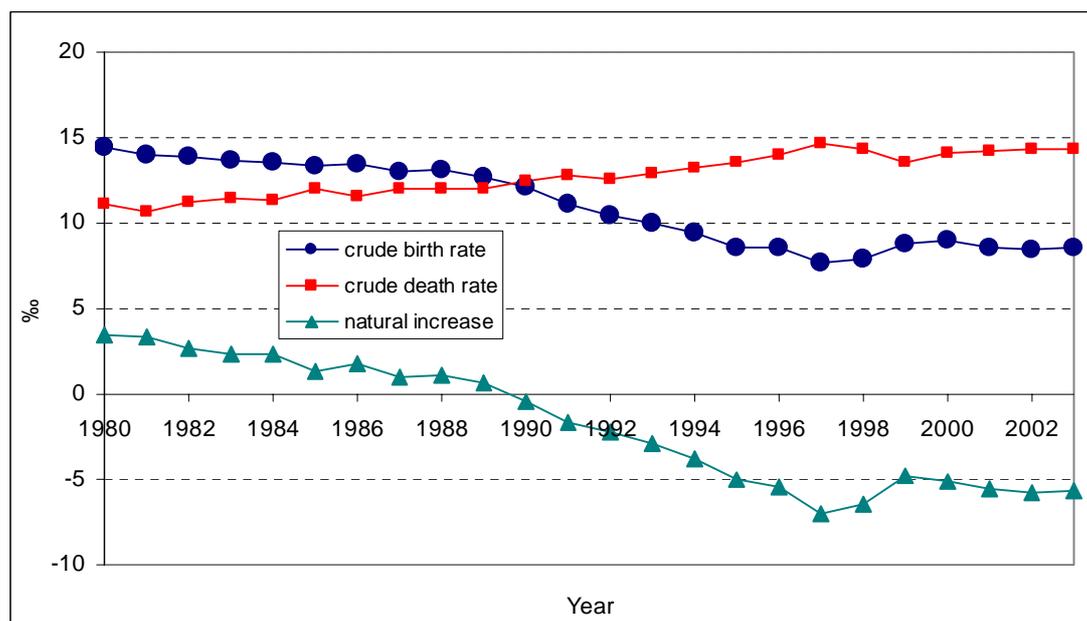


The country's area is 110 910 square kilometers and in 2001 the population was 7 932 984, leading to a population density of 71.5 persons per square kilometer. From 1944 to 1990, Bulgaria belonged to the communist part of Europe with close social and economic ties to the Soviet Union. After the fall of the communism at the

end of 1989, a strong movement toward democratization, modernization and westernization of the society arose.

Additionally, the demographic changes observed in all the Eastern European countries in the last decade have not passed Bulgaria by. In the course of only 15 years (from 1986 till 2001), the population has decreased by one million: the combined result of the negative natural increase and high emigration. According to Kaltchev (2001), the population decrease during the period between the last two censuses in 1992 and 2001 can be split down into a negative natural increase of about 337 000 and a decrease of 221 000 due to emigration. He estimates a loss of about 27 000 people per year due to migration. The natural increase of the population had a negative value for the first time in 1990 (-0.4), and has stayed well below the zero level since then (see Figure 2.2).

**Figure 2.2:** Crude birth rate, crude death rate and crude rate of natural increase, Bulgaria, 1980-2000



Source: NSI, 2003

The drop in the crude birth rate and the rise in the crude death rate had already started in the 1980s, but these changes gathered speed after 1990 reaching values never previously observed in the history of Bulgaria. After 1997 a slight stabilization appears in both birth and death rates, and the natural increase becomes somewhat less

negative. However, the values of these crude rates are very different to the ones observed before the start of the country's transition to a market economy.

Together with the decrease in the size of the population, we can also find changes in the structure by age and ethnic groups. In Table 2.1 we present the ethnic composition of the population in Bulgaria. The data are from the censuses in 1992 and 2001 and provide information for the three main ethnic groups in the country – Bulgarians<sup>1</sup>, Turks and Roma. The rest of the ethnic groups – there are about 25 and they are very small – are gathered in the group “others”. Answering the question about ethnical identity was not compulsory in Census 2001, which explains why an extra column is included in the tables for those who refused to identify themselves or who did not give any answer.

**Table 2.1:** Ethnical composition of the population

	Total	Ethnic group				Does not identify or does not answer
		Bulgarians	Turks	Roma	Other	
<b>2001</b>						
Number (thousands)	7 929	6 655	747	371	69	87
Percent (%)	100.0	83.9	9.4	4.7	0.9	1.1
<b>1992</b>						
Number (thousands)	8 487	7 271	800	313	103	
Percent (%)	100.0	85.7	9.4	3.7	1.2	

Source: NSI, 2002, Census 2001, Census 1992

Although it is difficult to compare the data from the two years, at first glance it is visible that the Bulgarian group has diminished by almost two percentage points while there is a rise in the Roma group of one percentage point. The National Statistical Institute (NSI, 2002) states that the rise in the size of the Roma population is due to the comparatively high birth rate among them. The percentage of those who do not identify themselves and who refuse to give an answer is 1.1 % in 2001, which is probably distributed in the groups for the data from 1992. If we look at the changes

<sup>1</sup> When we make a distinction between the ethnic groups and talk about Bulgarians, we mean the ethnic Bulgarians.

in the size of the population by ethnic group we see that there is a rise only in the Roma group, even though they are known to identify themselves as Bulgarians or Turks.

However, many scientists and experts question the recorded rise of the Roma population. According to some of them (UNDP, 2002, for instance), many organizations, as well as some European researchers, have estimated that the size of the Roma population in Bulgaria is between 600 000 and 750 000 (or 7.6-9.5 % of the whole population): perhaps twice the recorded number. UNDP (2002) reports that according to most of the research, the size of the Roma population has not changed over the last ten years: although they have a high fertility, they also have high mortality rates.

One of the most important tendencies in the Bulgarian demographic situation is the serious drop in the fertility: the total fertility rate remained well below the reproductive level (2.1) for more than 10 years and in 1997 reached the lowest ever observed level in the country of 1.09<sup>2</sup>.

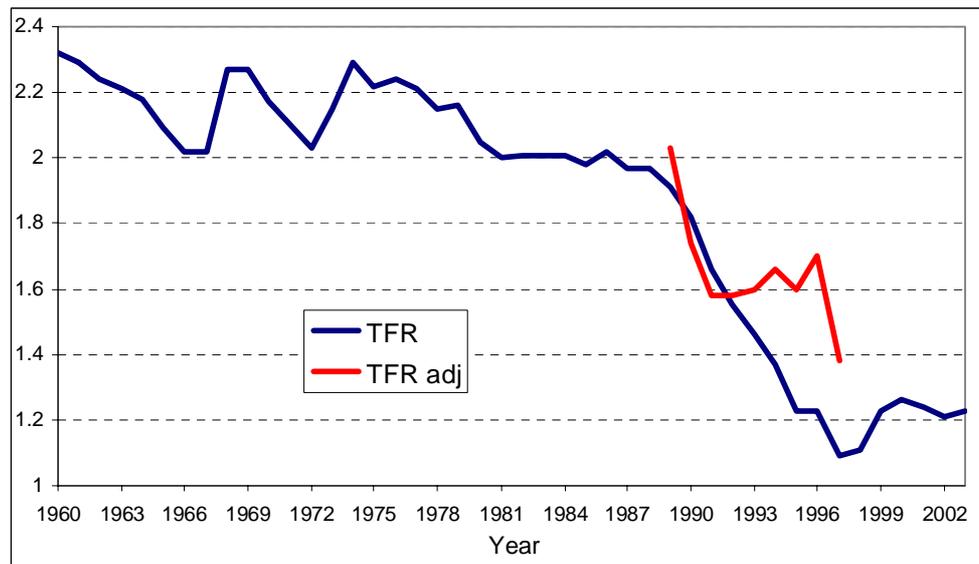
Indeed, Bulgaria belongs to a group of countries identified as having extremely low fertility (lowest-low fertility). The term lowest-low fertility is defined by Kohler, Billari and Ortega (2002) as a TFR level below 1.3. The first countries in Europe to reach this level were Spain and Italy (in 1993), and in 1995 Bulgaria and some other Eastern European countries joined them. The group of the lowest-low fertility countries is constantly growing, reaching 14 in 2001.

The drop in the total fertility rate is due to the drop in the number of children the women have, as well as the postponement of births in time: many young families are delaying their reproduction waiting for “better times” (Kohler and Philipov, 2001). The two authors also estimate an adjusted TFR for Bulgaria, presented in Figure 2.3.

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<sup>2</sup> The total fertility rate is one of the most important measures of fertility. Although it has many disadvantages (Bohgaarts and Feeny, 1998, Kohler and Philipov, 2001) it remains the most suitable measure for international comparisons as it is not influenced by the structure of the population. The total fertility rate measures the average number of children that a woman bears given that she lives until the end of her reproductive age with specific fertility rates remaining those observed at the present period.

**Figure 2.3:** Total fertility rate in Bulgaria for the period 1960 – 2003 and adjusted total fertility rate

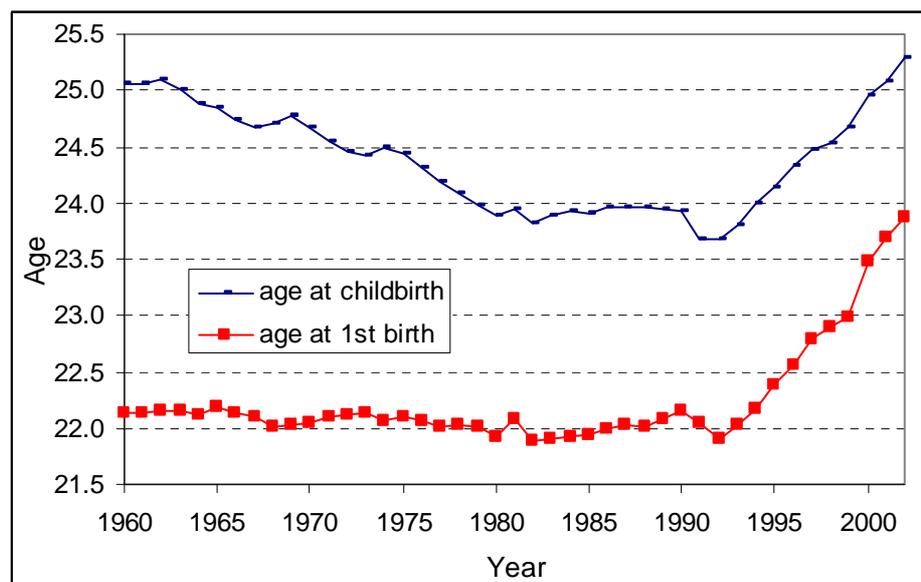


Source: NSI, 2002

According to Kohler and Philipov (*ibid.*), the drop before 1993 is mainly due to the quantum effect, and after that the tempo effect prevails.

Sobotka (2004) conducted another profound study for the postponement of childbearing and the adjustment of the TFR measure. He investigates the trends in a large number of European countries and finds out that none of the countries have an adjusted TFR below 1.4. He argues that the low fertility is mainly due to the increasing age at motherhood and concludes that this phenomenon will fade away once the postponement stops.

The fact that there is a postponement in births is proved also by the data for the mean age at first birth for women. Bulgaria is traditionally a country in which the birth of the first child appeared at a very early age compared to Western countries. For instance, for a very long period (at least from the 1950s), the average age of first birth for women remained at a value around 22. The tendency in the last 10 years has been a gradual increase and in 2001 it already reached the level of 23.8. Of course, together with this, the mean age at birth for women also continues to rise (Figure 2.4).

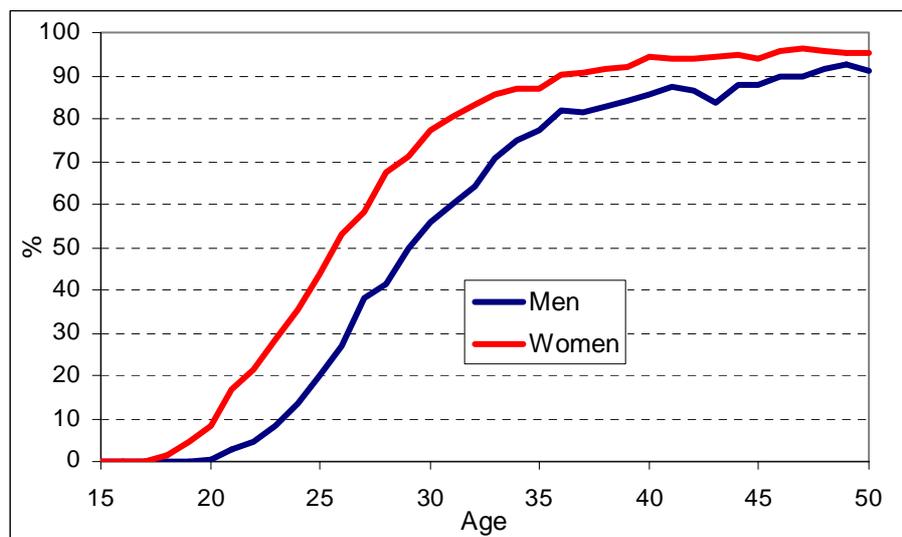
**Figure 2.4:** Mean age at first birth and mean age at birth for women

Source: NSI, 2002

The difference between the two mean ages is smaller for the last year of the observed period. This can be explained by a rise in the percentage of women who stay with one child; in other words, for many women the age at birth and at first birth is one and the same.

There are also changes in the distribution of the population according to marital status. Figure 2.5 depicts data from a 2 % random sample of the Census 2001. In the original data the marital status is divided into four categories: single, married, divorced and widowed. Here, the three last categories are summed up in order to calculate the number who have ever been married. By age 50 about 92-94 % of the population has had a marriage. For women, about 90 % have married by age 36 while for the men this value is reached at age 47. The data from the Census 1992 (Philipov 2000) show that 90 % of the women had been married by age 30 and the men by age 40. This trend clearly shows a process of delay in marriages. Nevertheless, the entering of a marriage remains almost universal for the population in Bulgaria.

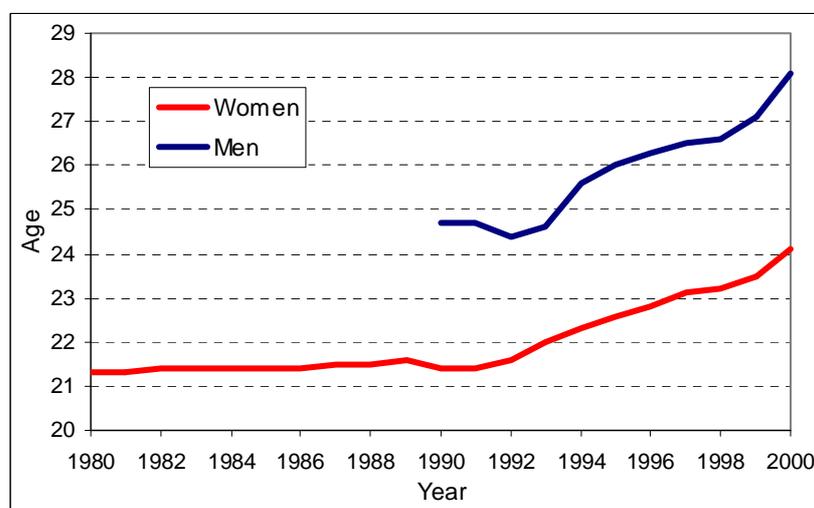
**Figure 2.5:** Distribution of men and women who have ever been married according to age, year 2001



Source: Own calculations from the 2 % sample of Census 2001

Since the 1980s, the number of marriages has also decreased substantially: in 1980 there were 69 729, in 1990 the figure had already decreased to 59 874, and by 2000 there were only 35 164 marriages. Of course, looking at these numbers, one should also bear in mind that the percentage of the population in ages where marriage rates are high has also diminished. Nevertheless, a delay in the marriages can also be observed (Sougareva, 1995). More and more people enter marriage at later ages, compared to the years before. This can be seen from the data for the mean age at entering marriage (Figure 2.6).

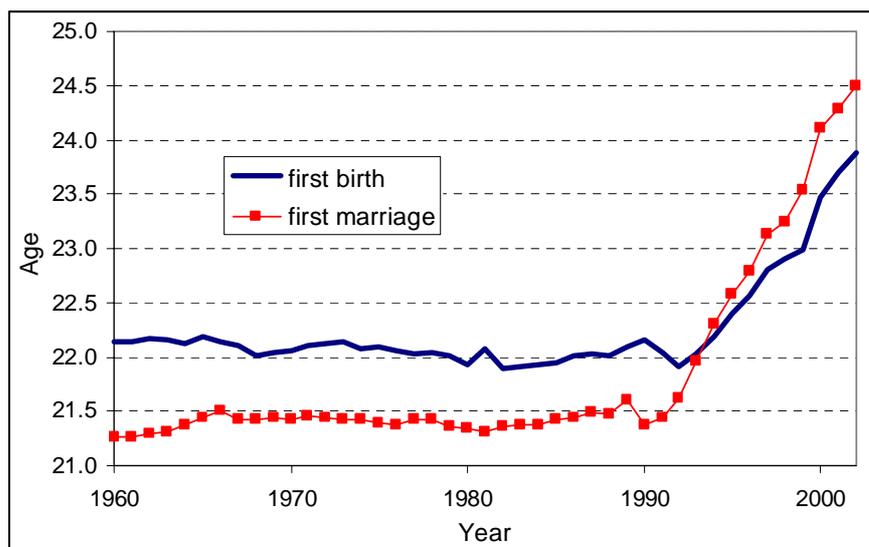
**Figure 2.6:** Mean age at first marriage for men and women



Source: NSI, 2001

In 2000 the mean age at first marriage for men is 28.1 and for women 24.1. The increases in comparison with year 1990 are 3.4 and 2.4 years respectively. After the continuous, relatively stable trend, this increase seems quite extreme and for men it is even stronger than for women.

**Figure 2.7:** Mean age at first birth and first marriage for women for the period 1965 – 2000



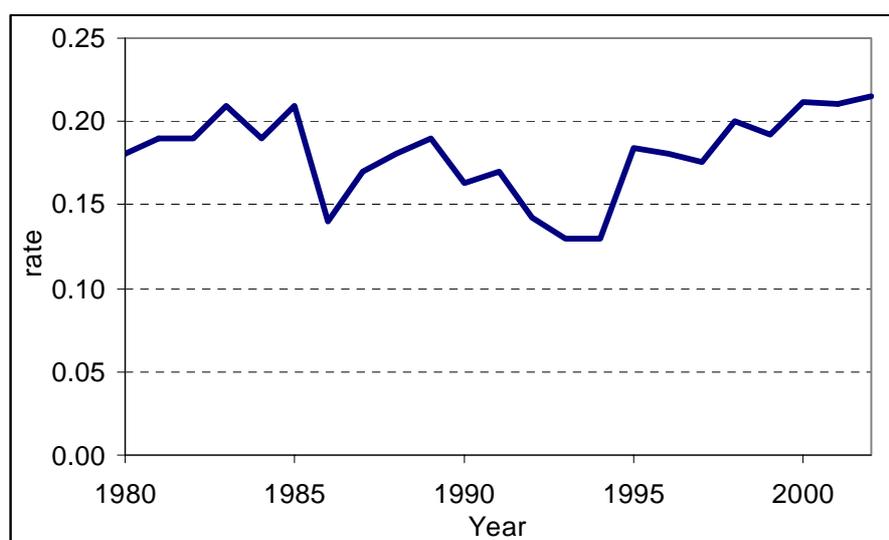
Source: NSI, 2003

The mean ages at first birth and first marriage for women were quite stable until 1990 (Figure 2.7). The mean age at marriage remained at 21.4 years and the mean age at birth 22.0 years. The difference between them was always around 0.6 to 0.8 years. Until 1994 the average age at first marriage had always been lower than the one at first birth. After that the situation reversed and a new phenomena could be observed: the age at first birth is significantly lower than the age at first marriage – in 2000 the difference between them was 0.6 years. Figure 2.7 also reflects another tendency – the drastic increase in births out of wedlock. While in the 1980s approximately every tenth child was born out of marriage, in 2001 42 % were out-of-wedlock births. A similar increase has been observed in all the Eastern European countries, but Bulgaria is one of the leaders in this respect. This process of births outside marriage is closely connected with another new phenomenon – cohabitation. While in Western Europe this model of family has been very popular for decades (van de Kaa, 2003), this is still very new for the countries of the Eastern bloc. In the Bulgarian scientific literature the new terminology of cohabitation is introduced by

Kostova (2000) and defined as the “living together of two people of different genders, in which they live as married people without having an official marriage for various reasons, such as impossibility or unwillingness, temporarily, or in principle”. The latest data show (Belcheva, 2003) that 13.1 % of the population aged 15-59 live together without being married. According to the data of the last Census, the proportion of cohabiting people at ages 15-29 is 17.6 %, at ages 30-44 12.1 %, and at older ages (45-59) it is 10.4 %. Belcheva (2003) also presents the distribution of cohabiting people according to ethnic groups. The Roma population has the highest value (33.7 %), followed by the Turks (16.2 %) and the Bulgarians have the lowest percentage (11.3 %). This is a new tendency of family formation in Bulgaria and this process has not yet been deeply investigated. What we do already know is that the high percentage of out-of-wedlock births “is not necessarily synonymous with children being born outside a family union of some type” (Council of Europe, 2001).

Among the values of the coefficient for divorces we can observe peaks and troughs, but as a whole, with a few exceptions, it stays in the range of 0.15 – 0.20. In addition, a trend can be observed in the increase in divorces from first marriages whilst at the same time there is a decrease in the divorces during the first ten years of the marriages (Council of Europe, 2001, Figure 2.8). According to Zhekova (2000) “the relatively low level of divorces in Bulgaria is due to the still preserved old traditional norms and values regarding marriage and family”.

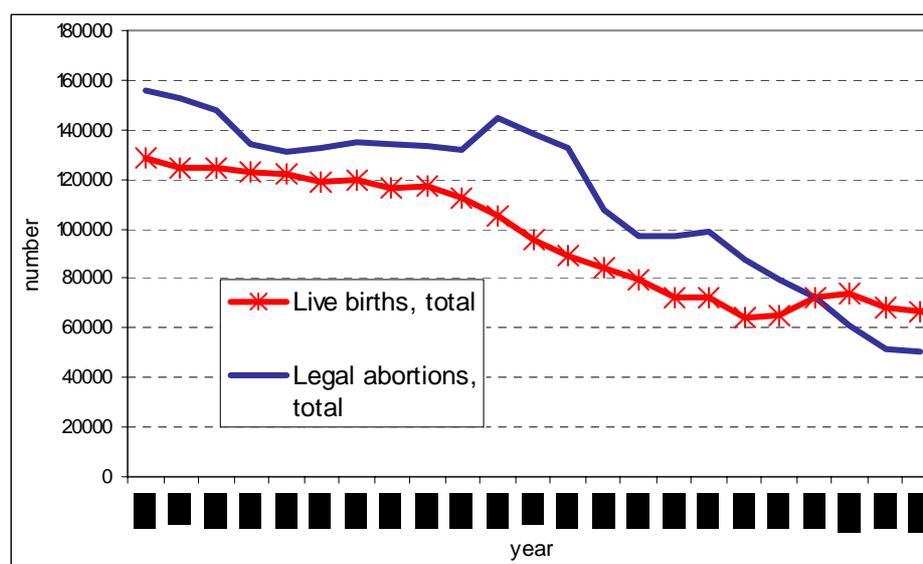
**Figure 2.8:** Total divorce rate for the period 1980 – 1999.



Source: Council of Europe, 2003

A prominent characteristic of Bulgaria is also the high number of legal abortions. However, the data in Figure 2.9 show that the number of abortions has somewhat decreased in the last years and that in 2000, for the first time, abortions do not outnumber live births. Nevertheless, the number of abortions is still at a very high level.

**Figure 2.9:** Number of live births and number of legal abortions for the period 1980 – 2002



Source: Council of Europe, 2003

The abortion rate<sup>3</sup> estimated by the National Statistical Institute (NSI, 2003) also shows a dramatic drop. The value of the rate in 1990 was 69.7, while in 2002 it reached a level of 26.7. For a very long time abortion was one of the most popular means of control for birth and family size, and we can obviously conclude that the use of modern contraceptives is gaining strength, which results in the lower number of abortions. Carlson and Lamb (2001) describe these changes in more detail: according to them a drop in the number of abortions can only be observed in the younger generations living in larger towns. The number of abortions remains high in the small towns and villages.

These tendencies in fertility and family formation patterns in Bulgaria show that the biggest changes have happened since 1990, the start of political and economic

<sup>3</sup> Abortion rate is the ratio between the number of abortions and the average annual number of women at reproductive age (15 to 49 years old). It indicates the average number of abortions per 1 000 women at reproductive age for the respective year (NSI, 2003).

changes in the country. We will now review the most frequently given theoretical explanations of this demographic “upheaval”.

## **2.2 Theories for the explanation of fertility and family dynamics**

Sudden changes in demographic measures have been observed in almost all Eastern European countries in transition to a market economy. Everywhere in these countries we find a drop in the fertility and a rise in the mean ages at first birth and first marriage, although the rate of change varies. Moreover, similar tendencies are not unknown for the countries of Western Europe: similar processes had already been observed for several decades, beginning right after the baby boom in the 1960s. Many theories and empirical studies exist to attempt an explanation for these trends: they include Becker (1991), Easterlin (1987), Oppenheimer (1988), Lesthaeghe (1995), and van de Kaa (1996). In general, these theories can be summarized into two fields – the first one offering predominantly economic reasons for low fertility, the other reflecting more on the role of changing values and norms in a society. We follow the view that economic and ideological explanations complement rather than compete with each other (Lesthaeghe & Surkyn, 1988; Lesthaeghe, 1998).

### ***2.2.1 The economic paradigm in fertility theory***

With the changes that have occurred in the demographic variables in the last decade, a need has emerged for new theories that can explain these changes, generalize them, and analyze them. Many scientists and researchers devote their time to a search for the answers to this problem.

The contemporary economic theory of fertility (the New Home Economics) is mainly connected with the name of Gary Becker (1991). At the foundation of his model lies the statement that children are a special kind of capital goods. They are considered to be durable assets that produce a flow of services in time and that require initial gains and periodical expenditures. Their utility comes from the flow of services that they produce, which in turn produces utility for the parents. One of the economic puzzles in the historical development of the demographic transition was the question of why fertility drops with a rise in income. Becker addressed this problem by

introducing into the model the idea of “quality of child”, and this concept is at the root of all the later theories. The demand of the parents is not connected with the children themselves, but with the services that they receive from the children or the flow of utility those children produce for their parents. The total services from the children can be expressed as being equal to the number of children times the average quality of the child. The quality of the child is elastic with respect to time (this includes education, upbringing and so on), whereas the number (of children) is not. After a rise in income, the demand for children actually also went up. But this demand for services from children (or the utility they produce) is closely connected with the quality of the children. In other words, the demand of the parents is for higher quality of children rather than higher quantity of children.

Also, the effect of economic development on the two genders leads to different results. The improvement of economic possibilities for men leads to earlier family formation, while improved possibilities for women lead to the opposite effect (Becker 1991). The explanation for this is that in Western countries the women’s participation in the labor market has increased, as well as the actual income, and this has led to a higher rise in the price of the intensive in time quality of the child. So, the price of a child has increased and the demand for children in a quantitative respect has decreased.

Applying these general theoretical statements to the case of Bulgaria after 1990, we need to consider some particularities of the Bulgarian society. With respect to the demand for the number and quality of children, we cannot see any major changes through time in the country; both before and after 1990 the majority of young Bulgarians have always hoped for two children (Philipov et al., 2004), and families have always strongly supported and valued the education of their children. There is a point, however, which Becker’s theory could make about the increase of costs for children in Bulgaria after 1990. As the general social security for citizens has clearly diminished with the end of state socialism, and since the state support for parenthood is not very strong anymore, parents may need (and tend) to have less children in order to be able to achieve the same “quality of child” during the difficult transition times.

There is another term from the economic theory which may be relevant for the Bulgarian case and which was introduced by Schultz (1969). According to his concepts of costs and benefits, the time spent for raising children is taken from the ability of the mother to earn additional income or undertake some other (economic)

activities. He names the price that mothers pay for this “opportunity costs” and these are considered to be an important part of the total price of raising children. The price is higher when the society is in a higher stage of economic development. Addressing the difficulties in measuring these costs, Schultz proposes an indirect way: the degree of women’s labor participation could be used as a replacement for the possible income of women and their access to the labor market.

In a society such as Bulgaria, where women have strongly participated in the labor market since the 1960s, this argument of opportunity costs needs to be modified. Since the family policies have not changed much since 1990 (see more details on this in section 2.3.1), we can say that Bulgarian women have always been reimbursed to a great extent for the time that they stayed at home and looked after a child. Thus, the question is one of the relative value of this reimbursement. Compared to the secure life in 1990, women may indeed experience higher opportunity costs since, firstly, they are less certain to receive all the benefits from the private employers and, secondly, the transfer payments received by the state usually do not keep up with the increasing living costs and chances of income in a capitalist economy.

The classical economic theory of Becker has been discussed, developed and criticized by many scientists. According to Pollak and Watkins (1993) any interpretation and development of the theory has to take into account that changes in personal motives make individuals change their behavior in predictable ways. For instance, if the time of the mother is considered to be one of the main investments in the child production, services of children or quality of children, then the model predicts that if there is an increase in women’s salaries (price of time) then we can expect a decrease in the production of children, services of children and quality of children. With the same logic, the model predicts that women who have higher salaries (for instance, those with higher education or human capital) are more prone to have less children. The authors admit that it is difficult to make predictions from these assumptions. For example, higher salaries of women may also have a positive income effect, which can overtake the effect of replacement in such a way that the rise of the salaries of the women can also lead to an increase in the number of children and not a decrease.

Robinson (1997) also outlines other problems that are neither answered nor taken into consideration at all by the economic theory. For instance, he criticizes the theory since it cannot give an exact definition of quality of children and this cannot be

estimated. Moreover, the theoretical model lacks an account of the sex of the children. He argues that in some countries and cultures it is of high importance if the child is masculine, as it is regarded as the continuer of the family. Nevertheless, he concludes that the economic theory for fertility has not still completely opened the doors for fully understanding of fertility, but it still has the chance to do so. These new developments of the economic theory of fertility have not been systematically discussed for the Bulgarian case so far.

The economic theory of marriages and divorces which was developed along the same lines by Becker (1991) and Stigler and Becker (1977)<sup>4</sup>, also follows the economic paradigm of consumer behavior. Their theory assumes rational people that try to maximize their personal utility function by judging the advantages of getting married (or staying married) in comparison to staying outside of marriage (or getting divorced). According to Becker (1991), men with higher income have higher utility from entering a marriage than other men. The reason for this is that men with higher income have better positions on the marriage market. That is why they marry at younger ages and have lower inclination to get divorced. Moreover, they get remarried quicker in the cases where they did divorce.

On the other hand, women with higher income have a lower utility from marriage compared to the other women. The reason for this is that nowadays women have less children and do not gain a high utility from the gender division in the household and family work (Becker, 1991). Because of this, women with higher income should marry in later ages and have higher aptitude of getting divorced. According to Becker (1991) the rise in income has contributed most crucially to the observed changes in family formation in the last decades, including the rise in the divorce rates and the drop in the fertility rates.

For the Bulgarian case during the socialist rule, we suppose that the impact of income on marriage timing as described by the theoretical framework was marginal due to the low income differentials in the country during this period. After the start of the transition towards market economy the labor market changed entirely and the diversity in the salaries increased. As a result, the impact of income on the family formation timing is probably more relevant in the 1990s. It could be that women in leading positions and with a high career development (who supposedly are the ones

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<sup>4</sup> Also termed the “New Home Economics”

with high salaries) postpone union formation to a greater extent. Arguably, these could be the better educated women, who certainly have better positions in the labor market.

Easterlin (1987) claims that one of the most important factors that affect a couple's decision whether and when to get married and raise children is their outlook on supporting their material aspirations. The economic prospects of a couple are formed from two elements – the potential earning power and the material aspirations. The economic prospects depend on the individual's energy, ambitions, education, "connections" and so on, while the material aspirations are largely shaped by the economic circumstances or income of one's parents, or they are adopted from elsewhere during a person's socialization.

Thus, the rise in female income is not the only reason for the fertility drop. It is considered that the level of education is also a factor behind the drop in the marriage rates and the rise of the mean age of marriage. According to Stigler and Becker (1977), the level of education has a twofold effect on the utility of marriage or divorce because a marriage between highly educated persons reduces the labor division between the spouses (thus, reduces the utility from a marriage) and at the same time increases the utility from any other division of labor. For instance, women with a higher level of education have better opportunities of finding a better paid job, which increases the proportion of work time over free time. This means that women have less time and possibilities for work in the household, which lowers the utility of a marriage. On the other hand, the educated spouses "have higher utility from marriage because they possess market and non-market abilities of a high level" (Stigler and Becker 1977).

For the Bulgarian case, the education differentials of women were not that relevant for income levels during state socialism. Additionally, the centrally planned economy tried to achieve a high compatibility between women's employment and childrearing through easily accessible public childcare system. In total, the opportunity costs of foregone earnings while taking care of a child were minimized. During the times of transition to a market economy and the accompanying severe economic crises (see section 2.3.1), the structure of the labor market was completely changed and became more competitive. The degree of education and specialization became more relevant and highly correlated with finding occupational promotion. At the same time, the direct costs of children increased and the state support for raising

children decreased significantly. This is why we consider that the indirect costs (the missing earnings) are much higher during the times of transition to a market economy.

Education can also affect marriages due to a rise in the mean age of entering a marriage (Carlson 1979, Keely 1977). One of the reasons for this is that the utility of entering a marriage while the person is still in the educational system is very low, which can affect divorce rates through the connection between education and age of entering a marriage: studies show that the effect of age at marriage on divorce has a concave curve (Stigler and Becker 1977). Obviously, a high level of education reduces divorces through the reduction of relatively early marriages (Bumpass and Sweet 1972). At this point another important topic requires theoretical consideration, namely the potential interrelations between education, marriage, and fertility. If children increase the price of a divorce (Stigler and Becker 1977), then a higher education level would also increase the possibility of divorce through reducing fertility. In a similar way, a woman's high level of education would also decrease the advantages of entering a marriage because of a reduction in fertility (Becker 1991). Furthermore, it is possible that education is correlated with a third variable, for instance, the preferred time of entering a marriage, and affects the marital status in this way. That is, variables that are unobservable and are only correlated with education can also affect the timing of entering a marriage (Sander 1992). It is still an open question whether or not these interrelations exist for the Bulgarian case.

However, there are opinions that oppose the education hypothesis as a general explanatory factor for a decrease in the number of births. For instance, Easterlin (1987, p.58) provides counter-evidence by pointing out that "the 'advancing education' hypothesis clearly does not stand up to the test of consistency between the baby boom and the baby bust periods". His proof is the observation that from 1940 to 1960 there was an increase in the average number of years that women studied and nevertheless this period was accompanied by a baby boom.

As a whole, we consider that education level plays a significant role in the observed new demographic behavior of women in Bulgaria. In general, women strive for better education for mostly economic reasons, which hinders them from making other life transitions like family formation and childbearing. We provide more arguments for this in section 2.4.2.

A lot of other social and technological factors may still exist that possibly have an influence on the delay in entering a marriage. Some of them are the high

number of young people who go to universities, the unfavorable conditions of the labor market, the use of contraceptives, which reduces the risk of unwanted birth and a consequent marriage, and many other factors. But the most substantial influence on the changes in the model of family formation is, according to Akers (1967), the disproportion in the structure of the population by gender. Migration can lead to such disproportion in the population if it is highly selective by sex. These disproportions come from the absolute differences in the total number of men and women. But, disproportions can appear from the age differences between the typical age in which a woman gets married and that of men (which is traditionally some years higher); the number of women in the standard marital ages can be lower than the number of men who are in the standard age of getting married if there were big fluctuations in fertility about 20 years beforehand. If, for instance, the number of the women is higher, then for most of the women it will take longer time than usual to find a suitable partner, and this would add to the other costs in an economic model. As a result women could delay their entry into marriage with the hope of finding somebody in a suitable age later. Alternatively, they could marry somebody who is not in the most appropriate age, or they might skip the marriage completely. This dilemma that women have when reaching marriage age has been termed “marriage squeeze” (Akers, 1967).

The population structure is also an issue in Bulgaria and its influence should not be neglected. As we already described in section 2.1, the Bulgarian population has undergone substantial changes in structure and size and this inevitably has an impact on the explanation of demographic behavior.

Oppenheimer (1988) also regards the difficulties in finding a suitable marriage partner (searching costs) as a relevant factor for trends and differences in time of entering a marriage. She states that finding an appropriate marriage partner can be done in two different but supplementary ways. In the first case a suitable marriage is formed through a kind of a selection process: the individuals choose each other by means of common or complementary distinctive features that they (or sometimes their parents) appreciate. In the second case, an adaptation or change in the existing features of the one or the both partners is observed in order to improve the quality of the relationship or the marriage. In her theoretical framework, Oppenheimer (1988) criticizes the marriage squeeze theory because it only explains these changes at the time of entering a marriage, which have contrasting effects on the two sexes and cannot explain changes occurring equally for the two genders.

The idea of Oppenheimer is that socio-economic factors have a very important influence on the trends and differences in the timing of entering a marriage and these factors have a high degree of non-prediction. To develop her approach, Oppenheimer (1988) uses the theory of job search: the main idea in this theory is that a certain distribution of the potential job offers exists for each individual who is looking for a job and only a small part of this distribution is “perfectly” suitable. This means that to find the best offer one needs to conduct a long search, which in most cases requires the investment of not a little money. The search can be expensive for other reasons: physical expenses are included here as well as the direct financial expenses for the job search (for instance, transport). Oppenheimer (1988) transforms the theory of job search into a theory of partner search – the search for suitable partners on the marriage market. Of course, there are several differences in these searches that are very important. One of the problems is simply to discover if there actually is a search for marriage partner: by definition, unemployed people are those who are looking for a job, but in the marriage market the situation is quite different. Young people start to date even before they are adults, in most cases in their early teenage years – too early for it to be prudent to consider that they are looking for a marriage partner. To complicate the issue additionally, the partner search is usually combined with other activities – school, work, entertainment activities and so on. Sometimes it is not even necessary to look for a marriage partner but you still find one. In view of these measurement difficulties, the best strategy is not to study whether there is a search for a marriage partner, but to measure the conditions that positively influence or postpone the finding of a marriage partner. This is why our study also expects to find the fundamental factors for marriage and fertility behavior in Bulgaria in socio-economic and socio-cultural factors rather than in the mere population structure.

### ***2.2.2 Theories of ideational and demographic change***

The basis of the theories of ideational change is the proposition that the values and traditions of people change with time. These theories look for an answer as to how these values change and affect fertility by affecting the choice of the people when to have a child or if to have a child at all, when to marry or to marry at all.

The idea of changes in the value system of the societies and their impact on the fertility behavior of the people is most often associated with the notion of a

Second Demographic Transition which was introduced for the first time by Lesthaeghe and van de Kaa (1986). Their theory is based on the observed tendencies in western countries. Lesthaeghe (1995) defines three main periods in the Second Demographic Transition:

- (1) First period (1960-1970): end of high fertility (baby boom), end of early marriages, start of rise in divorces.
- (2) Second period (1970-1985) rise in cohabitation and raising children in cohabitation.
- (3) Third period (1985 till now) divorces remain without a change, rise in after-marriage cohabitation, fertility stays at the same level, higher percentage of births above age of 30 for the women.

According to van de Kaa (1987), the logical consequences of the demographic changes are characterized by four main transitions in Western societies: (1) from the golden ages of marriage to the dawn of cohabitation; (2) from the era of the child-king to the era of parent-kings with a child; (3) from the contraceptive means of pregnancy to getting pregnant according to one's own will; and (4) to pluralistic families and households. These changes in fertility and family formation became possible because of wide range of cultural and value changes that occurred in the 1960s in Western Europe.

It is still unresolved whether this theory also applies to the transition countries of Eastern Europe and to the Bulgarian case in particular. There is some debate on "modernization" and "individualization" of the Bulgarian society in the public media, but there have been no scientific investigations of this so far. Thus, we need to present our own considerations on these issues here. For this it will be helpful to look at concepts and theories that address the question of what the driving forces of the Second Demographic Transition are.

The idea of the Second Demographic Transitions comes from the viewpoint that there are clear differences between the demographic changes in Western countries in the 1950s and those that appear after that. These ideas stem from several theoretical spheres. Shorter (1975), for instance, describes two sexual revolutions: the first one is characterized by the fact that there are changes in the factors for choosing a partner – personal choice becomes more important, based on the attraction and perspectives for good connection and intercourse – and the second sexual revolution is characterized by an increase in the sexual aspect within the partnership as well as

the desire for eroticism. All this leads to an earlier age of first sexual intercourse; sexual satisfaction gains importance and meaning.

Another distinction of two periods is proposed by Westoff and Ryder (1977), who describe changes in the use of contraception. The first period they describe as characterized by the usage of ineffective means of contraception, with the second period being marked by the appearance of effective methods, culminating in the “perfectly contraceptive society”.

Aries (1980) discusses the existence of two periods based on a consideration of the motivation of the parents. According to him, the first period is characterized by the persuasive impingement of the bourgeois family model, in which men are the ones who finance the family and the women are responsible for the household, raising the children, and increasing the standard of life of the family members. In the second period more attention and a greater importance is given to the good relationship between the parents. Children are still very important, but they are not anymore on the top of the value pyramid. This comes from the fact that children are no longer regarded as an obstacle for a divorce between the parents.

It is hardly conceivable though, from our point of view, that these proposed mechanisms contribute much to the understanding of the contemporary Bulgarian reality and to the explanation of changes in fertility and family formation during the last decades. The only aspect that fits is that contraception may have had some impact on the changed behavior of women in Bulgaria. Kotzeva and Kostova (2003) describe in more detail the change in the contraception use of the young generations: a higher use of contraceptives leads to lower number of unwanted pregnancies. In state socialism the Bulgarian population also regulated the number of children and the family size in total, but this was mainly through abortion. Nevertheless, the Bulgarian family was characterized by “nearly universal first birth” and the “two-child family model” (Philipov, 2001).

As far as couple relationships are concerned, the abovementioned concepts also hardly hold. The socialist role model of the “working women” lead to a substantial anti-bourgeois role of women in the family, and no fundamental changes can be observed in this model during recent years. Whether or not the relevance of sexuality and romanticism within couple relationships has increased or not cannot be answered without empirical studies.

What about another prominent line of reasoning concerning the question of a Second Demographic Transition: values? The two most important lines of changes in the values in the West have been described as the processes of secularization and of individualization (Lesthaeghe and Surkyn, 1988). Secularization can be described as a decrease in the belief in the traditional religious foundation; individualization is a way of life in which the individuals follow their own ideas and act according to their own free and independent beliefs. The process of individualization has not been a linear one: peaks and troughs have been observed. In other words, there were periods of belief in the institutions and then de-institutionalization, and periods of supporting the common norms followed by periods characterized by a search for greater individual freedom and tolerance (Lesthaeghe and Surkyn, 1988). According to the same authors, sexual freedom, the societal approval of birth out of marriage, partnership without marriage, and easy divorce are positively contributing to the process of individualization. This can be traced back to a fundamental decline in religious domination of people's lives.

According to Lesthaeghe and Surkyn (1988) the traditional religious beliefs, an individual's religious disposition, trust in the religious institutions, moral, conformism in the socialization, and traditionalism in the marriage all increase with age and, within the same age group, decrease with increasing education. The tolerance to some personal preferences (with respect to abortion or homosexuals), to postmaterialism and leftism, the aims in education, as well as the independence and other qualities for success in life, the deduction of personal content and also sexual freedom – all this is more weakly expressed in the younger age groups and is more inherent to the people with high education.

According to Preston (1986) the value system and its institutional, legal and personal manifestations are among the factors that affect people's behavior. The individuals are constantly pressured to choose and the chosen behavior is more or less compatible with the prevailing value systems. The result from the choice of behavior among the members of a society creates a given model of behavior: if these models are constantly diverting from a given value system, then this system is undermined because its strength is dependent on the public acceptance and motives. The individuals distinguish when a system has lost its influence and according to this they are also changing their behavior. In this way the value system of a group influences individual behavior and individual behavior influences the values of the group.

These concepts pose particularly difficult questions in the case of Bulgaria. Even without reading any empirical study that addresses these issues, we would argue that the Bulgarian society can be described as having strong secularization with little individualization for the time from 1950 until 1990, due to the well-known effects of the socialist regime. After 1990, we observe some tendencies toward ideological pluralization (including de-secularization) and individualization. It is clear that some parts of the society, particularly the younger cohorts, are strongly oriented toward Western experiences and Western lifestyles (and many work or study abroad). However, it is not clear whether this also refers to the private sphere of life, or rather to consumption aspirations alone. Because, on the other hand, the family-orientation of Bulgarians (also the young ones) remains strong and here we can also observe some aspects of re-traditionalization: to name but one example, some parts of society have deliberately turned back towards the Christian Orthodox roots of Bulgarian life and it has become “modern” to attend church services again. This is true mainly for the ethnic Bulgarians. As we describe later in section 2.3.2., the three main ethnic groups in the country have different religions and, thus, any changes in the traditions would inevitably affect ethnic groups in different ways. However, it is questionable how far these changes have an impact on family and fertility behavior as described by the Second Demographic Transition model.

Lesthaeghe and Surkyn (1988) outline two more mechanisms that can lead to changes in the values and aims and thus the preferences of the people, and to us these seem to be more rewarding to look at for the Bulgarian case. The first mechanism refers to the economic growth and its influence on the value changes and needs from “irreducible needs” to “higher order needs”. The second mechanism deals with the role of social stratification and education in the process of cultural transmission (Lesthaeghe and Surkyn 1988). This coincides to some extent with the classical theories of Tarde (1890) and Sorokin (1947) who claim that the cultural changes start from the higher strata in the society as a result of the privileges, education and concentration of means and opportunities; the lower social strata perceive the new preferences through imitation. This adds an additional thought to our considerations on the impact of education on family and fertility behavior in Bulgaria (see the section above). Education can – and has to – be viewed not only as a factor affecting the commodity costs of children, but also as the main carrier for the circulation and spread of new views and values. If there is a Second Demographic Transition in

Bulgaria, one could argue that it should start from the higher education strata of society. As we mentioned above, the increase of the number of women with a higher level of education in Bulgaria after 1990 may have led to the drop in fertility. According to Malhotra (1997), the education effect on the delay in marriage can be equally explained with both types of theories – the economic and ideational changes. The argument for the human capital is that the longer education can contribute to the later marriage through the increased opportunities coming from the higher qualification and the additional abilities. Also, a higher education level can lead to a change in ideas and values, especially those of younger people, because at university they are exposed to new aspirations and ways of thinking, as well as to a broader view of life.

However, education may also affect the “traditional” forms of behavior. In this connection demographic diffusion theories also have an important point to make. The diffusion of ideas, behavior and techniques is often considered to follow the routines established by socio-cultural forces such as language, ethnicity, living quarter, working place, or channels of communication and exchange (de Bruijn, 1999; Bernardi, 2003; Kohler et al., 2001). According to Kirk (1996), diffusion is not only a residual effect, it is an active factor in the increase or decrease of birth control. The fact that an individual or a family accepts or refuses family planning can be explained by the readiness of accepting new changes, and not by socio-economic conditions. In other words, birth control is a group decision rather than the sole decision of an individual or a family (Kirk, 1996).

In these terms, the particular situation of Bulgaria as a multi-ethnic country is relevant. It will be necessary to consider ethnic differences also in family and fertility behavior as the ethnic groups are largely different with respect to religion, language, gender roles, educational attendance, household, and living forms. We talk more about them in section 2.3.2.

To sum up, our study draws on the widely-shared opinion that economic and cultural factors impacting on demographic changes are not mutually exclusive, but operate together (UNECE, 2002). The two types of factors may even be blended and interact with each other.

## **2.3 Description of the economic and cultural situation in Bulgaria in the 1990s**

The theories described above and the studies conducted were originally developed for Western populations. We have tried to indicate their relevance to the Bulgarian situation. Still, in order to be able to investigate the validity for the Bulgarian case of the theories of how economic and value changes impact on fertility and family formation, we need firstly to outline the economic and cultural changes that have occurred in the country, and secondly, to describe the theoretical connection between the macro level indicators and demographic behavior.

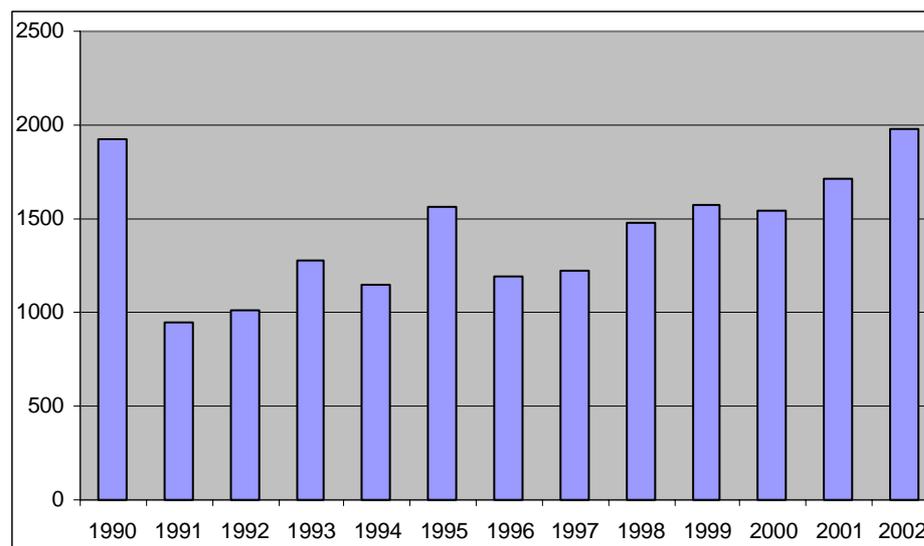
### ***2.3.1 Transition to market economy***

When the communist party came into power in Bulgaria, huge political and economic changes started in the country, which led to the formation of public property, gender equality and rule of the majority. Although the socialist ideology was to create freedom and equality for all people, the ruling party imposed a discriminative social order, which prohibited diversity and violated human rights. The official ideology forbade individualism and introduced collectivism as a norm, which legalized the oppression of minorities and purposefully erased differences in opinions, outlook and behavior amongst the population (Pisankaneva, 2003).

In comparison with most of the other ex-socialist countries, the transition to a market economy in Bulgaria has been more difficult, slower and more painful. Moreover, “it provides a good example of how words (plans and programs) and deeds often remain far apart” (Hekkilä and Kuivalainen, 2003, p.45). Economic crises, high inflation, and devaluation of the income of the population accompanied the changes in the country. For instance at the end of 1996 and beginning of 1997, the country was struck by unprecedented inflation that reached more than 240 %, although only for a few months. In the middle of 1997 the government concluded an agreement with the International Monetary Fund and put the economy under the operation of a currency board, which still continues to operate. This contributed to the financial and economic stabilization of the country, but did not lead to a substantial improvement in the standard of living of the population. The Gross National Domestic Product rose

slightly in recent years but still remains at a very low level. To some extent, the changes in the GDP reflect the tempo, intensity and timing of the reforms: for a period of 10 years it experienced constant ups and downs and it only reached its 1990-level again in 2002 (the results for 2002 are still preliminary ones).

**Figure 2.10:** GDP per person in US dollars



\*preliminary results  
Source: NSI, 2002

Unemployment was an unknown problem in the country in the times before the political and economic changes started. The loss of working places for the economically active population means not only a loss of income but also the impossibility of professional realization and development. In recent years unemployment in the country has remained around the level of 16 %; the highest level was reached in March 2000 – 18.5 %. Unemployment is highest in the younger age groups, where it is twice as high as the average. Nevertheless, there has been a slight decrease in this percentage, too; according to Beleva and Tsanov (2001), however, this is not a result of a higher number of jobs, but rather due to young people withdrawing from the labor market and entering the shadow economy or staying longer in the education system (see Table 2.2).

**Table 2.2:** Unemployment rate by age, 1993 – 1999

Period	Unemployment rate, total	Age		
		15-24 years	25-54 years	55+ years
September '93	21.4	47.0	18.2	20.8
October '94	20.5	44.8	16.8	17.3
October '95	14.7	37.6	11.8	8.6
November '96	13.7	33.4	11.6	7.5
November '97	15.0	35.9	12.7	8.7
November '98	16.0	35.9	13.6	10.8
November '99	17.0	36.0	14.7	10.0

Source: Beleva and Tsanov, 2001

One of the goals of socialism<sup>5</sup> was to put women on an equal social and public level as men. Women were encouraged to participate actively in the labor force, in the communities and in the society. The aim was to put to an end to the capitalist situation in which the women were “confined to private and domestic functions” (Sowards, 1996). The socialist ideology opposed the traditional image of woman and fostered a new role model of the working woman (Pisankaneva 2003). Nonetheless, the high number of employed women and their equal position with men doesn't necessarily mean that the job positions they held were prestigious and well paid. Women under socialism still had a second-class economic status (Sowards, 1996).

The changes in unemployment patterns differed for each gender (Table 2.3). From 1993 to 1997 the unemployment rate for women was higher than that for men. In 1998 and 1999 the rate is higher for men. According to Beleva and Tsanov this is a result of the privatization process which contributed to the reduction of jobs in predominantly male sectors, such as mining, the chemical industry and some other industrial sectors. Women's unemployment was higher in the first period of transition, due to the economic crisis, the process of restructuring and privatizations in industries such as textile, food, clothes and tobacco production.

<sup>5</sup> We want to define more accurately the meaning that we imply in the word socialism here. The term “socialism” was used “to denote the social order created by the communist parties after they came to power. The latter was propagated as a predecessor of the perfect communist state.” (Pisankaneva, 2003, p.1)

**Table 2.3:** Unemployment rate in percent, 1993-1999, according to gender

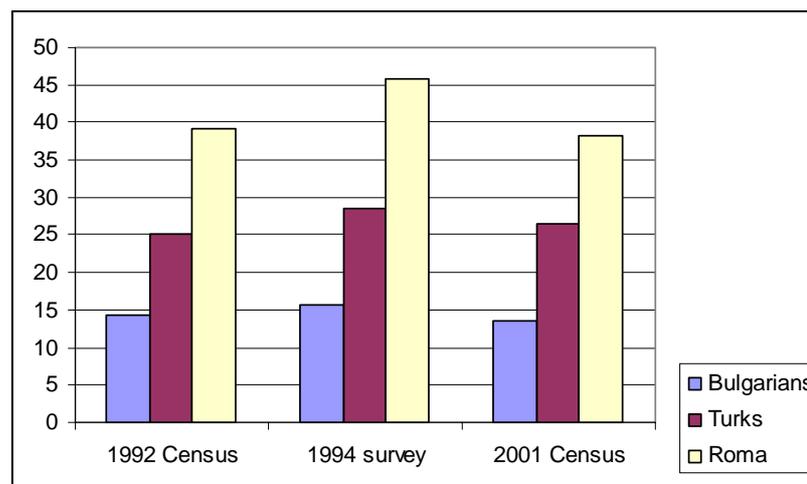
Unemployment rate	1993	1994	1995	1996	1997	1998	1999
Total	21.4	20.5	14.7	13.7	15.0	16.0	17.0
Women	22.0	20.6	15.0	13.8	15.3	15.9	16.8
Men	20.9	20.4	14.4	13.6	14.7	16.1	17.3

Source: Beleva and Tsanov, 2001

The contribution of women's unemployment to the fertility decision in Bulgaria has been discussed by Philipov et al. (2004). According to the authors, women's unemployment could have diverse effects. On the one hand, an unemployed woman could opt for childbearing since she stays at home anyway – this could be the case in families where the husband's income is sufficient for the household. On the other hand, an unemployed woman could prefer to go back to work in order to contribute to the household income or to make a professional career. Since female employment is very high, the authors suggest that it is more likely that the effect of unemployment is in the second direction.

Other researchers have similar opinions. Kovacheva and Pancheva (2003) claim that although the Bulgarian society inherited one of the most developed systems for birth and parental leaves, “the economic crisis pressed parents to stay on in their jobs and it was mostly unemployed mothers that profited from the long parental leave”. Additionally, Stoyanova (1996, cited by Kovacheva and Pancheva, 2003) estimates that in 1994, about 15 % of the mothers did not take their whole two-year paid maternity leave.

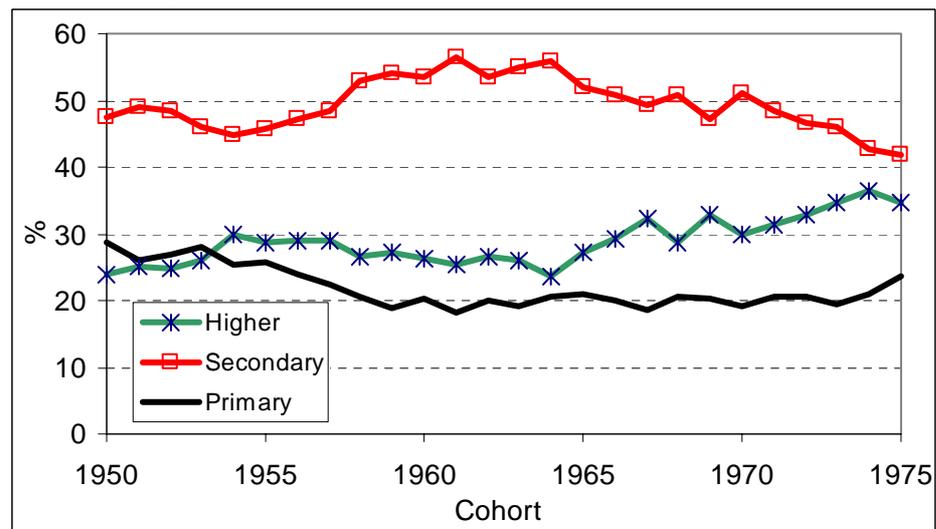
Unemployment has its ethnical dimension too (Figure 2.11). Usually, the Roma population is the one that suffers most from the harsh economic situation. The unemployment rate in this group was never lower than 35 % during the whole of the 1990s. One of the reasons is considered to be the regional settlement patterns of the Turks and Roma population – they live mostly in rural and mountain areas, which were very severely struck by unemployment right from the beginning of the 1990s. Another reason could be the educational desegregation; this would be valid mainly for the Roma group, who most often drop out from school.

**Figure 2.11:** Unemployment rate by ethnic groups

Source: UNDP 1997. The data for Census 2001 are the author's own calculations on the basis of a 2 % representative sample from the Census results.

Women also had access to higher education and universities. In Bulgaria the quotas for students at the universities for men and women are equal – 50 % of the places are appointed for each gender: this absolute gender proportionality applies no matter what the specialization or the faculty is and these quotas are still valid today. Discussions are occurring as to whether this is discriminatory or not. Across the socialist countries, women made up to 45 and 51 % of university students, which is, according to Sowards (1996), a “clear departure from traditional discrimination and under-representation”.

Nevertheless, we can still observe an increase in women's participation in the educational system after 1990. We consider this to be a result of the financial difficulties that most of the people had: as we described above, according to the economic theories, the rise in women's education is connected with the human capital investment in order to assure a better realization in life at a later stage in time. We suppose that this is exactly what can be observed in Bulgaria at the moment. In Figure 2.12 we present the female level of education of several cohorts.

**Figure 2.12:** Women by birth cohorts and level of education

Source: 2 % Census sample, 2001, own calculations

From the women born in the 1950s, 25 % finish higher education, while in cohort 1975 this figure is already 35 % (Figure 2.12)<sup>6</sup>. Parallel to this, the number of women progressing only as far as secondary education is lower – from 48 % in cohort 1950 to 42 % in cohort 1975. Receiving a better education gives better opportunities for achievement in the labor market. A higher level of education supposedly provokes a higher interest of the individual for a working career. From this we expect that the majority of the women would delay family formation including the bearing of children. Women with higher education have a higher probability of finding a better paid job. Higher income, according to the economic theory, leads in turn to higher opportunity costs. This leads to a decrease in the number of children and postponement of birth.

The ethnic groups are also highly segregated by education level. As we explain below, the Roma population most often drops out of school, which lowers the education level they finally achieve. Table 2.4 presents results from the UNDP where the workforce is structured by ethnic group and education level:

<sup>6</sup> A significant increase in the number of women studying in universities is also found in a study by Kotzeva and Kostova (2004)

**Table 2.4:** Education Structure of the Workforce from the Different Ethnic Communities (percentages).

Level	Bulgarians	Turks	Roma
Higher and semi-higher	20.2	2.0	0.9
Secondary	54.0	24.6	7.8
Basic	22.6	55.0	46.2
Elementary	3.0	16.0	36.7
Illiterate	0.2	2.3	8.5

Source: UNDP, 1997

The Roma population mostly has a basic or elementary education. Within this population group, higher education is almost an unknown event. The Turk population also has a high number of people with basic education, but they have more people with secondary education, too. The Bulgarians have the highest overall level education of all the main ethnic groups. About 75 % of this group have secondary or higher education.

The economic crisis in Bulgaria after the start of the transition towards a market economy lead as a whole to a reduction in the number of jobs, higher unemployment rates, and low income. One of the explanations for the low fertility is based on the increased direct expenses of bringing up children, which is a result of the economic crisis (Philipov 2001). The high direct costs of children are a very significant factor for the decision of having a child, since the birth of a child is an irreversible event (Philipov et al. 2004) and thus the costs caused by childbearing have to be covered for a long time to come.

The Bulgarian population has difficulties in satisfying its basic needs, the standard of living for many people became significantly worse, which resulted in poverty and low income. Although the Bulgarian government has still not chosen an official measurement of poverty in Bulgaria, there are many studies that try to give the exact number of people that are living in poverty. According to the United Nations Development Program (UNDP), more than 22 % of the Bulgarian population lived in poverty in 2000. Poverty is higher in the villages and 41 % of the village and 33 % of the town population lives in poverty. The poverty has an ethnic dimension too – it is higher in the Roma and Turk populations in Bulgaria. More than 40 % of the Bulgarian Turks and 84 % of the Roma live in poverty, according to UNDP (2002). Data from NSI (2002) shows that the percentage of the whole consumption expenditures of the households made up by food expenditure was 45 % in 2001. For

comparison, in the countries of the European Union, expenditures for food comprise 10-14 % of all monetary expenditures. Data from the NSI survey conducted in May 2000 show exactly the financial problems that the population faces (Table 2.5).

**Table 2.5:** Perceived difficulties in satisfying basic needs, 2000

Basic needs	No	Yes, seldom	Yes, often	Yes, almost always
Food	25.7	27.7	29.9	16.7
Clothes and shoes	7.7	16.1	30.7	45.5
Heating	14.7	18.1	28.9	38.3
Health services	16.4	20.8	31.5	31.3
Education	64.7	9.8	10.7	14.8
Housing	9.9	14.1	28.7	47.3
Furnishing	11.0	8.9	18.3	61.8
Vacation	5.9	5.7	13.5	74.9

Source: NSI, 2000

Apparently, the problems with satisfying the basic needs affect the larger part of the population. Only 26 % of the households say that they don't have difficulties in providing food, while 46 % say they experience such difficulties often or almost always. The biggest difficulties are experienced in providing resources for vacation (84 % have this problem often or almost always), housing, furnishing and clothing. Although the survey does not specifically include the difficulties concerning bringing up a child, the fact that the parents have financial problems is a determinative factor for satisfying the needs of the children, and when the parents experience difficulties, this reflects invariably on the needs of children.

