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ABSTRACT

The Determinants of Motherhood and Work Status: A Survey^{*}

In this paper we present important empirical evidence regarding recent trends in women's participation and fertility in European countries, and provide several interpretations of the differences across countries. Several recent analyses have considered labour supply and fertility as a joint decision and have explicitly taken into account the endogeneity of fertility in labour market participation decisions of women. We survey microeconomic analyses that explore the impact of social policies on the joint decisions of labor market participation and fertility. The results of most analyses indicate that social policies, taking into account several variables (family background, the allocation of time within the household, religion and culture), have a very relevant role in explaining different degrees of incompatibility between employment and child rearing across different countries. The incompatibilities between motherhood and careers find reconciliation in policies that enhance employment flexibility and diminish the potential opportunity costs of children.

JEL Classification: J2, C3, D1, H31

Keywords: labor market decisions, fertility, child care, family policies

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1 Introduction

Over the last few decades women labour market participation rates have increased remarkably in the European countries, while fertility has declined and is now below the replacement rate.

Since 1970, as well as these rising participation rates (especially among married women with children) women's college attendance and graduation rates have also greatly increased relative to males. These changes are reflected in their occupations and earnings relative to those of men. They now have more years of accumulated job experience and their returns to job experience have grown as well. Given the higher investments in human capital and higher returns, women started delaying marriage and childbearing to take formal education more seriously and dedicate more time to establish work relationships. The combination of the postponement of marriage and more divorces increased the number of years spent unmarried and made them more valuable for the women's financial independence provided by stronger attachment to the labor market (Goldin 2006). The decline in fertility associated with the increased labour market participation is consistent with microeconomic theory which emphasizes the opportunity cost associated with women's rising level of education, stronger labour market attachment, and improved earnings prospects (Becker 1991; Cigno 1991; Ermisch 2003).

Since the mid 1980s, however, cross-national studies show that the negative correlation has turned positive. Recent studies have explained this change with reference to the changes in welfare state support of working mothers which have contributed to diminish the incompatibility between motherhood and careers, by providing policies that both enhance employment flexibility (such as part-time opportunities) and reduce the opportunity costs of children (child benefits, parental leave, and subsidized childcare). Empirical evidence shows that, in fact, in the Nordic countries where more generous social policies have been implemented, fertility rates and women's labor market participation are both high, while in the Southern countries where much less has been done both fertility and participation are lower.

In this paper, we survey important empirical evidence regarding participation and fertility, and microeconomic analyses that explore the impact of social policies on the joint decisions of labor market participation and fertility, and give some attention to the new directions of research.

2 The Facts

The temporal relationship between fertility and female participation has changed significantly in the last decades (Figure 1). During the 1970s and part of 1980s, the relationship had a strong negative sign.

The growth of women's participation in the labour market and the decline in fertility carries with it some positive and negative implications for the ability of countries and the European Union itself to meet a variety of social and economic targets. On the one hand, the increased number of workers helps to pay pensions to current retirees, while, on the other, the declining population levels make it less likely that the current form of European pension systems can be sustained.

Other important negative implications concern lower economic growth (in particular as a result of the declining working-age population), lower savings, and a greater number of people with few immediate family ties, which will increase the demand for the provision of both public and private services. An understanding of this relationship is therefore relevant to policy makers in ways, which go beyond theoretical speculation.

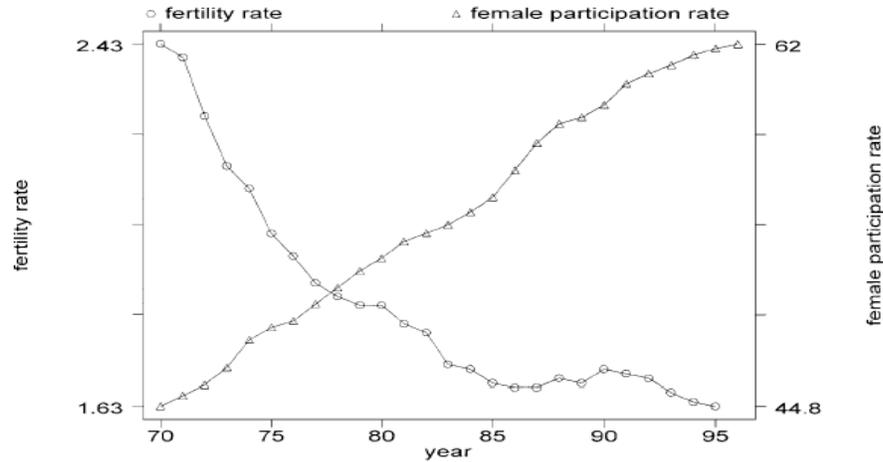


Figure 1. OECD average fertility and participation rates

Source: *Ahn and Mira (2002)*.

The correlation between female participation and fertility, changed sign in the late 1980s and, since then has continued to weaken: the participation of women in the labour market continued to increase in all countries, but fertility rates started to decline at a lower rate or, in some countries, began to grow again (Figure 2).

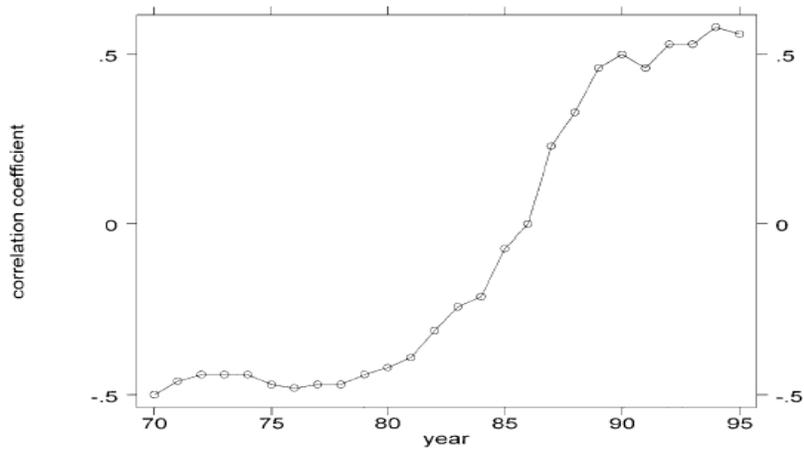


Figure 2. Cross country correlation between the total fertility rate (TFR)² and female labour force participation rate (FPR)

Source: *Ahn and Mira (2002)*.

² The total fertility rate is computed from age-specific birth rates in a given year. Female labor force participation is the total number of women in the labor market (employed and unemployed) in a given year.

This phenomenon has been attributed more often to changes in the economic constraints that women face in their choices of participation and motherhood than to changes in women's preferences. In fact important changes have been implemented in Europe with the introduction of child-oriented policies such as parental paid leave and affordable childcare. These policies have contributed to reducing the costs of childbearing and, in addition, labour market policies have increased labour market flexibility, which help to reconcile motherhood and work. Nevertheless, in spite of long term changes in social norms, as well as new priorities centred on careers and work (at least among younger women), survey data show that in European countries preferences for number of children have not changed significantly: 2.2-2.4 on average, with very little variation across countries (Sleeboos 2003). The comparison of the desired fertility with the actual fertility rate seems to indicate important limitations in the welfare state.

