Economic Determinants of Fertility in Belarus: a Micro-Data Analysis

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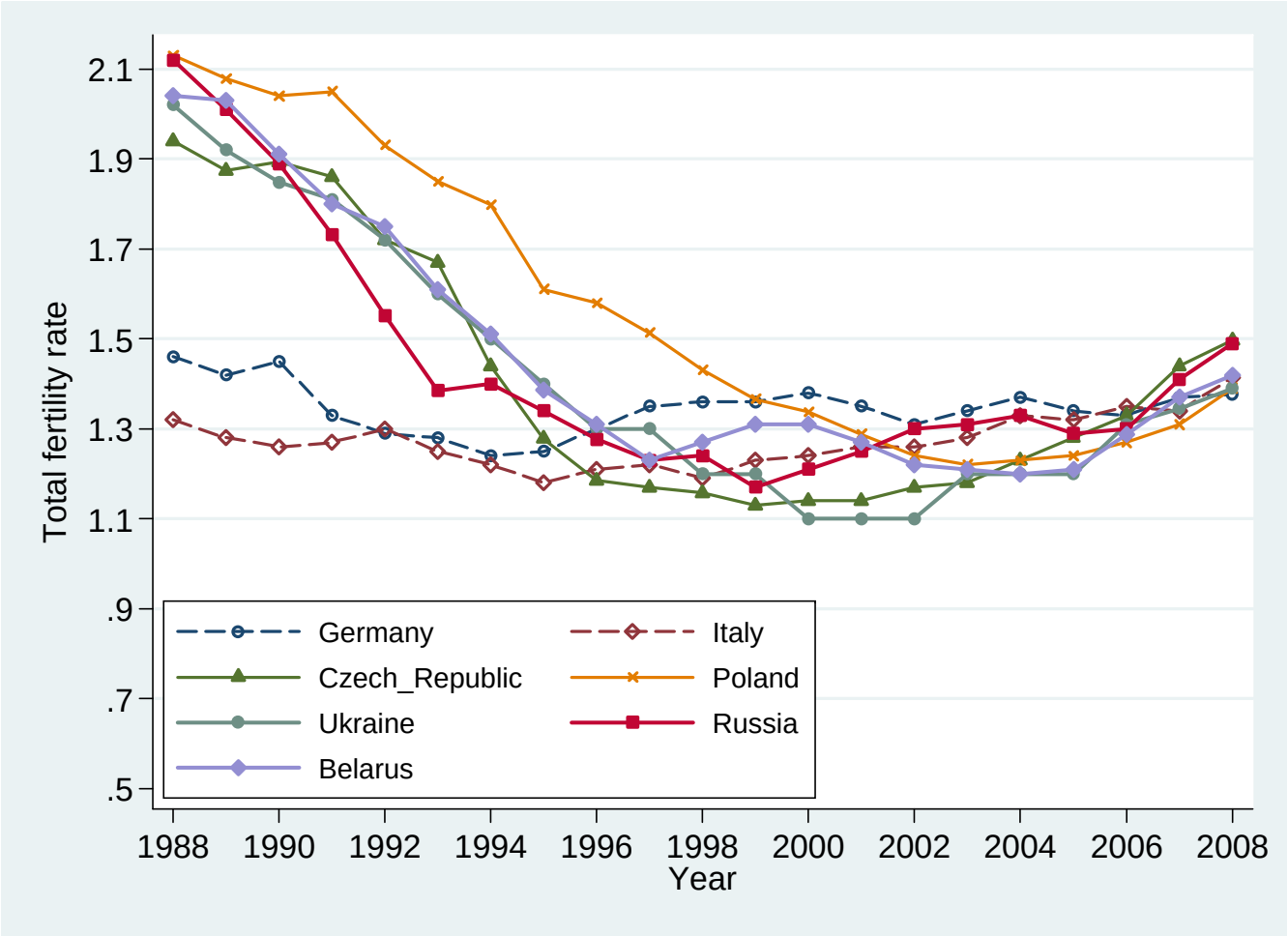
Fertility decline

- Many countries have experienced a sharp decline in childbearing over the past few decades
- In Spain, Italy, Germany and Austria, the total fertility rate fell especially sharply - to 1.5 and below
- FSU and the former Soviet block countries:
  - the decline in fertility started much later (in the 1990s)
  - the magnitude of this decline was no less severe

Figure 1. Total fertility rate in selected European countries.



- Belarus, Russia and Ukraine and some of the former Soviet block countries had a higher fertility rate than some of the developed countries in the Southern and Central Europe throughout most of the 1990s,
- However, their total fertility has declined sharply when most of these countries have started transition to a market economy in the early 1990s and the total fertility rates (TFR) in most these countries have dropped to levels below those in the developed European countries