Several authors have already pointed out (Galor and Weil, 2000; UNECE, 2000) that in a modern society the birth of a child is the easiest way to decrease the well-being of the household and its members. Children require long term financial investments, which for many people in Central and Eastern Europe are increasingly difficult, sometimes impossible. By restricting their fertility, families aim at protecting themselves from having to lower their standard of life. Macura (2000) points out that such a behavior is actually highly rational from the economic point of view. Likewise, according to Conrad, Lechner and Werner (1996), the decreased fertility in East Germany is to a large extent due to the unfavorable economic

situation, the high expenditures for raising a child, and the uncertainty regarding the future which people feel. They introduce a new term “freezing”, which they define as a temporary moratorium from getting married and giving birth to a child. What looks like an (irrational) shock reaction at first glance is actually a rational answer: it helps young people to gain some time to adapt their life plans to the requirements of the new situation. Speder (2003) also points out the rational behavior of people when examining the impact of economic factors on fertility in Hungary. He states that people in a disadvantaged situation may be less rational in their behavior. These are often people with lower education.

Another feature of the economies of the ex-socialist countries is the high uncertainty for the future that the population faces. This issue has received a lot of attention in the scientific literature (Ranjan, 1999; Bhaumik and Nugent, 2002; Philipov, 2002). According to Billari and Philipov (2003), during the socialist time there was less uncertainty thanks to the lack of unemployment and this led to earlier marriage, as people could easily plan and foresee much of their life. The recent uncertainty about the future could be a factor influencing people to postpone or forego major life commitments, especially when they require higher price investments (Sobotka 2002). Kreyenfeld (2004) states that the labor certainty (employment) in the socialist countries would assume that women initiate childbearing after finishing university education, before their labor market entry. We assume that this situation changed after 1990. Women, especially those with higher education (who we regard as more ambitious), would try first to achieve a good position in the labor market with stable employment prospects, and then start with their childbearing career. This would lead to a delay in the entry into motherhood, since the settlement into a stable job position can take some time.

There is another aspect to economic uncertainty. Many of the private enterprises that emerged after 1990 did not grant labor contracts for some periods in time. This was done due to different reasons: hiding taxes, being in the shadow economy, or something else. A survey was conducted by Yachkova (1997, cited by Kovacheva and Pancheva, 2003), where she discovers that in the age range 21-30, more than three quarters of women have worked without a work contract. This fact makes women very vulnerable to “receive no protection in risks of pregnancy and motherhood”.

Additionally, it could be that the economic uncertainty has had differing impacts through the years – sometimes it is stronger, sometimes weaker. Bhaumik and Nugent (2002) find such impact on the decision to bear children in the case of East Germany.

In almost all the studies in Bulgaria investigating the fertility behavior, the economic situation is considered to be one of the crucial factors that contribute to the drop in fertility. According to Zhekova (2001), the economic reasons for this are not primarily the direct rise in expenditures, but rather the limitation of the professional and social mobility of the parents that having a child means: the potential parents prefer to stay flexible, rather than settling down and having a(nother) child.

Together with the economic changes in the country, changes have also occurred in the political aspect, in particular in family policies<sup>7</sup>. Until 1989, the policy of the government was strongly pronatalistic and a decree of birth incentive was introduced (this decree was in place until 2002, although under different conditions). Every citizen of the country who was 21 years old and did not have a child (own or adopted) had to pay a “bachelor tax” of 5 % of their income. A temporary release from the tax was granted to people who married (for the first 3 years of marriage). The tax rate also rose with age, reaching 15 % for people above age 35. The birth incentive was oriented mostly to 2<sup>nd</sup> and 3<sup>rd</sup> children – the child allowance increased until the third child, and then decreased like a value. The women were entitled to maternity leave of 135 days, 45 of which could be taken before the birth. In addition, mothers had the right to use a paid vacation for 2 years for the care of the child which could be taken over from the father or from one of the parent’s parents. On request, the woman or the person who took care of the child could take one additional year of unpaid vacation until the child was 3 years old. The time spent in paid and unpaid vacations is considered to be a working practice and contributed to the mother’s pension. Additionally, mother’s work place was preserved for this time.

The policies concerning maternity leave in Bulgaria are very liberal regarding the persons who have the right to take such a leave. According to Kovacheva and Pancheva (2003), Bulgaria is probably the only country where parental leave could and still can be taken from the third generation – not only from the mother or the father, but also from one of their parents.

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<sup>7</sup> For a detailed overview of the family policies in Bulgaria, see Kovacheva and Pancheva, (2003) and Todorova (2000).

In the years before 1990 kindergartens and crèches were very widespread as it was a part of the policy for integrating women into the labor market and, thus, providing additional public facilities. After the change of regime in the country, the number of places in kindergartens and crèches decreased, but not as drastically as in other countries in the region (Kovacheva and Pancheva, 2003). The decrease is more a response to the decreasing number of children of these ages and thus an attempt to avoid creating surpluses in the places available. Additionally, the parents' payment for the kindergartens is also rising, although kindergartens are still subsidized by the state, the local budget, sponsorships and so on.

The right for abortion in Bulgaria was recognized comparatively early – in 1957. It was more connected to the act of equalization of the rights of men and women. However, this right was restricted in 1973 in order to stimulate the growth of birth rates. In parallel with the right of abortion, the state was reluctant to facilitate access to mass contraception (Todorova, 2000). This resulted in increase of of abortions and establishment of specific social norms in the area of the family and reproduction. For example, the public tolerates voluntary abortion much better than divorce (Todorova, 2000).

Housing support for the family was never well developed in Bulgaria (Kovacheva and Pancheva, 2003) in contrast to some other ex-socialist countries. In the state-socialism young families had the right to receive bank loans for longer periods and lower interest rates. However, “there were insufficient flats to be bought in the cities and families signed up long waiting lists” (Kovacheva and Pancheva, 2003). Young families in villages most often managed in their own building family houses. With the transition towards market economy, the housing market started a slow development, but the state programs for support of young families were given up (Kovacheva and Pancheva, 2003).

After 1990 most of the acquisitions that were gained through the pronatalistic policy remained valid<sup>8</sup>, the only difference is the canceling of the bachelor tax. But although the child allowance and the birth payments still exist, they have lost their value because their nominal value was not changed and the high inflation largely reduced their real value. In 2002 the child payments were updated, but they still

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<sup>8</sup> We account only for the changes till year 2002, as our study is focused only until this period of time.

remained very low and cannot be used or considered as a birth incentive anymore (they have a value of approximately € 9 per month).

As a whole, social security benefits are very low, income has dropped and new poverty has hit many households. The economic development and changes in Bulgaria have characteristics and a dimension different from those in the Western countries. We cannot talk about a stable market economy or a normal market of goods, services, labor. Good times change with bad times; prosperity and crises take turns. The economic transition is painful, accompanied by harsh crises, high inflation, bankruptcy of companies, corruption, an inadequate and unreliable law system, and weak social policy (Genov, 1998).

### ***2.3.2 Cultural and ideational change***

Together with the economic and political changes in Bulgaria, many changes in the social norms in society have also occurred. The ideals of the people changed with the social standards. This kind of changes in people's way of life and norms occur in a different way and a different speed compared to the political ones: the people's thinking and their preferences change slowly, but surely.

Unfortunately, there are only very few empirical studies that deal with the value changes in Bulgaria and their impact on fertility and family formation patterns. When we find such studies at all, most of them deal with Bulgaria only in comparison to other ex-communist countries (Philipov, 2001), or they cover Bulgaria grouped together with several other countries from the Eastern European region and the results are given for the region and not separately for the countries (UNECE, 2002; Sobotka, 2002). It is therefore not possible to get a specific picture of the real changes in the country: it is only possible for the whole region. Nonetheless, we want to mention some interesting findings from the existing literature and discuss them with respect to values and their impact on the fertility and marriage trends.

The process of change in social norms and values for the Bulgarian population that appeared after the start of the transition is quite different from the one observed in Western Europe in the 1960s. One of the basic differences, for instance, is the lack of secularization. While in Western Europe this process resulted from the rise of free and democratic movements, in the state-socialist Bulgaria atheism was imposed by the government of that time (Philipov, 2001). Neither during the time of communist

regime nor afterwards had the church a strong impact on the determination of norms, values and behavior of the people. Thus, we cannot say that a part of the process of the value changes in the Bulgarian society comes from the disbelief in religious foundations, as was the case in Western Europe.

Another difference in the value changes in the eastern European countries compared to western ones is the rising female autonomy, coming from the higher participation of women on the labor market. In Bulgaria, women have been integrated to a much higher degree in the labor market; in fact, the female labor force participation was already implemented by the planning system of the totalitarian regime (Philipov et al., 2004). The cases when a woman does not work and is responsible only for the household and raising of the children were very rare in the communist times. This again implies that this status of women was not achieved through value changes, but through the specifics of the communist regime (Philipov, 2001). Socialism provided, apart from education and jobs for the women, child-care centers, communal kitchens and household conveniences in order to free the women from most of the household obligations (Sowards, 1996). But although the women always worked as much as the men, the distribution of the work within the household was still mainly traditional – usually the woman was the one who did most of the work concerning the family and the children.

However, other aspects of the ideational shifts, such as individualization and tolerance of new forms of behavior, started to establish after 1990 (Philipov et al., 2004). One of the main characteristics of the communist rule was the strong control of people's behavior and social norms. Instead of having freedom of expression and association, socialist citizens were “subjected to an authoritarian regime that restricted all personal freedoms and enforced uniform individualities” (Pisankaneva, 2003, p.1). After 1990, the new freedoms also included the ability to choose from a growing number of alternative life styles (UNECE, 2000). These alternative ways generally imply moving away from traditional lifestyles, that is marriage and children, and avoiding the long-term commitments that they require. A similar statement is made by UNECE (2002) about the changing lifestyles of young people in the Eastern European countries. They report that “there is a substantial rise in the number of women who do not need children for life fulfillment, who regard marriage as an outdated institution, and who consider that motherhood for women without a partner or husband is acceptable” (p. 215). Sobotka (2003) also investigates the changing preferences of the

people, mostly coming from the new consumer societies. He also finds that the growing consumerism is actually very closely related with the increase in individualism, the lack of long-term commitments, as well as the rising importance of leisure time. This statement also implies avoidance of the traditional lifestyles and later family formation.

Another aspect of the changing society after 1990 is the appearance of many deviant behaviors, among them corruption and the crime, which UNECE (2000) highlights as having spread in the Eastern European countries. The awareness of the existence of such behavior lowers the confidence of people in their society and its future, and affects their desire for children in a negative way. Philipov et al. (2004) also takes into account the appearance of anomie in these countries. According to them, the spread of the new norms and values that gradually replace the old ones, makes people lose orientation and avoid making plans for the future. As a result there is a quick diffusion of postponement of childbearing, or even childlessness. Genov (1998) also conducts a profound study on the impact of anomie on the quality of life in Bulgaria. According to him, the cure for this situation is cultural and institutional innovation.

Another important effect of the social changes in the ex-socialist countries is the spread of higher education. It is considered that the increased education for women has also helped the spread of the new forms of family formation and demographic behavior (UNECE, 2000). Sobotka (2003) also states that “in the post-communist countries, university students are often the pioneers of ‘libertarian culture’ and the new forms of behavior, such as cohabitation and living-apart-together relationships” (p.709). Additionally, the behavior of the more highly educated women differs also with respect to career orientation and other interests that are not connected with the family, and as a result they have less children.

Another factor behind the changes in the social norms and behavior is the penetration through imitation of the “western style of life” (van de Kaa, 2003). After the fall of the Berlin Wall many “western cultures” came into the country that were easily accepted by the younger generations (mainly). This had an effect on the people’s preferences and their perceptions of style of life, and a process of individualization and independence appeared. All this has an impact on the fertility behavior of the population: the models of family formation are changing; sexual freedom is increasing; and the demand for children is decreasing.

Of course, together with all the changes in the social norms, a contribution to the lower fertility is made by the higher use of contraceptives. As we described in section 2.1, together with the decline in number of births there is a decline in the number of legal abortions in Bulgaria. According to Sobotka (2003), in most of the Eastern European countries delayed ‘contraceptive and sexual revolutions’ have taken place since 1990. The use of better contraceptives reduces the number of unwanted births and contributes to the better planning of the timing of the births, which inevitably results in delay of childbearing.

An important distinction that we have to make when describing the changing values in the Bulgarian society is the behavior of the main ethnic groups in Bulgaria. Also the attitude towards the different ethnicities and the freedom of the ethnic groups was very different during state-socialism and the following developments. Many of the ethnic groups suffered under the politics of the communist party. The communist leaders declared Bulgaria to be a “one nation state” and undertook various attempts to assimilate the ethnic groups (Ilieva, 2003). The biggest process, which aimed to rename all the ethnic Turks took place in 1984-85 and is known as the “Revival Process”<sup>9</sup>: this process was conducted forcibly, though not many of the Bulgarians were aware of that fact. Later, after 1989, much of the violence was revealed. The renaming of the Muslim population was done with the help of the State Security Service, the People’s Militia, the Red Barrettes and the army. At this time, every kind of data regarding ethnicity was secret and forbidden to be published. That is why, in practice, there was no research on the ethnical differences in demographic indicators in Bulgaria. Very little is known about the behavior of the major ethnic groups in the country at this time.

After the fall of the Berlin Wall, the new democratic regime restored the rights of the minorities<sup>10</sup>. The new elite tried to rebalance the political system and to remedy the errors of the communist regimes and granted the minorities a major role in the process of transition towards democracy and market economy (Koppa, 1999). The greater religious freedom and the restoration of a multi-party system in Bulgaria made it possible for the ethnic Turks to have their own party (Ilieva, 2003).

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<sup>9</sup> The Revival process was based on the assumption of the communist leaders that “all the Muslims in Bulgaria are Bulgarians who adopted Islam during the Ottoman Rule and need an ‘awakening’ to their true national consciousness and identity” (Ilieva, 2003).

<sup>10</sup> For a detailed description of the ethnic situation after 1990 in Bulgaria, see Vassilev (2002).

At this point we would like to offer a short description of the three main ethnic groups in Bulgaria. The *Bulgarians* (which make up about 80 % of the population) are formally orthodox: although atheism was propagated during the communist regime, most of their traditions and customs stem nonetheless from the Orthodox Church. The illiteracy in the Bulgarian population is very low and a large percentage finish higher education. The leading positions in the economy are mostly occupied by Bulgarians. Many Bulgarians are affected by the high unemployment rates, but they have the lowest unemployment compared to the other ethnic groups (Figure 2.11). Women in the Bulgarian society have equal rights to men and it is not exceptional that the leading positions are also held by women. The Bulgarians regard good education as one of the major aims for the bringing up of their children; the ideas that have been termed the “quality of children” are important objectives for them. Also, the Bulgarians are strong adopters of the new “western” styles coming to the country, including western music, films and culture.

The second big ethnic group in Bulgaria, the *Turks* (about 10 % of the population), are predominantly Muslim<sup>11</sup>. They are usually more religious than the ethnic Bulgarians. A major part of the Turkish population is concentrated in villages and small towns, and their main occupation is agriculture. In the socialist times they were more suppressed and did not have high positions in the labor market. Nevertheless, they have always taken advantage of the educational possibilities and their illiteracy rate is low. The gender roles are very traditional, with the man as the representative of the family and the woman dealing mainly with the household work.

The group of the *Roma* (European gypsies) is the smallest of the three main groups (about 6 to 8 % of the population)<sup>12</sup>. Their culture and traditions are different from the other two ethnic groups. Traditionally, that is, in the case of Bulgaria, before 1946, the Roma were mainly craftsmen and they wandered from area to area, settling down in one place only for the winter (semi-nomadic behavior). During socialist times they were forced to settle down and were engaged mainly in factory work (as low-qualified workers) and agriculture. After the start of the transition in the country,

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<sup>11</sup> There are several detailed articles dealing with the Muslim culture and Muslim minorities in Bulgaria, for instance Gradeva and Ivanova (2001) and Zhelyazkova (2001).

<sup>12</sup> The size of the Roma population in Bulgaria has been estimated by different organizations and institutions and their estimates vary greatly. For instance, according to the NSI data from the Census (NSI, 2003) the Roma make up 4.7 % of the population, while an estimate from the World Bank ([www.web.worldbank.org](http://www.web.worldbank.org)) states 8-12 %. However, more moderate estimates remain in the range 6-8 %. For more information on this issue see also Pamporov (2005).

they slowly began returning to their old life-styles and traditions (Pamporov 2003). However, they are most strongly affected by the economic crisis and high unemployment rates. A high percentage of the Roma population is illiterate, which hinders them from finding a good job. The Roma population does not put pressure on its students to finish school, and as a consequence many drop out early, which increases the tendency to marry and have children early (Federal Research Division of the Library of Congress, 1991). In addition to suffering from poverty and lack of competitiveness on the labor market, the Roma population is affected by prejudice against them throughout the modern history of Bulgaria (Zhelyazkova 2001).

The scientific literature still lacks a profound study of the demographic behavior of the different ethnic groups in Bulgaria. Philipov (2001) studied the demographic tendencies in Bulgaria differentiated by ethnic groups and concludes that when talking about a second demographic transition, we can talk only for the Bulgarian ethnic group.

The process of change of social and individual norms is difficult to measure. Nevertheless, there are some studies that can prove or disprove the existence of the changing norms in the society. One of them is the Time Use Survey, which was a part of the Census program in March 2001. According to the results of this survey, the women are the ones who invest more time in maintenance of the household – this includes cooking, dishwashing, cleaning, shopping, taking care of the children and so on. Women spend on average 4.5 hours daily on such activities, while men spend 2.5 hours on them. These results imply that the traditional household division of labor still prevails.

A proof for the changes in the value norms, however, is the higher number of people who cohabit. Preston (1986) cites some surveys that prove that such a tendency reflects not only the preferences of the people and the derival of benefits but also shows that there is a broad diffusion of social approval and acceptance of this phenomenon by the society. As we described before, there has been a drastic increase in out-of-wedlock births. They reached 42 % in 2001 – almost every second child is born out of marriage. The availability of such a high number of out-of-marriage births shows that the social norms regarding the family formation patterns and the pressure of conducting a marriage when the woman is pregnant are fading away and losing their importance.

Additionally, a UNECE study (2002), for instance, points out that in Bulgaria the number of cohabiting young adults is still very low. But those people who cohabit bear certain characteristics that are regarded as more free and consisting of less traditional ideas. UNECE describes the childless cohabitants in Eastern Europe as having “a higher propensity to protest, postmaterialism, expressive work, and socialization values” (ibid., p.212) and a higher orientation towards companionship than the people who have never cohabited. Moreover, the people who give birth to children in cohabitation even have some additional characteristics. They are associated with “secularism, distrust of institutions, a propensity to protest, an accentuation of expressive values, and a lowering of standards in matters of civil morality”, as well as “a low level of national pride and weaker local identification” (ibid., p.212). Cohabiting people with or without children are similar in some of their attitudes and values to the cohabiting people in Western Europe, but also differ greatly in some other characteristics.

UNECE also points out that parents who live or have lived in consensual unions in Eastern Europe are not necessarily characterized with “a reduction in their overall degree of non-conformism, nor with a correction in their attitudes towards civil morality in particular” (ibid., p. 213). The authors of the study (R. Lesthaeghe and J. Surkyn) conclude that the group of cohabiting people in the eastern part of Europe consists “more of respondents with complex and perturbed partnerships and marital histories than in western and central Europe” (ibid., p. 213)<sup>13</sup>.

Sobotka (2002) makes a distinction between the Eastern countries according to their main religion. In this comparison he finds out that in the 1990s the Christian Orthodox regions had considerably higher fertility rates among teenage women and the lowest fertility rates of older women; that is, they had an earlier fertility pattern compared with the other countries in the region. He also makes a distinction between the countries with Orthodox religion and separates them into two groups – a “traditional” group (Belarus, Moldova, Ukraine) and a more “modern” one (Bulgaria, Romania, Russia). According to him, the gap between these groups with respect to non-marital births is enlarging and differences increasing. However, it is very difficult

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<sup>13</sup> UNECE (2002) also weighs the impact of the economic and ideational factors of demographic behavior against each other. The authors state that both types of factors have a different force and their effect on the demographic changes is changing with time. Their statement is that if the economic crisis has the bigger influence in Eastern Europe, it could be that after the transitional recession the value

to ascertain the influence of the Orthodox religion on the changing fertility and family patterns. In the countries with other religious orientations the influence of the religion seems more straightforward and visible. Nevertheless, Sobotka (2002, p.64) states that the “relatively intensive increase in the proportion of non-marital births in the Christian Orthodox countries is not compensated by cohabitation and most non-marital children are born to single mothers”.

Philipov (2001) presents data from some ex-socialist countries on the ideal number of children that people consider as appropriate to be in one family. From the data for Bulgaria, a tendency of changing preferences and demand for children can be clearly seen. In 1990 the respondents in ages 20-30 answered that their ideal number of children is 2.19 children per family. In the period 1995-1997 this number was already 1.99. The data from the survey “Study of natality and reproductive behavior” in 2001 show that the average number of children that the people in the same age group consider to be ideal was 1.86. Obviously more and more young people consider that it is better to take care of one child rather than two children. Zhekova (2001) also points out that there are changes in people’s reproductive behavior. She asserts that a new category of people is formed who do not want to form a family and have children at all. The data show that 3 % of the young adults do not want to have any children, which is still a low number compared to most western countries, but proves the emergence of such a group. Additionally, a recent study (Kotzeva and Kostova, 2003) also shows a change in the sexual behavior of young people in Bulgaria. The most important aspect of it is the drop in the age of first sexual intercourse, which can be associated with the changes in the sexual norms in the society after 1989.

As a whole, scientists agree that the second demographic transition has reached the countries of Eastern Europe. Van de Kaa (2003) states that Bulgaria and Romania will quickly start to move along the road of the demographic transition, though a further decline of the fertility in these regions can still be expected. UNECE (2002) also concludes that the new patterns of household formations are establishing in Eastern Europe, though in terms of actual behavior these countries still “have not reached the ‘take-off phase’” (ibid., p. 216). Further diffusion of the second demographic transition will be not a surprise.

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changes start to play a bigger role (have more importance). This would mean that when the economic situation is improved, this would not necessarily lead to recuperation of the old demographic values.

## 2.4 Research questions of the study

As we saw in section 2.3, the societal upheaval in Bulgaria has elements of both an economic crisis and a cultural transformation. There is good reason to believe that *both* elements have exerted an impact on childbearing and family formation behavior since 1990. As we saw in the previous sub-chapters, there is some debate about these issues among Bulgarian and other scholars; however, investigations using *individual level data*, let alone contemporary *time-to-event* methods in order to investigate demographic behavior are still missing. Our study intends to fill this gap and subjects economic and ideational explanations of individual behavior to an empirical test using the behavior of individuals as the unit of analysis.

In order to have a better structure for our research questions, we segregate them into several different topics, which are the most relevant for our study. For each of them, we will shortly summarize the most important assumptions from the theories and formulate our research questions.

### 2.4.1 *The impact of the societal transition on fertility and family formation*

The first and only “macro” indicator we observe in order to trace the changes in the Bulgarian fertility and family formation is calendar time. It is essential for our analyses to compare the different economic, political and societal settings in the period before and after the transition of the country on a macro level. Other factors that impact upon childbearing and family formation may have a different meaning and strength according to calendar time. Therefore, we need to keep an eye on various interactions of covariates with time. In the following, we outline the expected interaction effects.

During the socialist regime the almost universal prevalence of the two-child family model, for instance, implied that factors like education and social background did not play a substantial role in fertility decisions and their timing. The homogeneity of social life as well as the dominant strong social norms can be regarded as some of the reasons for the observed uniformity in the fertility patterns. After the transition in the country, the rise of democracy gave access to different options in life and the actors today have (and seize) the right to choose which way to go. More variety in

family formation patterns and fertility choices has appeared. In addition, new types of partnership behavior have appeared and gained acceptance: people became freer to choose to live together unmarried without feeling any pressure from the society. They can choose whether and when to have children and whether to have them in a legal marriage or cohabitational union. New opportunities and possibilities have appeared in the society and many people now decide to shape their biography according to their own preferences. This results in the prevalence of more individualistic lifestyle, especially among the younger generations.

To give another example for a probable interaction with time, we expect that women from the older cohorts, who entered the marriage age (20-21) before 1990, have a higher propensity of getting married than women in later cohorts. This suggestion stems from the fact that in the first period social norms for forming a family and the pro-natalistic policies of the country were strong factors that pushed women to enter a marriage at a relatively early age (compared to all the western countries). Since the policies have lost their effect and the social norms their power since 1990, we can expect a postponement and lower propensity of getting married.

Similar to the transition to marriage, we suppose that there is a big difference in the transition to first birth according to calendar time. For the period after 1990 a higher postponement is observed and we expect that the risk is generally lower than before. We want to follow these fertility changes and try to explain them taking into account the two very different societal situations in Bulgaria before and after 1990.

To sum up, our main research questions regarding calendar time are:

- to identify the differences between the fertility and family formation timing for the two main periods – before and after the start of the transition in the country;
- to investigate the role of the new form of union formation after 1990 – does cohabitation compensate for the later and fewer marriages?

### ***2.4.2 The impact of education enrolment and attainment on fertility and family formation***

The core individual-level characteristic according to the many frameworks of fertility theories is education, mainly women's education. We consider women's education as one factor that also plays a role in the recent Bulgarian fertility decline. We suppose that the impact of education level on fertility and family formation is strong, especially after the start of the societal transition. In socialism, women expected a secure employment career, and family formation decisions usually did not involve considerations regarding job opportunities and career possibilities. Universal access to low-cost institutional child care and the universal provision of places of work allowed women to combine childrearing and full-time work. For the post-communist period we expect the situation to be quite different. We expect that the high level of unemployment and the economic crisis after 1990 has pushed people to obtain a higher education in order to have better positions on the labor market and be able to find a better paid job with perspectives. This leads to a delay of family formation, as the state support for childbearing has been strongly reduced since the start of the transition. Many women now may be inclined to try to establish good positions in their career development first, and start a family and raise children later. In other words, according to our theory, an increasing level of education and the accumulation of knowledge and skills can be expected to reduce the tendency to family formation and childbearing.<sup>14</sup>

Furthermore, we suppose that the impact of the educational level will be strong not only for the delay in first births and first marriages, but also for the transition to a second child. Economic theory leads us to expect that women with higher education delay their first birth and refrain more often from a second birth, as they are more career oriented and experience higher opportunity costs.<sup>15</sup>

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<sup>14</sup> We want to point out that most of the empirical research contradicts this hypothesis, at least for the case of Western Europe (e.g. Berrington and Diamond, 2000; Coppola, 2003). However, the research in some Eastern European countries for the 1990s shows that education level either has neither an effect on childbearing nor on family formation (Kantorova, 2004; Kreyenfeld, 2000; Billari and Philipov, 2003; Olah and Fratzcak, 2003), or that higher education is associated with later childbearing and family formation.

<sup>15</sup> Once again, most of the research for Western Europe shows the opposite (for instance, Kreyenfeld and Zabel, 2005; Andersson, Hoem and Duvander, 2005).

Of course, the level of education could also have impact on the type of first union formation. It would not be surprising if highly educated women are more “liberal” in their views concerning family and are the ones who most often start union with cohabitation. We would rather associate direct marriages with lower education of women, at least for ethnic Bulgarians.

Finally, another important effect of education comes from *educational participation*. We consider (in line with the described theories above) that family formation and enrolment in education are rather incompatible and that women tend to postpone marriage and childbearing until they finish education (Hoem, 1986; Thornton et al., 1995). We expect that this interdependency can be observed during both periods of the analysis. In fact, since more women have continued their studies in universities after 1990 in Bulgaria we would expect a contribution to the delay of the transition to marriage and childbearing as the “waiting time” for finishing education is now prolonged.

Nevertheless, we suspect that union formation is not so heavily postponed as childbearing. Bringing up children is much more time consuming and implies more effort than forming a union does. It could be that women who stay very long in the educational system would still get married or form a non-marital union before finishing school if they find the right partner. Our theoretical consideration implies that balancing the student role with the role of a spouse is much easier than with the role of a parent. Additionally, we would argue that cohabitation is much more common among students than marriage, as marriage involves a more serious commitment.

Thus, all-in-all, we argue that the educational level should play a strong role in the life of the Bulgarians and the educational participation is a major factor for the postponement of births.

To sum up, in the present research, we want to study:

- the impact of education level on fertility and family formation;
- the importance of education participation on demographic behavior;
- how a woman’s education level is related to non-marital cohabitation and extra-marital childbearing.

### ***2.4.3 The impact of ethnicity and cultural milieus on fertility and family formation***

In our analysis, the core indicator of the cultural characteristics of individuals is their recorded ethnicity. On the whole, we suppose that each of the ethnic groups in Bulgaria has its own reaction to the political and societal change of the country as regards fertility and family formation patterns. Before 1990 we expect to find a smaller impact of ethnicity on demographic behavior than afterwards. We know that during socialist times any “deviant” behavior from the “normal” (that is marriage and two children) was not tolerated by the state and as a result the socialist organs of the state exerted a strong pressure, especially on Turks and Romas. We expect that when the secret agencies disappeared in 1990 and the freedom of choice increased, the “traditional” diversity between the ethnic groups also regained power: each of them could hold on to its own values and customs. Of course, this also affects demographic behavior.

Several studies for the ethnic groups show that the ethnic Bulgarians have the lowest fertility level, and we assume that they also have the lowest propensity to get married. Regarding the changes in family formation patterns, we suppose that they also more readily accept the “new” western values and ideas, and that they have a higher percentage of cohabitation than the other two ethnic groups.

As the Turkish community’s own societal norms are very strong, we expect them to have adopted the changes of values more slowly; with “western” family formation patterns remaining exceptional. They basically do not accept cohabitation and out-of-wedlock births. Since family norms are stronger in their culture and most probably the most influential factor concerning fertility decisions, we can expect that educational attainment has a weaker impact on fertility and family behavior for the Turks than for the Bulgarians.

The communal way of life of the Roma population and the traditional kinship ties imply that their family formation and fertility patterns are probably different again from those of the other ethnic groups. The culture of the Roma generally includes an early start to sexual life, early first births, and early marriage. Given their low acceptance of contraception, they tend to have a high fertility rate. We argue that the level of education and the participation in school does not affect the fertility and family behavior of the Roma in the same way as that of the other ethnic groups. For this part of the population it is more relevant to consider the division between literate

and illiterate (Pamporov, personal conversation). The proportion of women with secondary or high education is extremely small (see Table 2.4) and it is hard to register the influence of the level of education. Additionally, in the majority of this population, the parents stop their daughters from attending school long before finishing secondary level (Pamporov, 2005). So, we consider that it is the economic crisis rather than education that has the main impact on the drop in the fertility levels.

In other words, our research question is:

- to understand the influence of cultural differences between the main ethnic groups on their fertility and family formation, independent of other explanatory variables.

## Chapter 3

# Data, Method and Hypotheses

In this chapter we want to provide a detailed description of our two data sets: the sample size, the target population and the information gathered in the surveys. Additionally, we will introduce our time constant and time varying covariates, and the basic distributions and characteristics of our samples. In section 3.3 we describe the model that we use in estimating the fertility and family formation transitions. At the end of the chapter, in section 3.4, we present in full detail the hypothesis for each variable included in the analyses.

### 3.1 Data from the 2001 Census and the Study of Natality and Reproductive Behavior

The empirical analyses are based on data from the Census 2001 and a sample survey “Study of Natality and Reproductive Behavior” carried out at the same time as the census. The census gathered data on housing, households and personal data for each household member<sup>15</sup> and the sample survey gathered data on the fertility intentions and problems that people face with raising children. The aim of the study was to contribute to the explanations of the problems that the contemporary Bulgarian family encounters, in order to serve the development of future fertility policies. In this survey there were 11 775 respondents, aged 15-49 (women) and 15-59 (men).

For our analyses we use a linked data set which joins the information from the census and the sample survey: the information on the same person from the census was added to each record of the respondents in the sample survey. Thus, the size and characteristics of the sample of our linked data set are the same as that of the “Study of Natality and Reproductive Behavior”. We restrict our analyses to women; the total number of women in the sample is 5 274.

The linkage of the two data sets led to a few problems. Some of the data for the respondents did not match with the data from the census. We had to perform a

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<sup>15</sup> For more information on the census data, see Kohler, Kaltchev and Dimova (2002).

logical correction of the data: there were several questions that overlapped in both studies and this allowed us to compare and cross-check them. In case there were inconsistencies we had to decide which were the “true” data. For instance, when there was a mismatch in the age of the respondent, we took as the “true” one the age written down in the census. This decision was made because of the nature of the questions that were asked: in the census the respondents were asked to fill in their date of birth, whereas in the survey they were asked “What is your age?” and we suspect that when people are asked about their age, they tend either to hide their real age by reducing it a little or to round their age off to a number ending in 0 or 5. The other questions that we could crosscheck were the last level of education achieved, the marital status at the time of the survey, the number of children born, and the ethnical affiliation. In case there were inconsistencies in the last level of education the respondent had, we assumed the information from the census to be correct as this included information on the educational histories (simply the dates at finishing each level of education). We assumed that when the respondents have to track their education histories they pay more attention when filling in the information and the mistakes should thus be minimal. We proceeded in the same way in the cases of mismatch between the information on the number of children each woman has. Since the census gathered the whole birth histories, we assume that here the information is more consistent and thus more reliable than in the sample survey. However, this was not the case with the data on marital status. In the census the respondents were asked their current marital status and the date of the last event they had (marriage, divorce, widowhood). In the sample survey the respondents had to fill in their marital histories. In case there were inconsistencies in this data, we took the answers from the sample survey as there the questions on marital status were more systematically ordered than in the census and the answers should have fewer mistakes. Additionally, there were some inconsistencies in the data in the sample survey itself. For instance, many cases existed where the respondent had answered that he/she is married, currently lives together with the marriage partner and at the same time some questions later answers that he/she cohabits with this person. Such inconsistencies were corrected to married, not cohabiting. We also considered answer to the question for the ethnic affiliation from the census to be the right one; in cases where there were missing values, we replaced them with the answers from the sample survey. We proceeded in this way

with each variable in case of missing values: if it was possible, we replaced it with the answers given from the other part of the data.

Where the months of some events were missing, we inputted them by assuming the average month of the whole sample. In cases where a year was missing, we had to exclude the record, as it was impossible to logically reconstruct it. Also, when there were complete inconsistencies in the data referring to the occurrence of particular life events, we deleted the records. In total, 57 % of the exclusions made were because of missing values, about 38 % because of inconsistencies in the records, and about 5 % due to very early conception (before age 13), birth before year 1950 or cases of twins.

As a result of the data cleaning and the abovementioned exclusion of some records, the sample size for the analyses of first birth and first marriage was reduced to 5008 records. The sample size for the analyses of second births is even smaller – 3366 records – because we only included women who had their first child in 1975 or afterwards, in order to be able to make a comparison between the 1980s and 1990s. The basic distributions of our sample are given in Tables A 1, A 2, and A 3 in Appendix A.

With the linked data set<sup>16</sup> we are able to study the transition to first marriage, first birth and second birth. For each of these transitions we have the opportunity to compare the trends in our two major periods – before and after the start of the societal changes in the country. About 72 % of the women in the sample entered a marriage before the end of our observation period. A slightly higher proportion of the women had a first child – just over 73 %. In the sample of the analyses for the transition to second birth we included only women whose first child was born not earlier than 1975. About 62 % of all the observed women had a second child by March, 2001 – the end of our observation window.

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<sup>16</sup> In general, we will refer to this data set as the “census data” throughout the whole analyses, in order to discern it easily from the other data set that we use.

### 3.2 Data from the 2002 Social Capital Survey

For the complimentary analyses of family formation patterns, we use an additional data set coming from the Social Capital Survey<sup>17</sup> in Bulgaria. The aim of this survey was to explore the impact of the significant economic, cultural, social, and institutional changes in Bulgarian society on family formation and fertility. It also put a lot of effort into gathering information that can reveal more to the scientists on the connections between coping strategies, social capital and fertility. The idea of this study is to be a panel survey with waves every two years. We use the first wave of it, which took place in June-September 2002. The sample of the survey was based on the data from Census 2001 and includes 10 009 participants aged 18 to 34 at the time of the interview. Originally, the sample size was planned to be 10 000. Out of the sampled people, 9 046 persons agreed to participate in the survey (90.46 %)<sup>18</sup>. In order to achieve the originally planned size, a supplementary sample of another 1 000 persons was drawn. Unfortunately, we do not have information on the response rate in this additional sample. We study only the female participants of the survey and compare the results with those of the census data. The number of women participating in the survey is 4 775 or 47.7 % of all the participants.

We use this survey to study the family formation patterns and to distinguish between different kinds of union formation – marriage and cohabitation. This data set is the first of its kind in Bulgaria that includes union histories of the respondents. As little is known about the changes in the family formation patterns in Bulgaria, such an analysis will substantially contribute to understanding the demographic changes as a whole. We can analyze the family formation patterns only for the period after 1985 as the respondents in the study are from very young cohorts. The oldest cohort was aged 22 in year 1990. This period for the analyses is a very satisfying one because as we know that most of the changes that appear in the transition to first marriage took place after the end of the 1980s. This data allows us to follow the changes in the 1990s and account for the effect of cohabitation on fertility.

The cleaning procedure of the data set was less complicated than with the census data, as it is not a linked data set and there are no possibilities for cross

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<sup>17</sup> The ‘official’ name of this survey is “The Impact of Social Capital and Coping Strategies on Reproductive and Marital Behavior”, but it has become more well-known under the name “Social Capital Survey”, so we adopt this name for convenience and for the sake of brevity.

checking of the information. In most of the cases where we had missing values (for a month or a year of an event) we could not do anything except drop the case. However, we needed to make some considerations before doing so. For instance, we found out that concerning the date of a start of first union, when a month was missing it referred more often to a cohabitational union than to a marriage: people whose first union is a cohabitation have greater difficulties in defining the exact month of the start of the union. This is very natural, as the start of cohabitation can be more complicated: it could start gradually as a couple spend more and more nights per week together and it is hard for the people to discern an exact month when the cohabitation started (Di Giulio, 2004; Manning and Smock, 2003). The case of the marriage is very different – people can easily recall the day – and the cases when the month was missing were very few. So, we found out that deleting all the cases when a month of the first union is missing would lead to mainly cohabitations being deleted and this could bias our sample. In order to be sure that nothing significantly changes, we experimented with two different possibilities in dealing with this problem: deleting these cases, risking this bias; or inputting the month as a random number from 1 to 12. This led to two samples with different sizes and we performed the analyses with each sample and compared the results. We found out that there were no significant differences between the results from both samples. So we decided in the present work to present the results from the smaller sample, the one where we did delete the cases with missing values.

As a result of the cleaning procedure for this data set, removing cases with missing values and inconsistencies, the sample size diminished to 4 295 women. The basic distributions in the sample are given in Tables A 4 and A 5, Appendix A.

With this data set we study the transition to first marriage and compare the results from the analyses with the census data. Additionally, we also study the transition to first union, where we discern entry into direct marriage, cohabitation, and marriage after cohabitation. We also study the transition to first and second birth and compare the result with the study from the census data. Unfortunately, with this data set we cannot compare the trends before and after 1990.

About 53 % of the women under study entered first marriage before the end of the observation period. The proportion of women who enter a marriage directly is

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<sup>18</sup> Bulgarian Academy of Science, Internal document, mimeo

slightly lower: 43 % of the women under observation do so. Women who enter cohabitation are relatively few: about 22 % start their first union with cohabitation. In the next transition under study, we continue to observe the women who have started their first union as cohabitation and we study the transition to marriage after cohabitation. Women who transformed their first cohabitation into a marriage are about 42 % of all the women who started a non-marital union.

In our Social Capital Survey data, about 60 % of the women had a child before the end of the observation period. Women are regarded as at risk of having a second child after the birth of the first child. In our sample, 42 % of the women had a second child before the date of the interview.

### **3.3 Variables**

#### ***3.3.1 Dependent variables***

As we described above, with the census data we study the transition to first marriage, first birth, and second birth. With the Social Capital Survey data we study the same process, but we add additionally the transition to direct marriage, transition to first cohabitation, and transition from cohabitation to marriage. In the studies of first and second birth, we actually observe the women only until their conception. The time of conception is estimated as nine months before the time of birth. We backdate all the recorded births to obtain the conception date, which means that we study only conceptions which have resulted in a birth. This procedure allows us to study the impact of conception on the other possible transitions (marriage, cohabitation and so on). If we study only the impact of birth and observe the women only after giving birth, it will lead to loss of valuable information on the decision process of life-course transitions. However, our data set does not allow us to take into account all the conceptions, which would include those that ended in miscarriage, abortion or still birth.

### 3.3.2 Covariates

#### *Time-varying covariates*

An important variable in our study is the current *calendar time*. Controlling for the calendar year is a key step in our analyses. In the census data we make a distinction between the state-socialism times and the following transition to market economy starting in 1990. The two periods are characterized by different economic development and societal systems, which may have various influences on childbearing patterns. In our sample for first birth and first marriage the earliest calendar time in which a woman becomes 13 years old and starts to be under observation is January, 1964. This means that we follow the changes in the transition rates from the mid-1960s to March 2001. The analysis of second conception is restricted to only those women who had their first child in 1975 or later. This allows us to compare the trends in the second conceptions in the 1980s with those in the 1990s.

Since the Social Capital Survey includes younger cohorts, the start of the observation is much later. In fact, we observe the transition to first marriage, first birth and second birth only after 1988. Thus, we are only able to follow the trends and the changes through the 1990s. Inclusion of the calendar year in the analyses with the Social Capital Survey data allows us to pay a closer look at the changes that occur in the 1990s.

One of our key explanatory variables is the current *educational level*. It is constructed as a time-varying covariate and its value changes as soon as the woman achieves a higher level of education. For simplicity, we divide the education level into three major groups: primary (which includes elementary and primary education, or lower); secondary (secondary education); and higher (higher than secondary education, usually colleges and university degrees). However, the construction of this variable was not so straightforward in the census data. First, we do not have available data on the starting time of any of the studies. That is, we make an assumption that once a woman enters the educational system she does not interrupt her studies before finishing the last level of education she obtained. This assumption seems plausible, as the cases when women return later to the educational system are rare; it is more common for men to interrupt their studies, often because of military service. People in

Bulgaria usually start school at age 7: this was the obligatory age until 1990. After that parents were able to choose to send their children to school at age 6 or 7. Nevertheless, most of the parents still consider that age 7 is more appropriate for starting school. So, we assume that all our respondents started their studies at age 7. Additionally, we have the date of ending the educational level only for the secondary and higher education. That is, if a woman has a lower educational level we do not know the exact time when she finished it. As the educational system is quite uniform in all the regions and schools in Bulgaria, it is possible to estimate the approximate time of finishing each level of education with reasonable accuracy. To finish the elementary level of education three years are needed, so we assume that our respondents finish their elementary education at age 10. For those who reported that they have a lower level of education than elementary, we assumed they were at school for two years and thus left school at age 9. After elementary, five more years are needed to complete primary education; on average people finish primary education at the age of 15. So, for all our respondents who reported that they completed primary education, we assumed this happened at age 15. For the other levels of education we have the finishing dates.

The information on education level in the Social Capital Survey data was gathered in a slightly different way. Again, we do not have the real education histories, but we have more information on the education enrolment for the highly educated women than in the census data. For the lower education levels (below secondary), the date of finishing education is also not given; the procedure that we apply in this case is the same as in the census data – we know how many years it takes on average to complete a certain level and we assign a school starting age of 7. However, we do have data on finishing secondary education. Where a month is missing, we inputted the month May, as this is the usual month when people finish their secondary school in Bulgaria. We have much richer information about higher education: each woman was asked to fill in the start of the studies at university or college and every interruption longer than one year. Additionally, we have the date of completion of this level of education. With such information we can see if women started their high education right after secondary school or if there was an interruption (this was not possible with the census data).

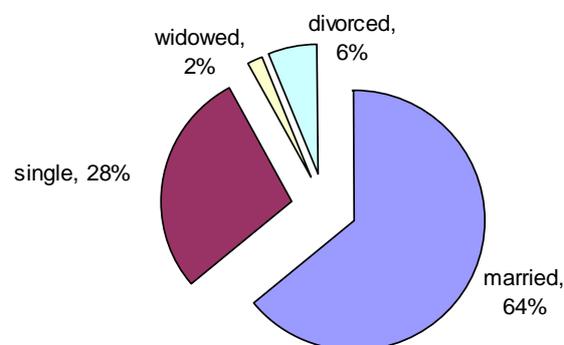
Apart from the educational attainment, in our analyses we make a distinction concerning the *educational enrolment*. We construct a time-varying binary variable

indicating if the woman is studying or is out of the educational system. In both data sets there is a question asking if the woman is doing her studies at the moment of the interview. The variable on education enrolment in the Social Capital Survey data is much more precise than the one in census data. In the latter, as we mentioned above, we have to make an assumption that there was not really an interruption in the studies and we just trace the highest finished level of education when constructing the education enrolment variable. In the Social Capital Survey data we do not need to make such assumptions as we have enough information on all the interruptions between secondary and high education, as well as all the interruptions in studies at universities or colleges.

We consider that including such a variable in our analyses can improve the better explanation and understanding of the transitions a woman makes in her life course. Many authors (Blossfeld and Huinink, 1991; Hoem, 1986; etc.) point out that the impact of education level on birth transitions is largely explained by the longer time spent in education by the highly educated. A large number of empirical studies demonstrate that birth risks are lower during studies, which is interpreted as incompatibility between the statuses of student and parent.

We also use *marital status* as a time-varying covariate in the analyses of first and second birth. In the census data we make a distinction between single, married, divorced and widowed women. See Figure 3.1 for the distribution of the marital status of the women at the time of the interview.

**Figure 3.1:** Marital status of the women at the time of the interview, Census 2001 data



We know from other studies that entering a marriage usually influences the decision whether to have children. Unfortunately, with this data set we cannot account

for cohabitation as no event histories were gathered on living together with a partner without being married. However, we can do this with our additional data set coming from the Social Capital Survey. This is the only survey in Bulgaria that has gathered information on union histories and we are thus able to construct a time-varying variable indicating the *union status* of the women. Having such information gives us the opportunity to study the changes in fertility in the 1990s according to changing patterns in family formation. The categories in this variable are: single, cohabiting, married directly, and married after cohabitation.

In the analyses for the transition to first marriage with the census data we include a variable indicating the *motherhood status*. We distinguish between women who have no children and are not pregnant, those who are pregnant with their first child, women who have one child and are not pregnant, women who are pregnant with their second child, and women who have a second child and are not pregnant. Such a variable is very important for the analyses of first marriage, as it can reveal to what extent union formation and marriage are stimulated by a pregnancy, for instance. It can also show us the influence of the social norms concerning family formation patterns.

We include a similar variable in the analyses of first marriage transition with the Social Capital Survey data. However, here we use our information on cohabitation and integrate it with the motherhood status. We call this variable *civil status* and it indicates not only whether a woman has a child or is pregnant, but also if she is in consensual union or not. We consider that the additional information on cohabitation can reveal some otherwise invisible trends for us in the analyses with the census data. In the analyses for the transition to direct marriage, to first cohabitation, and to marriage after cohabitation, we also include a motherhood status variable as it is constructed in the census data.

#### *Time-constant covariates*

The most important of our time-constant variables is the *ethnic group*. We form a variable indicating four different ethnic groups – Bulgarians, Turks, Roma, and ‘others’; this latter group was included only for the neatness of the analysis. However, we refrain from interpreting or subdividing the results for this

heterogeneous category since it consists of approximately 25 different ethnic groups but represents only about 2 % of our samples.

Generally, there are not substantial differences in forming the variable on ethnic group for our two data sets. However, we expect that there could be some differences in our results, because in the census data people were allowed not to answer this question. We assigned those who refused to indicate their ethnic group a value 99 and added them to the group of the ‘other’ ethnic groups. It could be that people who refused to give such information are a specific group with some characteristics. In any case, this group is not a large one – it is less than 1 % in our sample.

We also include some additional, control variables in our analyses. We use *number of siblings* as a measure for women’s attitude towards family size. It is often considered that women who come from a bigger family tend to reproduce the same family size later on when they form their own family. We make a distinction between no, one, two, and three or more siblings.

The next time-constant variable that we include in our analyses is a variable indicating the *place of residence* where the respondent lived until the age of 15. In our census data we distinguish four categories of settlements: villages, small towns, larger towns (administrative centers), and the capital. With the Social Capital Survey data we are not able to have such detailed categories of the residence places: there are only two categories – urban and rural. However, we still consider this as important for our analyses because of the considerable differences in family dynamics and fertility between the urban and rural populations in Bulgaria.

We also control for the *level of religiosity* that the respondents have. As this variable was measured only at the time of the interview, we assume that the level of religiosity has not changed through time. In the census data we make a distinction between deeply religious, somewhat religious, not very religious, and not religious at all. In the Social Capital Survey data we are able to distinguish only two categories: religious and not religious.

### **3.4 Method of Event History Analysis**

The study of an individual’s life course has become very popular in the last few decades. Different social sciences are interested in investigating the life course

development; psychologists, sociologists, historians, anthropologists and many others have contributed to the development of this paradigm. According to Winsborough (1979) demographers consider the life cycle as a collection of transitions between the different stages of the life course, which are connected to demography and which pertain to series of birth cohorts. Life course, according to Elder (1975), refers to sequences of socially defined events and roles that the individuals adopt with time. A little later he defines the concept of life course as the individual's pathways structured by age in different conditions starting with birth and finishing with death (Elder, 1981).

Although the objects of investigation in the empirical studies are individuals, life course is a key element of the social structure. According to Mayer and Tuma (1990), the study of life course has two aims: (1) to explain life events of the individuals and the social tendencies of the life trajectories in one common conceptual and empirical framework; and (2) to present the social processes that generate these events and trajectories.

The study of life course is based on the statement that a single event from the life stages cannot be studied in isolation from other events. Moreover, life events and stages must be investigated as parts of the life trajectory, in which the later events, to some extent, are a consequence of earlier events and experiences. Explaining one event usually means indicating another event from the past as a "cause" of the event under study. Of course, the two events must be connected with a causal mechanism. This mechanism is usually the time in which these events occur.

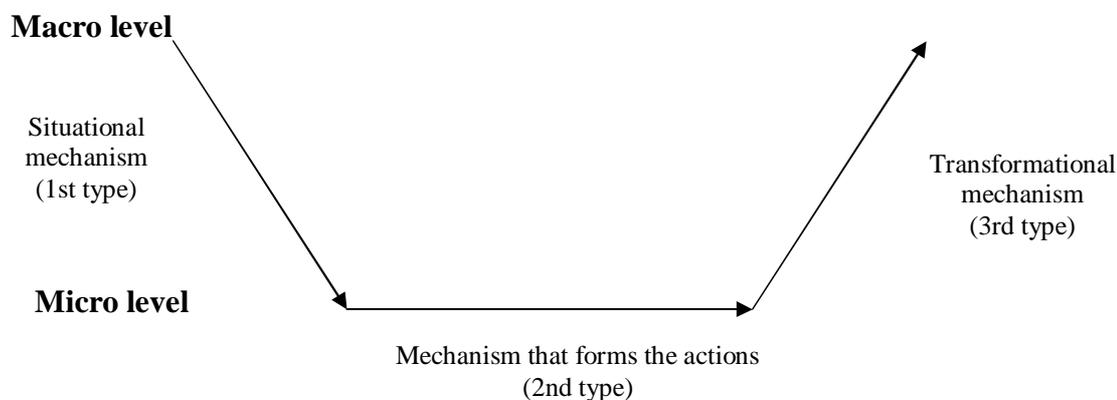
The life course development of individuals usually consists of trajectories or event histories. The trajectories are composed of different transitions, which in turn are the actions of the individuals between two states. The states are a static picture of one dynamic process, which is a series of events. Elder (1998) defines this stating that the key elements of the new life course paradigm "are events combined in event histories or trajectories that are then compared across persons or groups by noting differences in timing, duration, and rates of change".

In other words, the life course of an individual is a complex sequence of events and is influenced not only by individual decisions, but also by social norms and structures. Sometimes the different events compete with each other. For instance, a single woman can decide to get married, to start cohabitation with a partner without marrying, or to continue to live alone. Which transition she chooses and when she

chooses it is unpredictable for the researcher, since the transition depends on many other factors as well as on earlier events in her life. Mayer and Tuma (1990) claim that life course is predictable on an aggregated level, but not on the individual one. This comes from the fact that deviations from standard life courses always exist, but they often reflect systematic social processes, which make them predictable. Moreover, the diversions from institutionalized tendencies not only have an impact on the subsequent events in the life of every individual, but also generate new social structures and institutions, if they occur in large numbers. Social forces not only penetrate from the social institutions into people's lives, but also filter up from the actions of individuals, leading to changes in existing social models and the creation of new ones (Mayer and Tuma, 1990).

Coleman (1994) presents three types of social mechanisms that operate between the two levels in society at a macro and micro level. Figure 3.2 presents his graphic, which has become popularly known as Coleman's 'bathtub'.

**Figure 3.2** Coleman's bathtub



The first type of mechanism – the situational one – explains the effect of society on the given individual. Every individual is exposed to a specific social situation and this situation impacts him in a certain way (Hedstroem and Swedberg, 1998). At this point, the direction of the interaction runs from macro to micro level. The second mechanism operates from micro to micro level. It explains the way in which the actions of the social individuals are formed. Each individual possesses a specific combination of desires, beliefs and possibilities for action, and this generates the final action of each individual. The third type of mechanism operates from micro

to macro level and explains the transformations in society. The individual actions are transformed into a joint result, no matter if it was planned or occurred unintentionally.

The major elements that demography typically aims to explain are social actions (or events) of the individuals which affect the structure and size of the population or of a group of the population. Of course, the study of the whole life course of an individual is an extremely complex and demanding exercise and many scientists usually concentrate on a certain moment of the life cycle: for instance, childhood, fertility or retirement. In the present work we want to focus attention on the fertility and family formation part of the life course of Bulgarian women. Moreover, we study an individual's life course in two different historical periods and societal settings – before and after the start of the changes in the country. According to Elder and Pellerin (1998), the most distinctive feature of the life course paradigm is the attention that it pays to the connection between the historical changes and life characteristics.

Event history analysis is the most suitable method for studying the individual's life course transitions. We will use such a method in the present project when studying the fertility behavior of women in Bulgaria.

Espenshade and Braun (1982) state that the proper study of the transitions in life includes a reference to age, historical time, and duration of stay in a particular status. Age has a normative influence on the timing of transitions, the historical settings are unique for each cohort or state and they can affect transitions in certain ways, and the duration of a stay in a given status is an important factor in analyzing the individual's life course.

The statistical tool used in the analyses of event histories is hazard models (known also as intensity models, hazard rates or transition rates). Hazard regressions deal with the structure and correlations of the occurrence of the events (Yamaguchi, 1991). By definition, the occurrence of an event assumes a preceding time interval, which is the non-occurrence of the event. In other words, there should be a certain time period of non-occurrence of the event so that the occurrence could be considered as an "event".

In defining the duration of non-occurrence of an event, another crucial concept of practical importance is the risk period. The risk period is the period in which, at least from logical point of view, a given event could be experienced (Yamaguchi, 1991). An example from our analyses can be the transition to second birth. A second

birth can happen to women only if they have one child already. The childless women are not at risk of giving a birth to a second child. The risk in moment  $t$  is the probability that the event happens at moment  $t$ , given that the event has not occurred before that moment (Blossfeld and Rohwer, 1995).

According to Blossfeld and Rohwer (1995), the essence of the event history analysis is that it deals with events that occur in the life course of the individuals: these events mark the transitions from one state to another. The event history analysis studies the transitions between the different states as well as the length of the time interval between entering and exiting the specific state. The time spent in a given state is also sometimes called the episode, spell, waiting time or duration.

The most simple model is when the process under study consists only of one single episode and two states: origin and destination. If there are several destinations from one state, then we have a multistate model (Blossfeld and Rohwer, 1995). Such models are also called models with competing events or risks. For instance, when a woman is single, she can make a transition to marriage, to cohabitation, or she can continue to be single. In this case, we have multiple destinations from the state of origin.

Additionally, the analysis can include several time-varying covariates and time intervals (clocks). For instance in the analysis of the transition to first birth we can include additional data on the time of finishing education and entering a marriage and study how the timing of finishing school and entering a marriage affects the timing of first birth.

The most general formula (Lillard and Panis, 2000) in the simplest model is:

$$\ln h(t) = \gamma T(t) + \beta' X(t)$$

where  $\ln h(t)$  is the logarithm of the risk of occurrence of the event in moment  $t$ ,  $\gamma T(t)$  covers the risk duration of the event and  $\beta' X(t)$  represents the (possibly time-varying) covariates, which affect the risk of occurrence of the event. The baseline hazard duration dependence,  $\gamma T(t)$ , in our models is always a piecewise-linear spline. Each of the covariates included in the models contributes a shift to the baseline.

Hazard regression models can deal with the unobserved characteristics of the population under study. By adding the unobserved heterogeneity term to the model

the analyst can control for the effect of unobserved personal characteristics on the risk of experiencing an event. The assumption for including this term in the equation is that usually the behavior of people could be affected by some factors that are unobservable for the researcher or that cannot be measured. Usually the heterogeneity term, denoted with  $\varepsilon$  in the formula below, is assumed to be normally distributed. The formula then reads:

$$\ln h(t) = \gamma T(t) + \beta' X(t) + \varepsilon$$

However, there are processes that can be endogenous, where the survival in one state depends on the outcome of other processes. The most commonly used technique in dealing with such cases in event history analyses is to allow unobserved heterogeneity to be correlated across the processes, which allows to control for some unmeasured factors that simultaneously influence the processes under study (for more details see Lillard (1993), Lillard and Panis (2003), Baizan et al. (2003)). The hazard rate equations then read:

$$\left| \begin{array}{l} \ln h^A(t) = \gamma^A T(t) + \beta' X(t) + \varepsilon \\ \ln h^B(t) = \gamma^B T(t) + \beta' X(t) + \delta \end{array} \right.$$

The two unobserved heterogeneity terms,  $\varepsilon$  and  $\delta$ , are assumed to have a joint bivariate normal distribution with a term capturing the correlation between the unobserved heterogeneity terms of the processes. We use a simultaneous hazard equation approach in section 5.5, Chapter 5 and section 6.5, Chapter 6, where we explain in detail the processes that we study.

Hazard models are estimated using the maximum likelihood method (Lillard and Panis, 2003). The total likelihood can be expressed as a product of transition-specific factors. In our stepwise analyses we use a log-likelihood ratio test (LLRT) to compare the goodness-of-fit of different models. Our procedure implies that we estimate first a basic model including no covariates and then add them stepwise to the model. The LLRT compares the goodness-of-fit and degrees of freedom of nested models against each other. Two models are nested “if and only if one model is obtained by adding some parameter(s) to the other model” (Yamaguchi, 1991). The

assumption is that the model with more parameters is the correct one. With the LLRT we can accept or reject this hypothesis.

The event history analyses of the transitions to first union formation, first birth and second birth are performed with the help of the statistical software aML, version 2.0, developed by Lillard and Panis (2003). The data preparation is done with the help of the Stata software package, version 7.0.

### **3.5 Summary of the transitions under study**

At the end of this section, we want to summarize the events that we observe and analyze in our study. We also want to outline at what point in time we start to observe the women in the sample and when we censor them for each transition (see table 3.1).

As we have said already, with the census data we study the transition to first marriage, while with the Social Capital data we are able to make a distinction between marriage and cohabitation in the first union formation. In both cases, we start to observe the women as soon as they become 13 years old<sup>19</sup>. In the case of the transition from cohabitation to marriage, the observation window starts at the time of the cohabitation formation. We censor the women at the time of the interview date in case they haven't experienced the event. When we study the transition to direct marriage, we also stop observing them where they enter cohabitation and, vice versa, when we study the transition to first cohabitation, we censor the women in cases where they marry directly. When studying the transition to marriage after cohabitation we stop observing the women in cases of dissolution of the cohabitation or at the time of the interview.

When studying the transition to motherhood, we also start to observe the women at age 13. The end of the observation is the time of the interview. This holds for our two data sets. For the second birth transition, we start to observe the women as

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<sup>19</sup> Actually, for both of the transitions first union formation and first conception, we assign age 13 as a starting point of observation. The reason to have this early age is that in our sample we have enough cases of early conceptions and forming a family. We decide not to exclude this group of women from our analyses in order to obtain an accurate picture of the fertility and family formation patterns in Bulgaria.

soon as they have their first child. The observation window ends at the time of the interview.

**Table 3.1:** Summarizing overview of the events under study

<b>Event in woman's life</b>	<b>First union formation</b>		<b>Marriage after cohabitation</b>	<b>First birth</b>	<b>Second birth</b>
	<b>Direct marriage</b>	<b>Cohabitation</b>			
<b>Origin of process time</b>	Age 13	Age 13	Start of cohabitation	Age 13	Birth of first child
<b>Right censoring in case of not experiencing the event</b>	Interview date; Cohabitation	Interview date; Direct marriage	Interview date; Dissolution of cohabiting union	Interview date	Interview date

### 3.6 Hypotheses

Based on the discussion of the theories in Chapter 2, we now derive our hypothesis for the impact of our covariates on the fertility and family formation in Bulgaria. We want to start with our expectations on the general changes of these processes through time.

#### *Hypotheses on changes of fertility and family formation*

As we already saw in the descriptive Section 2.1 in Chapter 2, the changes in the fertility and family formation that occurred after 1990 are quite dramatic compared to the stable trends in the decades before. The changes in the economic development in the country, the newly appeared life styles, and changes in society all had an influence on the timing of union formation and bearing children. During the 1970s and 1980s the most common kind of union formation was marriage. The social pressure and the strong family policies in the country fostered this pattern. Then, since 1990, people have been freer to choose what kind of life they want to lead, the family policies have lost their strength, and the social pressure has diminished. As a consequence, a strong postponement in entering marriages appeared and additionally, new forms of unions gathered more popularity and spread through the population. The

rise in the mean age of first marriage suggests that there is a delay in entering a marriage and/or appearance of other forms of union formation.

(H 1) —→ We expect that the most popular form of union formation in the 1970s and 1980s was a direct marriage. With the start of the 1990s, as well as the significant delay in marriages, we suppose that cohabitation became more popular. However, we hypothesize that the appearance of cohabitation as an alternative way of union formation does not compensate fully for the fewer and later marriages of the women in Bulgaria.

The changes in first and second births should find expression in a delay of childbearing and subsequent birth and higher percentage of voluntary childlessness. During the 1970s and 1980s, the policy in Bulgaria supported an early age of childbearing and higher order births. During the 1990s however, these kind of policies lost their significance and many new alternative courses in life also appeared which women could freely choose from. Additionally, the economic crises and poverty in the country contributed to the higher price of childbearing. As a result women tend to delay the birth of their first child. However, the birth of a child is still a universal process in Bulgaria (Philipov and Kohler, 2001). We expect that the economic crisis and uncertainties contributed more strongly and in a negative way to the second order births. Other studies have also found that there are signs of the break-up of the two-child family model (Philipov, 2001). While almost every woman has a child, there is more consideration when it comes to the birth of a second child. This could lead to a longer interval between first and second birth, as well as the smaller number of women who have a second child.

(H 2) —→ We expect that during the 1990s there is a drop in both first and second birth rates, but it is stronger for the second births. Also, there should be an enlargement of the interval between the two births. We expect to find that the child-bearing pattern in the 1990s sharply contrasts to the two-child family model that prevailed throughout the 1970s and 1980s.

*Hypotheses on impact of ethnicity on fertility and family formation*

We expect that differences in the union formation according to ethnic groups appeared only after 1990. Before that, all the ethnic groups were equally subjected to the same pressure and policy and we expect that there were no significant differences in the patterns of family formation. However, after the start of the transformations in the country, each ethnic group reacted to the changing society according to their own beliefs and customs, and it is very probable that differences between the timing and pattern of family formation started to appear between the ethnic groups. We suppose that the ethnic Bulgarians postpone entry into union more than other ethnic groups. Traditionally, they are more inclined to invest time in education, which leads to postponement in other life course events. On the opposite side, we consider that the Turks and the Roma have a comparatively early family formation, as they are known to be closer to traditional societies where strong social pressure reinforces traditional norms. Other studies also show (Sougareva, 1995) that the Roma population has the highest marriage rate compared to all the other ethnic groups.

