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# Fertility Decline in Russia in the Early and Mid 1990s: The Role of Economic Uncertainty and Labour Market Crises

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**Abstract.** This paper analyses the fertility decline in Russia during the early and mid 1990s from both a macro- and micro-perspective and presents a striking divergence between these two empirical viewpoints. While the former suggests that the fertility decline after 1989 is associated with the economic hardship accompanying the transition to a market economy, the micro-evidence using the Russian Longitudinal Monitoring Survey is to the contrary. There is no negative association between labour market uncertainty or a labour market crisis and fertility, and frequently there is even a positive association. That is, women or couples who are themselves affected by labour market crises often had a higher probability of having another child in the period 1994–1996 than women/couples who were less affected by such crises. The lack of a negative association, and the presence of a positive association in many instances, is surprising from the standpoint of economic fertility theory. It is also contrary to many explanatory theories about the recent fertility decline in Central and Eastern European countries that are built on a more or less direct connection between the labour market or an economic crisis and low fertility.

**Key words:** Russia, Eastern Europe, fertility decline, uncertainty, labour market

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**Résumé.** Cet article, qui analyse la baisse de la fécondité en Russie au début des années 1990 dans une double perspective macro et micro, présente une divergence frappante entre ces deux points de vue. Alors que le premier suggère que la baisse de la fécondité après 1989 est associée aux difficultés économiques générées par le passage à l'économie de marché, l'analyse micro, qui s'appuie sur l'enquête de surveillance longitudinale russe, arrive au résultat inverse. Il n'existe aucune association négative entre l'instabilité économique ou la crise du marché du travail et la fécondité et souvent on retrouve même une association positive. Ainsi, les femmes ou les couples qui étaient touchés par la crise du marché du travail ont souvent eu une plus grande probabilité d'avoir un autre enfant dans les années 1994–1996 que ceux qui ont été épargnés par cette crise. L'absence d'association négative ou même, dans certains cas, l'existence d'une relation positive, ne cadrent pas avec la théorie

économique de la fécondité. Elles vont aussi à l'encontre des nombreuses théories explicatives sur la baisse récente de la fécondité dans les pays d'Europe centrale et orientale qui reposent sur une relation plus ou moins directe entre crise économique et basse fécondité.

**Mots clés:** Russie, Europe de l'est, baisse de la fécondité, instabilité, marché du travail

## 1. Introduction

All countries in Central and Eastern Europe have experienced a substantial decline in fertility since the onset of the socioeconomic transition in 1989. For instance, in the period 1990–1998 the total fertility rate (*TFR*) dropped in the Russian Federation by almost 35%, in Bulgaria and the Czech Republic by 39%, and in Estonia and Latvia by more than 40%. A fertility decline of similar magnitude has occurred in many other Central and Eastern European countries (see Table I, relative changes of TFR as compared to 1990 are given in parentheses), and this change often coincides with a decline in life expectancy and a rapid aging of the population (Council of Europe, 2000; see also Kohler et al., 2001).

The ubiquity of this drastic fertility reduction in Central and Eastern Europe during the 1990s has led many observers to the conclusion that this widespread decline in fertility is inherently connected to the political and economic transformation that began in 1989. Considerable disagreement exists, however, regarding the explicit mechanisms linking this process of social, economic, and political transformation to the recent trends in fertility levels. In particular, three major arguments can be distinguished (for a related discussion, see also Philipov, 2001):

(*a*) The proponents of the "economic crisis argument" (e.g. Adler, 1997; Bodrova, 1995; Chase, 1996; Eberstadt, 1994; Heleniak, 1995; Rimashevskaya, 1997; Rutkevich, 1996; Witte and Wagner, 1995) reason that a falling income level, a rise in economic and labour-market uncertainty, and the disruption of traditional public transfer and support systems induce couples either to postpone having children (which leads temporarily to a low level of fertility) or to reduce their desired number of children (which leads to a permanently low level of fertility).

(*b*) Researchers supporting the "adjustment school" do not emphasize the economic difficulties and crises associated with the transformation process, but rather view the transformation as a convergence process towards "western" social and economic incentives for childbearing. This explanation has been proposed for the East German experience in particular (e.g. Conrad et al., 1996; Kreyenfeld, 2002; Lechner, 2001). Because fertility occurred at younger ages in East Germany, this adjustment argument implies that fertility levels in East Germany will be temporarily lower, but will then ultimately converge towards the West German levels. Similar arguments can be made for other Eastern European countries as well. Rabusic (1996), for instance, claims for the Czech Republic "that the decrease of the marriage rate and the fertility rate, and gradual increase of the age

*Table I.* Total fertility rate and mean age at first birth for selected Central and Eastern European countries (the percentages in squared parentheses give the relative change as compared to 1990)

| | Total Fertility Rate | | | Mean Age at First Birth | | |
|---|---|---|---|---|---|---|
| | 1990 | 1994 | 1998 | 1990 | 1994 | 1998 |
| Russia | 1.9 | 1.39 | 1.24 | 22.6 | 22.5 | 23.1 |
| | – | [–26.8%] | [–34.7%] | – | [–0.4%] | [+2.2%] |
| Bulgaria | 1.82 | 1.37 | 1.11 | 22.2 | 22.2 | 22.9 |
| | – | [–24.7%] | [–39.0%] | – | [+0.0%] | [+3.2%] |
| Czech Republic | 1.9 | 1.44 | 1.16 | 22.5 | 22.9 | 24.4 |
| | – | [–24.2%] | [–38.9%] | – | [+1.8%] | [+8.4%] |
| Estonia | 2.04 | 1.37 | 1.21 | 22.9 | 22.8 | 23.6 |
| | – | [–32.8%] | [–40.7%] | – | [–0.4%] | [+3.1%] |
| East Germany | 1.5 | 0.77 | 1.06 | – | – | – |
| | – | [–48.7%] | [–29.3%] | | | |
| Hungary | 1.87 | 1.65 | 1.33 | 23.1 | 23.6 | 24.5 |
| | – | [–11.8%] | [–28.9%] | – | [+2.2%] | [+6.1%] |
| Latvia | 2.01 | 1.39 | 1.1 | 23 | 23.3 | 24 |
| | – | [–30.8%] | [–45.3%] | – | [+1.3%] | [+4.3%] |
| Lithuania | 2.02 | 1.52 | 1.36 | 23.2 | 23 | 23.6 |
| | – | [–24.8%] | [–32.7%] | – | [–0.9%] | [+1.7%] |
| Poland | 2.05 | 1.81 | 1.44 | 23.3 | 23.6 | 24.2 |
| | – | [–11.7%] | [–29.8%] | – | [+1.3%] | [+3.9%] |
| Romania | 1.84 | 1.41 | 1.32 | 22.6 | 22.6 | 23.4 |
| | – | [–23.4%] | [–28.3%] | – | [+0.0%] | [+3.5%] |
| Slovenia | 1.46 | 1.32 | 1.23 | 23.7 | 24.6 | 25.8 |
| | – | [–9.6%] | [–15.8%] | – | [+3.8%] | [+8.9%] |
| Ukraine | 1.89 | 1.5 | 1.19 | – | – | – |
| | – | [–20.6%] | [–37.0%] | | | |

*Source:* Council of Europe (2000).

at first marriage and increase of illegitimacy rate are normal and even necessary characteristics of modern democratic societies" (quotation from the abstract).

(*c*) A third line of explanations for the recent fertility trends in Central and Eastern Europe attempts to separate the realms of the socioeconomic transformation and the recent demographic changes (e.g. Andreev et al., 1998; Cornia and Panicciá, 1996; Vishnevsky, 1996; Zakharov, 1999; Zakharov and Ivanova, 1996). Instead of being directly intertwined with the process of socioeconomic transformation, the demographic trends are a reflection of a second demographic transition (Lesthaeghe and Van de Kaa, 1986; Van de Kaa, 1987). In Zakharov's (1999: 308) view, Russia and other Eastern European countries have "entered the

period of long-term fundamental changes which had started in the West 20–30 years earlier and are still going on. ... Current socioeconomic changes occurring in Eastern Europe appear to stimulate and accelerate changes in the population area which ripened long ago and could even have been detected by refined methods of analysis but were blocked by State paternalism and mass traditionalism of pre-reforming Soviet society". In this view the recent demographic trends do not constitute a crisis, nor are they directly linked to the economic hardship associated with the transformation towards a market economy. Rather, they occur due to a "second demographic transition", which transforms family and fertility behaviour towards more secular and individualistic behaviour. This view also suggests that the transformation of demographic behaviour is permanent, and that fertility or other demographic measures are unlikely to return to pre-1990 patterns.