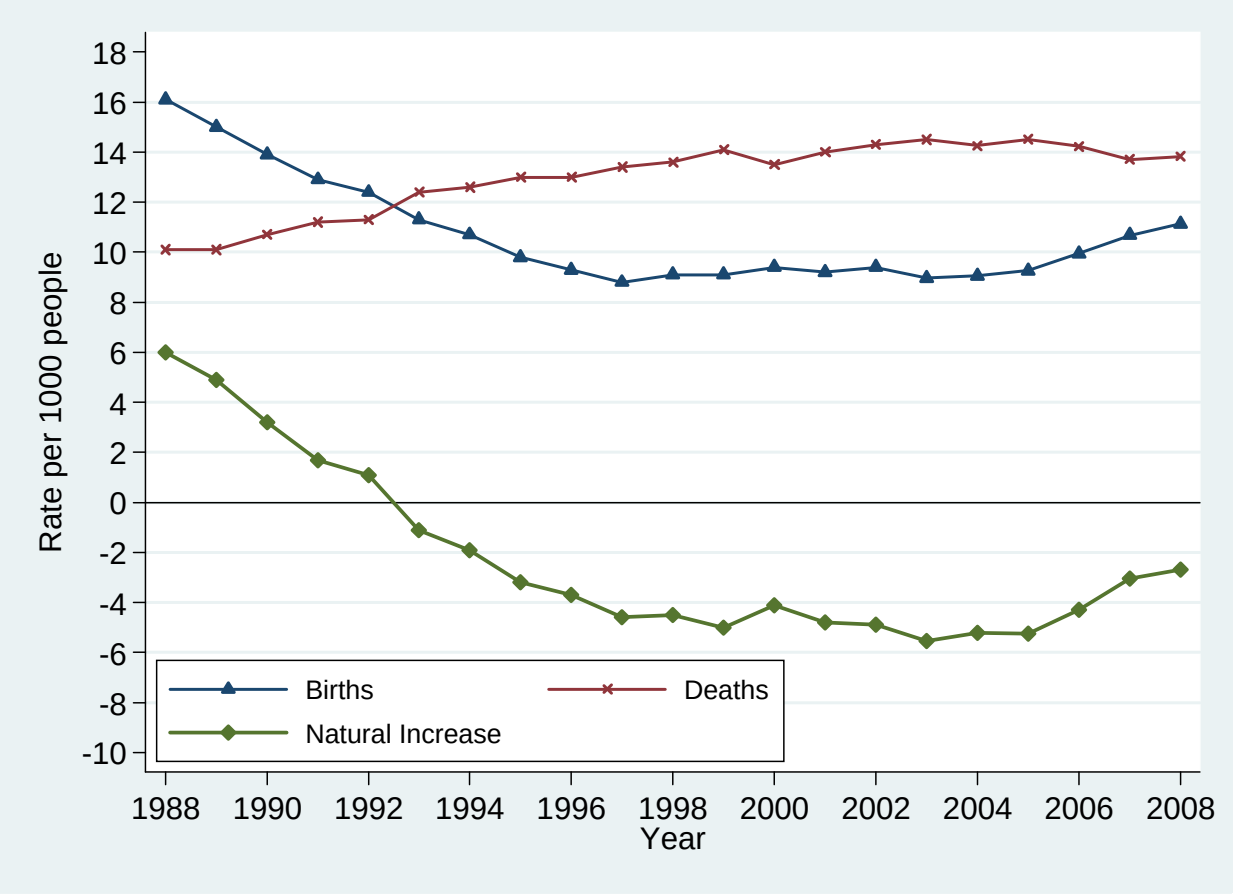
Fertility in Belarus

- Belarusian total fertility has followed a similar trend to Russia and Ukraine.
  - TFR of 2.03 at the end of the 1980s was close to the replacement rate of 2.1
  - TFR plummeted during the transitional 1990s to less than 1.3 children per woman in 1997
- While fertility had started to rebound in the second half of 2000s, Belarus only ranked 214 out of 223 countries in terms of total fertility rate in 2009 (The World Factbook 2009)

Explanations for fertility decline in Belarus

- Low fertility is not a new phenomenon for Belarus, which had some of the most highly educated labor force among the Soviet Republics.
- It has been argued that the major factor behind the fall in fertility is that the contribution of the large generation of 80's is declining (Shakhotska 2007).
- Other cited factors include decline of childhood mortality, delay in having births and changing role of woman in the family
- However, the secular shifts in the demographic structure and social norms cannot fully reconcile the very rapid decline during the 1990s and unusually depressed fertility afterwards.
  - In just eight years the Belarusian TFR slipped from 2.03 (in 1989) to 1.23 (in 1997).
  - The speed of fertility decline exceeded that of any of the developed European countries, and the TFR remained under 1.5 for over 14 years

Figure 2. Birth, death, and natural increase rates in Belarus



- The decline of fertility appears to be the main factor of natural population decline after 1992
- It was cited as a major threat to the demographic security of the Republic followed by high adult mortality (Shakhotska 2006; 2007).
- According to the 2009 Census, the population of the Republic shrank by 5.5% in 10 years.
- With the current rate of childbearing, the population is estimated to shrink to about half of its size by 2050 (Shakhotska 2007).

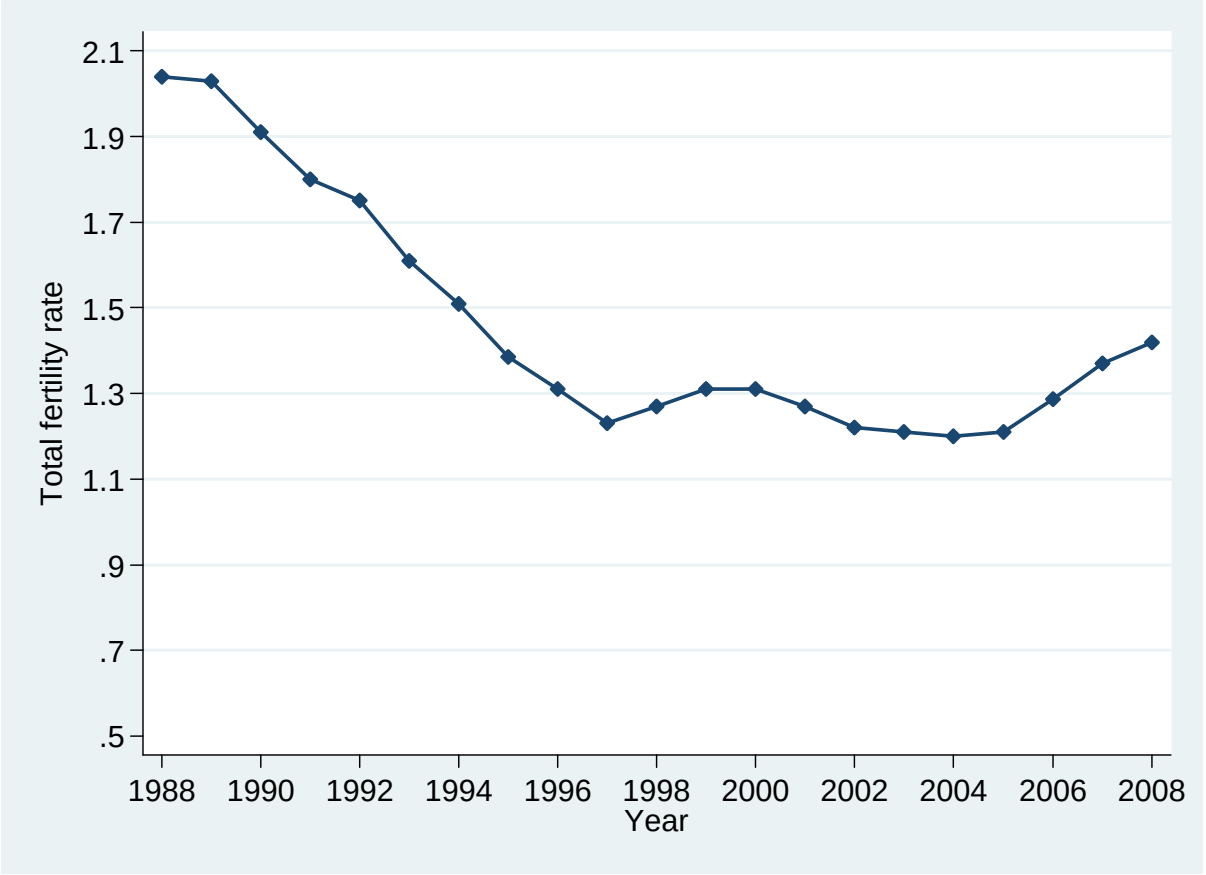
Economic explanation of fertility decline in Belarus