Regarding the type of first union (marriage versus cohabitation) it is very difficult for us to derive a strong hypothesis, as there are no studies that deal with a comparison of the ethnic groups and the kind of unions they enter. However, bearing in mind the higher traditionalism in the Roma and Turkish groups regarding values and customs, we suppose that they usually start their first union with a direct marriage and that cohabitation as an alternative way of forming a family is more widespread among the Bulgarians.

(H 3) —→ We expect that the differences between the ethnic groups in the family formation patterns appear only after 1990. We expect that the strongest postponement of entering a marriage or a union as a whole to be found among the Bulgarian ethnic group. The Roma and the Turks continue to engage in early formation of a family. Also, we suppose that the leaders of the acceptance of new types of unions are the Bulgarian group.

Concerning childbearing patterns and ethnic groups, again we expect that the biggest differences appear only after the start of the transition in the country. In socialist times the behavior of most of the people was quite uniform and almost

identical no matter what their ethnic group. However, we expect strong differences between ethnic groups to appear regarding the transition to first and second birth.

Early family formation is closely connected with early childbearing. It is known to us from other studies that the Roma group has the earliest age of first sexual intercourse from all the ethnic groups (Philipov, 2001) and the lowest use of contraception, and we have already hypothesized that they have an early formation of family. Thus, we assume that the Roma group also has the earliest start of childbearing compared to any other ethnic group in Bulgaria. We suppose that on the opposite site of the scale we will find the Bulgarian group with the latest start in childbearing.

Regarding the second births, we suppose that there is a drop for each ethnic group. The overall decline in fertility shows that every ethnic group is affected by the changes in the country. Other studies (Philipov, 2001) also show that the decline in fertility is observed in each ethnic group in Bulgaria. We expect, however, the differences in the propensity of second birth to be the same as with the first births. The Roma group, having the earliest start of childbearing, should be more inclined to continue with the second birth transition. Additionally, it is known that the Roma group has the lowest planning level in their reproductive behavior (Belcheva, 2003), so we expect that the interval between first and second birth should be the shortest in comparison to the other ethnic groups. We suppose that the Turks also have a relatively quick transition to second birth, in case they decide for a second child, and that the Bulgarians exhibit the longest interval before the second birth.

(H 4) → We expect the differences in childbearing patterns between the ethnic groups to appear only after 1990. However, there is a drop in fertility for each ethnic group, more visible when we study the second births. Our hypothesis is that the Roma population has the earliest start of childbearing and the shortest interval between first and second birth. The Turks remain somewhere in the middle and the Bulgarian ethnic group has the latest start of childbearing and longest interval between first and second birth.

*Hypotheses on impact of education on fertility and family formation*

The effect of education on fertility and family formation is a topic that has received a lot of attention from researchers. In Chapter 2 we already outlined the numerous theories explaining the connection between education and demographic behavior, especially of women. Before outlining our hypotheses we want to explain the way we measure and analyze the effect of education in the Bulgarian case.

We follow Blossfeld and Huinink (1991) who report that the observed relationship between attained level of education and fertility is largely explained by the longer time spent in education by the highly educated.

Our suggestion to the effect of education level is that during the socialist time there were no significant differences between women with different education level as regards their family formation pattern and timing. During this time the process of forming a family was highly uniform and there were hardly any deviant behaviors. That is why we expect to find equal behavior of the women independent of their education level.

We also suppose that during the times before 1990 the effect of education enrolment was very low. We know that in the 1970s and 1980s life was quite secure and the population did not have to put much effort into finding a proper job, in turn postponing any family transition.

However, things change after the start of the transition. The economic development after 1990 in Bulgaria is accompanied by growing opportunities, more freedom and diverse choices in life. At the same time we can observe worsening of the living conditions and higher social inequalities. The low income and the recently emerged poverty (partly as a result of high unemployment and low value of social benefits) also have a strong impact on the fertility behavior. Here we follow the standard economic theory and suggest that in order to find a better paid job (which ensures economic prosperity and insurance against poverty), women invest more time in the human capital accumulation. They are willing to spend a longer time in education, to apply for additional qualifications in order to have better positions in the labor market and higher chances of prospective work. The prolonged stay in the education system would contribute to the delay in childbearing and family formation in general. The differences in family formation patterns between women of different education levels should be stronger.

We also suppose that due to the changes in values and social norms, non-marital unions have also become more widespread. According to the outlined theoretical conceptions, we expect women with higher education to be the ones who bring the emerging new family patterns into the society since they spend more time in the universities which are considered to be places where the new ideas and values are spread.

(H 5) → As a whole, we expect to find a small and insignificant impact of education level and enrolment on family formation during the 1970s and 1980s. In contrast, we suppose that during the 1990s, women with higher education levels tend more often to postpone forming a union. Additionally, they also should start a union with a cohabitation more often rather than with a direct marriage. Education enrolment also should have a stronger effect on the family formation timing than it had in the years before 1990.

The effect of education level and enrolment on fertility is also a very important one. As with family formation, we expect that during the 1970s and 1980s, the differences between the effects of education level on first and second birth were either non-existent or insignificant. This comes from the fact that the family policies promoting early births were very strong at this time and life security was at a good level. Women did not have to finish their education first, then find a job and then think about a family. The support from the state was very high and early childbearing seemed to be a pattern for a high proportion of the women.

The patterns are not quite the same in the years after 1990. As we explained already in Chapter 2, the uncertainty in the economic situation and the labor market pushed people to first achieve a settled perspective concerning labor and then proceed with the childbearing. That is, women with higher education are thought to have greater ambitions for career development and thus delay to a greater extent the start of their reproductive behavior. Additionally, according to our theoretical concept, they have higher opportunity costs as they will leave a better position in the labor market if they want to devote themselves to bringing up a child.

According to us, this concept is valid for second order births too. We expect that if women with high education have one child, they will try to return as soon as possible to the labor market and continue to follow their high career aspirations. This

would lead to lower transition rate to second birth among this group of women. And, if they decide to have a second child, we expect that the interval between the births will be longer, as the spacing of the births will be well planned and many other considerations will be taken into account, which would possibly intervene with the decision for a second birth.

(H 6) → To sum up, we expect no large differences in fertility patterns in the years before 1990s between the women grouped according to different education levels and education enrolment. During the 1990s we suppose that women with higher education postpone entry into motherhood to a greater degree and have a lower tendency to have a second child. And, if they have a second child, the interval between births is longer than for the women with a lower education level.

Different religions, cultures and customs, and different lifestyles characterize the three main ethnic groups in Bulgaria. That is why we consider the ethnic group as the measure for cultural differences and the diffusion for the new behavior. Due to the cultural differences we expect them to have different behavior regarding childbearing as well.

As ethnicity in Bulgaria was a very delicate question for a long time, little data was available concerning the demographic behavior of the ethnic groups in Bulgaria before our surveys. During socialist times, such data was even secret and never published. After the start of the transition of the country, the ethnicity remained a tricky issue, but more and more data and studies dealing with minorities appeared. The National Statistical Institute still does not publish any important statistics differentiated by ethnic groups. It is a crucial point for us to be able to study the life course transitions of the women according to the ethnic groups in Bulgaria, as such a study will fill a long term gap in the Bulgarian demography and will contribute to better understanding of the cultural differences impacting on family behavior.

#### *Hypotheses on impact of background characteristics on fertility and family formation*

Although we will use the information on the background characteristics of the women more as control variables and as explanatory ones, we still want to make our suggestions on the expected impact on fertility and family formation.

We consider that certain background characteristics of the women are formative for their views and ideas about family formation behavior and fertility intentions. The *number of siblings* that a woman has grown up with is found to have an impact on her future family size in many studies throughout the world. It is considered in the literature that women tend to reproduce a similar family size to the one which they know from their childhood. From these theoretical considerations, we expect that women who have lived with a higher number of siblings also tend to have more children themselves. As a result, they have a higher propensity of getting married because of their ideas and plans concerning reproduction. We suppose that the influence of the number of siblings is equally strong for the two observed periods.

There is a substantial difference between urban and rural life in Bulgaria. In the rural settlements the social norms are stronger and community life is predominant. People there tend to enter events like marriage and parenthood earlier in their lives. Alternative family formation forms are not so widespread due to the social pressure to conform. In contrast, life in the big cities allows for greater anonymity and individualism prevails. As a consequence, it is more probable that the new forms of family formation, like cohabitation and raising children in cohabitation, are much more widespread in town and cities than in villages.

During communist times, however, whether a woman grew up in a smaller settlement or a big city did not make any difference to the transition to marriage. As we mentioned above, the uniformity of the society and of people's behavior was one of the characteristics of socialism. That is why we assume that *residence place* does not have any significant effect on the timing of the family formation before 1990. We suppose that the differences appear only after 1990. The diffusion of the new values and aspirations in the small towns and village occurs at a clearly lower speed. We expect that women who have lived in a small place of residence until age 15 and reached marriage age after the transition in Bulgaria have a higher propensity to marriage than women who grew up in larger towns.

During communist times the performance of religious rituals and ceremonies was officially forbidden. The ruling party proclaimed atheism as the only way to paradise, so to speak. As a consequence, many religious traditions were abandoned and not practiced; for this reason we assume that people's *level of religiosity* did not play any role in the transition to family formation before 1990. After the start of democracy, people were allowed to practice their religious beliefs again. The church

in Bulgaria still does not have a strong influence in any sphere of life, but we nevertheless expect that the people who claim they are highly religious tend to marry earlier in their lives and not to accept the new forms of family formation. On the other hand, we expect people who define themselves as not at all religious to have a lower propensity of getting married and to more readily accept the new family patterns, such as cohabitation.

(H 7) → So, the main hypotheses can be summarized as: women who have more siblings tend to form a family earlier (rather marry than cohabit), to start childbearing earlier, and to have more children in total; people who have grown up in rural areas are more prone to start with the family and reproductive behavior earlier in their lives. Also it is more common for them to start a union with direct marriage rather than with a cohabitation. The same we expect for people who define themselves as highly religious. They should be more likely to marry directly and do this in earlier ages, as well as to have more children.

#### *Hypotheses on the interaction of marital with fertility behavior in Bulgaria*

For both periods of observation we can expect a considerable interdependency of marital and fertility behavior. We suppose that if a woman is pregnant, the risk of getting married is clearly higher, especially in the years before 1989 when the social pressure was extremely strong regarding the bringing up of children in a legal family. Extra-marital children were considered as “second class children” and strongly discriminated against. For the years after, the influence of a pregnancy on the transition to marriage probably decreased, but we believe that it has not disappeared fully.

We also suppose that there is a difference in the interdependency between marriage and birth, and cohabitation and birth. Our opinion is that couples who marry are highly likely to conceive, since marriage is considered to be a clear sign of ‘settling down’, which includes forming a family and giving birth to children. Regarding cohabitation, we suppose that the link to the birth of a child is much weaker. People who start to cohabit are not necessarily thinking of having children soon. It is most probable that the cohabitation is a ‘trial’ period in the union formation and the couple is usually more concerned about whether they are able to live together.

This makes us suppose that starting cohabitation is not a strong sign of desire to have children.

By contrast, we suppose that once a woman has a child the impact on marital behavior disappears because if a woman does not marry during the pregnancy then there is not much reason for changing her behavior after the birth. But still, if a second pregnancy comes we hypothesize another increase in the risk of marriage again (in socialist times). However, we suppose that for the time after 1990, the second pregnancy does not have a significant impact on the family formation any more. The emergence of the new family forms and the value changes in the society imply that if a woman has not married when she has her first child, then there is not much higher probability to do this when pregnant with her second child. Also, after the birth of the second child we do not expect any impact on the marital behavior anymore – neither before 1990 nor after.

(H 8) → To sum up, we suppose that the impact of pregnancy on transition to marriage in the 1970s and 1980s is much stronger than in the 1990s. After the birth of a child, the marriage rate is expected to be lower. The same holds for the effect of second birth. Additionally, we suppose that the relation between cohabitation and birth is much weaker than between marriage and birth.

Altogether, we want to put the theoretical predictions to an empirical test, and analyze their explanatory power for the understanding of people's transitions to first birth, first marriage, and second birth. We do not extend the investigation further to cover higher order births or higher order marriages since these are comparatively rare events in the last half century in Bulgaria and the people who experience them may be more selective than we can control for. The contemporary family and fertility behavior is clearly dominated by the three events we named, and so we aim at revealing explanations in this “mainstream” part of society and not at its margins. To display our derived hypotheses in a summarizing chart, we structure them in a table format and separate them in two periods: before and after the transition times (Tables A 6 and A 7, Appendix A).



## Chapter 4

# First union formation

### 4.1 Analytic strategy

In the following chapter we concentrate on the analysis of the transition to first union formation. The main interest in our investigation is the reduction in marriages in Bulgaria and the role of the new emerging patterns of union formation. We want to compare the union formation trends before and after the start of societal transformation in the country; to discuss the changes and the possible explanations; to investigate the differences between the main ethnic groups in Bulgaria; and to study the impact on the transition to first marriage and first cohabitation of women's education attainment and education level, as well as their background characteristics.

We perform our analyses with the help of our two data sets. The census data allows us to follow the changes in marriage transition over a longer time interval – from the middle of the 1960s to the end of the 1990s. The results of the analyses of the transition to first marriage are presented in section 4.2. As a second step, we replicate the modeling using our second data set – the Social Capital Survey (section 4.3). This additional data set gives us the opportunity to concentrate on the changes in the 1990s and to take into account the effect of cohabitation on first marriage formation. We then compare the results from the analyses. In a third step, to supplement the analyses on union formation, we make a distinction between transition to direct marriage and transition to cohabitation. We also study the transition from cohabitation to marriage. For these analyses we use the Social Capital Survey data and we present the results of each of these transitions in section 4.4. In the last section of this chapter (4.5), all the results are summarized and discussed with reference to the theoretical background.

To assess the trends of the marriage transition in Bulgaria, we use hazard regression models, as explained in Chapter 3. Our baseline hazard is the age of the women and we start the observation of a woman as soon as she reaches age 13.

Undoubtedly, one of the biggest advantages of the event history analyses is the possibility of including time-varying covariates in the model. In Chapter 3 we already described in detail all the variables that we include in our models; here we will just enumerate them. As time-varying covariates we include age of woman (baseline), calendar year, level of education, education participation and motherhood status. The time-constant variables are ethnic group, number of siblings, place of residence until age 15, and level of religiosity. We also have given detailed sample characteristics in Chapter 3. The same set of variables is included in the analyses with the data from the Social Capital Survey.

In our event history modeling for each transition under study, we run six different models in which we introduce all the dependent variables step-by-step. We start with a simple model (Model 1) where only the baseline (age of woman) is included. Gradually we add the rest of the splines and variables starting with the duration splines for calendar year (Model 2) and ethnic group (Model 3). We then add two additional variables connected with the women's education – education attainment and education enrolment – in Model 4. In Model 5 we include an indicator of the motherhood status. Adding our three other control variables forms Model 6, our final one. Detailed results of all models are presented in Appendix B.

## **4.2 First marriage before and after the start of the societal transition**

Before starting with the analyses, we firstly want to present some of the main distributions concerning union formation in our census data. About 72 % of all the women in our sample have entered a first marriage. Approximately the same percentages of the Bulgarian and the Turk women have been in a first marriage, while only about 56 % percent of the Roma group have done so. Of all the first marriages, about 13 % do not survive, mostly ending in divorce. The Bulgarians have the highest number of divorces – 11 % of first marriages – while for the Turks it is 7 % and for the Roma 8 %.

A comparatively high proportion of the marriages are conducted while the women are still in studies: 26 % of the first marriages happen before finishing education. The Bulgarians do this most often: about 30 % of their first marriages happen before finishing education, compared to only 8 % for the Turks and 6 % for the Roma.

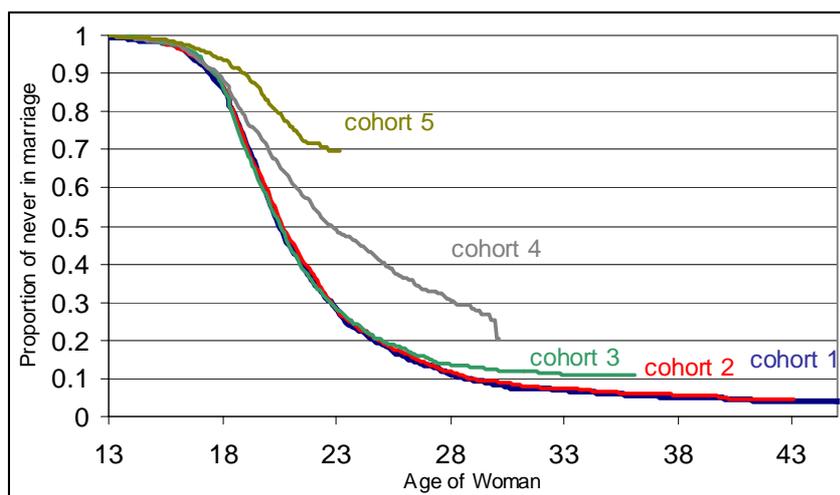
However, about 64 % of the marriages that happen before finishing education are entered into by women pursuing studies in a college or university. So, women who marry before finishing the studies are the ones who study for higher education and, thus, prolong their studies. About 96 % of these women come from the Bulgarian ethnic group.

About half of the marriages are preceded by conception, but only about 14 % of the marriages are preceded by the birth of a child. It thus appears that a good part of the marriages are accompanied by a parallel transition – namely the birth of a first child.

This general data gives us only a rough picture of the trends in family formation in Bulgaria. We proceed now to the finer analyses of these trends in order to better understand the real patterns and look for the possible impact and reasons for them.

To start with, we present Kaplan-Meier survival estimates of the transition to first marriage according to basic characteristics of the women. Figure 4.1 displays the transition to first marriage according to 5 different cohorts, divided as follows: cohort 1 – people born in 1951-1957, cohort 2 – born in 1958-1964, cohort 3 – born in 1965-1970, cohort 4 – born in 1971-1977 and cohort 5 – born in 1978-1986.

**Figure 4.1:** Transition to first marriage by cohorts



Notes: (1) Method: Kaplan Meier survival estimate; event: transition to first marriage measured from age 13. (2) Cohorts: 1 – people born in 1951-1957, 2 – born in 1958-1964, 3 – born in 1965-1970, 4 – born in 1971-1977, 5 – born in 1978-1986. (3) Own calculations, Census 2001 data.

There is almost no difference in the marriage transition pattern between the first three cohorts. Women born between years 1951 and 1970 have similar trends in

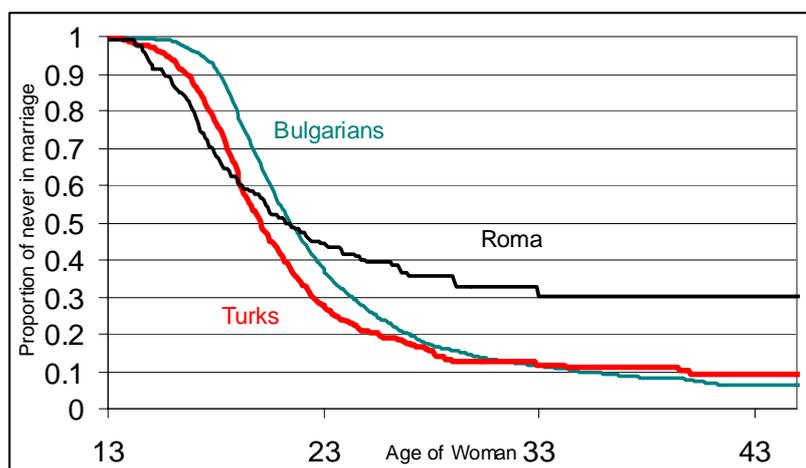
their family formation. The changes start to be really visible only for the generations born after 1970 – people who were 19 or younger at the start of the political and economic transformation in Bulgaria. These cohorts were below the mean age of marriage in the country in 1990.

For the first three cohorts, about 50 % of the women are already married at age 21, while among women born in 1971-1977 this percentage is reached at age 23. The youngest cohort has about 30 % married women at age 23.

In addition to the visible postponement of entry into marriage, we can see that it will not be a surprise if the two youngest cohorts retain a higher percentage of never-married women than the older cohorts. It is still difficult to predict this with certainty, since the two last cohorts are still too young, but we can already see signs of such a trend in cohort 3 – it has a slightly higher percentage of never-married women at age 35 than the first two cohorts.

As our main interests for analyzing transition to first marriage include the delay of marriage and the differences by ethnic groups and education level of women, we also estimated the survival curves according to those characteristics. The transition to first marriage according to ethnic groups is presented in figure 4.2.

**Figure 4.2:** Transition to first marriage by ethnic group



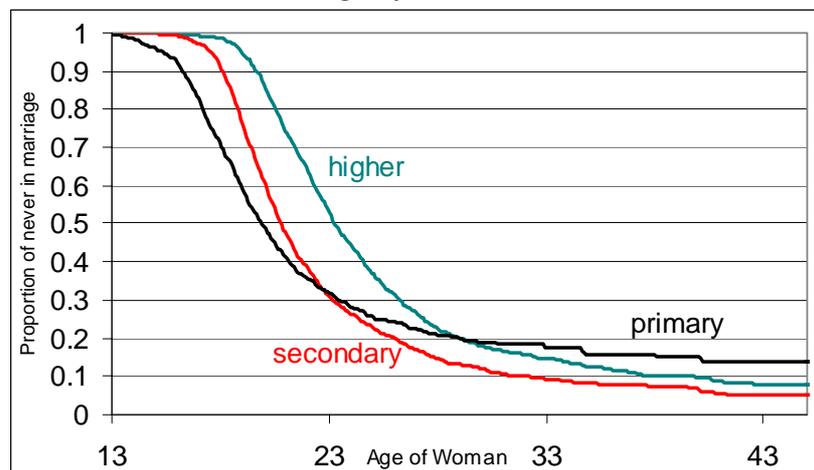
Notes: (1) Method: Kaplan-Meier survival estimates; event: transition to first marriage measured from age 13. (2) Own calculations, Census 2001 data.

The Roma group starts at the earliest age with the transition to first marriage, followed by the Turks and the Bulgarians. However, the early start of the Roma group quickly slows down and at age 43 about 30 % are still never-married. About 50 % of the Turks are married by the age of 21, while for the Roma and Bulgarians this

percentage is reached one year later. The percent of never-married women at age 45 for the Bulgarians and the Turk group is low: only 9 % of the Turks and 6 % of the Bulgarians stay unmarried.

The survival curve of the transition to first marriage according to education level is estimated according to the final education level the woman achieved. Although measured at the time of the interview and used as an anticipatory variable<sup>20</sup> (Hoem, 1986; Kravdal, 2004), the final education level can still give us an approximate picture of the different trends in the transition to first marriage between the women with different level of education. In the later event history analyses we use education level as a time-varying covariate. The survival curves are presented in figure 4.3.

**Figure 4.3:** Transition to first marriage by final education level



Notes: (1) Method: Kaplan-Meier survival estimate; event: transition to first marriage measured from age 13. (2) Education level measured as the final education attainment of the women. (3) Own calculations, Census 2001 data.

The women with primary education start earliest with the entry into marriage, while the women with higher education start latest. At age 20, 50 % of the women with primary level of education are already married, while women with secondary education reach this figure at age 21 and women with higher education at age 23. Similarly, as with the group of the Roma population, the women with primary

<sup>20</sup> The problem with anticipatory variables comes from the fact that they are measured as time-constant variables, although in fact they are time-varying. In our case, the education level of the women is assigned as the one that she has obtained by the end of our observation and not necessarily had at the time of the first conception. It could be that she obtained a higher degree after the birth. For the problems that arise from using such anticipatory analyses see also Blossfeld and Huinink (1991), Kravdal (2004).

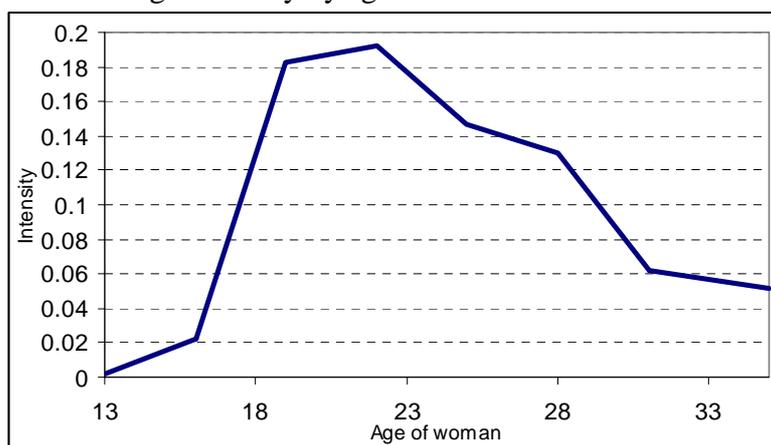
education start the transition to first marriage at earliest, but they end up with a higher percent of never-married women. At age 49, 5 % of the higher educated, 8 % of the secondary and 14 % of the primary educated women are still never-married.

To further facilitate our analyses, we performed an event-history modeling where we were able to take into account the influence of each time-varying and time-constant variable. The results from the stepwise models are presented in Appendix B, Tables B 1 and B 2. In the text we will mainly discuss the results of the final model.

For each of the performed models, we use a Log-Likelihood Ratio Test (LLRT) to test the improvement of the fit of the model with each newly introduced variable. In our case, the fit of each consecutive model (starting from Model 2 to Model 6) was significantly improved ( $p < 0.000001$ ). This means that each new piece of information included in the analyses contributes to the intensity and has an impact on the transition to first marriage.

In Figure 4.4 we display the intensity of first marriage from the first model. The slope gradients are given in Appendix B, Table B 1 for each of the six models. When introducing stepwise new variables to the model, we do not observe any major changes in the shape of the curve: it is mainly the level of the intensity which changes. That is why we plot only the intensity of the first model.

**Figure 4.4:** First marriage intensity by age of the woman



Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Graph constructed on the basis of the first model (no additional variables included). (3) Own calculations, Census 2001 data.

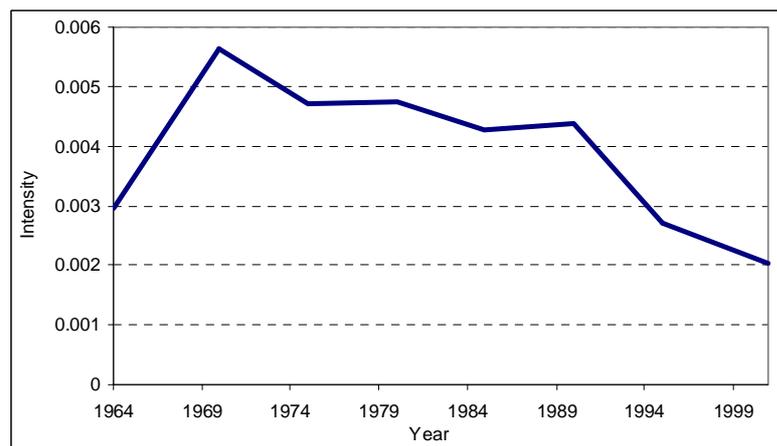
Results show that the highest intensity of getting married can be observed between ages 19 and 22, which then decreases a bit, but stays at a high level until age

28, after which the decrease is steeper. The curve does not have a well defined peak; there is a range of ages at which the intensities are high.

Introducing a duration spline for the calendar year to the model allows us to follow how the risk of transition to first marriage changes according to the period. In Figure 4.5 we have plotted the slopes from the final model in order to have a better visual description. The values of the slope gradients are given in Appendix B, Table B 1 and Table B 2.

We observe a rise in the risk of first marriage in the second half of the 1960s, followed by a small decline. In the second half of the 1970s and during the 1980s, the risks stay relatively stable and unchanged. A strong decline is observed after 1990, which continues to be there after 1995, but is less strong at the end of the 1990s. We give our reflection on the drop of marriage intensities in section 4.5.1.

**Figure 4.5:** First marriage intensity by calendar year



Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Census 2001 data.

#### **4.2.1 First marriage and ethnic group**

We include the variable for ethnic group in our analyses for the first time in Model 3 (see Appendix B, Table B 1). For convenience, we present an extract from the table here in the text and compare Model 3 with the final Model 6.

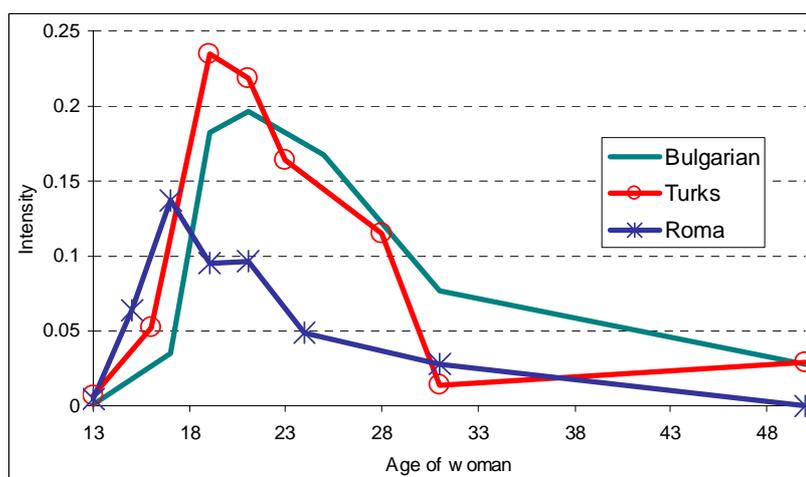
**Table 4.1:** Relative risk of first marriage. Effect of ethnic group. Two models compared

	Model 3		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>				
Bulgarians (ref)	1		1	
Turks	1.39	***	1.11	*
Roma	1.03		0.76	***
Other	1.04		0.99	

Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Model 3 includes variables for age of woman, calendar year and ethnic group, Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Census 2001 data.

When controlling only for age and calendar year, we do not find any difference in the marriage risks between Bulgarians and the Roma group. The Turks have an almost 40 % higher risk of first marriage (significant). When we control for education and background characteristics (Model 6), however, the picture changes substantially. The group of the Turks no longer has a risk that is so much higher – it is about 11 % higher than for the Bulgarian group and is still significant on the 10 % level. There is a serious change in the risk of the Roma group though – its risk becomes significant and changes the sign. The Roma group has 24 % lower risk of getting married than the Bulgarians and 35 % lower than the Turks have. The change of the results could be due to the fact that the education, motherhood status and some background characteristics also have an influence on the transition to first marriage and when we do not account for them we have biased results for the ethnic groups.

The results about the ethnic groups are not sufficient in order to be able to define profoundly the differences in the marriage behavior between the groups. In order to have a closer look at the divergence of the trends, we estimated some additional models and interactions. In Figure 4.6 we provide the intensities for first marriage by ethnic groups. In these models no other control variables are added and the purpose of this graph is to present the differences according to age between the ethnic groups.

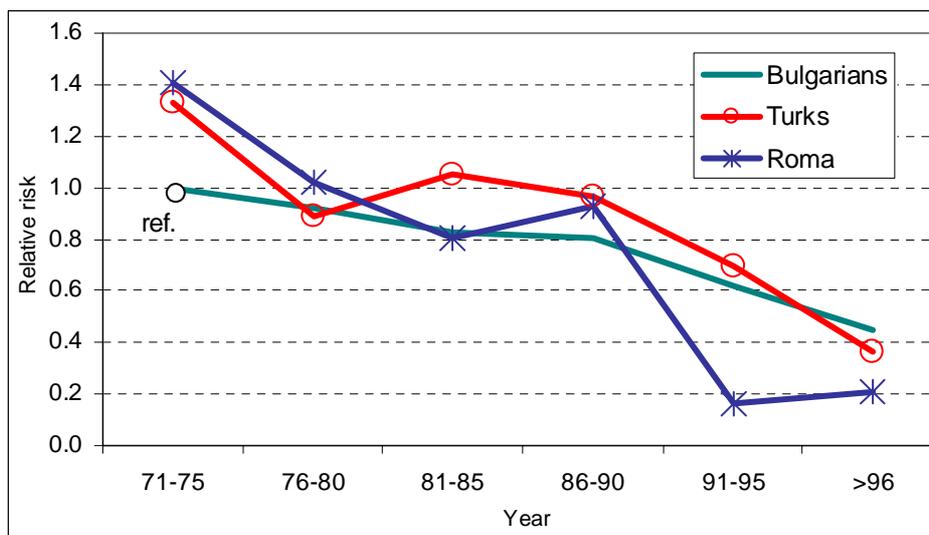
**Figure 4.6:** Intensities of first marriage by age of woman for three ethnic groups.

Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Graph constructed on the basis of 3 separate models (one for each ethnic group) controlling for age of woman. (3) Own calculations, Census 2001 data.

It is clearly visible that the Roma group has the lowest risk and the Turks have the highest risk, especially before age 23. The Roma group starts the transition to first marriage at earliest ages and the peak is at age 17. The Turks also make the transition to first marriage at relatively early ages – the transition risks are highest between ages 18 and 21. The Bulgarians do not have such a well-formed peak – the risk is highest between ages 19 and 25.

An intriguing question is whether the differences between the ethnic groups have always been the same over time. Were they the same in the period before and after the start of societal transformation? To answer this question, we included an interaction between the ethnic groups and the calendar year. In the model with the interaction we have included all the variables that we have at our disposal as they are in Model 6. The results are presented in Figure 4.7. The values of the relative risks are additionally given in Table B 3 in Appendix B.

**Figure 4.7:** Relative risk of first marriage. Effect of ethnic group and period. Bulgarian ethnic group and period before 1975 as a reference group



Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Interaction between ethnic group and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Census 2001 data.

The reference group here is the period before 1975 and the Bulgarian ethnic group. In the first period the risks of first marriage are actually in reversed order compared to the order we know from the analyses up to now – the Roma group has the highest transition risk, followed by the Turks, and the Bulgarians have the lowest. During the second part of the 1970s and 1980s some fluctuations are observed with a general decline of the risks for the Bulgarians and the Roma group and a rise in the risks of first marriage for the Turkish ethnic group. Our expectations were that before 1990 there are not any major differences between union formation patterns of the ethnic groups, but the reality has turned out to be somewhat different. After year 1990 a clear decline is observed for each group, but the steepest is for the Roma group. After 1995 the risk of this group stays almost at the same very low level, while for the other groups the decline still continued. However, in the last observed period, the Bulgarians have the highest relative risk of transition to first marriage compared to the other ethnicity groups. Throughout the 1990s, the Roma group stays with the lowest transition rate. We interpret our findings for the interdependency of marriage and ethnicity in section 4.5.2.

### 4.2.2 First marriage and education

Another variable of main interest for our analyses is the education indicator. As we have explained in Chapter 3, we take into account two aspects of education – the woman’s education attainment and her education enrolment. In Table 4.2 we show extracts from Table B 2 in Appendix B comparing Model 4, the first one in which we include information about education, and Model 6, the final model that also contains background characteristics and information on marital status of the women<sup>21</sup>.

**Table 4.2:** Relative risk of first marriage according to education attainment and education enrolment. Two models compared.

	Model 4		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Education level</i>				
Primary	0.82	***	0.80	***
Secondary (ref)	1		1	
Higher	0.87	**	0.98	
<i>Education enrolment</i>				
Out of education (ref)	1		1	
In education	0.39	***	0.55	***

Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Model 4 includes variables for age of woman, calendar year, ethnic group, education attainment and enrolment, Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Census 2001 data.

For the education level our reference group is the group of women who have a secondary level of education. In Model 4 the primary and higher educated women have significantly lower risks of getting married than the women who have a secondary level of education. When controlling for motherhood status and background characteristics of the woman, we do not find any difference anymore between the secondary and higher educated women. The risk of the primary educated

<sup>21</sup> We also tried other ways of computing the influence of education level and education enrolment on the first marriage intensities. One attempt was using education enrolment as a fourth “education level”. Another attempt was to perform an interaction between level of education and enrolment. As the obtained results were not much different from the following tables and graphs, we stayed with the simpler version.

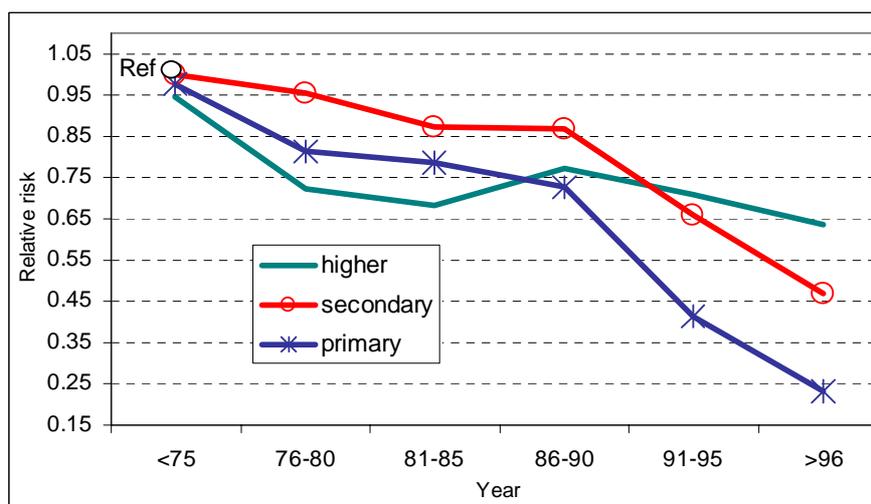
women however, retains its value and significance and remains 20 % lower than that of the other groups.

Being in education reduces the risk of getting married significantly. In Model 4 the risk is 61 % lower than for the women who have finished their studies. When controlling for additional variables the contrast becomes less, but it still stays significantly low – women in education have 45 % lower risk of getting married than women who are out of school.

In order to see how the differences between the education groups in the transition to first marriage developed through time, we again performed an interaction between the education level and calendar year. The results are presented in Appendix Table B 4 and in Figure 4.8.

Our reference group is women with secondary education and period before 1975. The differences in the marriage transition risks according to the education levels in the first period are very small, but the more highly educated women have the lowest transition to first marriage. During the end of the 1970s and the early 1980s, there is a slight drop in the risks for each education level and the differences between the groups stays quite clear: the secondary educated women have the highest risk, followed by the primary educated, and finally the higher educated women.

**Figure 4.8:** Relative risk of first marriage. Effect of education level and period. Secondary education and period before 1975 as a reference group.



Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Interaction between education level and period on the basis of the final 6<sup>th</sup> model, including all the variables (3) Own calculations, Census 2001 data.

After 1990, however, bigger changes occur. The drop in the risk of the highly educated women is a very slight one and remains almost the same as before the start of the transition of the country. However, the picture for the other groups is different: we can observe a very steep decrease for the primary and secondary educated women throughout the 1990s. In the last observed period the differences between the risks of the education groups become very large with the primary educated women having the lowest risk and higher educated the highest. To some extent these results contradict our expectations: our assumption was that for the period before 1990 there would be no major differences in transition to first marriage between women of different education levels.

It is also interesting to see if the role of education enrolment changed through time. We supposed that during the 1970s and 1980s education and family life were more compatible than in the 1990s. The interaction between education enrolment and period shows that being in education has always led to a low transition to marriage. The results are presented in Table 4.3.

**Table 4.3:** Relative risk of first marriage. Effect of education enrolment and period. Out of education and period before 1990 as reference group

Period	Out of education		In education	
	Relative risk	Sig.	Relative risk	Sig.
Until 1989	1		0.53	***
Since 1990	0.58	***	0.34	***

Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Interaction between education enrolment and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Census 2001 data.

The results show that being in education has a strong negative effect on marriage entry before and after the start of the societal changes – that is, throughout the observed period. For the period after 1990 we observe a drop in the marriage risk for each category. However, the relative differences between those in and out of education remain very similar: the relative difference for the period after 1990 is  $0.34/0.58=0.59$ , compared to 0.53 beforehand. Once again, this finding contradicts our assumptions. We expected education attainment to have a very low impact on the intention to get married for the period before 1989. Our reflections on these findings can be found in section 4.5.3.

### 4.2.3 First marriage and motherhood status

The process of entering into marriage has always been connected with the process of entry into motherhood. That is why it is essential for our analyses of transition to first marriage to study the impact of pregnancy and birth of a child for the woman. In Table 4.4 we present an extract from the Table B 2 in Appendix B. We do not find relevant difference between the results of the motherhood status variable in Models 5 and 6. That is why we only discuss the final model.

**Table 4.4:** Relative risk of first marriage according to motherhood status. Final model

	Model 6	
	Relative risk	Sig.
<i>Motherhood status</i>		
No child, no pregnancy (ref)	1	
No child, 1 <sup>st</sup> pregnancy	12.80	***
Parity 1	1.42	***
Parity one, pregnant	2.19	***
Parity 2	0.84	

Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Census 2001 data.

In line with our expectations, the first pregnancy of a woman leads to extremely high rise of the first marriage intensity – more than 12 times higher than for non-pregnant childless women. Women with a child are still 42 % more likely to get married than women who do not have a child and are not pregnant. This suggests that most of the unmarried women with children are in a union. At this stage of our analyses, however, we are not able to analyze the cohabitation process, for the data do not contain the right kind of information. Being pregnant with a second child also leads to a higher risk of entering a marriage, twice as high as non-pregnant nullipara. Women with two children have the lowest risk of getting married.

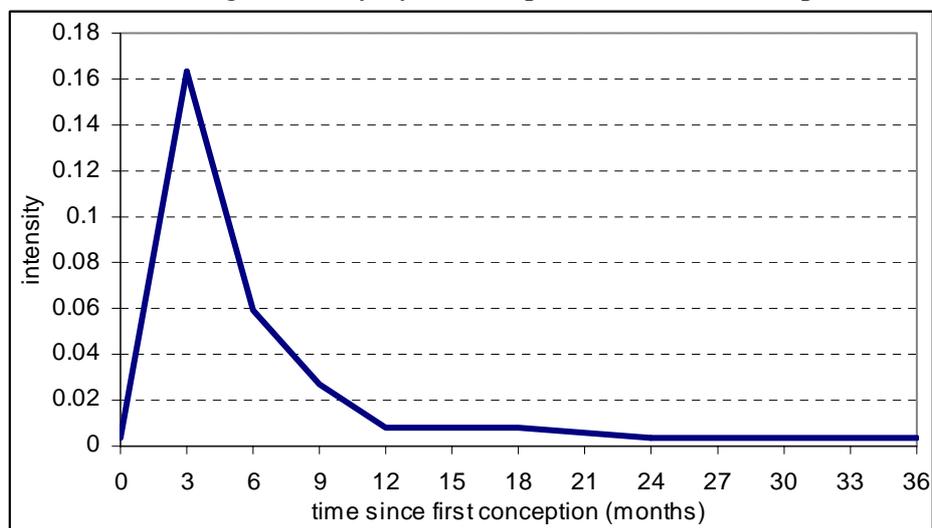
We also performed an interaction between motherhood status and calendar year in order to see if the effect of pregnancy has changed with time. The results are given in Table B 5 in Appendix B. The general trend is that the impact loses its strength in the last decade: as we have expected, the influence of a pregnancy or a child is not as strong in the 1990s as it was in the years before.

In order to have a closer look at the effect of the duration of pregnancy on the transition to marriage we add to our model a duration spline indicating the time passed since the first conception. Such a spline operates for women who have not entered a marriage yet and its effect shows only after a conception occurs<sup>22</sup>. The hazard function then reads:

$$\ln h_i(t) = y(t) + \sum \alpha_j \chi_{ij} + \sum \beta_j \omega_{ij}(t) + c(t - u_i)$$

where the additional duration spline  $c(t - u_i)$  kicks in at time  $u_i$  of the occurrence of conception. The results are presented in Figure 4.9.

**Figure 4.9:** First marriage intensity by time elapsed since first conception



Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Census 2001 data.

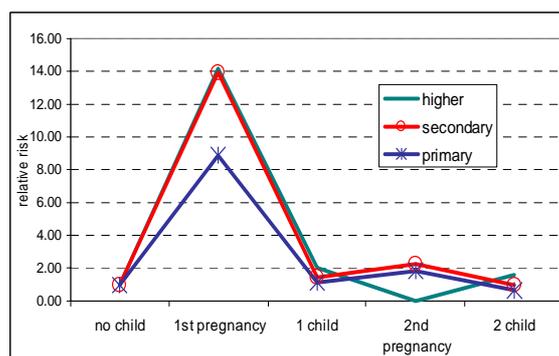
We see that the risk of entering a marriage is at its highest level between a point around the second month of pregnancy and approximately the sixth month. Obviously, recognition of a pregnancy elevates the risk of marriage: many of the women tend to legalize their pregnancy with a “shotgun” wedding. This is usually done within the first two trimesters of the pregnancy. After the sixth month of a woman’s pregnancy her marriage intensity drops sharply, however, and after the birth

<sup>22</sup> In the language of aML users, this kind of duration spline is also known as a kick-in spline (Lillard and Panis, 2003).

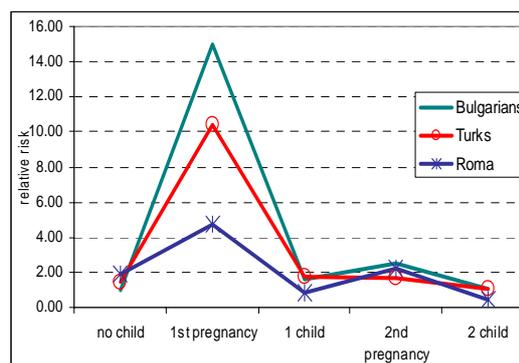
of the child, the risk returns to a very low level: it appears that once the child is born, the desire to get married disappears. We reflect more on this in section 4.5.4.

It is interesting to see whether the impact of pregnancy on the transition to first marriage is as strong for each ethnic group and education level of the women. To form a picture of this, we performed two interactions: the first one with the motherhood status variable and ethnic group, and another one with the motherhood status variable and education level. The results are presented in Figures 4.10 and 4.11. The values of the relative risks are given in Tables B 6 and B 7 in Appendix B.

**Figure 4.10:** Relative risk of first marriage. Effect of education level and motherhood status. Secondary education and no child as a reference group.



**Figure 4.1:** Relative risk of first marriage. Effect of ethnic group and motherhood status. Bulgarian ethnic group and no child as a reference group.



Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Interaction between 1- education level and motherhood status and 2 - ethnic group and motherhood status on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Census 2001 data.

The two pictures look almost the same – by far the highest risk of marriage is seen when the woman is pregnant. Women with higher and secondary education level are more prone to enter a marriage during the pregnancy than women with primary education. Also, the Roma population has a much lower of getting married in a pregnancy than the two other ethnic groups, but the risk is still almost five times that of our baseline group (nulliparous non-pregnant Bulgarians). These results are consistent with the previously presented results and outline once again the differences

between the ethnic groups and education level, as well as the strong impact of pregnancy on first marriage risks.

#### 4.2.4 First marriage and background characteristics

In the next step of our analyses we want to describe the results of the impact of some personal characteristics of the women on the transition to first marriage. Table 4.5 presents a part of the final model of our analyses, which is fully presented in Appendix B, Table B 2. The variables that we additionally include in our analyses are the number of siblings of a woman, the place of residence where she has lived until age 15 and the level of religiosity.

**Table 4.5:** Relative risk of first marriage according to some personal characteristics.

Final model

<i>Number of Siblings</i>	R. R.	<i>Place of residence (till age 15)</i>	R. R.	<i>Level of religiosity</i>	R. R.
0	0.97	Village	1.23 ***	Deeply religious	1.02
1 (ref)	1	Small town	1.06	Somewhat religious (ref)	1
2	1.03	Big town (ref)	1	Not very religious	1.03
3 +	1.05	Capital	0.86 *	Not religious at all	0.93

Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Census 2001 data.

Contrary to our expectations, we do not find any significant effect of the number of siblings on the transition to marriage: the differences between women with different number of siblings are very small. However, when we look at the changes of this variable through time (Table B 8, Appendix B), the results show that there was a positive effect of the number of siblings for the period before 1990. During the 1990s, there is not a substantial impact of the number of siblings on the marriage risk.

However, a clear distinction can be made for the place of residence of the women. Those who lived in a village until age 15 have a significantly higher risk of getting married. On the contrary, women who grew up in the capital have a significantly lower risk of getting married – 14 % less than women who lived in a big town. These results are fully in line with our theoretical expectations. The impact of

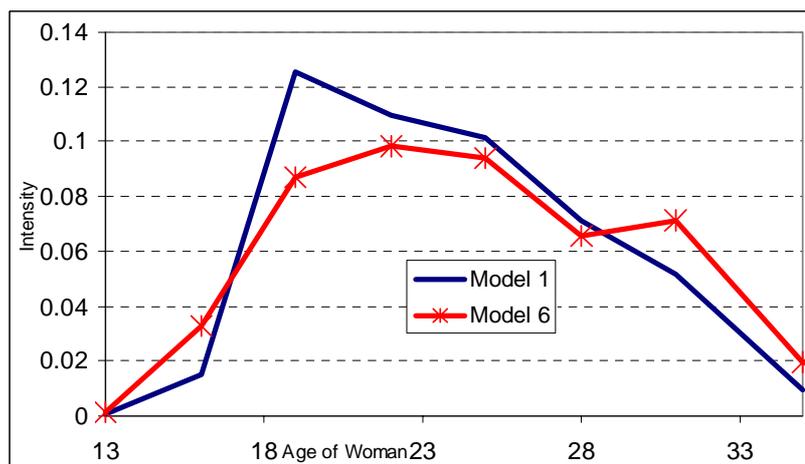
the place of residence pertains through time (Table B 9, Appendix B). For each of the two periods we observe the same direction of the impact, however, in the 1990s, the relative risk of first marriage lowers substantially for each category of residence place.

There is no difference in the impact of the level of religiosity, which contradicts our expectations. The differences we find there are small and insignificant. We discuss this issue later in section 4.5. Regarding the changes through time, we do not find any real trend of the impact of level of religiosity on the transition to first marriage (Table B 10, Appendix B).

### **4.3 First marriage in the young generations**

We have obtained information on the patterns of forming a marital union for the time before and after the start of societal transformation in the country, as well as the differences between the ethnic groups, and the impact of level of education. Now we know a lot more than before about the delay in marriages and the impact of pregnancy and childbirth on marriage formation. But what we still do not know is the role of cohabitation in marriage formation. In order to study this, we use our second data set (from the Social Capital Survey, as described in Chapter 3). The procedure that we use for our first analysis with this data set is identical to the one we had with the census data. The purpose is to make a comparison of the results from the two data sets. In Appendix B in Tables B 11 and B 12 we present six different models. However, here we will discuss mostly the final model – the sixth one – and compare it to the analyses from the census data. The only additional variable that is added in the analysis is the one that controls both for cohabitation and motherhood status. We constructed this time-varying covariate as a combination of the transitions in and out of cohabitation and parity status of the woman. The reference category is the woman who does not have a child and is not living in any union.

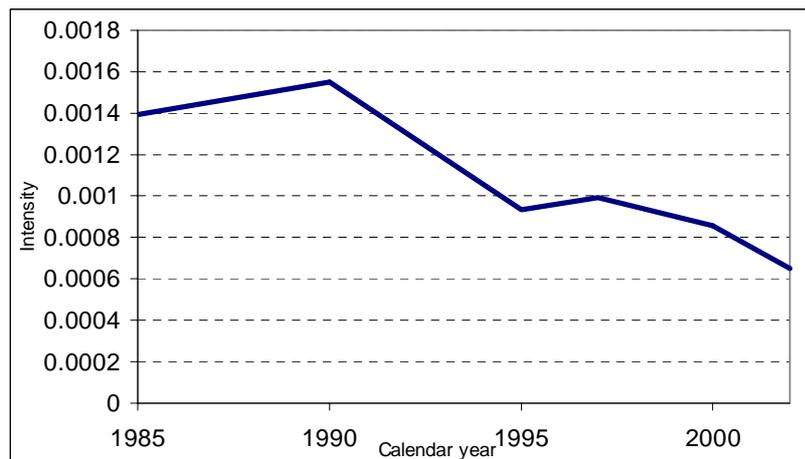
Figure 4.12 presents the intensities of the transition to first marriage from the first and the final model. We plot them in order to better see the changes that have occurred by introducing additional personal characteristics of the model.

**Figure 4.12:** First marriage intensities by age of the woman. Two models compared

Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Model 1 includes only one variable – age of woman, Model 6 is the final model, including age, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) Own calculations, Social Capital Survey data, 2002.

In the model in which we control only for the age of the woman, the intensity has a well-formed peak at age 19. After that the intensity decreases gradually to reach low levels after age 30. But when we introduce all the additional information that we have into the model, the peak at age 19 disappears. The shape of the curve becomes more similar to the one from the census data – with no clear peak, but rather a range of ages at which the intensity is high.

The results for the effect of the calendar year on the transition to first marriage are exactly identical with the ones from the census data. We graphically present the spline gradient from the final model in Figure 4.13.

**Figure 4.13:** First marriage intensity by calendar year

Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

We observe the relatively stable trend during the second half of the 1980s (and we know from the previous results that there was such a stable period in the 1970s too) and then the sharp decline after year 1990, which slows down in the second half of the 1990s. The lower risk of transition to first marriage after the start of the political and economical changes in the country is undoubted.

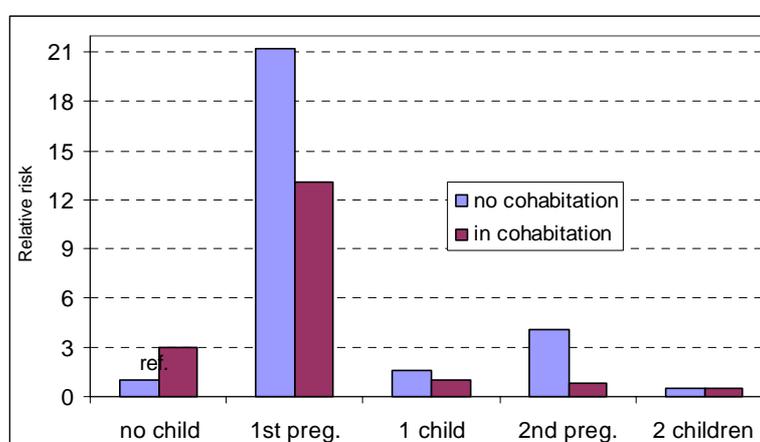
The differences between the ethnic groups on the transition to first marriage are not as clearly identified as with the census data set. Still, the high transition to marriage of the Turk group is very clear and significant: they have a transition rate 20 % higher than the Bulgarians have (Table B 12 in Appendix B). The lower transition of the Roma group is not so strong here, however. Adding the information on cohabitation in our analyses changes the results slightly, but the differences are not very large.

The trends in the marriage transition according to the education level of women show the same directions as in the previous analyses. The primary educated women have a significantly lower transition rate – 39 % lower than women with secondary education (Table B 12 in Appendix B). There is also a defined trend of higher transition rate of the higher educated women, though it is not significant. Being in education is associated with a lower propensity of marriage. Women who study have about 40 % lower risk of getting married than women who have finished their education.

The variable that we want to pay more information to in this analysis is the partnership and motherhood status. In order to make use of the additional information

that we have about cohabitation in the Social Capital Survey, we formed a time-varying variable indicating the motherhood status of the woman and at the same time whether she is cohabiting or not. The reference category is a woman who does not have a child and is not cohabiting. There are no substantial differences between Models 5 and 6 regarding this variable, which is why we shall discuss only the results from the final model. The results are given in Table B 12, Appendix B. In order to make the discussion easier, we plotted in Figure 4.14 the relative risks of first marriage of the women according to their motherhood and civil status.

**Figure 4.14:** Relative risk of first marriage according to motherhood and civil status



Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

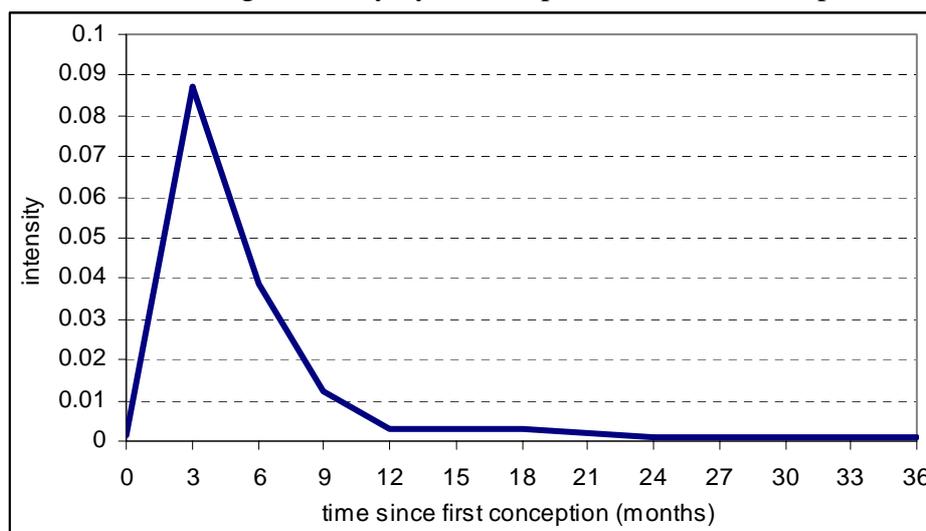
A cohabiting woman who does not have children and is not pregnant is three times more likely to get married than a non-cohabiting woman with the same motherhood status: for many women cohabitation seems to be a transition towards marriage, and, obviously, many couples start to live together when they already know they will get married. The highest risk of getting married can be found among the women who are pregnant with their first child and live out of cohabitation – 21 times higher than the reference group. Comparing women who live in cohabitation, those who are pregnant are about four times more likely to marry than those without a child. In both cases (cohabiting or not) we see again the importance of pregnancy for marriage transition. We have to underline, though, that pregnant women who have already formed a union have much lower transition risk to marriage than pregnant women who do not live together with their partner. This shows that a large part of the out-of-wedlock births actually occur in a union.

A second pregnancy also has a high impact on the transition to first marriage, but only for the women who are not living in cohabitation. For women who are living in cohabitation, the risk is much lower. Obviously, when there is already a union formed (although “unofficial” from the legal perspective), the second birth does not contribute to any change in the marital status. But, when a second birth comes and there has been no union formation beforehand, it influences strongly the entrance into marriage. We reflect more on this in section 4.5.4.

To further facilitate the analysis of the impact of pregnancy and cohabitation on the transition to first marriage, we introduce to our final model two additional duration splines – one indicating the time passed since first conception and the other the time passed since the start of cohabitation.

The impact of the time since first conception on the marriage risk is presented in Figure 4.15.

**Figure 4.15:** First marriage intensity by time elapsed since first conception



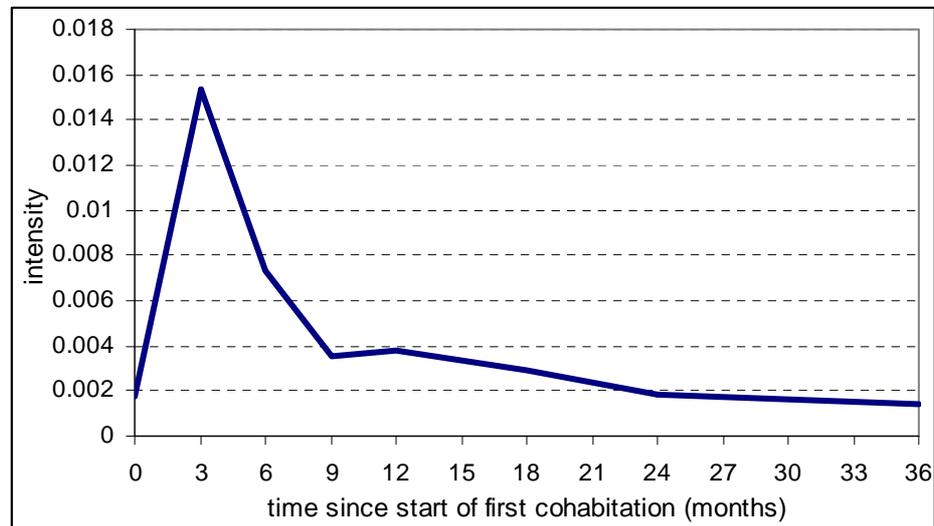
Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

The trend that we observe is very much identical to the one we saw from the census data. The risk of first marriage is higher between the second and sixth months of the pregnancy. After the birth of the child, the transition to first marriage is very low.

Almost the same can be observed when relating the transition to marriage to the formation of a cohabitation (Figure 4.16). The highest chances of marriage are in

the first three months of the cohabitation. The risk becomes very low after the first six months, has a small peak at one year and reaches a very low level at the second year of cohabitation.

**Figure 4.16:** First marriage intensity by time elapsed since start of first cohabitation



Notes: (1) Method: hazard regression model; dependent variable: transition to first marriage measured from age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

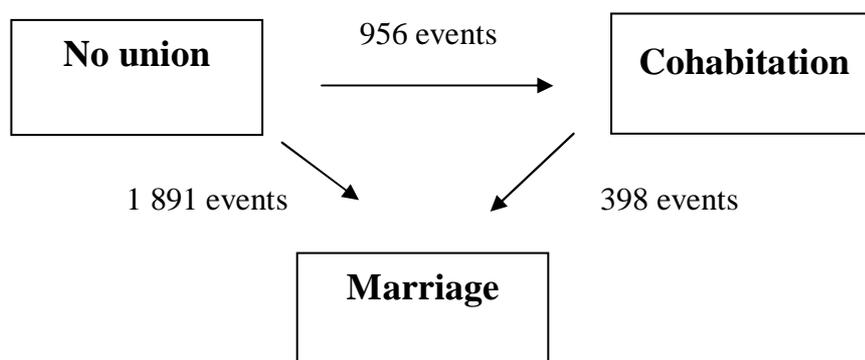
The last two graphs show once again the importance of pregnancy and cohabitation on marriage transition for the Bulgarian women. Pregnancy raises the risk of marriage significantly, especially before the sixth month of pregnancy: a large group of women stick to the traditional way of family transitions – first forming a legal family, then giving a birth to a child. The step towards cohabitation is also seen as a preparation for marriage: a large proportion of women get married within the first three months of the cohabitation. The longer a woman stays in cohabitation, the lower the risk of getting married.

#### **4.4 First union formation in the young generations – the role of cohabitation**

As we saw in our previous analyses, the transition to first marriage is influenced by other transitions in a women's life-course. The educational career and the birth pattern of the women play a very strong role in the decision to enter a marriage. Additionally, the emergence of cohabitation as an alternative is gaining in

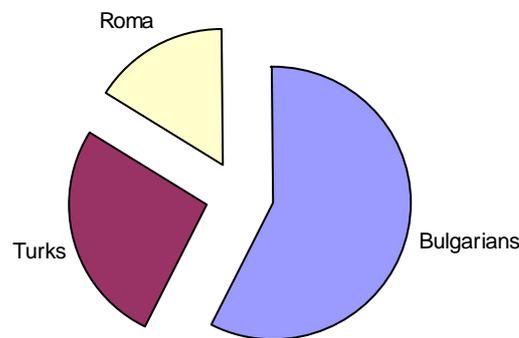
significance: there is a large difference between the tendencies of transition to first marriage between women living in or out of cohabitation. The influence of pregnancy on the transition to first marriage is much stronger for women who are not already living in a union. Many marriages start with cohabitation, but there are also cohabitations that never transfer into a marriage, so we can see that one thing missing in our analyses so far is the distinction between direct marriage and marriage after cohabitation. It is possible that women who enter a marriage directly, without cohabiting beforehand, are a selected group and have certain specific characteristics. Also, women who stay on in cohabitation and never make a transition to marriage should also have special features that distinguish them from the married women. This leads us to extend our analyses into three more different transitions. We analyze separately the transition to direct marriage, to first cohabitation, and to marriage after cohabitation. The transitions are presented visually in Figure 4.17.