In this paper we investigate these "crisis" and "adjustment" explanations for the fertility trends in Russia during the early and mid 1990s. In particular, we focus on the interrelation between fertility behaviour and labour market problems, such as male and female unemployment, uncertainty of finding a new job, or unpaid wages. The analyses are primarily based on the second wave (1994–1996) of the Russian Longitudinal Monitoring Survey (RLMS). In addition to individual-level data, we incorporate contextual effects such as community labour market conditions, availability of infrastructure and media, etc., and we investigate the extent to which such contextual effects influence fertility behaviour and desires.

## 2. Demographic trends in Russia during the 1990s

Before 1990, the Russian TFR fluctuated around replacement level (1965–1980) and then rose to a peak of 2.19 in 1987 as a result of pronatalist family policy measures, which included a partially-paid maternity leave and special housing and other public benefits for families with three or more children (Zakharov and Ivanova, 1996). Starting in 1989 the *TFR* began to decline, and this decline accelerated substantially after 1990. This precipitous decline in the Russian total fertility rate after the onset of the economic and political transformation in 1990 is depicted in Figure 1(a).

This transformation process disrupted the established economic system considerably and led to a severe economic and labour market crisis (our description of this transformation process in this and the following two paragraphs is based on Curtis, 1996). By 1990 the government had virtually lost control over economic conditions. At the end of 1991, when the Soviet Union officially dissolved, the national economy was in a virtual tailspin. In 1991 the Soviet gross domestic product had declined by 17 percent and was further declining at an accelerating rate. Overt inflation was becoming a major problem. Between 1990 and 1991, retail prices in the Soviet Union increased 140 percent. Under these conditions, the general quality of life for consumers deteriorated, and public dissatisfaction with economic conditions was much more overt than ever before in the Soviet

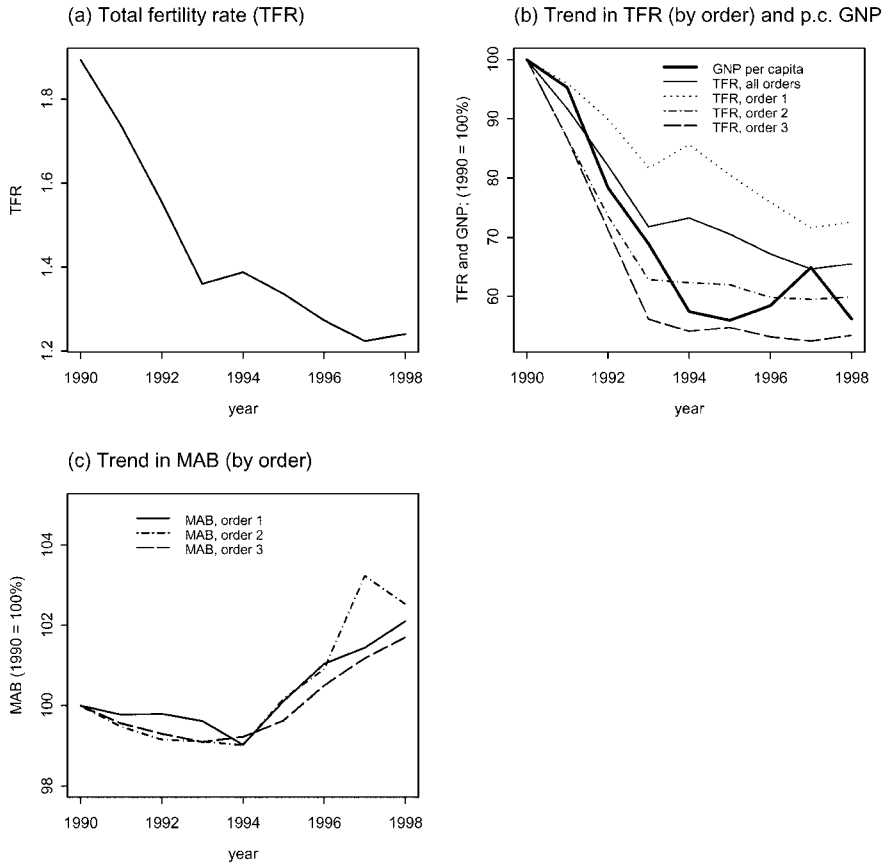


*Figure 1.* Demographic and economic trends in the Russian Federation: (*a*) Total fertility rate, (*b*) relative trends in the order-specific total fertility rates and *GNP* per capita, and (*c*) the relative trend in the order-specific mean age at birth (Sources: World Bank, 2000 (*GNP* is in US$); Unpublished fertility data from the Centre for Demography and Human Ecology, Institute for Economic Forecasting, Russian Academy of Science).

period. In 1991, macroeconomic stabilization measures were implemented in order to achieve stabilization. The Government lifted price controls on 90 percent of consumer goods and 80 percent of intermediate goods. The program also called for sharp reductions in government spending, targeting outlays for public investment projects, defense, and producer and consumer subsidies. These ill-advised monetary and fiscal policies resulted in an inflation rate of over 2,000 percent in 1992. Moreover, by the end of 1992, the Russian budget deficit was 20 percent of GDP, much higher than the 5 percent that were stipulated under the International Monetary Fund conditions for international funding. These difficult economic times at the end of 1993, were accompanied by a major political change, when Yeltsin issued decrees prescribing procedures for multiparty parliamentary elections, which would be the first since tsarist time.

In 1995 official government estimates placed 39 million people, or 26 percent of the population, below the poverty line. Moreover, delays in wage payment had become a chronic problem even in profitable Russian enterprises, and it affected an estimated 13 million people in mid-1995. In many cases, enterprises simply passed along the burden of late payments of state subsidies and customer debts. The economic condition of many Russians was only ameliorated by earnings from additional jobs or by access to private plots of land. In a 1994 survey, 47 percent of respondents reported some form of additional material support, and 23 percent reported having supplementary employment (OECD, 1995).

Conditions changed by the second half of 1995. The members of the State Duma faced elections in December, and Yeltsin faced dim prospects in his 1996 presidential re-election bid. Therefore, political conditions caused both Duma deputies and the president to make promises to increase spending. In the last quarter of 1995, the monthly inflation rate also remained steady below 5 percent, and it only modestly increased in the first half of 1996 to a monthly level of 16.5 percent.

As of mid-1996, four and one-half years after the launching of Russia's post-Soviet economic reform, experts found the results promising but mixed. In a recent country report about Russia, for instance, the World Bank writes:

> In spite of the promise and optimism with which the dissolution of the USSR was greeted, the economic transition upon which Russia embarked in 1992 has not always sustained that optimism. The process of making the transition to a market-based economy has not yet provided Russia with an enduring basis to sustain growth. Recent developments serve only to accentuate the fragility of the gains which have been made in severing Russia's bonds with the Soviet legacy. The course of transition is far from complete. . . . [P]overty still remains a serious problem. The working poor, families with many children, and single enterprise towns, where factories have been down-sized or closed, have experienced the greatest difficulties. In this situation, given constrained financial resources, ear-marking and better targeting of state assistance to the poor is the key issue for the government and the focus of social reforms (World Bank, 1998: 1).

This report emphasizes not only the problems associated with a restructuring of the economy but also the disappointment that the initial promises and hopes did not materialize during this process. Moreover, the report also stresses the disproportional effect of the transformation on certain social groups, including families with children.[1]

Figure 1(b) relates the trends in per capita *GNP* (in US$, Atlas method),[2] which is an approximate and widely used measure of economic well-being, to the total fertility rate since 1990. Most importantly, the figure reveals a striking association between the decline in fertility and per capita *GNP*. In particular, the total fertility rates for second and third births fall and then level-off in close accordance with per capita *GNP*. Only for first births is this association between *GNP* and the total fertility rate less marked. This pattern is supportive of the "crisis explanation" for

the fertility decline after 1990, since this theory emphasizes the close association between economic well-being and fertility. This graph is also consistent with the World Bank's assessment that families with children are among the groups most affected by the transformation process. And it is consistent with the argument that the transition was associated with a substantial disincentive for having children, especially of higher order (see also Andreev et al., 1998).

Further support for this "crisis argument" is provided in Figure 1(c), which depicts the order-specific mean age at birth since 1990. While declining fertility is frequently associated with an increasing mean age at birth, the surprising finding here is that there has been no substantial increase in the mean age at birth in Russia during 1990–1994. In this period the total fertility rate declined by 27%, and at the same time the mean age at first birth also declined. This development is accompanied also by an early mean age at marriage (see for example Vishnevsky, 1996).[3] This decline in the mean age at first birth in Russia is in contrast to the pattern observed during the early 1990s in other Central and Eastern European countries, such as the Czech Republic, Hungary and Poland (see Table I). It is shared only by some of the countries of the former Soviet Union, as well as by Bulgaria and Romania. For example, the order-specific mean age at birth started to increase in Bulgaria only after 1993, when we observe the emergence of relevant tempo effects in the fertility decline (for a related discussion, see Philipov and Kohler, 2001). This lack of postponement of births is problematic for the explanations that emphasize a convergence of fertility behaviour to "western" patterns, or a second demographic transition. The fertility rates declined almost proportionally across all ages, and there is no sign of a pronounced trend towards delayed childbearing.