However, the analysis of disaggregated data, show that the change in the sign and significance of the relationship between labour market participation and fertility reveals profound differences across countries.

The countries that currently have the lowest levels of fertility (Spain, Italy and Greece) are those with relatively low levels of female labour force participation, while the countries with higher fertility levels (Denmark and France) have relatively high female labour force participation rates. Figure 3 and Figure 4 show the cross-country relationship in the 1970s and in the 2000s. In the Southern European countries, a positive correlation is observed, as there is a low participation and a low fertility rate, while in the Northern European countries there is a high participation and a high fertility rate. In the high participation countries, the total fertility rate began to decline in 1970 from 2.19, eventually reaching 1.65 before turning back at the end of the 1990s to 1.79. In the low participation countries, the fertility rate was 2.72 in 1970 and declined to 1.4 (see Ahn and Mira 2002; Engelhardt and Prskawetz 2004).

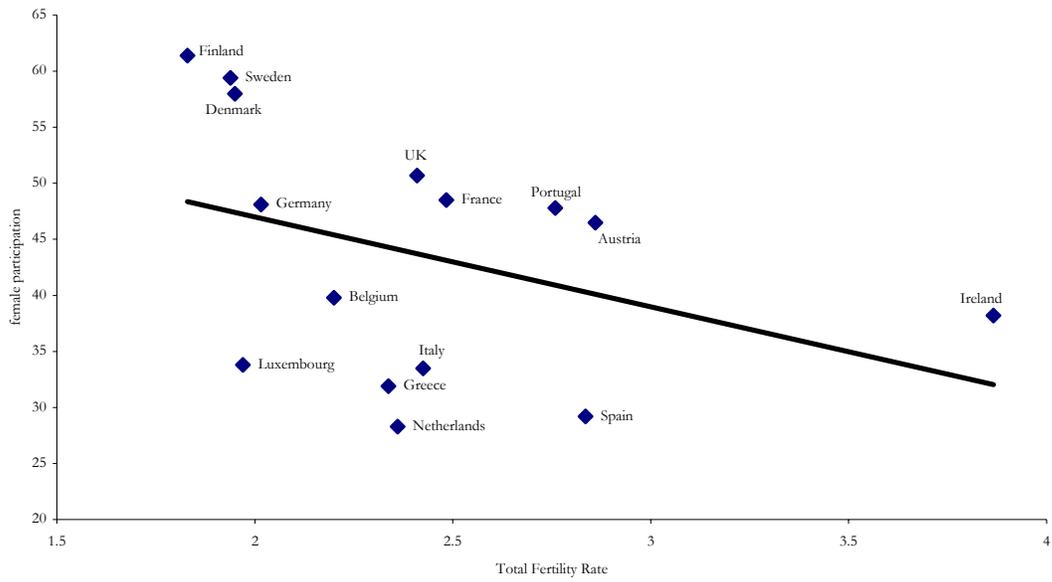


Figure 3 Female participation and fertility (1970)

Sources: Eurostat 1999 *Demographic Statistics*, OECD 2001 *Employment Outlook*.

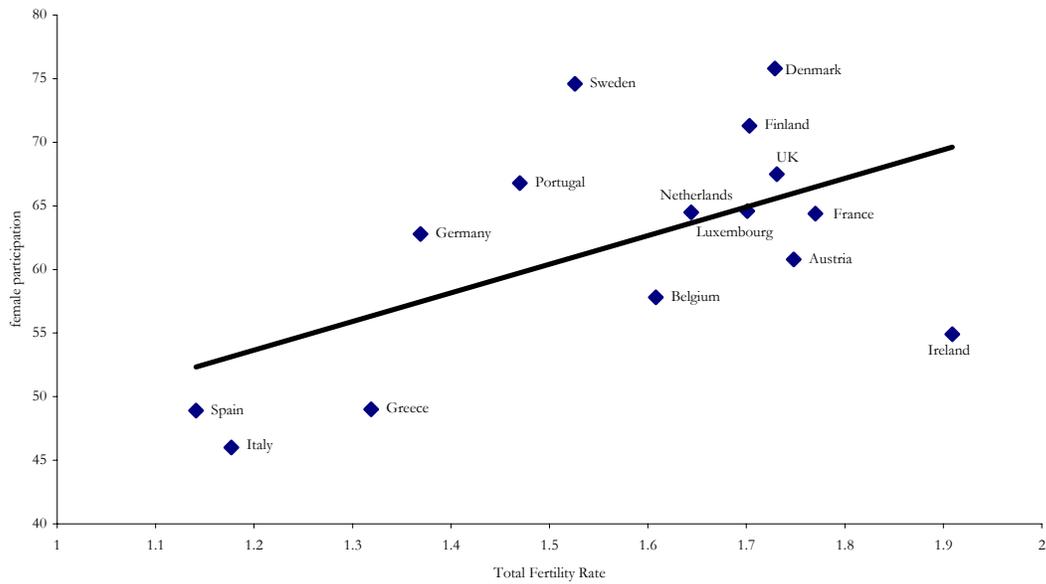


Figure 4. Female participation and fertility (2000)

Sources: Eurostat 1999 *Demographic Statistics*, OECD 2001 *Employment Outlook*.

These differences reflect the fact that only the Nordic countries (and France) have implemented institutional structures that enable them to balance women's work and childbearing, while in Southern Europe very little welfare state support concerns working mothers.

The incompatibility between motherhood and careers may find reconciliation in policies that enhance employment flexibility (such as part-time jobs) and that diminish the potential opportunity costs of children (subsidized childcare, parental leave, and child benefits).

Part-time opportunities are in general widespread in the Nordic countries while this type of employment is quite rare in Southern European countries resulting in low employment rates of married women, particularly those with children. Where part-time opportunities are limited, married women are forced to choose between full-time work or not working at all, neither of which is necessarily their preferred option. Married women who choose to work tend to have full-time work commitments that prove incompatible with having large numbers of children (Tab. 1).

Table 1. Proportion of women working part-time and with contracts of limited Duration

	<i>% part-time work in female employment</i>	<i>% employees with contracts of limited duration</i>
Sweden	36.3	14.7
Netherlands	71.3	14.3
Denmark	31.6	9.4
UK	44.4	6.7
Germany	39.3	12.4
France	30.4	14.9
Italy	17.8	9.5
Spain	11.6	17.3
Greece	7.2	12.9

Source: Eurostat, *New release Labour Force Survey, 2002a*

In spite of recent institutional changes, the Southern European labour market still remains a highly regulated one, with strict regulations concerning the hiring and firing of workers and the types of employment arrangements permitted. The hiring system and high entry wages along with very strict firing rules severely restrict employment opportunities for labour market entrants. These labour market regulations have been largely responsible for the high unemployment rates of women and young adults. Women in Southern Europe, in fact, participate less in the labour market and have fewer children given that strict labour market regulations and unemployment discourage exits from the labour market and make re-entry a difficult enterprise. Women who decide to bear a child tend either not to withdraw from the labour market or never re-enter after childbirth.

