Luxembourg and France: Comparable Family Benefits, Comparable Fertility Levels?

Anne REINSTADLER

Luxembourg and France:
Comparable Family Benefits, Comparable Fertility Levels?

Anne Reinstadler[1]
CEPS/INSTEAD, Luxembourg

Abstract: The economic theory of the family as proposed by Becker (1981, 1991) predicts clearly the relationship between income (especially the mother's income) and fertility. Indeed, it assesses that an income effect and a substitution effect could coexist, whose net impact is thus to be determined empirically. Many authors have already attempted to do so, some interested in the effect of the woman's wage on fertility, others focusing on the effect of some family policy measures on the decision to have a first child. Our own analysis is situated in this latter framework. Using the Luxembourgish sample of the EU-SILC data, we estimate the effect observed in the Grand-Duchy and compare the result with those obtained in France, a country with quite similar family policies.

Key-words: Fertility, family benefits, endogeneity

JEL Classification: J13

I. Introduction

Using the concepts of production, division of labor and specialization in the allocation of time, Gary Becker has applied to the family "an analysis based on rational behavior". Sometimes considered as provocative, this approach has proven useful especially for the analysis of the fertility determinants. In fact, one of Becker's points was to explain the demand for children by the family income and the price of children.

The economic theory of the family as proposed by Becker (1981, 1991) predicts quite clearly the relationship between income (especially the mother's income) and fertility. Indeed, it assesses that an income effect and a substitution effect could coexist, whose net impact is thus to be determined empirically. Many authors have already attempted to do so, some interested in the effect of the woman's wage, others focusing on the effect of some family policy measures on the decision to have a first child. Our own analysis is situated in this latter framework. Using the Luxembourgish sample of the EU-SILC data, we estimate the effect observed in the Grand-Duchy and compare the result with those obtained in France, a country with quite similar family policies.

This paper briefly reminds in section 2 the relationship the theory suggests between fertility and financial elements. Section 3 shows the results found in the literature, depending on the type of family benefits. In section 4, we present the existing family policy measures in France and Luxembourg respectively. The level of fertility is observed in both countries in section 5. Finally, the effect of these policies on fertility (probability of having a first child) in France and Luxembourg is compared in section 6.

II. Theoretical link between household financial resources and fertility

The price of a child depends on one hand on the goods that are necessary to raise him/her. Thus, the child has a direct cost, because he/she needs to be fed, clothed, sheltered, etc. On the other hand, his/her price depends on the time that his/her parent has to devote to his/her education. In this sense, the child has an indirect cost as well, also called opportunity cost, equal to the value of the time spent with him/her instead of working. The magnitude of this opportunity cost depends thus on the parent's earnings. Because a large majority of

fathers usually do not participate in childcare activities, the theory foresees that they do not experience any opportunity cost after the birth of a child. By contrast, an increase in the mother's wage rate will raise her opportunity cost, and lead thus to a *decrease in her fertility*. Because the wage rate is assumed to increase with the education level (according to the Human Capital theory, Becker 1964), the fertility is expected to be lower for more educated women.

The household real income is supposed to have an effect on the demand for children as well. An increase in this income should indeed raise the demand for different goods, the demand for children being no exception as they are considered to be a normal good. In other words, an increase in the household income should lead to an *increase in fertility*. Now, the father's and mother's potential wages play a part in the household income. As a consequence, an increase in either of these two wages should have a positive effect on fertility. However, Becker explains the potential absence of such a positive relationship in introducing the concept of quality of children. In fact, households with higher income levels would prefer to raise the quality of their already born children instead of their quantity. Thus an additional hypothesis can be made: the demand for children would be lowest for households whose income is median; higher income levels would be enough to allow an increase in both the number and the quality of the children.

Henceforth, the theory foresees two potential effects on fertility of an increase in the woman's earnings, of opposite direction.[2] The empirical analysis has thus a great part to play in order to assess the overall effect financial resources have on fertility. Historically, a negative association between female labour supply and fertility has been observed in all western countries during the last decades. This seems to indicate that the opportunity cost was high enough to win over the income effect (Apps & Rees, 2004). However, it is now quite clear in some European countries that the higher the female employment rates, the higher the fertility levels. This could make one wonder if the relationship between female wage rate and fertility has changed – if the opportunity cost has been lowered.

What effects on fertility does the economic theory of the family foresee for the different family policies? These policies can have a positive impact on fertility either by

---

[2] An increase in the male wage rate is supposed to have only an income effect.

diminishing the (direct or indirect) cost of children for the parents or by increasing the household financial means.

For example, direct policies such as family allowances, whose objective is to compensate the cost of the children (at least part of it), increase the family income. Thus, they could lead to an increase in the demand of children.