- Sharp drop in GDP following the transition reduced family incomes which led to falling demand for children
- Economic uncertainty and increased job insecurity might have also led Belarusians to delay or forgo children as it has been seen in the European Union
- The increasing childcare cost could have also depressed fertility as many previously public daycare facilities and kindergartens either became commercial or disappeared
- Shahotska (2007) proposed several other proximate determinants of the fall in the number of births in the 1990s:
  - worsening of the housing problem;
  - increased concerns about child health in the aftermath of the 1986 Chernobyl disaster;
  - worsening of the reproductive health and increasing infecundity.

Government policies to reverse the decline

- The shrinking workforce is projected to strain pension and social security programs as soon as the early 2020s
- After the population of Belarus had started to decline in 1992, the government introduced several measures.
  - Initially, the government policy towards family allowances in the 1990s was considered as a mere tool of preventing poverty among families with children: childbirth and childcare allowances were paid at a fixed rate per child and were not intended as incentives to increase childbearing
  - Recently, the childbirth allowances were increased and transformed into a tool of promoting births: in 2007 the childbirth allowance was differentiated by parity and paid BYR 1,247,050 (approximately USD 582) for the first child and BYR 1,745,870 (approximately USD 814) for the second and each subsequent child.
  - Currently, the Belarusian Ministry of Labor is developing a strategy for stimulating second births within a complex of measures under the national program of demographic security.

Reversal of the decline in the 2000s



- After stagnating between 1996 and 2004, total fertility rate in Belarus has been continuously improving starting in 2004-2005.
- It is hard to say whether the government incentives started having an effect or whether something else that was happening concurrently (for example, changing age structure of the population, changing social norms, rising incomes, reduced economic uncertainty) caused the recent rise in childbearing.

Research Question and Contributions

- So far quantitative research on the determinants of fertility in Belarus had been limited to cross-tabulations and was only descriptive with no attempt to disentangle the influence of various factors or to establish a causal effect of economic factors on fertility (Shahotska 2007).
- Paucity of fertility studies in Belarus is in part due to the lack of data:
  - many more studies looked at fertility in Russia with the use of the Russian Longitudinal Monitoring Survey (RLMS) panels (for example, Kohler and Kohler 2002; Grogan 2006; Kumo 2009) and
  - in Ukraine with the use of the Ukrainian Reproductive Health Survey (URHS) (Perelli-Harris 2005) and the Ukrainian Longitudinal Monitoring Survey (ULMS) panels (Perelli-Harris 2008).To the best of our knowledge, Belarus does not have comparable panel surveys or retrospective fertility surveys.
- The cross-sectional population Census and the Belarusian Household Budget Surveys (BHBS) in Belarus are not specifically designed to studying the determinants of fertility at the individual level.

Research Question and Contributions

- It is important to understand how economic factors can influence fertility in Belarus in order to evaluate the consequences of policy interventions that alter family income and to forecast the future fertility trend.
- However, the most recent fertility data used in quantitative analysis of births in the most comparable states was only from 2002 in Ukraine (Perelli-Harris 2005b) and only from 2004 in Russia (Kumo 2009), making it impossible to understand the trend for the most recent years when fertility rate was growing in these countries.
- We address this issue by using micro-data from 1995-2008 waves of BHBS to identify the determinants of childbearing in Belarus.
- In addition to exploring the economic determinants, we utilize the richness of the BHBS survey to see whether any complementary socio-economic and demographic factors can be identified.

Data

- We conduct the empirical analysis using the 1995-2008 waves of the Belarusian Household Budget Survey (BHBS).
- BHBS was initiated in 1995 and interviewed a nationally representative sample of approximately 5,000 households and all their members every year.
- BHBS is considered to be the most reliable and comprehensive source of micro-data in Belarus.
- Although the primary goal of the survey is to record various sources of income and types of expenditures, it also has detailed demographic and socio-economic information.