The empirical analyses of in-kind transfers show that the availability of childcare services significantly affects women's preferences for non-market time versus time spent in paid work. Differences emerge among European countries: in Southern Europe the childcare services are typically inadequate and characterized by extreme rigidity in the number of weekly hours available. Table 2 shows that in Southern European countries the percentage of children under 3 who are in childcare is quite low compared with Nordic countries such as Sweden and Denmark, while the proportion of children over 3 in childcare is relatively high even compared with Nordic European countries.

Table 2. Childcare for children under 3 and for 3-6 (in percentage)

	<i>Aged under 3</i>	<i>Aged 3-6</i>
Sweden	48	80
Denmark	64	91
Netherlands	6	98
UK	34	60
Germany	10	78
Austria	4	68
Belgium	30	97
France	29	99
Italy	6	95
Spain	5	84
Greece	3	46

Source: OECD, *Employment Outlook*, 2001.

Finally, longer maternity leave to alleviate the tension between the conflicting responsibilities that women may face as mothers and as workers is a topic of current policy debate. Under EU law, employed women are entitled to maternity leave of fourteen weeks. This law sets minimum guaranteed levels of protection, and the Member States can therefore choose to extend these minimum requirements. The Member States are also free to decide on how to apply this protection in national law. This explains the wide discrepancy on this issue from country to country within the EU. Thus, for instance, maternity leave varies from a minimum of fourteen weeks in the U.K. to twenty-eight weeks in Denmark. Furthermore, pay during maternity leave varies from full pay in the Netherlands and Austria to reduced pay in other Member States. There is not always a correlation between the length of maternity leave and the benefit levels provided. Some countries offer long leave entitlements but low statutory pay, and women may not be able to afford to take extended leave.

The differences described above help explain the different shapes of the participation rate in the life cycle of women in different countries. In Italy, for example, the participation rate of women decreases sharply after their childbearing years, while in Sweden the proportion of women working is high, and women enter the labour market in large numbers when young and stay during their childbearing years. Finally, in the UK some women leave during childbearing but come back after a few years. (Figure 5). In the next section, we will review and discuss several analyses focusing on the link between participation, fertility, and social policies.

3 Issues

In research on female labour supply behaviour, the vast majority of empirical studies found a negative effect of fertility on labour supply. However, the effect may not be causal. The negative correlation may be the result of selection effects, whereby women with stronger preferences for motherhood are also those with lower unobservable skills and motivation in the labour market. Using cross-sectional data, Mroz (1987) tested the sensitivity of the parameters of the labour supply equation of married women with respect to a number of assumptions, including the exogeneity of fertility. He concludes that, conditional on participation, fertility is exogenous to women's labour supply.

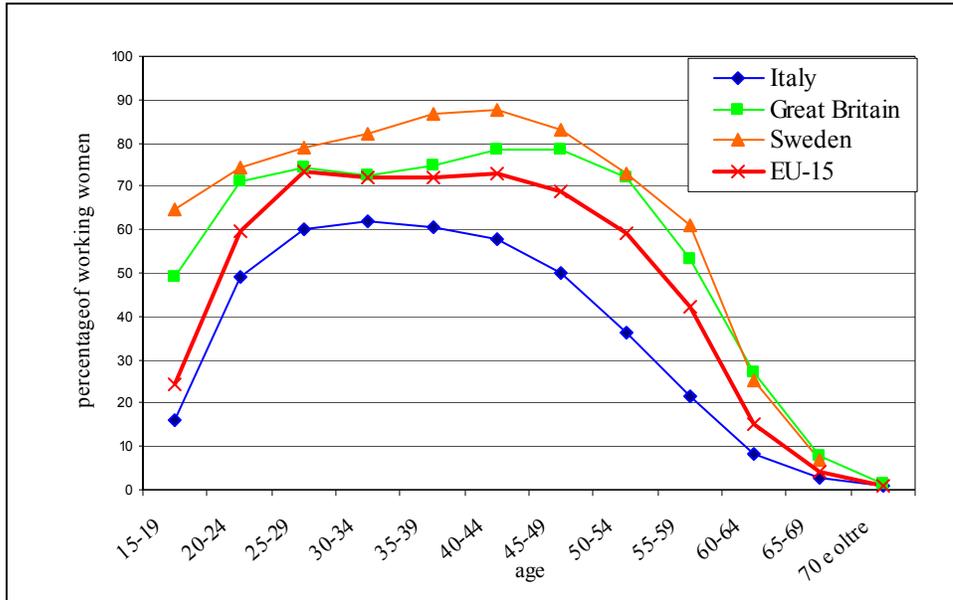


Figure 5 Women's participation rates, by age

Source: Eurostat, 2001.

The potential endogeneity of fertility has also been addressed by adopting an instrumental variables methodology. In searching for instruments, researchers have looked at sources of unplanned births (e.g. the presence of twins (Rosenzweig and Wolpin 1980), and the availability and cost of contraceptives (Rosenzweig and Schultz 1985). Angrist and Evans (1998) suggest the use of the sibling-sex composition as an instrumental variable, given the plausible exogeneity of sibling-sex composition and the observed correlation between having two children of the same sex and further childbearing. However, this latter approach is particularly difficult to implement using European data since the number of women in Europe with at least two children is typically very small. The difficulty of finding suitable instruments and the very mixed results when testing the exogeneity of fertility hypothesis strongly suggests that fertility decisions should be examined in a more realistic manner, in which the jointness of fertility and labour market participation decisions is directly taken into account (Cigno 1991; Hotz and Miller 1988; Moffit 1984; Francesconi 2002; Del Boca 2002; Apps and Rees 2004; Laroque and Salaniè 2005). In these models, fertility and labour market participation decisions are generated by the

maximization of household expected lifetime utility under budget and time constraints, in an explicit dynamic framework. Desired participation status and the desired number of children depend on the whole sequence of prices and wages and on household preferences (for a review, see Cigno 1991, Arroyo and Zhang, 1997).

The two types of decisions are simultaneous, in the sense that they are the solution to a common constrained maximization problem. The increasing use of panel data allows researchers to take into account the dynamics involved in the relationship between childbirth and the work status of women. Moreover, it allows the inclusion of important factors such as fecundity and other individual and marriage-specific traits. These are important factors in explaining fertility decisions, but are unobservable and often omitted by the researcher. As a result of the consideration in the previous section, an understanding of the relation between fertility and labour supply is critical to a number of policy debates. We will review here what, to our knowledge, we consider the most relevant empirical results on the determinants of fertility and participation decisions. We distinguish between these empirical analyses which have considered personal characteristics (such as education and prices and income variables), and those that have also included “environmental variables” related to labour market characteristics and social policies

In the analysis of women’s decision to both work and have children, the effects of wages and income have been considered among the most important variables. Table 3 summarizes some of the results of the studies that focus mainly on the effects of wages and income. The results are quite consistent with the implications of microeconomic analysis and indicate that female wages have a negative effect on fertility and a positive effect on participation. By contrast, male wage coefficients have the opposite sign and are positive on fertility and negative on women’s participation.

When only the mother’s time and market goods are required for child rearing, wage increases for working women induces both income and substitution effects on fertility (as well as on labour supply). A wage increase leads to an increase in labour supply at low wages as the substitution effect dominates the income effect. At higher wages, it may even become negative. For fertility at sufficiently high levels of female wages, further wage increases could also reverse the negative sign, thus producing a positive demand for children.