Russia therefore constitutes an exception among the Eastern European countries. Most of these countries already experienced increases in the mean age at first birth in the early 1990s, and with the exception of Lithuania, all experienced a larger relative and absolute increase in the mean age at first birth during the period 1990–1998. As a direct consequence of this, Russia also differs from other European countries (both Eastern and Western) in the adjusted total fertility rate, which reflects the quantum of fertility or the total fertility rate that would have been observed if there had been no tempo effects (Bongaarts and Feeney, 1998; Kohler and Philipov, 2001).[4] In the Czech Republic, Hungary and Poland, the adjusted total fertility rate exceeds the observed *TFR* throughout the 1990s. This difference has often been associated with a cautious optimism that the low levels of fertility are only temporary, and that increases in the *TFR* are likely once the further postponement of births slows down. In Russia, however, the difference between observed and adjusted total fertility rate is substantially smaller and occurs only after 1994. Hence, in comparison to the fertility patterns in other Central and Eastern European countries, Russia's fertility decline in the early 1990s is characterized by a substantially larger relevance of quantum effects and a lesser relevance of tempo or postponement effects (see also Philipov and Kohler, 2001).

In summary, the data presented in this section favour economic hardship as a possible explanation for the fertility decline in Russia during the early 1990s. The fertility trend traces closely the per capita *GNP* (a measure of economic well-being), and the fertility rates declined more or less proportionally for all ages at each birth order. In contrast to other Eastern European countries, the postponement of births is not very prevalent in Russia during the precipitous fertility decline in the early 1990s. This postponement, however, is an important characteristic of an adjustment process to western fertility patterns and also of the second demographic transition.

The major shortcoming of the analysis in this section is the focus on macro-data. The association of aggregate measures of economic well-being and fertility trends does not constitute strong evidence that economic deprivation is the major disincentive for having children at the individual level. In particular, the aggregate association neglects the variation across social strata or geographic regions, and it does not shed any light on the question of *who* is having children in contemporary Russian society – is it those most affected by economic hardship, or is it those who have experienced a more or less successful adjustment to the new social and economic system? In order to investigate this question further, we turn our analysis in Section 4 to micro-data with extensive economic and social information.

## 3. Data: the Russian Longitudinal Monitoring Survey (RLMS)

The following analyses are based on the *Russian Longitudinal Monitoring Survey (RLMS)*. The survey was conducted with the support and assistance of the World Bank, the Agency for International Development (USAID), the National Science Foundation, the National Institute of Health, and the North Carolina Population Center.[5]

The RLMS consists of two phases. The first phase of the survey was conducted in 1992 and 1993, and the second phase covers the period 1994–2000 (in the second phase, the data were collected annually from October through December). The main unit of observation in the survey is the household, and the data constitute a random sample of Russian households. In particular, the RLMS is the first nationally representative random sample for Russia, albeit a highly clustered one (Russian Longitudinal Monitoring Survey, 1998). The survey covers primarily the European part of the Russian Federation, but the distribution of household size in the sample within urban and rural areas corresponds well to the figures from the 1989 census (for a detailed comparison between the 1989 census and the RLMS, see Russian Longitudinal Monitoring Survey, 1998). The households were selected on the basis of a multi-stage process, with the households being clustered into primary sampling units ("sites").[6] Although the target sample size was set to 4,000 households, the number of households drawn into the sample of the second phase was 4,728 in order to allow for a non-response rate of about 15 per cent. The response rate of households in the beginning of the second phase of the RLMS

exceeded 80 per cent, and individual questionnaires were obtained from about 97 per cent of the individuals listed in the household rosters.

Even though the RLMS is a longitudinal study of Russian households, the survey does not feature a true panel design. For instance, with few exceptions, individuals and household were not followed and interviewed if they had moved from the original sample unit. The net effect of attrition and non-response to the questionnaire, however, is relatively modest and has been highest for the respondents from the metropolitan areas of Moscow and St. Petersburg. Because lower rates of participation in these regions was anticipated, the initial allocations to these strata were increased in order to accommodate this higher attrition rate.

The data were collected for the household as well as on the individual level for each of the household members, and information about the residential community was also recorded. The data allow for longitudinal analyses within each phase but not for the period of the whole survey, because the two phases include entirely different population samples. Our analysis is based on the second phase of the survey since these most recent data include individual information from a special female questionnaire about contraception and fertility, as well as information about female labour supply and household workload.

In particular, our analyses focus on childbearing during the period 1994–1996. The initial year, 1994, is the first year for which the analyses can be conducted on the basis of the second wave of the RLMS, and we include the period until 1996 (December 1996) because the focus in this paper is on the early phase of the socioeconomic transition in Russia. All explanatory variables (i.e. "right-hand-side variables") and fertility desires are therefore measured in 1994, while fertility outcomes are measured over the period 1994–1996.

## 4. Labour markets and fertility

Our arguments in Section 2 suggest that socioeconomic conditions may play an important role in the precipitous decline in fertility in the early 1990s. In this section we focus on the labour market crisis as one important aspect of the overall socioeconomic conditions, and we investigate the relations between economic conditions and fertility behaviour on the micro-level using the second phase (1994–1996) of the Russian Longitudinal Monitoring Survey. Specific attention will be given in this context to the role of unemployment and female labour force participation. In particular, we use *objective* and *subjective* indicators of labour market uncertainty. The former include measures such as unemployment or non-payment of wages by the employer, while the latter consist of indicators such as the individual's subjective evaluation of the chance of losing one's primary job.[7]

### 4.1. ECONOMIC FERTILITY THEORY AND ITS PREDICTIONS: WHAT RELATIONS SHOULD WE EXPECT?

Before embarking on an estimation and interpretation of the empirical relations between fertility and labour market indicators, it is useful to review briefly the basic economic approach to fertility decisions (for a comprehensive and influential treatment see Becker, 1981). The main assumptions of this approach include that parents derive utility from children, and that the decision to have children is associated with trade-offs. Children are costly in both monetary and psychosocial terms, and they also require a substantial investment of time. Since fertility decisions have long-term implications, the most important determinant of these decisions are expectations about the medium and long-term costs and time investments associated with the decision to have children. Moreover, these time requirements for rearing children are usually distributed asymmetrically within households, with women carrying the primary responsibility. Female labour force participation is thus inherently connected to fertility decisions, and is therefore central to many economic fertility models.

Figure 2 represents the basic relations that are derived from the "value of time" approach to fertility, which juxtaposes the decision of a couple/woman to have children against the degree of female labour force participation within the household.

The bold lines **AB** and **CD** represent different budget constraints associated with different levels of female and male wages. The optimal fertility choice is where the indifference curve is tangent to the budget constraint and where the household optimally allocates the female time between the labour force and child-rearing in order to maximize its utility.

In the upper panel of Figure 2 the line **CD** differs from **AB** due to a decline in male wages. Since female wages remain unchanged, the marginal costs of children in terms of foregone female labour income remain unaffected by the declining male income. Hence, in the case of a decline in male wages, the "value of time" approach yields an unambiguous prediction regarding the effect of wage changes on fertility: the lower male wage should be associated with a lower fertility level.

This situation changes in the lower panel of Figure 2, where the lines **AB** and **CD** differ due to a decline in female wages. Since only women's time is used for raising children in this model, a change in female wage affects the marginal costs of children: the lower the female wage, the less expensive are children. In addition to this "substitution effect", a change in female wage also has an income effect: at any given choice for the number of children and labour force participation, a decline in female wages implies a reduction of income that reduces the total resources available for the household.

Because changes in female wages imply an income as well as a substitution effect, the implications of a decline in female wages are ambiguous. The income effect leads towards a lower fertility level, whereas the substitution effect resulting from lower marginal costs of children leads towards a higher fertility level. It is not

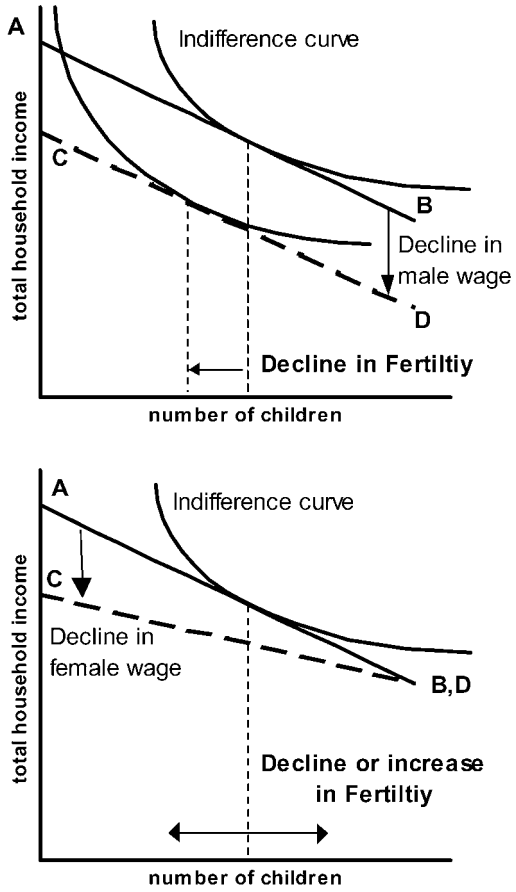


*Figure 2.* Economic fertility theory: the "value of time" approach.

theoretically determined which of these two effects will dominate, although it is frequently assumed that the substitution effect is more important than the income effect.