As for policies aiming at reconciling work and family life[3], they are supposed to reduce the opportunity cost the mother faces; she could therefore continue working, childcare services taking over (at least partly) the cost in time created by the presence of the child. Such policies would thus allow to limit or even to eradicate the decrease in fertility due to the female labour supply. In other words, the relationship existing between female labour supply and fertility would be observed negative if the mother has to take care for her child; it would become positive[4] if the childcare can be overtaken by others (Apps and Rees, 2004).

III. The effect of family policies on fertility: A brief literature review of empirical analyses

A family policy whose objective is to impact the fertility level has theoretically three channels: firstly, via a direct financial support, this family policy would increase the disposable income for parents to care for their child. Secondly, via policies aiming at reconciling work and family life (childcare facilities for example), such a family policy would allow active women to have a child, by reducing the opportunity cost they would face once the child was born. Finally, via relevant fiscal measures, a family policy would avoid disincentives for inactive mothers wanting to work, or for active women wishing to have a child.

Allowances related to the birth itself, and especially family allowances, belong to the first of these three categories. Indirect measures supporting childcare services enter the second

---

[3] These measures include especially childcare services, at an affordable price, of acceptable quality, available during time slots allowing the parents to work.
[4] Or at least less negative.

one. Finally, policies such as the Earned Income Tax Credit in the United States, or the Working Tax Credit[5] in the United-Kingdom, or the French tax system as well belong to the third category.

One logical question is thus the following: are all of these policies effective in raising the fertility level? The empirical literature is quite rich on the subject, and gives some answers in the context where the majority of authors agree on the fact that it is difficult to assess the effect of one specific family policy measure because the family policy rarely consists of one measure only but more often of a set of measures, the effects of which it is difficult to disentangle (see for example Thévenon, 2009).

Concerning the **direct financial support**, Haan and Wrohlich (2009) identify a positive effect in Germany. Were the family allowances to be raised by 20% compared to their actual level for children less than 3 years of age (meaning an increase of 360€/year), the fertility would be raised by around 5%. In Canada, Milligan (2005) estimates that the probability of having a first child has been raised by 12% following the introduction of the *Allowance for Newborn Children* (allocating 500$CAN/year for the first child). He further estimates that, should the financial aid given during the first year of the child be increased by 1000$CAN/year, the probability of having a child would increase in turn by around 17%. This effect is indeed not negligible, but the cost of such a policy would not be either.

However, Ekert-Jaffé (1986) estimates in 1986 for the French case that the financial support as a whole has indeed increased the total fertility rate, but only by 0.2 child per woman on average. In a more recent study concerning France as well, Laroque and Salanié (2008) use micro data and observe a clear effect of the financial support on the birth of the third child, and a weaker effect when the child is the first born (and almost no effect when the child is the second born). In other words, the impact of a direct financial support depends on the rank of the child. Brewer *et al*. (2009) find an income effect in the United-Kingdom as well, but only for women living in a couple, and especially for the first child.

---

[5] These measures consist in a tax credit given to households where at least one person is employed. The amount granted increases clearly with the number of children. One of the admitted objectives of these measures is to increase the labour supply.

Direct measures aiming at reducing the childcare cost could raise fertility as well. Such a positive relationship is verified by Del Boca *et al*. (2008) in Italy, and by Mörk *et al.* (2009) in Sweden – especially for women working part-time. However, Hank and Kreyenfeld (2001) do not observe it in Germany.

As for the **measures aiming at reconciling work and family life**, Lalive and Zweimüller (2005) suggest that extending the duration of the parental leave in Austria would increase the probability of having a second child in the three years following the birth of the first child by 15%. However, Del Boca *et al.* (2008) cannot find any significant link in Italy. It seems that these differences in results could be due to the duration of the parental leave initially defined in each country, and to the level of the grant.

The increased availability of childcare services seems to have a positive effect on the fertility in Italy (Del Boca, 2002) and in Spain (Baizan, 2009). Still, Del Boca *et al*. (2008) add that this positive effect is observed only for low educated women. However, Hank (2002) and Hank and Kreyenfeld (2001) do not observe any effect in Germany. These authors suggest that this non expected result is due to the constraints the women face: because the level of childcare supply is so low in Germany, women decide to have a first/second child or not without even taking this low level into consideration.

Considering that the historically negative relationship between female labour supply and fertility has sometimes become positive in some western countries in the recent years[6], some authors (Hank, 2002; Apps and Rees, 2004) suggest that these very measures increasing the childcare services have changed the arguments of the trade-off between the labour supply and the number of children. In other words, according to these authors, these measures allow the women to be present on the labour market and to have a child at the same time.