Data

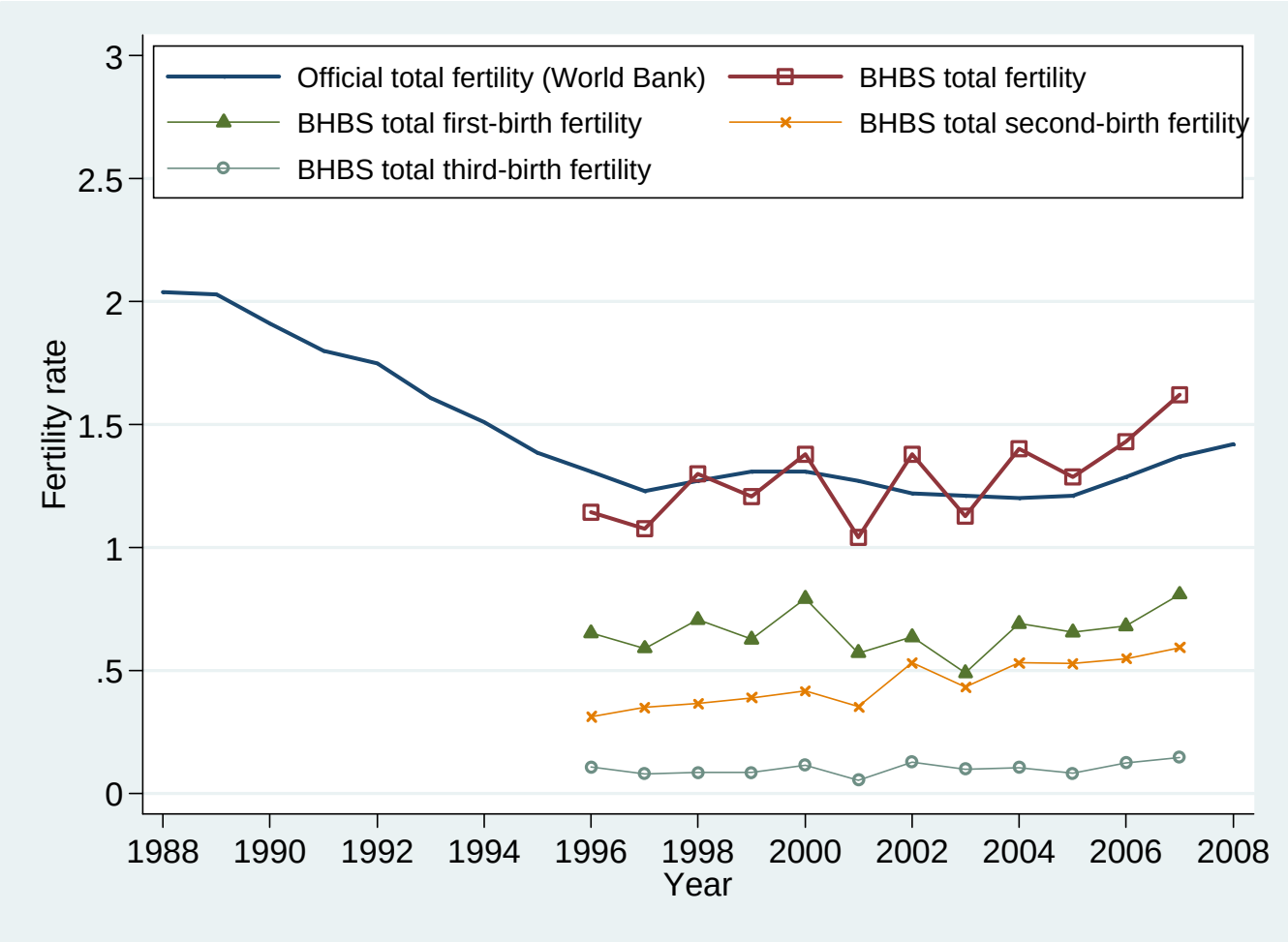
- The information on fertility can be obtained in each year from the questions about the number of children a woman had in her lifetime and the age at first birth (in years).
- Since every member of a household was included in the survey, it was possible to determine presence of 1 y.o. children and match them to mothers residing in the same household by using women's fertility variables.
- Our analysis focuses on women between the ages 20 and 39, in which most of the childbearing takes place.
  - We avoid looking at teenage births because teenage pregnancies are likely to be determined by other factors. In addition, teenage births are likely to be under-reported in the survey data
  - We also exclude births after age 39 in order to exclude a large pool of women among whom there is very little variation in our dependent variable, which is the probability of giving a birth.

Appendix table 1. Assignment of 1 y.o. children to their mothers.

Imputation step	Number of mothers	Percent	Cum. Percent
0	1,641	84.24	84.24
1	53	2.72	86.96
2	236	12.11	99.08
3	18	0.92	100
Total	1,948	100	

- In step 0, children were assigned to the only woman in the household who reported having had a child.
- In step 1, children were assigned to the only woman in the household regardless of whether she reported having had children.
- In step 2, children were assigned to the only woman who reported having had birth within one year of the year of birth of the 1 y.o. child.
- In step 3, children were assigned to the only woman aged 20-40 who reported having had a child.
- This assignment procedure rendered a complete assignment of 1 y.o. to the mothers.

Figure 4. Total fertility in Belarus according to the official data and according to the Belarusian Household Budget Survey (BHBS) 1997-2008 data.



- Total fertility rates and trends constructed from the BHBS are similar to the official levels and trends (World Bank 2010) during the analysis period.

Measures and Methods

- We estimate the following model using probit regression:

$$\Pr(birth_{ig}) = \alpha + \beta_1 \overline{X}_g + \beta_2 Z_{ig} + \varepsilon_{ig}$$

- Dependent variable is a binary indicator of giving a birth (separately for any birth and for the first, the second, and the third birth).
- Independent variables consist of two types:
  - average economic characteristics within woman's 5-year age, region and education group measured at the time of conception of the 1 y.o. (i.e. two years before the survey year)
  - Group-level variables include
    - average monthly earnings of woman and its square,
    - average monthly household income and its square,
    - standard deviation of the monthly household income (as a measure of economic uncertainty),
    - average pregnancy and maternity benefits, childcare benefits and
    - the percentage of employed women.
  - actual individual-level characteristics that are unlikely to change over time, which are measured at the time of the survey

Measures and Methods

- The focus of this paper is to establish the effect of economic factors on fertility.
- Estimating the causal effect of men's and women's earnings on fertility is complicated by the endogeneity of earnings:
  - Third factors that affect individual's earnings potential, such as health or preference for family, could also affect his/her family formation and fertility decisions.
  - At the family level, fertility may be closely related to other lifetime choices of parents, such as the amount of time allocated to work, the investment in the human capital of children, and saving to smooth lifetime earnings.
- Estimation techniques that do not account for these factors lead to biased estimates.
- In order to give the coefficients on economic variables a causal interpretation and to deal with the measurement error, our empirical strategy is to use group averages of economic variables measured at the time of conception.
- An additional advantage of using group-level average earnings instead of the individual-level earnings is that we do not have to deal with the sample selection issue of only including workers who reported earnings.
- Thus, the average earnings in our regressions can be interpreted as the earnings a woman can expect to earn given her characteristics, and are a reasonable proxy for the theoretical opportunity cost of childbearing.

Economic Measures (group-averages)