**Figure 4.17:** Graphical presentation of the transition under analyses



Women whose first union is cohabitation total 956 in our sample, which is about 22 % of all the women at risk of this event. Those who start directly with marriage are 1891 or 44 % percent of all the women in our sample (or 66 % of the women who start first union). Around 55 % of the Roma population start their first union as cohabitation while only 19 % of the Bulgarians do so. The consensual unions that are later transformed into marriages are 40 %, of which about half are conducted within six months after the start of the cohabitation. The Bulgarians are the ones that most often transform their consensual union into a marriage – about 51 %. The Roma population very rarely transforms cohabitation into a marriage – around 14 % do so – and from the Turks 23 % turn the cohabitation into a marriage (Figure 4.18).

**Figure 4.18:** Distribution of the ethnic groups by the number of transformed cohabitations into marriages



Source: Social Capital Survey, 2002, own calculations.

However, only about 10 % of the consensual unions finish with separation – there is either a marriage or a long-term cohabitation observed. Out of all the cohabitational unions that are transformed into a marriage, the biggest share is of the ethnic Bulgarians – 84 %. The Turks and the Roma hold a small part – 7 % and 5 % respectively.

The primary educated women more often start a union with cohabitation – about 45 %, while for the secondary and higher educated women this figure is about 17 %. Approximately 62 % of the women with higher education who have started a union with cohabitation transform it into a marriage. This percentage is lower for the rest of the women – about 50 % of the women with secondary education do so and only 21 % of the women with primary education.

Of course, this descriptive information can not answer all our questions regarding the characteristics of the people who are more prone to cohabit. To obtain more information, we return to our event-history analyses.

#### ***4.4.1 Direct marriage***

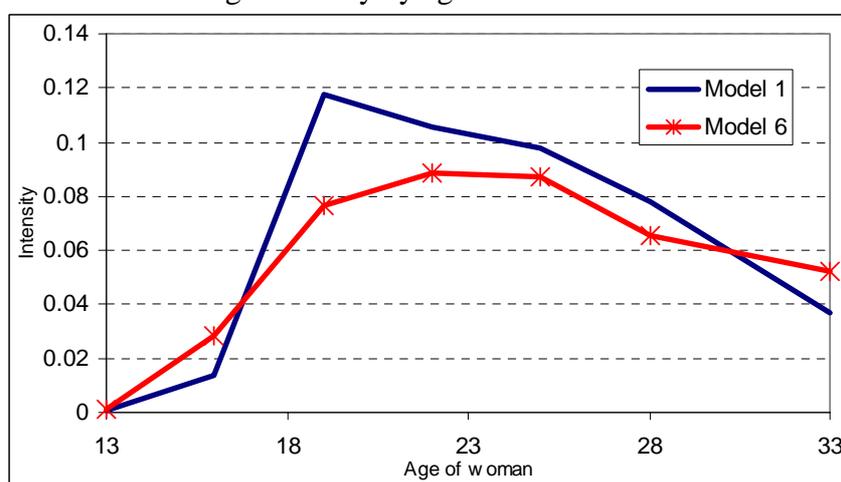
With the analyses of transition to direct marriage we want to outline the trend and the development of the risks of direct marriage according to time. It is interesting to know if the number of direct marriages is decreasing. Another question that we want to develop is the identification of the women who are most prone to commit a direct marriage. We are mainly interested in the differences between the ethnic groups

as well as the impact of the education level on the transition to direct marriage. Of course, the impact of pregnancy will be further discussed in the analyses.

The dependent variable is the transition to direct marriage measured from age 13 of the woman. A woman is censored as soon as she starts to cohabit, or at the date of the interview. We use stepwise modeling again and include the variables gradually into our analyses. In Appendix B, Tables B 13 and B 14, we present the results for all the variables for each model.

In order to provide a better visual view of the effects of age of woman and calendar year on the transition to direct marriage, we plot them in Figures 4.19 and 4.20.

**Figure 4.19:** Direct marriage intensity by age of the woman



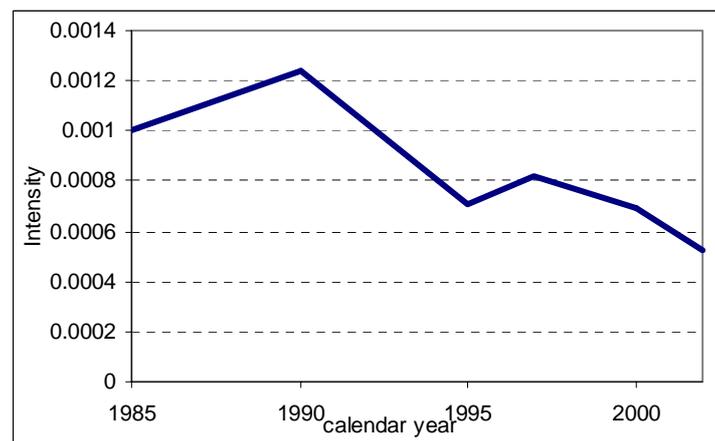
Notes: (1) Method: hazard regression model; dependent variable: transition to direct marriage measured from age 13. (2) Graph constructed on the basis of the first model (no other variables included) and the final 6<sup>th</sup> model (including all the variables). (3) Own calculations, Social Capital Survey data 2002.

The shapes of the curves are very similar to the one that we obtained from the analyses of the transition to first marriage. The intensity in the first model peaks at age 19 and then gradually decreases over the higher ages. Not controlling for any covariates in the model results in a higher risk of direct marriage at younger ages. The curve from the final model does not have such a skewed shape and the direct marriage risk stays high for an interval of ages. The risk after the first observed age gradually grows, stays high between ages 19 and 25, and then slowly decreases. However, the risk is still quite high at age 33.

The trend of the transition to direct marriage over the years is as expected: during the 1990s there is a substantial drop (Figure 4.19, full results in Table B 14,

Appendix B), with a sharp decline from 1990 to 1995. Then we observe a small peak and another decline starting afterwards. The drop of the transition to direct marriage does not come as a surprise, as we already observed a drop in the transition to first marriage. This implies that the direct marriages should also decline.

**Figure 4.20:** Direct marriage intensity by calendar year



Notes: (1) Method: hazard regression model; dependent variable: transition to direct marriage measured from age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

We obtain interesting results for the transition to direct marriage analyzed according to the ethnic group of the women. In Table 4.6 we present the results from Model 3 and Model 6, which are also given in Table B 13 and Table B 14 in Appendix B. The Roma group and the Turks have substantially higher risks of entering a direct marriage than the Bulgarians. When we do not control for any other characteristics except for age and calendar year, the risk of the Turks is 50 % higher than of the Bulgarians and the Roma group has almost twice as high a risk of entering a direct marriage. When controlling for education, motherhood status and basic personal characteristics, the risk is lower but still significant. The difference between the Turk and Roma populations appears to be small. These findings are in contrast to the results from the previous analysis of first marriage<sup>23</sup>. Therefore it seems that the role of cohabitation in first union formation has a crucial difference between the ethnic groups. We will investigate this hypothesis further in the next stage of analysis.

<sup>23</sup> As a reminder for the reader, the results from the analyses to first marriage showed that the Roma group has the lowest risk of entering a marriage.

**Table 4.6:** Relative risk of transition to direct marriage according to ethnic group.

Two models compared.

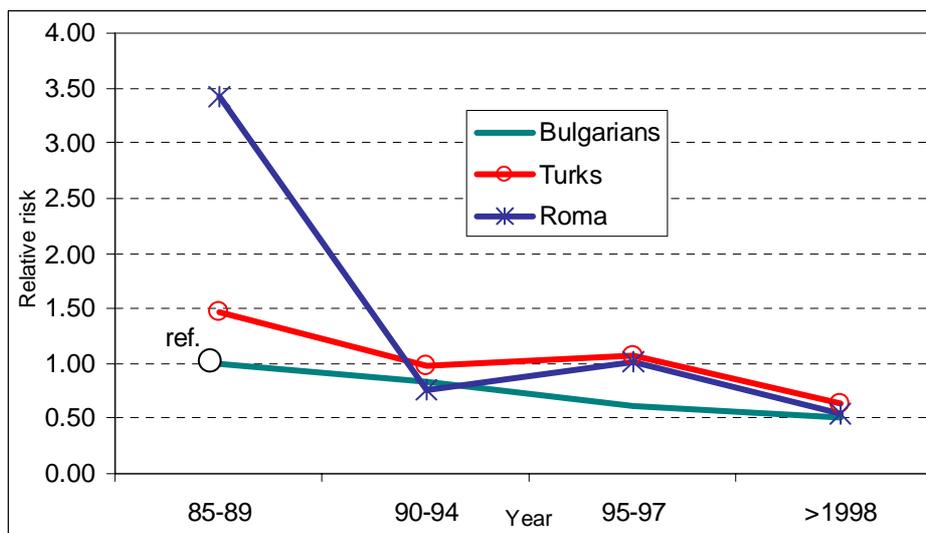
	Model 3		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>				
Bulgarians (ref)	1		1	
Turks	1.54	****	1.34	***
Roma	1.97	***	1.49	***
Other	1.18		0.90	

Notes: (1) Method: hazard regression model; dependent variable: transition to direct marriage measured from age 13. (2) Model 3 includes variables for age of woman, calendar year and ethnic group, Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey data, 2002.

We want to point out to the reader that the above results are substantially different from the ones obtained from the census data (section 4.2.1). This difference is due to the fact that with the census data we did not distinguish the kind of marriage: whether it is a direct one, or a marriage after cohabitational union. This makes the two results difficult to compare.

In order to see if the differences by ethnic groups have persisted through time, we performed interaction between the ethnic groups and period. The results are presented in Figure 4.21 and the values of the relative risks are given in Table B 15 in Appendix B.

**Figure 4.21:** Relative risk of direct marriage. Effects of ethnic group and calendar year. Risk of the Bulgarians before 1989 is the reference category.



Notes: (1) Method: hazard regression model; dependent variable: transition to direct marriage measured from age 13. (2) Interaction between ethnic group and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

We see that the Bulgarians had a persistently low relative risk throughout the whole period. In the years before 1990 the differences between the ethnic groups were very large, with the highest risk being shown by the Roma group. During the 1990s the differences became smaller, with the changes in the trends for the Turks and the Roma occurring in parallel. The decline for the Bulgarian group is smooth and it also stays statistically significant. We discuss these results some more in section 4.5.2.

The results according to education are very similar to the ones obtained from the analyses of the transition to first marriage. In Table 4.7 we present the results of Model 4 and Model 6, which can be found also in Table 14 in Appendix B.

**Table 4.7:** Relative risk of transition to direct marriage according to education attainment and education enrolment. Two models compared.

	Model 4		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Education level</i>				
Primary	0.74	***	0.68	***
Secondary (ref)	1		1	
Higher	0.99		1.10	
<i>Education enrolment</i>				
Out of education (ref)	1		1	
In education	0.38	***	0.56	***

Notes: (1) Method: hazard regression model; dependent variable: transition to direct marriage measured from age 13. (2) Model 4 includes variables for age of woman, calendar year, ethnic group, education attainment and enrolment, Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey data, 2002.

The results from the two models are very similar ones: the changes that occur in the results when controlling for more variables are not very large. The primary educated women have the lowest transition to direct marriage – about 30 % less than the other groups. We do not find any differences between the risks among secondary and those among higher educated women.

People who are in education have significantly lower transitions to direct marriage. When we control for motherhood status and additional characteristics, the risk increases a little, but it is still lower than for the women who have finished their studies. Women who study have a 44 % lower risk of direct marriage than women who are out of the education system.

The effect of pregnancy is extremely high for the transition to direct marriage. In Table 4.8 we present an extract of Table B 14 in Appendix B.

**Table 4.8:** Relative risk of transition to direct marriage according to motherhood status. Final model

	Model 6	
	Relative risk	Sig.
<i>Motherhood status</i>		
No child, no pregnancy (ref)	1	
No child, 1 <sup>st</sup> pregnancy	21.55	***
Parity 1	1.68	***
Parity one, pregnant	3.01	***
Parity 2	0.50	*

Notes: (1) Method: hazard regression model; dependent variable: transition to direct marriage measured from age 13. (2) Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey data, 2002.

Women who are pregnant with their first child have a high risk of entering a direct marriage – about 21 times higher than women who do not have a child. Women who have not formed a union by the time or during the time of their pregnancy are the most likely to get married. Many people want to bring up their child within a family and so as soon as they realize they are pregnant they commit to a marriage. Women who have not married during the pregnancy may do so after the birth of the child. Mothers of one child still have an almost 70 % higher risk of getting married than women with no children. A second pregnancy also leads to a high likelihood of getting married: about three times higher than the reference group. Women who have not married by the time of the birth of their second child will most probably stay unmarried – they have the lowest risk of entering a direct marriage.

We will not discuss the effect of the additional characteristics on the transition to direct marriage, because most of them do not have significant and important effects. The number of siblings and level of religiosity of the women did not show any impact on the transition to direct marriage. The results from place of residence show that people who grew up in rural areas have a 15 % higher risk of marrying directly than women who lived in urban areas.

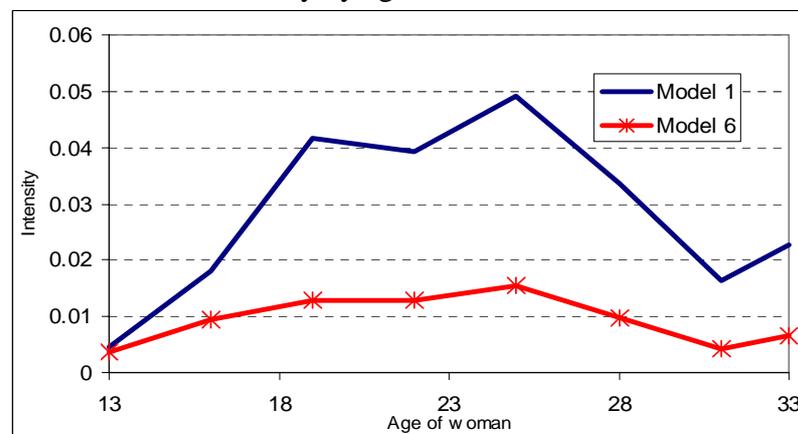
#### 4.4.2 Cohabitation

As we saw from the results of the analyses for the transition to direct marriage, direct marriage became less popular in the 1990s. With the analyses of the transition

from single to cohabitation we want to see whether cohabitation gains popularity among young cohorts and if it compensates for the drop in marriages. We also want to investigate the characteristics of women who are most prone to cohabit and pay special attention to the ethnic group and level of education.

Again, we want to start with our main intensity – cohabitation by age of the women starting from age 13. In Tables B 16 and B 17 in Appendix B we give the results from each separate model that we estimated – in each one adding a new set of variables. In Figure 4.22 we plot the intensity from the final model.

**Figure 4.22:** Cohabitation intensity by age of the woman



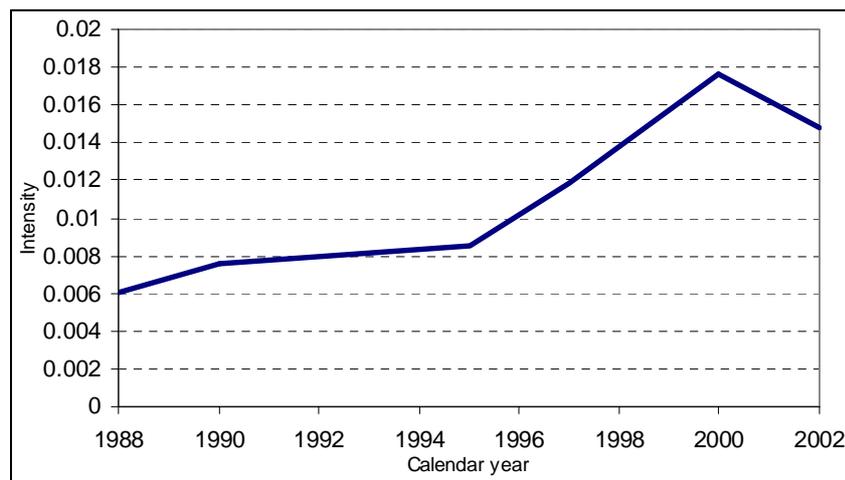
Notes: (1) Method: hazard regression model; dependent variable: transition to cohabitation measured from age 13. (2) Graph constructed on the basis of the first model (no other variables included) and the final 6<sup>th</sup> model (including all the variables). (3) Own calculations, Social Capital Survey data 2002.

The differences in the intensities between the two models arise mainly from the level and not from the shape of the curves. Adding additional information to the model lowers substantially the risk of entering cohabitation. However, in both models, the transition to cohabitation according to women's age gradually increases to peak around age 25. Then a sharp decline takes place and a secondary peak appears at the beginning of the 30s. The transition to cohabitation according to age does differ slightly from the transition to direct marriage. The 20s are the age-span at which it is most probable that a woman forms a union, but the cohabitation unions are formed at later ages, while the direct marriages have a higher intensity at comparatively young ages

From Figure 4.23 (spline gradients are given in Table B 16 and Table B 17 in Appendix B), it can be seen that cohabitation increasingly gains in popularity with time, which is in line with our expectations. A gradual rise is observed already in the

late 1980s. However, it takes time until the new family forms become popular and are accepted by society; in the first half of the 1990s we do not observe any significant rise in the transition to cohabitation. However, in the second half the transition rate again increases substantially. We give our interpretations on these findings in section 4.5.1.

**Figure 4.23:** Cohabitation intensity by calendar year



Notes: (1) Method: hazard regression model; dependent variable: transition to cohabitation measured from age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

In Table 4.9 we present extracts from Tables B 16 and B 17, Appendix B, concerning the results for the differences between the ethnic groups. We present two models – Models 3 and 6 – with the first being the one in which the ethnic group is introduced, and the second is the final model.

**Table 4.9:** Relative risk of transition to cohabitation according to ethnic group. Two models compared.

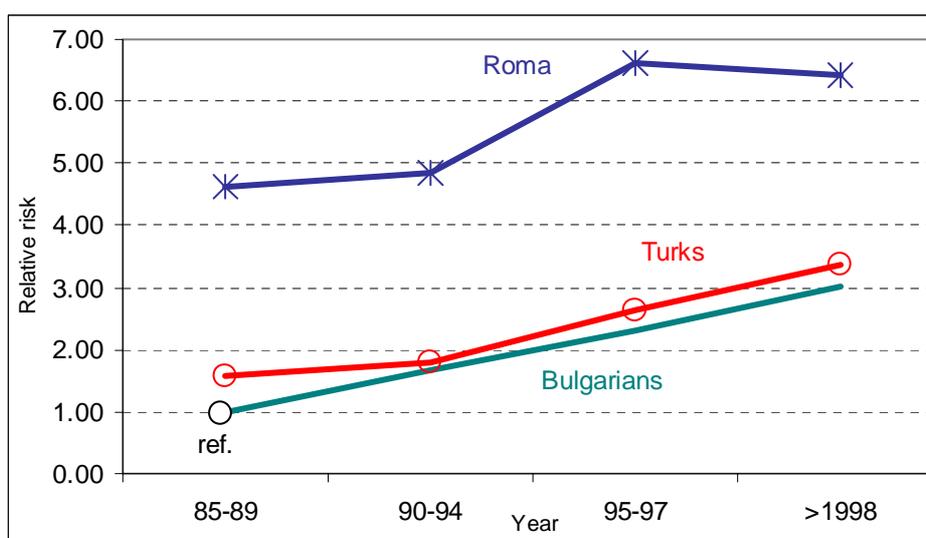
	Model 3		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>				
Bulgarians (ref)	1		1	
Turks	2.05	***	1.13	
Roma	6.41	***	2.60	***
Other	2.06	***	1.26	*

Notes: (1) Method: hazard regression model; dependent variable: transition to cohabitation measured from age 13. (2) Model 3 includes variables for age of woman, calendar year and ethnic group, Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey data, 2002.

The results from the two models differ strongly: the values of the relative risks point in the same direction but the levels are very different. When we do not control for the education of the women, motherhood status and the background characteristics, the relative risk of the Turks for a transition to cohabitation is more than twice as high as that of the Bulgarians, and the Roma have a risk more than five times higher than that of the Bulgarians. However, when we account for the education attainment and education participation, as well as introducing our background characteristics, the differences between the ethnic groups are not as strong anymore. Obviously, the education of the women has a strong impact on the transition to cohabitation and if one does not take it into account, the results can be very biased. In the final model, the Turks have 13 % higher risk of transition to cohabitation than the Bulgarians and the Roma group 160 %. These results are consistent with the results from the analyses on the transition to first marriage, where we found out that the Roma group has the lowest transition risk. Here, they show the highest risk, which would mean that they still have a high transition risk to first union formation.

Again, to see if the differences between the ethnic groups were constant over the whole of our observation period, we performed an interaction between the ethnic group and the calendar year. The results are given in Table B 18 in Appendix B and for better visual receptivity we plot them in Figure 4.24.

**Figure 4.24:** Relative risk of transition to cohabitation. Effects of ethnic group and period. Bulgarians and period before 1990 as a reference group.



Notes: (1) Method: hazard regression model; dependent variable: transition to cohabitation measured from age 13. (2) Interaction between ethnic group and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

The differences in the transition to cohabitation between the ethnic groups are present over the entire observed period; the Roma group has the highest transition risk and the Bulgarians the lowest. The differences between the Bulgarians and the Turks are not very large. For each group we observe an almost linear increase over the years in the transition risks. We give more reflections on these results in section 4.5.2.

Table 4.10 presents the results from two models for the transition to cohabitation according to education attainment and education enrolment. The other models are fully presented in Tables B 16 and B 17 in Appendix B.

**Table 4.10:** Relative risk of transition to cohabitation according to education attainment and education enrolment. Two models compared.

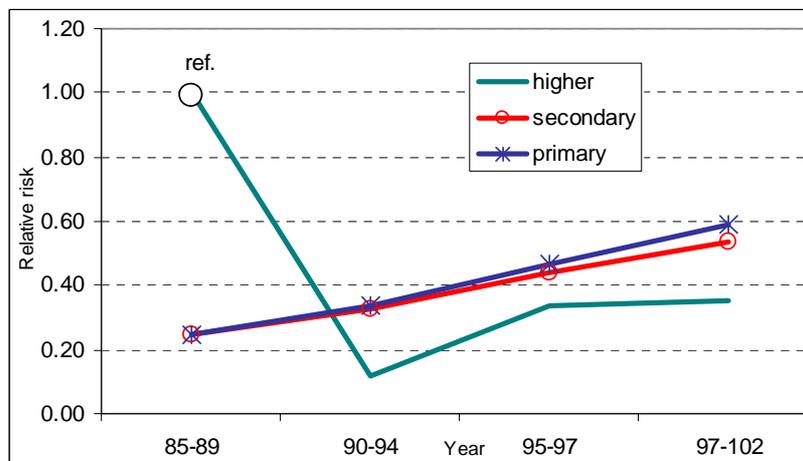
	Model 4		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Education level</i>				
Primary	1.22	***	1.04	
Secondary (ref)	1		1	
Higher	0.66	***	0.66	***
<i>Education enrolment</i>				
Out of education (ref)	1		1	
In education	0.31	***	0.41	***

Notes: (1) Method: hazard regression model; dependent variable: transition to cohabitation measured from age 13. (2) Model 4 includes variables for age of woman, calendar year, ethnic group, education attainment and enrolment, Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey data, 2002.

In Model 4 the differences between the education groups in the transition risks to cohabitation are significant with the primary educated women having the highest risk and the higher educated women the lowest risk. When accounting for motherhood status and additional personal characteristics for the women, the differences between the primary and secondary educated women disappear. However, the risk of the higher educated women does not change and stays 34 % lower than the risk for the other groups of education.

Being in school leads to a low risk of transition to cohabitation. Women who are still studying are not prone to forming a union. Controlling for additional characteristics does not change the result much – women in education have about 60 % lower risk of entering a cohabitation.

**Figure 4.25:** Relative risk of transition to cohabitation. Effects of education level and period.



Notes: (1) Method: hazard regression model; dependent variable: transition to cohabitation measured from age 13. (2) Interaction between education group and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

The differences between the education groups have not been always the same throughout the observed period (Figure 4.25, the results are also presented in Table B 19 in Appendix B). In the period before 1990, the highly educated women were most prone to make a transition to cohabitation. However, after 1990 their risk declined strongly and then started increasing again. In the last five years the changes in the risk of the higher educated women are not large. We do not find any differences between the groups of secondary and primary educated women: their risks stay similar throughout the time. We observe a constant increase in the risks and at the beginning of the 1990s they overtook the highly educated women to have the highest propensity of transition to cohabitation.

The effect of motherhood status on the transition to cohabitation is shown in Table 4.11. The results come from the final model and are an extract from Table B 17 in Appendix B. Pregnancy has a strong impact in transition to cohabitation. Women who conceive out of a union have about five times higher risk of entering a cohabitation than women who do not have children. If a woman has not formed a union during the pregnancy, the risk of doing so after the birth of a child is very low. Women with a child have 30 % lower risk of making a transition to cohabitation than women without children. A second pregnancy also does not elevate the risk of entering a cohabitation. In general, the highest risk of entering a cohabitation can be found during the first pregnancy of the woman. Having a child, being pregnant with a

second child or having two children decreases significantly the risk of forming a cohabitation.

**Table 4.11:** Relative risk of transition to cohabitation according to motherhood status.

Final model

	Model 6	
	Relative risk	Sig.
<i>Motherhood status</i>		
No child, no pregnancy (ref)	1	
No child, 1 <sup>st</sup> pregnancy	5.42	***
Parity 1	0.68	*
Parity one, pregnant	0.80	
Parity 2	0.18	***

Notes: (1) Method: hazard regression model; dependent variable: transition to cohabitation measured from age 13. (2) Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey data, 2002.

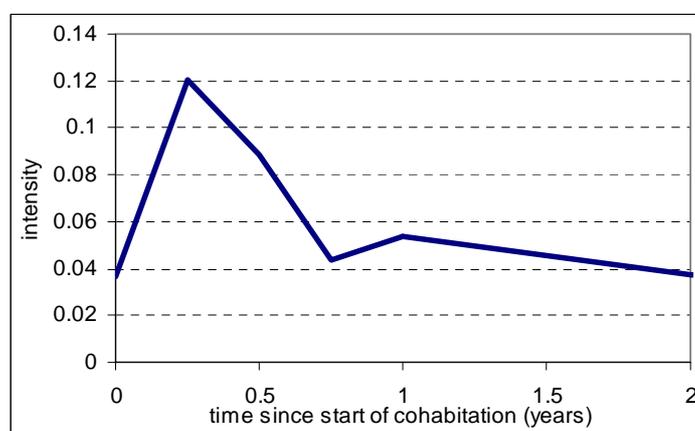
For the first time in our analyses we find a significant impact of the number of siblings that a woman has. In the transitions to first marriage and direct marriage we were not able to distinguish any differences, so it seems that the number of siblings only plays a role in the process of cohabitation. We find a positive impact: the higher the number of siblings, the higher the risk of entering a cohabitation (see Table B 17 in Appendix B). Women who have two siblings a have 50 % higher risk and women with three or more siblings have a 100 % higher risk of forming a cohabitation than women with one sibling.

#### 4.4.3 Marriage after cohabitation

The results from our analyses up to now showed that there is a growing transition rate to cohabitation and a decreasing one to direct marriage. However, we still do not know much about the development of the first cohabitation: what proportion of the unions is transformed into marriages, and how long a cohabitation usually survives. We would also like to know more about the people who are prone to marry after cohabiting. What is the role of pregnancy in the transition to marriage after cohabitation?

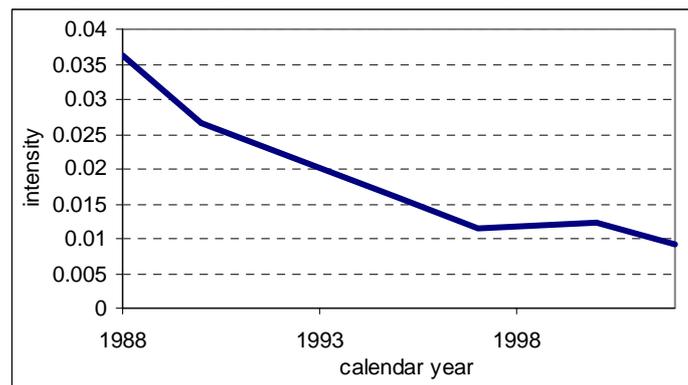
We therefore calculate the intensity which shows the transition to marriage according to the time that has passed since the start of the cohabitation (Figure 4.26). The results of all our models can be found in Table 20 and Table 21 in Appendix B. We find the highest risks during the first six months after the start of the cohabitation. After two thirds of a year have passed, the risk becomes very low. This trend is very similar to the results analyzing the transition to marriage according to the pregnancy of the woman: the risk is highest during the pregnancy and then drops to very low levels.

**Figure 4.26:** Intensity of marriage after cohabitation by time elapsed since start of first cohabitation



Notes: (1) Method: hazard regression model; dependent variable: transition from cohabitation to marriage measured since the start of the cohabitation. . (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

In Figure 4.27 we present the transition to marriage after cohabitation according to the calendar year.

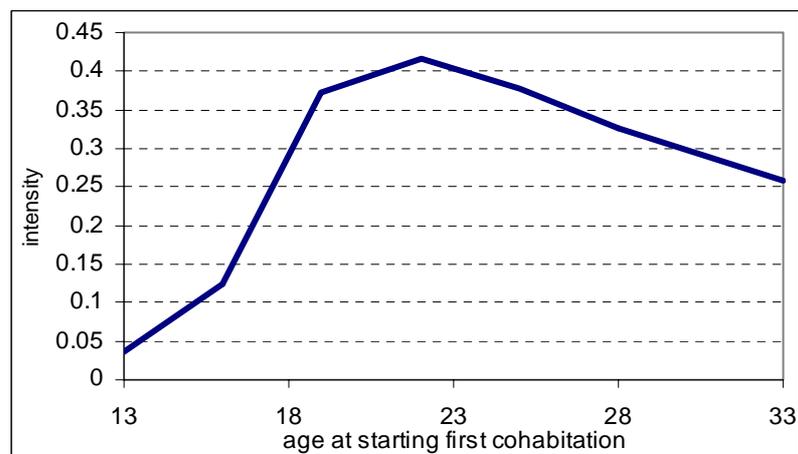
**Figure 4.27:** Intensity of marriage after cohabitation by calendar year

Notes: (1) Method: hazard regression model; dependent variable: transition from cohabitation to marriage measured since the start of the cohabitation. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

The results show that the risk of getting married when living in consensual union is decreasing constantly over time. In the past, people who started to live in cohabitation were very likely to get married; cohabitation during this period was used more as a prelude to a marriage. This tendency became less and many people who have a consensual union do not necessarily make a transition to marriage. The changes show the appearance of the new family formation patterns and the growing importance they have.

What we also need to know is if there is a special trend in the transition to marriage after cohabitation according to the age of the woman when she started cohabiting. For this purpose, we estimated an additional duration spline capturing the effect of women's age at first cohabitation. We plot the results in Figure 4.28.

**Figure 4.28:** Transition to marriage after cohabitation according to age of the woman at first cohabitation



Notes: (1) Method: hazard regression model; dependent variable: transition from cohabitation to marriage measured since the start of the cohabitation. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

The highest risk of getting married after cohabitation can be found among the women who start cohabitation between ages 19 and 25. This age span is rather too broad to allow us a plausible conclusion about the impact of age. Moreover, although the risk decreases after age 25, it still stays at quite a high level until the end of our observation window. Women starting a cohabitation at age 33, for instance, still show a high risk of transforming the consensual union into a marriage.

**Table 4.12:** Relative risk of transition from cohabitation to marriage according to ethnic group. Two models compared.

	Model 3		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>				
Bulgarians (ref)	1		1	
Turks	0.46	***	0.66	*
Roma	0.25	***	0.41	***
Other	1.00		0.97	

Notes: (1) Method: hazard regression model; dependent variable: transition from cohabitation to marriage measured since start of cohabitation. (2) Model 3 includes variables for age of woman, calendar year and ethnic group, Model 6 is the final model, including all the variables (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey data, 2002.

In the transition to marriage after cohabitation (Table 4.12, full results also given in Table B 20 and Table B 21, Appendix B) we find essential differences between the ethnic groups. In both models the trend stays the same. However, in the

final model the differences become smaller, but they are still substantial and significant. The Roma group has the lowest transition to marriage when the women are living in consensual unions – 59 % lower risk than the Bulgarians. This result is consistent with the findings of the other part of the analyses – in general this group has the lowest transition to marriage and the highest to cohabitation. The group of the Turks also shows a significantly lower level of transition to marriage after cohabitation compared to the Bulgarians: their risk is more than 30 % less. So, when a union starts with cohabitation, the Roma and the Turks are more prone to remain in this form of a union, while the Bulgarians are more likely to convert it to marriage.

Since there are no essential differences between the models for the results on the impact of the education on the transition to marriage after cohabitation, we present in Table 4.13 only the final model.

**Table 4.13.** Relative risk of transition from cohabitation to marriage by education attainment and education enrolment. Final model.

	Model 6	
	Relative risk	Sig.
<i>Education level</i>		
Primary	0.54	***
Secondary (ref)	1	
Higher	1.35	
<i>Education enrolment</i>		
Out of education (ref)	1	
In education	1.17	

Notes: (1) Method: hazard regression model; dependent variable: transition to cohabitation to marriage measured since start of cohabitation. (2) Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey data, 2002.

We find out that when the primary educated women form a cohabitation, they tend to stay with it and hardly make a transition to marriage afterwards – their risk is 46 % lower than that of secondary educated women. By contrast, higher educated women have the highest risk of getting married when living in this simple consensual union – 35 % higher risk than that of secondary educated women.

Being enrolled in studies does not have an impact on the decision to get married when living in cohabitation. Transforming a cohabitation into a marriage is not influenced by the factor whether a woman is studying at the moment or not.

The inclusion of the information on background characteristics of the women does not improve the fit of our model ( $p=0.22$ ). Additionally, we do not find any specific significance or trend in the risks according to the place of residence or level of religiosity of the women (see Table B 21 in Appendix B). The results on the impact of number of siblings show that the more siblings a woman has, the less prone she is to get married when she lives in cohabitation. We reflect on this issue in section 4.5.5.

## **4.5 Discussion of the results**

In this part of our analysis we want to outline the most important findings and to discuss the possible interpretation and explanation of the results.

### ***4.5.1 Union formation and time***

Our first important result is the decrease in the rate of marriage transitions for women in Bulgaria during the 1990s (see Figures 4.5 and 4.13): since the start of the transition of the country, women have become less likely to conduct marriages. At the same time, an increasing number of people start their union formation with a cohabitation. This is shown by the reduction in the formation of direct marriages – a trend that is observed throughout the last twelve years and which shows no sign of slowing down (see Figure 4.20). In general, we observe a postponement of the union formation in Bulgaria: women from the younger cohorts delay this process. Moreover, there is a sign of an increase in the number of women who stay never-married; however, this is compensated to a great extent by the newly emerged family formation pattern: cohabitation. As a whole, the results we obtained are in line with our expectations (see Chapter 3, Hypothesis 1).

There could be two major reasons for the change in the marriage behavior of the women. One is the economic deprivation. For instance, it has long been recognized that marriage rates increase in times of prosperity and decrease in times of recession (Bracher and Santow, 1998). Also, marriage is viewed as a long-term commitment and people usually consider their action well before getting married.

They try to marry the most suitable partner according to their requirements. An individual without a job and good future prospects does not have a good chance in the marriage market<sup>24</sup>, and the decline in income, unemployment, and deprivation affected all age groups in the population. Thus, we suppose that fewer people are ready to start a marriage before making sure they have job prospects and some security in life. Todorova (2000) also states that nowadays many couples postpone forming a family till they acquire economic independence, a behavior which has firm traditions in western societies. Additionally, a marriage ceremony is a very pricey event. Even if a marriage is highly supported from the parents and they want to take over most of the expenses (which is mostly the case in Bulgaria), it can be difficult for them to finance the celebration, since their income has also shrunk a lot and most of their savings were eaten up by the periods of high inflation that accompanied the economic development through the 1990s. Marriage rates could be also affected by worsening expectations about future living standards as a whole (Cornia and Paniccia, 1996).

The other reason could be the emergence of a new family formation pattern, namely cohabitation. We have discovered that cohabitation as a first union formation is becoming ever more popular. The emergence of such a new pattern shows either a change in the societal norms or a reduction in the importance of these norms, or, most probably, both. The societal pressure to live together only when married is losing its strength. Moreover, even people who tend to transform their consensual union into a marriage are becoming less in number. This shows that for many people it is not of great importance if their union is a legal marriage or a simple consensual union: it can be enough to live together and not much attention is paid to the fact of whether this is legal or not. This is a sign of clear changes in the value orientations of people in general and less social pressure for marriage. Also, this could be an indication that converting cohabitation into marriage is independent of any direct measure of economic independence (Bracher and Santow, 1998). There have hardly been any signs for such development during the state socialism and this novel behavior has its

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<sup>24</sup> This argument, according to us, refers not only to the attractiveness of men on the marriage market, but also to women. In the Bulgarian society, the role of women is seen not only as a mother and housewife, but also as an active participant in the labor market with a possible career orientation (see also Chapter 2).

strong onset only after the start of the political and economical transformations in the country.

#### ***4.5.2 Union formation and ethnic groups***

In general, our findings for the union formation trends according to the ethnic groups are as we predicted in Chapter 3 (Hypothesis 3). In our study, we were able to distinguish which kind of people are the ones that have the lowest transition risk to marriage. Our census data showed that after 1990 the Roma population are the ethnic group that is the least prone to form a marriage (see Figure 4.7), whereas before 1990 they had the highest transition risk of entering a marriage. This result indicates the close connection between the changes in the family formation pattern and the changes in the country connected with the societal transformation. The data from the Social Capital Survey allowed us to look in more detail into the union formation behavior of each of the ethnic groups. In general, our findings for the ethnic groups can be summarized as follows.

The Bulgarians start with the family formation process at oldest ages compared to the other ethnic groups and most often conduct a marriage. If they happened to start the union formation with cohabitation, then it can be considered that this simple consensual union is just a short period until the marriage is conducted (see Figure 4.6 and Tables 4.6, 4.9 and 4.12).

The picture for the Roma population looks quite different. In the past they had the highest tendency to get married, but since the start of the transition of the country, their pattern of behavior has changed substantially and they now have the lowest risk of getting married of all the ethnic groups (Figure 4.7). However, the start of union formation in this ethnic group begins at young ages. The more detailed analyses showed that the Roma group is highly prone of committing a direct marriage or forming a cohabitation – that is starting a union. Cohabitations are not often transformed into a marriage.

The trends of the Turkish ethnic group lie somewhere between the Bulgarians and the Roma. They have a comparatively early start in family formation, and have the highest propensity to form a marriage. However, when we distinguish between direct marriage and marriage after cohabitation, it turns out that they are inclined

either to form direct marriages or to form cohabitations, but if the latter is formed, it is not very likely that they turn it into a marriage.

There could be several possible explanations for the low risk of marriage for the Roma group. One of them is that the Roma usually start their sexual life in very early ages (Yachkova, 1998) and it is not unusual for them to have a child before age 16<sup>25</sup>. In this age group it is not that easy to get married in Bulgaria. Before the age of 14 it is impossible, and between 14 and 16 one needs a special permission from the parents, the court and other authorities in order to legalize a relationship. So, it can be considered that many Roma simply do not get married or delay marriage for this very reason (Kaltchev, personal communication). Another explanation could be that the Roma group is usually educated to only a low level, suffers strongly from unemployment and usually lives on social benefits. A mother gets higher social benefits if she is a “lone” mother – that is, not married. This could be also another reason for the Roma population’s lower tendency to get married. However, the most common and plausible explanation lies in a different direction, stemming from cultural and anthropological studies. According to some studies in Bulgaria (Pamporov, 2003), after 1990 the Roma population returned to their old customs and morals and live according to their own traditions. This suggests that they conduct marriages according to their customs, which does not include visiting the town hall. In other words, it is possible that the Roma population form marital unions, but not according to the “official rules”, which leads to this “bias” in the statistical results. Whatever the true reasons for the Roma group’s low intensity of entering a marriage are, we want to underline our opinion that what we observe is not a change in the values and ideas as seen in the theory of the Second Demographic Transition, but rather economical motives or ethnic-cultural peculiarities (Ilieva, 1995).

Of all the ethnic groups, the Turks have the highest risks of getting married. And this pattern is observed for the majority of our study period. It can be explained by the cultural values of their ethnical group: we consider that they are more conservative regarding family formation (based on their religion), and extramarital birth is almost inconceivable according to their customs. We presume that the first step towards childrearing is actually forming a legal union – entering a marriage.

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<sup>25</sup> The available data is very scarce on this issue. According to NSI, at the time of the Census, of all the Bulgarian women aged 15 and below, about 0.01 % had a child. The equivalent figure for the Roma women is 0.9 % (NSI, 2001).

However, we also found out that if a woman decides to marry directly (without forming a consensual union beforehand) she will mostly probably be from the Roma ethnic group or from the Turks<sup>26</sup>. The Bulgarians are the ones that are least prone to enter a direct marriage. And this tendency could also be observed before the fall of communism. We also found a drop in the direct marriage intensities of the Roma group (Figure 4.21), but nevertheless, they still have the highest risk compared to the other ethnic groups. The change in these values can be coupled to the fact that the risk for cohabitation increased significantly during the 1990s for the Roma groups (see Figure 4.24); this can be said to compensate the lower risk of direct marriage. The results about cohabitation show that the Bulgarians have the lowest risk of forming a consensual union before and after the start of the transition. They are followed by the Turks, who remain somewhere in the middle. However, when we talk about marriage after cohabitation, the Bulgarian ethnic group is the leader – they are the most prone to transform their union into a legal one and conduct a marriage (Table 4.12). These results show that in general, the Bulgarian women postpone union formation the most, compared to the other ethnic groups, and they are most in favor of marriage as a form of union. The high intensity of forming a cohabitation for the Roma group can again be interpreted with the fact that marriage has a different meaning for them: in our data, if a marriage is not conducted in the town hall it is considered to be a cohabitation, which leads to a rise in the cohabitation risk of the Roma population in our results (Pamporov, 2003). Also, the same explanation can be given for the results for the transformation of cohabitation into marriage: the Roma population is seen to have the lowest risk of doing so because they consider themselves married anyhow and have no incentive to undergo a marriage in the town hall.

The results about union formation and ethnic groups allow us to conclude that there are generally different patterns of forming a union for each of the ethnic groups. Also, most of the currently observed trends are valid only from the beginning of the 1990s.

One may conclude from all this that the Bulgarian ethnic group is the forerunner of the Second Demographic Transition behavior in Bulgaria. They are the

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<sup>26</sup> We again want to clarify that here we talk about direct marriage. The results from the Census data for transition to marriage (direct or after cohabitation) show different trends. This comes from the fact that we do not take into account cohabitation there. We explain in more detail how this variable was recorded in each data set in Chapter 3.

ones that are most prone to delay union formation and they are most reluctant to start a union as a direct marriage. However, they are not the most prone to live in cohabitation. So far, there are not many studies with which we can compare our results. For instance, Philipov (2001) claims that the Roma group has still not finished the first demographic transition.

However, this interpretation could be only partly revealing the whole picture of the difference between the behaviors of the ethnic groups. We need to study the fertility patterns in order to have a better picture of the developments and the impact of culture.

### ***4.5.3 Union formation and education***

The educational level of women also plays a significant role in the timing of first marriage. Our results show that women with the lowest education have the lowest transition to first marriage (Table 4.2). And this trend is observed only after the economical and political changes in the country took place (Figure 4.8). Beforehand, the trend was the opposite one: the primary educated women were highly disposed to getting married and the higher educated women less likely to commit a marriage. The result for direct marriage was the same (Table 4.7). However, the trend in cohabitation is much more different. We found out that women with higher education are the least susceptible to forming this simple consensual union (Table 4.10), while between the secondary and primary educated women we did not find any differences. This finding is in contrast with our expectations and assumptions (see Chapter 3, Hypothesis 5). An opposite trend is observed for entering a marriage after cohabitation (Table 4.13). Women with higher education tend to transform their cohabitation into a legal union, while women with primary education are the least prone to enter a marriage after being in cohabitation.

Contrary to the expectations that women with higher education are the heralds of new ideas and the ones who first accept the non-marital cohabitation (Lesthaeghe, 1995) here we see that this is not the case in Bulgaria. It turns out that women with primary education also have a low risk of entering a marriage. Similar results have been obtained by Kantorova (2004) for the Czech Republic; Bumpass et al (1991) for the US; Kennedy (2004), and many others. There could be several reasons for this finding. We suppose that women with primary education belong to the group of

people having no good position in the labor market and thus the delay of marriages is caused by financial difficulties. Cohabitation requires less investment and does not involve long-term commitment. Therefore it might be a preferred replacement of marriage for the poorly educated women (Thornton et al., 1995). Furthermore, the finding that the higher educated women are highly inclined to enter a marriage does not support the neoclassical economic theory (Becker 1991): this theory states that the higher the education of women, the lower the women's gains from marriage. However, this hypothesis is based on the traditional division of labor in the household. Other authors have already stated that the economic theory does not cover all the gains that one has in a marriage, such as the psychological or social gains (Berrington and Diamond, 2000). Another reason for the higher proneness of the higher educated women to enter a marriage could be the longer time that they invest in education. Usually they postpone the union formation activities until they finish education and after that, within a short time, they form a family. This trend is known as the time-squeeze effect (Kreyenfeld, 2002; Bracher and Santow, 1998). Similarly, Billari and Philipov (2003, p.214) find for the case of the Eastern European countries that "entry into first unions is much more linked to end of education than to the achieved level of education". Coppola (2003) also shows that the human capital investment seems to accelerate rather than to delay the process of union formation. Higher propensity to marry after being in cohabitation for higher educated women is also found for the case of Sweden (Duvander, 1999). One of the explanations for this trend is that the couples with more economic resources have a higher gain from marriage.

We also find that the enrolment in education has a strong impact on the transition to first union formation. Our results show that being in education leads to a significantly lower level of willingness to form a family – no matter if we are talking about marriage or cohabitation. Additionally, it turns out that education enrolment does not have any impact on the transition from cohabitation to marriage. This then shows that being in education matters only for the first union formation process. If a woman has already formed a union, then education enrolment does not play any role in the transformation of this union. The negative association between education enrolment and cohabitation or marriage is found in other studies too – Hoem, 1996; Thornton et al, 1995; Bracher and Santow, 1998; Goldscheider et al, 2000; Baizan et al, 2003; Coppola, 2003; and Nazio and Blossfeld, 2003, to name a few. A

widespread view of this trend is that enrolment in education delays women's transition to adulthood, in line with the normative expectations that if women are studying, they are still not 'ready' for marriage and motherhood (Blossfeld and Huinink, 1991). Also, it is regarded that a woman in studies is economically dependent on her parents (Blossfeld and Huinink, 1991), which affects her ability to marry or form a union. In general, students have less money, time and inclination for the commitments of marriage (Hoem, 1986). Additionally, this causality could be operating in both ways. From one side, women in education are unlikely to feel that they have the financial resources to get married; from the other side, it is much more difficult to become a student for women facing economic constraints (Rindfuss and Van den Heuvel, 1990). Sander (1992) also suggests that education could be correlated with unobservables (for instance, the rate of time preferences) that affect the marital status.

To sum up, these results show that the choice of marriage versus cohabitation is highly dependent on the economic prosperity of the women. It seems to us that women who are highly educated (and presumably they have a good position in the labor market and, thus, higher income) are more attractive on the marriage market. They have higher chances of finding an appropriate partner, which leads to a higher propensity of entering a marriage.

#### ***4.5.4 Union formation and effect of pregnancy***

Although we find that cohabitation is gaining more popularity among the Bulgarian population, it is also true that when it comes to raising children, many women still prefer this to happen within a legal marriage.

The results show a great importance for the first pregnancy on the transition to first marriage (Table 4.4). That is, women who experience premarital pregnancy are highly inclined to get married (Blossfeld and Huinink, 1991; Billari and Kohler, 2000; Goldscheider et al., 2000). The high inclination of unmarried women to get married when they become pregnant could be connected to a high desire to offer their child the social and economic environment and protection that normally accompanies a legally sanctioned union (Baizan et al., 2003). Another explanation for this trend is that the social norms that promote marital fertility still prevail in the Bulgarian society. In the last years there were many couples that cohabit, but obviously, when it

comes to children, most of them prefer to have the children in an official marriage. Similar results are seen in other studies in Bulgaria, for instance by Mirchev (1998). However, we found out that the impact of pregnancy on marriage is not as strong in the 1990s as it was in the decades before (which is in accordance with our Hypothesis 8 from Chapter 3). Additionally, there are still important ethnic differences concerning childbearing and union formation. We found that women from the Roma group tend most strongly to bring up children in a non-marital union.

We find differences in inclination towards marriage between pregnant women who are living in cohabitation and those who are not. Women who are living in cohabitation have a somewhat elevated disposition towards marriage when they become pregnant (Figure 4.14) but it is not as high as for women outside of any union. To look at this relation from a different perspective: when a motherhood is expected and the woman is living out of union, she is more prone to form a direct marriage rather than a cohabitation. Similar results are obtained from studies of other societies (Manning, 1993; Manning, 1995; Berrington and Diamond, 2000; Kantorova, 2004; Kulik, 2005). It is argued that a pregnant woman living alone would rather marry directly than start cohabitation, since marriage is usually considered more appropriate for raising children. Or, following Bracher and Santow (1998), we may argue that couples living apart have already signaled they do not favor cohabitation, and thus also prefer marriage when it comes to raising a child. On the other hand, cohabiting couples who are about to become parents can offer their child much the same environment as married couples and, thus, they do not feel such an urgent need to sanction their union, resulting in the less pronounced increase in transition to marriage.

Interestingly, the transition to second birth also pushes the couple to get married when they do not live in union (Figure 4.14). For people in cohabitation, however, the second birth does not influence them strongly to change their civil status. Obviously, when there is already one “illegitimate” child, the approaching appearance of a second child is not an incentive for cohabiting couples to get married, and this can explain why the behavior of the parents who are expecting their second child differs to that of the couples who are becoming parents for the first time.

The duration of pregnancy also has an effect on the family formation pattern. We found out that the women are more susceptible of getting married in their second trimester of the pregnancy – between the third and sixth months (see Figures 4.9 and

4.15). This is understandable, because it usually takes some time until a pregnancy is recognized, so even if they react quickly, the marriage would not take place in the first trimester. Women at the later stage of the pregnancy are not very disposed to entering into a marriage, nor those who have just given birth. Other studies have shown (Kantorova, 2004) that a pregnant woman in the beginning of the pregnancy is more prone to entering a marriage, whereas at a later stage of the pregnancy she is more disposed to entering cohabitation. However, we were not able to repeat this finding for Bulgaria: the pattern is the same for marriage and cohabitation according to time passed since first conception. After the end of the pregnancy, women have a very low level of proneness to get married: it reaches the pre-conception level. According to Blossfeld et al. (1999), the decision to get married after the child is born out of wedlock has a different quality: the child is already “illegitimate” and the time pressure to marry has disappeared.

To summarize, we find some signs of the increasing role of cohabitation, even when a pregnancy occurs. The proneness of forming a simple consensual union when a woman has conceived is not as high as for forming a marriage, but the fact that there is an elevated disposition shows that cohabitation is gaining power. We will not be surprised if the proportion of women who bring up children in cohabitation continues to rise.

#### ***4.5.5 Union formation and personal background characteristics***

The size of the family in which the woman has grown up does not have any impact on the transition to first marriage (see Table 4.5 and Table B17 in Appendix B) – neither before nor after the start of the political and economic changes in the country. However, we find a significant impact on the transition to cohabitation. The results show that the more siblings the woman has, the more likely she is to form a cohabitation. We can assume that women from bigger families tend to leave them earlier in order to form their own family, and this often takes the form of cohabitation since it does not involve long preparations and strong investments. We also found that the number of siblings has an impact on the willingness to get married after cohabitation. The more siblings a woman has, the less prone she is to get married if she lives in cohabitation. Once more, this shows that women from big families are not disposed to getting married, but they prefer to form a simple consensual union. This

result is in line with our hypothesis that more siblings lead to higher likelihood of entering marriage (see Chapter 3, Hypothesis 7). We suppose that a big family is economically worse off than a small family since the parents' income is divided among more people. Less wealthy people tend to form a cohabitation as it is less expensive and does not require any investments. This is in line with our suggestion that the economic constraints of the woman and her family influence the choice between marriage and cohabitation.

The results from the census data show that people from villages have the highest risk of entering a marriage and those in the capital the lowest. This is in accordance with our expectations (see Chapter 3, Hypothesis 7) that the surroundings the women grew up in make a real difference and have a real influence on their attitudes towards family formation matters. Also, in Bulgaria, smaller settlements can be correlated with more traditional values. Other reasons for this trend could be that the gains from marriage for women are higher in rural areas, due to the less favorable female employment opportunities (Sander, 1992). Other authors (McLaughlin, Lichter and Johnston, 1993) state that the urban/rural differences could be partially explained by the variations in the attributes of the young women, their families and the local marriage market. According to the authors, the decision process itself is very different for women living in rural and urban areas; the economic well-being of the potential mates is not as important in the spouse selection process for women living in rural areas. Of course, the lower degree of traditionalism and social control in big towns also contributes to the low inclination towards getting married for women in urban areas (Nazio and Blossfeld, 2003).

Contrary to our expectations in Hypothesis 7 (see Chapter 3), a woman's level of religiosity is not associated with the risk of entering a marriage or cohabitation. We did not find any impact here for the union formation pattern. Blossfeld and Huinink (1991) have the same finding for Germany. Such a trend can be explained by the fact that in socialist times, all kinds of religious practices and church services were forbidden and that many Bulgarians adopted atheism. As a result, the religious attitudes did not penetrate people's lives and, thus, do not necessarily influence their demographic behavior.

As a whole, the analyses of marriage and cohabitation reveal specific impacts of culture and economy on the lives of people living in Bulgaria, without one of these factors dominating the decision process too distinctly. We will now proceed to the

analyses of fertility and see which of the economic and cultural changes after 1990 can also be identified as a cause for this demographic behavior.



## Chapter 5

# Transition to motherhood

### 5.1 Analytic strategy

In the following chapter we focus our attention on the trends in the transition to first birth. In Chapter 2 we already offered a description of the changes in the child-bearing patterns in Bulgaria. However, the information from the basic statistics is not sufficient to give answers to the questions concerning the impact of other life-course transitions on the reproductive behavior of the women. More detailed analyses are needed in order to be able to resolve our research questions as described in Chapter 2. We again use the two data sets described in Chapter 3: with each of them we perform a stepwise modeling, where in each subsequent model we add more variables. We perform six different models and discuss the changes in the results for each of them.<sup>27</sup>

The first part of this chapter (section 5.2) contains the analyses for the time before and after the start of the transition of the country towards a market economy. We make comparisons for the development of the trends through three decades – the 1970s, 1980s and 1990s. Including such a broad time period in the analyses allows us to make a comparison between the two different economic and political systems in the country. Particular attention is paid to the influence of ethnic group, education and marital status on the transition to motherhood: for this analysis we use the census data from March 2001. In section 5.3 we present the results of technically the same analyses, but only for the young cohorts in Bulgaria. We follow the trends of first birth at the end of the 1980s and through the 1990s. The main advantage of this analyses is the inclusion of information on the formation of cohabitations. As the cohabitations in Bulgaria are increasing and the number of out-of-wedlock births is constantly growing, such information is essential for the explanation of the

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<sup>27</sup> Here we would like to remind the reader that we actually analyse the transition to first conception – estimated as nine months before the birth. Since the analyses only include pregnancies that lead to a birth (we do not have information on non-birth pregnancies) we cannot measure the conceptions risk consistently. Nevertheless, throughout our analyses we will refer to this studies transition as transition to first birth, because it corresponds more precisely to the behaviour we analyse.

childbearing trends in Bulgaria. The dataset that we use is the Social Capital Survey conducted in 2002. In the subsequent part of the chapter, section 5.4, we compare the results of the analyses from the two different data sets and discuss the possible explanations. A widespread opinion is that motherhood and union formation are highly interrelated processes and are determined by the same factors. To see if this is also the case in Bulgaria, in section 5.5 we perform additional analyses where the transition to union formation and first birth are modeled as interrelated process. We make our concluding remarks in section 5.6.

## **5.2 Motherhood before and after the start of the societal transition**

### ***5.2.1 General description***

In the analyses of first birth we want to look closely at the postponement of motherhood among the younger cohorts and we also want to identify the people who are more prone to having a first child earlier in their life.

We start the analyses with a description of several basic distributions in our sample from the 2001 Census. Of all the first births in our sample, 47 % were conceived out of marriage. The highest percentage of conceptions out of marriage can be found in the Roma group – 65 % of all the births. For the Bulgarians this figure is 48 % and for the Turks 39 %.

Although the proportion of out-of-wedlock conceptions is high, the number of births outside of marriage is comparatively low – about 14 % of first births in our sample occur out of marriage. This phenomenon of getting married when a conception is recognized is most common among the Bulgarians: although 48 % of the first births are conceived before the marriage, only 9 % of first births happen out of wedlock. The Roma group, in contrast, does not necessarily enter a marriage when a conception occurs: about 54 % of first births occur out of marriage. Among the about 20 % of first births are out of wedlock.

Of all the pregnancies that happened before the year 1980, 44 % occurred before the marriage. This figure has not changed much over the years – between 1980 and 1990, 47 % of first conceptions happened out of wedlock and after 1990 it was 49 %. However, in the years before 1990, when a conception occurred it was usually

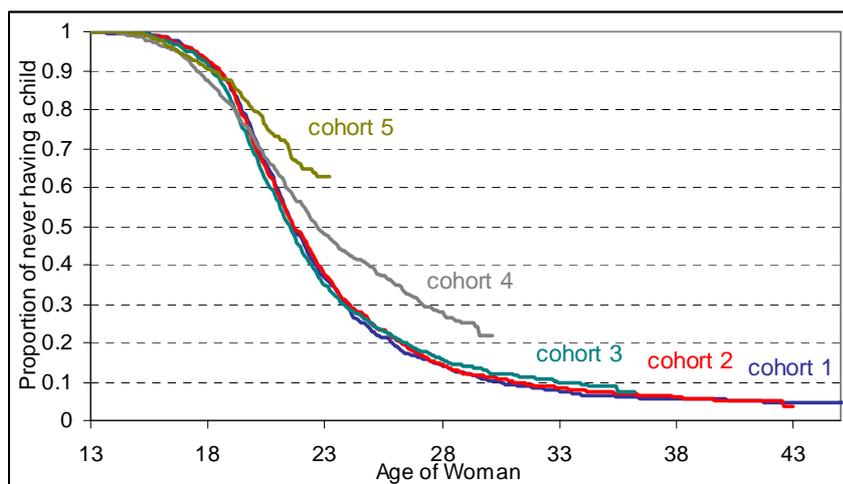
followed by a marriage so that the birth happened within a legal family; only about 10 % of the first births happened out of marriage. After 1990 this percentage doubled and reached about 20 %. So we can see that the tendency is for fewer conceptions to be “legalized” and followed by a marriage before the birth occurs.

Of all the conceptions in our sample, 23 % happened before women finished their education. This happened more often during the 1970s (28 %) and 1980s (24 %) than during the 1990s (18 %). Women who give birth to a child before finishing their education compose about 18 % of all the births in our sample. Out of them, about 70 % are in higher education studies and 30 % in secondary education studies. The proportion of the women who give birth to a child while still studying also diminishes with time: during the 1990s it was 15 % of all births whereas during the 1970s it was about 20 %.

However, a deeper analysis is needed to understand the real behavior of the women in relation to the timing of first birth and the influence of the family formation and the differences by ethnic groups and level of education of the women.

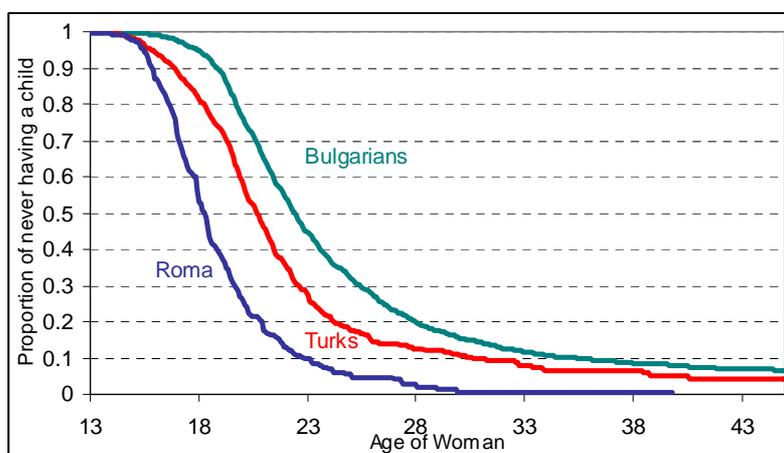
To start with, we estimated Kaplan-Meier survival estimates on the transition to first conception differentiated for five different cohorts. The first cohort consists of women born in the years 1951-1957, the second cohort are women who were born between 1958 and 1964, in the third cohort the women were born in 1965-1970, the fourth cohort consists of women born between 1971 and 1977 and in the last, fifth cohort, the women are born between 1978 and 1986. The results are presented in Figure 5.1.

There is hardly any difference to be observed between the first three cohorts. People born between 1955 and 1970 have the same fertility behavior – about 50 % of the women in these cohorts have a child by the time they are 22. Also, the figure of childless women is very low – about 5 % at age 40. Although the youngest two cohorts are still too young to follow their fertility behavior until the end of their reproductive age, we can observe a clear delay in the first conception: half of the women in cohort 4 have a child by age 23, while at the same age only about 36 % of the women from cohort 5 have already conceived.

**Figure 5.1:** Transition to first conception according to cohorts

Notes: (1) Method: Kaplan Meier survival estimate; event: transition to first conception measured since age 13. (2) Cohorts: 1 – people born in 1951-1957, 2 – born in 1958-1964, 3 – born in 1965-1970, 4 – born in 1971-1977, 5 – born in 1978-1986. (3) Own calculations, Census 2001 data.

There is also a difference according to ethnic groups in the transition to first conception. The survival curves are presented in Figure 5.2.

**Figure 5.2:** Transition to first conception according to ethnic group

Notes: (1) Method: Kaplan-Meier survival estimates; event: transition to first conception measured since age 13. (2) Own calculations, Census 2001 data.

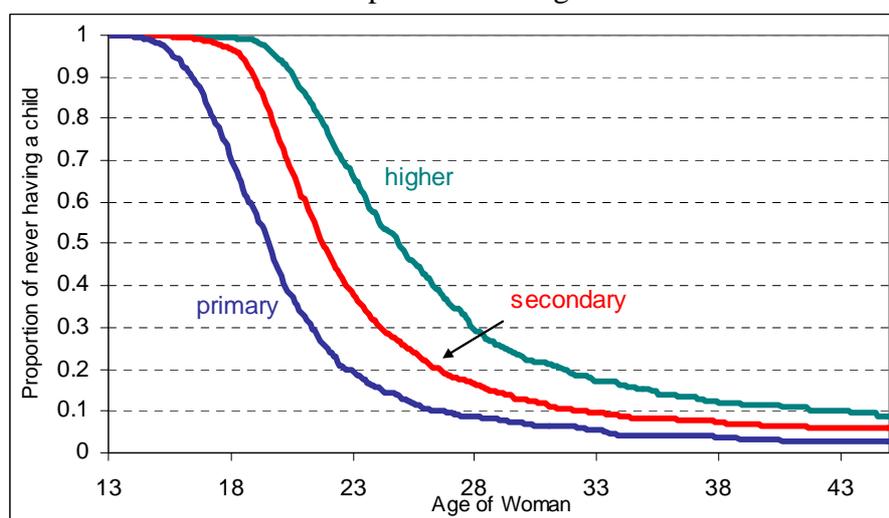
The Roma group starts at earliest ages with their reproductive behavior. Half of the women from this group have conceived by age 18. For comparison, at this age only about 20 % of the Turks and 7 % of the Bulgarians have experienced their first conception. The mean age of first conception for the Turks is 21 and for the Bulgarians it is 23. None of the ethnic groups has a high percentage of childless

women; the highest figure is for the Bulgarians – about 7 % – followed by the Turks with 4 %. The Roma population has almost 100 % first conception for the women.