In his literature review of the link between family policies and fertility, Thévenon (2009) also suggests that these measures aiming at reconciling work and family life have probably the strongest effect on fertility in France. For the author, the direct financial support for families is indeed quite weak in France. However, he considers that measures aiming at reconciling work and family life can on the other hand guarantee in the medium-term

---

[6] Meaning that the income effect played by the mother's wage could have become stronger than the opportunity cost she has to face because of the child's birth.

confidence in the wish of the public authorities to support active women having young children, and thus can increase the probability of these women having children. Still according to Thévenon, this would explain both that few women stay childless in France, and that the female (full time) employment rate is quite high among women having a young child.

Policies related to the labour market can also have an impact in terms of reconciliation of work and family life, and thus in terms of fertility. It is particularly the case of those facilitating working part-time, especially in countries where childcare services are quite limited (in opening hours), as in Italy[7] (Del Boca *et al*., 2008). Besides, it is the difference in reconciliation of work and family life policies between France and Germany that is used by Breton and Prioux (2009a) in order to explain the different levels of childless rates in these two countries. In fact, this rate was of 10% for women born in France in 1930-1960 – see Régnier-Loilier and Solaz (2010) –, and double in Germany – see Breton and Prioux (2009b).

Finally, a study published in 1989 by Cigno and Ermisch has estimated at that time that increasing the tax rate on women's income (thus diminishing the opportunity cost of the child), or decreasing the tax rate on men's income led to an increase of the fertility in the United-Kingdom. In fact, the duration between marriage and a child's birth would be reduced. As for the much more recent analysis by Brewer *et al*. (2009), it shows that the probability of having a child has been increased by 1.3 percentage point due to the 1999 reform introducing the Working Families' Tax Credit.

To sum up, all of the three channels used by family policies can have, at least in some countries, a certain effect on the fertility level. However, this effect clearly depends on the rank of the child. Moreover, the effect of some of these measures on the fertility level seems quite small. This is especially the case of financial allowances granted directly to families, which could have a time effect rather than an impact on the completed fertility. Indeed, these financial measures could allow families to bring forward their child's birth or to improve the situation of their already born child(ren) (improving their quality), but would not lead them to

---

[7] However, Del Boca (2002) underlines that this positive effect of the increase in part-time jobs on fertility disappears when the empirical model is better specified, using a joint analysis (bivariate probit model).

have more children than they intended to have[8] (Brewer *et al.*, 2009; Thévenon and Gauthier, 2010).

IV. Family Policies in France and Luxembourg: Similarities and Differences

The most usual scheme of family policy consists in an allowance granted to families having children. Table 1 shows the amount paid in France and Luxembourg, depending on the number of children.

Table 1. Family Allowances, in France and Luxembourg in 2010, depending on the number of children (in Euros – supplements according to the age of the child not included)

	Families with 1 child	Families with 2 children	Families with 3 children
France[9]	0	126	287
Luxembourg[10]	186	441	803

Reading guide: in France, families with an only child do not get any family allowances. Families with two children receive 126€/month (amounts rounded to the nearest Euro).

This table clearly shows that family allowances are more generous in Luxembourg than in France.[11] Families living in Luxembourg seem thus to be privileged.

However, these family allowances are not the only family policy. And measures allowing to reconcile family and professional lives could have a real impact on the fertility level. The share of public expenses for families in the gross domestic product is quite informative in this sense. These expenses can be of three types (OECD classification): direct

---

[8] Some authors even worry about the fact that some measures could have pernicious effects. For example, Botev (2008) underlines that a parental leave leading a parent to withdraw from the labour market for quite a long time could reduce his/her employability, and thus the probability of further births. However, it seems that this kind of measure could also have an effect in the opposite direction: staying for a long time out of the labour market could give incentives to have another child.

[9] Source: http://www.caf.fr/wps/portal/particuliers/catalogue/metropole/af

The increase for children older than 11 is 35€/month, and 63€ for children older than 16, when they were born until April 30 1997. Afterwards remains only one increase, which is 63€/month for children older than 14.

[10] Source: http://www.cnpf.lu/

The amounts indicated here do not take into account the different increases for age, equal to 16€/month for each child older than 6, and 49€ for each child older than 12.

[11] The contrast is just by a bit softened when the amounts are expressed in purchase power parities (PPP). For example, the amounts are respectively of 257 PPP in France and 670 PPP in Luxembourg for families having three children (with PPP = 1 in the EU27).

expenses (family allowances, parental leave…); expenses directed to services for families (especially for families with young children – childcare services); and expenses through the fiscal system (different deductions due to the presence of children) – see Table 2.