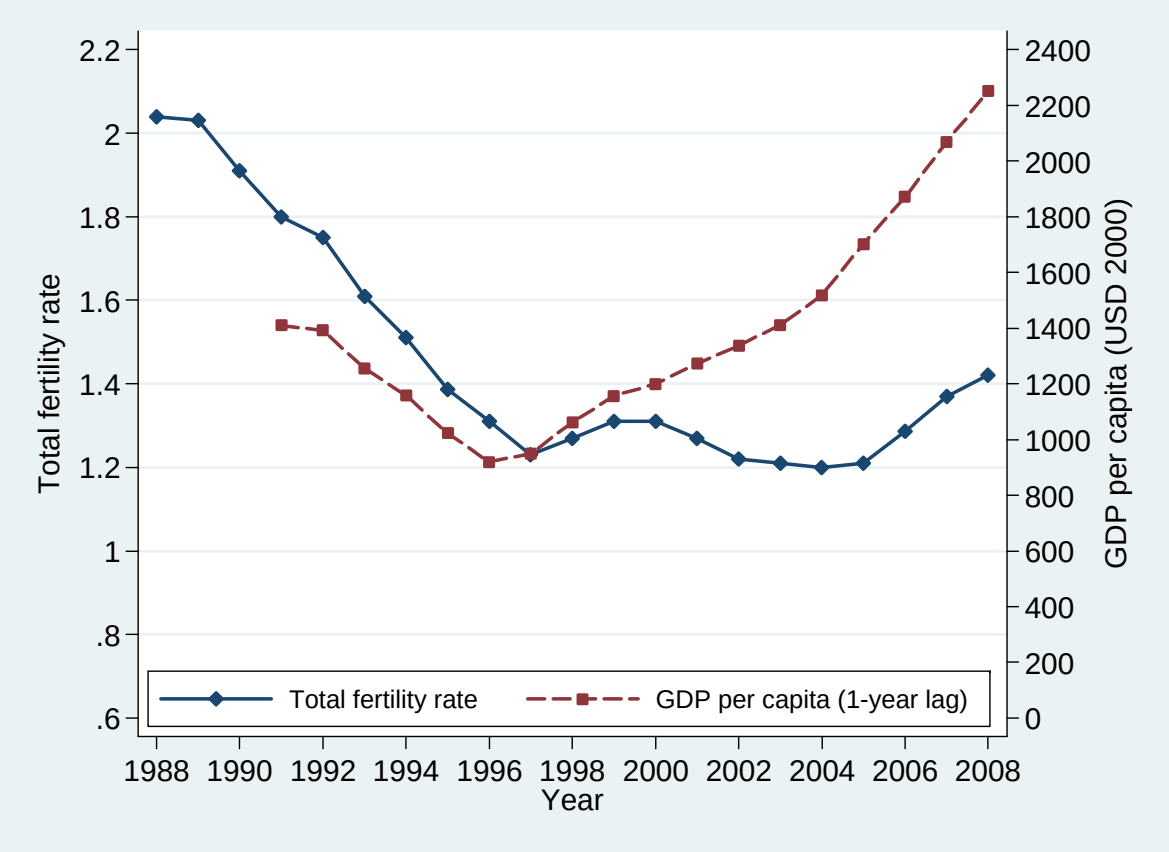
- Woman's earnings are the net monthly earnings, measured as an average during the year (defined in the questionnaire as "wages from the main job including subsidies, benefits and dividends after deducting payroll, other taxes and alimonies" and "other subsidies from the main job that are not included in wages, plus in-kind payments from the main job").
- Household income was measured using total household expenditures, which are considered to be a better measure of household income due to frequent under-reporting of income in transitional countries.
- Household expenditures were adjusted for the household composition by using an OECD equivalence scale
- Pregnancy and maternity benefits were measured using the survey item "Maternity benefits, benefits for women registered within 12-week pregnancy period, benefits for those who look after the disabled/elderly, burial, lump-sum payments related to the termination of work and other local authority benefits". We believe that this variable mainly captures pregnancy and maternity benefits.
- Childcare benefits were measured using the survey item "Postnatal allowance and benefits for care of children under 16(18)".
- We include a measure of income uncertainty in the fertility equation because micro-economic theories of demand for children predict a negative association between economic uncertainty and fertility (Becker 1991; Easterlin and Crimmins 1985). By using a standard deviation of household income within a narrowly defined group (age-education-region), we hope to provide a reasonable approximation to the individual-level uncertainty experienced by the families.

Individual-level controls

- Individual-level demographic controls include:
  - year dummies,
  - 5-year age group indicators,
  - number of children a woman had and its square,
  - marital status, and
  - age at first birth (in the models for the second and the third birth).
- Other socio-economic controls measured at the individual level include
  - an indicator for whether the family owns their residence,
  - living area of the dwelling,
  - indicators for woman's educational attainment,
  - indicators for the six voblasts and the capital Minsk,
  - indicator for living in the rural area,
  - indicator for bad health equal to one for health self-evaluation being "Not very good, but not bad" and "Bad" (vs. "Very good " and "Good"),
  - indicator for practicing sports and
  - an indicator for smoking.
- We use three educational categories: below secondary, secondary, and university education.

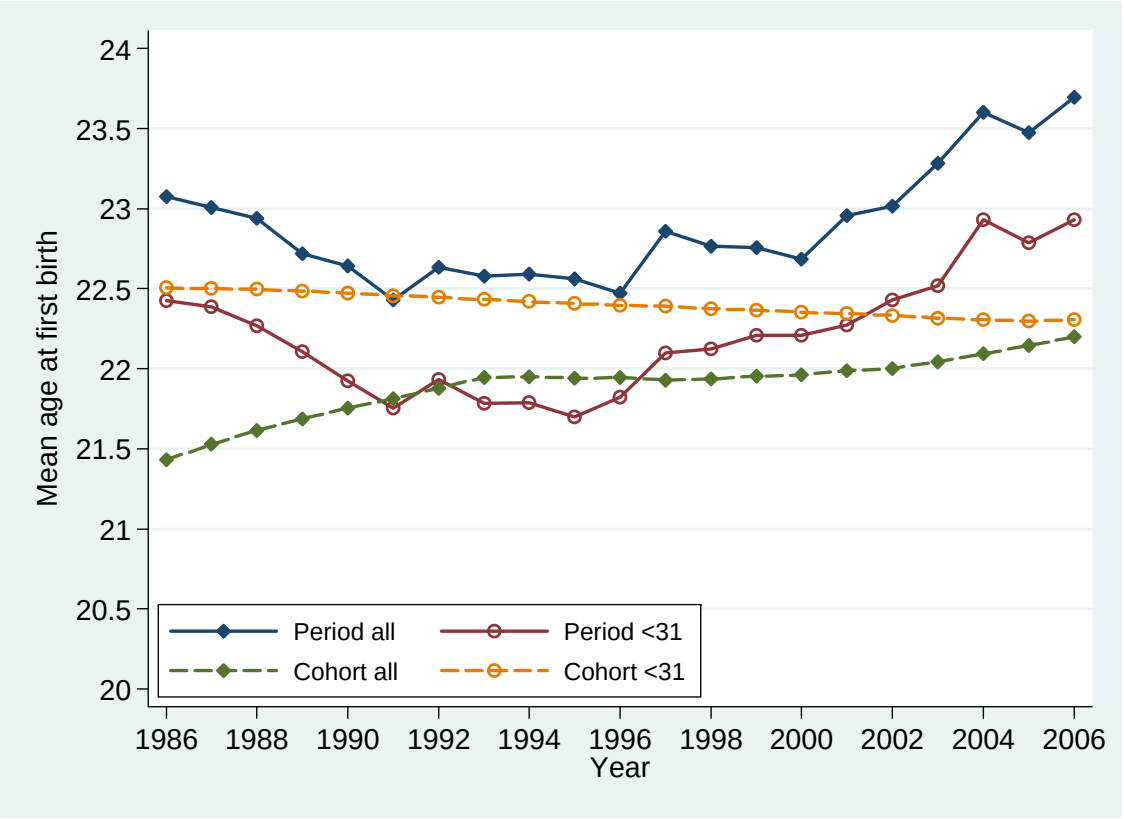
Results: Descriptive analysis

Figure 5. GDP per capita and TFR in Belarus.