This model clearly represents a simplistic view of fertility decisions, and considerable effort has been devoted to extending it (see for instance Becker, 1981 or Hotz et al., 1997 for a review of these extensions). Despite its simplicity, however, the above model is very useful as a benchmark for considering the fertility effects of labour market crises. In particular, many changes in the labour market conditions during the transition, such as higher unemployment or lower job security, affect the individual's wage level. For instance, in the presence of unemployment the expected future earnings consist of the wage conditional on being employed times the probability of finding employment. Persistent rises in unemployment or job insecurity, therefore, directly affect the expectations about future earnings and wages. Moreover, the individual's expectations about such

persistent changes in unemployment or job insecurity are likely to be strongly influenced by current changes in unemployment and labour-market conditions: the most recent conditions constitute the relevant experience that can be extrapolated into the future by individuals, and this "learning on the basis of recent experience" is likely to be particularly relevant in transition countries where individuals are faced with new institutional contexts that share few commonalities with the pre-1990 situation (for formal models about the formation of expectations based on current macroeconomic conditions, see e.g. Kohler, 2000; Sargent, 1993).

In an approximate sense, therefore, the above model is useful for evaluating the main theoretical effects and behavioural changes following from changing labour market situations for both men and women. In particular, changes in labour market uncertainty and unemployment rates can be considered as factors that affect male and female wages, or non-labour income, and the above model then provides a framework to evaluate the implications of these changes on fertility behaviour.

The most important restrictions of the above model refer to the absence of explicit birth timing and joint household decision-making. Both aspects extend beyond the discussion that is possible within the limited space of the present paper. At the same time, these limitations may not be very severe for our goal of analyzing the main implications of economic uncertainty and labour market crises on fertility decisions in Russia during the early to mid-1990s. While household decision-making is likely to affect the allocation of resources within households, it does not lead to major changes in the main implications derived from the above model (for discussions, see Behrman, 1997; Ott, 1992). The timing of fertility, on the other hand, is likely to constitute a key aspect in low and lowest-low fertility countries (Gustafsson, 2001; Kohler et al., 2001). However, due to the short time period that is available in RLMS panel data, our ability to systematically investigate timing versus quantum changes in fertility is limited. Within a short time horizon, decisions to delay and decisions to reduce the number of children are indistinguishable. Moreover, they are likely to be driven by similar socio-economic determinants, and in the short term the above theoretical framework provides again a background for assessing the fertility implications of changes in both wages and labour market uncertainty. The question of whether delayed births are indeed recuperated at a later age, which is the key issue that determines the extent to which cohort fertility is affected by the current low levels of period fertility, depends on medium and long-term developments of socioeconomic conditions and labour market situations (for related discussions, see Happel et al., 1984; Ranjan, 1999).[8]

### 4.2. LOW FERTILITY AND LABOUR MARKET CRISES – WHAT IS THE EMPIRICAL CONNECTION?

The dependent variable for the analyses in this section is the occurrence of a childbirth within the period 1994–1996 (i.e. between rounds 5 and 7 of the RLMS). The probability of a birth is estimated with logistic regressions, using individual charac-

teristics and indicators of economic and labour market uncertainty as explanatory variables. The specific indicators used in this paper to reflect the labour market crisis in Russia are (*a*) employment status (currently unemployed), (*b*) whether the primary employer failed to pay wages in the last month, and (*c*) whether a woman is concerned about losing her job or about obtaining daily necessities. The same variables are also included for the husband (partner) if the woman is married (cohabiting). The individual characteristics and our indicators of economic uncertainty are all measured at the beginning of the observation period, i.e. 1994.

In addition to these individual-level variables, we utilize the clustered-sample structure of the RLMS, which is based on sampling sites (see note 6 for a description of the sampling procedure). In particular, we calculate for each site the proportion of women and their husbands who are unemployed, receive no payment on their primary job, or are very concerned about job loss and obtaining daily necessities. On the one hand, these "cluster variables" have the interpretation of contextual effects, and on the other hand, they serve as proxies for the respective individual-level variables when there is concern that a particular variable, such as worries about obtaining daily necessities, may be highly correlated with unobserved characteristics affecting fertility behaviour.[9]

Table II reports summary statistics of the variables included in the following analyses of fertility behaviour using the RLMS. Table III additionally gives the correlation matrices for women (lower triangle) and their husbands (upper triangle). Many of these correlations are rather low, indicating that the different measures of job uncertainty reflect quite different aspects of labour market uncertainty. (Obviously, current unemployment and concern about job loss are mutually exclusive because the latter requires primary employment.) Moreover, the correlation between a woman and her partner regarding the individual-level measures of uncertainty is quite modest. Naturally, the husband-wife correlation for the community-level indicators of uncertainty is higher, since both partners share the same socioeconomic environment of their household.

Whereas in the top panel of Table III individual-level unemployment and concerns about obtaining necessities exhibit a relatively low correlation, the concern about job loss is moderately associated with concern about obtaining daily necessities. On the level of sampling clusters, a high degree of job uncertainty is associated with concerns about obtaining daily necessities, whereas actual unemployment in a sampling cluster is only moderately related to no payment.

The negative correlation for men between the percentage of unemployed and the concern about job loss suggests that unemployment in these survey sites is not short-term, with many transitions in and out of the labour market, but rather long-term, where areas with a high proportion of unemployed are not necessarily those in which many employed men are highly concerned about job loss. The long-term nature of this unemployment is also confirmed by other labour market measures. For instance, 41% of the unemployed men in round 5 are still unemployed in round 7.

*Table II.* Summary statistics for women and their husbands in the RLMS sample

| All women age 15–40 (N = 1254)[a] | | | | Fertility indicators | |
|---|---|---|---|---|---|
| mean age | 28.896 (7.446) | Proportion unemployed | 0.091 (0.288) | Number of observed births, round 5–7 | 95 |
| Proportion with low education | 0.225 (0.418) | Proportion with unpaid wages | 0.101 (0.301) | among married women | 69 |
| Proportion with high education | 0.458 (0.498) | Prop. very concerned about job loss | 0.425 (0.495) | unmarried women | 26 |
| Prop. with at least one child | 0.731 (0.443) | Prop. very concerned about obtaining daily necessities | 0.597 (0.491) | Proportion wanting another child (round 5) among | 35% |
| average number of children | 1.280 (1.154) | | | married women | 46% |
| | | | | unmarried women | 29% |
| All women age 15–40 with husband present (N = 818)[a] | | | | | |
| wife's characteristics | | | | husband's characteristics | |
| mean age | 31.243 (5.909) | Proportion unemployed | 0.086 (0.281) | Proportion unemployed | 0.092 (0.290) |
| Proportion with low education | 0.251 (0.434) | Proportion with unpaid wages | 0.112 (0.316) | Proportion with unpaid wages | 0.170 (0.376) |
| Proportion with high education | 0.510 (0.500) | Prop. very concerned about job loss | 0.439 (0.497) | Prop. very concerned about job loss | 0.316 (0.465) |
| Prop. with at least one child | 0.916 (0.278) | Prop. very concerned about obtaining daily necessities | 0.622 (0.485) | Prop. very concerned about obtaining daily necessities | 0.556 (0.497) |
| average number of children | 1.701 (1.116) | | | | |

*Notes:* Standard deviation in parentheses. (*a*) The actual number of observations in the subsequent analyses can be lower due to missing values on the explanatory variables.