Table 3. Fertility and participation: the effects of wages and incomes

	Fertility		Participation	
	Female wage	Male wage	Female wage	Male wage
Aaerge et al., 1998 (Italy)	--	--	0.65	-0.08
Carliner et al., 1980 (Canada)	-0.01~-0.016	0.01~0.02	0.18	-0.05
Ermisch, 1989 (U.K.)	-0.26 ~ -1.01	0.18~1.18	0.69 ~ 0.87	0.24 ~ -0.34
Colombino and Di Tommaso, 1996 (Italy)	-2.3	0.2	1.34	-0.018
Di Tommaso, 1999 (Italy)	-0.66	0.09	2.82	-0.2
	-2.5	0.2	--	--
Hotz and Miller, 1988 (US)	-0.02		1.23	

A mother's time spent in childcare has a significant negative effect on the likelihood of having another birth, as well as tending to reduce the mother's labour supply, while an increase in the father's income increases the probability of another birth (Hotz and Miller 1988).

Among personal characteristics, education is a very important factor in the explanation of women's participation, and some studies focus on this aspect. Differences in women's educational level affect wages, as well as wage profiles, with important effects on participation and fertility decisions and the timing of the events (see Chapter 6 by Gustafsson and Kenjo in Del Boca and Wetzles (eds) 'Social Policies, Labor Markets and Motherhood'). Internationally, high levels of literacy and educational attainment by women characterize countries with the lowest rates of fertility. In contrast, high levels of illiteracy and very low levels of educational attainment by women characterize countries with the highest rates of fertility (United Nations Development Programme 2000).

While previous studies including education find a positive effect on women's labour market participation and a negative effect on fertility, more recent ones show positive links between education and fertility (Moffit 1984, for the US, Bloemen and Kalwij 2001, for the Netherlands). Del Boca and Pasqua 2005, estimating a cross-country model of participating and fertility, report that education has a positive sign in the employment equation, but also a positive effect on the probability of having a child. This

effect can be interpreted in part as a permanent income effect, given that fathers' education is not included in the analysis (assortative mating). Moreover, higher education might also positively affect the preference for having more children, e.g. to provide the better socialization of an otherwise single child. A rising fertility rate with increasing education could be explained by the prevalence of income over substitution effects at higher levels of education, especially when childcare can be purchased in the market (see, e.g. Ermisch 1989).

Most studies show that an increase in a woman's years of schooling more significantly affects the timing of births than completed fertility. Gustafsson and Wetzels (2000) have analysed the postponement of births in Germany, the UK, the Netherlands, and Sweden, and have reported on the important effects of education. Postponement also leads to involuntary childlessness, as well as to increases in medical costs and health risks for both mothers and their late-born children. However, the negative consequences offset the positive ones represented by the gains in lifetime earnings (Del Boca and Wetzles , 2007).

Bratti (2001) explains women's participation decisions in the period surrounding a birth event, by estimating the effect of education and several economic variables on the decisions to give birth and to participate in the labour market. He found that education increases women's commitment to their work. In particular, highly educated women continue to work in the period surrounding a birth event, and therefore education causes fertility postponement. His results imply that policies aiming at increasing women's education would have a positive effect on participation but an uncertain effect on fertility, given evidence of a U-shaped pattern of fertility with education (interpreted in terms of the prevalence of income over substitution effects due to education and by more access to private childcare for highly educated women).

In order to specifically explore the impact of social policies, some researches have exploited the time or regional variation within one country. Del Boca (2002) analysed the case of Italy and considered a simple model of labour supply and fertility in which rationing and market imperfections are taken into consideration. The analysis includes several variables reflecting levels of potential and actual family support, as well as institutional characteristics of the regional childcare system and local labour market, in order to explicitly take into account relevant constraints that Italian households face when

making their labour market and fertility decisions. Even if some of the elasticities are not large, the results seem to indicate that labour force participation and fertility decisions are both affected by similar forces. The decisions to work and to have a child are positively influenced by the available supply of public childcare as well as the availability of part-time jobs. The empirical results also indicate that the availability of family support, both in the form of transfers and in the form of time, increases both the probability of market work and the probability of having children. Similar results also emerge for Spain where a high opportunity cost is associated with childbearing because of the lack of ‘social care services’ and is compensated by a strong family support network (Baizán et al. 2002).

Laroque and Salanié (2005) have considered a country, France, which has introduced important transfers programme that appear to have influenced the trends of declining fertility. Taking into account the tax benefit system in great details, they explored whether the increase in births in France since 1995 has been explained by more generous family benefits. The results that emerged from the estimation and simulation of a joint structural model of participation and fertility suggest that fertility responds to incentives in a non-negligible way. These findings are consistent with more “indirect” estimates coming from comparative panel data of countries with similar cultural and economic characteristics, which indicate that Italian and Spanish women would substantially increase their birthrates if they had the benefit of relatively more generous French family policies (Del Boca and Sauer, 2006).

Given the difficulties in isolating the effects of particular policies within one country, the most common way to test the effects of alternative policy-setting is through a comparative international analysis which can be styled as a quasi-“natural experiment” on the effects of policy variation. The problem here concerns how to compare different countries. An established method (which borrows from sociologists and political scientists) consists in grouping countries into policy “regimes” that have a similar policy approach, even if welfare-regime classification remains a debated concept (see Del Boca and Wetzles (2007).

Social policies oriented to reduce the incompatibility between motherhood and careers can be distinguished in policies that enhance employment flexibility (such as part-time jobs) and in policies that diminish the potential opportunity costs of children

(subsidized childcare, parental leave, and child benefits). Comparative studies have found a high correlation between the proportion of part-time jobs and the participation rates of women, in particular married women with children. The low proportion of part-time opportunities does not seem to be consistent with self-reported preferences. A large number of women who are unemployed or do not participate in the labour force report that they would actually prefer to work part-time: surveys at different points of time and in different areas of the country have reported similar results. Even among the employed, more people state a preference for working fewer paid hours than for working longer hours at the given hourly wage (European Economy 1995).

Bardasi and Gornick (2000) show that motherhood decreases the probability of selecting full-time work and increases the probability of both non-working and working part-time. However, the effect of the presence of young children is less in Italy (where part-time jobs are less widely available) than in other industrialized countries (the UK, the US, Canada, and Germany). In some sense, it appears that the Southern European countries are stuck in a 'low female participation rate' equilibrium, in which one of the major reasons for low participation rates is the mismatch between the types of jobs sought by married women with children and the types of jobs offered (full-time).

