

The impact of income on fertility– breaking up stylized facts

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Extended abstract

1) Résumé

Our paper provides a deeper insight in the mechanisms behind the U-shaped pattern between income and fertility, which was found for some highly developed countries, by focusing on individual fertility decisions linked to income. First, we propose a theoretical model explaining why increases in household/women's income lead to increases in women's completed number of children from a certain level of income on. We extend an idea initially developed by Jones et al. (2004) that suggests that outsourcing child care could lead higher wage parents to choose to have more children than what is observed with canonical models. Assuming endogenous female labor participation, we give the conditions under which the U-shaped pattern between income and fertility may theoretically occur. Second, we empirically test whether the U-shaped pattern between income and fertility can be confirmed for micro data. To estimate the impact of household/women's income on the number of children in European countries, we use survey data from the EU-SILC (Statistics of Income and Living Conditions). We are particularly interested in the question under what circumstances an increase in individual wage income and in the partner's wage income incites couples to have another child. Among other things, we test the hypothesis that various possibilities to externalize child care can explain this "income effect" for higher income groups. We consider methodological issues like birth postponement and intra household decision making procedures. In order to address these issues in a satisfying manner, we complete our EU-SILC data analysis with a case study for Germany based on the SOEP data base.

2) Detailed description

2.1. State of the art

Recent macro-panel data analysis gives evidence for a re-increase of fertility in several highly developed countries. Myrskylä *et al.* (2009) show that while the correlation between total fertility rates and the Human Development Index (HDI) was negative in 1975 when observing more than 100 countries, observations of 2005 suggest a rather positive correlation between the two variables.

To identify the driving factors of the fertility rebound, Luci and Thévenon (2011a) focus their analysis on OECD countries only as the rebound is mainly observable in highly developed countries. A closer look at the HDI components (GDP per capita, life expectancy, school enrolment) shows that for OECD countries, the variation is greatest for GDP per capita in comparison to the other components. This is why Luci and Thévenon (2011a) analyze the impact of GDP per capita on fertility using a macroeconomic panel data set that includes observations of 30 OECD countries over four decades (1960-2008). They find a clear U-shaped pattern (or inverse J-shaped pattern to be more concrete) between GDP per capita and fertility. This implies that fertility first decreases with economic development, but then slightly re-increases from a certain level of aggregated income on. Survival of the U-shaped association between GDP per capita and fertility is found with the use of tempo-adjusted fertility rates (control for birth postponement), with control for country and time fixed effects and by instrumenting GDP per capita to treat potential endogeneity. Moreover, by decomposing GDP per capita into several components, Luci and Thévenon (2011a) identify female employment as a co-varying factor for re-increases in fertility in highly developed countries. The compatibility of childbearing with female employment emerges thus as a key factor for the fertility rebound. This finding suggests that the existence of institutions allowing parents to combine working activities with childrearing plays an important role for fertility.

Luci and Thévenon (2011b) confirm this by showing that fertility increases are likely to be small if economic development is not accompanied by institutional changes that improve parents' opportunities to combine gainful employment with family life. They examine how far fertility trends respond to family policies in OECD countries by using data from 18 OECD countries that spans the years 1982 to 2008. The result confirms that each instruments of the family policy package (paid leave, childcare services and financial transfers) has a positive influence on fertility while controlling for birth postponement and for different national contexts such as economic development, women's economic empowerment, labour market insecurity as well as gender and childbearing norms.

2.2. Open questions

The existing literature so far only considers macro-level factors of the fertility rebound that can be observed in several highly developed countries. To date, it is not explored how the influence of these macro-level factors varies with individual characteristics. In addition, a theoretical framework for explaining a fertility rebound that goes hand in hand with economic development and income increases is completely missing in the literature.

The existing analysis suggests that highly developed countries succeed best in offering parents the possibility to combine work and child rearing. However, it is still unclear what exactly behind income increases leads to better reconciliation possibilities for parents which drive parents to increase their number of children. Moreover, we do not know which household types are concerned. Is it rather high income or rather low income households that contribute to the fertility rebound? For answering this question, it is important to know how reconciliation policies vary between households of different income.

2.3. Hypotheses

One can think of three basic explanations how economic development may facilitate a combination of work and family life for parents in highly developed countries. The three possible mechanisms result from the fact that GDP can be divided in three macro-economic components: private consumption, company investments and public expenditure (trade surplus is negligible for this analytical purpose).

First, economic development is likely to increase a household's income. This leads to an increase in private consumption, not only for consumer goods but also for private childcare services. Thus, a larger household budget may encourage parents' investments in private childcare services. The facilitated recourse to nannies and child minders, who can adapt to the time management of working parents, also makes it more attractive for dual earner couples to have one or more children.

Second, economic development is likely to increase entrepreneurial investments. Since dual earner couples are becoming more and more common in highly developed countries, enterprises are increasingly concerned about their employees' work-life balance requirements. Support to parenthood in terms of flexible working arrangements and the provision of childcare services through the company is increasingly becoming a corporate issue in large, modern and competitive enterprises. The rising consideration of parental responsibilities at the work place coming along with company investments and company subsidies for child care facilities may encourage fertility.