Table 2. Share of expenses directed to families in the gross domestic product (2007), in France and Luxembourg

	Share of the **total** public expenses designed for families in the gross domestic product	Share of the public expenses **in services** designed for families in the gross domestic product
France	3,71	1,66
Luxembourg	3,13	0,47

Source : OECD Family Database : www.oecd.org/els/social/family/database

This table shows that in 2007 the family policy was more generous in France in terms of the total public expenses designed for families, and even more so in terms of the expenses aiming at helping families to reconcile work and family life.

Unfortunately, no comparable data are available after 2007. Yet, from that time, Luxembourg has dramatically increased the total amount directed towards families (Reinstadler, 2011). Firstly, a new scheme has been introduced in January 2008, which is exactly equal to the former tax deduction for children for those who could benefit from it before it was suppressed, and which can also benefit families whose taxable income is lower (who were therefore previously not entitled to the tax deduction). Secondly, the expenses directed to childcare services have increased, both by raising the number of childcare slots for young children whose parents work, and by subsidizing the price of these slots (Bousselin, 2011; Bousselin and Segura, 2011). No more recent comparative information is currently available, but figures from the Luxembourgish Ministry of the Family[12] indicate that between 2007 and 2010, the foreseen expenses have increased for three reasons. Firstly, foreseen expenses for family benefits have increased by 50%; secondly, the expenses for childcare services subsides have been expected to know a dramatic increase of 127%; finally, the foreseen expenses concerning the parental leave have been raised by 17%. In other terms, the general public expenses designed for families with children have been expected to increase dramatically in these three years, leading to a situation that is probably closer to the French situation than it was previously.

---

[12] Sources: *Loi du 22 décembre 2006 concernant le budget des recettes et des dépenses de l'Etat pour l'exercice 2007*, and *Loi du 18 décembre 2009 concernant le budget des recettes et des dépenses de l'Etat pour l'exercice 2010*.

To sum up, this analysis of the family policy measures existing in France and Luxembourg has shown that the direct family allowances are more generous in Luxembourg, but that the total public help directed to families were parents work could be of comparable extents in both countries since the recent changes introduced in Luxembourg. Henceforth, the situation in these two countries could be considered as quite comparable.

Let us now analyze the situation in both countries in terms of fertility level.

V. Fertility levels in France and Luxembourg

Comparing the total fertility rate for France and Luxembourg allows two interesting conclusions (Table 3). Firstly, the figures do not exceed the value of 2.0, reached only in France at the end of the observed period.[13] Yet, for the generations to be renewed, the total fertility rate should be 2.1.[14]

Table 3. Total fertility rate, in France and Luxembourg, for selected years

	1990	*1995*	*2000*	*2005*	*2009*
France[15]	1,78	1,71	1,89	1,94	2,00
Luxembourg	1,60	1,70	1,76	1,63	1,59

Source : Eurostat (http://appsso.eurostat.ec.europa.eu/nui/show.do)

Secondly, these figures indicate that the situation is different in both countries. The total fertility rate is quite good in France and is the result of a regular upward trend since the mid 1990s, whereas the level of fertility is quite lower in Luxembourg and even seems to have deteriorated in the 2000s (analyzing the figures year after year indicates that this damage

---

[13] In France, this figure is between 1.89 and 2.01 since 2000: this quite good result is stable in the country for one decade.

[14] This value of 2.1 takes into account the context (for example the infant mortality rate) of the country: it is valid only in developed countries. Let us remind that this value should in fact be compared to the completed fertility indicator, which gives with more accuracy the total number of children women will eventually have once they have completed childbearing. However these two indicators are quite close if there is no postponement of births.

[15] The figures for 1990 and 1995 are available only for Metropolitan France. They are thus probably underestimated compared to those concerning women living on the whole French territory (however, for the following years, when the two series of figures are known, the observed difference is only 0.02 for each year).

has occurred essentially at the beginning of the 2000s, the situation remaining quite stable afterwards).

The evolution of the fertility level hides in fact the evolution of different elements: that of childless women, and that of the age of the women at the birth of their first child.

The rate of childless women is quite low in France: only 10% of women born in the 1930s-1960s were concerned (Régnier-Loilier and Solaz, 2010). The figure is higher in Luxembourg, where it has been shown that 18% of women born in 1952-1956 have remained childless (Bodson, 2010, using the data of the 2001 census).

On the other hand, studies have shown that an increase in the mother's age at first childbirth can lead to a decrease in the total number of children. The figures for the two countries show that women in Luxembourg have on average their first child a bit later than women in France (Table 4).

Table 4. Mean age of women at first childbirth, in France and Luxembourg (2008)

	Mean age of women at the birth of their first child
France	28,6
Luxembourg	29,3

Source: OECD Family Database : www.oecd.org/els/social/family/database

To sum up, the situation concerning the fertility level is more worrying in Luxembourg than in France, which could be due to the fact that two components of the fertility level (rate a childless women and mean age at first childbirth) are worse as well.