In our first set of analyses we include the "objective" measures of the labour market crisis, such as actual unemployment or no-payment on the primary job, among the explanatory variables of fertility behaviour. Table IV reports the respective logistic regressions of the dependent variables "childbirth between rounds 5 and 7" (i.e. between 1994 and 1996) on individual characteristics and "objective" measures of labour market uncertainty. Since we are primarily concerned with the effects of the latter, we do not report the estimated coefficients for individual characteristics, which yield relatively standard results. (The individual characteristics include age, age$^2$, dummies for low and high education, a dummy whether a woman already has at least one child, and the number of children.)[10]

The initial analyses are based on all women aged 15–40 in the sample and use either a woman's individual measure of labour market crisis or the respective cluster measure. The second set of analyses is based on all married/cohabiting women and uses the labour market measures of their husbands/partners. The third set of results is again based on married/cohabiting women, but it includes the

*Table III.* Top panel: correlation matrix for women (lower triangle) and their husbands (upper triangle) for various indicators of labour market uncertainty (the columns are in the same order as the rows of the table, and the variable names across columns are indicated by abbreviations). Bottom panel: male–female correlation (= within-household correlation) between the indicators of labour market uncertainty

| | UE | NP | JL | GN | %UE | %NP | %JL | %GN |
|---|---|---|---|---|---|---|---|---|
| Correlation matrix[a] | | | | | | | | |
| unemployed (UE) | ■ | – | – | 0.13 | 0.39 | 0.11 | –0.07 | 0.03 |
| no pay (NP) | – | ■ | 0.12 | 0.14 | 0.08 | 0.47 | 0.04 | 0.10 |
| very concerned about job loss (JL) | – | 0.07 | ■ | 0.36 | –0.06 | 0.05 | 0.47 | 0.27 |
| very concerned about obtaining necessities (GN) | 0.04 | 0.06 | 0.30 | ■ | 0.04 | 0.07 | 0.23 | 0.45 |
| % unemployed in site (%UE) | 0.32 | 0.01 | 0.04 | 0.01 | ■ | 0.25 | –0.15 | 0.08 |
| % with no pay in site (%NP) | 0.03 | 0.34 | 0.06 | 0.01 | 0.06 | ■ | 0.06 | 0.20 |
| % very concerned about job loss in site (%JL) | 0.05 | 0.05 | 0.42 | 0.18 | 0.05 | 0.12 | ■ | 0.52 |
| % very concerned about obtaining necessities in site (%GN) | 0.01 | 0.03 | 0.19 | 0.37 | –0.04 | 0.04 | 0.46 | ■ |
| Male – female correlation between the uncertainty measures | 0.09 | 0.21 | 0.27 | 0.37 | –0.01 | 0.27 | 0.45 | 0.55 |

*Notes:* (*a*) Lower triangle: correlations for women; upper triangle: correlations for men.

labour market measures of both partners. The analyses are always based on the largest sub-sample of women for whom all explanatory variables were available. The sample sizes therefore differ slightly depending on the specification of the estimated models (e.g. analyses that include "unemployment" are restricted to women in the labour force, and analyses that include "no payment of wages by the employer" are restricted to women who have primary employment).

Panel 1 of Table IV reveals the somewhat surprising result that female unemployment is not significantly associated with the probability of having a child in the period 1994–1996. However, labour market uncertainty reflected in a high prevalence of companies that do not pay wages to their employees, is significantly associated with the probability of having a child. The direction of this effect, however, is contrary to the theory and intuition outlined in Section 4.1: couples living in areas with frequent unpaid wages have a *higher* probability of having a child than couples living in areas where unpaid wages are rare (for related findings and discussions, see also Kohlmann and Zuev, 2001).

Panel 2 of Table IV confirms this surprising and somewhat counter-intuitive finding further: women with an unemployed husband have a higher probability of childbirth than women with employed husbands. Moreover, sampling clusters with a high prevalence of unpaid wages for men exhibit a higher probability of childbirth, quite similar to the earlier finding for women.

*Table IV.* Fertility behaviour and objective measures of labour market uncertainty: results of a logistic regression of "childbirth between 1994–1996" on individual characteristics and measures of labour market crises (only the latter coefficients are reported; see main text for the specification of individual chacteristics included in the analyses)

| Dependent variable | Childbirth between Rounds 5–7 (1994–1996) | | | | | |
|---|---|---|---|---|---|---|
| Panel 1: Female labour market measures | | | | | | |
| unemployed (female) | –0.153 | – | –0.187 | – | – | – |
| | (0.382) | | (0.401) | | | |
| % unemployed (females) | – | 0.156 | 0.330 | – | – | – |
| in site | | (1.186) | (1.254) | | | |
| no pay (females) | – | – | – | 0.040 | – | –0.287 |
| | | | | (0.380) | | (0.421) |
| % with no pay (females) | – | – | – | – | 2.221 | 2.552 |
| in site | | | | | (1.172)* | (1.302)** |
| *N* | 1166[a] | 1166[a] | 1166[a] | 1058[b] | 1058[b] | 1058[b] |
| log likelihood | –266.05 | –266.11 | –266.01 | –240.85 | –239.21 | –239.00 |
| Panel 2: Male labour market measures | | | | | | |
| unemployed (husband) | 0.825 | – | 1.039 | – | – | – |
| | (0.388)** | | (0.454)** | | | |
| % unemployed (husbands) | – | 0.070 | –1.469 | – | – | – |
| in site | | (1.127) | (1.483)[f] | | | |
| no pay (husband) | – | – | – | 0.477 | – | 0.226 |
| | | | | (0.448) | | (0.523) |
| % with no pay (husbands) | – | – | – | – | 1.278 | 1.078 |
| in site | | | | | (0.750)* | (0.888) |
| *N* | 776[c] | 776[c] | 776[c] | 703[d] | 703[d] | 703[d] |
| log likelihood | –172.58 | –174.62 | –172.10 | –146.62 | –146.05 | –145.93 |

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Panel 3 of Table IV reports the corresponding estimates for married/cohabiting couples, and the analyses include not only the labour market uncertainty of one partner but the uncertainty measures of both partners.

The results are supportive of our earlier findings: male unemployment and a high prevalence of unpaid female wages remain positively associated with childbirth. Since the sample sizes become rather small in these last regressions, the statistical significance of the result is obviously reduced, but our general interpretation remains. Contrary to the intuition and to the theoretical arguments in Section 4.1, labour market uncertainty, as it is reflected in unemployment and unpaid wages, is *not* negatively related to fertility. This finding is particularly surprising for men, where the theoretical model laid out above unambiguously predicts a negative effect. The results for women are also surprising, but they are at least consistent with the theoretical structure.[11]

*Table IV.* Continued

| Dependent variable | Childbirth between Rounds 5–7 (1994–1996) | | | | | |
|---|---|---|---|---|---|---|
| Panel 3: Female and Male labour market measures | | | | | | |
| unemployed (wife) | –0.402 | – | –0.484 | – | – | – |
| | (0.494) | | (0.490) | | | |
| unemployed (husband) | 0.853 | – | 1.095 | – | – | – |
| | (0.392)** | | (0.450)** | | | |
| % unemployed (females) | – | –0.119 | 0.492 | – | – | – |
| in site | | (1.496) | (1.546) | | | |
| % unemployed (husbands) | – | 0.064 | –1.535 | – | – | – |
| in site | | (1.121) | (1.471)[f] | | | |
| no pay (wives) | – | – | – | –0.088 | – | –0.541 |
| | | | | (0.505) | | (0.552) |
| no pay (husband) | – | – | – | 0.362 | – | 0.299 |
| | | | | (0.486) | | (0.548) |
| % with no pay (females) | – | – | – | – | 2.505 | 3.184 |
| in site | | | | | (1.345)* | (1.428)**[f] |
| % with no pay (husbands) | – | – | – | – | 0.050 | –0.212 |
| in site | | | | | (0.829)[g] | (0.918)[g] |
| *N* | 776[c] | 776[c] | 776[c] | 648[e] | 648[e] | 648[e] |
| log likelihood | –172.24 | –174.61 | –171.66 | –136.19 | –135.13 | –134.64 |

*Notes:* Standard errors are in parentheses. The standard errors are adjusted for the clustering of respondents in sample sites using the Huber-White estimator of variance. *p-values:* $*p \leq 0.10$; $**p \leq 0.05$; $***p \leq 0.01$. The pseudo-$R^2$ for the analyses in the above table ranges between 0.13 and 0.23. *Samples used in the analyses:* Women aged 15–40 who participated in rounds 5–7 of the RLMS, have non-missing information on the included individual characteristics in round 5, and who are (*a*) in the labour force, (*b*) have a primary employment, (*c*) are married/cohabiting with husband present and in labour force, (*d*) are married/cohabiting with husband present and husband has primary employment, (*e*) are married/cohabiting with husband present and husband and wife have primary employment. *Further notes:* (*f*) The coefficient on the individual level variable and the respective coefficient on the cluster variable are jointly different from zero at a 10% or lower *p*-value. (*g*) Both included cluster variables are jointly different from zero at a 10% or lower *p*-value.

The above analyses shed a rather puzzling light on recent fertility behaviour in Russia. Whereas the macro-level analysis in Section 2 suggests that the decline in fertility is inherently connected to the economic crisis, the analysis of micro-data leads towards a more differentiated interpretation. On the individual level there is no negative association between labour market uncertainty and fertility – frequently there is even a positive association. Thus, the explanation of fertility behaviour cannot be inferred merely from the "crisis explanation", which initially seemed quite appealing, based on our macro analysis.