Gutierrez-Domènech (2002), analyzing the relationship between motherhood and career prospects, shows that the career transition after a first birth may be of different types: previously employed women may leave their job and the labour force, or they may experience downward occupational mobility. That is, even if a woman remains employed she may end up in an occupation that has a lower status than the one held before the birth in terms of quality, payment, and responsibility. There are several potential reasons why this may occur. Mothers may be willing to supply labour that involves fewer responsibilities in exchange for being able to take care of their children. Or, employers may be reluctant to hire mothers for high profile positions since their family role may absorb their energy and interfere with their productivity. Therefore, in countries such as the UK, where a large number of part-time opportunities are available, women return to part-time jobs after childbearing. However part-time jobs tend to be more concentrated in occupations with low qualifications and thus have a negative impact on women's career prospects. Furthermore, Gutierrez-Domenech (2002) shows that relative to other

countries, in the UK part-time jobs tend to be more concentrated in occupations with low qualifications and represent more of a temporary solution while searching for better job opportunities when women are young or during their childbearing years.

The decision to work and to have a child is also influenced by the availability of subsidized childcare. Del Boca and Pasqua (2005) comparing various policies using European Community Household Panel (ECHP) data show that the labour force participation of women and the decision to have children is affected by childcare availability. Family support, both in the form of transfers and in the form of help with the children, increases the probability of women's participation as well as their probability of having children. In countries where private childcare prevails childcare costs are more important than its availability. The results of several studies for the US, the UK and Canada show that childcare cost is a very important variable with significant effects on the participation of mothers. By contrast in the Northern European countries, where public childcare is readily available, the cost of childcare is less important for the mother's decision to work (for a survey on child costs impact across different countries see Del Boca and Vuri 2006).

Governmental measures aimed at reducing the cost of children can be expected to have a positive effect on the demand for children. Apps and Rees (2004) analysing OECD countries show that countries which support families by providing childcare facilities rather than child benefits, are likely to have both a higher female labour supply and higher fertility.

A theoretical distinction is drawn between measures aimed at reducing the direct costs of children (direct expenditures) and measures reducing the opportunity cost of children (foregone earnings). The magnitude of these effects may depend on the work status of the beneficiary. Higher cash benefits have a greater effect on unemployed women than on highly paid executives. On the other hand, higher cash benefits may lead not only to an increased demand for children but also to a demand for higher quality childcare provision. Child benefits may also be expected to have distinct effects on women with different numbers of children. If the same benefits are paid for each child regardless of birth order, benefits can have an increasing influence on the decision to have a greater number of children, since their cost would be lower with each additional child (economies

of scale). Some studies suggest the existence of a timing effect: higher family benefits would encourage early entry into motherhood but not necessarily a large family size (Ermisch 1989). A cross-country comparison, which considers benefits for one-child, two-child and three-child families separately, indicated a positive but very limited effect of child benefits on fertility (Gauthier and Hatzius 1997). These results vary widely across countries and by birth order. The cross-country comparison shows that, while cash benefits do not affect fertility in Anglo-Saxon countries, they have a positive effect in Scandinavian countries, since they are likely to be correlated with other family support policies. In Southern European countries the effect is significant only for the first child, while in other countries (France and Sweden, for example) it is significant for the third child (Gauthier and Hatzius 1997). These differences reflect important differences in family support policies across countries.

The influence of child transfers on fertility has not been widely studied with individual data. The analysis of cash benefits must take into account two important factors. First, child benefit effects may be greater for lower income households, i.e. fertility would increase in households where the average number of children is higher. The second aspect concerns the potential discouraging effects on mothers' labour supply. These effects are likely to be significant and raise crucial policy questions. These conclusions underline the importance of estimating fertility and participation decisions simultaneously.

Another important social policy, which has an impact on balancing work and child rearing is that of parental leave. Evidence shows that long maternity leave causes the most difficulties for employers, but for many firms an intermediate duration of maternity leave will be especially costly and may have the largest negative impact on the position of women in the labour market. Gustafsson et al. (1996), analysing national household panel data, found that from 1985-1993 nearly 80 per cent of the women in the UK, Germany, the Netherlands, and Sweden, participated in the labour market prior to having their first child. However, twenty-four months after giving birth to their first child, the participation rate decreased in all EU countries to under 39 per cent except for Sweden where it decreased to 57 per cent. The labour force participation rate around the birth of the second child and around the birth of the third child was not higher than it was before the birth and was considerably lower after the birth (less than 40 per cent) in all countries studied except for

Sweden. Gustafsson et al. (2002) found that at the child's fifth birthday, the labour force participation rate in these countries remains below 50 per cent. Most of the exits occur in the child's first year. Del Boca and Pasqua (2005) considered transitions around the time of the first child's birth in several European countries and showed that only in the Netherlands, Belgium, and Ireland there are transitions from full-time work to part-time work higher than transitions from in employment to out of employment.

Examining changes in the labour supply of mothers of infants in countries where maternity leave statutes were passed between 1980 and 1990, Klerman and Leibowitz (1994) show a negative relation between the employment of mothers and maternity leave legislation. Ruhm and Teague (1997), using comparative data, examine the association between leave policies and indicators of macroeconomic conditions and found that paid leave is associated with an increased domestic GDP, increased employment, and reduced unemployment. Unpaid leave is associated with increased labour force participation and employment and also with increased unemployment, presumably because unpaid leave is not sufficient to discourage mothers who want longer leaves from leaving their jobs.

4 New Research Directions

In the analysis of the puzzle of the relationship between labour market participation and fertility and its differences across countries several questions remain unanswered. We summarize here some new research directions that have started to explore important issues, thanks to the availability of comparative data sets on subjective information like religion, time use of different members of the family (the Multinational Time Use study, the European harmonized time survey (ETUS), the World Value Survey (WVS), and the International Social Survey Programme (ISSP).

a) Heterogeneity in preferences

Most of the analyses we discussed above have implicitly or explicitly assumed that women in different European countries have homogenous preferences but face different choice sets 'determined' by the social policies implemented in the different

countries. One approach to help control for unobservable differences such as attitudes towards gender roles is to limit the set of countries to only those with ‘similar’ cultural characteristics (Del Boca and Sauer 2006). In this context, given the similarity of the cultural and social dimension, the estimated differences in the patterns of work and fertility choices across countries could be attributed ex post to differences in the underlying institutions that govern employment and social policies.

Another approach consists of measuring the relative importance of cultural differences more ‘explicitly’. Algan and Cahuc (2006) have introduced self-reported information on beliefs concerning the role of women in the labour market and the household in the analysis of the participation of European women. They use international social surveys on family values and relations (the World Value Survey and the International Social Survey Programme) which cover the main OECD countries over the last two decades. These surveys make it possible to disentangle the role played by individual characteristics and country fixed effects on family attitudes. In fact, traditional explanations which put the emphasis on labour market rigidities and competition between demographic groups on the labour market, may explain both employment rates and family attitudes. They show that specific national family attitudes are highly correlated with the employment rates of the different demographic groups. This result is robust to the inclusion of traditional time varying labour market institutions and other country effects which could account for other cross-country differences in institutions. Fernandez and Fogli’s (2005) research started from the recognition that a significant part of the variation across time and space of fertility and participation can also be explained by beliefs such as the appropriate role of women in society. A difficult task is to separate these effects from those of markets and institutions. They dealt with this problem by studying women born in one country but whose parents were born in another country. They have examined the work and fertility behaviour of women born in the US, but whose parents were born elsewhere. Past female labour force participation and total fertility rates from the country of ancestry are considered cultural proxies capturing beliefs held about the role of women in society. They find that these cultural proxies have a positive and a significant role in explaining work and fertility outcomes (even

controlling for possible indirect effects of culture (e.g. education and spousal characteristics of spouses).