As a conclusion of this short descriptive analysis, it seems that two quite comparable family policies lead to two different situations in terms of fertility level. In other words, the Luxembourgish family policy seems to be less efficient than the French one in terms of its effect on the fertility level. Does this conclusion hold when the analysis controls for other factors?

VI. What is the effect of family policies on fertility in both countries?

In this section, we analyze the effect of family policy measures on fertility when controlling for different factors. Our own empirical analysis concerns Luxembourg only; our results are then compared to those obtained in the literature concerning France.

A. Methodological choices and data

Our objective is to estimate the effect of financial resources on the probability of the first child's birth. Yet recent studies have shown that fertility and labour market decisions are partly endogenous, which leads us to estimate them simultaneously. Such analyses are quite common in this field of the literature (see for example Del Boca, 2002; Kreyenfeld, 2002; Del Boca and Locatelli, 2006; Del Boca *et al*., 2008; Baizan, 2009; Haan and Wrohlich, 2009). Our choice is thus to estimate a **joint model**, with one equation of labour market participation (being employed or not), and another one of fertility decision (having or not a first child).

We estimate a **discrete time duration model**, firstly because the data we use are panel data (which, by contrast with historical data, do not give enough information on women having reached their non-fecundity period), and secondly because the information related to the child's birth is quite rough (known in years), forbidding to consider time as being continuous. Following Allison (1982, 2010), we estimate the probability of having a first child taking into account the time elapsing between the origin of time and the child's birth. In this analysis, the origin of time has been set to the year when the parents got married. Thus two probit equations are simultaneously estimated. Marginal estimated effects are calculated following Wooldridge (2009).

The analysis rests on a sample of married women aged 20-45, some having a first child in the ten years following their marriage (child born in the years 2003-2009, referring to the observation period of the data), others remaining childless during this period.

We have limited the population to married women for empirical reasons. Indeed, couple trajectories are better known for married couples than for the others. For sure, this choice does not allow to conclude for the whole population of women, which is one of the

limitations of our analysis (the proportion of births out of wedlock having increased in the last years – reaching 32% in Luxembourg and 54% in France in 2009 – Eurostat[16]). We use the Luxembourgish households panel (PSELL-3, Panel Socio-Economique Liewen zu Lëtzebuerg).

B. Results

We estimate the marginal effect of each explanatory variable on the probability, for a married woman aged 20-45, to have a first child in the 10 years after getting married. We are particularly interested in the effect of the financial resources of the household on this probability, but we comment briefly the other results we have obtained (Table 5).

---

[16] These figures consider all births together whatever the rank of the children. The proportion of births out of wedlock is probably higher for first born children.

Table 5. Bivariate Probit: Probability of having a first child and probability of being employed, in Luxembourg

Variable	Mean	Estimated parameter	p-value
Fertility equation			
intercept		- 4,88622	< 0,0001
marriage duration = 1 year	0,038	ref.	ref.
marriage duration = 2 years	0,177	0,65422	< 0,0001
marriage duration = 3 years	0,178	0,93442	< 0,0001
marriage duration = 4 years	0,139	0,68932	< 0,0001
marriage duration = 5 years	0,141	0,78940	< 0,0001
marriage duration = 6 years	0,107	1,00268	< 0,0001
marriage duration = 7 years	0,070	0,53511	0,0065
marriage duration = 8 years	0,057	0,74418	0,0003
marriage duration = 9 years	0,043	0,68098	0,0030
marriage duration = 10 years	0,051	0,32930	0,2685
age			
woman's age	30,26	0,23573	0,0006
woman's age squared	944,99	- 0,00443	< 0,0001
education level			
primary	0,149	0,14895	0,2296
secondary	0,375	0,04545	0,5914
post-secondary	0,477	ref.	ref.
nationality			
Luxembourgish	0,261	ref.	ref.
German	0,042	0,10590	0,5512
Belgium	0,065	- 0,16585	0,2672
French	0,143	0,09397	0,3898
Portuguese	0,221	0,19102	0,0886
other EU-15	0,069	- 0,04107	0,7819
other countries	0,198	- 0,27294	0,0109
financial resources			
household financial resources (in thousands Euros/year)	44,677	0,01234	< 0,0001
household financial resources squared	3102,88	- 0,00002775	< 0,0001
Labour market participation equation			
intercept		0,93711	< 0,0001
woman's age	30,26	0,00137	0,8218
education level			
primary	0,149	- 0,56634	< 0,0001
secondary	0,375	- 0,13672	0,0606
post-secondary	0,477	ref.	ref.
household financial resources (in thousands Euros/year)	44,677	- 0,00432	0,0001
rho[17]		- 0,3085	< 0,0001
N= 1823 observations (465 having a first child)			

Source: PSELL-3, 2003-2009.