Additionally, for the Roma group it is a very rare event to have their first conception after the age of 30. At this age, less than 1 % have not yet had a child. About 10 % of the Turks still do not have a child after turning 30 and about 15 % of the Bulgarians.

The differences in first conception transition by education level of the women are presented in Figure 5.3. The education level is estimated as the final level of education that the woman achieved. We have talked about the problem of recording the level of education at the time of interview in Chapter 4 already (Section 4.2), so here we will not discuss the possibly misleading aspects of the results.

**Figure 5.3:** Transition to first conception according to education level



Notes: (1) Method: Kaplan-Meier survival estimate; event: transition to first conception measured since age 13. (2) Education level measured as the final education attainment of the women. (3) Women who study at the time of the interview are excluded. (4) Own calculations, Census 2001 data.

As we expected, women with a primary level of education start earliest with their reproductive behavior. At age 19 half of them have already conceived. Women with secondary education start later with the transition to first conception and at age 22 about half of them have a child. Women with higher education start latest with reproduction and have the highest mean age at first conception – 25. Also, the higher educated women have the highest proportion of childless women – about 9 % at age 45 have never had a conception that lead to a birth of a child. Women with primary education have the lowest number of childless women – about 3 % – and women with secondary education have a figure of about 5 %.

### 5.2.2 Time trend

Our next step is to perform event history analyses, as explained in Chapter 3, for the transition to motherhood. In Appendix C Tables C 1 and C 2, we show all the stepwise models: from the first one, in which we control only for age of the woman, to the full model, in which we include all our variables. Before we proceed with the presentation of the results, we want to present our model once again and define our variables. The hazard formula reads:

$$\ln h(t) = y(t) + \sum_j a_j \chi_j + \sum_i \alpha_i \omega_i(t) + \sum_k z_k(u_k + t)$$

Where  $\ln h(t)$  is the log hazard rate of first birth for each individual at time (t) with time of exposure starting at age 13, which means that process time  $t$  is age attained minus 13 years. The notation  $y(t)$  represents a piece-wise linear spline, which captures the influence of current age on the intensity of first birth. Our time-constant covariates  $\chi_j$  with parameters  $a_j$  are ethnic group, number of siblings, place of residence till age 15 and level of religiosity. Our time-varying covariates  $\omega_i(t)$  include education attainment, education enrolment and union status of each woman. The values of the time-varying variables change at discrete times in the spell and are constant over the time span between those changes. We have also included duration splines in our model  $z_k(u_k + t)$  that capture the effects of covariates that are continuous functions of  $t$  starting from an origin  $u_k$  relevant for each individual and each covariate. In our model, these splines are effects of current calendar year (starting in year 1964 for the census data and year 1985 for the Social Capital Survey data), duration since first marriage, starting at marriage formation, and duration since first cohabitation, starting at the formation of such a union.

Firstly we want to describe the transition to first birth according to age of woman starting from age 13. This is actually our baseline in the model. As there are no significant changes occurring in the shape of the curve in each new model, we will discuss only the final, sixth model. The results are plotted in Figure 5.4.

The intensity of conceiving for the first time constantly rises from the start of the observation and peaks at age 19. The risk stays relatively high until age 22, after

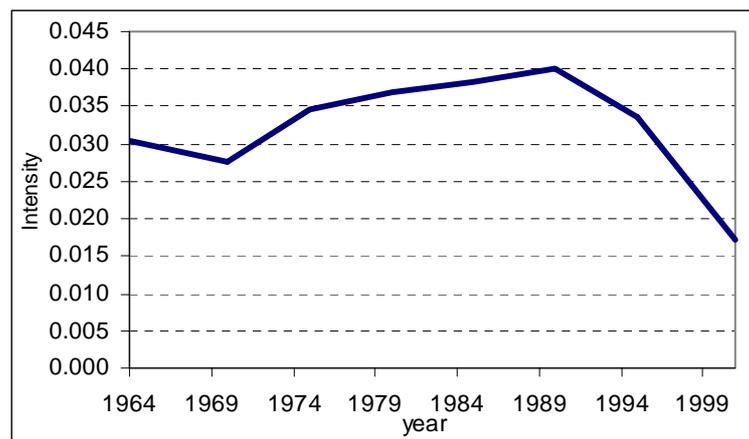
which it decreases comparatively quickly until age 31 and then stays at a very low level. Interestingly, the intensity for first birth has a well-defined peak. For comparison, the intensity for first marriage (see Figure 4.4 ) has a bell shape. This shows that while marriages happen at relatively wide interval of ages, the first birth is an event that is clustered in a smaller age interval for the women. The transition to first birth seems to be a more uniform process.

**Figure 5.4:** First birth intensity by age of woman



Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Census 2001 data.

Introducing the spline for calendar year in our model significantly improves the fit ( $p < 0.000001$ ). There are not any changes in the shape of the spline between model 2 (the first to introduce the calendar year spline) and the final model, that is why we only plot Model 6 (Figure 5.5.). The spline gradients are given in Tables C 1 and C 2 in Appendix C.

**Figure 5.5:** First birth intensity by calendar year

Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Census 2001 data.

The intensity of first birth was lower in the 1960s, when a small fertility decline could be observed. During the 1970s and 1980s there was a gradual consecutive increase in the risk of first birth. With the start of the political transformation in the country, we observe a sharp and steep decrease, which still had not leveled off by 2001. At year 2001 we observe the lowest level of first birth risk for the whole period. We offer our reflections on the changes of motherhood transitions through time in section 5.4.1.

### ***5.2.3 Transition to motherhood and ethnic group***

Our next step in the analyses is to study the differences of first birth by ethnic group (Model 3). Introducing a variable indicating the ethnic group of the women improves the fit of the model significantly ( $p < 0.000001$ ). In Table 5.1 we present the results on the impact of ethnic group on first birth from Model 3 and Model 6 and make a comparison between them. The full models are presented in Appendix C Tables C 1 and C 2.

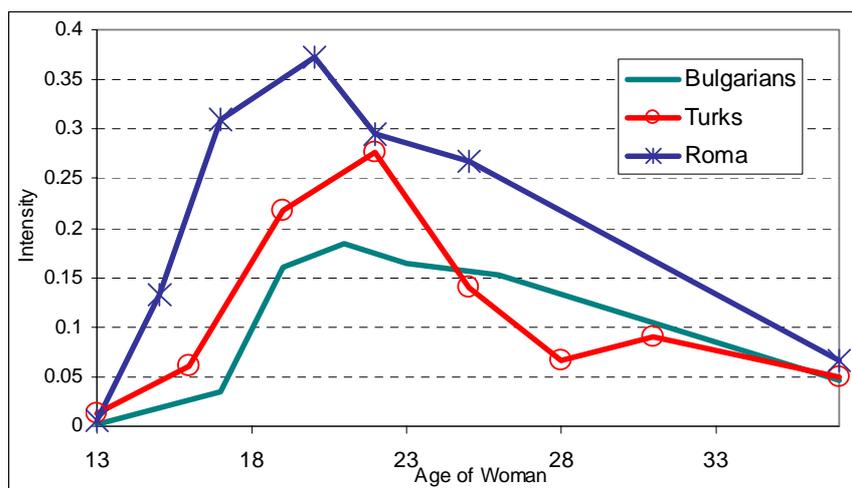
**Table 5.1:** Relative risk of first birth. Effect of ethnic group. Two models compared

	Model 3		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>				
Bulgarians (ref)	1		1	
Turks	1.61	***	0.96	
Roma	3.95	***	2.15	***
Other	1.06		0.85	*

Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Model 3 includes variables for age of woman, calendar year and ethnic group, Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, marital status, number of siblings, place of residence, level of religiosity. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Census 2001 data.

When controlling only for age of woman and calendar year, the differences in the risk of first birth according to ethnic group are extremely high. The Bulgarians have the lowest risk of first birth. The Turks have about 60 % higher and the Roma group a risk about three times higher. The results for the two last groups are significantly different from the results for the ethnic Bulgarians. However, when we introduce into the model variables such as education attainment and enrolment, marital status and background characteristics, the effects of the ethnic groups change. We do not find a difference anymore between the group of Bulgarians and Turks – their risk for first birth is very similar. The risk of the Roma group also diminishes, but is still well above the other groups: it is more than twice that of the Bulgarians. This shows that not controlling for additional information such as education and marital status can lead to artificially high or biased results.

In order to be able to further distinguish the differences between the ethnic groups on the risk of first birth, we estimated additionally the intensity for each ethnic group. The results are presented in Figure 5.6.

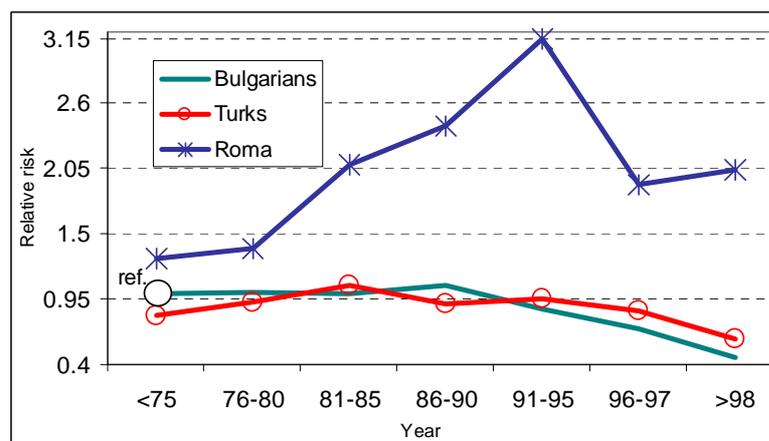
**Figure 5.6:** Baseline intensities for first birth by ethnic group

Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Graph constructed on the basis of 3 separate models (one for each ethnic group) with no additional variables in the model. (3) Own calculations, Census 2001 data.

As we have expected, the Roma group has the highest intensity of first birth. On the one hand, this group starts at the earliest ages with the reproductive behavior, and on the other hand, it has the highest intensity at all ages. The Turks have the second highest intensity, with a peak in the curve at age 22 and after that a sharp decrease. After age 25 the Turks have the lowest risk of first birth compared to the other ethnic groups; if a woman has not conceived by age 25, then the risk to do so after that age is very low. The Bulgarians hold the lowest level of transition to first birth in general. They start latest with the reproductive behavior. However, the Bulgarians do not have a well-defined peak for the risk of first birth: the highest intensities for this group lie between ages 19 and 28.

In order to see how these transition risks changed through time for each ethnic group we performed an interaction between period and ethnic group. The results are plotted in Figure 5.7 and the values of the relative risks are given in Table C 3 in Appendix C.

**Figure 5.7:** Relative risk of first birth. Effect of ethnic group and period. Bulgarians and period before year 1975 as a reference group.



Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Interaction between ethnic group and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Census 2001 data.

The relative risk of the Roma group is very high compared to the other groups throughout the whole observation period, and these features appear when we control for woman's age in each case. We observe a constant rise in the risk from the 1970s until 1995, after which a sharp decrease follows for the next two years and then a slow recovery. The differences in time trends between the Bulgarians and the Turks are not as high; during the 1970s and 1980s, the risk of first birth for the Turks and Bulgarians do not change much and after 1990 we observe a decline for the two groups, but sharper it is for the group of Bulgarians. In contrast to the pattern for the group of the Roma, after 1997 we do not observe any recovery for these two groups, with the decline in the risk continuing further. We expected the childbearing patterns to be quite similar between the ethnic groups before 1990, but we can now see that the differences already appeared in the 1980s. We discuss the results in section 5.4.2.

#### 5.2.4 Transition to motherhood and education

Our next step in the analyses of transition to motherhood is adding information referring to the education of the women. In Model 4 we add the variables for education attainment and education enrolment. The additional information improves the fit of the model significantly ( $p < 0.000001$ ). In Table 5.2 we present Model 4 and 6 for the impact of education on the transition to first birth.

**Table 5.2:** Relative risk of first birth by education attainment and education enrolment. Two models compared.

	Model 4		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Education level</i>				
Primary	1.16	***	1.00	
Secondary (ref)	1		1	
Higher	0.87	**	1.08	
<i>Education enrolment</i>				
Out of education (ref)	1		1	
In education	0.32	***	0.48	***

Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Model 4 includes variables for age of woman, calendar year, ethnic group, education attainment and enrolment, Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Census 2001 data.

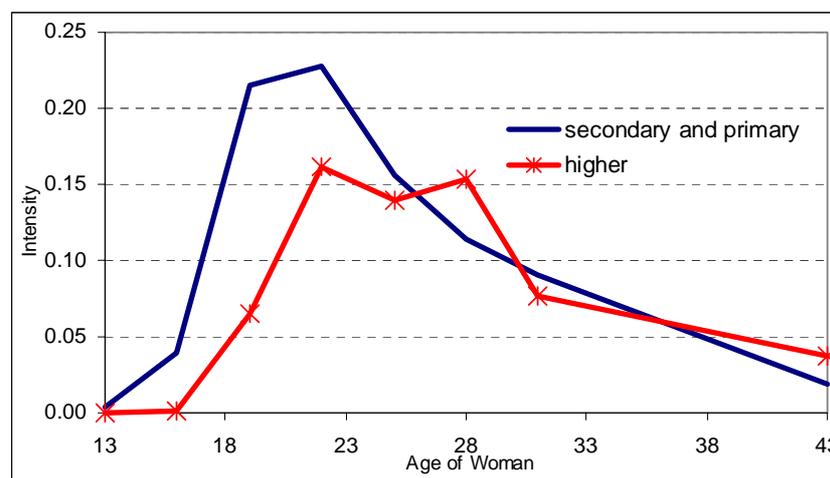
In the first model we have a very clearly defined downward trend of first birth risks according to the level of education of the women. Women with primary education have 16 % higher risk of conceiving than women with secondary education, and higher educated women have a 13 % lower rate of transition to birth than the middle group. Both estimates are significant in our model. However, when we add information on the marital status of the women and additional personal background characteristics, the effect of the level of education disappears. There is absolutely no difference between primary and secondary educated women and the higher educated show a slightly higher risk, but it is not significant. Obviously, having information on the marital status (see Model 5 in Table C 2, Appendix C) substantially contributes to the accuracy of the estimates. This is evidence that the process of having a child is interrelated with the process of forming a family. If we do not control for these characteristics, the results according to education level may be misleading. All in all, the observations do not support our expectation that the higher the education level of a woman, the lower her entry into motherhood.

Additionally, we control for the education enrolment of the women. In Model 4, women who are enrolled in their studies have 68 % lower risk of conceiving than women who have finished their studies. Adding information on the marital status and background characteristics changes slightly the result and increases a little the risk of conceiving for women in studies: they have “only” a 52 % lower risk. The estimates

in both models stay significant. The results on the impact of education enrollment are as we expected.

To further facilitate the analyses of first birth according to education level, we ran an additional model in which we separated the intensity into two parts – one for the women who finished their studies after secondary school and the other part for women who continued their studies into higher education. Presumably, women who finish their education after secondary school stop studying at latest at age 19<sup>28</sup>. We expect the first-birth risk to differ substantially between these two groups of women. The results are presented in Figure 5.8.

**Figure 5.8:** Baseline intensities for first birth for women with higher education and women with secondary or primary education.



Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Graph constructed on the basis of 2 separate models (one for each education group) controlling for age of woman. (3) Own calculations, Census 2001 data.

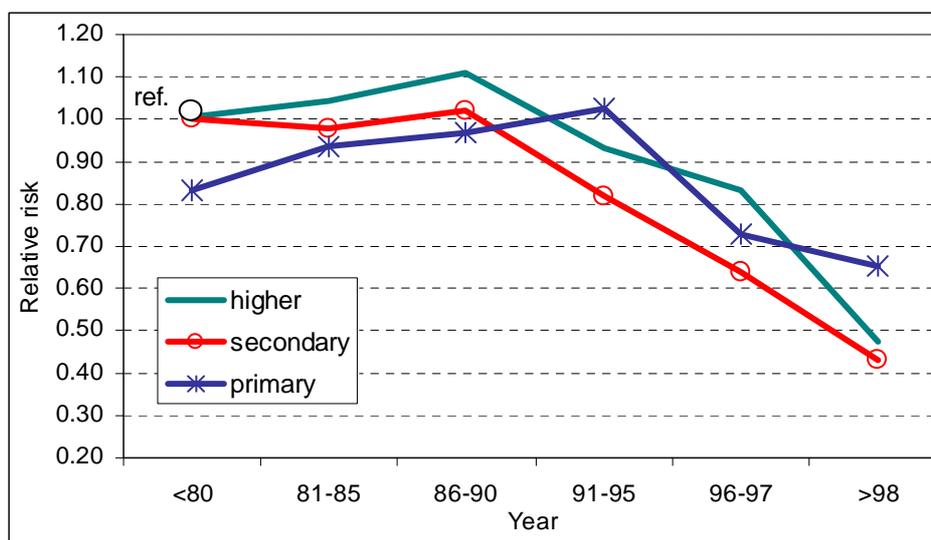
Women with primary or secondary education start their reproduction behavior much earlier than the higher educated women – probably due to the fact that they finish school much earlier. An interesting point that these results reveal is that women with secondary or primary education have high birth risks within a relatively short age interval (between ages 18 and 22). For women with higher education the corresponding age span is broader: we observe two peaks of high risk around ages 22 and 29. Additionally, through almost all ages the higher educated women have a lower risk of first birth.

<sup>28</sup> The idea for this differentiation was taken from Panis et al., 2001

To see how the differences between the risks according to education level developed through time, we performed an interaction between period and education attainment. The results are plotted in Figure 5.9. and the estimates are presented in Table C 4 in Appendix C.

At first glance, one sees that the relative risk of first birth according to level of education is decreasing with time. This decrease starts at the beginning of the 1990s for women with secondary and higher education. For women with primary level of education the change towards lower risk starts a bit later – in the middle of the 1990s. During the 1980s, the highest risk of having a child is to be found among the women with higher education and the lowest among women with primary education. The trend changes in the 1990s: the women with secondary education have the lowest level, while women with higher education are sometimes overtaken by women with primary education. At the end of our observation period the primary educated women have the highest transition rate and the difference between the higher and secondary educated women has become very small: for both groups the risks are now significantly lower than for the primary educated women.

**Figure 5.9:** Relative risk of first birth. Effect of education level and period. Women with secondary education and period before 1975 as a reference group.



Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Interaction between education level and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Census 2001 data.

Another question that interests us is the compatibility of schooling with child-bearing. The results showed that when a woman is in studies she has an extremely low

risk of becoming a mother. But, has this been the same throughout the period observed? We know that under state socialism the promotion of childbearing also targeted the women in universities; the aim was to make the roles of mother and student compatible. This would lead to the assumption that in the years before 1990 childbirth while studying was not such an unusual event. To check this, we performed an interaction between period and education enrolment and divided the period simply in two groups – before and after 1990. To check the significance of our interaction, we perform a log-likelihood ratio test (LLRT) in which we compare the final model with the model of the interaction. The test shows that the fit of the model is significantly improved ( $p < 0.000001$ ). The results are presented in Table 5.3.

**Table 5.3:** Relative risk of first birth. Effects of education enrolment and period. In education and period before 1990 as a reference group

Period	Education enrolment	
	Out of studies	In studies
Before start of 1990	1	0.50 ***
After start of 1990	0.79 ***	0.34 ***

Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Interaction between education enrolment and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (5) Own calculations, Census 2001 data.

As we expected, we find a slight difference between the two periods. In both periods we observe a lower risk of childbearing for women who are studying. Women in studies during the 1970s and 1980s were more prone to becoming a mother than women in studies during the 1990s. This means that in the second period it is more probable that a woman finishes her education before she has her first child.

We give our reflection on the impact of education level and enrolment on childbearing in section 5.4.3.

### 5.2.5 Transition to motherhood and marital status

As we have mentioned several times already, a widespread opinion is that the process of becoming a mother is closely connected with the process of union formation; in other words, the marital status of the women should have a strong impact on the transition to first birth. In Table 5.4 we present the effect of marital status from our final model (we did not find any difference between Model 5 and

Model 6). The full models can be seen in Table C 2 in Appendix C. Introducing the variable of marital status to the model improves the fit significantly ( $p < 0.000001$ ).

**Table 5.4:** Relative risk of first birth by marital status. Final model

	Model 6	
	Relative risk	Sig.
<i>Civil status</i>		
Single	0.14	***
Married (ref)	1	
Widowed/Divorced	0.25	***

Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Census 2001 data.

We divide the marital status into three categories. The statuses widowed and divorced are combined because there are few cases of widowed women in reproductive age who do not have a child. Our reference group is the married women. As we expected, the highest risk of first birth is to be found among the women who are in marriage. Women who are single have an extremely low risk – 14% of that of married women. Similarly, women who are divorced or widowed also have a very low risk – 25 % of that of the reference group. However, they still have a higher risk than the single women.

We also want to see if this behavior is the same for all the ethnic groups. That is why we estimated interaction between the marital status and the ethnic groups. The results are presented in Table 5.5 (LLRT –  $p < 0.000001$ ). For one category we do not have enough observations to get an estimate: divorced or widowed women before first birth from the Roma ethnic group. However, the results can still be discussed.

**Table 5.5:** Relative risk of first birth. Effects of marital status and ethnic group. Married and Bulgarian as a reference group

Ethnic group	Marital status				
	Single		Married	Widowed/divorced	
Bulgarian	0.14	***	1		0.27 ***
Turk	0.14	***	0.94		0.28 *
Roma	0.42	***	1.45	***	n.o

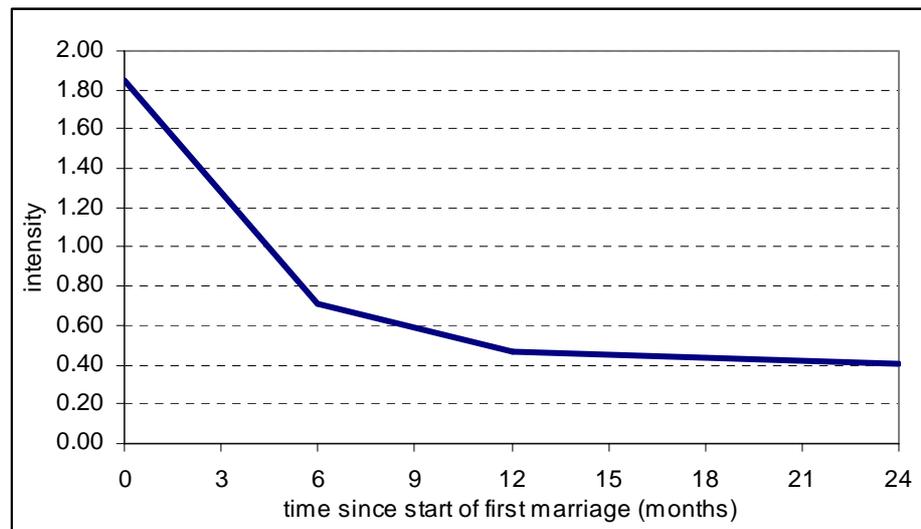
Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Interaction between ethnic group and marital status on the basis of the final 6<sup>th</sup> model, including all the variables. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (5) Own calculations, Census 2001 data.

We do not find any difference between the relative risk of Bulgarians and Turks: both groups have very low risks of first birth when single or divorced/widowed. The results are very similar to the one obtained from Model 6 in our general analyses (Table 5.4). The Roma group has slightly different results: we find a significantly higher risk of first birth for single or married Roma women. The single Roma women have a 58 % lower risk than the reference group, while single Bulgarian or Turk women have 86 % lower risk. Also, the Roma married women have 45 % higher risk of first birth than the Bulgarian married women.

We also tested the interaction effect of marital status and education level, but this was not statistically significant and did not show any pattern. For the keen reader we present the results in Table C 5 in Appendix C.

The effect of marriage formation seems to be particularly strong regarding the timing of pregnancy. To see how the timing of marriage influences the reproductive processes, we introduced an additional spline to our model, indicating the time passed since start of a marriage (Figure 5.10).

**Figure 5.10:** First conception intensity according to time passed since start of marriage



Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Census 2001 data.

The highest rate of first conception is at the very beginning of a marriage. The rate declines afterwards but stays relatively high for the first half year of the marriage. The longer time spent in a marriage, the lower the probability of becoming a mother. This result again shows the interrelation between the two processes – marriage and entry to motherhood. It seems that many women marry when they decide to have a child and become pregnant right after a marriage occurs. We discuss this further in section 5.4.4.

### ***5.2.6 Transition to motherhood and background characteristics***

Apart from the other life course events that influence the timing of first birth, such as completing education and marriage, the fertility behavior of a woman can also be influenced by other personal characteristics and experiences in the early life stages. So, as a final step in our modeling procedure we include three additional variables for the background characteristics of the women (see all the models in Table C 1 and C 2 in Appendix C). In Table 5.6 we present a part of Model 6.

**Table 5.6:** Relative risk of first birth according to some personal characteristics. Final model

<i>Number of Siblings</i>	R. R.	<i>Place of residence (until age 15)</i>	R. R.	<i>Level of religiosity</i>	R. R.
0	0.96	Village	0.98	Deeply religious	1.01
1 (ref)	1	Small town	1.01	Somewhat religious (ref)	1
2	1.04	Large town (ref)	1	Not very religious	1.09 **
3 +	1.12 **	Capital	0.82 ***	Not religious at all	0.98

Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Census 2001 data.

Regarding the number of siblings that the woman has, we do not find any strong effect on the transition to motherhood, although a slight increase in the risk can be observed for women with three or more siblings: they have a 12 % higher rate than women with one sibling. We also performed an interaction between period and number of siblings in order to see if the trends persisted through the whole observed period. The LLRT shows that the interaction model versus the final model has a significant improvement in fit ( $p < 0.000001$ ). Results from the interaction of period and number of siblings (Table C 6, Appendix C) are not very much different from the ones shown here. For the both periods we find an increase of the first birth risk with the number of siblings a woman has.

The woman's place of residence before age 15 also does not have a strong influence on first birth risk: for the transition to motherhood it does not matter if a woman has grown up in a village, small or large town (administrative center) – the risk is the same. The only category that shows a difference is the capital: women who grew up in Sofia have a significantly lower risk of first birth – 18 % less than women from other places of residence. We also followed the changes of the impact of residence place through time (Table C 7, Appendix C) and found out that during the 1990s very clear difference, following the trend we expected: the larger the size of the residence place, the lower the transition to first birth. For the period before 1990, this effect is not so clearly defined, except for the effect of having grown up in the capital.

We do not find any strong impact on the level of religiosity on the transition to motherhood. There is almost no difference in the risk of first birth between women who are highly religious or not religious at all. Similar results were obtained for the

transition to first union formation (see Chapter 4). The results on the impact of level of religiosity on the transition to motherhood through time show that it never had any strong impact: neither before, nor after 1990 (Table C 8, Appendix C). We give interpretations of our results on the impact of personal characteristics in section 5.4.5.

### **5.3 Transition to motherhood in the young generations**

In the previous stages of our analyses of transition to motherhood we tracked the changes through time and looked at the impact of ethnic group, education and marital status. Our next step is to concentrate on the first birth process during the 1990s. We use the Social Capital Survey data and approximately the same technical modeling, but this time we are able to include information not only on the marital status of the women but on the union status. This part of the analyses can thus give us a deeper insight into the changes during the political and social transformations in Bulgaria. We use it as a complementary analysis of the first birth process.

To start with, we will provide some main descriptive statistics of our sample concerning the first birth of the women. Out of all the first conceptions in our sample, 58 % of them occur outside of marriage and 40 % are outside of any union: this means that about 18 % of the conceptions that are recorded as extra-marital actually occur in cohabitation. Out of all the conceptions outside of marriage, Bulgarian women have the highest share – 75 %. The Roma population and the Turks have 11 % each of the out-of-wedlock conceptions. Of the conceptions that happen out of any union, 83 % are attributed to Bulgarian women. The Turkish women have a share of 9 % and the Roma women 6 %.

Although the proportion of first conceptions out of marriage is very high, it is not so with the births. Out of all the first births in the sample, 23 % occur out of wedlock and only 8 % out of union. This shows that it is very important when studying the transition to first birth to take into account the new family formation patterns: otherwise, the number of births for single women will be exaggerated.

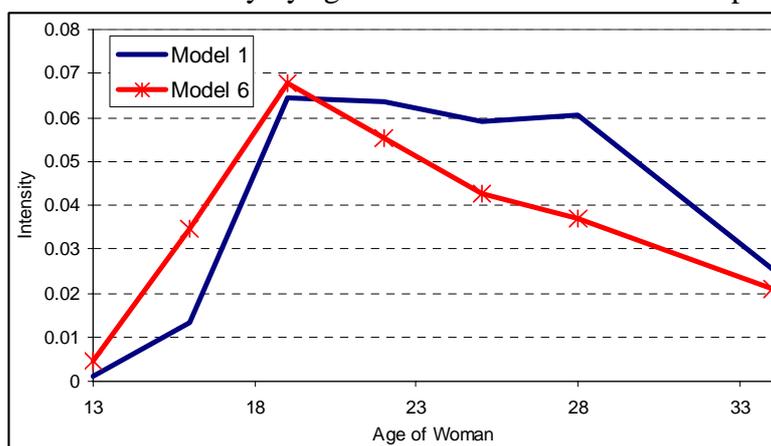
Out of all the conceptions that happen among Bulgarian women, 55 % are out of marriage. However, the births out of marriage are only 16 % of all the births that the Bulgarian women have in our sample. These proportions are a little bit different for the other ethnic groups. For the Turkish women, 57 % of all conceptions occur out

of marriage and 38 % of all births occur out of marriage. The proportions for the Roma group are even higher: out of all the first conception for the Roma, 79 % happen out of marriage and 66 % of the first births also happen out of marriage.

### 5.3.1 Changes in time

For our further analyses we follow the same analytic modeling as with the census data and estimate six different models, presented in Appendix C, Tables C 9 and C 10. We start with the basic intensity – transition to first birth according to age of woman starting from age 13. In Figure 5.11 we present the intensities from our first and final models.

**Figure 5.11:** First birth intensity by age of woman. Two models compared.

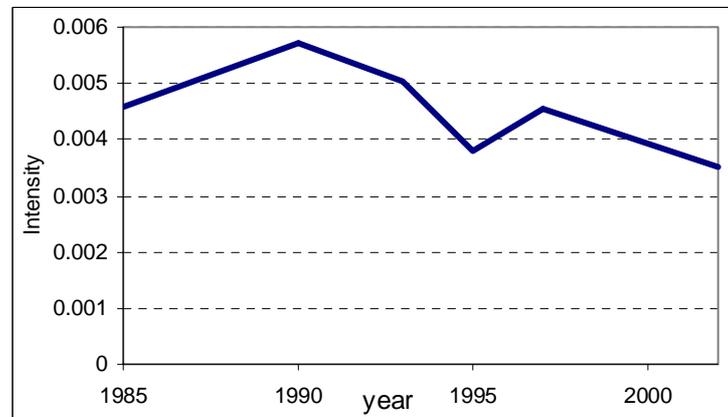


Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Model 1 includes only one variable – age of woman, Model 6 is the final model, including age, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) The level of the curve of model 1 is changed in order to be able to compare the shapes of the two curves. (4) Own calculations, Social Capital Survey data, 2002.

The curves from the two models have very different shapes. When we do not control for any additional characteristics except for age, the intensity of first birth has a very broad interval – it stays high between ages 18 and 28, after which the risk decreases steeply. In our full model, the intensity has a peak at age 19, after which it gradually and almost linearly decreases until the end of the observation window (age 34). Obviously, the inclusion of additional variables to our model contributes substantially to the change of the shape of the observed intensity. Also, the curve of

Model 6 resembles very much the intensity from our previous analyses with the census data.

**Figure 5.12:** First birth intensity by calendar year.



Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data 2002.

Our second model consists of two splines – one for the age of the woman and one for the calendar year. Introducing the second spline to the first model improves the fit significantly ( $p < 0.000001$ ). Since with every subsequent model, the shape of the curve does not change and only the level is changing, we present in Figure 5.12 only the results from the final model. The full results are presented in Table C 9 and Table C 10 in Appendix C. The trend is very similar to the spline for calendar year from the analyses with the census data. We observe an elevation of the risk until 1990 and a strong drop afterwards. However, here we are able to see more details for the period after 1990: after 1995 there was a small recovery and the risk of first birth increased until 1997, after which it steadily went down again.

### 5.3.2 Transition to motherhood and ethnic group

Introducing information on the ethnic group of the women into our model (Model 3) improves the fit of the model significantly ( $p < 0.000001$ ). In Table 5.7 we present two models – Model 3, which is the first in which ethnic variable is introduced, and Model 6, which is our final model. In the model where only the age of woman and calendar year is included, the differences between the ethnic groups in the transition to first birth are large and significant. The group of the Turks has twice as

high a risk of conceiving than the Bulgarians, and the group of the Roma has three and a half times the risk of the Bulgarians. The biggest changes in the relative risk of the ethnic groups occur when introducing information on education and union status to the models (see Table C 10 in Appendix C). In the final model the differences between the ethnic groups are much smaller. The Turks have 19 % and the Roma 33 % higher risk than the Bulgarians. The direction of the differences did not change, however. For comparison, in the previous analyses with the census data, we also found that the Roma group has the highest risk of first birth (although the level was somewhat higher), but we did not find any difference between the Turkish and the Bulgarian populations. The discrepancy between the two results could be because of the differences in some of the additional variables in models, the most influential of which is the marital versus the union status. In accordance with our general strategy, we will abstain from giving any interpretations of the results at this stage. We discuss all the results and interpret them at the end of this chapter, in section 5.4.

**Table 5.7:** Relative risk of first birth. Effect of ethnic group. Two models compared

	Model 3		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>				
Bulgarians (ref)	1		1	
Turks	2.06	***	1.19	***
Roma	3.57	***	1.33	***
Other	1.49	***	1.09	

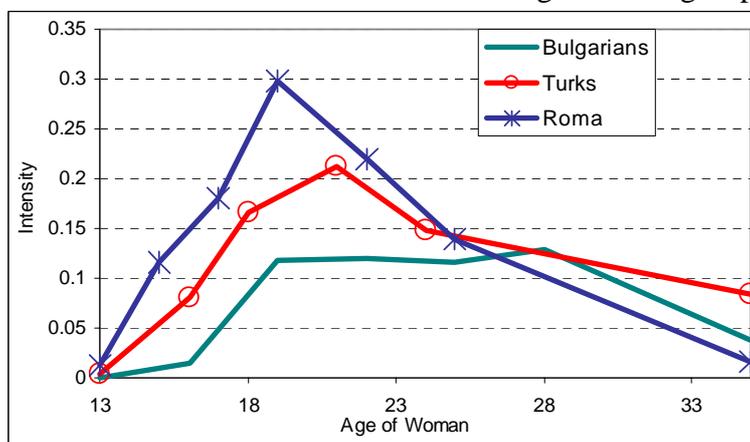
Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Model 3 includes variables for age of woman, calendar year and ethnic group, Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey, 2002.

Our next step is to use one baseline intensity for each ethnic group under observation. The results are presented graphically in Figure 5.13.

The results are very similar to the ones we obtained from the census data. The Roma group has the highest risk of first birth and starts with the reproductive behavior at earliest ages. The highest risk for Roma population occurs at age 19. The group of the Turks has the second highest risk of conceiving, but they start at later ages with the childbearing: the highest risk is observed at age 22. The Bulgarians start at the latest age with the reproduction and have in general the lowest risk of first birth. Also,

the shape of the curve has a very different shape from the ones for the other ethnic groups. Between ages 18 and 28 we almost do not observe any change in the risk of birth – the curves stay flat at a high level.

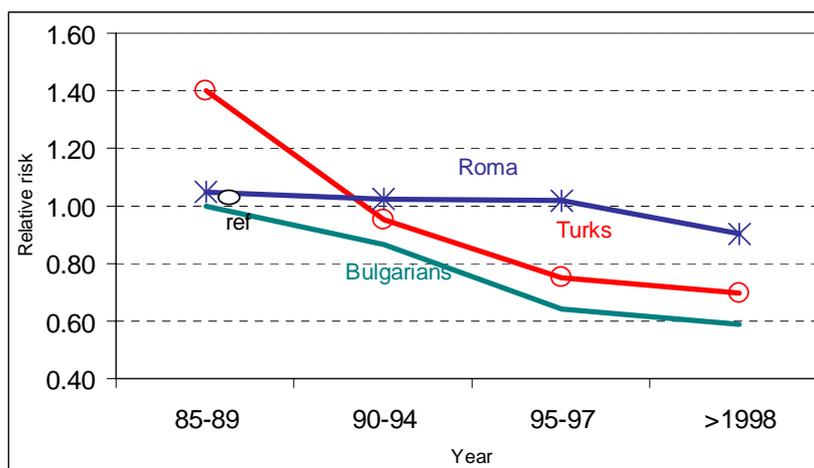
**Figure 5.13:** Baseline intensities for first birth according to ethnic group



Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Graph constructed on the basis of 3 separate models (one for each ethnic group) controlling for age of woman. (3) Own calculations, Social Capital Survey, 2002.

As in the previous analyses, to see how the risk for each ethnic group developed through time, we perform an interaction between the period and the ethnic group. The results are plotted in Figure 5.14 and the values of the relative risks are given in Table C 11 in Appendix C. The results are a little different from the ones we obtained with the census data, especially for the first two periods that we observe now. This could be due to the fact that in the previous interaction, the reference group was taken as Bulgarians and period before 1975, whereas in the present analyses, we choose another period as the reference group against which all the relative risks are compared. Additionally, some of the variables that are included in the model are slightly different (see Chapter 3) and this can understandably lead to different estimates. However, the results for the period after the mid-1990s are very much comparable with the results obtained with the census data.

**Figure 5.14:** Relative risk of first birth. Effect of ethnic group and period. Bulgarians and period before 1990 as a reference group.



Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Interaction between ethnic group and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey, 2002.

At the beginning of the period, the Turks have the highest relative risk of first birth, followed by the Roma group. With the start of the transition of the country, we observe a sharp drop in the risk for the Bulgarians and the Turks, while for the Roma group the changes are very small. After the mid-1990s there is a decrease in the risks of first birth for each group, and at the end of our observation window the Roma group has the highest risk, followed by the Turks and the Bulgarians.

Our interpretations on the influence of ethnic group on childbearing are presented in section 5.4.2.

### 5.3.3 Transition to motherhood and education

Our next step in the analyses is to introduce information about the women's education into our model. Model 4 is the first one in which we include education attainment and education enrolment and we compare it with the results from Model 6, our final model. In Table 5.8 we present extracts from Model 4 and Model 6. For the full models, see Appendix C, Table C 10. Introducing the information on education significantly improves the fit of the model ( $p < 0.00001$ ). The results obtained are very similar to those from our previous analyses on first birth transition with the census data.

**Table 5.8:** Relative risk of first birth according to education attainment and education enrolment. Two models compared.

	Model 4		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Education level</i>				
Primary	1.10		0.90	*
Secondary (ref)	1		1	
Higher	0.86	*	0.96	
<i>Education enrolment</i>				
Out of education (ref)	1		1	
In education	0.28	***	0.46	***

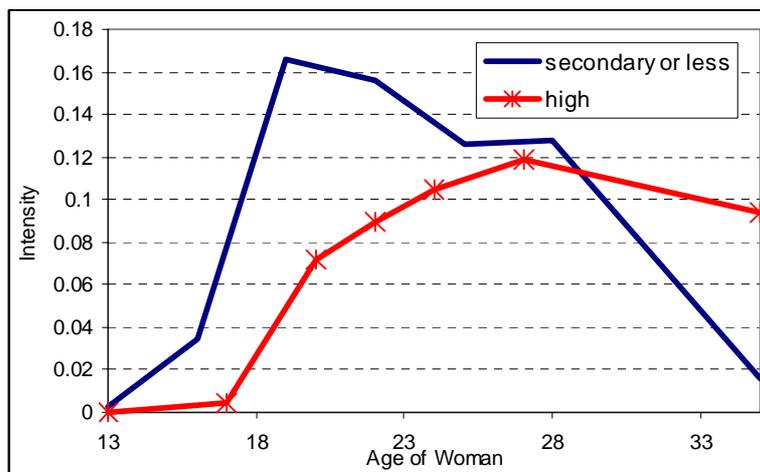
Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Model 4 includes variables for age of woman, calendar year, ethnic group, education attainment and enrolment, Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey, 2002.

In Model 4, women with higher education have a 14 % lower risk of first birth compared to women with secondary education. On the other hand, the primary educated have a 10 % higher risk than the secondary educated women. However, when we control for union status and additional background characteristics, the risk of the primary educated women changes its sign and is 10 % lower than the one for the secondary educated women. The difference between secondary and higher educated women almost disappears.

Being in education significantly reduces the risk of first birth. In Model 4 the risk of women who are enrolled in studies is 72 % lower than for women who have finished their education. When introducing more variables to the model, the risk for women in studies is not so low any more, but it is still significant and different from the women who are out of education. As usual, we are not going to discuss the results here: we give interpretations in section 5.4 of the current chapter.

To have a more detailed picture of the differences between first birth transitions according to education attainment, we again divide the intensity into two groups – one for women with higher education and one for women with primary or secondary education (presumably, these are women who finished their studies at the latest when they were 19). Results are presented in Figure 5.15.

**Figure 5.15:** Baseline intensities for first birth for women with higher education and women with secondary or primary education

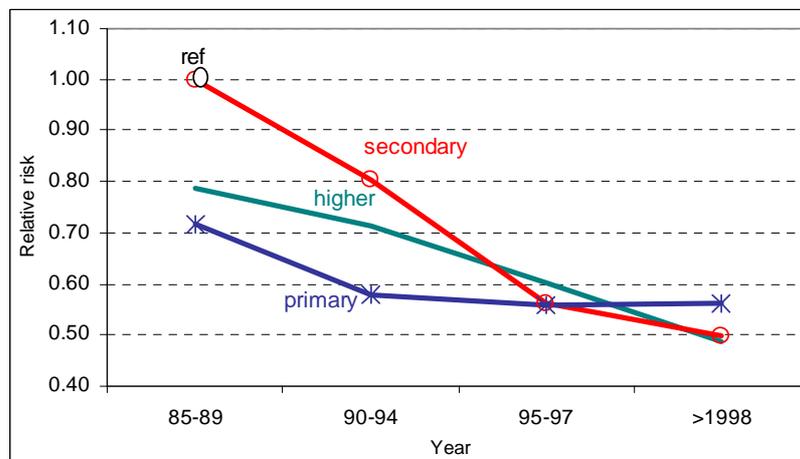


Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Graph constructed on the basis of 2 separate models (one for each education group) controlling for age of woman. (3) Own calculations, Social Capital Survey, 2002.

The results are very similar to the ones that we obtained already with the census data. Women with primary education start childbearing much earlier than women with higher education. We see that as soon as they finish education (age 18-19), they have an elevated risk of conceiving. The risk stays high until age 22 and then gradually decreases. After age 28 the decline is much stronger. Women who prolong their studies start childbearing at later ages – that is, when they finish or at least when they are near the end of their studies. It seems that the higher educated women are the ones who postpone their motherhood transition the most. The risk of childbearing starts to increase only at age 21 (possibly the college educated) and is still at a very high level at age 34.

As in the analyses with the census data, we also performed an interaction between the education level and period in order to follow the changes of first birth through time. The results from the interaction are presented in Figure 5.16. The values of the relative risks are given in Table C 12 in Appendix C.

**Figure 5.16:** Transition to first birth. Effect of education level and period. Secondary education and period before 1990 as a reference group.



Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Interaction between education level and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey, 2002.

The results for the first two periods differ from the one that we obtained with the census data, while those of the last two periods are similar in the two datasets. The differences are most likely caused by the different specification of some of the variables included in the models. The inclusion of union status here and only marital status in the models based on the census data also explains some of the difference. Additionally, there are some differences in the definition of the education level between the two datasets (see Chapter 3 for more detailed description) that might also have some effect on the results obtained.

At the beginning of the observation period, women with secondary education have the highest risk of first birth. The differences between the secondary and higher educated women are very small. During the 1990s for each group we observe a decrease in the risk of entering motherhood, but the steepest decrease is for the secondary educated women. For the primary educated women we observe a decrease in the beginning of the period and afterwards an almost steady level. During the last years under observation, the primary educated women have the highest risk of conceiving and there is almost no difference between women with higher and secondary levels of education. We discuss the results of the impact of education in section 5.4.3.

### 5.3.4 Transition to motherhood and union status

Our next step in the analyses of first birth is to introduce information about the union status of the women into the model. In Table 5.9 we present an extract of our final model. For the full model, see Appendix C, Table C 10.

**Table 5.9:** Relative risk of first birth by union status. Final model

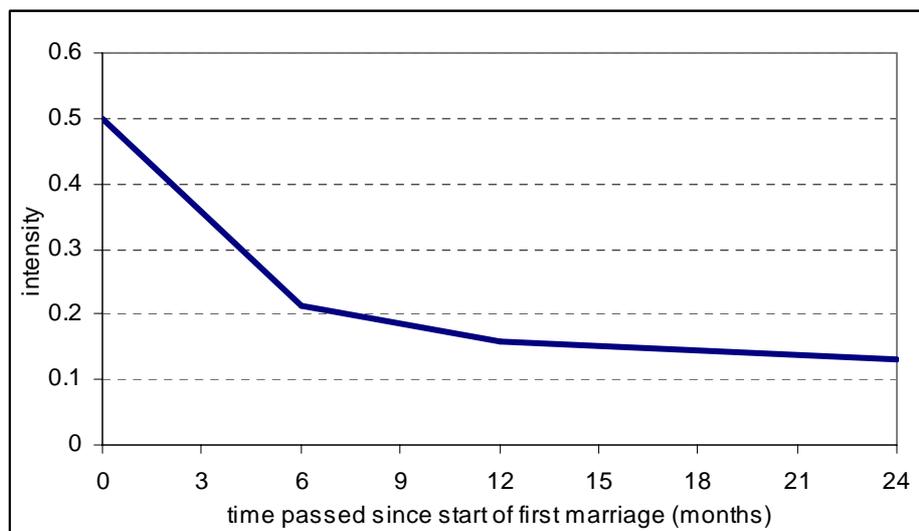
	Model 6	
	Relative risk	Sig.
<i>Civil status</i>		
Single (ref)	0.09	***
Cohabiting	0.66	***
Married directly	1	
Married after cohabitation	1.21	**

Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Model 6 is the final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey, 2002.

A woman who is in marriage (direct or after cohabitation) has a significantly higher risk of becoming a mother than a woman who is cohabiting. If we compare the two groups of married women, we see that women who married after being in cohabitation have 21 % higher risk to enter motherhood than women who married directly. Transforming a cohabitational union into a marriage is connected to the higher risk of giving birth to a child.

The high risk of first conception when entering a marriage shows once again that there is a tight connection between marriage and childbearing. In order to see the influence of the marriage duration on childbearing, we introduced to our final model an additional spline indicating the time passed since start of marriage. It operates only for women who get married. The result is presented in Figure 5.17.

**Figure 5.17:** First conception intensity according to time passed since start of marriage.

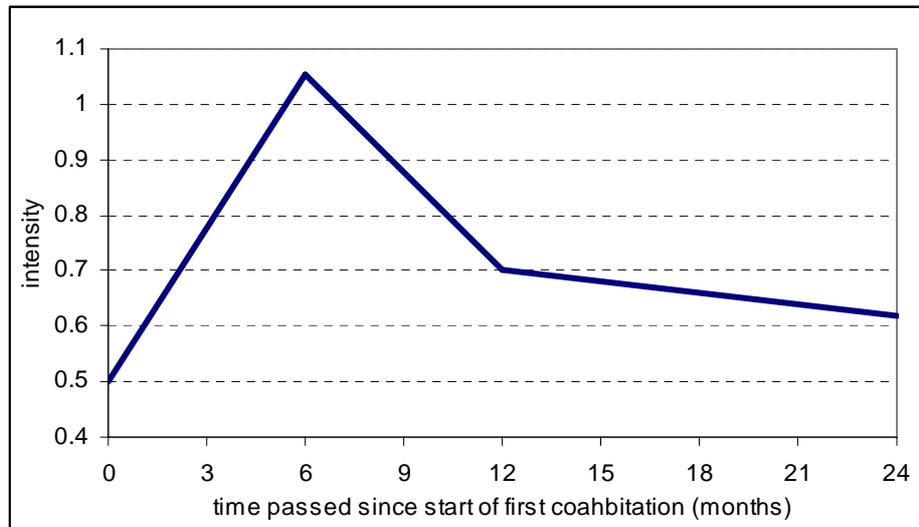


Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey, 2002.

The result is very much the same as the one from in the analyses of first conception with the census data. We have the highest risk of conceiving in the first half a year of the marriage. The risk stays relatively high during the first year and after that is very low. When a woman decides to get married, she is most likely to get pregnant within the first year of marriage. Or: if a woman starts to think of children, she also starts to think of a “legal” family formation.

In order to see if this also holds true for cohabitation, we added to this model an additional spline indicating the time passed since start of cohabitation. It again operates only for women who live in cohabitation and starts with the beginning of the cohabitation. The result is plotted in Figure 5.18.

**Figure 5.18:** First conception intensity according to time passed since start of cohabitation.



Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey, 2002.

The risk of first conception in cohabitation has a different pattern of duration-dependency than that in marriage. At the start of the cohabitation, the women are not highly prone to conceiving a child. The risk elevates after several months of living together to peak at six months after the start of the cohabitation. After one year in this simple consensual union, the risk of conceiving decreases substantially. So, cohabitation is not as highly associated with childbearing as marriage, especially at the beginning of the union. The proneness to childbearing comes a bit later – within half a year from the start of the union.

A more detailed discussion on the connection between union status and motherhood can be found in section 5.4.4.

### ***5.3.5 Transition to motherhood and background characteristics***

The final step of this part of the analysis is the introduction of three additional background characteristics of the women to our final model. In Table 5.10 we present extracts from Model 6. Full information on the final model is available in Appendix C, Table C 10.

**Table 5.10:** Relative risk of first birth according to some personal characteristics.

Final model

<i>Number of siblings</i>	R. R.	<i>Place of residence (until age 15)</i>	R. R.	<i>Level of religiosity</i>	R. R.
0	0.95	Urban (ref)	1	Religious	0.99
1 (ref)	1	Rural	1.13 **	Not religious (ref)	1
2	1.22 ***				
3 +	1.31 ***				

Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Final model, including age of woman, calendar year, ethnic group, education attainment and enrolment, motherhood status, number of siblings, place of residence, level of religiosity (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey, 2002.

Women who have more siblings tend to have a higher risk of first birth. Those who have at least two brothers or sisters have a 22 % higher risk than those who have one brother or sister. Women with three or more siblings have the highest observed risk – 31 % more than women with one sibling.

Place of residence has the impact we supposed. People who have grown up in rural areas have a higher risk of birth than people who have grown up in urban areas. However, the differences between the residence places are not very high – people in small residence places have a 13 % higher risk of birth.

Level of religiosity does not have any impact on the transition to motherhood. We do not find any difference between women who define themselves as religious or non-religious.

We discuss the impact of personal characteristics in section 5.4.5.

## 5.4 Discussion of the results

In the previous two sections of this chapter we presented our analyses for the transition to first birth of women in Bulgaria. The difference between the two analyses stems from the different source of information and the different samples used for the studies. In the following section we aim to compare the results and discuss the possible explanations of the trends that we found.

### **5.4.1 Trend**

In general, the start of the reproductive behavior of the Bulgarian women occurs fairly early. We found out that most women are prone to having their first child between the ages of 19 and 25 (see Figures 5.4 and 5.11). These ages are very low compared to western countries and even to other former socialist countries, such as the Czech Republic, Hungary, Poland, and Croatia.

We find a steady decline in the tendency to give birth to a child (Figures 5.5 and 5.12). Our analyses through time showed that there has been a strong decline in likelihood to have a first birth since the start of the transformations in the country. This finding is in line with our expectations (see Chapter 3, Hypothesis 2). During the first part of the period (we were able to observe a period of three decades with the census data), there was a constant rise in the tendency of first birth. During the late 1960s and 1970s the Bulgarian government introduced in several stages a strong pro-natalistic policy in order to reduce the decrease of fertility already being observed. The main priority of the government was to establish conditions which would enable the Bulgarian woman to successfully combine motherhood, a working career and social activity (Keremedchieva, 1998). To some extent this policy turned out to be successful and managed to elevate the fertility somewhat during that period. However, these policies were only successful until the end of the 1980s. After the fall of the Berlin Wall, the government could not control the fertility and give strong support to the mothers any more. After year 1990 we observe a strong drop in the willingness to bear a child for the Bulgarian women. In the second part of our analyses, we were able to study the changes through the 1990s in more detail. We observed a strong drop until 1995, a small recovery for the next two years, and then another smooth decline in the transition to first birth. The increase in 1996 and 1997 is a little bit surprising, since at this time there was a very strong economic crisis in Bulgaria (see Chapter 2) and our suggestion was that when there are financial difficulties, fertility is delayed for later times. It turned out that the economical difficulties either did not have a strong effect on the first births or they had the opposite impact – the bigger the financial problems and the poorer the population, the higher the fertility. To further understand the influence of the economic development on childbearing, we would need to extend our study and include more information on

additional aspects of the well-being of the women. However, such an analysis is behind the scope of this work.

#### ***5.4.2 Motherhood and ethnic group***

The analyses according to the ethnic group showed that the highest tendency for first birth can be found among the Roma population (see Tables 5.1 and 5.7). This result was obtained with both data sets, with the census data showing stronger values. Apart from this high fertility intentions, the Roma group is also characterized by an early age for the start of childbearing (Figures 5.6 and 5.13). This is in accordance with our outlined assumptions in Chapter 3 (see Hypothesis 4). After 1990 we observe a decline in the likelihood of childbearing but it is not as strong as for the other ethnic groups. Additionally, we do not find very strong differences between the reproductive behavior of the Bulgarians and the Turks (Figures 5.7 and 5.14). Similar results have been obtained in many other studies too (Zhekova, 2001; Philipov, 2000; etc.). The Turks have slightly higher intensities of first childbirth, but the changes through the years follow very much the same direction and pattern. The assumption that the differences between the ethnic groups appear only after year 1990 was not supported by our results.

The large differences between the Roma group and all the other ethnic groups could have several different causes. Sougareva (1995) argues that Roma traditionally get married at a younger age and that the transition to first child occurs much earlier in comparison to the other ethnic groups. According to Zhekova (2001), the higher fertility in the Roma group is a result of their cultural and value differences and of the higher number of unplanned births. The Roma have higher a percentage of unplanned births since they have a lower level of effective contraceptive usage (Yachkova, 1998), low family planning, and a different cultural level regarding the upbringing and education of their children when compared to the other ethnic groups in Bulgaria (Zhekova, 2001).

According to Pamporov (2003), since 1990 the Roma population have returned to the traditions, values and social strategies that prevailed in the times before the start of the communist regime. As a result of this, the demographic behavior of this ethnic group is very similar to the one that was characteristic before the start of the ‘first demographic transition’, namely extremely high mortality and

high fertility. This return to the older traditions was also discussed in Chapter 4 with reference to the low tendency to marriage in the Roma group. Regarding first births, there is another cultural aspect to consider for this ethnic group: the birth of the first child is highly connected with the traditional model of socialization, according to which a Roma girl only becomes a woman after she gives birth. Additionally, the birth should happen within the first year of the marriage (Pamporov, 2005). The different behavior of the Roma group can also be regarded as a kind of ethnic identification, which is becoming more and more significant in the Balkans as whole.

The differences between the ethnic groups and their different cultures have always existed, but they were suppressed during the socialist ruling of the country. As freedom of lifestyle and choice becomes available, the differences between the ethnic groups are likely to become more pronounced. However, a change of values or a return to old customs requires more time, so a longer period of investigation is necessary in order to detect the real trends in each ethnic group.

Nevertheless, in our analyses we were able to detect an effect of different cultures on the first birth process. It seems that the fertility of the Roma group is not as strongly affected by the harsh economic situation in the country as that of the other ethnic groups. This in itself demonstrates that we should pay attention to the cultural and value differences, and not just the economic situation, when we study the fertility behavior in a country like Bulgaria.

### ***5.4.3 Motherhood and education***

In our analyses we were not able to find any significant effects of the education level of the women on the risk of first birth (see Tables 5.2 and 5.8). The results from the two data-sets showed that primary, secondary and higher educated women are equally likely to bear children. The lack of any substantial difference between the women with differing education levels could be due to the fact that the transition to first birth in Bulgaria is still a very universal process – more than 90 % of women have at least one child. The women who nevertheless stay childless do not have obviously different education levels to the mothers; in other words, education does not influence the transition to motherhood. We would assume that staying childless is either unwanted or is a decision that is not influenced by the education attainment.

However, when following the changes of first childbirth trends by education level and time, we have slightly different results. For the different periods we find some differences between the first birth risk among differently educated women; the impact of the education level is different in almost each period. For the last observation period, the primary educated women have the highest risk and the other two groups of education levels do not differ much from each other (Figures 5.9 and 5.16). Hence, in Bulgaria we found only weak support for the hypothesis that the higher opportunity cost of childbearing inhibits transition to motherhood among women with higher education, or, in other words, we do not find any serious impact of education on the delay of first birth. The changes through time also show no evidence of a difference. These results contrast fully with our assumptions in Chapter 3 (Hypothesis 6).

The timing of first birth, however, does differ between the women with different education levels. Women with a higher education level start their reproduction behavior later than the others (Figures 5.8 and 5.15). This is mainly due to the fact that higher educated women spend longer time in the educational system. In our analyses we control for education enrolment, which explains why the effect of education level diminishes: all the education attainment groups are shown to have the same risk of first childbirth right after finishing their studies. However, none of the groups seems to seriously postpone their reproductive behavior after their studies – in order to have time for other things in life, such as working career, for instance.

We found out that the effect of education participation is stronger for the period after year 1990 (see Table 5.3). Before that, it seems that childbearing was more compatible with studies than afterwards; this is not a surprising result, since the former pronatalistic policies provided enough support for young mothers and made having a baby easy even for students. The situation changed substantially after the economic and political transformation in the country because state assistance for young mothers decreased substantially. This inevitably affected the childbearing behavior, leaving fewer women inclined to have a child while studying. The finding supports the argument which states that society has normative expectations that young women in education are not at risk of entering into parenthood (Blossfeld and Huinink, 1991). The negative affect of education enrolment on first birth is found to be valid by other researchers for many other countries (Blossfeld and Jaenichen, 1992; Lappegard and Rønsen, 2004; Vikat, 2004; Kantorova, 2004; to name a few).

However, we have to bear in mind that these results refer only to the transition to first birth when in education, not accounting for any other transitions that might interfere in this process. It would not be surprising if the influence of the education level turns out to be different when we account for the transition to first marriage or first union, for instance. In section 5.5 we study the transitions to motherhood and union formation as parallel processes.

#### ***5.4.4 Motherhood and union status***

In the first part of our analyses we studied the tendency of having a child according to the marital status of the women. Not surprisingly, the results showed that married women have the highest likelihood to have a child – compared to women who have never been married or to divorced and widowed women (see Table 5.4). Additionally, we did not find any difference in this trend according to the education level of women or to the ethnic group (except that the Roma group had an elevated risk in each category) (Table 5.5). This fact shows that the connection between childbearing and union formation is very strong for each group of people that we study. The behavior of the women according to their marital status, education level and ethnic group seems to be the same. Additionally, the interval between marriage and first conception is very short (Figure 5.10): our results showed that within the first six months of the marriage, the woman is highly disposed to conceiving, which shows that union formation can be considered to be connected with childbearing. A woman gets married when she plans to have a child or is prompted to consider having a child by the act of marriage. The strong link between bearing children and the decision to get married is found to be important in other studies too (Hoem and Selmer, 1984; Blossfeld and Huinink, 1991; Thornton et al., 1995; Billari and Kohler, 2000; Buber, 2001; to name a few). However, further investigation is needed concerning the strength of the relationship between the marriage and first birth. We study the two transitions (first union formation and first birth) as parallel processes in section 5.5.

In the second part of our analyses we were able to make a distinction between cohabitation and marriage in the family formation process. The results showed that cohabitation has a strong influence on transition to first birth (Table 5.9), but that marriage nevertheless has the highest influence on childbearing. Union formation in general leads to a higher likelihood of childbirth, but when the union is marriage, then

this is even higher. This demonstrates that many people tend to live in cohabitation, but when it comes to childbearing, they prefer to have it in a “legal” family. Additionally, the duration of the cohabitation has a different impact on first conception compared to the impact of marriage duration (see Figures 5.17 and 5.18): at the beginning of the consensual union, women are not so prone to childbearing, but as the months pass, the inclination to conceive gets stronger and is highest after six months of cohabiting. This contrasts with the pattern for marriage, where the likelihood of pregnancy is much higher at the beginning. This result is in line with our hypothesis (see Chapter 3, Hypothesis 8) that the relationship between marriage and birth is much stronger than between cohabitation and birth.

#### ***5.4.5 Motherhood and background characteristics***

Fully in line with our expectations (see Chapter 3, Hypothesis 7), our results show that having more siblings leads to a higher inclination to first birth. Women with three or more siblings have the highest tendency to start reproduction, whereas we do not find any significant difference between women with one sibling and those with none (Tables 5.6 and 5.10). Zhekova (2001) also finds a positive relationship between the number of siblings and number of children that the women have in the case of Bulgaria. This result replicates the findings in many countries and proves the hypothesis that women who stem from a bigger family tend to reproduce the size within their own family. Another explanation for this trend could be the greater economical and psychological push to leave home in cases where there are many siblings, which leads to an earlier adoption of adult roles, including that of motherhood (Rindfuss and St. John, 1983). Additionally, families with more children have greater difficulties in sending their daughters to college. This could lead to an early start of childbearing, as an alternative to higher education (Rindfuss and St. John, 1983).

The place of residence where the woman lived until age 15 plays a role similar to the one we expected (see Chapter 3, Hypothesis 7). Women who have grown up in rural areas have an elevated tendency to make the transition to first birth (Table 5.10). We suppose that life in the villages is more conservative and the changes in the lifestyles and the values are developing more slowly than in the urban areas. Higher

fertility in the villages in Bulgaria is also reported by other scientists, for instance Zhekova (2001), Ilieva (1998), and Mirchev (1998).

In one of the analyses we were able to make a distinction not only between urban and rural, but also between the sizes of the place of residence. We found out that women who grew up in the capital have a lower risk of first birth, while there were no differences between the other groups of settlements (Table 5.6). The connection between place of residence and childbearing is studied in many other researches too. Rindfuss and St. John (1983) argue that the lack of attractive female career opportunities in rural areas may make early motherhood more appealing. There is also the indirect effect of educational and career aspirations, which often leads to first birth at early ages.

It is usually considered that the level of religiosity has a positive impact on the birth of a child (Lesthaeghe, 1998). However, in our analyses we found out that the level of religiosity does not play any role on the transition to first birth (Tables 5.6 and 5.10). The same was found for the transition to family formation. Such a finding is in contrast with our expectations that the highly religious people are more susceptible to early childbearing. We would again assume that because religious practices were restricted over a long period of time, religiosity does not necessarily influence people's fertility behavior anymore. The Orthodox Church is very liberal towards abortion and contraception (Sobotka, 2002) and does not impose any restrictions on people's decisions concerning children.

## **5.5 First union and first birth as parallel processes**

The study to first union formation in Chapter 4 and the study to first birth in the current chapter showed that there is a strong interdependency between these two processes. We found a significant impact of pregnancy on union formation and vice versa: a strong impact of the union formation on the transition to first birth. There is a reverse causality between these processes, which means that the one process affects the other and vice versa (Blossfeld et al., 1999). The timing of first birth and first union are endogenous, that is, the survival in one state depends on the outcome of the other process (Baizan et al., 2003). To be able to address this endogeneity, we allow the unobserved heterogeneity terms for the processes to be correlated, following the

modeling procedure proposed by Lillard (1993). In order to control for shared unmeasured factors that simultaneously influence first birth and first union formation, we allow unobserved heterogeneity to be correlated across the two processes of marriage/cohabitation and entry into parenthood (Baizan et al., 2003). Estimates will be biased unless this correlation is accounted for in estimation. This is a form of simultaneous equations, or endogeneity, bias (Brien and Lillard, 1994).