- Both series followed a similar path up until 1999 (correlation coefficient 0.92) but the relationship broke down after 1999 (correlation coefficient only 0.67)
- This suggests the need to separate family income and female wage

Figure 6. Period mean age at first birth (MAFB) and cohort MAFB for all women and for women age 30 and under in Belarus.



- Under the changing social norms hypothesis, fall in fertility in the 1990s should coincide with (and result from) the delay of first births and rising MAFB.
- Little change in MAFB suggests that fall in birth rates during the 1990s and the increase after 2004 has little to do with the transition of Belarus towards the European pattern of childbearing, and has more to do with the timing and the number of births of higher parities.
- Therefore, our analysis also examines the determinants of the second and the third births, which are more likely to be amenable to economic conditions.

Table 1. Descriptive statistics of the analysis sample.

Variable	Mean	SD	Min	Max	N
Any birth	0.058	0.234	0	1	25341
First birth	0.099	0.298	0	1	7139
Second birth	0.059	0.236	0	1	9104
Third birth	0.016	0.125	0	1	7594
Female wage (avg.)	0.845	0.596	0.014	3.774	25341
Female wage sq. (avg.)	1.35	1.992	0	17.685	25341
Household expenditure (avg.)	1.402	0.894	0.258	5.411	25341
Household expenditure sq. (avg.)	3.454	4.661	0.078	47.59	25341
SD of household expenditure	0.673	0.484	0	4.57	25341
Maternity benefits (avg.)	0.018	0.029	0	0.327	25341
Childcare benefits (avg.)	0.077	0.075	0	0.934	25341
Share employed women	0.758	0.195	0	1	25341
Rural	0.501	0.5	0	1	25341
Own dwelling	0.543	0.498	0	1	25341
Living area (sq. m)	35.005	13.731	4	220	25341
Bad health	0.051	0.22	0	1	25341
Sports practicing	0.024	0.152	0	1	25341
Smokes	0.015	0.123	0	1	25341
Single	0.477	0.499	0	1	25341
Year of conception	2000.401	3.511	1995	2006	25341
Brest voblast	0.142	0.349	0	1	25341
Vitsyebsk voblast	0.138	0.345	0	1	25341
Homyel voblast	0.158	0.365	0	1	25341
Hrodna voblast	0.119	0.323	0	1	25341
Minsk city	0.186	0.389	0	1	25341
Minsk voblast	0.141	0.348	0	1	25341
Mahilyow voblast	0.117	0.321	0	1	25341
Below secondary education	0.22	0.414	0	1	25341
Secondary education	0.576	0.494	0	1	25341
University education	0.204	0.403	0	1	25341
Age 20-24	0.251	0.434	0	1	25341
Age 25-29	0.234	0.424	0	1	25341
Age 30-34	0.242	0.428	0	1	25341
Age 35-39	0.273	0.445	0	1	25341
Number of children	1.135	0.953	0	10	25341
Number of children sq.	2.198	3.393	0	100	25341
Age at first birth	21.83	2.622	15	39	25341

Key statistics:

- Total of 1,192 births conceived between 1995 and 2006.
- 25,341 women were at risk of giving a birth or gave birth during the analysis period.
- Out of this number, 7,139 women were at risk for the first birth, 9,104 were at risk for the second birth, and 7,594 were at risk for the third birth.
- It is very rare to have first child in the 30s in Belarus: out of 7,139 first births in the sample, only 1,180 births (16.5%) were conceived after the age of 30.
- The residual number of women who were at risk for a birth of the fourth or higher parity child was only 1,504, which suggests that having three or more children is very rare in Belarus.
- The rest of the descriptive statistics were computed for the years 1995-2006, which are the years when the sample births were conceived.
- Average monthly female wage was 84.5 constant 2008 U.S. dollars,
- Average monthly household expenditure was $140.2 during the analysis period.
- The average age at first birth was close to 22 years.

Table 2. Probit marginal effects for individual-level controls.

	Any birth		First birth		Second birth		Third birth	
	Age 20-29	Age 30-39	Age 20-29	Age 30-39	Age 20-29	Age 30-39	Age 20-29	Age 30-39
Rural	0.020***	0.004**	0.007	0.001	0.038***	0.005	0.001	0.002
	(0.006)	(0.002)	(0.005)	(0.010)	(0.007)	(0.005)	(0.005)	(0.001)
Own dwelling	-0.013***	-0.002	-0.013***	0.006	-0.014*	0.010***	-0.000	-0.008***
	(0.003)	(0.002)	(0.003)	(0.006)	(0.007)	(0.004)	(0.003)	(0.002)
Living area (sq. m)	-0.000	-0.000	-0.001***	-0.000	0.001***	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Bad health	-0.049***	-0.011**	-0.045***	-0.041***	-0.045***	-0.026***	-0.017***	-0.002
	(0.007)	(0.005)	(0.016)	(0.004)	(0.009)	(0.009)	(0.002)	(0.003)
Sports practicing	-0.047***	-0.007	-0.062***	-0.018	-0.025	-0.028***	-0.014***	0.016
	(0.014)	(0.011)	(0.014)	(0.012)	(0.028)	(0.009)	(0.002)	(0.019)
Smokes	-0.025	0.007	-0.012	-0.052***	-0.044**	0.011	0.007	0.013
	(0.017)	(0.009)	(0.026)	(0.005)	(0.018)	(0.012)	(0.021)	(0.018)
Single	-0.030***	-0.013**	-0.044***	-0.041**	-0.021***	-0.024**	-0.006*	-0.004**
	(0.006)	(0.006)	(0.007)	(0.018)	(0.005)	(0.010)	(0.003)	(0.002)
Secondary education	0.009	-0.005	0.031*	-0.016	-0.001	-0.009	-0.012***	0.001
	(0.007)	(0.006)	(0.016)	(0.022)	(0.016)	(0.011)	(0.004)	(0.003)
University education	0.006	0.004	0.038	0.027	-0.015	-0.002	-0.008*	0.004
	(0.006)	(0.004)	(0.024)	(0.019)	(0.016)	(0.008)	(0.005)	(0.003)
Number of children	-0.055***	-0.024***						
	(0.008)	(0.003)						
Number of children sq.	0.005*	0.004***						
	(0.003)	(0.001)						
Age at first birth					-0.008***	-0.001	0.000	-0.000
					(0.001)	(0.001)	(0.001)	(0.000)
Year dummies	✓	✓	✓	✓	✓	✓	✓	✓
Age group dummies	✓	✓	✓	✓	✓	✓	✓	✓
Voblast dummies	✓	✓	✓	✓	✓	✓	✓	✓