---

[17] As rho coefficient is both significant and negative, there is evidence that fertility and labour market decisions are endogenous and that having a first child is negatively correlated to having a job.

The woman's **age** has a clear non linear effect on the first birth. This effect is first positive until the age of 26.6, then it becomes negative. For example, at the age of 23, the probability of having a first child is increased by 3 percentage points; at 35, this probability is decreased by 7 percentage points.

As for the **nationality**, Portuguese women behave differently from Luxemburgish women: their probability of having a first child in the ten years following their marriage is higher by 6 percentage points (significant at 9% level). It is in fact well-known that the total fertility rate prevailing in this small country[18] is quite different depending on the nationality of the women.[19] In a few words, Luxembourgish and foreign women had, in 1990, as many children. However, this equality of situation has been limited in time: in the previous years, the fertility rate of foreign women was clearly higher than that of Luxembourgish women. From 1990 on, the number of children per woman has indeed increased for both sub-groups, reaching a maximum in 2000. However, this increase has been more marked for foreign women, and the following decrease observed in both sub-groups has been weaker for them, Portuguese women making up more than 30% of the foreign population in Luxembourg since the 1980s (Statec).

The **education level** (defined in three categories) of the woman has no effect on the first birth. Yet this education level is correlated to the woman's wage rate, and is thus often considered as a good proxy of it. The absence of effect allows thus to conclude that the opportunity cost of the child has no negative effect on his/her birth, contrary to what previous studies had historically shown in many countries, but in accordance with more recent analyses.[20]

---

[18] The country had 512 000 inhabitants on 31 December 2010 (Public Statistical Office – STATEC, Luxembourg).

[19] Yet the foreign population is quite large: in 2011, it exceeds 40% of the total population (43.2%).

[20] Some recent studies even show a positive effect of the education level on the probability of having a child (Del Boca *et al*., 2008), whereas previous studies had shed light on an effect of the opposite direction. Kreyenfeld (2002) wonders about this recent positive relationship between education (or wage) and fertility. The author shows that it can sometimes hide a selection bias: when analyzing the probability of having a second child, the effect of the education level is negative again when controlling for the fact that women having a second child have a preference for children. However, this assessment cannot be applied to our own analysis since only the first birth is considered here.

Finally, when the **financial resources**[21] of the household increase, the probability of having a first child increases as well. Thus an income effect is confirmed. However, this income effect is quite small, all the more for higher resources, as the effect is not linear. In other words, increasing financial means does not really affect the probability of having a child for the most well-off households. This result can be interpreted as a disincentive for the policy makers to increase the financial help designed to encourage the birth of the first child of these well-off families. On the other hand, increasing the financial resources of the less well-off families could have a small effect on the fertility: for households whose resources are around the Luxembourgish poverty line (around 19000€/year in 2009), increasing the family allowances by 2000€/year (i.e. by around 167€/month) would increase the probability of first birth by 2.2 percentage points. This effect would be of 2.1 points for households with resources equal to 30000€/year, and of 1.7 points for those whose resources are twice as high (60000€/year).

This effect for Luxembourg can be compared to the results shown in the literature concerning France. In fact, early studies have shed light on an effect of very small extent if any at all, using macro data (Blanchet and Ekert-Jaffé, 1994; Gauthier and Hatzius, 1997). For example, Gauthier and Hatzius (1997) find that increasing the family benefits by 25% would increase the number of children by 0.07 per woman[22].

Basing their analysis on micro data as we do, more recent studies have estimated the effect of financial incentives on the fertility behaviour (Del Boca *et al.*, 2008; Laroque and Salanié, 2008), also using methods taking into account the non independence of both fertility and labour choices. Del Boca *et al.* (2008) apply a bivariate probit model to estimate the probabilities of working and having a child, but the authors do not distinguish between the children depending on their birth order. Moreover, they put different countries together, according to the type of social security regime they belong to, which prevents from distinguishing the estimated effects in each country. This could perhaps be a reason why none

---

[21] These financial resources have been measured as follow: sum of all resources of the household, and then deduction of those linked with any professional activity of the woman. Making this usual choice (see Del Boca *et al.*, 2004; 2008) allows to reason independently from the woman's situation on the labour market.
[22] As the dependent variable these studies define is quite different from our own dependent variable (probability of having a first child in the 10 years following marriage in our case, total fertility rate in theirs), results cannot be directly compared. Still it is possible to conclude that all these studies show a positive but quite small effect of family policies on fertility.

of the family policy variables is significant (neither childcare availability, nor duration of parental leave, nor level of family allowances), if these effects are of opposite sign in the different countries belonging to the same group.