Berman et al. (2006) analyze the impact of religion, and in particular special aspects of Catholicism. They report evidence that the decline of Catholic “religiosity” is one of the major causes of subsequent fertility decline in Italy, Spain, Portugal and Ireland. In order to investigate the fertility effects of changes in social services provided by Catholic communities, they merge data on fertility and economic variables with indicators of religiosity and social service provision in Catholic communities. The cross-national nature of the data allows this effect to be distinguished from that produced by a European change in European fertility norms. Their results imply that the decline in Catholic fertility was not primarily caused by religiously-induced change in *preferences* for children. Instead, institutional decline and social effects appear to be much more important, such as the loss of many child-friendly social services traditionally provided by Catholic communities, including schools, hospitals, day care.

b) Time allocation within the family

Most studies of fertility and labour supply decisions have assumed that the primary role of the male partner consists of market work and mainly considered his income and earnings as an exogenous contribution to the household production process. With the greater labour market attachment of women, husbands’ contribution to home production may be more relevant.

Only recently, data on time use have revealed some new developments. In fact, trends in parental time invested in children since the 1960s in industrialized countries using time-use survey data show that parents appear to be devoting more time to children than they did 40 years ago. Mothers continue to devote more time to childcare than fathers, but the gender gap has been reduced and husbands’ contribution to home production has become more relevant. Craig (2006) using ECHP data analyses the link between time allocation and women’s decision to have children and finds support that birth rates are higher where male and female time allocation to paid and unpaid work is more equitable.

Apps and Rees (2005) comparing Australia, the UK, and Germany argue that not only gender differences in earnings and employment can be explained by fiscal and social policy but also life cycle variation in time use. Profiles of time use are compared over the life cycle defined in term of age as well as in term of phases that represent the key transitions in the life cycle of a typical household. They conclude that, given the decision to have children, differences in life cycle time use and consumption decisions of households are determined significantly by public policy (e.g. on access to high quality, affordable childcare).

De Laat and Sevilla Sanz (2006) explain the cross-country differences in fertility by attitudes in gender roles which constrain the way in which families distribute their allocation of time and, in particular, the man's contribution to household chores. Their argument is that men's contribution to household activities is not important in a world of low levels of female education, as was the case in all countries in the 1970s. Since then it has become more relevant as female education (and potential wages) increase and women find it profitable to work in the market. Whereas in the Northern European countries women's incorporation in the workforce was followed by an increase in men's contribution to household activities, in Southern Europe this was not the case³. As a consequence, Southern European women searching for ways to alleviate time pressures (facing a welfare system almost hostile to mothers working) have no choice but to reduce fertility.

Esping-Andersen et al. (2006) question the traditional model of family decision making in which the husband's contribution is only monetary. Given the rapid convergence of men's and women's employment rates, it appears relevant to relax the assumption of such models and also pay more attention to the nature of the contribution of men also in terms of time. They explore the ways couples make fertility decisions jointly, considering two very different examples of family friendly policies: Denmark and Spain. While in Denmark (with universal child care coverage, job security and flexibility) men's contribution to household production encourages fertility, in Spain it has no significant role. Their results suggest that a decision-making logic very different from that the traditional model is evolving in Denmark, while Spanish couples continue to adhere to the traditional model.

³ Among the Southern families, adult children living with their parents much beyond the attainment of adulthood, are not expected to participate in the household production process.

c) *Endogeneity of social policies*

Del Boca et al. (2005) using ECHP data, analyse Italy, France, and the UK, and show that social policies have strikingly different signs and size across countries. In fact, they are not only characterized by different levels of generosity but also have a different ‘nature’ (different objectives and goals), which explains the differences in the parameters across countries. These findings show that part-time work has a positive effect only in Southern European countries. In these countries, in fact, part-time jobs are characterized by higher job protection and social benefits than in the rest of Europe, and have very similar characteristics to full-time jobs (more permanent positions with higher hourly wages) than elsewhere. Social transfers, on the other hand, have a significant effect on the probability of working only in France and the UK but not in Italy. The composition of social transfers is quite different across countries: in France and the UK family benefits are a greater component of public transfers, while in Italy they mainly consist of pensions.

It is important to know whether Italian or British women would have the same fertility and labour force participation rate as the French, if they had the same incentives as the French. We do not in fact know whether they choose to have different social policies as a result of having different preferences concerning work and children. However, different institutions may themselves depend on cultural differences across countries. According to the well-known research by Heckman (1978), institutional choices may reflect preferences, and by ignoring this endogeneity one may obtain strongly biased estimates of the ‘causal’ effect of institutions on outcomes. The example he gave concerned the effect of state-based anti-discrimination laws on measured racial inequality in labour market outcomes. If more ‘progressive’ states are more likely to enact such laws, the effect of extending them to ‘non-progressive’ states would be expected to be considerably less. In the Northern European countries, generous social policies are likely to reflect collective preferences toward equality both across and within households. In the Southern European countries, the lack of social policies may, instead, be attributable to the persistence of a central role of the family in providing services and support with implications of unequal household allocation

For example, the low availability of childcare as well as part-time work in the Southern European countries also depends on the values that the families attach to the

care of the younger children.⁴ On the other hand, the lower proportion of family-related transfers in total expenditure in social transfers across countries depends on the central role of the family that traditionally provides social and financial support to its members. The role of the extended family is very important in South Europe where it represents an important support in the case of both children and the elderly⁵.

Del Boca et al. (2006) using ECHP data have explored the reasons underlying different sets of institution and analysed the impact of social policies on women's participation and fertility using a statistical model that allows its potential endogeneity to be taken into account.

d. Children' outcomes

The analysis of social policies designed to increase participation rates and fertility still neglect their important effects on outcomes for children, in terms of both welfare levels and cognitive results.

Policies encouraging fertility, for example, have potential negative implications that have to do with the family 'types'. If child benefits are relatively small, only families among lower income and lower education groups will be affected by them. This may imply a negative impact on children's welfare and greater income inequality across families. Public policies directed to encourage female employment instead may also have the positive effect of reducing inequality in household income distribution and may also result in a more equitable distribution of resources and welfare within the household (Del Boca and Pasqua 2005).

Ermisch and Francesconi (2005) consider the impact of a mother's employment during childhood on the child's well-being, focusing on the trade-offs between her time spent in nurturing the child and household income. They find some empirical evidence that, while the loss of the mother's child-care time has a negative effect on the child's well-

⁴ Evidence from the World Values Survey shows a high variability in the attitudes regarding the use of childcare and the attitudes regarding mothers' work. A larger number of parents in Southern Europe report that pre-school children are likely to suffer because their mother works. This proportion varies from 18 per cent in Denmark to 80 per cent in Italy and Spain.

⁵ Croda and Gonzales-Chapela (2005) show that grandmothers in Southern European countries take care of the grandchildren more often than grandmothers in the Nordic European countries.

being (e.g. socio-emotional adjustment and cognitive outcomes), it is also the case that the additional income from mother's employment has positive implications for expenditures on goods consumed by the child. These effects vary across countries and across family types, so the net impact of a mother's employment on the child's welfare can be expected to vary across national environments as well.