In the following paragraphs we extend the above regression to different measures of labour market uncertainty. Whereas in Table IV "objective" measures of the labour market crisis were used, we now investigate whether a similar pattern is found when subjective measures of labour market uncertainty are used. Since the

*Table V.* Fertility behaviour and subjective measures of labour market uncertainty: results of a logistic regression of "childbirth between 1994 and 1996" on individual characteristics and measures of labour market crises (only the latter coefficients are reported; see main text for the specification of individual chacteristics included in the analyses)

| Dependent variable | Childbirth between Rounds 5–7 (1994–1996) | | | | | |
|---|---|---|---|---|---|---|
| Panel 1: Female labour market measures | | | | | | |
| very concerned about job loss (females) | 0.151 (0.265) | – | 0.068 (0.233) | – | – | – |
| % very concerned about job loss in site (females) | – | 0.525 (0.889) | 0.459 (0.888) | – | – | – |
| very concerned about obtaining necessities (females) | – | – | – | –0.291 (0.224) | – | –0.375 (0.243) |
| % very concerned about obtaining necessities (females) in site | – | – | – | – | 0.284 (0.671) | 0.651 (0.735) |
| *N* | 802[a] | 802[a] | 802[a] | 1206[b] | 1206[b] | 1206[b] |
| log likelihood | –164.10 | –163.96 | –163.94 | –272.16 | –272.82 | –271.71 |
| Panel 2: Male labour market measures | | | | | | |
| very concerned about job loss (husbands) | 0.519 (0.339) | | 0.191 (0.363) | – | – | – |
| % very concerned about job loss in site (husband) | – | 1.710 (0.738)** | 1.543 (0.801)*[f] | – | – | – |
| very concerned about obtaining necessities (husbands) | – | – | – | 0.424 (0.291) | – | 0.134 (0.302) |
| % very concerned about obtaining necessities (husbands) in site | – | – | – | – | 1.689 (0.700)** | 1.563 (0.739)**[f] |
| *N* | 673[c] | 673[c] | 673[c] | 780[d] | 780[d] | 780[d] |
| log likelihood | –136.70 | –135.01 | –134.91 | –174.72 | –172.55 | –172.47 |

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correlations between objective and subjective measures of labour market uncertainty are not particularly strong, these subjective measures add an additional dimension to the analyses: the anticipated future labour market uncertainty for the individual.

In the analyses in Table V we replace the objective measures "unemployment" or "unpaid wages" with more subjective measures of labour market uncertainty, such as "concerns about job market loss" and "concerns about obtaining daily necessities".

The Panel 1 of Table V reveals, quite surprisingly, that there is no association between a woman's subjective evaluation of labour market uncertainty (or the subjective evaluation in the respective sample cluster) and her fertility behaviour. For married/cohabiting couples, on the other hand, a high prevalence of male concerns about job loss in the sample cluster, or a high prevalence of male

*Table V.* Continued

| Dependent variable | Childbirth between Rounds 5–7 (1994–1996) | | | | | |
|---|---|---|---|---|---|---|
| Panel 3: Female and Male labour market measures | | | | | | |
| very concerned about | –0.012 | – | –0.353 | – | – | – |
| job loss (wife) | (0.398) | | (0.395) | | | |
| very concerned about | 0.349 | – | 0.068 | – | – | – |
| job loss (husband) | (0.373) | | (0.415) | | | |
| % very concerned about job | – | 0.814 | 1.173 | – | – | – |
| loss in site (wives) | | (1.416) | (1.479) | | | |
| % very concerned about job | – | 1.307 | 1.256 | – | – | – |
| loss in site (husband) | | (1.089) | (1.164)[g] | | | |
| very concerned about | – | – | – | –0.562 | – | –0.676 |
| obtaining necessities (wife) | | | | (0.271)** | | (0.299)** |
| very concerned about | – | – | – | 0.611 | – | 0.359 |
| obtaining necessities (husbands) | | | | (0.280)** | | (0.299) |
| % very concerned about obtaining | – | – | – | – | –0.054 | 0.602 |
| necessities (wives) in site | | | | | (0.894) | (0.988)[f] |
| % very concerned about obtaining | – | – | – | – | 1.709 | 1.399 |
| necessities (husbands) in site | | | | | (0.726)**[g] | (0.781)*[g] |
| *N* | 530[e] | 530[e] | 530[e] | 778[d] | 778[d] | 778[d] |
| log likelihood | –94.62 | –92.85 | –92.62 | –173.01 | –172.46 | –170.38 |

*Notes:* Standard errors are in parentheses. The standard errors are adjusted for the clustering of respondents in sample sites using the Huber-White estimator of variance. *p-values:* $*p \leq 0.10$; $**p \leq 0.05$; $***p \leq 0.01$. The pseudo-$R^2$ for the analyses in the above table ranges between 0.15 and 0.27. *Samples used in the analyses:* Women aged 15–40 who participated in rounds 5–7 of the RLMS, have non-missing information on the included individual characteristics in round 5, and who are (*a*) have primary employment, (*b*) no further restriction, (*c*) are married/cohabiting with husband present and husband has primary employment, (*d*) are married/cohabiting with husband present, (*e*) are married/cohabiting with husband present and husband and wife have primary employment. *Further notes:* (*f*) The coefficient on the individual level variable and the respective coefficient on the cluster variable are jointly different from zero at a 10% or lower *p*-value. (*g*) Both included cluster variables are jointly different from zero at a 10% or lower *p*-value.

concerns about the ability to obtain daily necessities, is *positively* associated with the probability of having a child (Panel 2 of Table V).

When the subjective evaluations of both partners are included, the concerns about job loss lose their statistical significance, although there remains a joint positive influence of the male and female cluster variable (Panel 3 of Table V). Finally, when both partners' concerns about obtaining daily necessities are included among the covariates, a negative association between these worries about daily necessities and fertility is found for women. Male concerns about obtaining necessities, on the other hand, are positively associated with fertility.

One might argue that the negative effect for women is due to the anticipated additional costs or burdens of a child, and hence this explanatory variable may be strongly correlated with unobserved characteristics. We therefore also report the

analyses with the cluster averages replacing the individual variables. In this case the significant association for women vanishes, but a strong positive association between the prevalence of male concerns about obtaining daily necessities and fertility remains. When both individual and cluster measures of the concerns about daily necessities are included, women exhibit, once again, a negative association between these concerns and fertility, whereas a high prevalence of male concerns in the cluster maintains a strong positive association.

### 4.3. IS A RECOVERY OF FERTILITY LIKELY?

The analysis in Section 4.2 revealed that the labour market crisis in Russia has surprising and counter-intuitive effects on fertility behaviour. In order to understand this pattern further, we investigate in this section the desire to have another child in the future.

The variable whether a woman "wants another child" is the only information in the RLMS data about long-term fertility intentions. Despite the limitation of self-reported fertility intentions, we therefore use the fertility desires expressed in the variable "want another child" as a dependent variable and estimate relations analogous to those in Section 4.2.

Of particular relevance in this context is the question of whether the long-term fertility behaviour, measured by the fertility intentions reported by women, corresponds to the short-term effects that were found for the period 1994–1996. For instance, if labour market uncertainty primarily affects the timing of children and less their desired quantity, then we expect that the above measures of the labour market crisis influence the observed fertility pattern stronger than the overall desire to have children. If, on the other hand, the current economic crisis is associated with a long-term reduction in fertility desires, then we expect a stronger relation between the variable "want another child" and the indicators of labour market uncertainty discussed above.

The results for the variable "want another child" (round 5 of the RLMS, 1994), which include the same set of objective and subjective measures of labour market uncertainty as in our earlier analyses in Panel 3 of Tables IV and V respectively, are reported in Table VI.

The first striking finding in this table is the virtual absence of a systematic relation between individual unemployment or individual-level unpaid wages and fertility desires. As was the case for male and female unemployment, there is also no statistically significant relation between concerns about job loss and fertility intentions. However, the analysis indicates that fertility intentions are positively related to the prevalence of unpaid wages within communities. This finding corresponds to our earlier result that the prevalence of unpaid wages is positively associated with observed fertility behaviour in the period 1994–1996. This conformity between the findings for fertility desires and fertility behaviour

*Table VI.* Fertility desires and measures of labour market uncertainty: results of a logistic regression of "want another child (round 5, 1994)" on individual characteristics and measures of labour market crises (only the latter coefficients are reported; see main text for the specification of individual chacteristics included in the analyses)

| Dependent variable | Want another child (Round 5, 1994) | | | | | |
|---|---|---|---|---|---|---|
| Panel 1: Female and Male labour market measures – objective | | | | | | |
| unemployed (wife) | 0.525 | – | 0.343 | – | – | – |
| | (0.314)* | | (0.350) | | | |
| unemployed (husband) | 0.322 | – | 0.264 | – | – | – |
| | (0.335) | | (0.350) | | | |
| % unemployed (females) | – | 1.871 | 1.531 | – | – | – |
| in site | | (1.168) | (1.238) | | | |
| % unemployed (husbands) | – | 0.823 | 0.546 | – | – | – |
| in site | | (0.745)[d] | (0.800) | | | |
| no pay (wife) | – | – | – | 0.383 | – | 0.045 |
| | | | | (0.277) | | (0.299) |
| no pay (husband) | – | – | – | 0.060 | – | –0.204 |
| | | | | (0.256) | | (0.274) |
| % with no pay (females) | – | – | – | – | 2.724 | 2.657 |
| in site | | | | | (1.315)** | (1.381)* |
| % with no pay (husbands) | – | – | – | – | 0.818 | 1.010 |
| in site | | | | | (0.744)[d] | (0.787)[d] |
| *N* | 890[a] | 890[a] | 890[a] | 735[b] | 735[b] | 735[b] |
| log likelihood | –355.10 | –354.63 | –353.68 | –279.53 | –274.84 | –274.64 |

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suggests that the positive association above reflects a quantum effect on fertility rather than merely a different pattern of fertility timing.