As for Laroque and Salanié (2008), they find a "sizeable" effect on fertility of a change in family policy in France: increasing the family benefits by 100€ per month would raise the probability of having a first child by 3.0 percentage points. In other words, a change in family policy in France smaller than the change we have tested for Luxembourg would lead to an increase in fertility that would be indeed higher. [23]

VII. Conclusion

The general conclusion of this study is threefold. Firstly, France and Luxembourg have defined family policy measures aiming both at supporting directly parents (by means of child benefits – more generous in Luxembourg) and at helping them to reconcile work and family life (through quite developed childcare services in the two countries).

Secondly, a descriptive analysis of fertility shows that its level is higher in France.

Thirdly, an analysis controlling for different factors simultaneously seems to allow the conclusion that an almost identical change in financial incentives indeed has a positive effect on the probability of having a first child in both countries, but that this effect is larger in France.

These two differences (both in total fertility level and in the effect of family policy measures on individual fertility decisions) observed in a quite comparable present family policy context could be due to the fact that the measures which aim at helping parents to reconcile work and family life are more recent in Luxembourg (defined mostly in 2008 and 2009). Should this hypothesis be verified, the observed differences could become smaller in the medium-term.

---

[23] Recall that this effect has been estimated as being non linear in the Grand-Duchy, ranging from 1.7 percentage points for the most well-off women to 2.2 points for the less well-off.

Two further steps will be considered in the near future to extend this analysis. Firstly, we would like to make a similar comparison between France and Luxembourg for second and third births, as the literature has shown that family policies can have a different impact on fertility depending on the rank of the child. Secondly, we would like to use international comparable data in order to compare the situation prevailing in different countries. This should allow us to take into account individual characteristics (socio-demographic ones, or those concerning the labour market) and contextual information (such as the generosity of the social benefits, or the availability of child care services), and therefore to conclude in terms of their respective effect on fertility.

References

ALLISON Paul D. (1982), "Discrete-Time Methods for the Analysis of Event Histories", *Sociological Methodology*, Vol. 13, pp. 61-98.

ALLISON Paul D. (2010), *Survival Analysis Using SAS. A Practical Guide*, Second Edition, SAS Institute Inc., 324 pages.

APPS Patricia, REES Ray (2004), "Fertility, Taxation and Family Policy", *The Scandinavian Journal of Economics*, Vol. 16, No. 4, December, pp. 745-763.

BAIZAN Pau (2009), "Regional childcare availability and fertility decisions in Spain", *Demographic Research*, Vol. 21, pp. 803-842.

BECKER Gary S. (1991), *A Treatise on the Family*, Enlarged Edition, Harvard University Press, Cambridge, 424 pages.

BLANCHET Didier, EKERT-JAFFE Olivia (1994), "The Demographic Impact of Fertility Benefits: Evidence from a Micro-Model and from Macro-Data", in *The Family, the Market and the State in Ageing Societies,* J. Ermisch and N. Ogawa (Eds.), Oxford, Clerendon Press, pp. 79-105.

BODSON Lucile (2010), "De plus en plus de femmes sans enfant", Les Cahiers du CEPS, Cahier N° 2010-05, Avril, 12 pages.

BOUSSELIN Audrey (2011), "Bilan du Chèque-service accueil un an après sa mise en application. Mise au point d'indicateurs de suivi à partir de données administratives", Etude réalisée pour le compte du Ministère de la Famille et de l'Intégration du Grand-duché de Luxembourg, CEPS/INSTEAD, février, 26 pages.

BOUSSELIN Audrey, SEGURA Jordane (2011), " Bilan du Chèque-service accueil un an après sa mise en application. Conséquences sur la demande de modes d'accueil des enfants et l'activité professionnelle des parents. Conséquences sur l'activité des prestataires de l'accueil socio-éducatif", Etude réalisée pour le compte du Ministère de la Famille et de l'Intégration du Grand-duché de Luxembourg, CEPS/INSTEAD, février, 180 pages.

BOTEV Nikolai (2008), "Can policies enhance fertility in Europe? and questions beyond", Vienna Yearbook of Population Research 2008, pp. 29-34.

BRETON Didier, PRIOUX France (2009a), "The one-child family: France in the European context", *Demographic Research*, Vol. 20, Issue 27, June, pp. 657-692.

BRETON Didier, PRIOUX France (2009b), "L'infécondité en France et en Allemagne : des lectures différentes d'un phénomène de plus en plus fréquent ?", Communication au XXVIe congrès international de la population, session 39, Marrakech, 28 septembre.

BREWER Mike, RATCLIFFE Anita, SMITH Sarah (2009), "Does Welfare Reform Affect Fertility? Evidence from the UK", *The Institute for Fiscal Studies*, WP08/09, 42 pages.