Family policies have then to be oriented to favour *both* fertility and women's employment. So, what are alternative policies that positively affect fertility without discouraging labour market participation of women? Several examples concern in-kind policies (affordable childcare, after-school care, lower prices for children's goods, and flexible schedules), as well as incentives to share the costs of child rearing (i.e. parental leave options for both parents). Many questions on "What is a good policy." still remain unanswered. To evaluate what is a "good policy" (given a specific target), a social welfare function that evaluates all costs to society (also including who pays for the policy) is needed.

Conclusion

In this paper we have presented important empirical evidence regarding recent trends in women's participation and fertility in European countries, and discussed and interpreted several differences across countries. We surveyed a literature that focuses on the joint decisions of labour market participation and fertility, and explores the impact of social policies. The results of most analyses indicate that social policies have a very relevant role in reducing the incompatibility between employment and child rearing. Several open questions concerning the relevance of culture, the role of husbands' time in household production, and the effects of social policies on outcomes for children are the objectives of important ongoing research.

Appendix A

Studies on motherhood and participation: data sources and results

Authors	Country	Data	Results
Apps and Rees (2004)	OECD countries	OECD	Countries which have individual rather than joint taxation, and which support families through childcare facilities rather than child payments, are likely to have both higher female labour supply and higher fertility.
Del Boca (2002)	Italy	Bank of Italy Panel	Childcare and part-time work increase both participation and fertility.
Del Boca and Sauer (2006)	Italy, Spain, France	ECHP Panel	Employment is more persistent in countries where less part time and childcare is available.
Del Boca et al. (2005)	Italy, France, the UK	ECHP Panel	Part-time work has a positive effect on participation and fertility only in Italy. Social transfers have a significant effect only in France and the UK.
Del Boca and Pasqua (2005)	Italy, NL, France, Spain, Denmark	ECHP Panel	Childcare has a positive effect on participation and fertility. Part-time work has a positive effect on participation. Unemployment has a negative effect on participation.
Di Tommaso (1999)	Italy	SHIW (Bank of Italy)	An increase in female wages reduces the probability of having children and increases the probability of participation.
Francesconi (2002)	US	NLS of young women (1968-91)	Work interruptions due to childbirth affect participation (differences between part-time and full-time work).
Hotz and Miller (1988)	US	PSID	Parents cannot perfectly control conceptions, variations in childcare costs affect life cycle spacing of births.
Laroque and Salanié (2005)	France	Labour Force Survey	Child benefits significantly affect fertility decisions.
Moffit (1984)	US	NLS of young women	An increase in female wages reduces the probability of having children and increases the probability of participation.

Notes:

OECD = Organisation for Economic Co-operation and Development

ECHP = European Community Panel

SHIW = Survey on Household Income and Wealth

PSID = Panel Study of Income Dynamics

NLS = National Longitudinal Survey

Appendix B

New directions: culture, time use, outcomes for children

Authors	Country	Data	Results
Apps and Rees (2005)	Germany, Italy,	ABS, TUS;GSOEP	Life cycle time use and consumption decisions of households are determined significantly by public policy (e.g. affordable child care).
Esping-Andersen et al. (2005)	Denmark and Spain	ECHP Panel	Men's contribution to household production encourages fertility in Denmark, while in Spain it has no significant role.
Ermisch and Francesconi (2005)	Britain	BHS	Women's employment negatively affects children's cognitive development but this is less for part-time work.
Del Boca et al. (2006)	15 countries	ECHP Panel	Social policies (childcare and part-time work) have an important effect on participation but could not reject endogeneity.
Fernandez and Fogli (2006)	US	US Census	Female LFP and TFR in 1950 by country of ancestry are economically and statistically significant in explaining how much women work and how many children they have.
De Laat and Sevilla (2006)	31 countries	ISSP94	Heterogeneity in egalitarian attitudes across all households explains fertility differences of up to 0.87 children.
Berman et al. (2006)	31 countries	ISSP and WDI	Fertility is affected by the set of services provided by the religious institution.
Algan and Cahuc (2006)	19 OECD countries	ISSP and WVS	Family attitudes are highly correlated with the employment rates of the different demographic groups.

Notes:

ABS = Australian Bureau of Statistics

TUS = Time Use Survey

GSOEP = German Socio-Economic Panel

BHS = British Household Survey

ECHP = European Household Panel

ISSP = International Social Survey Programme

WDI = World Development Indicators

WVS = World Value Survey

References

- Aaberge, R., U. Colombino and S. Strom 1998. 'Evaluating Alternative Tax Reforms in Italy with a Model of Joint Labour Supply of Married Couples', *Structural Change and Economic Dynamics* 9: 415-433.
- Ahn, N. and P. Mira 2002. 'A note of the relationship between fertility and female employment rates in developed countries', *Journal of the Population Economics*, 14 Spring.
- Angrist, J. D. and W. N. Evans 1998. 'Children and Their Parents. Labor Supply: Evidence from Exogenous Variation in Family Size', *American Economic Review* 88(3): 450-77.
- Algan, Y. and P. Cahuc 2006. 'The root of low Employment in Europe: family culture?', in C. Pissarides (ed.) *NBER Macroeconomic Annual*.
- Apps, P. and A. Rees 2004. 'Fertility, Taxation and Family Policy', *Scandinavian Journal of Economics*, 106: 745-763.
- Apps, P. and A. Rees 2005. 'Time Use and the Costs of Children over the Life Cycle', in D. Hamermesh and G. Phann (eds.), *The Economics of Time Use*, Elsevier.
- Arroyo, C. R. and J. Zhang 1997. 'Dynamic microeconomic models of fertility choice: A survey', *Journal of Population Economics* 10.
- Baizán, P., F. Billari and F. Michielin 2002. 'Political Economy and the Life Course Patterns', *Demographic Research* 6: 189-240.
- Bardasi, E. and J. C. Gornick 2000. 'Women and Part-Time Employment: Worker 'Choices' and Wage Penalties in Five Industrialised Countries', *ISER Working Paper* 2000-11.
- Becker, G. 1991. *A Treatise on the family*, Cambridge Mass.: Harvard University Press.
- Berman, E., R. Iannaccone and G. Ragusa 2006. 'From Empty Pews to Empty Cradles: Fertility Decline Among European Catholics', University of San Diego, mimeo.
- Bloemen, H. G. and A. Kalwij 2001. 'Female labor market transitions and the timing of births: a simultaneous analysis of the effects of schooling', *Labour Economics* 8 (5): 593-620.
- Bratti, M. 2001. 'Labour Force Participation and Marital Fertility of Italian Women: the Role of Education', *Journal of Population economics* 16 (3): 525-554.
- Carliner, G., C. Robinson and N. Tomes 1980. 'Female Labour Supply and Fertility in Canada', *Canadian Journal of Economics* 13 (1): 46-64.
- Cigno, A. 1991. *Economics of the Family*. Oxford: University Press.
- Colombino, U. and M. L. Di Tommaso 1996. 'Is the Preference for Children so Low or is the Price of Time so High?', *Labour* 10(3): 475-493.