(1)

$$\left\{ \begin{array}{l} \ln h^B(t) = y^B(t) + \sum_k z_k^B(u_k + t) + \sum_j a_j x_j + \sum_i \alpha_i \omega_i(t) + \varepsilon \\ \ln h^C(t) = y^C(t) + \sum_k z_k^C(u_k + t) + \sum_j a_j x_j + \sum_i \alpha_i \omega_i(t) + \delta \\ \ln h^M(t) = y^M(t) + \sum_k z_k^M(u_k + t) + \sum_j a_j x_j + \sum_i \alpha_i \omega_i(t) + \delta \end{array} \right.$$

In Chapter 3 we have explained in more detail the meaning of each subscript in the equation of an event history model. Here we only want to emphasize the main points in this kind of model. The superscripts B, C and M denote first birth, first cohabitation and first direct marriage. The equations for entering first cohabitation and first marriage are modeled as competing risk processes and we allow them to have a joint heterogeneity term ( $\delta$ ). This is a way to study the process of first union formation, where  $\delta$  reflects unobserved factors influencing the timing of first union, independently of the type of the first union (Baizan et al., 2002). The equation for transition to first birth has another heterogeneity term and we estimate the correlation between the two of them. This procedure will allow us to estimate the correlation between the union formation process and the decision to have a child<sup>29</sup>. As we are interested in the interdependency between motherhood and union formation, we study only the relation between birth on one hand and cohabitation and marriage (that is union formation) on the other. We do not include in our model the conversion of cohabitation into marriage since this process does not refer to first union formation.

The two heterogeneity terms  $\varepsilon$  and  $\delta$  are assumed to have a joint bivariate normal distribution in which  $\rho_{\varepsilon\delta}$  is the correlation between them.

<sup>29</sup> We restrain from estimating separately the correlation between birth and cohabitation and between birth and marriage as our primary interest is to study the interrelatedness of union formation and childbearing.

(2)

$$\begin{pmatrix} \varepsilon \\ \delta \end{pmatrix} \sim N \left( \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_{\varepsilon}^2 & \sigma_{\varepsilon} \sigma_{\delta} \rho_{\varepsilon\delta} \\ \sigma_{\varepsilon} \sigma_{\delta} \rho_{\varepsilon\delta} & \sigma_{\delta}^2 \end{pmatrix} \right)$$

A critical assumption in the behavioral equations is that all correlation, either among replications of the same process or among processes, is captured by the heterogeneity components (Brien and Lillard, 1994).

We expect that women who are most likely to form a union are the ones who are also most likely to make a transition to motherhood. The reasons for this close connection between the two processes could have different origins. One of them, for instance, can be the importance of education attainment and education enrolment. As Marini (1984) states, age at first birth may affect education attainment because age at first birth is correlated with age at first marriage. This problem should be resolved by allowing for correlation between the two processes. There could also be unobservable joint factors influencing the risk of first birth and union formation: these could be an individual's value orientations and attitudes towards family life (Baizan et al., 2003), including personal intentions, influence of peers or relatives, possibilities for balancing family and work life, and so on. Value orientations, as well as social norms, produce a selection effect, by which individuals choose consistent paths during their life course (Baizan et al., 2003). For instance, aspirations for high education attainment can lead to a preference for postponing the first birth in order to achieve educational goals (Rindfuss and St. John, 1983). These are all factors that we are not able to measure, but they are captured by the unobserved heterogeneity terms in our model.

The results of the full model are presented in Tables C 13, C 14 and C 15 in Appendix C. In general, the results do not differ much from what we have found out so far for each transition under study. However, most of the values of the variables are somewhat stronger and the differences between the categories are more pronounced. The directions in which they operate, though, are unchanged. Still, there is one variable which we want to pay more attention to, namely the level of education. For a better visual picture of the change in this variable, in Table 5.11 we plot the results for each transition for the separate studies and the interrelated study.

**Table 5.11:** Results on the effect of education attainment on the transition to first union formation and first birth. Comparison of separate study and interrelated study

		Primary education		Secondary education (ref)		High education	
		Rel. risk	Sig.	Rel.risk	Sig.	Rel. risk	Sig.
Direct marriage	(separate study)	0.68	***	1		1.10	
Direct marriage	(interrelated study)	1.22	***	1		0.71	***
First cohabitation	(separate study)	1.04		1		0.66	***
First cohabitation	(interrelated study)	1.81	***	1		0.51	***
First birth	(separate study)	0.90	*	1		0.96	
First birth	(interrelated study)	2.00	***	1		0.41	***

Notes: (1) Method: hazard regression model; (2) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (3) Own calculations, Social Capital Survey, 2002.

The interesting thing about these results is that the impact of the education level appears to be completely different from that which we previously found out. For the transition to direct marriage, the variable has fully changed the direction of its influence. We find out that women with primary education are the most prone to start a union with a direct marriage, while women with high education are the least susceptible of doing so. The results for the transition to first cohabitation do not change their direction, but the influence of the education level becomes more pronounced as well as more significant. Women with primary education are about 80 % more disposed to starting union with cohabitation than women with secondary education. The highly educated women are about 50 % less inclined to do so. The results for the transition to first birth are also worth mentioning. Contrary to our findings up to now, here we distinguish differences in the transition rate to childbearing according to education level of the women. Women with primary education show the highest risk of childbearing, while women with high education have the lowest transition rate to first birth.

The changes between the models of the impact of education level on the risk of first birth seem to us to be the most interesting results here and we want to discuss them further before proceeding with the rest of our results. In our opinion, the differences in the estimates could be due to the fact that women who make a transition

to motherhood are to some extent a selected group. It could be that they have some personal values and aspirations towards bringing up children which we cannot account for in our separate model. Additionally, the process of first birth is dependent on additional characteristics of the women and is related to the formation of union. Estimating these processes simultaneously allows us to take into account the relatedness. For this reason we consider these results as more reliable than the ones obtained from the separate models.

The higher risk of first birth for the women with primary education and the lower risk for women with high education is not a new finding. It has been shown by many other studies in other countries too (Rindfuss et al., 1980; Marini, 1984; Rindfuss et al., 1984; Liefbroer and Corijn, 1999; Buber, 2001; Baizan et al., 2003; Lappegard and Rønsen, 2004; etc.). There could be several reasons why the lower educated women have a higher risk of first birth. One, of course, is the prolonged stay in studies for the highly educated women, which leads to them delaying other life course events. Additionally, the lower educated women can be considered to be affected to a higher degree by the worsening economic situation and to be more vulnerable in the labor market, which means they have less economic resources to take care of a child. However, lower education also leads to fewer alternatives for personal developments to choose from. So, having worse chance on the labor market could push women to devote to motherhood. Other reason for this differential could be that since the better educated women can respond more strongly and efficiently to the prevailing socioeconomic climate: they delay fertility the most in response to the conditions (Rindfuss et al., 1984). For the case of Bulgaria, this means that the delay of childbearing for the highly educated women could be a response to the worsening economic situation in the country and the general insecurity in life.

Additionally, the fact that this differential appears only after we account for unobservable characteristics and the influence of union formation shows that there are factors, not measured by us, which play a significant role in the decision to have a child. One set of these unmeasured factors could be the characteristics of the women's partners. For instance, the education level and employment status of the partner should also have a role in the decision for childbearing; unfortunately, we cannot draw any conclusions about that – this is a topic for future investigations.

Let us now proceed with the rest of our findings. We found a very high and positive correlation between the process of first union formation and first birth for the case of Bulgaria. The results are given in Table 5.12.

**Table 5.12:** Heterogeneity terms and their correlation in the processes of union formation and first birth

Process	Heterogeneity term		
	Value	SE	Sig.
First union formation	1.90	0.050	***
First birth	2.30	0.107	***
Their correlation:			
	0.96	0.010	***

Notes: (1) The results of the full models can be found in tables C13, C14 and C15 in Appendix C; (2) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (3) Own calculations, Social Capital Survey, 2002.

The basic conclusion from these results is that the women who are most prone to form a union (for reasons we partly do not observe) are also most likely to have a first birth. This finding suggests that first union formation and first birth are part of the same process of forming a family (Baizan et al., 2003). The postponement of first union formation could be strongly connected to the delay in first births and these two processes could be determined by some joint factors. Similar studies have been conducted for other countries too. Baizan et al. (2003) study the same interrelated processes for Spain and they find a positive and significant correlation with a value of 0.65. Le Goff (2002) studies the correlation between first birth and first marriage for West Germany and France. He finds a positive and significant correlation with a value of 0.55 for the case of West Germany, and low and insignificant correlation for the case of France. In another study for the case of the Czech Republic by Kantorova (2004), the correlation between first union formation and first birth is found to be 0.93. Bearing in mind the high correlation we found and comparing it to the other studies, it seems to us that the dependence between union formation and childbearing is stronger in the countries from the former socialist bloc, compared to their western counterparts. This could be due to the fact that the process of value change started much later in the eastern countries (only in the last decade and a half); the change of societal norms and personal ideas is a slow process and requires a longer time span to reach all the segments of the population. Thus, we consider that more time has to pass

before the effects of this value change will be observed – as a weaker connection between childbearing and family formation.

## 5.6 Conclusion

In the present chapter we analyzed the transition to motherhood for women in Bulgaria and we focused mainly on the changes over time in the childbearing patterns, as well as the differences by ethnic group and education of the women. A large part of the study was devoted to the influence of the union formation on the timing of first birth, and we studied these processes simultaneously in order to estimate the correlation between them.

One of the main findings is that in the last decade we can observe a steady decline of the rate of entry into motherhood in Bulgaria. Furthermore, this trend appears in each subpopulation in our data. In other words, each education group of women and each ethnic group exhibits a delay in the risk of first birth. However, the pattern of the decline is different for each group.

The results regarding ethnic group showed that there are significant differences in childbearing behavior for women coming from the Roma ethnic group, as compared to the rest of the women. In addition, these differences could also be observed before the start of the political and economic transition in the country. We argued that such strong differences show that the role of values and culture is very strong and should not be neglected in studies of fertility.

The role of the education enrolment on fertility was found to be in accordance with our expectations. Women in studies showed a significantly lower level of first births rates than women out of education. This finding replicated the expectation that women who are in education are largely considered not to be at risk of entering motherhood and that a prolonged education participation leads to a delay in entering adulthood, thus affecting the women's childbearing. The results concerning the education attainment, however, were not that straightforward. In the first part of our analyses, where we studied first birth process independently of other transitions in life, we did not find any difference between women with a different education level, with regard to their transition to first birth. This result appeared in both of our data sets. However, when we took into account the transition to forming a union, a strong

difference between the education levels appeared. Women with primary education showed the highest risk of first birth and women with higher education the lowest. We argue that the women with low education do not respond as strongly to the changing macro environment and that they do not have many alternatives for different pathways in their life course transitions; they are, thus, more likely to start childbearing earlier.

Possibly the most interesting finding in the analysis from this chapter is the fact that there is a very high interdependency between the process of union formation and the process of entering motherhood in the Bulgarian society. The two processes are a part of the overall family formation pattern, meaning that when women form a union they are most likely to proceed to childbirth, and when they plan to have a child, they also tend to form a union. This result shows that there is a certain attitude of the mother, but also of the society to the events of marriage and birth. Todorova (2000) points out that nowadays the discriminatory attitudes to illegitimate children are motivated mostly by the rational assessment of the economic and social risks arising from the upbringing of such children. According to the author, “the disapproving attitudes of the public to illegitimate births today are determined mostly by a rational judgment about the interests of the child” (Todorova, 2000).

Additionally, the joint estimation of the processes showed that it is important to include a term for the unobserved characteristics of the women in the models and to account for the possible relation of different processes, in order to avoid misleading results.

## Chapter 6

# Second Birth

### 6.1 Analytic strategy

To conclude our picture of fertility and family formation in Bulgaria, we analyze second births<sup>30</sup>. As we already mentioned several times in this dissertation, we expect a strong drop in the second birth risk, which contributes to a large extent to the lowest-low fertility level observed in the last decade. Our aim is to identify the women who are most likely to bring up a second child and to discuss different explanations of the trends that we will reveal.

The structure of this chapter is very similar to the previous empirical chapters. Firstly, we start with the analyses of the transition to second birth in which we pay more attention to the changes through time (section 6.2). We use our census data and also study the second birth risk according to other variables as described in Chapter 2 and Chapter 3. Our second step is to replicate the analyses with the Social Capital Survey data set. The reason for including the additional data set is the fact that it contains information on union histories, which are lacking in the first data set, and the results so far in this study have shown that the impact of cohabitation on fertility is getting stronger through the years and it is crucial to take it into account. The results from this analysis are presented in section 6.3. In the following section (6.4), we compare both sets of results and discuss possible interpretations of the trends. Several studies (e.g., Kravdal, 2001 and Kreyenfeld, 2002) have shown that women who are at risk of getting a second child are a selected group – they already have one child. Women with one child may have certain characteristics in common, which influence their intention to have a second child. To deal with these selectivity problems, we need to apply special modeling techniques as described in Chapter 3. The results of

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<sup>30</sup> As with the analysis of first births, we refer to the transition under study here as second birth, although in reality the event observed starts nine months before birth, at the time of conception.

the joint modeling of the transition to first and second births are presented in section 6.5. Our main concluding remarks are given in the last section (6.6).

The observation period for the event of conceiving a second time starts at the moment of the first birth. Our duration variable is the time passed since first birth. In most of the cases, this is identical with the age of the first child, but not necessarily, as we do not account for the death of a child.

The analyses with each data set are technically the same. We use a stepwise procedure, including in our subsequent models more and more explanatory variables, and follow the changes in the indicators. We run six different models with each data set. We start with the simplest model, in which we include only the baseline intensity – time passed since first birth (Model 1). Then we add two additional splines, one for calendar year and one for age of mother at first birth (Model 2). In Model 3 we add information on the ethnic affiliation of the women. Adding variables for education attainment and education participation forms our Model 4. In the next step we add information on the marital/union status (Model 5). Including three additional variables on the background characteristics of the women forms our final model, Model 6.

## **6.2 Second birth before and after the start of the societal transition**

### ***6.2.1 General description***

Before we proceed to our event history analysis, we want to provide a description of the basic distributions in our sample from the census data.

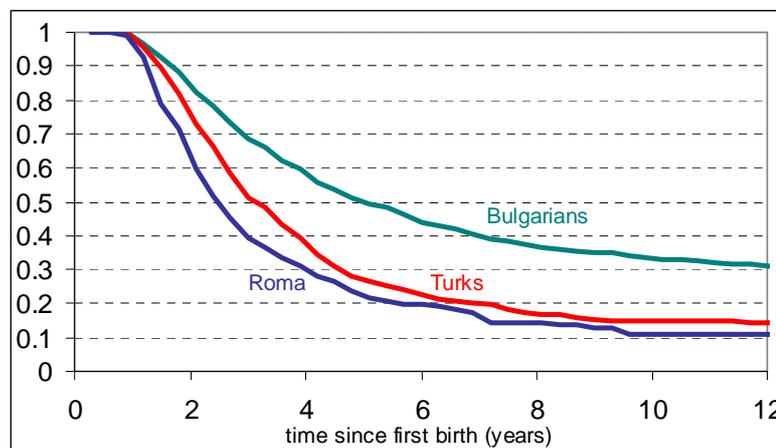
Our sample consists of 3366 women who already have one child. By the end of our observation period (March 2001), 62 % of them also have a second child. On average, women in our sample have their second child about three and a half years after the birth of the first child.

The average age of second conception for women from different ethnic groups differs substantially in our sample. For women coming from the ethnic Bulgarian group it is 24.79, for the Turks it is 22.66, and for the Roma it is 20.42. As a whole, the Roma population shows not only an early transition to first birth, but also an earlier second conception. At the other end of the scale are the ethnic Bulgarians with the highest age range for second conception.

Similar differences persist for women with different education levels. In our sample, the average age of conceiving a second time for women with primary education is 21.56. It is substantially higher for women with secondary education: 24.39. The highly educated women in our sample have the highest mean age of second conception – 27.24 years.

Additionally, we estimated the survival curves of the transition towards a second birth according to ethnic group and level of education of the women. The differences between the ethnic groups can be seen in Figure 6.1, in which we present the survival curves by time since first birth.

**Figure 6.1:** Transition to second birth according to ethnic groups



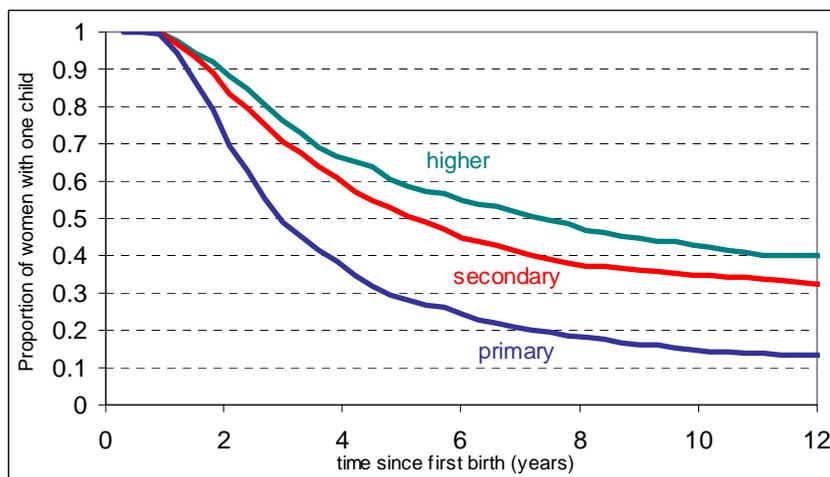
Notes: (1) Method: Kaplan-Meier survival estimates; event: transition to second birth measured since first birth. (2) Own calculations, Census 2001 data.

Nearly 30 % of the Bulgarian women stay with one child and never make the transition to a second birth. This proportion is substantially lower for the other ethnic groups – about 13 % of the Turks and 9 % of the Roma stay with one child. Additionally, the Bulgarians make the transition to second birth latest and have the highest birth interval. About 50 % of the Bulgarian women have a second child before the first child has reached age 5, whereas 50 % of the Turks have their second child before the first reaches age 3 and 50 % of the Roma have their second child before the first has reached age 2.5.

Taking a snapshot of all three populations at this time point (2.5 years after first birth), we observe that half of the Roma have their second child (as we just stated), and the proportions among the Bulgarian and Turkish women are 25 %, and 40 % respectively.

There is also a difference in the transition to second birth according to the education level of women. In Figure 6.2 we present the results from the Kaplan-Meier estimates on the transition to second birth according to education level of women.

**Figure 6.2:** Transition to second birth according to level of education of women



Notes: (1)

Method:

Kaplan-Meier survival estimate; event: transition to second birth measured since first birth. (2) Education level measured as the final education attainment of the women (3) Own calculations, Census 2001 data.

The percentage of the women with higher education who stay with one child only is relatively high – about 40 % of the women in our sample do not have a second child. This compares with the figures of 30 % for the women with secondary education and about 10 % for the women with primary education.

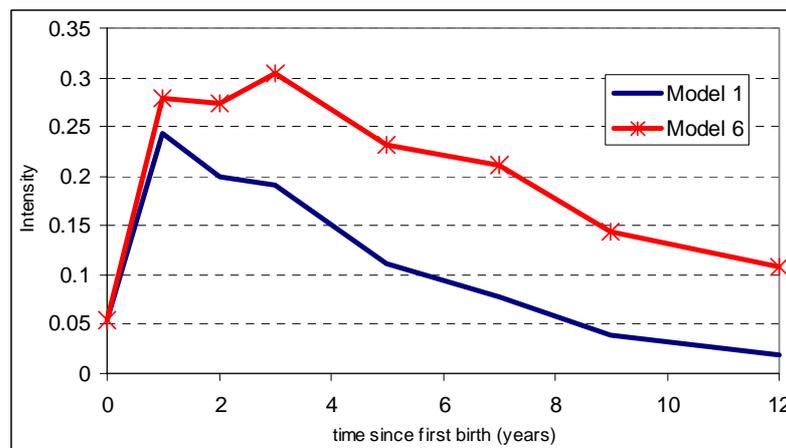
The transition to a second birth is made at the earliest point by the group of women with primary education. About 2.5 years after the first birth, half of the women with primary education have conceived for a second time. When the first child has reached age 3, about 24 % of the higher educated women and 30 % of the secondary educated women have conceived for a second time.

### 6.2.2 Time trend

The survival estimates give us a good picture of the trends of second conception according to different groups of people, but in these models we do not take into account any additional characteristics of the women. To further improve our analyses and look at the impact of other life course events on the transition to second

birth we now proceed to the event history analyses. As a first step, we present the results from the baseline intensity – the second birth transition rate according to the time passed since first birth (Figure 6.3). We present results from our first and final models in order to compare the changes that occur when we introduce more variables to the model. The full results of the models are given in Table D 1 and Table D 2 in Appendix D.

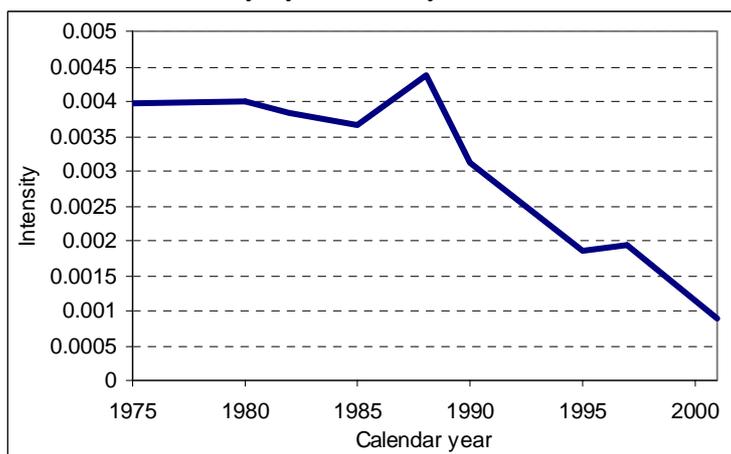
**Figure 6.3:** Second birth intensity by time passed since first birth. Two models compared.



Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Graph constructed on the basis of the first model (no other variables included) and final 6<sup>th</sup> model, including all the variables. (3) The reference point for model 6 is changed to the starting point of model 1. The change of the reference point is done in order to have a better visual comparison of the shapes of the curves (4) Own calculations, Census 2001 data.

In Model 1 we observe a clear peak for second birth at one year after the first birth. After that the risk decreases gradually – almost linearly. Controlling for other characteristics of the women (Model 6) changes the shape of the curve. In the final model we do not observe a well-defined peak anymore. The risk of second birth stays high between one and four years after the first birth, peaking at three years.

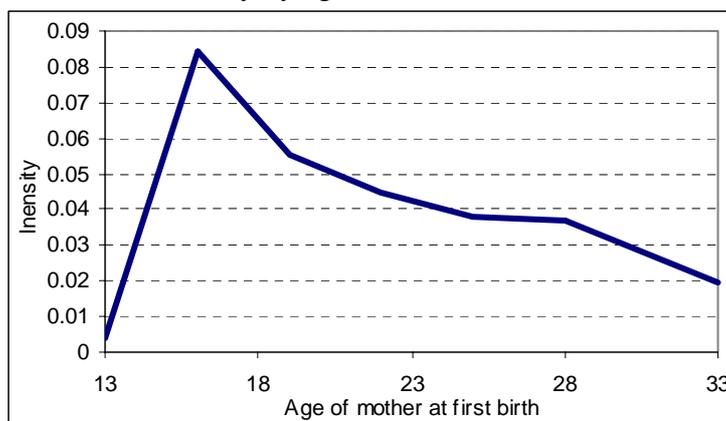
In our next step we include in the model two additional duration splines which capture the effect of the calendar year and the age of mother at first birth on the second birth risks. Introducing this additional information to the model improves the fit significantly ( $p < 0.000001$ ). The results of the calendar year spline are presented in Figure 6.4, available also in Table D 1 and D 2 in Appendix D.

**Figure 6.4:** Second birth intensity by calendar year

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all covariates. (3) Own calculations, Census 2001 data.

The trend of the second birth risks according to calendar year is as we expected – during the 1970s and 1980s we observe a relatively high and stable level with some fluctuations. Throughout the whole of the 1990s there is a steep decrease in the risk of second birth. We observe a small slowdown of the decline only in the period 1995-1997 and after that the steep downward trend continues. Such a large decrease in second birth risk has no precedent in the demographic history of Bulgaria.

We also investigate the effect of the age of mother at first birth on the timing of the second birth. The results are presented in Figure 6.5 (see also Table D 1 and Table D 2 in Appendix D).

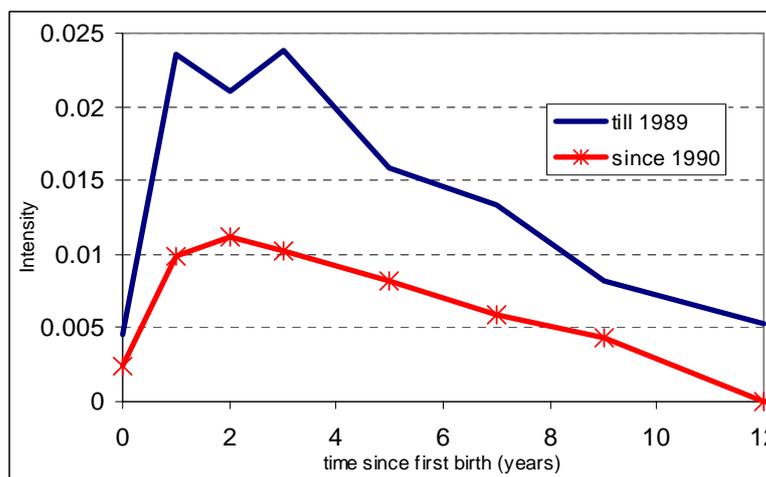
**Figure 6.5:** Second birth intensity by age of mother at first birth

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all covariates. (3) Own calculations, Census 2001 data.

Since the start of the observation (age 13) the risk of second birth according to age of mother at first birth constantly rises. It stays at a very high level till age 19 and then gradually diminishes. A steeper decrease of the risk of second birth can be observed where the age of mother at first birth is higher than 28. The later a woman has her first birth, the lower the risk of conceiving a second time. In other words, women who start their reproductive behavior early tend to have more children on average.

Another point of interest in our analyses is the investigation of the birth interval throughout our observation window. We know how the second birth risks develop according to the time passed since first birth, but we do not know if this pattern was observed throughout the years. That is why, in our next step, we divide the intensity into two periods: before 1989 and after 1990. These are the main periods that we aim to compare. The separation into the two periods is done according to the time at first birth. In the intensity for the period before 1989 we include women who have given birth to their first child. The other intensity contains women who had their first child in 1990 and afterwards. The results are plotted in Figure 6.6.

**Figure 6.6:** Baseline intensities for transition to second birth for two different time periods



Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) In the model are included all covariates. (3) Own calculations, Census 2001 data.

Not surprisingly, the intensity of second birth during the 1990s is lower than it was for the years before. This reflects the drop in the second births after the start of the transition of the country. The results show that there are fewer women in the

1990s who have a second child compared to the 1970s and 1980s and that the process of conceiving a second time is more uniform: it happens within a small interval after the first birth. We also observe small changes in the shape of the curve. For the period before 1989 we have a somewhat broader interval in which the second birth occurs – the highest risk is between one and three years after the first birth. The peak for the intensities after 1990 seems to be less broad – there is a peak at approximately 2 years after the first birth and then a gradual decline. However, we still cannot speak of any major changes of the birth interval for the two periods.

We give more reflections on the changes of second birth risk through calendar time in section 6.4.1.

### 6.2.3 Second birth and ethnic group

Our next step in the analyses is to study the impact of ethnic group on second birth. Introducing a variable that indicates the ethnic group to our model (Model 3) improves the fit significantly ( $p < 0.000001$ ). In Table 6.1 we present the results from two different models – Model 3 and Model 6, which is the final model. The full results of these models are given in Appendix D, Tables D 1 and D 2.

**Table 6.1:** Relative risk of second birth. Effect of ethnic group. Two models compared

	Model 3		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>				
Bulgarians (ref)	1		1	
Turks	1.56	***	1.06	
Roma	2.14	***	1.41	***
Other	1.69	***	1.37	***

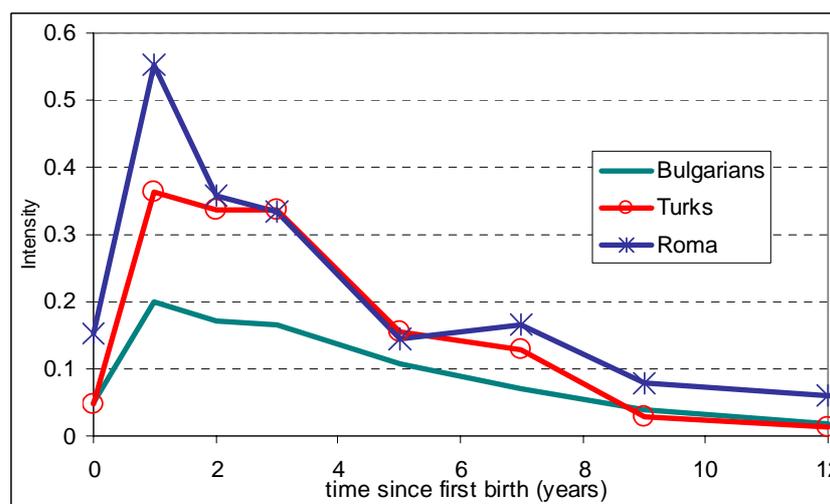
Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Model 3 includes variables for time passed since first birth, age of woman at first birth, calendar year and ethnic group, Model 6 is the final model, including time passed since first birth, age of woman at first birth, calendar year, ethnic group, education attainment and enrolment, marital status, number of siblings, place of residence, level of religiosity. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Census data, 2001.

In Model 3 the difference between the ethnic groups' risks of second birth are very high. The Turks have a 56 % higher risk of getting a second child than the Bulgarians do and the Roma have more than twice as high a risk as the Bulgarians.

The Roma group has the highest transition risk of a second birth compared to all the other ethnic groups. However, when we control for education, marital status and other background characteristics the results are completely different. In our final model we do not find any difference in second birth risks between the Bulgarian and Turkish ethnic groups. The Roma group still has the highest risk, but it is not as high. The Roma population now has a 41 % higher risk of having a second child than the Bulgarians. It seems that if we do not control for education and marital status, the results for the effect of ethnic group are highly biased.

In our further analyses, we estimate the intensity risk for second birth separately for each ethnic group. Although in this estimation we do not control for any additional variables, it helps us to better distinguish the differences between the ethnic groups according to the time passed since first birth. The results are presented in Figure 6.7.

**Figure 6.7:** Baseline intensities for second birth by ethnic group



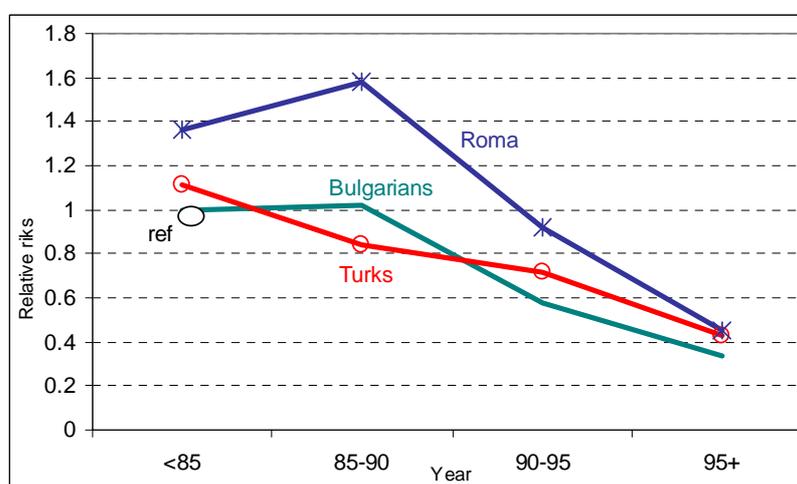
Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Graph constructed on the basis of 3 separate models (one for each ethnic group), no additional variables included. (3) Own calculations, Census 2001 data.

The results again show that the Bulgarian ethnic group has the lowest risk of second birth, followed by the Turks and then the Roma with the highest risk. However, the additional information here is that the Roma group starts earliest with the second birth and has the highest risk until two years after the first birth. After the first child has reached two years, the intensities for the Roma and Turkish group almost do not differ – they are very much on the same level and have a similar shape. The Bulgarians have the lowest risk of second birth throughout the whole time after

the first birth. However, their intensity stays high between one and three years after the first birth.

The next question of interest to us is whether it is true throughout the whole time period of our observation that the Bulgarians always had the lowest risk of second birth and the Roma group the highest. To obtain an answer we perform an interaction between ethnic group and calendar year. The interaction improves significantly the fit of the model ( $p < 0.000001$ ). The results are plotted in Figure 6.8. In Table D 3 in Appendix D we present the values of the relative risks.

**Figure 6.8:** Relative risk of second birth. Effect of ethnic group and period. Bulgarians and period before 1985 as a reference group.



Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Interaction between ethnic group and period on the basis of the final 6<sup>th</sup> model, including all covariates. (3) Own calculations, Census 2001 data.

Except for the second half of the 1980s, the Bulgarians have always had the lowest risk of second birth compared to the other ethnic groups. On the other hand, the Roma group is characterized by a high risk for the whole observation period. The common feature of the three ethnic groups is the decrease in the risk of getting a second child after 1990. In each group we observe a relatively steep decline. For the Turkish group this decline starts earliest, but on the other hand, it is the least steep. At the end of the observation period, there is almost no difference in the risk of second birth for the Turks and Roma, and the Bulgarians still have the lowest risk. Overall, the differences between the ethnic groups have decreased over time.

We give our reflections on the effect of ethnic group on second birth intensities in section 6.4.2.

### 6.2.4 Second birth and education

For the next step in our analyses, we add to our model information concerning the level of education of the women as well as information on the education enrolment, which significantly improves ( $p < 0.000001$ ) the fit of the model. We present the results from Model 4 and Model 6 in Table 6.2. The full results of these models are presented in Appendix D, Table D 2.

**Table 6.2:** Relative risk of second birth according to education attainment and education enrolment. Two models compared.

	Model 4		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Education level</i>				
Primary	1.59	***	1.49	***
Secondary (ref)	1		1	
Higher	0.97		1.03	
<i>Education enrolment</i>				
Out of education (ref)	1		1	
In education	0.68	***	0.71	***

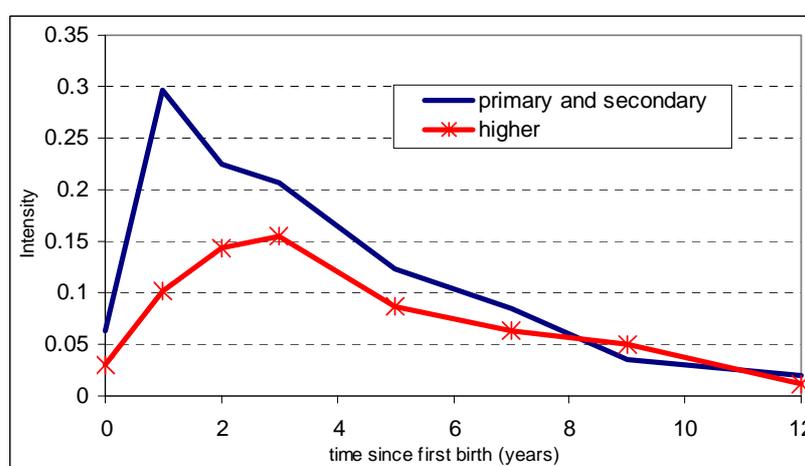
Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Model 4 includes variables for time passed since first birth, age of woman at first birth, calendar year, ethnic group and education attainment and enrolment, Model 6 is the final model, including time passed since first birth, age of woman at first birth, calendar year, ethnic group, education attainment and enrolment, marital status, number of siblings, place of residence, level of religiosity. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Census 2001 data.

As a whole, we do not find any significant differences between the two models. Introducing information on marital status and background characteristics of the women does not contribute essentially to the estimates of the effect of education. In both of the models the primary educated women have the highest risk of having a second child: in the final model it is almost 50 % higher than for the women with secondary education. We do not find any significant differences between women with secondary and those with higher education. Contrary to the findings of the transition to first birth, where we did not find any significant influence of education level, it seems that in the transition to second birth, the level of education is of importance.

Whether a woman is in the education system or not is also significant for the transition to second birth. Women who study have a lower risk of having a second child – about 30 % lower than women who have finished their education.

To further gain insight into the second birth risks according to the education level of women, we estimated two different intensities for women who stopped their studies after secondary education and those who continued to colleges and universities. The results are plotted in Figure 6.9.

**Figure 6.9:** Baseline intensity of second birth for women with higher education and women with secondary or primary education

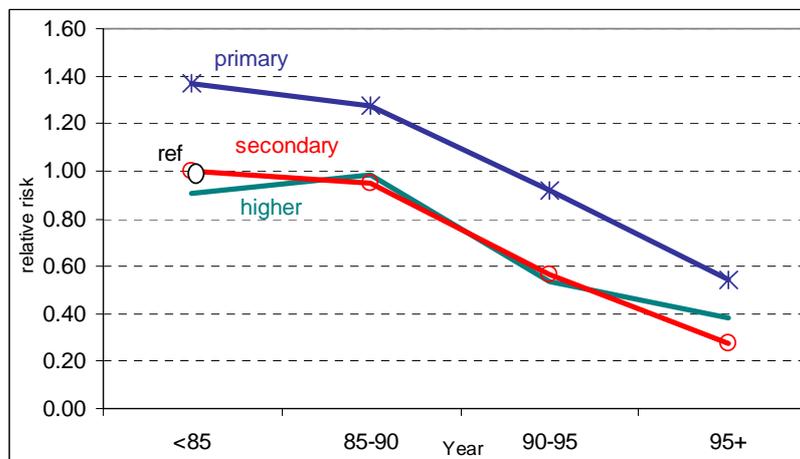


Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Graph constructed on the basis of 2 separate models (one for each education group) no additional variables included. (3) Women in studies excluded from the analyses. (4) Own calculations, Census 2001 data.

Women with higher education degrees have a lower risk of second birth and have an extended second birth interval. They have their highest risk of conceiving for a second time about three years after the first birth. Women who finish their education after secondary school or earlier have a second birth very soon after the first birth – the peak is at one year, but the risk stays high until the first child reaches age three.

So, we can already say that the primary educated women not only have the highest risk of second birth, but also tend to have the second child within a small interval after the first birth. To see if this higher risk prevails throughout the whole observation period, we perform an interaction between education level of women and calendar year. The results are plotted in Figure 6.10 and the values of the relative risks can be seen in Appendix D, Table D 4.

**Figure 6.10:** Relative risk of second birth. Effect of education level and period. Women with secondary education and period before 1985 as a reference group.



Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Interaction between education level and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Census 2001 data.

We receive a very clear picture – the differences between the second birth risks of women with differing education levels have not changed much through time. The primary educated women had the highest risk of second birth throughout the observation period. There are almost no differences between the secondary and higher educated women – with exceptions at the beginning and end of the observation window, but these differences are only minimal. Nevertheless, a very essential result is the evidence that there is a decline of second birth risks for each of the education groups. The result that the differences in education level have persisted through time is contrary to the expectations that the level of education was not relevant for the fertility behavior in the years before 1990.

Our next step in the analysis is to check if the impact of education enrolment persisted through time. We performed an interaction between calendar year and enrolment in education. The results are presented in Table 6.3 (LLRT –  $p=0.0056$ ).

**Table 6.3:** Relative risk of second birth. Effect of education enrolment and period. Out of education and period before 1990 as reference group

Period	<i>Out of education</i>		<i>In education</i>	
	Relative risk	Sig.	Relative risk	Sig.
Till 1989	1		0.78	***
Since 1990	0.47	***	0.28	***

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Interaction between education enrolment and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Census 2001 data.

The results show that in addition to the lower risk of second birth after 1990, the negative impact of being enrolled in studies is stronger, which supports our assumptions that childbearing was more compatible with studying during the socialist era.

Another important aspect of the effect of education level on the second birth risks is the fact that women from the different education groups start reproductive behavior at different ages and thus the influence of age at first birth varies significantly across the groups. At this point we need to include additional reflections on this issue before we proceed with the presentation of the next results. In the studies for higher order births, B. Hoem (1996) is the first one to point out that at each age childbearing behavior according to the different education groups holds different standards – for one group a certain behavior can be completely normal, while for another group the same behavior can be very unusual at the same age. When investigating the influence of age at second birth on the transition to third birth in Sweden, she proposes that one should use a relative age at second birth (relative to the mean age of second birth for each education group) instead of the standard use of the absolute age. This method is adopted by other scientists (Hoem et al. 2001; Kreyenfeld, 2002) in studies of second or third birth risks in other West European countries. However, common to these studies is the fact that when they use the absolute age at the previous birth, they find an elevated risk of transition to the next birth for highly educated women. Introducing the relative age helps to find out if this elevated risk still persists or not. It is considered that the higher risk of subsequent birth for the highly educated women could be due to the time squeeze effect – college educated women start their reproduction behavior at later ages and thus have less time to reach their desired family size as they approach the end of the reproductive age span. In our analyses up to now, however, we have not found a similarly elevated risk

of second birth risk for the highly educated women. Nevertheless, we want to replicate this analysis to see the implications of this alternative specification for our models.

The mean age at first birth for the primary educated women in our sample is 19.68 years, for the secondary educated women it is 21.97 and for the higher educated women it is 24.55. For the women who have their first birth at ages lower than the mean age at their education group we assign the age ‘below average’ and for women who have the first birth later than the mean age in their group we assign the age ‘above average’. The results from the interaction between the relative age at first birth and education level are presented in Table 6.4.

**Table 6.4:** Relative risk of second birth. Effect of education level and relative age at first birth. Secondary education level and ‘below average’ age at first birth as a reference group.

Education level	Age at first birth			
	Below average		Above average	
	Relative risk	Signif.	Relative risk	Signif.
Primary	1.88	***	1.13	
Secondary	1		0.74	***
Higher	0.84	*	0.72	***

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Interaction between education level and age of mother at first birth, relative to the mean age at first birth for each education group. (3) Estimations are done on the basis of the final 6<sup>th</sup> model, including all the variables. (4) Own calculations, Census 2001 data.

For neither of the education groups do we find an elevated risk of second birth if the first birth occurred relatively later than average. On the contrary, the risk of conceiving for a second time gets lower if the first birth happened later than the average and this is true for each education level. So, for the Bulgarian case, we do not find signs of the time squeeze effect. Women who start with the reproduction behavior late in their lives, for their educational level, tend to have lower second-birth risks.

The differentials between women at the various education levels still persist – the primary educated women have the highest second birth risk regardless of whether they had their first birth at an age below or above the average age for such women. However, we find that women with higher education who had their first birth earlier than average have a lower risk than the secondary educated women from the

corresponding group. This is the only sign of difference that we observe between secondary and higher educated women when we study the second birth risks.

In section 6.4.3 in this chapter we discuss in more detail the differences in the transition to second birth according to education level and education enrolment.

### 6.2.5 Second birth and marital status

As we saw in the previous chapter of this dissertation, the marital and union status of women has a great importance and influence on the transition to motherhood. We would like to see if the impact of marital status also persists for the decision to have a second child. In Model 5 we add the information on the marital status of the women. This improves significantly the fit of our model ( $p < 0.000001$ ). In Table 6.5 we present the results only from Model 6 as they are very similar to the ones from Model 5. The full results of Models 5 and 6 can be found in Appendix D, Table D 2.

**Table 6.5:** Relative risk of second birth by marital status. Final model

	Model 6	
	Relative risk	Sig.
<i>Civil status</i>		
Single	0.74	***
Married (ref)	1	
Widowed/Divorced	0.38	***

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Model 6 is the final model, including time passed since first birth, age of woman at first birth, calendar year, ethnic group, education attainment and enrolment, marital status, number of siblings, place of residence, level of religiosity. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Census 2001 data.

As one would expect, married women have the highest risk of having a second child. Living in a union is an essential point in the decision of having a second child. Interestingly, women who are single also have a relatively high risk of getting a second child – only about 26 % less than the married women. This is a much higher risk than for the divorced or widowed women – they have about 60 % lower risk of conceiving a second time than the married women. This implies that there is a need to investigate the role and influence of consensual unions on the second birth transitions.

We are able to do this in our further analyses of second birth risks with the Social Capital Survey data. We make a comparison and discuss the results in section 6.4.4.

### 6.2.6 Second birth and background characteristics

Adding three additional variables to our model that indicate background characteristics of the women improves the fit significantly ( $p < 0.00001$ ). The relative risks of second birth according to these characteristics are given in Table 6.6. The results are from the final model. The full results can be seen in Appendix D, Table D 2.

**Table 6.6:** Relative risk of second birth according to some personal characteristics. Final model

<i>Number of Siblings</i>	R. R.	<i>Place of residence (till age 15)</i>	R. R.	<i>Level of religiosity</i>	R. R.
0	0.91	Village	1.25 ***	Deeply religious	1.03
1 (ref)	1	Small town	1.20 ***	Somewhat religious (ref)	1
2	1.16 **	Big town (ref)	1	Not very religious	0.98
3 +	1.35 ***	Capital	0.99	Not religious at all	0.99

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Estimates are from Model 6, the final model, including time passed since first birth, age of woman at first birth, calendar year, ethnic group, education attainment and enrolment, marital status, number of siblings, place of residence, level of religiosity. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Census 2001 data.

The results from the variable ‘number of siblings’ prove that there is impact of the size of the family in which a woman has grown up on the size of her future family. We find out that the more brothers and sisters a woman has, the higher the risk of having a second child. A woman who has three siblings has a 35 % higher risk of conceiving a second time than a woman who has only one sibling. We also followed the changes of the impact of the number of siblings on the second birth risks through time (Table D 5, Appendix D). We did not find any strong changes between the periods: throughout the period there is a positive effect related to the factor of the number of siblings.

There is also a difference in the second birth risks according to the size of the place of residence in which the woman lived until age 15: in accordance with the theoretical expectations, we found that the smaller the residence place, the higher are

the fertility levels. Women who have grown up in a small village have a 25 % higher risk of conceiving a second time than women who lived in a big town (administrative center). Actually, the clear difference here is between having lived in a village or a town: an urban/rural differentiation. Following the impact of place of residence through time (Table D 6, Appendix D) shows that these trends were only persistent before 1990. After that we do not observe significant differences between the different residence places for the impact of second birth.

We do not find any impact of the level of religiosity on women's decision to have a second child; this finding is similar to the results from the transition to first union and motherhood. We also checked if the impact of level of religiosity differed according to our two main periods (Table D 7, Appendix D). We were not able to find any real trends in the impact of this variable on second birth risks.

We offer our reflections on the impact of personal characteristics on second birth transitions in section 6.4.5.

### **6.3 Second birth in the young generations**

In our further analyses, we make use of our complementary data set from the first round of the Social Capital Survey (see Chapter 3). We use the same technical modeling as with the census data and estimate six different models, presented in Appendix D, Tables D 8 and D 9. The aim of using this data is to study the transition to second birth in detail during the 1990s and to take into account the influence of cohabitation on the fertility decisions. As a first step, we want to make a brief description of the basic distributions in our sample.

The sample consists of 2505 women who already have one child. 39 % of them have a second child by the end of our observation period. The average interval between first and second birth for the whole sample is 3.75 years. The number of second birth differs according to ethnic groups. Women from the Bulgarian ethnic group in our sample who have a second child comprise 35 % of all the women from this ethnic group. This is the lowest proportion for all the ethnic groups: about 47 % of the Turkish women have a second child by the end of our observation window and 60 % of the Roma women do so.

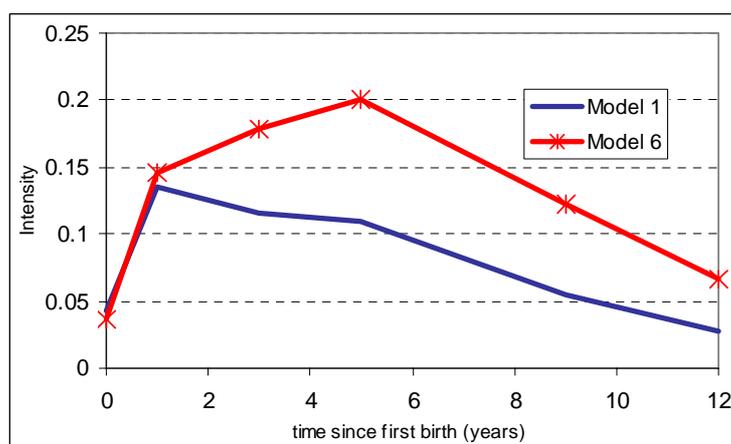
Women from different ethnic groups have different intervals between first and second birth. The Bulgarians give birth to the second child four years after the first birth, on average. The Turkish women have an average interval of 3.4 years and the Roma women 2.8 years. The average interval between first and second birth for women who had their second birth by 1995 is 2.55 years. For women who had a second birth after 1995, this interval is 4.38 years.

The differences according to education level also seem to be substantial. About 55 % of the women with primary education who already have a child also have a second child. The proportion of secondary educated women is not so high: 36 % of them have a second child. Higher educated women have the lowest share of second births – more than two thirds of them stay with one child. (27 % have a second child by the end of our observation period). More information on other basic distributions in our sample is given in Appendix A, Table A 5.

### 6.3.1 Time trend

As usual, we start with the baseline intensity of second birth. In Figure 6.11. we present the intensities from the first and the final models. The full results are given in Table D 8 and Table D 9 in Appendix D.

**Figure 6.11:** Second birth intensity by time passed since first birth. Two models compared.

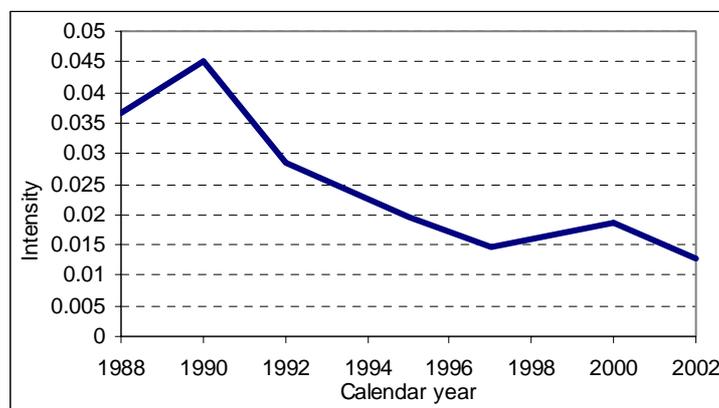


Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Graph constructed on the basis of the first model (no other variables included) and final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data, 2002.

The results are very similar to the ones we received with the census data: when not controlling for any other information in our model, we obtain slightly biased results – the highest intensity of a second birth is about one year after the first birth. When we introduce additional variables to the model, the peak of the intensity shifts to the right and we have the highest intensity of second birth later in time. The peak is at five years after the first birth, but the intensity stays high within a large time interval – from one year after the first birth until almost eight years. The change in the intensity again shows that it is essential to account for other events in the life course when studying the transition to second birth.

Our next step in the analyses is to introduce two additional duration splines – one for the calendar year and one for the age of the mother at first birth (Model 2). Introducing this information to the model improves significantly its fit ( $p < 0.00001$ ). The results for the spline of the calendar year are plotted in Figure 6.12 (see also Table D 8 and Table D 9, Appendix D).

**Figure 6.12:** Second birth intensity by calendar year



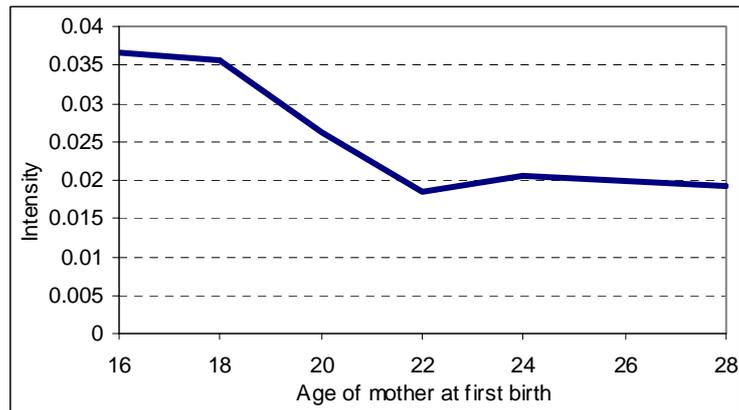
Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all covariates. (3) Own calculations, Social Capital Survey data, 2002.

We find a strong decline in the second birth risks during the 1990s. The drop is relatively steep until year 1997, after which we observe a small recovery and an increase in the intensities. However, this holds only until the year 2000, and after that we again observe another drop, which looks like it will continue into the future.

The results for the risk of second birth according to age of mother at first birth are presented in Figure 6.13. The values of the gradient splines are given in Table D 8 and D 9, Appendix D. We receive similar results to those we obtained from the census

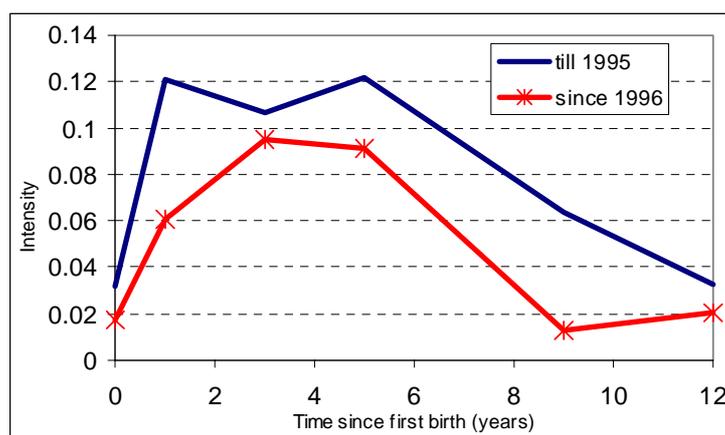
data. Having the first child by age 18 increases significantly the risk of conceiving a second time. After that the risk declines relatively steeply and after age 22 at first birth, the risk stays almost unchanged until age 28. This result again shows that the younger the mother is at first birth, the higher the probability is that she has a second child.

**Figure 6.13:** Second birth intensity by age of mother at first birth



Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Graph constructed on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data, 2002.

Our next topic of interest is whether the shape of the intensity has changed through time. In the analysis with the census data we were able to follow the changes through our two main periods – before and after the start of the societal transition of the country. Here, we are not able to make such a differentiation, as we have too few cases of second births before 1990, but we still want to see if there are any changes in the birth intervals through the 1990s. In order to be able to follow any alterations, we divide the intensity into two periods – before 1995 (including 1995) and after that. The results are presented in Figure 6.14.

**Figure 6.14:** Baseline intensities of second birth for two different periods

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) In the model are included all our variables. (3) Own calculations, Social Capital Survey data, 2002.

The intensity before 1995 is very similar in shape to the intensity before 1990 (see Figure 6.6). We observe a high intensity in the first year after the first birth and a second peak at the fifth year. In the intensity after 1996 we see that the risk of conceiving a second time within 1-2 years after the first birth is very low. Women in the second half of the 1990s tend to have the second child around three to five years after the first birth. This observation is a sign of a growing interval between the first and second birth.

It seems that the intervals between first and second birth were the same until approximately 1995 (not only until 1990, which we have expected). The real changes in the intervals only started in the second half of the 1990s. Obviously, it takes time until women adapt their fertility behavior to the changing impact of the societal transition in the country. These results show why in the previous analyses with the census data set we did not find any significant differences in the interval between first and second birth through time: our separation of the groups was into “before 1990” and “after 1990”. We discuss more on these trends in section 6.4.1.

### 6.3.2 Second birth and ethnic group

Now we advance to our next part of the analysis, namely the effect of the ethnic group on the process of second birth. Adding information on the ethnic group of women to our model improves the fit significantly ( $p < 0.000001$ ). Model 3 is the first model in which we include this variable. In Table 6.7 we present the results from

Model 3 and Model 6. The full results of the models can be seen in Appendix D, Tables D 8 and D 9.

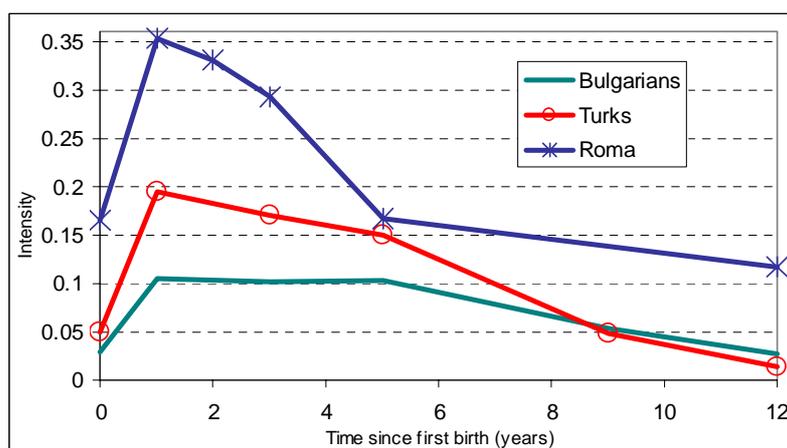
**Table 6.7:** Relative risk of second birth. Effect of ethnic group. Two models compared

	Model 3		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>				
Bulgarians (ref)	1		1	
Turks	1.36	***	0.88	
Roma	2.23	***	1.33	**
Other	1.21		0.95	

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Model 3 includes variables for time passed since first birth, age of woman at first birth, calendar year and ethnic group, Model 6 is the final model, including time passed since first birth, age of woman at first birth, calendar year, ethnic group, education attainment and enrolment, marital status, number of siblings, place of residence, level of religiosity. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations Social Capital Survey data, 2002.

The results from the two models differ substantially. However, they are similar to the results we already obtained from the analyses with the census data. When we do not account for many of the essential characteristics, we observe significant differences in the risk of second birth according to the ethnic groups. The Bulgarians have the lowest risk, while the group of the Turks has 36 % and the group of the Roma has more than twice as high a risk of having a second child. However, when we control for education, marital status and additional characteristics in our model, the second birth risk of Turkish women is not higher than that of the Bulgarians. The Roma group stays with the highest transition risk, but it is not as high as in the previous model. This time, there is only a 33 % higher risk of conceiving a second time than the Bulgarians. We are thus able to show that a considerable part of the inter-ethnic differences are explained by differences in union status, as introducing information on cohabitation contributes most to the changes in the effect of ethnic group.

To see the level of the intensities for second birth according to the time passed since first birth for each ethnic group, we estimate separate models for each group. The results are presented in Figure 6.15.

**Figure 6.15:** Baseline intensities of second birth by ethnic group

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Graph constructed on the basis of 3 separate models (one for each ethnic group), no additional variables included. (3) Own calculations, Social Capital Survey data, 2002.

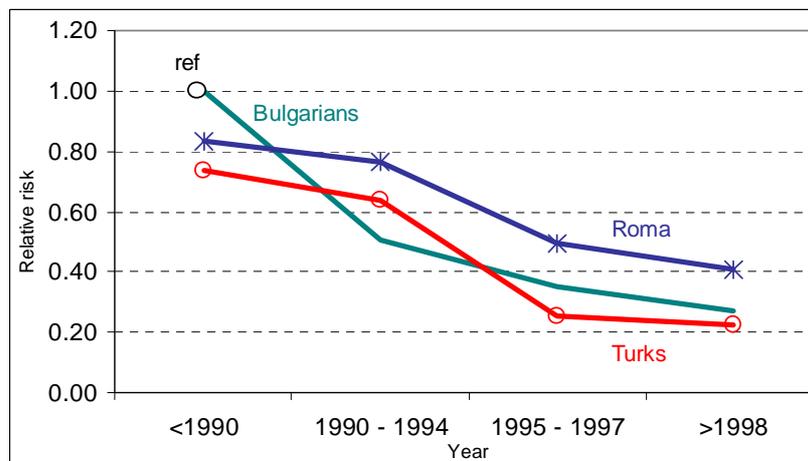
We again find that the Roma group is the one which starts with the transition to second birth earliest after the first birth. Their curve peaks at about one to two years after the first child is born. Additionally, they have the highest intensity risk throughout the whole time period.

The group of the Turks has substantially lower intensity of second birth and their time of highest intensity is between one to five years after the first birth. Here it is well visible that the Turkish group in this sample has much lower second birth transition than the Turkish group in the census sample. This shows us that the younger population of the Turks has substantially different behavior concerning the second births.

The group of the Bulgarians is characterized by the lowest intensity risk of conceiving for a second time. They do not have such a clearly shaped peak for the highest intensity, but the highest risks are also observed between one and five years after the first birth. As a whole, this result shows that the group of women who have high risk of conceiving second time also starts at earliest with this process.

In order to see if these differences between the ethnic groups persisted through time, we additionally estimated an interaction between the ethnic groups and calendar year. The results are plotted in Figure 6.16 and the values of the relative risk can be seen in Appendix D, Table D 10.

**Figure 6.16:** Relative risk of second birth. Effect of ethnic group and period. Bulgarians and period before 1990 as a reference group.



Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Interaction between ethnic group and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data, 2002.

The results show that the Roma group has the highest relative risk for second birth almost throughout the observation period. The risk curves of the Bulgarians and the Turks intersect repeatedly and there is not a clear difference between them. However, the more interesting observation here is that there is a strong drop in the risk of getting a second child for each of the ethnic groups. The decline seems to be of equal strength for each group. It appears that the behavior according to ethnicity is very similar through the years, regarding the second birth risks. We refer the reader to more discussion on the differences according to ethnic group in section 6.4.2.

### 6.3.3 Second birth and education

Our further analyses investigate the effect of education on second birth risks. We include in our model time-varying covariates indicating the education level and education enrolment of women (Model 4). The inclusion of this information significantly improves the fit of the model ( $p < 0.000001$ ). In Table 6.8 we present the results from the education variables for two models. The full results of these models are presented in Appendix D, Table D 9.

**Table 6.8:** Relative risk of second birth according to education attainment and education enrolment. Two models compared.

	Model 4		Model 6	
	Relative risk	Sig.	Relative risk	Sig.
<i>Education level</i>				
Primary	1.65	***	1.45	***
Secondary (ref)	1		1	
Higher	0.92		0.96	
<i>Education enrolment</i>				
Out of education (ref)	1		1	
In education	0.58	***	0.62	***

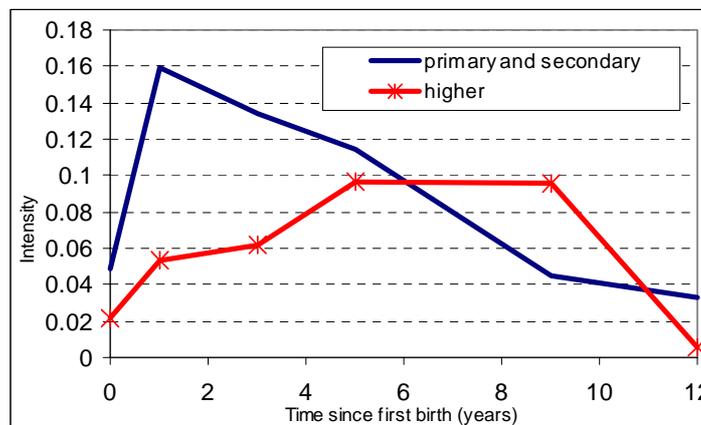
Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Model 4 includes variables for time passed since first birth, age of woman at first birth, calendar year, ethnic group and education attainment and enrolment, Model 6 is the final model, including time passed since first birth, age of woman at first birth, calendar year, ethnic group, education attainment and enrolment, marital status, number of siblings, place of residence, level of religiosity. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey data, 2002.