Third, economic development is likely to increase government expenditure. Highly developed countries can afford to invest more in family policy instruments than poorer countries, and therefore they tend to offer more public child care facilities as well as more

subsidies for private childcare services. Moreover, wealthy countries can afford costly investments in incentives for parents to combine family and career more easily. Parental leave paid over a limited time period as a percentage of the parent's former wage would be such an incentive. This leave scheme encourages parents to work before childbirth and to return to work soon afterwards. However, this type of incentive is more expensive for governments in comparison to leave schemes that offer lump-sum benefits: A proportion of the earned wage is particularly attractive for highly qualified parents with a high wage. Highly developed countries can afford to invest more in child care and various leave schemes which support a combination of work and family life, which is likely to increase fertility. In contrast, poorer countries tend to invest more in lump-sum benefits and family allowances for low-income families, which intends to prevent child poverty. The relatively low income ceilings that come along with these benefits are likely to discourage parents to increase their labor supply. Therefore, generous lump-sum benefits for low income-families tend to make parents to choose between work and children, and hence may decrease overall fertility.

To sum up, we intend to test the following hypotheses:

- a) The income effect of fertility varies between households of different income.
- b) "Reconciliation" options differ with household income.
- c) Women who combine full-time employment and child-rearing are either from the lower income decile (economic necessity for mothers to work) or the upper income decile (increased access to nannies...).
- d) Partner income plays a crucial role in explaining the ambiguous correlations between fertility and women's wage income.

2.4. Methodology

a) Theory / Modelisation

To start, we provide a theoretical model explaining why there can be observed a U-shaped pattern between household/individual income and number of children in highly developed countries, i.e. why there is a turn in the effect of income on fertility from negative to positive on the micro level.

We propose a theoretical model explaining why increases in household/women's income lead to increases in women's completed number of children from a certain level of income on. We extend an idea initially developed by Jones et al. (2004) that suggests that outsourcing child care could lead higher wage parents to choose to have more children than what is observed with canonical models.

Our aim is to propose a simple benchmark model able to reproduce the observed stylised facts. We shall build an overlapping generations model in which households optimally choose consumption and the number of children. First, the household will act as a single agent, without distinguishing men from women in either salaries per labour unit, in

education levels, nor in labour participation. Then, we will enrich the model distinguishing optimal decisions made by men and women. Hence, assuming endogenous female labor participation, we shall give the conditions under which the U-shaped pattern between income and fertility may theoretically occur.

Existing models assume that child rearing entails a double cost: a parental time cost and a fixed cost. Some authors introduce preference heterogeneity to reinforce results (see for instance Jones et al., (2008)). Nevertheless, the only necessary condition to generate declining fertility with income is the parental time cost. Indeed, as the household wage increases, the opportunity cost of child rearing increases. In order to keep results as general as possible, we will only allow for income heterogeneity keeping preferences identical for all households. We believe that the key to the rebound in fertility is the nannies hired to raise children. As long as the household can afford outsourcing part of child care, they will be able to increase fertility without experiencing a proportional reduction neither in income nor in labour participation. Although this explanation was first formulated in Jones et al. (2008), its importance is underestimated in a framework with heterogeneous preferences.

Using our benchmark model, we will obtain the analytical expressions for the household optimal decisions. Then, we will do a comparative static analysis exercise. As we have already advanced in section 2.3, we shall quantify the effect of increases in female unit wages, the cost of Day-care, the income dependent impact of subsidies to Day-care through levied taxes, etc. A priori, it seems obvious that the lower the nanny cost per child, the higher the household participation in the job market. However, is it so for all households regardless of their income/education level?

We conclude our theoretical analysis with a study of the long-term and the transition trajectories towards the steady state. We wonder whether the steady state is unique and what are the factors that may trigger long-term increases in welfare. Without making the hypothesis that the household future human capital is positively correlated to its current level, we wonder whether policies that increase fertility in the upper tail of the income distribution can increase aggregated welfare. Note that this situation would correspond to a welfare state in which education financed by the government at all levels.

b) Empirical Investigation

We empirically test whether the U-shaped pattern between income and fertility can be confirmed for micro data. To estimate the impact of household and of women's income on the number of children in a couple of selected countries, we use survey data from the the EU-SILC (Statistics of Income and Living Conditions) and the German SOEP. We use micro panel data in order to be able to control for individual characteristics and causality issues (Fixed Effects Estimation, use of time lags).

A particular challenge for our empirical estimation will be to eliminate birth postponement due to education and other effects related to mothers' age that influence

women's income and their number of children. One possibility is to analyze the impact of income on the completed number of children of women. However, considering women aged 45+ only implies a significant reduction in the number of observed individuals. Moreover, the EU SILC data contains only information about the number of children actually living in parents' household. Thus, we complete our analysis with a case study based on the German SOEP – a database that contains more reliable information about the actual number of children a women has.

3) Outlook

Finally, we intend to derive policy implications from our theoretical and empirical results. Our objective is to find out which policy mix is most likely to succeed in offering a coherent setting that allows parents of all income groups a satisfying combination of work and family life.

4) References

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