The strongest association in Table VI is between the cluster-level concerns about obtaining the daily necessities of life and fertility behaviour shown in the bottom panel of the table. Interestingly, this association is in different directions for husbands and wives. For women a high level of concern about daily necessities in the site is negatively related to fertility desires, whereas for men this association is positive. Couples who reside in areas with a high level of male concerns about daily necessities tend to have a *higher* fertility desire, whereas the respective prevalence of female concerns leads to *lower* fertility desires.

This pattern changes slightly when the individual concerns about daily necessities are added to the model. In particular, once the overall concerns in the cluster are controlled for, couples where the husband is concerned about the daily necessities tend to have lower fertility desires. This is in a sharp contrast to the effect observed in the site, where a high level of common male concerns about daily necessities is positively associated with child desire.

*Table VI.* Continued

| Dependent variable | Want another child (Round 5, 1994) | | | | | |
|---|---|---|---|---|---|---|
| Panel 2: Female and Male labour market measures – subjective | | | | | | |
| very concerned about job loss (wife) | 0.047 (0.257) | – | –0.068 (0.275) | – | – | – |
| very concerned about job loss (husband) | 0.107 (0.274) | – | 0.158 (0.297) | – | – | – |
| % very concerned about job loss in site (wives) | – | 0.771 (0.759) | 0.847 (0.826) | – | – | – |
| % very concerned about job loss in site (husband) | – | –0.320 (0.822) | –0.475 (0.868) | – | – | – |
| very concerned about obtaining necessities (wife) | – | – | – | –0.206 (0.196) | – | –0.004 (0.204) |
| very concerned about obtaining necessities (husbands) | – | – | – | –0.287 (0.186) | – | –0.409 (0.200)**[c] |
| % very concerned about obtaining necessities (wives) in site | – | – | – | – | –2.106 (0.526)*** | –2.093 (0.643)***[c] |
| % very concerned about obtaining necessities (husbands) in site | – | – | – | – | 0.906 (0.526)*[d] | 1.284 (0.561)**[d] |
| *N* | 601[b] | 601[b] | 601[b] | 896[a] 896[a] | 896[a] | |
| log likelihood | –209.29 | –208.78 | –208.63 | –356.19 | –352.88 | –350.96 |

*Notes:* Standard errors in parentheses. The standard errors are adjusted for the clustering of respondents in sample sites using the Huber-White estimator of variance. *p-values:* $*p \leq 0.10$; $**p \leq 0.05$; $***p \leq 0.01$. The pseudo-$R^2$ for the analyses in the above table ranges between 0.32 and 0.36. *Samples used in the analyses:* Women age 15–40 who participated in rounds 5–7 in the RLMS, have non-missing information on the included individual characteristics in round 5, and who are (*a*) are married/cohabiting with husband present, and wife and husband are in the labour force, (*b*) are married/cohabiting with husband present and husband and wife have primary employment. *Other notes:* (*c*) The coefficient on the individual level variable and the respective coefficient on the cluster variable are jointly different from zero at a 10% or lower *p*-value. (*d*) Both included cluster variables are jointly different from zero at a 10% or lower *p*-value.

In summary, the above analyses are relatively inconclusive concerning the effects of labour market and economic crisis on fertility desires. The relation between various measures of labour market uncertainty and fertility desires is, in our opinion, strikingly weak. Only concerns about obtaining daily necessities exhibit a strong association with fertility desires. And this relation is in the expected direction only for women. For men, the pattern is reversed and in correspondence with our earlier findings on fertility behaviour: if at all, then male labour market uncertainty and concerns about daily necessities within the sampling cluster are *positively* related to both fertility behaviour and preferences.

This weak association between the measure of labour market uncertainty and fertility desires makes it rather difficult to come to any conclusions about possible long-term fertility behaviour. Based on the analyses presented here it is difficult to assess whether a worsening of the labour market situation leads to a substantial

reduction in fertility desires. At the same time, the above analyses suggest that an improvement of the labour market situation would not lead towards an increase in fertility desires. The only – admittedly somewhat weak – conclusion is that general economic difficulties, as measured in the concerns to obtain daily necessities, are negatively related to fertility desires for women and improvements in the economic situation in this aspect could possibly lead to higher fertility preferences.

## 5. Discussion and concluding remarks

This paper analyses the recent fertility decline in Russia during the early and mid-1990s from both a macro- and a micro-perspective and presents a striking divergence between these two empirical viewpoints. While the former perspective suggests that the fertility decline after 1989 is associated with the economic hardship during the transition to a market economy, the micro-evidence is to the contrary. There is no negative association between labour market uncertainty or labour market crises and fertility, and frequently there is even a *positive* association. That is, women or couples who are themselves affected by labour market crises, or who themselves live in areas most affected by such crises, often had a higher probability of having another child in the period 1994–1996 than women/couples who were less affected by such crises.

The lack of a negative association, and the presence of a positive association in many instances, is surprising from the standpoint of economic fertility theory. It is also contrary to many explanatory theories about the recent fertility decline in Central and Eastern European countries which emphasize a more or less direct connection between labour market or economic crises and low fertility.

At least in our study, those women/couples who had children in the period 1994–1996 were *not* necessarily those who were least affected by the economic crisis. In fact, we are tempted to make the opposite conclusion – that women or couples who are directly or indirectly affected by the severe labour market crisis tend to have higher fertility than those who are not.

Of course, caution is called for when making such a conclusion. First, one could argue that the dynamic process of the economic transition and the fertility decline is quite different from any patterns that can be detected with cross-sectional micro-studies, such as the one conducted in this paper. Second, one could argue that the positive relation between the labour market crisis and fertility behaviour in our study merely mirrors some long-term systematic differences between social strata. This line of reasoning would suggest that our findings are primarily due to unobserved heterogeneity and not to behavioural relations. The limitations of the available data do not allow us to test for the above two concerns with more sophisticated methods. We believe, however, that the relationship we have detected between labour market behaviour and fertility is too diverse and subtle to be merely a selection effect. In addition, similar findings have also been found by Kohlmann and Zuev (2001) for Russia, by Kreyenfeld (2000, 2002) for East Germany,

and similar patterns have been found for teenage contraceptive use and teenage pregnancies in the U.S. by Brewster et al. (1993) and Brewster (1994).

If one accepts the findings in this paper, one is led to the more interesting question of whether relatively simple economic reasoning, such as the value-of-time approach to fertility presented in Section 4.1, is appropriate for understanding fertility patterns in Eastern Europe. Alternatively, do labour markets in transition countries exhibit idiosyncrasies that render the standard economic approach misleading or insufficient?

Whereas standard economic reasoning in such a context suggests that uncertainty is associated with lower fertility, Friedman et al. (1994) argue that this uncertainty may even constitute a distinct motive in favour of fertility. In particular, they argue that the reduction of uncertainty in individuals' lives is a primary behavioural incentive, and they propose that "the impetus for parenthood is greatest among those whose alternative pathways for reducing uncertainty are limited or blocked" (p. 383). Children are, according to Friedman et al., among the few "global strategies" available for individuals for reducing a broad range of uncertainties. The two primary alternative strategies are marriage and a stable career. Individuals who have limited possibilities for uncertainty reduction through stable careers are therefore more likely to have children. To support this interpretation, Friedman et al. cite various studies showing, for instance, a positive relation between labour market success and childlessness in the U.S. and a negative relation between employment opportunities in the neighbourhood and contraceptive use among black teenage Americans.

The interpretation that fertility serves as a "global strategy" for uncertainty reduction implies that individuals/couples are more likely to use this strategy the more they are excluded from pursuing this goal via alternative strategies. A stable career, in Friedman et al.'s view, is one of the most important alternative strategies. And the availability of this alternative strategy is most impaired by a labour market crisis with high unemployment.