Table 2. Probit marginal effects for group-level controls.

	Any birth		First birth		Second birth		Third birth	
	Age 20-29	Age 30-39	Age 20-29	Age 30-39	Age 20-29	Age 30-39	Age 20-29	Age 30-39
Female wage (avg.)	-0.016	0.007	0.047	0.037	-0.090*	-0.015	-0.002	0.009
	(0.052)	(0.010)	(0.074)	(0.042)	(0.047)	(0.029)	(0.019)	(0.011)
Female wage sq. (avg.)	0.007	-0.002	0.003	-0.003	0.010	0.002	0.007	-0.002
	(0.012)	(0.001)	(0.018)	(0.006)	(0.010)	(0.004)	(0.007)	(0.002)
Household income (avg.)	0.036**	-0.018**	0.005	-0.117***	0.078***	0.016	-0.002	-0.014***
	(0.014)	(0.008)	(0.023)	(0.032)	(0.018)	(0.023)	(0.022)	(0.003)
Household income sq. (avg.)	-0.002*	0.003***	-0.004	0.008***	0.000	0.001	-0.005	0.002***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)	(0.001)
SD of household income	-0.027***	-0.012***	-0.001	0.008	-0.052***	-0.023**	0.004	-0.009**
	(0.005)	(0.004)	(0.015)	(0.009)	(0.016)	(0.011)	(0.009)	(0.004)
Maternity benefits (avg.)	-0.004	0.101	-0.024	-0.568***	-0.010	0.284***	-0.083	0.039
	(0.091)	(0.067)	(0.123)	(0.201)	(0.131)	(0.088)	(0.109)	(0.070)
Childcare benefits (avg.)	0.160***	-0.002	0.224***	0.146**	0.029	-0.048	0.028	-0.001
	(0.041)	(0.018)	(0.070)	(0.061)	(0.104)	(0.037)	(0.020)	(0.017)
Share employed women (avg.)	-0.020	0.012	-0.025	0.009	0.023	0.045**	-0.013	-0.008
	(0.023)	(0.008)	(0.045)	(0.021)	(0.023)	(0.020)	(0.019)	(0.005)
Observations	12238	13103	5959	1180	4667	4437	1436	6158
Pseudo-R2	0.037	0.084	0.033	0.10	0.050	0.069	0.12	0.11
Log likelihood	-3500.0	-1626.3	-1926.5	-270.7	-1165.6	-740.9	-184.5	-350.7

Source: data from BHBS 1995-2008. Notes: Significance: * p<0.1, ** p<0.05, *** p<0.01. Estimates in the table are probit marginal effects. Heteroskedasticity-robust standard errors, clustered by region, are in parentheses. Estimates are weighted by the BHBS sampling weight.

Key results on the economic variables

- Total household income had significant and non-linear effect on births, which also differed by age of woman and by parity.
  - Generally, higher income led to higher probability of giving a birth among the younger women, and a lower probability among the older women.
  - A 100 dollar increase in per capita monthly income led to 3.6 percent increase in the probability of giving a birth among the 20-29 y.o. women and to a 1.8 percent decrease in the probability of giving a birth among the 30-39 y.o. women.
  - However, the positive effect of household income was only observed for the second birth among the younger women, while the negative effect was only observed for the first and the third births among the older women.
  - The positive effect of household income found among the younger women fits with the classical economic model of fertility, where, if child is viewed as a normal good, higher income leads to higher fertility.
  - On the other hand, the negative effect on fertility observed among the older women can be explained either using the quantity-quality framework, where parents invest in child quality instead of child quantity if their income increases (e.g., Becker and Lewis 1973), or using other explanations based on assortative matching of parents or the assumption that the value of time in non-market activities is increasing in husbands' earnings (for a discussion, see Jones et al. (2008)).
- Female wage did not have a significant effect on birth probability, except for the negative and marginally significant effect on the second births among the younger women.
- There was a strong response of fertility to economic uncertainty: one standard deviation increase in household income led to 2.7 and 1.2 percent decreases in the probability of giving a birth among the younger and the older women, respectively.
  - The analysis by birth parity revealed that this response was confined to the second and the third births.
- Maternity benefits were associated with the lower probability of giving first birth among 30-39 y.o. women.
  - This is likely a result of sample selection, i.e. women who plan to have a child and face higher maternity benefits have it at the age of 20-29, while those who are still at risk for the first child after age 30 form a very selected group of women with unusually low fertility or who have problems with fecundity. Unfortunately, there is no question in the survey that would ask about the reproductive health of a women or men.
  - On the other hand, higher maternity benefits resulted in higher probability of having a second child at the age of 30-39.
- Higher childcare benefits raised the probability of having the first child at all ages, with no effect on the second or the third child.