We find significant differences in the transition to second birth between the primary educated women on the one hand and the secondary and higher educated women on the other. The difference between secondary and higher educated women is small and insignificant. In Model 4 the primary educated women have 65 % higher risk of getting a second child than the women with secondary education. Introducing more information to the model slightly lowers the risk for the primary educated women, but it still stays significantly high – 45 % higher than the reference group.

Being enrolled in studies lowers significantly the risk of second birth. Women who have finished their education have about 40 % higher risk of conceiving for a second time than women who are still studying. Introducing more variables to the model does not change the risk much. These results are consistent with our findings up to now; the analyses from the census data also showed no differences in the transition to second birth for secondary and higher educated women and a high risk for the primary educated women.

In order to see if there is a difference between the interval between first and second birth according to level of education, we estimate separate intensities for primary and secondary educated women and for higher educated women. The results are presented in Figure 6.17.

**Figure 6.17:** Baseline intensity of second birth for women with higher education and women with secondary or primary education



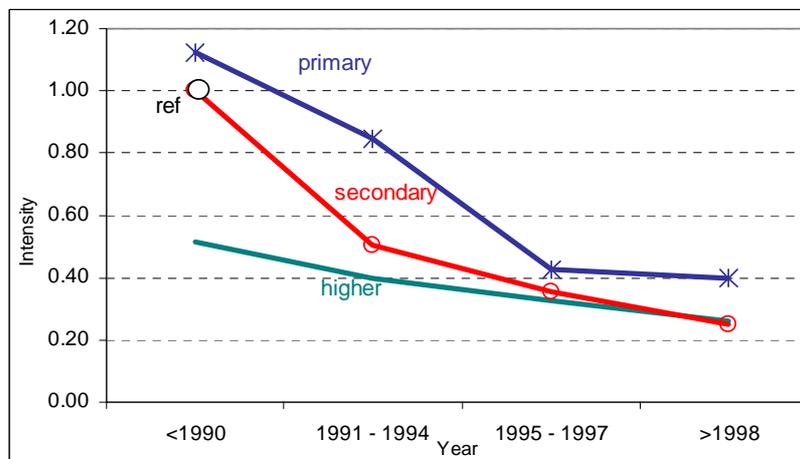
Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Graph constructed on the basis of 2 separate models (one for each education group) no additional variables included. (3) Women in studies are excluded from the analyses. (4) Own calculations Social Capital Survey data, 2002.

We find a clear difference in the timing of second birth relative to the first one between those women who continued their studies after finishing secondary school and those who did not. The differences are actually unexpectedly large. Although the trends are very similar to the one we found with the census data, here the differences between the two groups are much more pronounced. The women who have less than secondary education tend to make the transition to second birth quickly after the first one. They have the highest risk of second birth one year after the first birth, although the risk stays relatively high until the fifth year after the birth of the first child. Additionally, as a whole, this group of women has a higher risk of second birth than the higher educated women.

Women who continue their studies after secondary school delay much more the transition to second birth relative to the first one. They have the highest risk of second birth between five and nine years after the first birth. So, if highly educated women decide to have a second child, they do so when the first child is quite old. And, of course, we find a lower risk of second birth for the highly educated women.

Additionally, we perform an interaction between the education level of women and the calendar year in order to see if these differences persisted through time. The results are plotted in Figure 6.18 and the values of the relative risks can be found in Table D 11 in Appendix D.

**Figure 6.18:** Relative risk of second birth. Effect of education level and period. Women with secondary education and period before 1990 as a reference group.



Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Interaction between education level and period on the basis of the final 6<sup>th</sup> model, including all the variables. (3) Own calculations, Social Capital Survey data, 2002.

The results are very similar to the ones we obtained with the census data. We find out that the primary educated women had the highest risk of conceiving a second time throughout the observation period. The differences between the secondary and higher educated women are not substantial, especially after year 1990. The common feature for each group is the decline of the second birth risks. For each of the group we find a decrease and the steepest decline occurred for the primary educated women. The higher educated women seem to have a moderate decline. After the period 1995-1997 for the primary educated women we find a slowdown of the decline in the risk of second birth.

And, as our last step in the analyses of second birth and the effect of education, we also want to replicate the interaction between relative age at first birth and education level with the Social Capital Survey data set. The reader can find more explanation of the relative age at first birth and its meaning in section 6.2.3. In the present analyses we want to see if there is any different behavior in the 1990s according to the education level and the age at first birth. The average age at first birth in our sample for women with primary education level is 18.94 years. The secondary educated women become mothers on average at 21.46 years and the higher educated women at 24.06 years. We use these mean ages at first birth as separators for the categories 'below average' and 'above average'. The results of the interaction of the relative ages at first birth and the education level of women are given in Table 6.9.

**Table 6.9:** Relative risk of second birth. Effect of education level and relative age at first birth. Secondary education level and ‘below average’ age at first birth as a reference group.

Education level	Age at first birth			
	Below average		Above average	
	Relative risk	Sig.	Relative risk	Sig.
Primary	1.73	***	1.33	**
Secondary	1		0.82	**
Higher	0.87		0.87	

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Interaction between education level and age of mother at first birth, relative to the mean age at first birth for each education group. (3) Estimations are done on the basis of the final 6<sup>th</sup> model, including all the variables. (4) Own calculations, Census 2001 data.

The differences in the second birth risks between the below average and above average age at first birth in each education category are smaller than in the previous analyses with the census data. However, the trend is the same. We do not find any elevated risk for the higher educated women if they had their first birth relatively later than the other women with the same education level; once again there is no sign of a time-squeeze effect. It seems that women who start latest with the reproductive behavior also end up with fewer children on average.

We also find again that there is a slight difference between the relative risks of women with secondary and higher education when they have their first birth at an age below average for their education group.

Further discussion of the influence of education level and enrolment on second birth risks can be found in section 6.4.3.

#### **6.3.4 Second birth and union status**

The major contribution of our Social Capital Survey data set to our analysis is the availability of information on the union status of the women. This data is much more relevant for the transition to motherhood than to the second birth; one should not neglect the possible influence of a cohabitational status on the decision for another child. We make use of this information and as a next step include a time-varying covariate in our model (Model 5). The inclusion of this variable significantly improves the fit of the model ( $p < 0.000001$ ). The results of the full model are presented in Appendix D, Table D 9. In Table 6.10 we present the results only from

the final model as the results on the union status do not change much between Model 5 and Model 6. Additionally, we checked whether the differences between women cohabiting, married directly, and married after cohabitation are statistically significant. The test showed that there is a significant difference between cohabiting women and married directly, while women married after cohabitation did not show any significant difference from the rest of the groups.

**Table 6.10:** Relative risk of second birth according to union status. Final model

	Model 6	
	Relative risk	Sig.
<i>Civil status</i>		
Single (ref)	1	
Cohabiting	2.31	***
Married directly	1.91	***
Married after cohabitation	2.19	***

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Model 6 is the final model, including time passed since first birth, age of woman at first birth, calendar year, ethnic group, education attainment and enrolment, marital status, number of siblings, place of residence, level of religiosity. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey data, 2002.

In general, being in union substantially elevates the risk of conceiving second time. The differences in the risks according to each type of union are not very large. However, the highest risk of second birth is observed for cohabiting women, after that come the women who are married after cohabitation and then the directly married women. Each of the groups has significantly high risk of getting a second child. Additionally, the relative risk of second birth for cohabiting woman is significantly different from the one of married directly but not significantly different for the married after cohabitation.

The finding that cohabiting women have the highest risk of conceiving a second time is a bit puzzling. Since cohabitation is considered to be the form of union that is least reliable and that does not involve any long-term commitment, it is surprising that it leads to higher transition risk to a next birth. We return to this issue in the discussion section below (section 6.4.4).

Additionally, to check the influence of union status, we experimented and created a variable indicating the union status of the women at first birth, which we included in our model. The results of the effect on the second birth of this variable

were almost identical with the results from the time-varying variable for union status – we found the highest risk of getting a second child for the cohabiting couples. As the results are almost identical, we do not present them here.

### 6.3.5 Second birth and background characteristics

Our next step in the analyses is to add our last set of variables, namely the information on the additional background characteristics of the women. The inclusion of these covariates improves significantly the fit of the model ( $p < 0.00001$ ). The results are presented in Table 6.11. The full results of the model can be seen in Appendix D, Table D 9.

**Table 6.11:** Relative risk of second birth according to some personal characteristics.

Final model

<i>Number of Siblings</i>	R. R.		<i>Place of residence (till age 15)</i>	R. R.		<i>Level of religiosity</i>	R. R.
0	0.83		Urban (ref)	1		Religious	1.03
1 (ref)	1		Rural	1.14	*	Not religious (ref)	1
2	1.38	***					
3 +	1.42	***					

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Estimates are from Model 6, the final model, including time passed since first birth, age of woman at first birth, calendar year, ethnic group, education attainment and enrolment, marital status, number of siblings, place of residence, level of religiosity. (3) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (4) Own calculations, Social Capital Survey data, 2002.

As the results from the census data also showed, the number of siblings has an impact on the relative risks of second birth for the women. Here the effect is even more pronounced. Women who have grown up alone, without any brothers or sisters, have an almost 20 % lower risk of conceiving a second time than women who have at least one sibling. Having two siblings significantly increases the risk – these women are 38 % more likely to have a second child than women with one sibling. Having three or more siblings also leads to an elevated risk, but the difference with the previous group is not large.

There is also a difference when analyzed by the place of residence until age 15. Women who come from rural areas have higher risks of conceiving a second time

than women who come from urban areas – the difference is 14 %. Similar results were obtained from the census data.

Again, we do not find any influence of the level of religiosity on fertility behavior. This result is similar to the one obtained for the transition to first union formation and first birth.

## **6.4 Discussion of the results**

### ***6.4.1 Changes in time***

As a whole, our analyses found a clear drop in the risk of second birth during the 1990s. Compared to the relatively stable trends in the second birth risks during the 1970s and 1980s (where some fluctuations are observed but the alterations are generally small), the changes in the next decade seem to be really strong and drastic (see Figures 6.4 and 6.12). These results are in line with our expectations (see Chapter 3, Hypothesis 2). The decline in the second birth risks coincides with the overall changes on the macro level in the country. That is why we are willing to believe that the lower likelihood of getting a second child for the Bulgarian women is highly connected with the difficult economic situation and uncertainty they have to face through the years as well as with the changing values and attitudes towards children. What we observe in the last decade is a possible breakdown of the two-child family model that had persisted for decades before in Bulgaria.

Additionally, we found clear signs of changing second birth intervals. This kind of changes appears to be happening more slowly than the drop in second births. When we compared the periods before and after 1990, the differences in time passed between first and second birth were not very clear (Figure 6.6). For both periods the most probable time at which a woman has her second child is one to three years after the first birth. However, when we distinguished between the period after 1995 and the first half of the 1990s, a clear and undoubted difference in the second birth pattern became visible (Figure 6.14): during the second half of the decade women seem to prefer to have the second child more than three years after the first birth. In fact, the most common time for second birth has already risen to between three and five years after the first birth.

The results from these changes in time show that it is essential not only to compare the two main periods in our study, before and after 1990, but also to follow closely the developments through the whole of the 1990s. During this decade, changes appear almost every year. In the period before 1990 the processes were very uniform, but it is difficult to define a clear characteristic of some of the processes after 1990. Each woman plans her reproductive behavior according to other relevant life events for her and the preferences are more diverse nowadays than they were in the state-socialist era.

Another important issue is the effect of age of mother at first birth on the timing of second birth (Figures 6.5. and 6.13). We found that the younger the mother at first birth, the more likely she is to have a second child. This phenomenon is known from many other studies in other countries (Bumpass et al., 1978; Trussel and Menken, 1978; Finnäs and Hoem, 1980; Rindfuss et al., 1984; etc.) and is also famous as the “engine of fertility”. Marini and Hodson (1981) state that one of the reasons that the younger mothers have a higher probability of second birth is that the maturity of the mother may result in better contraception practice. This would mean that the higher the age of mother at first birth, the more carefully she considers the spacing of further births.

However, more recent studies show that the effect of age of mother at first birth on the second birth transitions is not that strong any more (Teachman and Heckert, 1985; Morgan and Rindfuss, 1999). The argument for this is the appearance of dramatic changes in fertility: a higher number of non-marital unions; an overall postponement in the start of the reproductive behavior; and other factors. Thus, the association of the timing of the second birth and the influence of age at first birth is weaker since many other factors also play a substantial role.

#### ***6.4.2 Effect of ethnic group***

Through the inclusion of the ethnic dimension in our study, we analyzed the influence of cultural differences between the main ethnic groups in Bulgaria in second birth risks. We use ethnicity as an important indicator of the cultural conditions of new behavior diffusion; the results indicate that there are signs of new behavior concerning the second births.

As a whole, we found that the Roma group has the highest transition to second birth (see Tables 6.1 and 6.7) and it also has the smallest interval between first and second birth (Figures 6.7 and 6.15). This is in accordance with what we expected (see Chapter 3, Hypothesis 4). The Turks and the Bulgarians have a similar propensity of second birth. The Bulgarians have a longer interval between their first two births than the other ethnic groups.

The differences between the second birth trends according to ethnic groups are partly due to the different cultures and traditions that each of these groups possess. For instance, as we described earlier, the Roma population have a distinctively low age of first sexual intercourse (Philipov, 2001), an early start of childbearing, a low usage rate of contraceptives, a high infant mortality, and a higher rate of unwanted fertility. We also consider that the Roma population invests less time in bringing up children as they do not have high demand for a child's quality (in terms of educational success). This implies that they would be more inclined to have bigger families.

The Bulgarians, by contrast, have the highest age at first sexual intercourse (Philipov, 2001) and a higher mean age at first birth. And, as we saw, the higher age at first birth leads to a lower proneness of having a second child.

To support our findings, we decided to check the answers of one interesting question in our Social Capital Survey, namely, the number of intended children – the number of children a woman wants to have. We found out that there is a difference in the answers by ethnic groups. Firstly, we compared the answers of the ethnic groups on the number of intended births reported by women without children. It turns out that 31 % of the Bulgarian women want to have one child in total, compared to 28 % of the Turk women and 22 % of the Roma women. The Roma group is the one that intends to have the most children – 18 % of the women want to have three or more children, while only 9 % of the Turks and 4 % of the Bulgarians want to do so.

Secondly, we compared the answers to this question for women who have already a child. Interestingly, the proportion of those who report they want three or more children is much higher (the same holds for the ones who answer that they want two children). The proportion of the Bulgarian women with one child who want to have three or more children is 12 %, for the Turks 16 % and for the Roma 45 %. This shows the higher intention of having more children for the Roma population, which may be due to their traditional culture. Of course, there is a difference between the

intended children and the number of the children actually born, but we are not going to investigate this issue here.

However, regardless of the differences in the second birth intensities between the ethnic groups, they still have one common feature: all the ethnic groups experience a strong decrease in the second birth intensities during the 1990s (Figures 6.8 and 6.16). The speed of the changes is different, but the direction is the same, a lower proneness for more children. Obviously, the economic and societal changes in the country strongly affect each of the groups and they react in a similar way – they have less children in times of uncertainty and economic difficulties.

The cultural differences between the ethnic groups concerning their inclination for second birth still persist, but all of the groups are experiencing substantial changes, which are in the same general direction. We would argue that the differences in the cultures and traditions are less predominant than this effect. It seems that the changes in the political system and economy impacted negatively and had a stronger influence on the whole population's readiness to have a second child in the 1990s.

### ***6.4.3 Effect of education***

In both data sets we found no differences between the higher and secondary educated women on the transition to second birth (Tables 6.2. and 6.8). Women with primary education have the highest proneness of having a second child, which is in line with our expectations (see Chapter 3, Hypothesis 6). This difference between the primary educated women and the secondary and higher educated women could be observed throughout our whole observation window (Figure 6.10). In other words, in the state-socialist times the primary educated were already more prone to have a second child. This finding is not in line with our expectations. We supposed that the differences between the levels of education would appear some time after the transition. In the socialist times the higher educated women probably did not incur higher opportunity costs, mainly because the returns on an investment in education were not very high. We are more inclined to suggest that the higher educated women have higher expectations concerning their children and invest more in the quality rather than the quantity of children. However, after 1990 it is possible that other factors also contribute to the difference between the lower and higher educated women. In times of uncertainty women may have different coping strategies in

overcoming the difficulties. The highly educated put more effort into finding a highly qualified and better paid job which leaves them less time to spend with the family. They also experience higher opportunity costs for raising another child. Additionally, the group of higher educated women is constantly growing: more and more women are oriented to a job career rather than a family career.

By contrast, women with primary education are presumably not career-oriented since they are not competitive enough on the labor market. This would lead to higher fertility intentions or opportunities to have more time for raising children. We also must not forget that women with primary education are the ones who start childbearing earliest (see Chapter 5). There are studies that prove that the attained education may also exert a significant delaying effect on the timing of higher order births through the age at initiation of childbearing (De Wit and Ravanera, 1998). Rindfuss et al. (1980) also state that apart from age at first birth, education at first birth also affects preferences for the timing and number of children.

Additionally, we found out that women with secondary or primary education (those who finish their studies by age 19) make the transition to a second birth shortly after the first birth – between one to three years (Figures 6.9 and 6.17). Women with a college or university degree are less likely to conceive a second time and additionally, when they do so, they have a large interval between the two births (this finding is in line with our assumptions in Chapter 3, Hypothesis 6). Their highest risk of second conception is to be found between three to nine years after the first birth. The broader interval for second conception of the higher educated women shows that this process is not highly uniform and each woman probably carefully considers the best time to have the second child. This also suggests that there should be less unwanted or accidental conceptions.

Nevertheless, there are some common features of the women with different levels of education in the transition to second birth; for instance, they all have declining rates of second birth throughout the 1990s. From this observed decline of fertility in each level of education group we can suppose that women with different education levels are equally affected by the macro level factors. The societal transition in Bulgaria has suppressed the second birth risk in each of the education groups of women to the same extent.

Additionally, we do not find a time squeeze effect for the higher educated women in Bulgaria (Tables 6.4 and 6.9). Women with higher education are not in a

hurry to proceed with the second birth after the first one (although they start later with the reproductive behavior). There is no pressure to reach the desired number of children. One of the reasons for this could be that even the higher educated women in Bulgaria start on average much earlier with childbearing than their counterparts in the Western countries (in Bulgaria it is still unusual to have the first child later than age 30). This means that the women are not being pressed from biological point of view to have their second child quickly.

Another reason could be that the higher educated women prefer to have fewer children and the desired number of children is low. This possible reason is not very clear, though. We found out from our Social Capital Survey that 30 % of the women with higher education who do not have children yet intend to have one child. The same percent is for the women with secondary education, while about 25 % of the women with primary education want to have one child in their life. Of course, this trend differs if the same question is asked to women who have already one child. About 90 % of the women with higher education that have one child say they want to have two children in total and 9 % say they want to have three children. The same holds for women with secondary education. From the women with primary education who have a child already, about 75 % say they want to have a second child and 25 % say they want to have three or more children in their life. This last figure is an indication of the higher fertility intentions of the primary educated women.

A study on the fertility intentions by Philipov et al (2004) reveals that the highly educated women in Bulgaria are more willing to have a second baby than the lower educated women. However, when studying the timing of the second births, the results show that the lower educated women are more prone to have the child earlier. This result replicates our findings on the lower transition to second birth for women with secondary and higher education.

Regarding effect of education enrolment on second birth proneness, we found out that women in studies have a lower willingness to have a second child. This result is not very surprising and is in line with our expectations. In comparison to the transition to first birth, however, this proneness is higher than for women with no children. This comes from the fact that making the transition to a second child does not require such a strong change in the woman's life as the transition to a first child; a family with one child already has a routine for taking care of a child and the appearance of a second one requires less re-arrangements.

Additionally, we found out that during the 1980s, a woman with a child and in education had a higher tendency to have a second child than the same category of women in the 1990s. This difference can be due to the fact that during state socialism the compatibility of studies and family life was much higher. In both periods, women who are still enrolled in a course of studies are not highly disposed to having a child, but once they did so, the willingness to have a second one while still studying is relatively high.

#### ***6.4.4 Effect of union status***

The influence of the union status of the women on the transition to second birth is not as strong as for the first births (in the analyses for first motherhood, we found a very high risk of having a child for women who enter union). The effect of the marital status on second birth is more moderate (Table 6.5). Married women have a 26 % higher risk of second birth than single women, and widowed/divorced women have a 62 % lower risk than married women.

In the second part of the analyses, where we made a distinction for non-marital unions, we found that the cohabiting women actually have a surprisingly high risk of second birth (Table 6.10). So the status of cohabitation plays a significant role in the decision to have a second child.

This is a novel finding which needs some consideration. Probably the couples that live (or have lived) in cohabitation unions and have one child are a highly select group that decides not to marry before the first birth, as most couples do. Maybe they are less traditional: they have decided for children, but not only in order to satisfy conservative family values; or they have other characteristics that we do not observe in our data.

Another possibility could be that the women who marry directly are a special group nowadays, since cohabitation is spreading more and more. (It must be said, though, that the directly married are still a large group in our sample). Women who marry directly usually do so when they recognize a pregnancy. This could mean that they are a bit more traditional and conservative regarding the family and bringing up children. In this case, the marriage is forced upon the woman (a child is on the way) and it is thus not necessarily associated with plans and personal desires for a big family. This result is not in accordance with the findings that a non-marital first birth

leads to lower proneness of second birth than a marital first birth (for the case of USA, as observed by Hayford, 2004). When accounting for the consensual union, the results are totally different.

#### ***6.4.5 Effect of additional background characteristics***

Two out of three background characteristics of the women that we include in our analyses turn out to have a significant impact on the second birth risks (Tables 6.8 and 6.11). The number of siblings that a woman has has a strong effect in the direction that we expected (see Chapter 3, Hypothesis 7): the more brothers and sisters a woman has, the more she is inclined to have a higher number of children herself. Explanations for this include the possibility that women who grew up with more brothers and sisters consider that it is better for a child to grow up with siblings than growing up alone, or that women from big families are more strongly socialized toward a career as a mother and a housewife and thus more inclined to have children earlier, leading to more children (Blossfeld and Huinink, 1991).

The place of residence where a woman lived until her fifteenth birthday also has a strong impact on the decision to have a second child, as predicted in Chapter 3, Hypothesis 7. Women who have grown up in smaller residence places (villages or small towns) have a higher inclination to second birth. The demarcation line is actually between urban and rural – the size of the urban area (big towns or the capital) does not have much of an effect. So, the statement that the new trends start from the urban areas, while the rural are more traditional, holds for the case of second order birth. The two-child family model seems to prevail in the smaller residence places.

The level of religiosity of the women does not play any role in the decision to have a second child. We do not find any differences in the trends of second births according to the reported level of religiosity. This is in contrast with our outlines assumptions in Chapter 3, Hypothesis 7. As we argued in the analyses of the transition to motherhood and first union formation, we consider that religiosity in Bulgaria is not associated with certain life styles that would affect the decision for family size or type of union. The church in Bulgaria does not have this strong impact on people's behavior, as it is the case in some Catholic countries, for instance.

## 6.5 Considering selectivity by joint modeling of first and second births

As we pointed out already in Chapter 3, by using event history analyses we are able to deal with the problems arising from the fact that each transition can be characterized by some non-observable or non-measurable factors. The classical way to cope with this problem is to introduce an unobservable heterogeneity factor to the model. Here, however, we know that this step will probably not be enough to control for the possible selection of the women who are at risk of having a second child. It seems that the better way is to model jointly the transition to first and second births; some other authors have used this (Kravdal, 2001; Kreyenfeld, 2002). The results then should be free of any selection for the second births, as we take into account the effect of the transition to first birth in the same model. It may be that women who are at risk of having a second child (that is who already have one child) have certain characteristics and are selected for being prone to form a family.

The formulae for the joint modeling looks like this:

$$\begin{aligned}\ln h^{1B}(t) &= y^{1B}(t) + \sum_k z_k^{1B}(u_k + t) + \sum_j a_j x_j + \sum_i \alpha_i \omega_i(t) + \varepsilon \\ \ln h^{2B}(t) &= y^{2B}(t) + \sum_k z_k^{2B}(u_k + t) + \sum_j a_j x_j + \sum_i \alpha_i \omega_i(t) + \varepsilon\end{aligned}$$

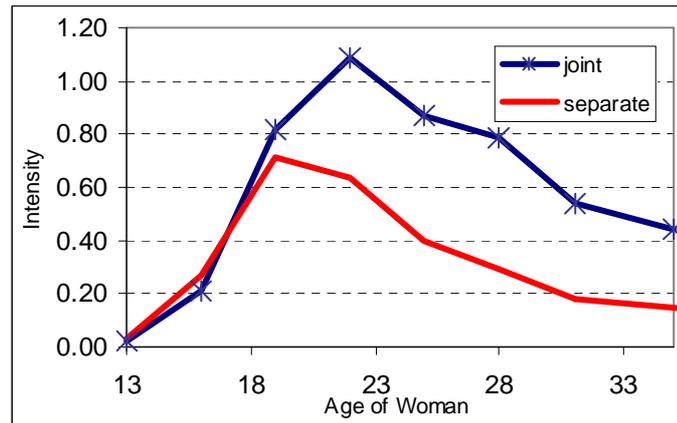
The first equation refers to the transition to first birth and the second to the second birth. The denoting of each element of the equations is already explained in Chapter 3. Here we want to point out the unobserved heterogeneity term  $\varepsilon$  which we have taken to be common for both transitions. In this case, the correlation between the the process is restricted to be one. Such a way of estimation allows us to see if one and the same unobservable characteristics are influencing the two processes in the same way.

When we estimate in a joint model the transition to first and second birth, we receive slightly different results of what we presented up to now. These changes of the result are valid for both our data sets. In Appendix D, Table D 12 we present the

results of the joint model with the census data and in Table D 13 the same model estimated with Social Capital Survey data.

We first want to point out the most profound changes in the results for the first birth transition. For a better visual presentation, we plot the results for the intensity from the census data in Figure 6.19.

**Figure 6.19:** Baseline intensity of first birth. Separate and joint model compared.



Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Graph constructed on the basis of 2 models. The separate model is the final model for first conception. The joint model includes transition to first and second conception with a common heterogeneity term. (3) Own calculations Census 2001 data.

In the baseline intensity (with age of the woman, starting at age 13, as process time) we find out that in the joint model the risk of becoming a mother at younger ages (earlier than age 19) is lower and becomes higher in the ages after 23. In contrast to the previous results, the highest peak is not at age 19, but at 22. Obviously, the higher risk of becoming a mother for the younger women was an over-estimation. In fact, the highest risk of getting the first child is to be found among women between 22 and 28, which is more in line with the recent trends of postponement of first birth in Bulgaria. It seems that introducing the unobserved heterogeneity term is a very important issue to achieve unbiased results.

The effect of the calendar year in both data sets does not change much when we estimate the joint models. However, the level of the risk is lower, although the shape and the trend is identical.

The values of the effect of the ethnic groups stay in the same direction too, only that the impact becomes stronger and, thus, the differences become more pronounced.

The changes in the results for the effect of education level are more interesting, though. In order to be able to make an easy comparison, we present in Table 6.12 the relative risk of the separate and joint models for the two data sets.

**Table 6.12:** Transition to first birth and effect of education – separate and joint models compared

	Separate model		Joint model	
	Relative risk	Sig.	Relative risk	Sig.
<b>Census data</b>				
<i>Education level</i>				
Primary	1.00		1.28	***
Secondary (ref)	1		1	
Higher	1.08		0.78	***
<i>Education enrolment</i>				
Out of education (ref)	1		1	
In education	0.48	***	0.38	***
<b>Social Capital Survey data</b>				
<i>Education level</i>				
Primary	0.90	*	1.06	
Secondary (ref)	1		1	
Higher	0.96		0.75	***
<i>Education enrolment</i>				
Out of education (ref)	1		1	
In education	0.46		0.41	

Notes: (1) Method: hazard regression model; dependent variable: transition to first conception measured since age 13. (2) Models include all the variables - age of woman measured since age 13, calendar year, ethnic group, education attainment and enrolment, marital status, number of siblings, place of residence, level of religiosity. (3) Separate model includes the transition to first birth only; joint model includes the transition to first and second birth with a common heterogeneity term (4) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ . (5) Own calculations, Census 2001 data and Social Capital Survey data, 2002.

There is a very important aspect in the results for the education effect on the first birth risk. The effect of education level now becomes obvious and we see that actually there is a difference in the risk of first birth according to education level of the women<sup>31</sup>. We get a clear result for the higher educated women – with both data

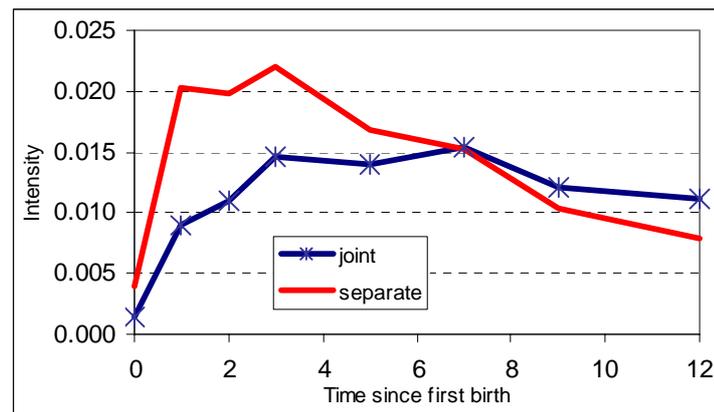
<sup>31</sup> This effect we also obtained when we modeled jointly the transition to first birth and first union formation.

sets the results show that they have about 25 % lower risk of starting childbearing than the women with secondary education. This result is very important for our interpretation of the effect of education on childbearing in Bulgaria. We see that if we do not control for any unobservable characteristics we may obtain biased results. So, actually it turns out that our hypotheses that the primary educated women are more likely to become mothers is true and proved from the analyses of the joint models.

The effect of being enrolled in studies does not go through such profound changes, but does become even stronger than what we observed before. Women who are studying have about 60 % lower probability of becoming mothers than women who have finished their studies.

We do not want to go into detail for the changes in the results of the rest of the variables that influence the transition to first birth since we do not find any profound alterations. The effect of marital or union status respectively becomes even more manifested – the differences between the statuses become larger and stay significant. Only a few and weak changes appear in the results for the number of siblings, place of residence and level of religiosity of the women.

Of course, introducing an unobserved heterogeneity term and modeling the transition to first and second birth together also changes the results of the second birth risks (Tables D 12 and D 13 in Appendix D). The curve for the intensity (time since first birth) shifts to the right and the highest peak of the transition to second birth stays between three and seven years after the first birth. The high intensity that we had between one and three years after the first birth becomes much lower. This change is observed in both of our data sets. Obviously, one gets biased results when not controlling for the selectivity problems in the transition to second birth. We plot the results for the intensities from the separate model and the joint model in Figure 6.20.

**Figure 6.20:** Baseline intensity of second birth. Separate and joint model compared.

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Graph constructed on the basis of 2 models. The separate model is the final model for second conception. The joint model includes transition to first and second conception with a common heterogeneity term. (3) Own calculations Census 2001 data.

There is also a difference in the results controlling for the impact of the calendar year on the transition to second birth. When we jointly model the two processes under study, we see a lower risk for getting a second child, but the shape of the curve stays the same. The same happens with our other duration spline – age of mother at first birth. There is no change in the shape of the curve, but the risks are much lower than we observed before.

The relative risks of second birth according to ethnic group also change when we account for selectivity. The differences between the three ethnic groups become stronger, but they keep their sign. The Roma group has even a higher relative risk of conceiving second time than we obtained in the previous part of our analyses.

We again want to present the changes in the results for the effect of education in order to have a full picture of the influence of this variable. Though the changes for the second birth are not as dramatic as they were in the case of first birth, we want to pay attention to these results as well. In Table 6.13 we present the effect of education level and education enrolment of the separate and joint models of each data set.

**Table 6.13:** Transition to second birth and effect of education– separate and joint models compared

	Separate model		Joint model	
	Relative risk	Sig.	Relative risk	Sig.
<b>Census data</b>				
<i>Education level</i>				
Primary	1.49	***	1.73	***
Secondary (ref)	1		1	
Higher	1.03		0.96	
<i>Education enrolment</i>				
Out of education (ref)	1		1	
In education	0.71	***	0.65	***
<b>Social Capital Survey data</b>				
<i>Education level</i>				
Primary	1.45	***	1.65	***
Secondary (ref)	1		1	
Higher	0.96		0.94	
<i>Education enrolment</i>				
Out of education (ref)	1		1	
In education	0.62	***	0.57	***

Notes: (1) Method: hazard regression model; dependent variable: transition to second conception measured since time of first birth. (2) Models include all the variables - age of woman measured since age 13, calendar year, ethnic group, education attainment and enrolment, marital status, number of siblings, place of residence, level of religiosity. (3) Separate model includes the transition to second birth only; joint model includes the transition to first and second birth with a common heterogeneity term (4) \*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$ \*:  $0.05 < p \leq 0.10$ . (5) Own calculations, Census 2001 data and Social Capital Survey data, 2002.

The changes in the effect of level of education on the second birth risks are not as strong as with the first birth risks. At least, we do not observe any changes in the direction of the impact. Our main finding remains: the secondary and higher educated women do not differ significantly in their risk of getting a second child. The primary educated women possess the highest risk of conceiving second time. The joint model even strengthens their risk and it becomes significantly higher than the one we obtained before. The results show that the primary educated women have about a 70 % higher risk of having a second child than the rest of the women.

The results for the effect of education enrolment become stronger in the joint model, but keep their sign. Women who are enrolled in education experience a much

lower risk of having a second child. The joint model corrects the previous estimates with about 5-6 %.

The rest of the results also change slightly, but not substantially. The relative risk in most of the cases become stronger and the differences between the categories in one variable become more pronounced. But as a whole, the changes are very few.

The standard deviation of the unobserved heterogeneity term from the analyses with the census data is equal to 0.87 and is significantly different from zero. A similar value is shown by the results from the Social Capital Survey – there the unobserved heterogeneity term is 0.77 and is also highly significant. This result shows that there are unobservable characteristics of the women that affect fertility decision making.

The results that we obtain for the case of Bulgaria are comparable with the results of studies in other countries. For instance, Kravdal (2001) studies jointly the transition to first, second and third birth in the case of Norway and the standard deviation of the common unobserved factor for the three transitions has a value of 0.80 – also with high significance. Kreyenfeld (2002) studies jointly first and second birth transition for the case of West Germany. The value of the standard deviation of the joint unobserved heterogeneity term is 1.60 and is significantly different from zero.

So our observation that unobservable factors influence women's childbearing decisions is not new: we just prove that this finding also holds for the case of Bulgaria. We can deduce from this that omitting the heterogeneity term in such a kind of analysis leads to unwanted consequences, namely misleading results.

## **6.6 Conclusion**

In the present chapter we analyzed the transition to second birth and we mostly paid attention to the effect of the education level and ethnic group of the women on the proneness to have a second child. We found out that the risk of having a second child is higher for women coming from the Roma ethnic group and from the lower education groups. This difference pertains to the whole period of observation – since the middle of the 1970s. The economic, political and societal changes in the

country that started to develop after 1990 contributed to the decline of risks, but the differences between ethnic groups and education levels remained almost the same.

Another important finding is the effect of selectivity. We estimated jointly the transition to first and second birth with a common heterogeneity term in order to control for any selectivity of the women who are under a risk of second birth and any factors that we can not account for, but that could influence each of the transitions. We found out that it is absolutely important to account for these issues, as many of our results changed significantly when we added an unobserved-heterogeneity factor. The strongest alterations were to be found on the influence of education level on the transition to first birth. When we fitted the models separately, we did not find any differences by educational level. But the joint model with a common heterogeneity term revealed that actually the primary educated women have significantly higher transition risks to motherhood than women with secondary or higher education.

We learn from this that, regarding their decision for a second child, women in Bulgaria are affected in two different ways. Firstly, there have always been clear cultural differences in the family formation behavior. Roma women used to have higher second order fertility than other ethnic groups, and among the ethnic Bulgarian majority, those who live in rural areas (and have a stronger traditional background) have much higher second-birth risks. However, our analyses also show that these differences, however characteristic they were in former decades, lose their explanatory power after 1990 and seem weak when compared to the overall socio-economic trends in the whole country. For all ethnic groups the second birth propensities have been decreasing for more than ten years now and there are even signs of convergence in this between the groups. Interestingly, this conclusion also holds when looking at education levels: each of the education groups has faced a massive slump in second birth rates at the same time and speed. Still, our analyses show that the “classical differences”, such as lower education leading to higher birth risks, persist, but the parallel slow down of second childbearing over all social strata reveals that the various groups in Bulgaria have been affected at the same time by the same changes. We interpret this as evidence of a reaction to an economic crisis because a mere ideational mechanism would exhibit different patterns for a group of “early adopters” (highly educated people) who change their behavior more readily. We do not find any evidence of differentially affected groups of the population in our

results. In comparison to this, cultural differences are marginal today when we talk about the intention to have a second child.

## Chapter 7

# Conclusion

The empirical analyses yielded a large number of results on Bulgarian fertility and family behavior before and after the historical year of 1990. We used educational, ethnical, marital, and some other information from participants in the 2001 Census and the 2002 Social Capital Survey in order to perform event history analyses on respondents' transitions to first and second birth as well as to marriage and consensual unions. We have provided summaries on our in-depth insights into the single events at the end of the respective Chapters 4 to 6. The purpose of the present chapter is to compare the empirical findings on the transitions with each other (Section 7.1), and to link these results to our initial theoretical questions for the determining forces of the demographic transformation (Section 7.2). We conclude this chapter with a general interpretation and a summary of this book (Section 7.3).

### **7.1 A summarizing view of the findings on fertility and family formation in Bulgaria**

The empirical studies in this book deal with the entry into first union as well as with the transition to first and second conception. Some facts of the demographic transitions under study appear to develop along the same lines and to be affected by the same societal forces. Others have a very particular character. We now present common features and differences in a comparative summarizing view.

#### ***7.1.1 Changes in fertility and family formation over calendar time***

This study reveals in-depth insights into the interrelated processes of declining marriage rates, strongly declining first birth rates, and even more strongly declining second birth rates. The results support the idea of two underlying processes that the Bulgarian fertility and family demography has undergone since 1990 – before this

date it used to be a stronghold of universal, uniform, and early family formation, including the preference for marriage followed by the birth of two children. The two processes can be stated as follows: (i) the emergence of cohabitation as a new way of life; and (ii) the persisting postponement of childbearing in the life course. Additionally, our analyses show that it is not sufficient to assume the year of 1990 as *the* turning point: some demographic changes start to become virulent only after 1995. Here the analyses of the interrelatedness of marriage and childbearing provided us with details about this development.

The continuing “fading” of marriage is supported by our findings that the lower marriage numbers in Bulgaria are not only a result of the fact that less women enter their marital age nowadays (due to the continuing emigration, especially of the young generations), but also that women at these ages tend to postpone their family formation process or to form a cohabitation instead. Our analyses show that while almost 90% of the population still forms a union, a part of the women who are in their marital ages never marry. In particular, the tendency to enter direct marriage (without prior cohabitation) has continually decreased over time. Especially for the period after 1995, our data clearly shows that cohabitation is becoming more and more popular (in terms of clearly increased transitions rates).

Moreover, our analyses reveal other details about the “competing” family forms of marriage and cohabitation. We can deduce that there are two types of cohabitation unions. Firstly, there are couples who form a household with the clear plan to marry: there is a clear peak in the marriage rates for women during the first three months after the beginning of cohabitation. Here, cohabitation is shown to be a “waiting time” until the marriage is prepared and conducted. However, once this “waiting time” effect has passed, cohabiting couples do not show an increased tendency to marry: six months after the start of the cohabitation the risk of marriage already decreases to the same level that it had before, that is to say, it reduces to the same value as the risk of a “direct marriage”. From our perspective, this reveals the second type of cohabitation: an accepted long-term option for the life conduct of young Bulgarians. If there was a strong social pressure to marry, cohabiting couples would show a somewhat higher risk of marriage throughout a longer time interval.

However, to live together in a consensual union and have a child is still not a very common experience for Bulgarians. The conception of a first child (still) strongly affects the transition to marriage: during the first six months after conception

the risk of marriage exhibits a steep increase, and after that a strong decrease. Then, after the birth of the child, the transition rate to first marriage is very low. This shows that it is still a desired and expected behavior to legalize the birth of a child, and it is done quickly after the conception is recognized. However, the couples who do not marry during the first pregnancy do not then tend to change their union status after the birth of the child. Looking in the other direction, the effect also holds true: analyzing the first conception we reproduce the standard finding that women who marry have a clearly higher risk of conception than cohabiting people – by a factor of about two.

Interestingly, this difference disappears with regard to a second conception. Here, all types of unions hold largely comparable risks – with the cohabitants even slightly exceeding the other groups. These findings could not, however, be compared to the situation before 1990 because of data limitations. Thus, we can only suggest an interpretation of these changes. Taking into account that giving birth in non-marital unions was strongly discriminated against before 1990 (see Chapter 2) and that the prevalence of these cases was extremely low, our findings may provide the first evidence of a new and special group of unions emerging in Bulgaria. Before 1990, consensual unions with a child basically did not exist and non-marital births were exclusively experienced by single mothers. Given the finding that cohabiting mothers now have the same risk of having a second child as married couples, we see that for a (still small) fraction of the population, cohabitation has become a full family model.

Of course, all these insights also require an interpretation from the background of the massive general decline of fertility, which we explored by the investigation of women's risks of first and second conception. Here, we reproduced the findings of a strong drop in the risks of first conception and an even stronger drop in the risks of second conception. The overall picture is that of a fertility postponement (for second and first births) and reduction (for second births). With respect to timing and spacing of births, we observe: a) a postponement of first births to higher ages, b) an expansion of the interval of the age at first birth, and c) at the beginning of the 1990s, a marginal change in the spacing of the second child, which was then followed by a clear increase in the spacing of the second child after 1995: the highest risk is now to be found three to five years after the first birth.

In a nutshell, the current family and fertility behavior of Bulgarians can be characterized by the term “diversification on a traditional basis”. Coming from a largely standardized demographic past, many Bulgarians still consider that forming a

household, marriage and childbearing belong together, but the timing of these events is moving toward higher ages and exhibits a greater individual variability. Our results may reveal the first signs of the appearance of cohabitation on Bulgaria's demographic horizon, which may include these simple consensual unions as a fully fledged alternative to the "classical" model of marriage.

### *7.1.2 Changes of fertility and family formation with respect to ethnic groups*

The results on ethnical differences in Bulgaria with respect to demographic behavior yielded a diverse picture which shows how differently the societal changes have affected people in Bulgaria. They show that the conclusions drawn above about the general directions of family and fertility development in the country are dominated by the ethnic majority in the country: the ethnic Bulgarians. Very different trends appeared for the two other large ethnic groups, and it proved relevant for every part of the analysis to control for ethnicity in our data and to consider the behavioral differences between ethnic groups.

With respect to fertility, the observed patterns are surprisingly homogeneous. Before and after the transition of the country, the ethnic Bulgarians had the lowest intensities of first conception of all ethnic groups; and they have always started childbearing at later ages. By contrast, the Roma have the highest birth intensities and start childbearing at the earliest ages. The Turks and Bulgarians have had mostly very close and sometimes identical rates throughout the decades. The Turks mostly had somewhat higher rates for first conception than the Bulgarians, but there were also times when this relationship was inverted. The picture for second conceptions matches the pattern for first births – with slightly smaller differences between the ethnic groups.

What is striking in this ethnic picture of Bulgaria is that in all ethnic groups the first and second conception intensities started to sink at the same time (in the early 1990s) and almost at the same speed. One could expect that at least one or the other of the ethnic groups would surpass the others in some aspects of the fertility response to the societal changes, but we attain a very homogeneous picture.

Strong differences, however, show up when we look at the marriage behavior of Bulgaria's ethnic groups. Traditionally, the Turks have the highest marriage rates in Bulgaria. This lead has become stronger in the last decade – with ethnic Bulgarians

facing slightly sinking marriage rates and the Roma strongly sinking ones. A differentiation of this event then shows that: (i) for direct marriages, ethnic Bulgarians have the lowest intensities, whereas (ii) for a marriage after cohabitation they have the highest intensities. For entering a cohabitation (iii), we find high rates for Roma and Turks, whereas the rates stay comparatively low for ethnic Bulgarians.

These findings show that when Roma enter a first union (direct marriage or cohabitation) they usually do not change the form of the union anymore: a cohabitation is not followed by a marriage. We argued (in Chapter 4) that the terms “legal marriage” and “cohabitation” have a different relevance for the Roma: they define “being married” according to their own cultural rules, and whether a couple registers its “marriage” officially depends on various other conditions – mostly financial benefits. A similar interpretation may hold for the ethnic Turks: many of them live in very small villages and closed communities in which the “unofficial” union formation (for instance, in front of a Muslim minister) does not automatically lead to an official registration. By contrast, for ethnic Bulgarians there are no forms of “traditional marriages”. Thus, they start at lower intensities with union formation, and for them the direct marriage is still the most common way to form a union, although sinking tendencies can be observed. If they enter a cohabitation they transform it most often into a marriage. These results show that any analyses that do not take ethnic differences in Bulgaria into account will miss these important distinctions in marriage behavior.<sup>32</sup>

We also found out that the effect of pregnancy on the transition to marriage is weakest for the Roma group and strongest for the Bulgarians. This result could be a little distorted by the fact that we do not account for the possible “non-registered” marriages of the Roma population. It would not be surprising if the real effect of pregnancy is much stronger than the data actually revealed.

In this ethnic view on family formation and fertility we see that whilst we found a general tendency of “diversification and variation” after 1990 for all Bulgarians, this picture is somewhat different when we include these ethnical considerations. In summary, we cannot draw definite conclusions on the Roma and the Turkish behavior because we have strong evidence on data problems concerning their marriage behavior. What looks like a “liberal cohabitation” regime at first

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<sup>32</sup> A possibility for future surveys would be to offer at least two categories for “marriage”: married according to religion or married according to the town hall.

glance, might be in fact a “re-traditionalization” or a maintenance of traditional life styles beyond the town hall – we refrain from giving final conclusions on this aspect here. Nonetheless, for the theoretical interpretations, we have to keep in mind the uniform decline in fertility in Bulgaria across ethnical boundaries.

### ***7.1.3 Changes of fertility and family formation with respect to education***

The analyses of the dependence of fertility and family formation on educational attainment and enrolment reveal some patterns of stability and some of change for the case of Bulgaria. Women with low education have the lowest transition to marriage after 1990. Regarding union formation, we found out that women with higher education tend to start a union with direct marriage, whereas the lower educated women are more prone to start it with a cohabitation. However, after having entered cohabitation, higher educated women again show the highest risk of marriage.

This trend of a reversal of the marriage-education correlation appears as a consistent development only after 1990. This is surprising because we expected the lower education (and lower income) strata of the Bulgarian society to be more “traditional” and to opt for marriage rather than simple consensual unions, but this is clearly not the case.

In line with our expectations, being in education affects union formation in a negative way – both the entries into cohabitation and direct marriages. Marriage after cohabitation, however, appears not to be affected by the fact of whether a woman is in or out of education. So we can conclude that the role of education participation is strong for the first union formation, but then does not have any later impact on the transformation of this union.

Regarding fertility, in our first analyses we did not find any strong education level influence on the transition to motherhood (sections 5.2.4 and 5.3.3). Additionally, we found evidence that across the educational groups there is a substantial decrease in women’s likelihood to become a mother, which had already started before 1990.

Concerning second births, the results showed that women with primary education are more inclined to have a child than women with secondary and higher education. We also found a clear strong decrease in the intensities for second birth after 1990 for each education group. However, a more profound and detailed analysis

in which we accounted for selectivity (section 5.5), showed a clear difference in the behavior of women according to education level. When considering the possible influence of unmeasured factors in our model, the results showed that the higher educated women are less prone to become mothers and women with primary education are highly disposed to doing so. In other words, lower educated women start early with childbearing and have more children in total.

Being enrolled in studies also strongly influences a woman's decisions to form a union and to bear children. We found out that education participation hinders women from making steps to other life course events – in our case marriage and motherhood. And this trend is persistent throughout our observation period.

To summarize, the impact of education level and enrolment on fertility and family formation in Bulgaria is in the expected direction – women with low education have the highest fertility and union formation intensities. We argued that this result is due to the fact that women with primary education do not react so strongly to the changes on a macro level and have less choice of pathways in their life course. They also experience lower opportunity costs when looking after a child. This leads to their early start in childbearing and union formation. Additionally, we found out that regarding union formation, the higher educated women are *not* the innovative ones with respect to finding alternative ways of forming a family.

## **7.2 On the theoretical explanations of fertility and family formation in Bulgaria**

In this section we reflect on the conclusions that follow from our results for the theoretical explanations of the fertility and family behavior of the population of Bulgaria (presented in sections 2.2.1 and 2.2.2).

### ***7.2.1 The economic view***

Our results indicate a twofold impact of economic changes and people's economic capital on their demographic behavior. Firstly, we have to take the macro process of the collapse of the Bulgarian economy as a starting-point for the explanation of family and fertility behavior. As we said earlier (Chapter 2), the breakdown of the Bulgarian

economy was stronger and took more time than in most other countries in transition. We interpret our findings of a parallel decline of fertility that occurred simultaneously in all ethnic groups and in all educational strata of society as proof that the impact of economic hardships was felt in the entire population.

Secondly, and in addition to what we said above, the economic micro hypotheses that we formulated for the explanation of fertility differentials according to the New Home Economics (Chapter 3) also seem to be true. We observe that the demographic behavior of higher educated women differs in the expected ways from that of lower educated women. Women with a higher education indeed postpone childbearing most strongly and have fewer children in their lives, arguably due to their higher investments in career aspirations. It seems to hold true, as we hypothesized, that their search for a well-paid and prospective job position is the crucial factor for these behavioral changes, especially with respect to childbearing.

Childbearing and employment became less compatible than they were in the era of state-socialism. Assuming that the highly educated women are usually employed, due to their better position on the labor market, they experience to a higher extent the difficulties of combining childbearing and working life. According to the theoretical concepts, the highly educated women also have higher opportunity costs of childbearing. Usually, a career interruption is penalized (depending on the stage of the career of course) and highly educated women would pay higher costs for this.

The higher marriage rate of the highly educated women can be also explained in terms of economic uncertainty prevailing in the country. The women with higher education usually have better economic well-being and good perspectives in life, thus they may be more attractive on the marriage market. Also, possessing better qualities, they have better chances to find a better man. This results in higher marriage rates for the highly educated women. In contrast the alternative union formation for those less attractive on the marriage market could be cohabitation, since it is not a long-term commitment and has fewer costs. People taking this path would be those with a low education as they usually have worse occupational status and, thus, lack economical prosperity.

Additionally, we argue that the economic crisis and uncertainty has a stronger impact on the second births. The evidence of our conclusion comes from the fact that we did not find any sign of “early adopters” who react first to the new situation on the macro level. Rather, it appears that all of the strata of the population are affected in

the same way. This shows that it is the economic transformation playing a significant role here rather than any values or ideational changes.

In this sense we can conclude that Bulgarian women, to a certain extent, behave economically rationally. Those who put economic and educational prospects first in their lives avoid the burden of simultaneous family formation and childbearing. But at the same time, a specificity of the Bulgarian culture remains: family and children are usually not fully given up for the women's own professional career. Childlessness is still extremely rare and we do not find any strong signs of an increase.

### ***7.2.2 Second Demographic Transition?***

At first glance, our results provide evidence of changes in the Bulgarian family and fertility behavior that could be explained by the SDT: we observe a postponement of births and marriages, a decrease in the rates of births and marriages, an increase of consensual unions, a decrease in direct marriages, and higher proportions of childbearing out-of-wedlock.

Concerning the fertility patterns, the analyses revealed results in line with our hypotheses. We found that the higher educated women postpone childbearing the most and have fewer children in total. From the perspective of the second demographic transition notion, the highly educated women can be regarded as the 'leaders' of the changes in fertility patterns after 1990. However, this cannot be said for the changes in the family formation. The results show that the highly educated women are most prone to enter direct marriage and least prone to start union with cohabitation. This finding contradicts the assumption that the new patterns of behavior are diffused from the higher education strata, which is an important ingredient in the traditional version of SDT theory. On the contrary, in the case of family formation it seems that the lower educated women are the 'forerunners' in the changes. This shows that the diffusion of new ideas, behaviors and trends is a complex process itself and most probably interacts with other factors on the societal level. In this case especially, we assume that the changing values interact with the economic uncertainty. Cohabitation in particular is affected very strongly by this interaction. As we already suggested in the previous section, cohabitation may be an alternative for people who do not possess any good prerequisites for committing to a

marriage. In other words, people with lower education usually lack financial independence and good occupational status and thus do not have high chances on the marriage market.

This interpretation is also supported from our findings for the ethnic groups. Contrary to our expectations, the Bulgarian ethnic group is the least prone to start a union with a cohabitation and if this happens, then they make the transformation to marriage quickly after the start of the cohabitation. However, the Bulgarian group is the one that postpones the start of the first union the most. The intriguing result of the union formation is the high likeliness of cohabitation among the Roma population. We already gave possible interpretations of this phenomenon in Chapter 4. One of the suggestions was that since 1990 the state pressure on deviant behavior ceased and the Roma population returned to their old traditions and customs. Thus, we find a strong cultural impact, but none in terms of the second demographic transition theory.

Regarding childbearing, the results are as we expected and in line with our theoretical considerations. Our argument was that the Bulgarians tend to postpone at most entry into motherhood and have fewer children in total as a result of better contraceptive knowledge, openness to the new western life styles, and higher investment in human capital. The results confirmed our suggestions and it seems to us that, regarding fertility, the Bulgarian ethnic group is closer to the notions of the second demographic transition.

In summary, we find that people who have lower education cohabit more often, as do people from the Roma group, those who have many siblings, and those who live in rural areas. We do not observe any correlation with religiosity. These results contradict the expectations according to standard second demographic transition theory because cohabitation *cannot* be considered to be a result of the increase of personal autonomy or liberal and individualistic values in Bulgaria. Rather, it can be seen as a sign of the cultural (in case of the Roma group) or economic (in case of the lower educated group) exclusion from the formerly omnipresent patterns of household and family formation. We argue that this shows the complexity of the value change process and its interrelation with economic uncertainty in a country like Bulgaria.

### 7.3 Conclusion

The study of fertility and family formation in Bulgaria based on two recent data sources yielded a rich flora of results, which give a detailed illustration of the trends before and after the start of the societal transition in the country. Some of the results were in line with our expectations and theoretical concepts, other parts were surprising and showed trends unknown before. In general, the results revealed how complex the process of political, economic and societal transformation in the country is and in how many different ways it affects the interrelated trends of fertility and family formation.

In conclusion, we want to refer to the metaphorical description of the political and cultural impact on the fertility and family formation made by Lesthaeghe and Surkyn (2002) in a UNECE report. They describe the demographic changes as a cart pulled by two horses: one is the economic crisis and the other the cultural changes. At certain times it could be that one horse is pulling more strongly and the other is just trotting along. The changes in a country appear at different speeds and the two horses may be pulling more strongly at respectively different times. Our results give us evidence to believe that in the case of Bulgaria during the larger part of the 1990s, the horse of economic crises was pulling much more strongly than the horse of the cultural changes. However, it seems that the second horse is gathering speed and it will be not surprising if in near future it is the one playing the bigger role pulling the cart of demographic changes in Bulgaria.

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# **Appendix A**

**(to Chapter 3)**

**Table A1:** Summary of the characteristics of the sample for first conception. Census data.

Characteristics	Total		First conception		Censored	
	number	%	number	%	number	%
Total	5008	100.0	3664	73.2	1344	26.8
<i>Age of first conception</i>						
<17			371	10%		
17-19			1262	34%		
20-22			1187	32%		
23-25			483	13%		
26-28			209	6%		
29-31			81	2%		
>31			71	2%		
<i>Calendar time at first conception</i>						
1965-1970			58	2%		
1971-1975			421	11%		
1976-1980			677	18%		
1981-1985			723	20%		
1986-1990			738	20%		
1991-1995			606	17%		
1996-2001			441	12%		
<i>Education level (at the time of interview)</i>						
Primary	1391	28%	947	26%	444	33%
Secondary	2486	50%	1847	50%	639	48%
High	1131	23%	870	24%	261	19%
<i>Education level (at the time of conception)</i>						
Primary			1246	34%		
Secondary			2064	56%		
High			354	10%		
<i>Education enrolment (at the time of interview)</i>						
Studies	604	12%	68	2%	536	40%
Finished studies	4404	88%	3596	98%	808	60%
<i>Education enrolment (at the time of conception)</i>						
Studies			855	23%		
Finished studies			2809	77%		
<i>Marital status (at the time of interview)</i>						
Single	1410	28%	247	7%	1163	87%
Married	3208	64%	3044	83%	164	12%
Divorced	292	6%	279	8%	13	1%
Widowed	98	2%	94	3%	4	0%
<i>Marital status (at the time of conception)</i>						
Single			1729	47%		
Married			1919	52%		
Divorced			16	0%		
Widowed			0	0%		

**Table A1:** Summary of the characteristics of the sample for first conception. Census data.

(continued)

Characteristics	Total		First conception		Censored	
	number	%	number	%	number	%
<i>Ethnic group</i>						
Bulgarians	3950	79%	2827	776%	1123	84%
Turks	644	13%	489	13%	155	12%
Roma	260	5%	229	6%	31	2%
Other	114	2%	89	2%	25	2%
Does not identify	40	1%	30	1%	10	1%
<i>Number of siblings</i>						
0	479	10%	324	9%	155	12%
1	2906	58%	2012	55%	894	67%
2	955	19%	751	21%	204	15%
3+	664	13%	573	16%	91	7%
Does not know her parents	4	0%	4	0%	0	0%
<i>Place of residence (till age 15)</i>						
Village	1880	38%	1571	43%	309	23%
Small town	1505	30%	1043	28%	462	34%
Bigger town	1209	24%	778	21%	431	32%
Capital	414	8%	272	7%	142	11%
<i>Level of religiosity</i>						
Deeply religious	555	11%	430	12%	125	9%
To some extend	2234	45%	1623	44%	611	45%
Not much	1622	32%	1184	32%	438	33%
Not at all	597	12%	427	12%	170	13%

**Table A2:** Summary of the characteristics of the sample for first marriage. Census data.

Characteristics	Total		First marriage		Censored	
	number	%	number	%	number	%
Total	5008	100.0	3601	71.9	1407	28.1
<i>Age of first marriage</i>						
<17			281	8%		
17-19			1331	37%		
20-22			1185	33%		
23-25			468	13%		
26-28			207	6%		
29-31			61	2%		
>31			68	2%		
<i>Calendar time at first marriage</i>						
1965-1970			76	2%		
1971-1975			449	12%		
1976-1980			675	19%		
1981-1985			707	20%		
1986-1990			739	21%		
1991-1995			515	14%		
1996-2001			440	12%		
<i>Education level (at the time of interview)</i>						
Primary	1391	28%	793	22%	598	43%
Secondary	2486	50%	1883	52%	603	43%
High	1131	23%	925	26%	206	15%
<i>Education level (at the time of marriage)</i>						
Primary			1112	31%		
Secondary			2157	60%		
High			332	9%		
<i>Education enrolment (at the time of interview)</i>						
Studies	604	12%	75	2%	529	38%
Finished studies	4404	88%	3526	98%	878	62%
<i>Education enrolment (at the time of marriage)</i>						
Studies			980	27%		
Finished studies			2621	73%		
<i>Motherhood status (at the time of interview)</i>						
No child	1344	27	181	5	1163	83
First child	1295	26	1177	33	118	8
Second child	2369	47	2243	62	126	9
<i>Motherhood status (at the time of marriage)</i>						
No child, no pregnancy			2117	59%		
First conception			1195	33%		
First child			186	5%		
Second conception			29	1%		
Second child			74	2%		

**Table A2:** Summary of the characteristics of the sample for first marriage. Census data.

(continued)

Characteristics	Total		First marriage		Censored	
	number	%	number	%	number	%
<i>Ethnic group</i>						
Bulgarians	3950	79%	2873	80%	1077	77%
Turks	644	13%	461	13%	183	13%
Roma	260	5%	146	4%	114	8%
Other	114	2%	89	2%	25	2%
Does not identify	40	1%	32	1%	8	1%
<i>Number of siblings</i>						
0	479	10%	329	9%	150	11%
1	2906	58%	2052	57%	854	61%
2	955	19%	708	20%	247	18%
3+	664	13%	508	14%	156	11%
Does not know her parents	4	0%	4	0%	0	0%
<i>Place of residence (till age 15)</i>						
Village	1880	38%	1524	42%	356	25%
Small town	1505	30%	1022	28%	483	34%
Bigger town	1209	24%	786	22%	423	30%
Capital	414	8%	269	7%	145	10%
<i>Level of religiosity</i>						
Deeply religious	555	11%	403	11%	152	11%
To some extend	2234	45%	1635	45%	599	43%
Not much	1622	32%	1153	32%	469	33%
Not at all	597	12%	410	11%	187	13%

**Table A3:** Summary of the characteristics of the sample for second conception.  
Census data.

Characteristics	Total		Second conception		Censored	
	number	%	number	%	number	%
Total	3366	100.0	2098	62.3	1268	37.7
<i>Age of second conception</i>						
<19			114	5%		
19-22			426	20%		
23-25			821	39%		
26-28			416	20%		
29-31			195	9%		
>32			126	6%		
<i>Calendar time at second conception</i>						
1975-1980			345	16%		
1981-1982			205	10%		
1983-1985			326	16%		
1986-1988			356	17%		
1989-1990			195	9%		
1991-1995			401	19%		
1996-1997			121	6%		
1998-2001			149	7%		
<i>Education level (at the time of interview)</i>						
Primary	818	24%	623	30%	195	15%
Secondary	1707	51%	1048	50%	659	52%
High	841	25%	427	20%	414	33%
<i>Education level (at the time of second conception)</i>						
Primary			683	33%		
Secondary			1109	53%		
High			306	15%		
<i>Education enrolment (at the time of interview)</i>						
Studies	65	2%	22	1%	43	3%
Finished studies	3301	98%	2076	99%	1225	97%
<i>Education enrolment (at the time of second conception)</i>						
Studies			182	9%		
Finished studies			1916	91%		
<i>Marital status (at the time of interview)</i>						
Single	243	7%	124	6%	119	9%
Married	2797	83%	1805	86%	992	78%
Divorced	248	7%	111	5%	137	11%
Widowed	78	2%	58	3%	20	2%
<i>Marital status (at the time of second conception)</i>						
Single			205	10%		
Married			1855	88%		
Divorced			35	2%		
Widowed			3	0%		

**Table A3:** Summary of the characteristics of the sample for second conception.

Census data.