The implications of this theory are consistent with the cross-sectional finding in Section 4.2. This theory predicts that individuals/couples who live in areas with bleak labour market prospects or who are jobless in a situation with long-term unemployment have a *higher* probability of having a child than individuals/couples who are well-established in the job market.

If we interpret our findings from the RLMS as meaning that fertility is an "uncertainty reduction strategy", this has the advantage of resolving the apparent contradiction between our analysis of aggregate economic and fertility trends in Section 2 and the subsequent analyses of fertility using micro-data. The political and economic transition in Central and Eastern Europe has substantially altered the costs and benefits of children, and it has led to a considerably increased level of uncertainty within individuals' life courses. The former imply that it is perfectly rational for individuals/couples to pursue a lower fertility level in the "new" socioeconomic context. This interpretation is therefore consistent with Figure 1,

which reveals a close relation between the trends in overall economic welfare (measured by per capita *GNP*) and fertility after 1990. At the same time, when we use micro-data to analyze the individual characteristics associated with childbearing in the "new" socioeconomic context after 1990, uncertainty reduction can emerge as a motive for childbearing. This motive then yields an empirical pattern which tends to reveal a positive association between fertility and labour market uncertainty or subjective uncertainty measures.

From this perspective the divergence between our micro- and macro-findings is not inconsistent but rather an expected situation. The relation on the micro-level between the labour market crisis and fertility reflect the incentives for childbearing given the overall socioeconomic situation, and uncertainty reduction in Friedman et al. (1994) sense provides a plausible explanation for the relations found in our analyses. At the same time, the close association between a decline in economic well-being and fertility reflects changes in the overall socioeconomic situation, including general income levels, the costs of children, the effects of labour market crises, etc.

Considerably more research is necessary to decide whether Russia constitutes a special case regarding the interrelation of economic uncertainty and fertility in Central and Eastern Europe. A comparison of the trends in the total fertility rate and in the mean age at birth after 1990 suggests that Russia is distinctly different from the other countries in the region with respect to the aggregate fertility pattern. Whether this special role also holds for the relation between labour market crises and fertility is still an open question.

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## Notes

1. For further studies on the effects of the economic and political transition on individuals' well-being and socioeconomic situation, see for instance Lokshin and Popkin (1999), Jimeno et al. (2000) or Mroz and Popkin (1995).
2. The *GNP* is defined as the total value of goods produced and services provided in a country in one year, plus the total net income from abroad. In calculating gross national product in U.S.

dollars, the World Bank uses the Atlas conversion factor. The purpose of the Atlas conversion factor is to reduce the impact of exchange-rate fluctuations in the cross-country comparison of national incomes. The Atlas conversion factor for any year is the average of a country's exchange rate (or alternative conversion factor) for that year and its exchange rates for the two preceding years, adjusted for the difference between the rate of inflation in the country and that in the G-5 countries (France, Germany, Japan, the United Kingdom, and the United States). A country's inflation rate is measured by the change in its GDP deflator. The inflation rate for the G-5 countries, representing international inflation, is measured by the change in the SDR deflator. (Special drawing rights, or SDRs, are the IMF's unit of account.) The SDR deflator is calculated as a weighted average of the G-5 countries GDP deflators in SDR terms, the weights being the amount of each country's currency in one SDR unit. Weights vary over time because both the composition of the SDR and the relative exchange rates for each currency change. The SDR deflator is calculated in SDR terms first and then converted to U.S. dollars using the SDR to dollar Atlas conversion factor. The Atlas conversion factor is then applied to a country's GNP. The resulting GNP in U.S. dollars is divided by the mid-year population to derive GNP per capita (For further explanations, see the Data and Statistics section of the World Bank internet pages, http://www.worldbank.org).

3. Some of these demographic characteristics, such as relatively early marriage and fertility, have prevailed for considerable time prior to 1990, and they are also a characteristic aspect of Russian cohort fertility patterns. Moreover, these aspects have been remarkably stable despite the varying political and socioeconomic conditions in the post-war period (Scherbov and Van Vianen, 2001).
4. The adjusted total fertility rate is equivalent to the $TFR$ that would have been observed in a calendar year if there had been no increase in the mean age at birth during this period. The adjusted total fertility rate ($TFR'$) is calculated as $TFR' = \sum_i TFR_i/(1 - r_i)$, where $TFR_i$ is the total fertility rate of birth order $i$ and $r_i$ is the annual increase in the mean age at birth of order $i$. Further extensions of the fertility adjustment include "variance effects" and also the application to parity progression ratios (Kohler and Ortega, 2002a, b; Kohler and Philipov, 2001).
5. Detailed information about the Russian Longitudinal Monitoring Survey and data can be downloaded from the Carolina Population Center internet pages at: http://www.cpc.unc.edu/projects/rlms/.
6. The sampling of the RLMS is described in detail in Russian Longitudinal Monitoring Survey (1998): "In Phase II of the RLMS, a multi-stage probability sample was employed. First, a list of 2,029 consolidated raions was created to serve as primary sampling units (PSUs). These were allocated into 38 strata based largely on geographical factors and level of urbanization, but also based on ethnicity where there was salient variability. As in many national surveys involving face-to-face interviews, some remote areas were eliminated to contain costs; also, Chechnya was eliminated due to armed conflict. From among the remaining 1,850 raions (containing 95.6% of the population), three very large population units were selected with certainty: Moscow city, Moscow Oblast, and St. Petersburg city constituted self-representing (SR) strata. The remaining non-self-representing raions (NSR) were allocated to 35 equal-sized strata. One raion was then selected from each NSR stratum using the method 'probability proportional to size' (PPS). That is, the probability that a raion in a given NSR stratum was selected was directly proportional to its measure of population size. Although the target sample size was set at 4,000, the number of households drawn into the sample was inflated to 4,718 to allow for a non-response rate of approximately 15%. The number of households drawn from each of the NSR strata was approximately equal (averaging 108), since the strata were of approximately equal size and PPS was employed to draw the PSUs in each one. However, because we expected response rates to be higher in urban areas than in rural areas, the extent of over-sampling varies. Since there was no consolidated list of households or dwellings in any of the 38 selected PSUs, an intermediate stage of selection was then introduced, as usual. Professional samplers will recognize that this is actually the first stage of selection in the three SR strata, since those units were

selected with certainty. That is, technically, in Moscow, St. Petersburg, and Moscow Oblast, the census enumeration districts are the PSUs. The selection of second-stage units (SSUs) differed depending on whether the population was urban (located in cities and 'villages of the city type', known as 'PGTs') or rural (located in villages). In rural areas of the selected PSUs, a list of all villages was compiled to serve as SSUs. The list was ordered by size and (where salient) by ethnic composition. PPS was employed to select one village for each ten households allocated to the rural sub-stratum. Again, under the standard principles of PPS, once the required number of villages was selected, an equal number of households in the sample (10) was allocated to each village. Since villages maintain very reliable lists of households, in each selected village the 10 households were selected systematically from the household list. In a few cases, villages were judged to be too small to sustain independent interviews with 10 households; in such cases, 3 or 4 tiny villages were treated as a single SSU for sampling purposes. In urban areas, SSUs were defined by the boundaries of the 1989 census enumeration districts, if possible. If the necessary information was not available, 1994 microcensus enumeration districts, voting districts, or residential postal zones were employed – in decreasing order of preference. Since census enumeration districts were originally designed to be roughly equal in population size, one district was selected systematically without using PPS for each 10 households required in the sample. In the few cases where postal zones were used, one zone was likewise selected systematically for each 10 households. However, where voting districts were used, to compensate for the marked variation in population size, PPS was employed to select one voting district for each 10 households required in the urban sub-stratum".

7. Russia's unemployment rate has been hard to measure accurately because many firms unofficially dismiss workers but leave them on company rolls. Official unemployment rates in Russia around 1995 are relatively low, e.g. 9.3% in 1995 (World Health Organization, 1999), and they may not reflect the degree of economic uncertainty and unemployment risk in Russia during the transition period.
8. A potentially interesting issue, which is beyond the scope of the present paper, relates to the question of whether the effects of labour market uncertainty on fertility behaviour depend on the household or family structure (or social capital) of individuals. See for instance Philipov and Shkolnikov (2001) for a related discussion and estimation with RLMS data.
9. We used the Huber-White estimator for the variance in the logistic regressions to correct the standard errors of our models for a potential correlation of the random terms within clusters.
10. "At least one child" and the "number of children" were entered as two separate variables in order to allow for different effects for the first child and subsequent children on the probability of a further childbirth.
11. This effect is also quite in contrast to the increasing evidence that female labour market participation and labour market opportunities may be positively associated with fertility in Western industrialized countries (Brewster and Rindfuss, 2000; Hoem, 2000). Consistent with this evidence are also the very strong negative effects of unemployment on fertility in Spain documented by Ahn and Mira (2001).

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