- Craig, L. 2006. 'Do time use patterns influence fertility decisions? A cross-national inquiry', *International Journal of Time Use Research* 3 (1): 60-87.
- Croda, E. and J. Gonzales-Chapela 2005. 'How do European older adults use their time?' in A. Borsch-Supan 'Health, Aging and Retirement in Europe'. Mannheim Research Institute of Aging.
- De Laat, J. and A. Sevilla Sanz 2006. 'Working Women, Men's Home Time and the lowest low fertility', *ISER Working Paper* 2006-23.
- Del Boca, D. 2002. 'The Effect of Childcare and Part-time on Participation and Fertility of Italian Women', *Journal of Population Economics* 14.
- Del Boca, D. and S. Pasqua, 2005. 'Labour Supply and Fertility in Europe and the U.S.', in T. Boeri, D. Del Boca, C. Pissarides (eds.), *Women at Work: an economic perspective*. Oxford: Oxford University Press.
- Del Boca, D., S. Pasqua and C. Pronzato 2005. 'Employment and Fertility in Italy, France and the UK', *Labour* 4.
- Del Boca, D., S. Pasqua and C. Pronzato 2006. 'Motherhood and Employment Choices with Endogenous Institutions', mimeo, Collegio Carlo Alberto.
- Del Boca, D. and R. Sauer 2006. 'Lifecycle employment and fertility across institutional environments', *Carlo Alberto Notebooks*, Collegio Carlo Alberto.
- Del Boca, D. and D. Vuri 2006. 'The Mismatch between labor supply and child care', forthcoming *Journal of Population Economics*
- Del Boca, D. and C. Wetzel (eds) 2007. 'Social Policies, Labor Markets and Motherhood' Cambridge University Press
- Di Tommaso, M. L. 1999. 'A Trivariate Model of Participation, Fertility and Wages: the Italian Case', *Journal of Cambridge Economics* 23: 623-640.
- Engelhardt, H. and A. Prskawetz 2004. 'On the Changing Correlation Between Fertility and Female Employment over Space and Time', *European Journal of Population* 20: 35-62.
- Ermisch, J. 1989. 'Purchased Childcare, Optimal Family Size and Mother's Employment: Theory and Econometric Analysis', *Journal of Population Economics* 2: 79-102.
- Ermisch, J. 2003. *An Economic Analysis of the Family*: Princeton University Press.
- Ermisch, J. and M. Francesconi 2005. 'Parental work and children welfare', in T. Boeri, D. Del Boca, C. Pissarides (eds.) *Women at Work: an economic perspective*, Oxford: Oxford University Press.
- Esping Andersen, G. 2005 M. Guell and S. Brodman 2006. 'When Mothers work and Fathers care. Joint Household Fertility Decisions in Denmark and Spain', Pompeu Fabra University.
- European Economy 1995. 'Performance of the EU Labour Market: Results of an ad hoc Labour

- Market Survey', European Commission B-1049 Brussels.
- Eurostat 1999. Demographic Statistics.
- Eurostat 2002a. New release Labour Force Survey.
- Eurostat 2002b. Women and men reconciling work and family life, *Statistics in focus*, theme 3-9.
- Fernandez, R. and A. Fogli 2005. 'Mothers and Sons: Preference Formation and Female Labor Force Dynamics', *The Quarterly Journal of Economics*, MIT Press 119(4): 1249-1299.
- Fernandez, R. and A. Fogli 2006. 'Culture: An Empirical Investigation of Beliefs, Work, and Fertility', *NBER Working Papers* 11268, National Bureau of Economic Research, Inc.
- Francesconi, M. 2002. 'A Joint Dynamic Model of Fertility and Work of Married Women', *Journal of Labor Economics* 20 (2, part 1): 336-380.
- Goldin, C. 2006. 'The Quiet Revolution that Transformed Women's Employment, Education, and Family', 2006 Ely Lecture, American Economic Association Meetings, Boston MA.
- Gustafsson, S., C. Wetzels, J.D. Vlasblom and S. Dex 1996. 'Women's labor force transition in connection with childbirth. A panel data comparison between Germany, Sweden and Great Britain', *Journal of Population Economics* 9(3): 223-246.
- Gustafsson, S. and C. Wetzels 2000. 'Optimal age at first birth: Germany, UK, the Netherlands and Sweden', in Gustafsson, S. and D.E. Meulders. *Gender and the Labour Market*, MacMillan London.
- Gustafsson, S., E. Kenjoh and C. Wetzels 2002. 'Postponement of Maternity and the Duration of Time Spent at Home after First Birth. Panel Data Analyses comparing Germany, Great Britain, the Netherlands and Sweden', *Public Finance and Management* 2(2).
- Gustafsson, S. and E. Kenjo 2007. 'Fertility Trends in Europe' in D. Del Boca and C. Wetzles (eds) *Social Policies, Labor Markets and Motherhood*. Cambridge University Press. (forthcoming).
- Gutiérrez-Domènech, M. 2002. 'Job Penalty after Motherhood: A Spanish Case in a European Context', Family Friendly Policies Conference IZA Conference, May, Bonn.
- Gauthier, A.H. and J. Hatzius 1997. 'Family policy and fertility: An econometric analysis', *Population Studies* 51: 295-306.
- Heckman, J. 1978. 'Dummy Endogenous Variables in a Simultaneous Equation System', *Econometrica*, Econometric Society 46(4): 931-59.
- Hotz, V. J. and R. A. Miller 1988. 'An Empirical Analysis of Life Cycle Fertility and Female Labour Supply', *Econometrica* 56 (1): 91-118.
- Klerman, J. A. and A. Leibowitz 1994. 'Labour Supply Effects of State Maternity Leave Legislation', in F. D. Blau and G. Ronald (eds.), *Gender and Family Issues, in the Workplace* New York Russell Sage Foundation.

- Laroque, G. and B. Salanié 2005 , 'Does Fertility Respond to Financial Incentives?', *C.E.P.R. Discussion Papers* 5007.
- Moffit, R. 1984. 'Life Cycles Profile of Labour Supply and Fertility', *Review of Economic Studies* 51: 263-278.
- Mroz, T.A. 1987. 'The Sensitivity of an Empirical Model of Married Women's Hours of Work to Economic and Statistical Assumptions', *Econometrica* 55(4): 765-799.
- OECD 1999, 2001. *Employment Outlook*.
- Rosenzweig, M. and K. I. Wolpin 1980. 'Life-Cycle Labour Supply and Fertility: Causal Inferences From Household Models', *Journal of Political Economy* 88(2): 328-348.
- Rosenzweig, M. R. and T. P. Schultz 1985. 'The Demand for and Supply of Births: Fertility and its Life Cycle Consequences', *American Economic Review*, 75(5): 992-1015.
- Ruhm, C. J., and J. T. Teague 1997. 'Parental Leave Policies in Europe and North America', in F.D. Blau & Ronald, G., *Gender and Family Issues in the Workplace*, New York: Russell Sage Foundation.
- Sleebos, J. 2003. 'Low fertility in OECD Countries', *OECD Social Employment and Migration* 15.
- United Nations 2000. *Development Programme United Nations Publications NYC..*