(continued)

Characteristics	Total		Second conception		Censored	
	number	%	number	%	number	%
<i>Ethnic group</i>						
Bulgarians	2610	78%	1533	73%	1077	85%
Turks	442	13%	326	16%	116	9%
Roma	209	6%	163	8%	46	4%
Other	80	2%	59	3%	21	2%
Does not identify	25	1%	17	1%	8	1%
<i>Number of siblings</i>						
0	308	9%	160	8%	148	12%
1	1887	56%	1078	51%	809	64%
2	673	20%	448	21%	225	18%
3+	494	15%	409	19%	85	7%
Does not know her parents	4	0%	3	0%	1	0%
<i>Place of residence (till age 15)</i>						
Village	1418	42%	1012	48%	406	32%
Small town	960	29%	573	27%	387	31%
Bigger town	728	22%	381	18%	347	27%
Capital	260	8%	132	6%	128	10%
<i>Level of religiosity</i>						
Deeply religious	392	12%	266	13%	126	10%
To some extend	1505	45%	930	44%	575	45%
Not much	1073	32%	656	31%	417	33%
Not at all	396	12%	246	12%	150	12%

**Table A4:** Summary of the characteristics of the sample for first conception. Social Capital Survey data.

Characteristics	Total		First conception		Censored	
	number	%	number	%	number	%
Total	4289	100.0	2599	60.6	1690	39.4
<i>Age of first conception</i>						
<17			264	10%		
17-19			946	36%		
20-22			790	30%		
23-25			386	15%		
26-28			165	6%		
>29			48	2%		
<i>Calendar time at first conception</i>						
1985-1990			548	21%		
1991-1993			495	19%		
1994-1995			312	12%		
1996-1997			351	14%		
1998-2000			674	26%		
2001-2002			219	8%		
<i>Education level (at the time of interview)</i>						
Primary	791	18%	606	23%	185	11%
Secondary	2524	59%	1438	55%	1086	64%
High	974	23%	555	21%	419	25%
<i>Education level (at the time of conception)</i>						
Primary			759	29%		
Secondary			1570	60%		
High			270	10%		
<i>Education enrolment (at the time of interview)</i>						
Studies	635	15%	167	6%	468	28%
Finished studies	3654	85%	2432	94%	1222	72%
<i>Education enrolment (at the time of conception)</i>						
Studies			467	18%		
Finished studies			2132	82%		
<i>Marital status (at the time of interview)</i>						
Single	1535	36%	169	7%	1366	81%
Cohabiting	488	11%	332	13%	156	9%
Married directly	1882	44%	1742	67%	140	8%
Married after cohabitation	384	9%	356	14%	28	2%
<i>Marital status (at the time of conception)</i>						
Single			1058	41%		
Cohabiting			442	17%		
Married directly			953	37%		
Married after cohabitation			146	6%		

**Table A4:** Summary of the characteristics of the sample for first conception. Social Capital Survey data.

(continued)

Characteristics	Total		First conception		Censored	
	number	%	number	%	number	%
<i>Ethnic group</i>						
Bulgarians	3525	82%	2037	78%	1488	88%
Turks	406	9%	291	11%	115	7%
Roma	264	6%	211	8%	53	3%
Other	94	2%	60	2%	34	2%
Does not identify						
<i>Number of siblings</i>						
0	475	11%	270	10%	205	12%
1	2807	65%	1578	61%	1229	73%
2	643	15%	464	18v	179	11%
3+	364	8%	287	11%	77	5%
<i>Place of residence (till age 15)</i>						
Urban	2898	68%	1571	60%	1327	79%
Rural	1391	32%	1028	40%	363	21%
<i>Level of religiosity</i>						
Religious	2713	63%	1633	63%	1080	64%
Not religious	1564	36%	957	37%	607	36%
Refuse to answer	12	0%	9	0%	3	0

**Table A5:** Summary of the characteristics of the sample for second conception. Social Capital Survey data.

Characteristics	Total		Second conception		Censored	
	number	%	number	%	number	%
Total	2505	100.0	1039	41.5	1466	58.5
<i>Age of second conception</i>						
<19			148	14%		
19-22			356	34%		
23-25			284	27%		
26-28			164	16%		
>29			87	8%		
<i>Calendar time at second conception</i>						
1988-1990			123	12%		
1991-1992			127	12%		
1993-1995			218	21%		
1996-1997			151	15%		
1998-2000			282	27%		
2001-2002			138	13%		
<i>Education level (at the time of interview)</i>						
Primary	526	21%	158	15%	368	25%
Secondary	1383	55%	530	51%	853	58%
High	596	24%	351	34%	245	17%
<i>Education level (at the time of second conception)</i>						
Primary			366	35%		
Secondary			547	53%		
High			126	12%		
<i>Education enrolment (at the time of interview)</i>						
In studies	82	3%	14	1%	68	5%
Out of studies	2423	97%	1025	99%	1398	95%
<i>Education enrolment (at the time of second conception)</i>						
In studies			50	5%		
Out of studies			989	95%		
<i>Marital status (at the time of interview)</i>						
Single	157	6%	51	5%	106	7%
Cohabiting	322	13%	154	15%	168	11%
Married directly	1688	67%	704	68%	984	67%
Married after cohabitation	338	13%	130	13%	208	14%
<i>Marital status (at the time of second conception)</i>						
Single			62	6%		
Cohabiting			170	16%		
Married directly			693	67%		
Married after cohabitation			114	11%		

**Table A5:** Summary of the characteristics of the sample for second conception.  
Social Capital Survey data.

(continued)

Characteristics	Total		Second conception		Censored	
	number	%	number	%	number	%
<i>Ethnic group</i>						
Bulgarians	1961	78%	739	71%	1222	83%
Turks	279	11%	139	13%	140	10%
Roma	208	8%	136	13%	72	5%
Other	57	2%	25	2%	32	2%
<i>Number of siblings</i>						
0	260	10%	84	8%	176	12%
1	1518	61%	547	53%	971	66%
2	444	18%	226	22%	218	15%
3+	283	11%	182	18%	101	7%
Does not know her parents						
<i>Place of residence (till age 15)</i>						
Urban	1510	60%	565	54%	945	64%
Rural	995	40%	474	46%	521	36%
<i>Level of religiosity</i>						
Religious	1574	63%	658	63%	916	62%
Not religious	922	37%	377	36%	545	37%
Refuse to answer	9	0%	4	0%	5	0%

**Table A6:** Summary of the hypothesized effects of explanatory variables for fertility

Variable	Transition to first birth		Transition to second birth	
	Before 1990	After 1990	Before 1990	After 1990
<i>Ethnic group</i>				
Bulgarian	0	-	0	-
Turk	0	0	0	0
Roma	0	+	0	+
<i>Education level</i>				
Primary	0	+	+	+
Secondary	0	0	0	0
High	0	-	0	-
<i>Education participation</i>				
In education	-	-	-	-
Out of education	+	0	+	0
<i>Marital status</i>				
Single	-	0	-	0
Married	+	+	+	+
Divorced/Widowed	-	-	-	-
<i>Civil status</i>				
Single		0		0
Cohabiting		+		+
Married directly		++		+
Married after cohabitation		+		+
<i>Number of siblings</i>				
0	0	-	-	-
1	0	0	-	-
2	+	+	+	+
3+	+	+	+	+
<i>Residence place</i>				
Village	+	+	+	+
Small town	+	+	+	+
Big town	0	-	0	-
Capital	-	-	-	-
<i>Level of Religiosity</i>				
Deeply religious	+	+	+	+
To some extend	+	+	+	0
Not much	0	0	0	0
Not at all	0	-	-	-

**Table A7:** Summary of the hypothesized effects of explanatory variables for family formation

Variable	Transition to marriage		Transition to direct marriage	Transition to cohabitation
	Before 1990	After 1990	After 1990	After 1990
<i>Ethnic group</i>				
Bulgarian	0	-	-	+
Turk	0	0	0	-
Roma	0	+	0	-
<i>Education level</i>				
Primary	0	+	+	-
Secondary	0	0	0	0
High	0	-	-	+
<i>Education participation</i>				
In education	0	-	-	0
Out of education	+	+	+	0
<i>Motherhood status</i>				
No child	0	-	-	0
Pregnant, 1 <sup>st</sup> child	+	+	+	+
One child	-	0	0	0
Pregnant, 2 <sup>nd</sup> child	0	+	+	+
Two children	-	0	0	0
<i>Number of siblings</i>				
0	0	-	0	0
1	0	0	0	0
2	0	0	+	+
3+	+	+	+	+
<i>Residence place</i>				
Village	+	+	+	-
Small town	+	+	+	-
Big town	0	0	-	+
Capital	0	-	-	+
<i>Level of religiosity</i>				
Deeply religious	+	+	+	-
To some extent	+	+	+	-
Not much	0	0	0	+
Not at all	-	-	-	+



# **Appendix B**

**(to Chapter 4)**

**Table B1:** Transition to first marriage. Relative risks. Census data. (Models 1, 2 and 3)

	Model 1		Model 2		Model 3	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-6.064	***	-6.073	***	-6.125	***
<i>Age (baseline)</i>						
13-16 years (slope)	0.760	***	0.772	***	0.774	***
17-19 years (slope)	0.694	***	0.709	***	0.713	***
20-22 years (slope)	0.017		0.044	**	0.047	**
23-25 years (slope)	-0.089	***	-0.069	**	-0.069	**
26-28 years (slope)	-0.039		-0.034		-0.034	
29-31 years (slope)	-0.250	***	-0.263	***	-0.266	***
31 + years (slope)	-0.045		-0.005		-0.006	
<i>Calendar year</i>						
1964 – 1970 (slope)			0.021		0.022	
1971 – 1975 (slope)			-0.007		-0.008	
1976 - 1980 (slope)			0.006		0.005	
1981 - 1985 (slope)			-0.013		-0.012	
1986 – 1990 (slope)			0.018		0.019	
1991 – 1995 (slope)			-0.138	***	-0.138	***
1996 - 2001 (slope)			-0.070	***	-0.073	***
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)					1	
Turks					1.39	***
Roma					1.03	
Other					1.04	
Log-likelihood	-17559.48		-17359.22		-17338.68	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B2:** Transition to first marriage. Relative risks. Census data. (Models 4, 5 and 6)

	Model 4		Model 5		Model 6	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-5.334	***	-5.727	***	-5.820	***
<i>Age (baseline)</i>						
13-16 years (slope)	0.769	***	0.718	***	0.719	***
17-19 years (slope)	0.509	***	0.439	***	0.436	***
20-22 years (slope)	0.034		0.020		0.020	
23-25 years (slope)	-0.114	***	-0.052		-0.044	
26-28 years (slope)	-0.050		-0.029		-0.035	
29-31 years (slope)	-0.268	***	-0.196	***	-0.195	***
31 + years (slope)	-0.008		-0.013		-0.012	
<i>Calendar year</i>						
1964 – 1970 (slope)	0.067		0.111		0.107	
1971 – 1975 (slope)	-0.005		-0.040		-0.036	
1976 - 1980 (slope)	-0.002		0.000		0.002	
1981 - 1985 (slope)	-0.010		-0.023		-0.021	
1986 – 1990 (slope)	0.014		0.004		0.005	
1991 – 1995 (slope)	-0.132	***	-0.098	***	-0.097	***
1996 - 2001 (slope)	-0.075	***	-0.047	**	-0.046	***
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)	1		1		1	
Turks	1.11	**	1.21	***	1.11	*
Roma	0.80	***	0.80	***	0.76	***
Other	0.92		1.07		0.99	
<i>Education level</i>						
Primary	0.82	***	0.82	***	0.80	***
Secondary (ref)	1		1		1	
High	0.87	**	0.94		0.98	
<i>Education enrolment</i>						
Out of education (ref)	1		1		1	
In education	0.39	***	0.53	***	0.55	***
<i>Motherhood status</i>						
No child, no pregnancy (ref)			1		1	
No child, 1 <sup>st</sup> pregnancy			13.00	***	12.80	***
Parity 1			1.43	***	1.42	***
Parity one, pregnant			2.23	***	2.19	***
Parity 2			0.85		0.84	
<i>Number of Siblings</i>						
0					0.97	
1 (ref)					1	
2					1.03	
3 +					1.05	

**Table B2:** Transition to first marriage. Relative risks. Census data. (Models 4, 5 and 6)**(continued)**

	Model 4		Model 5		Model 6	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Place of residence (till age 15)</i>						
Village					1.23	***
Small town					1.06	
Big town (ref)					1	
Capital					0.86	*
<i>Level of religiosity</i>						
Deeply					1.02	
Some (ref)					1	
Not much					1.03	
Not at all					0.93	
Log-likelihood	-17050.63		-15141.20		-15119.39	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B3:** Relative risk of first marriage. Effect of ethnic group and period. Bulgarians and period before 1975 as a reference group. Census data

Period	Ethnic group					
	Bulgarians	Turks	Roma	Other		
<= 1975	1	1.33 **	1.41 *	1.00		
1976 - 1980	0.92	0.89	1.02	0.85 *		
1981 - 1985	0.83 ***	1.05	0.81	0.68		
1986 - 1990	0.81 ***	0.96	0.93	0.92		
1991 - 1995	0.62 ***	0.69 ***	0.16 ***	0.71		
>= 1996	0.45 ***	0.36 ***	0.21 ***	0.51 **		

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B4:** Relative risk of first marriage. Effect of education level and period. Secondary education and period before 1975 as a reference group. Census data

Period	Education level					
	Primary	Secondary	High			
<= 1975	0.98	1	0.94			
1976 - 1980	0.82 **	0.95	0.72			
1981 - 1985	0.79 **	0.87	0.68 **			
1986 - 1990	0.73 ***	0.87	0.77			
1991 - 1995	0.41 ***	0.66 ***	0.71 **			
>= 1996	0.23 ***	0.47 ***	0.63 ***			

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B5:** Relative risk of first marriage. Effect of motherhood status and period. No child and period before 1975 as a reference group. Census data

Period	Motherhood status									
	No child		1 <sup>st</sup> pregnancy		Parity 1		2 <sup>nd</sup> pregnancy		Parity 2	
<= 1975	1		10.84	***	2.11	***	2.44		1.51	
1976 - 1980	0.91		9.89	***	0.88		0.61		1.02	
1981 - 1985	0.79	***	9.58	***	1.04		2.66	**	0.58	
1986 - 1990	0.76	***	9.10	***	1.42	**	3.03	***	0.81	
1991 - 1995	0.52	***	7.46	***	0.71	*	0.86		0.51	***
>= 1996	0.33	***	6.99	***	0.48	***	0.62		0.19	***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B6:** Relative risk of first marriage. Effect of education level and motherhood status. Secondary education and having no child as a reference group. Census data

Period	Education level					
	Primary		Secondary		High	
No child	0.95		1		0.92	
1 <sup>st</sup> pregnancy	8.92	***	13.95	***	14.17	***
1 child	1.10		1.45	***	1.99	***
2 <sup>nd</sup> pregnancy	1.80	**	2.21	**	0.00	
2 children	0.62	***	0.98		1.62	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B7:** Relative risk of first marriage. Effect of ethnic group and motherhood status. Bulgarians and having no child as a reference group. Census data

Period	Ethnic group							
	Bulgarians		Turks		Roma		Other	
No child	1		1.48		1.91		1.20	
1 <sup>st</sup> pregnancy	14.98	***	10.40	***	4.73	***	11.31	***
1 child	1.60	***	1.78	***	0.88		1.18	
2 <sup>nd</sup> pregnancy	2.54	***	1.66		2.23	**	2.52	
2 children	1.08		1.05		0.46	***	0.92	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B8:** Relative risk of first marriage. Effect of number of siblings and period. Having one sibling and period before 1990 as a reference group. Census data

Period	Number of siblings							
	none		one		two		three or more	
Till 1989	0.94		1		1.11	**	1.21	***
Since 1990	0.68	***	0.65	***	0.57	***	0.46	***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B9:** Relative risk of first marriage. Effect of residence place and period. Big town and period before 1990 as a reference group. Census data

Period	Place of residence							
	Village		Small town		Big town		Capital	
Till 1989	1.29	***	1.08		1		0.88	
Since 1990	0.72	***	0.65	***	0.63	***	0.53	***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B10:** Relative risk of first marriage. Effect of level of religiosity and period. Religious to some extent and period before 1990 as a reference group. Census data

Period	Level of religiosity							
	Deeply religious		To some extent		Not much		Not at all	
Till 1989	1.26	***	1		0.69	***	1.10	
Since 1990	0.66	***	1.16	***	1.00		0.68	***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B11:** Transition to first marriage. Relative risks. Social Capital Survey data.  
(Models 1, 2 and 3)

	Model 1		Model 2		Model 3	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-7.465	***	-7.436	***	-7.478	***
<i>Age (baseline)</i>						
13-16 years (slope)	1.091	***	1.0951	***	1.103	***
17-19 years (slope)	0.706	***	0.736	***	0.736	***
20-22 years (slope)	-0.045	*	0.006		0.007	
23-25 years (slope)	-0.026		0.027		0.028	
26-28 years (slope)	-0.118	**	-0.108	*	-0.108	*
29-31 years (slope)	-0.107		-0.092		-0.092	
31 + years (slope)	-0.346		-0.247		-0.247	
<i>Calendar year</i>						
1985 – 1990 (slope)			0.071	**	0.072	**
1991 – 1995 (slope)			-0.154	***	-0.153	***
1996 - 1997 (slope)			0.007		0.006	
1998 - 2000 (slope)			0.025		0.023	
2001 - 2002 (slope)			-0.227	***	-0.227	***
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)					1	
Turks					1.20	***
Roma					0.92	
Other					1.23	
Log-likelihood	-11949.75		-11954.16		-11949.75	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B12:** Transition to first marriage. Relative risks. Social Capital Survey data.  
(Models 4, 5 and 6)

	Model 4		Model 5		Model 6	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-6.193	***	-6.550	***	-6.576	***
<i>Age (baseline)</i>						
13-16 years (slope)	1.095	***	1.060	***	1.055	***
17-19 years (slope)	0.406	***	0.325	***	0.324	***
20-22 years (slope)	0.030		0.037		0.040	
23-25 years (slope)	-0.041		-0.013		-0.014	
26-28 years (slope)	-0.113	**	-0.121	*	-0.119	*
29-31 years (slope)	-0.091		0.027		0.026	
31 + years (slope)	-0.231		-0.333		-0.322	
<i>Calendar year</i>						
1985 – 1990 (slope)	0.061	*	0.023		0.021	
1991 – 1995 (slope)	-0.143	***	-0.105	***	-0.102	***
1996 – 1997 (slope)	0.011		0.029		0.030	
1998 - 2000 (slope)	0.001		-0.044		-0.048	
2001 - 2002 (slope)	-0.234	***	-0.147	**	-0.138	**
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)	1		1		1	
Turks	1.22	***	1.25	***	1.20	**
Roma	1.03		0.97		0.96	
Other	1.17		1.00		0.96	
<i>Education level</i>						
Primary	0.58	***	0.61	***	0.61	***
Secondary (ref)	1		1		1	
High	1.07		1.14		1.14	
<i>Education enrolment</i>						
Out of education (ref)	1		1		1	
In education	0.42	***	0.60	***	0.62	***
<i>Civil and motherhood status</i>						
<b>Out of cohabitation</b>						
No child, no pregnancy (ref)			1		1	
No child, 1 <sup>st</sup> pregnancy			21.53	***	21.19	***
Parity 1			1.65	***	1.62	***
Parity one, pregnant			5.09	***	4.09	***
Parity 2			0.66		0.53	*
<b>In cohabitation</b>						
No child, no pregnancy			2.96	***	2.93	***
No child, 1 <sup>st</sup> pregnancy			13.03	***	13.04	***
Parity 1			0.98		0.99	
Parity one, pregnant			0.85		0.82	
Parity 2			0.52	**	0.53	**

**Table B12:** Transition to first marriage. Relative risks. Social Capital Survey data.  
(Models 4, 5 and 6)

(continued)

	Model 4		Model 5		Model 6	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Number of Siblings</i>						
0					1.00	
1 (ref)					1	
2					1.01	
3 +					0.96	
<i>Place of residence (till age 15)</i>						
Urban (ref)					1	
Rural					1.16	***
<i>Level of religiosity</i>						
Religious					1.00	
Not religious (ref)					1	
Log-likelihood	-11760.74		-10108.36		-10095.14	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B13:** Transition to direct marriage. Relative risks. Social Capital Survey data.  
(Models 1, 2 and 3)

	Model 1		Model 2		Model 3	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-7.607	***	-7.617	***	-7.743	***
<i>Age (baseline)</i>						
13-16 years (slope)	1.112	***	1.118	***	1.131	***
17-19 years (slope)	0.710	***	0.734	***	0.741	***
20-22 years (slope)	-0.034		0.015		0.021	
23-25 years (slope)	-0.028		0.031		0.036	
26-28 years (slope)	-0.075		-0.071		-0.072	
28 + years (slope)	-0.148	*	-0.105		-0.105	
<i>Calendar year</i>						
< 1990 (slope)			0.0806	**	0.084	***
1991 – 1995 (slope)			-0.157	***	-0.160	***
1996 – 1997 (slope)			0.032		0.032	
1998 – 2000 (slope)			0.002		-0.003	
> 2000 (slope)			-0.235	***	-0.239	***
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)					1	
Turks					1.54	***
Roma					1.97	***
Other					1.18	
Log-likelihood	-10065.38		-9987.21		-9961.36	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B14:** Transition to direct marriage. Relative risks. Social Capital survey data.  
(Models 4, 5 and 6)

	Model 4		Model 5		Model 6	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-6.603	***	-6.858	***	-6.904	***
<i>Age (baseline)</i>						
13-16 years (slope)	1.129	***	1.108	***	1.111	***
17-19 years (slope)	0.459	***	0.337	***	0.333	***
20-22 years (slope)	0.046		0.047		0.049	
23-25 years (slope)	-0.035		-0.004		-0.004	
26-28 years (slope)	-0.082		-0.096		-0.095	
28 + years (slope)	-0.102		-0.045		-0.045	
<i>Calendar year</i>						
< 1990 (slope)	0.073	**	0.043		0.043	
1991 – 1995 (slope)	-0.149	***	-0.113	***	-0.112	***
1996 – 1997 (slope)	0.040		0.068		0.070	
1998 – 2000 (slope)	-0.026		-0.058		-0.057	
> 2000 (slope)	-0.250	***	-0.134	*	-0.132	*
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)	1		1		1	
Turks	1.39	***	1.43	***	1.34	***
Roma	1.65	***	1.52	***	1.49	***
Other	1.07		0.95		0.90	
<i>Education level</i>						
Primary	0.74	***	0.71	***	0.68	***
Secondary (ref)	1		1		1	
High	0.99		1.09		1.10	
<i>Education enrolment</i>						
Out of education (ref)	1		1		1	
In education	0.38	***	0.54	***	0.56	***
<i>Motherhood status</i>						
No child, no pregnancy (ref)			1		1	
No child, 1 <sup>st</sup> pregnancy			21.84	***	21.55	***
Parity 1			1.71	***	1.68	***
Parity one, pregnant			3.10	***	3.01	***
Parity 2			0.53	*	0.50	*
<i>Number of Siblings</i>						
0					1.07	
1 (ref)					1	
2					1.07	
3 +					1.05	
<i>Place of residence (till age 15)</i>						
Urban (ref)					1	
Rural					1.15	***

**Table B14:** Transition to direct marriage. Relative risks. Social Capital survey data.  
(Models 4, 5 and 6)

(continued)

	Model 4		Model 5		Model 6	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Level of religiosity</i>						
Religious					0.98	
Not religious (ref)					1	
Log-likelihood	-9801.46		-8371.64		-8366.83	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B15:** Relative risk of direct marriage. Effect of ethnic group and period. Bulgarians and period before 1990 as a reference group. Social Capital Survey data

Period	Ethnic group							
	Bulgarians		Turks		Roma		Other	
1985-1989	1		1.46	**	3.42	***	1.18	
1990 – 1994	0.83	**	0.97		0.77		0.62	**
1995 – 1997	0.61	***	1.07		1.01		0.60	
>= 1998	0.51	***	0.63	***	0.54	**	0.52	**

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B16:** Transition to first cohabitation. Relative risks. Social Capital Survey data.  
(Models 1, 2 and 3)

	Model 1		Model 2		Model 3	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-5.4063	***	-6.0075	***	-6.410	***
<i>Age (baseline)</i>						
13-16 years (slope)	0.4672	***	0.3386	***	0.389	***
17-19 years (slope)	0.2762	***	0.2045	***	0.255	***
20-22 years (slope)	-0.0193		-0.0692		-0.044	
23-25 years (slope)	0.0737		0.0335		0.052	
26-28 years (slope)	-0.1266		-0.1642	*	-0.163	*
29-31 years (slope)	-0.2424		-0.2916		-0.314	*
31 + years (slope)	0.1662		0.2137		0.255	
<i>Calendar year</i>						
< 1990 (slope)			0.1658	***	0.161	***
1991 – 1995 (slope)			0.0272		0.009	
1996 – 1997 (slope)			0.1559	**	0.153	**
1998 – 2000 (slope)			0.1858	***	0.167	***
> 2000 (slope)			-0.1041		-0.120	*
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)					1	
Turks					2.05	***
Roma					6.41	***
Other					2.06	***
Log-likelihood	-6021.29		-5943.65		-5792.29	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B17:** Transition to first cohabitation. Relative risks. Social Capital survey data.  
(Models 4, 5 and 6)

	Model 4		Model 5		Model 6	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-5.399	***	-5.524	***	-5.706	***
<i>Age (baseline)</i>						
13-16 years (slope)	0.312	***	0.299	***	0.312	***
17-19 years (slope)	0.122	**	0.113	**	0.104	**
20-22 years (slope)	-0.009		0.006		-0.001	
23-25 years (slope)	0.021		0.052		0.065	
26-28 years (slope)	-0.178	*	-0.162	*	-0.154	
29-31 years (slope)	-0.300		-0.271		-0.277	
31 + years (slope)	0.226		0.220		0.234	
<i>Calendar year</i>						
< 1990 (slope)	0.144	***	0.135	***	0.141	***
1991 – 1995 (slope)	0.014		0.023		0.028	
1996 – 1997 (slope)	0.163	**	0.166	**	0.163	**
1998 – 2000 (slope)	0.141	***	0.125	***	0.137	***
> 2000 (slope)	-0.132	*	-0.086		-0.086	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)	1		1		1	
Turks	1.44	***	1.49	***	1.13	
Roma	3.56	***	3.43	***	2.60	***
Other	1.67	***	1.64	***	1.26	*
<i>Education level</i>						
Primary	1.22	**	1.26	**	1.04	
Secondary (ref)	1		1		1	
High	0.66	***	0.63	***	0.66	***
<i>Education enrolment</i>						
Out of education (ref)	1		1		1	
In education	0.31	***	0.35	***	0.41	***
<i>Motherhood status</i>						
No child, no pregnancy (ref)			1		1	
No child, 1 <sup>st</sup> pregnancy			5.75	***	5.42	***
Parity 1			0.75		0.68	**
Parity one, pregnant			0.91		0.80	
Parity 2			0.21	**	0.18	***
<i>Number of Siblings</i>						
0					0.84	
1 (ref)					1	
2					1.47	***
3 +					1.97	***
<i>Place of residence (till age 15)</i>						
Urban (ref)					1	
Rural					1.41	***

**Table B17:** Transition to first cohabitation. Relative risks. Social Capital survey data.  
(Models 4, 5 and 6)

(continued)

	Model 4		Model 5		Model 6	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Level of religiosity</i>						
Religious					0.94	
Not religious (ref)					1	
Log-likelihood	-5703.59		-5566.10		-5527.04	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B18:** Relative risk of cohabitation. Effect of ethnic group and period. Bulgarians and period before 1990 as a reference group. Social Capital Survey data

Period	Ethnic group						
	Bulgarians		Turks		Roma		Other
1985-1989	1		1.58		4.61	***	2.33 *
1990 – 1994	1.66	***	1.80	**	4.84	***	1.09
1995 – 1997	2.31	***	2.63	***	6.63	***	2.84 **
>= 1998	3.02	***	3.36	***	6.42	***	4.02 ***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B19:** Relative risk of cohabitation. Effect of Education level and period. Secondary education and period before 1990 as a reference group. Social Capital Survey data

Period	Education level				
	Primary		Secondary		High
1985-1989	0.75		1		2.08
1990 – 1994	1.06		1.12		0.42
1995 – 1997	1.49		1.53	**	1.17 *
>= 1998	1.93		1.87	***	1.26 ***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B20:** Transition from cohabitation to marriage. Relative risks. Social Capital Survey data. (Models 1, 2 and 3)

	Model 1		Model 2		Model 3	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-1.723	***	-3.582	**	-2.825	*
<i>Time since start of cohabitation (baseline)</i>						
0-3 months	4.621	***	4.745	***	4.793	***
3-6 months	-1.802		-1.758		-1.648	
6-9 months	-3.535	**	-3.539	**	-3.472	**
9-12 months	0.872		0.955		0.978	
12-24 months	-0.643	***	-0.760	***	-0.641	***
24 + months	-0.257	***	-0.289	***	-0.231	***
<i>Calendar year</i>						
< 1990 (slope)			-0.177	*	-0.163	*
1991 – 1995 (slope)			-0.123	**	-0.125	**
1996 – 1997 (slope)			-0.211	*	-0.188	
1998 – 2000 (slope)			0.085		0.066	
> 2000 (slope)			-0.168		-0.162	
<i>Age</i>						
13-16 years (slope)			0.361		0.295	
17-19 years (slope)			0.664	***	0.517	***
20-22 years (slope)			0.056		0.028	
23-25 years (slope)			0.044		0.019	
26-28 years (slope)			-0.039		-0.042	
28 + years (slope)			0.037		0.024	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)					1	
Turks					0.46	***
Roma					0.25	***
Other					1.00	
Log-likelihood	-1768.57		-1697.73		-1667.60	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table B21:** Transition from cohabitation to marriage. Relative risks. Social Capital survey data. (Models 4, 5 and 6)

	Model 4		Model 5		Model 6	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-2.579		-3.257	**	-3.236	**
<i>Time since start of cohabitation (baseline)</i>						
0-3 months	4.783	***	4.797	***	4.806	***
3-6 months	-1.556		-1.251		-1.232	
6-9 months	-3.449	**	-2.814	*	-2.783	*
9-12 months	0.100		0.875		0.913	
12-24 months	-0.573	**	-0.283		-0.296	
24 + months	-0.186	***	-0.117	*	-0.121	*
<i>Calendar year</i>						
< 1990 (slope)	-0.156	*	-0.145		-0.157	
1991 – 1995 (slope)	-0.109	**	-0.108	*	-0.100	*
1996 – 1997 (slope)	-0.214	*	-0.157		-0.162	
1998 – 2000 (slope)	0.064		0.031		0.024	
> 2000 (slope)	-0.166		-0.153		-0.146	
<i>Age (baseline)</i>						
13-16 years (slope)	0.386		0.384		0.378	
17-19 years (slope)	0.358	***	0.373	***	0.370	***
20-22 years (slope)	-0.011		0.025		0.028	
23-25 years (slope)	-0.019		-0.030		-0.032	
26-28 years (slope)	-0.041		-0.048		-0.046	
28 + years (slope)	0.005		-0.009		-0.017	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)	1		1		1	
Turks	0.62	**	0.61	**	0.66	**
Roma	0.39	***	0.39	***	0.41	***
Other	1.10		0.96		0.97	
<i>Education level</i>						
Primary	0.49	***	0.51	***	0.54	***
Secondary (ref)	1		1		1	
High	1.38	*	1.36		1.35	
<i>Education enrolment</i>						
Out of education (ref)	1		1		1	
In education	1.03		1.18		1.17	
<i>Motherhood status</i>						
No child, no pregnancy (ref)			1		1	
No child, 1 <sup>st</sup> pregnancy			4.01	***	4.05	***
Parity 1			0.52	***	0.53	***
Parity one, pregnant			0.94		0.99	
Parity 2			0.63		0.68	

**Table B21:** Transition from cohabitation to marriage. Relative risks. Social Capital survey data. (Models 4, 5 and 6)**(continued)**

	Model 4		Model 5		Model 6	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Number of Siblings</i>						
0					0.81	
1 (ref)					1	
2					0.76	*
3 +					0.71	*
<i>Place of residence (till age 15)</i>						
Urban (ref)					1	
Rural					1.08	
<i>Level of religiosity</i>						
Religious					1.07	
Not religious (ref)					1	
Log-likelihood	-1655.78		-1560.59		-1557.09	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .



# **Appendix C**

**(to Chapter 5)**

**Table C1:** Transition to first birth. Relative risks. Census data. (Models 1, 2 and 3)

	Model 1		Model 2		Model 3	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-5.793	***	-5.826	***	-5.981	***
<i>Age (baseline)</i>						
13-16 years (slope)	0.759	***	0.768	***	0.780	***
17-19 years (slope)	0.571	***	0.571	***	0.595	***
20-22 years (slope)	0.056	***	0.069	***	0.079	***
23-25 years (slope)	-0.092	***	-0.077	***	-0.073	***
26-28 years (slope)	-0.036		-0.031		-0.033	
29-31 years (slope)	-0.157	***	-0.169	***	-0.167	***
31 + years (slope)	-0.094	***	-0.062	**	-0.060	**
<i>Calendar year</i>						
1964 – 1970 (slope)			-0.025		-0.031	
1971 – 1975 (slope)			0.057	*	0.051	*
1976 - 1980 (slope)			0.002		0.001	
1981 - 1985 (slope)			-0.003		-0.001	
1986 – 1990 (slope)			0.016		0.014	
1991 – 1995 (slope)			-0.074	***	-0.074	***
1996 - 2001 (slope)			-0.132	***	-0.136	***
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)					1	
Turks					1.61	***
Roma					3.95	***
Other					1.06	
Log-likelihood	-17999.82		-17860.15		-17689.84	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C2:** Transition to first birth. Relative risks. Census data. (Models 4, 5 and 6)

	Model 4		Model 5		Model 6	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-5.249	***	-3.479	***	-3.492	***
<i>Age (baseline)</i>						
13-16 years (slope)	0.745	***	0.727	***	0.727	***
17-19 years (slope)	0.471	***	0.328	***	0.325	***
20-22 years (slope)	0.062	***	-0.041	*	-0.039	*
23-25 years (slope)	-0.124	***	-0.161	***	-0.160	***
26-28 years (slope)	-0.054		-0.098	**	-0.096	**
29-31 years (slope)	-0.177	***	-0.172	***	-0.171	***
31 + years (slope)	-0.066	**	-0.064	**	-0.064	**
<i>Calendar year</i>						
1964 – 1970 (slope)	-0.007		-0.017		-0.017	
1971 – 1975 (slope)	0.060	**	0.046		0.046	
1976 - 1980 (slope)	-0.002		0.012		0.012	
1981 - 1985 (slope)	0.003		0.007		0.007	
1986 – 1990 (slope)	0.012		0.011		0.010	
1991 – 1995 (slope)	-0.067	***	-0.037	**	-0.036	**
1996 - 2001 (slope)	-0.139	***	-0.112	***	-0.113	***
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)	1		1		1	
Turks	1.04		1.00		0.96	
Roma	2.14	***	2.25	***	2.15	***
Other	0.86		0.87		0.85	*
<i>Education level</i>						
Primary	1.16	***	1.03		1.00	
Secondary (ref)	1		1		1	
High	0.87	**	1.07		1.08	
<i>Education enrolment</i>						
Out of education (ref)	1		1		1	
In education	0.32	***	0.47	***	0.48	***
<i>Civil status</i>						
Single			0.14	***	0.14	***
Married (ref)			1		1	
Widowed/Divorced			0.25	***	0.25	***
<i>Number of Siblings</i>						
0					0.96	
1 (ref)					1	
2					1.04	
3 +					1.12	**
<i>Place of residence (till age 15)</i>						
Village					0.98	
Small town					1.01	
Big town (ref)					1	
Capital					0.82	***

**Table C2:** Transition to first birth. Relative risks. Census data. (Models 4, 5 and 6)**(continued)**

	Model 4		Model 5		Model 6	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Level of religiosity</i>						
Deeply					1.01	
Some (ref)					1	
Not much					1.09	**
Not at all					0.98	
Log-likelihood	-17319.41		-15933.20		-15922.59	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C3:** Relative risk of first birth. Effect of ethnic group and period. Bulgarians and period before 1975 as a reference group. Census data

Period	Ethnic group							
	Bulgarians	Turks	Roma	Other				
<= 1975	1	0.82	1.29	0.96				
1976 - 1980	1.01	0.92	1.38	*	0.86			
1981 - 1985	1.00	1.06	2.09	***	0.89			
1986 - 1990	1.07	0.91	2.40	***	0.92			
1991 - 1995	0.87	*	0.95	3.14	***	0.81		
1996-1997	0.70	***	0.85	1.91	**	0.22	**	
>= 1998	0.46	***	0.62	***	2.04	***	0.57	*

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C4:** Relative risk of first birth. Effect of education level and period. Secondary education and period before 1975 as a reference group. Census data

Period	Education level					
	Primary	Secondary	High			
<= 1975	0.81	1	1.72	**		
1976 - 1980	0.84	0.98	0.91	*		
1981 - 1985	0.93	0.97	1.03			
1986 - 1990	0.96	1.01	1.10			
1991 - 1995	1.01	0.81	**	0.92		
1996 - 1997	0.72	0.63	***	0.82	**	
>= 1998	0.64	***	0.43	***	0.47	***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C5:** Relative risk of first birth. Effects of marital status and education level. Married and secondary education as a reference group. Census data

Education level	Marital status				
	Single	Married	Widowed/divorced		
Primary	0.14	***	1.06	0.30	***
Secondary	0.15	***	1	0.20	***
High	0.16	***	1.08	0.32	***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C6:** Relative risk of first birth. Effect of number of siblings and period. Having one sibling and period before 1990 as a reference group. Census data

Period	Number of siblings			
	none	one	two	three or more
Till 1989	0.88 *	1	0.97	1.05
Since 1990	0.79 **	0.70 ***	0.81 ***	0.87 **

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C7:** Relative risk of first birth. Effect of residence place and period. Big town and period before 1990 as a reference group. Census data

Period	Place of residence			
	Village	Small town	Big town	Capital
Till 1989	0.82 ***	0.93	1	0.66 ***
Since 1990	0.76 ***	0.64 ***	0.57 ***	0.67 ***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C8:** Relative risk of first birth. Effect of level of religiosity and period. Religious to some extent and period before 1990 as a reference group. Census data

Period	Level of religiosity			
	Deeply religious	To some extent	Not much	Not at all
Till 1989	1.01	1	1.07 *	0.96
Since 1990	0.76 ***	0.74 ***	0.84 ***	0.77 ***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C9:** Transition to first birth. Relative risks. Social Capital Survey data. (Models 1, 2 and 3)

	Model 1		Model 2		Model 3	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-6.167	***	-6.299	***	-6.543	***
<i>Age (baseline)</i>						
13-16 years (slope)	0.844	***	0.826	***	0.841	***
17-19 years (slope)	0.528	***	0.532	***	0.554	***
20-22 years (slope)	-0.002		0.016		0.031	
23-25 years (slope)	-0.027		0.006		0.021	
26-28 years (slope)	0.009		0.005		0.004	
29+ years (slope)	-0.145	**	-0.127	**	-0.133	**
<i>Calendar year</i>						
1985 – 1990 (slope)			0.093	***	0.093	***
1991 – 1993 (slope)			-0.057	*	-0.057	*
1994 – 1995 (slope)			-0.188	***	-0.202	***
1996 – 1997 (slope)			0.016		0.016	
1998 – 2000 (slope)			0.116	***	0.107	***
2001 – 2002 (slope)			-0.281	***	-0.285	***
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)					1	
Turks					2.06	***
Roma					3.57	***
Other					1.49	***
Log-likelihood	-13434.05		-13388.18		-13230.88	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C10:** Transition to first birth. Relative risks. Social Capital Survey data. (Models 4, 5 and 6)

	Model 4		Model 5		Model 6	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-5.394	***	-5.489	***	-5.537	***
<i>Age (baseline)</i>						
13-16 years (slope)	0.776	***	0.709	***	0.707	***
17-19 years (slope)	0.356	***	0.233	***	0.227	***
20-22 years (slope)	0.065	**	-0.062	**	-0.063	**
23-25 years (slope)	-0.043		-0.082	**	-0.078	**
26-28 years (slope)	-0.009		-0.047		-0.047	
29+ years (slope)	-0.127	**	-0.102		-0.103	
<i>Calendar year</i>						
1985 – 1990 (slope)	0.076	**	0.044		0.048	
1991 – 1993 (slope)	-0.053		-0.049		-0.048	
1994 – 1995 (slope)	-0.182	***	-0.129	**	-0.128	**
1996 – 1997 (slope)	0.022		0.000		0.005	
1998 – 2000 (slope)	0.083	**	0.059	*	0.058	*
2001 – 2002 (slope)	-0.299	***	-0.238	***	-0.235	***
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)	1		1		1	
Turks	1.51	***	1.33	***	1.19	***
Roma	2.16	***	1.48	***	1.33	***
Other	1.22		1.22		1.09	
<i>Education level</i>						
Primary	1.10		0.99		0.90	*
Secondary (ref)	1		1		1	
High	0.86	*	0.94		0.96	
<i>Education enrolment</i>						
Out of education (ref)	1		1		1	
In education	0.28	***	0.44	***	0.46	***
<i>Union status</i>						
Single			0.09		0.09	
Cohabiting			0.68	***	0.66	***
Married directly (ref)			1	***	1	***
Married after cohabitation			1.24	***	1.21	**
<i>Number of Siblings</i>						
0					0.95	
1 (ref)					1	
2					1.22	***
3 +					1.31	***
<i>Place of residence (till age 15)</i>						
Urban (ref)					1	
Rural					1.13	**

**Table C10:** Transition to first birth. Relative risks. Social Capital Survey data.  
(Models 4, 5 and 6)

(continued)

	Model 4		Model 5		Model 6	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Level of religiosity</i>						
Religious					0.99	
Not religious (ref)					1	
Log-likelihood	-12954.34		-11472.73		-11456.91	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C11:** Relative risk of first birth. Effect of ethnic group and period. Bulgarians and period before 1989 as a reference group. Social Capital Survey data

Period	Ethnic group				
	Bulgarians	Turks	Roma	Other	
1985 – 1989	1	1.40 **	1.05	1.26	
1990 – 1994	0.87 *	0.95	1.03	0.54 **	
1995-1997	0.64 ***	0.75 **	1.02	1.32	
>= 1998	0.59 ***	0.70 ***	0.90	0.70	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C 12.** Relative risk of first birth. Effect of education level and period. Secondary education and period before 1989 as a reference group. Social Capital Survey data

Period	Education level		
	Primary	Secondary	High
1985 – 1989	0.72	1	0.79 ***
1990 – 1994	0.58 *	0.80 **	0.71 ***
1995 – 1997	0.56 ***	0.56 ***	0.60 ***
>= 1998	0.56 ***	0.50 ***	0.49 ***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C13:** Transition to direct marriage. Relative risks. Social Capital survey data. Results from the simultaneous equations model

	Spline gradient	Sig.
<i>Constant (baseline)</i>	-9.733	***
<i>Age (baseline)</i>		
13-16 years (slope)	1.360	***
17-19 years (slope)	1.049	***
20-22 years (slope)	0.537	***
23-25 years (slope)	0.282	***
26-28 years (slope)	0.001	
28 + years (slope)	-0.024	
<i>Calendar year</i>		
< 1990 (slope)	0.110	**
1991 – 1995 (slope)	-0.149	***
1996 – 1997 (slope)	-0.082	
1998 – 2000 (slope)	-0.023	
> 2000 (slope)	-0.250	***
	Relative risk	Sig.
<i>Ethnic group</i>		
Bulgarians (ref)	1	
Turks	1.80	***
Roma	5.54	***
Other	1.79	**
<i>Education level</i>		
Primary	1.22	**
Secondary (ref)	1	
High	0.71	***
<i>Education enrolment</i>		
Out of education (ref)	1	
In education	0.27	***
<i>Number of Siblings</i>		
0	0.97	
1 (ref)	1	
2	1.39	***
3 +	1.97	***
<i>Place of residence (till age 15)</i>		
Urban (ref)	1	
Rural	1.10	
<i>Level of religiosity</i>		
Religious	0.90	*
Not religious (ref)	1	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C14:** Transition to first cohabitation. Relative risks. Social Capital survey data  
Results from the simultaneous equations model

	Spline gradient	Sig.
<i>Constant (baseline)</i>	-9.186	***
<i>Age (baseline)</i>		
13-16 years (slope)	0.701	***
17-19 years (slope)	0.765	***
20-22 years (slope)	0.458	***
23-25 years (slope)	0.344	***
26-28 years (slope)	-0.081	
29-31 years (slope)	-0.180	
31 + years (slope)	0.207	
<i>Calendar year</i>		
< 1990 (slope)	0.184	***
1991 – 1995 (slope)	0.011	
1996 – 1997 (slope)	0.020	
1998 – 2000 (slope)	0.155	***
> 2000 (slope)	-0.144	*
	Relative risk	Sig.
<i>Ethnic group</i>		
Bulgarians (ref)	1	
Turks	1.52	***
Roma	8.28	***
Other	2.64	***
<i>Education level</i>		
Primary	1.81	***
Secondary (ref)	1	
High	0.51	***
<i>Education enrolment</i>		
Out of education (ref)	1	
In education	0.31	***
<i>Number of Siblings</i>		
0	0.77	*
1 (ref)	1	
2	1.76	***
3 +	3.62	***
<i>Place of residence (till age 15)</i>		
Urban (ref)	1	
Rural	1.21	**
<i>Level of religiosity</i>		
Religious	0.89	
Not religious (ref)	1	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table C15:** Transition to first birth. Relative risks. Social Capital Survey data  
Results from the simultaneous equations model

	Spline gradient	Sig.
<i>Constant (baseline)</i>	-10.169	***
<i>Age (baseline)</i>		
13-16 years (slope)	1.203	***
17-19 years (slope)	1.188	***
20-22 years (slope)	0.618	***
23-25 years (slope)	0.432	***
26-28 years (slope)	0.224	***
29+ years (slope)	0.014	
<i>Calendar year</i>		
1985 – 1990 (slope)	0.109	**
1991 – 1993 (slope)	-0.018	
1994 - 1995 (slope)	-0.292	***
1996 – 1997 (slope)	-0.091	
1998 - 2000 (slope)	0.053	
2001 - 2002 (slope)	-0.325	***
	Relative risk	Sig.
<i>Ethnic group</i>		
Bulgarians (ref)	1	
Turks	2.14	***
Roma	7.22	***
Other	2.10	***
<i>Education level</i>		
Primary	2.00	***
Secondary (ref)	1	
High	0.41	***
<i>Education enrolment</i>		
Out of education (ref)	1	
In education	0.21	***
<i>Number of Siblings</i>		
0	0.84	
1 (ref)	1	
2	1.73	***
3 +	2.81	***
<i>Place of residence (till age 15)</i>		
Urban (ref)	1	
Rural	1.04	
<i>Level of religiosity</i>		
Religious	0.92	
Not religious (ref)	1	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .



# **Appendix D**

**(to Chapter 6)**

**Table D1:** Transition to second conception. Relative risks. Census data. (Models 1, 2 and 3)

	Model 1		Model 2		Model 3	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-2.902	***	-5.461	***	-5.580	***
<i>Time since first birth (years)</i>						
0-1	1.492	***	1.672	***	1.644	***
1-2	-0.205	**	-0.009		-0.018	
2-3	-0.040		0.113		0.109	
3-5	-0.272	***	-0.140	**	-0.138	**
5-7	-0.176	**	-0.052		-0.054	
7-9	-0.351	***	-0.221	**	-0.216	**
9+	-0.259	***	-0.105	**	-0.103	**
<i>Calendar year</i>						
1975 – 1980 (slope)			0.006		-0.005	
1981 – 1982 (slope)			-0.025		-0.026	
1983 - 1985 (slope)			-0.021		-0.022	
1986 - 1988 (slope)			0.048		0.042	
1989 – 1990 (slope)			-0.168	***	-0.167	***
1992 – 1995 (slope)			-0.102	***	-0.106	***
1996 – 1997 (slope)			0.033		0.021	
1998 – 2001 (slope)			-0.190	***	-0.191	***
<i>Age of mother at first birth</i>						
13-16 years (slope)			1.244	*	1.146	
17-19 years (slope)			-0.217	***	-0.132	**
20-22 years (slope)			-0.175	***	-0.118	***
23-25 years (slope)			-0.068	**	-0.064	**
26-28 years (slope)			-0.034		-0.020	
28 + years (slope)			-0.119	***	-0.118	***
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)					1	
Turks					1.56	***
Roma					2.14	***
Other					1.69	***
Log-likelihood	-9874.51		-9589.26		-9538.25	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table D2:** Transition to second conception. Relative risks. Census data. (Models 4, 5 and 6)

	Model 4		Model 5		Model 6	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-5.676	***	-5.366	**	-5.528	***
<i>Time since first birth (years)</i>						
0-1	1.613	***	1.625	***	1.627	***
1-2	-0.037		-0.026		-0.023	
2-3	0.090		0.109		0.109	
3-5	-0.152	**	-0.138	**	-0.138	**
5-7	-0.057		-0.049		-0.047	
7-9	-0.215	**	-0.191	**	-0.194	**
9+	-0.098	*	-0.094	*	-0.091	*
<i>Calendar year</i>						
1975 – 1980 (slope)	-0.002		-0.003		0.001	
1981 – 1982 (slope)	-0.026		-0.029		-0.021	
1983 - 1985 (slope)	-0.015		-0.011		-0.014	
1986 - 1988 (slope)	0.047		0.049		0.058	
1989 – 1990 (slope)	-0.167	***	-0.165	***	-0.170	***
1992 – 1995 (slope)	-0.111	***	-0.106	***	-0.103	***
1996 – 1997 (slope)	0.018		0.018		0.023	
1998 – 2001 (slope)	-0.195	***	-0.200	***	-0.197	***
<i>Age of mother at first birth</i>						
13-16 years (slope)	1.103		1.032		1.019	
17-19 years (slope)	-0.108	*	-0.134	**	-0.140	**
20-22 years (slope)	-0.060		-0.067	*	-0.072	*
23-25 years (slope)	-0.053	*	-0.059	*	-0.054	*
26-28 years (slope)	-0.015		-0.013		-0.012	
28 + years (slope)	-0.121	***	-0.124	***	-0.126	***
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)	1		1		1	
Turks	1.19	**	1.19	**	1.06	
Roma	1.53	***	1.62	***	1.41	***
Other	1.52	***	1.53	***	1.37	***
<i>Education level</i>						
Primary	1.59	***	1.53	***	1.49	***
Secondary (ref)	1		1		1	
High	0.97		0.97		1.03	
<i>Education enrolment</i>						
Out of education (ref)	1		1		1	
In education	0.68	***	0.67	***	0.71	***
<i>Marital status</i>						
Single			0.75	***	0.74	***
Married (ref)			1		1	
Widowed/Divorced			0.37	***	0.38	***

**Table D2:** Transition to second conception. Relative risks. Census data. (Models 4, 5 and 6)**(continued)**

	Model 4		Model 5		Model 6	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Number of Siblings</i>						
0					0.91	
1 (ref)					1	
2					1.16	**
3 +					1.35	***
<i>Place of residence (till age 15)</i>						
Village					1.25	***
Small town					1.20	***
Big town (ref)					1	
Capital					0.99	
<i>Level of religiosity</i>						
Deeply					1.03	
Some (ref)					1	
Not much					0.98	
Not at all					0.99	
Log-likelihood	-9501.16		-9471.53		-9449.83	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table D3:** Relative risk of second conception. Effect of ethnic group and period. Bulgarians and period before 1990 as a reference group.

Period	Ethnic group			
	Bulgarians	Turks	Roma	Other
<1985	1	1.11	1.36 *	1.40
1985 – 1989	1.02	0.84	1.58 **	1.11
1990 – 1994	0.57 ***	0.72 **	0.92	0.98
>= 1995	0.33 ***	0.43 ***	0.45 ***	0.53 **

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table D4:** Relative risk of second conception. Effect of education level and period. Secondary education and period before 1990 as a reference group.

Period	Education level		
	Primary	Secondary	High
<1985	1.37 ***	1.00	0.91
1985 – 1989	1.28 **	0.95	0.99
1990 – 1994	0.92	0.56 ***	0.53 ***
>= 1995	0.54 ***	0.28 ***	0.38 ***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table D5:** Relative risk of second conception. Effect of number of siblings and period. Having one sibling and period before 1990 as a reference group. Census data

Period	Number of siblings							
	none		one		two		three or more	
Till 1989	0.90		1		1.13		1.17	*
Since 1990	0.40	***	0.41	***	0.51	***	0.78	**

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table D6:** Relative risk of second conception. Effect of residence place and period. Big town and period before 1990 as a reference group. Census data

Period	Place of residence							
	Village		Small town		Big town		Capital	
Till 1989	1.22	**	1.24	**	1		0.87	
Since 1990	0.58	***	0.52	***	0.45	***	0.53	***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table D7:** Relative risk of second conception. Effect of level of religiosity and period. Religious to some extent and period before 1990 as a reference group. Census data

Period	Level of religiosity							
	Deeply religious		To some extent		Not much		Not at all	
Till 1989	1.42	***	1		0.66	***	1.48	***
Since 1990	0.79	**	1.46	***	1.00		0.65	***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table D8:** Transition to second conception. Relative risks. Social Capital Survey data. (Models 1, 2 and 3)

	Model 1		Model 2		Model 3	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-3.145	***	-1.942	***	-2.378	***
<i>Time since first birth (years)</i>						
0-1	1.146	***	1.448	***	1.394	***
1-3	-0.080		0.138	**	0.112	*
3-5	-0.027		0.067		0.063	
5-9	-0.174	***	-0.124	**	-0.125	**
9+	-0.226		-0.181		-0.188	
<i>Calendar year</i>						
1988 – 1990 (slope)			0.091		0.095	
1991 – 1992 (slope)			-0.185	**	-0.197	**
1993 - 1995 (slope)			-0.104	*	-0.111	*
1996 – 1997 (slope)			-0.115		-0.132	*
1998 - 2000 (slope)			0.082	*	0.077	
2001 - 2002 (slope)			-0.171	**	-0.180	**
<i>Age (baseline)</i>						
16-18 years (slope)			-0.107		-0.011	
19-20 years (slope)			-0.351	***	-0.253	***
21-22 years (slope)			-0.263	***	-0.227	***
23-24 years (slope)			-0.006		0.027	
25+ years (slope)			-0.040	*	-0.028	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)					1	
Turks					1.36	***
Roma					2.23	***
Other					1.21	
Log-likelihood	-5266.84		-5146.60		-5119.90	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table D9:** Transition to second conception. Relative risks. Social Capital Survey data. (Models 4, 5 and 6)

	Model 4		Model 5		Model 6	
	Spline gradient	Sig.	Spline gradient	Sig.	Spline gradient	Sig.
<i>Constant (baseline)</i>	-2.548	***	-3.186	***	-3.304	***
<i>Time since first birth (years)</i>						
0-1	1.373	***	1.363	***	1.378	***
1-3	0.085		0.099		0.103	
3-5	0.039		0.055		0.057	
5-9	-0.135	**	-0.124	**	-0.123	**
9+	-0.212		-0.217		-0.206	
<i>Calendar year</i>						
1988 – 1990 (slope)	0.105		0.086		0.103	
1991 – 1992 (slope)	-0.214	**	-0.232	**	-0.233	**
1993 - 1995 (slope)	-0.114	**	-0.115	**	-0.121	**
1996 – 1997 (slope)	-0.148	*	-0.152	**	-0.150	**
1998 - 2000 (slope)	0.073		0.075		0.080	
2001 - 2002 (slope)	-0.181	**	-0.188	***	-0.184	***
<i>Age of the mother at first birth</i>						
16-18 years (slope)	-0.017		0.003		-0.017	
19-20 years (slope)	-0.174	*	-0.151	*	-0.150	*
21-22 years (slope)	-0.181	**	-0.177	**	-0.179	**
23-24 years (slope)	0.059		0.054		0.056	
25+ years (slope)	-0.012		-0.015		-0.016	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Ethnic group</i>						
Bulgarians (ref)	1		1		1	
Turks	1.01		1.02		0.88	
Roma	1.60	***	1.56	***	1.33	**
Other	1.07		1.02		0.95	
<i>Education level</i>						
Primary	1.65	***	1.63	***	1.45	***
Secondary (ref)	1		1		1	
High	0.92		0.93		0.96	
<i>Education enrolment</i>						
Out of education (ref)	1		1		1	
In education	0.58	***	0.58	***	0.62	***
<i>Union status</i>						
Single (ref)			1		1	
cohabiting			2.30	***	2.31	***
Married directly			1.88	***	1.91	***
Married after cohabitation			2.22	***	2.19	***
<i>Number of Siblings</i>						
0					0.83	
1 (ref)					1	
2					1.38	***
3 +					1.42	***

**Table D9:** Transition to second conception. Relative risks. Social Capital Survey data. (Models 4, 5 and 6)**(continued)**

	Model 4		Model 5		Model 6	
	Relative risk	Sig.	Relative risk	Sig.	Relative risk	Sig.
<i>Place of residence (till age 15)</i>						
Urban (ref)					1	
Rural					1.14	*
<i>Level of religiosity</i>						
Religious					1.03	
Not religious (ref)					1	
Log-likelihood	-5099.72		-5078.74		-5063.64	

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table D10:** Relative risk of second conception. Effect of ethnic group and period. Bulgarians and period before 1990 as a reference group.

Period	Ethnic group							
	Bulgarians		Turks		Roma		Other	
<1990	1		0.74		0.84		1.35	
1990 – 1994	0.51	***	0.64	**	0.77		0.47	*
1995 – 1997	0.35	***	0.26	***	0.49	***	0.40	
>= 1998	0.27	***	0.22	***	0.41	***	0.18	***

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table D11:** Relative risk of second conception. Effect of education level and period. Secondary education and period before 1990 as a reference group.

Period	Education level							
	Primary		Secondary		High			
<1990	1.12		1		0.51			
1990 – 1994	0.85		0.50	***	0.40	***		
1995 - 1997	0.42	***	0.36	***	0.32	***		
>= 1998	0.40	***	0.25	***	0.26	***		

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table D12:** Transition to first and second conception as joint models. Relative risks.

Census data

Transition to first conception			Transition to second conception		
	Spline gradient	Sig.		Spline gradient	Sig.
<i>Constant (baseline)</i>	-3.698	***	<i>Constant (baseline)</i>	-6.585	***
<i>Age (baseline)</i>			<i>Time since first birth (years)</i>		
13-16 years (slope)	0.718	***	0-1 (slope)	1.863	***
17-19 years (slope)	0.449	***	1-2 (slope)	0.214	**
20-22 years (slope)	0.093	***	2-3 (slope)	0.279	***
23-25 years (slope)	-0.075	**	3-5 (slope)	-0.018	
26-28 years (slope)	-0.033		5-7 (slope)	0.046	
29-31 years (slope)	-0.125	**	7-9 (slope)	-0.119	
31 + years (slope)	-0.051	*	9+ (slope)	-0.029	
<i>Calendar year</i>			<i>Calendar year</i>		
1964 – 1970 (slope)	-0.041		1975 – 1980 (slope)	0.027	
1971 – 1975 (slope)	0.056		1981 – 1982 (slope)	-0.012	
1976 - 1980 (slope)	0.017		1983 - 1985 (slope)	-0.021	
1981 - 1985 (slope)	0.014		1986 - 1988 (slope)	0.056	
1986 – 1990 (slope)	0.021		1989 – 1990 (slope)	-0.190	***
1991 – 1995 (slope)	-0.039	**	1992 – 1995 (slope)	-0.130	***
1996 - 2001 (slope)	-0.145	***	1996 – 1997 (slope)	-0.005	
			1998 – 2001 (slope)	-0.220	***
			<i>Age of mother at first birth</i>		
			13-16 years (slope)	1.128	
			17-19 years (slope)	-0.122	
			20-22 years (slope)	-0.068	
			23-25 years (slope)	-0.060	*
			26-28 years (slope)	-0.012	
			28 + years (slope)	-0.152	***
	Relative risk	Sig.		Relative risk	Sig.
<i>Ethnic group</i>					
Bulgarians (ref)	1			1	
Turks	0.87	*		1.05	
Roma	2.61	***		1.63	***
Other	0.68	***		1.45	**
<i>Education level</i>					
Primary	1.28	***		1.73	***
Secondary (ref)	1			1	
High	0.78	***		0.96	
<i>Education enrolment</i>					
Out of education (ref)	1			1	
In education	0.38	***		0.65	***
<i>Marital status</i>					
Single	0.10	***		0.71	***
Married (ref)	1			1	
Widowed/Divorced	0.28	***		0.30	***

**Table D12:** Transition to first and second conception as joint models. Relative risks.

Census data

**(continued)**

	Transition to first conception		Transition to second conception	
	Relative risk	Sig.	Relative risk	Sig.
<i>Number of Siblings</i>				
0	0.90		0.89	
1 (ref)	1		1	
2	1.12	*	1.20	**
3 +	1.22	***	1.46	***
<i>Place of residence (till age 15)</i>				
Village	1.01		1.37	***
Small town	1.03		1.28	***
Big town (ref)	1		1	
Capital	0.74	***	1.01	
<i>Level of religiosity</i>				
Deeply	1.04		1.06	
Some(ref)	1		1	
Not much	1.09		1.00	
Not at all	1.00		1.02	
<b>Sigma</b>	<b>0.87</b>	<b>***</b>		

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

**Table D13:** Transition to first and second conception as joint models. Relative risks.  
Social Capital Survey data

Transition to first conception			Transition to second conception		
	Spline gradient	Sig.		Spline gradient	Sig.
<i>Constant (baseline)</i>	-6.045	***	<i>Constant (baseline)</i>	-6.585	***
<i>Age (baseline)</i>			<i>Time since first birth (years)</i>		
13-16 years (slope)	0.693	***	0-1 (slope)	1.562	***
17-19 years (slope)	0.329	***	1-3 (slope)	0.233	***
20-22 years (slope)	0.021		3-5 (slope)	0.135	*
23-25 years (slope)	-0.016		5-9 (slope)	-0.054	
26-28 years (slope)	0.014		9+ (slope)	-0.153	
29+ years (slope)	-0.061				
<i>Calendar year</i>			<i>Calendar year</i>		
1985 – 1990 (slope)	0.044		1988 – 1990 (slope)	0.097	
1991 – 1993 (slope)	-0.029		1991 – 1992 (slope)	-0.282	***
1994 - 1995 (slope)	-0.161	***	1993 - 1995 (slope)	-0.133	**
1996 – 1997 (slope)	-0.004		1996 – 1997 (slope)	-0.174	**
1998 - 2000 (slope)	0.050		1998 - 2000 (slope)	0.067	
2001 - 2002 (slope)	-0.229	***	2001 - 2002 (slope)	-0.189	***
			<i>Age of the mother at first birth</i>		
			16-18 years (slope)	-0.013	
			19-20 years (slope)	-0.120	
			21-22 years (slope)	-0.196	**
			23-24 years (slope)	0.060	
			25+ years (slope)	-0.026	
	Relative risk	Sig.	Relative risk	Sig.	
<i>Ethnic group</i>					
Bulgarians (ref)	1		1		
Turks	1.20	**	0.84		
Roma	1.59	***	1.46	**	
Other	1.04		0.97		
<i>Education level</i>					
Primary	1.06		1.65	***	
Secondary (ref)	1		1		
High	0.75	***	0.94		
<i>Education enrolment</i>					
Out of education (ref)	1		1		
In education	0.41	***	0.57	***	
<i>Union status</i>					
Single (ref)	1		1		
Cohabiting	9.16	***	2.64	***	
Married directly	15.42	***	2.06	***	
Married after cohabitation	20.28	***	2.42	***	

**Table D13:** Transition to first and second conception as joint models. Relative risks.  
Social Capital Survey data

(continued)

	Transition to first conception		Transition to second conception	
	Relative risk	Sig.	Relative risk	Sig.
<i>Number of Siblings</i>				
0	0.95		0.84	
1 (ref)	1		1	
2	1.32	***	1.45	***
3 +	1.38	***	1.53	***
<i>Place of residence (till age 15)</i>				
Urban (ref)	1		1	
Rural	1.22	***	1.21	**
<i>Level of religiosity</i>				
Religious	0.98		1.04	
Not religious (ref)	1		1	
<b>Sigma</b>	<b>0.77</b>	<b>***</b>		

\*\*\*:  $p \leq 0.01$  \*\*:  $0.01 < p \leq 0.05$  \*:  $0.05 < p \leq 0.10$ .

## **ERKLÄRUNG**

Ich erkläre hiermit, dass ich die vorliegende Arbeit ohne unzulässige Hilfe Dritter und ohne die Benutzung anderer als der angegebenen Hilfsmittel angefertigt habe. Die aus fremden Quellen oder indirekt übernommenen Gedanken sind als solche kenntlich gemacht.

Die Arbeit wurde bisher weder im Inland noch im Ausland in gleicher oder ähnlicher Form einer anderen Prüfungsbehörde vorgelegt und ist auch noch nicht veröffentlicht.

Rostock, März, 2006

Elena N. Koytcheva

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