CIGNO Alessandro, ERMISCH John (1989), "A Microeconomic Analysis of the Timing of Births", *European Economic Review*, Vol. 33, pp. 737-760.

DEL BOCA Daniela (2002), "The effect of Childcare and part-time opportunities on participation and fertility decisions in Italy", *Journal of Population Economics*, Vol. 15, pp. 549-573.

DEL BOCA Daniela, LOCATELLI Marilena (2006), "The Determinants of Motherhood and Work Status: A Survey", *IZA Discussion Paper Series*, No. 2414, October, 32 pages.

DEL BOCA Daniela, PASQUA Silvia, PRONZATO Chiara (2004), "Why Are Fertility and Women's Employment Rates So Low in Italy? Lessons from France and the U.K.", *IZA Discussion Paper Series*, No. 1274, August, 36 pages.

DEL BOCA Daniela, PASQUA Silvia, PRONZATO Chiara (2008), "Market Work and motherhood decisions in contexts", *IZA Discussion Paper Series*, No. 3303, January, 28 pages.

EKERT-JAFFE Olivia (1986), "Effets et limites des aides financières aux familles : une expérience et un modèle", *Population*, Vol. 41/2, pp. 327-348.

GAUTHIER Anne H., HATZIUS Jan (1997), "Family Benefits and Fertility: An Econometric Analysis", *Population Studies*, Vol. 51, pp. 295-306.

HAAN Peter, WROHLICH Katharina (2009), "Can Child Care Policy Encourage Employment and Fertility? Evidence from a Structural Model", *IZA Discussion Paper Series*, No. 4503, October, 30 pages.

HANK Karsten (2002), "Regional Social Contexts and Individual Fertility Decisions: A Multilevel Analysis of First and Second Births in Western Germany", *European Journal of Population*, Vol. 18(3), September, pp. 281-299.

HANK Karsten, KREYENFELD Michaela (2001), "Childcare and Fertility in (West) Germany", *Max Planck Institute for Demographic Research, Working Paper* 2001-019, July, 31 pages.

KREYENFELD Michaela (2002), "Time-squeeze, partner effect or self-selection? An investigation into the positive effect of women's education on second birth risks in West Germany", *Demographic Research*, Vol. 7(2), July, pp. 15-48.

LALIVE Rafael, ZWEIMUELLER Josef (2005), "Does Parental Leave Affect Fertility and Return-to-Work? Evidence from a True Natural Experiment", *IZA Discussion Paper Series*, No. 1613, May, 44 pages.

LAROQUE Guy, SALANIE Bernard (2008), "Does Fertility Respond to Financial Incentives? ", *IZA Discussion Paper Series*, No. 3575, June, 43 pages.

Loi du 18 décembre 2009 concernant le budget des recettes et des dépenses de l'Etat pour l'exercice 2010, Mémorial A – N° 254 du 24 décembre 2009, pages 5107-5279.

Loi du 22 décembre 2006 concernant le budget des recettes et des dépenses de l'Etat pour l'exercice 2007, Mémorial A – N° 236 du 29 décembre 2006, pages 4313-4476.

MILLIGAN Kevin (2005), "Subsidizing the Stork: New Evidence on Tax Incentives and Fertility", *Review of Economics and Statistics*, Vol. 87(3), pp. 539-555.

MÖRK Eva, SJÖGREN Anna, SVALERYD Helena (2009), "Cheaper Child Care, More Children", *IZA Discussion Papers Series*, No. 3942, January, 38 pages.

REGNIER-LOILIER Arnaud, SOLAZ Anne (2010), "La décision d'avoir un enfant : une liberté sous contraintes", *Politiques sociales et familiales*, n°100, juin, pp. 61-77.

REINSTADLER Anne (2011), "Le rôle des ressources financières du ménage dans l'arrivée du premier enfant", Rapport réalisé pour le compte du Ministère de la Famille et de l'Intégration, n° 2011-01, Février, 52 pages.

THEVENON Olivier (2009), "Does Fertility Respond to Word and Family-life Reconciliation Policies in France ?", in Noriyuki Takayama and Martin Werdings (eds.), *Fertility and Public Policy: How To Reverse the Trend of Declining Birth Rates*, Cambridge MA and London UK: MIT-Press, Chapter 10, pp. 231-261.

THEVENON Olivier, GAUTHIER Anne (2010), "Variations de la fécondité dans les pays développés : disparités et influences des politiques d'aide aux familles", *Politiques sociales et familiales*, n°100, pp. 7-22.

WOOLDRIDGE Jeffrey M. (2009), Introductory Econometrics. A Modern Approach, Fourth Edition, South-Western Cengage Learning, 865 pages.

CEPS
INSTEAD