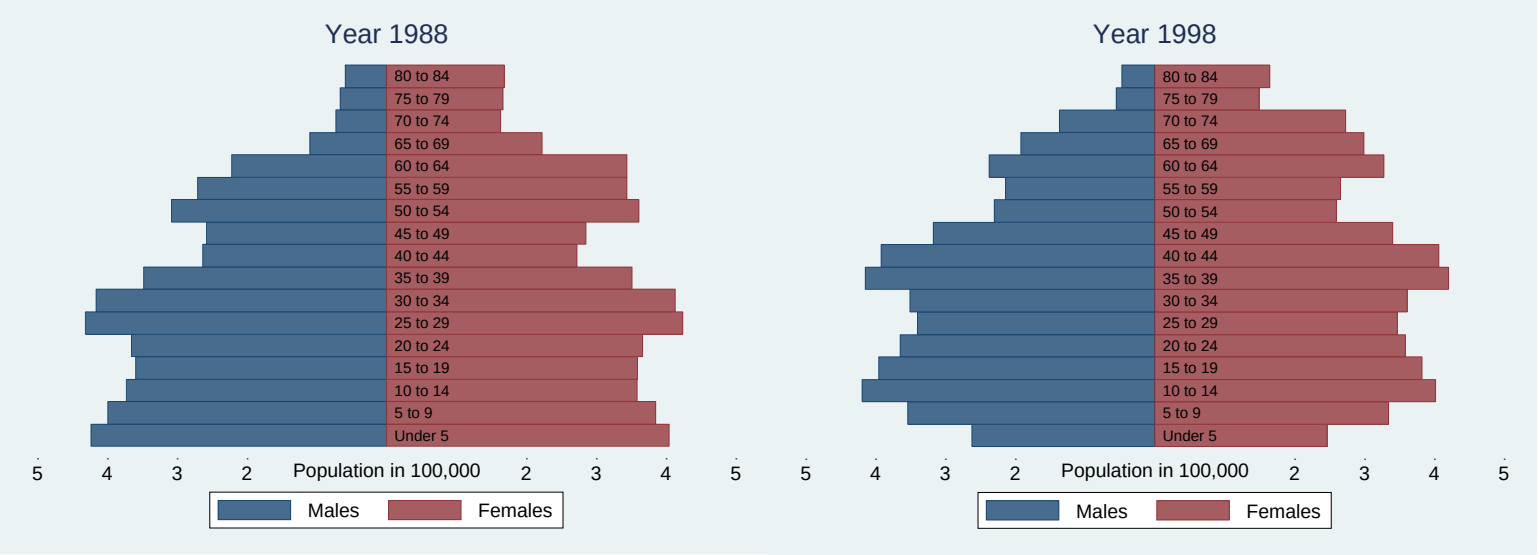
Discussion and Conclusion

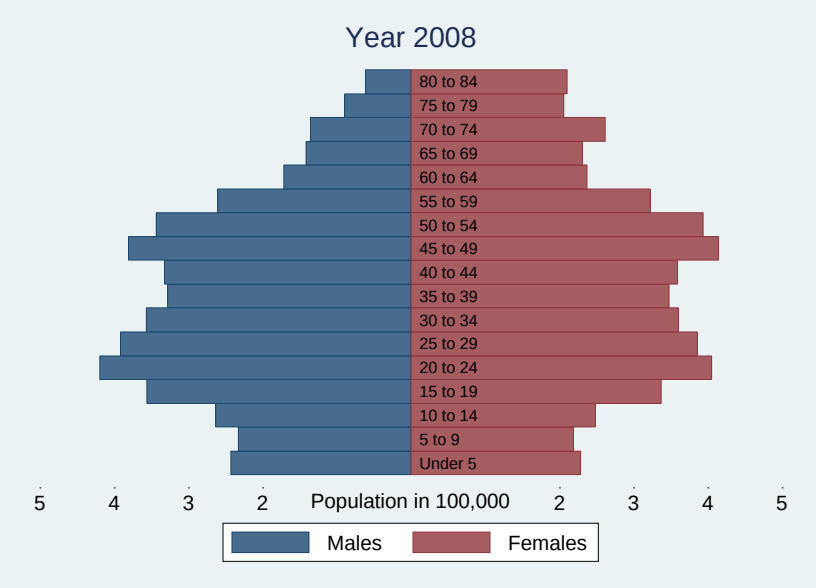
- This paper analyzed several hypotheses about the potential determinants of the recent trends in fertility in Belarus with a particular focus on the effect of economic factors.
- Our analysis revealed the importance of several previously unexplored economic determinants after holding the usual demographic and socio-economic determinants constant.
  - In particular, we found household income to have a positive effect on fertility of younger women, and a negative effect on fertility of older women. We also found this effect to be very different for different birth parities.
  - We confirmed that income uncertainty plays an important role in fertility decisions, with the effect confined only to the second and the third births.
  - We also found that fertility is amenable to maternity and childcare benefits.

Discussion and Conclusion

- Our results are in contrast to the recent literature on fertility in Russia (Kumo 2009; Roshina and Boikov 2005) that did not find a significant effect of incomes and wages on fertility after accounting for usual demographic controls.
  - The lack of effect of economic factors in these studies could be explained by the limited number of the economic variables used, the endogeneity of income measured at the individual level, or the failure to consider differential effect of these factors on births of different parities.
  - Careful demographic analysis of peculiarities of the childbearing process, such as nearly universal childbearing and young age at first birth in transitional countries, should precede and inform the formulation of the empirical specification.
- An important innovation of our study is employment of cross-sectional survey combined with using group-level economic variables in a micro-level study of the conditional probability of having a birth.
  - This empirical framework can be applied to study the causal effect of economic factors on fertility in other countries, especially when the retrospective fertility histories are not available.
- An important limitation of our analysis is that we only consider the short-term effect of economic fluctuations on the contemporary fertility decisions.
  - The effect of income and wages on the current fertility should be studied by considering a full history of earnings and the expectation of earnings in each future period (Hotz et al. 1997).
  - While the inclusion of several lags and leads of earnings did not yield significant coefficients (results not shown), future studies using other measures should test these predictions from the dynamic fertility model (Hotz et al. 1997).

Putting results in perspective: how economic factors could have shaped the population age structure.





Key points

- The increase in the number of births in 1949-1968 following the World War II can be seen in the larger cohort of the 20-39 y.o. in 1988, and the higher number of their offspring is reflected in the larger cohorts of 0-19 y.o. in 1988.
- If the slightly smaller cohort of 20-39 y.o. women in 1998 were experiencing the same economic conditions during their childbearing years as the cohort of the 20-39 y.o. in 1988, their fertility would only be proportionally smaller.
  - Instead, we observe disproportionally smaller cohorts of the offspring of women who went through their childbearing years in 1998 compared to same aged women in 1988, with the size of the offspring falling more for the younger women.
- Our analysis suggests that falling incomes and high economic uncertainty experienced by the former during the 1990s is a potential explanation for their smaller offspring.
  - However, the situation got even worse in 2008, when the relatively bigger cohort of the 20-39 y.o. women had even smaller offspring (compared to the same age cohort in 1998).
  - This suggests that women continue to postpone and/or forego having children possibly due to the high economic uncertainty despite the rising per capita real income