

BULLETIN

Identifying the Penalties in Pay Associated with Motherhood – a European comparative analysis

Issues around gender and earnings have been the subject of several recent research projects at the Warwick Institute for Employment Research (IER). This *Bulletin* presents a summary of work undertaken at IER, as part of the Female Employment in National Institutional Contexts (FENICs) research programme, funded by the European Commission under the 5th Framework Programme.¹ The *Bulletin* presents new estimates for the penalty in pay associated with motherhood for 11 European countries based upon comparable data derived from the European Community Household Panel Survey (ECHP).

Introduction

Across the European Union there has been a significant increase in the participation of women in paid employment. For a variety of reasons, including the decline in heavy manufacturing, the growth of service sector employment, the rise in educational participation and equal opportunity policies, women have postponed family formation plans, opting instead for continued full-time employment. However, at the same time, women's primary responsibility for children and the home have remained unchanged.

In terms of the economic well-being of families with children, it is therefore important to understand whether there is a penalty in pay associated with motherhood. Some recent studies have attempted to estimate the effect of children upon earnings, having controlled for both observed and unobserved characteristics. For example, Waldfogel (1997) estimates a penalty in pay of 6% for 1 child and 13% for 2 or more children; Lundberg and Rose (2000) estimate a penalty in pay of 5% associated with a woman's first birth; Budig and England (2001) estimate a penalty in pay of 3% for 1 child, 9% for 2 children and 12% for 3 or more children; and Anderson, Binder and Krause (2003) estimate a 4% penalty in pay associated with each child. However, these studies generally focus upon the United Kingdom or the United States, with relatively few studies providing evidence for

Scandinavian and continental European countries (exceptions being Albrecht et al, 1999 for Sweden, and Mertens et al, 1999 for the Netherlands).

Country specific studies are difficult to compare because of the differences in data sources and methodologies used. Harkness and Waldfogel (1999) undertook the most comprehensive cross-country analysis available to date, utilising data from the Luxembourg Income Study. They analysed the size of the family gap in pay in Australia, Canada, the United Kingdom, the United States, Germany, Finland and Sweden. They found that after controlling for differences in earnings-related characteristics, the effect of children on women's pay is largest in the United Kingdom, followed by the other Anglo-American countries and Germany, and smallest in the Nordic countries.

This bulletin presents new estimates for the penalty in pay associated with motherhood for 11 European countries based upon comparable data derived from the European Community Household Panel Survey (ECHP).

¹ The *Bulletin* was prepared by Rhys Davies at IER, and is based on research published as Davies, R. and G. Pierre (2005) *The Family Gap in Pay in Europe: a cross-country study*, *Labour Economics*, Volume 12, Issue 4, pages 429-612. For further information e-mail Rhys.Davies@warwick.ac.uk.

Table 1: Unadjusted Estimates of the Family Gap in Pay

Country	Number of Children			Age of Mother at First Birth		
	No children	One child	Two children	Three or more children	Under 25	Age 25 to 30
Average Hourly Earnings in ECUs (Number of observations)						
Germany	11.74 (392)	10.30 (421)	10.00 (567)	10.35 (158)	9.41 (719)	11.04 (330)
Denmark	14.21 (91)	15.52 (115)	14.68 (223)	13.96 (60)	13.79 (149)	15.12 (179)
Netherlands	12.98 (273)	12.93 (114)	12.45 (288)	11.71 (100)	11.05 (170)	12.5 (215)
Belgium	11.48 (107)	10.64 (148)	11.25 (231)	10.70 (78)	9.73 (178)	11.57 (203)
France	10.28 (173)	10.29 (223)	10.76 (376)	8.86 (145)	9.32 (340)	10.73 (292)
United Kingdom	9.72 (455)	8.70 (260)	7.33 (467)	6.96 (189)	6.36 (410)	7.85 (344)
Ireland	9.95 (119)	9.83 (73)	9.32 (118)	9.05 (121)	7.38 (111)	9.91 (124)
Italy	7.50 (219)	7.89 (234)	7.84 (253)	6.92 (59)	6.84 (250)	8.21 (179)
Greece	4.43 (96)	4.54 (94)	4.45 (195)	3.91 (43)	3.87 (170)	4.91 (116)
Spain	7.29 (196)	6.80 (188)	6.84 (203)	5.99 (63)	5.34 (193)	7.32 (178)
Portugal	3.88 (106)	3.18 (179)	3.50 (211)	2.65 (62)	2.6 (267)	3.95 (141)
Percentage Differentials (Base = No Children)						
Germany		88%	85%	88%	80%	94%
Denmark		109%	103%	98%	97%	106%
Netherlands		100%	96%	90%	85%	96%
Belgium		93%	98%	93%	85%	101%
France		100%	105%	86%	91%	104%
United Kingdom		90%	75%	72%	65%	81%
Ireland		99%	94%	91%	74%	100%
Italy		105%	105%	92%	91%	109%
Greece		102%	100%	88%	87%	111%
Spain		93%	94%	82%	73%	100%
Portugal		82%	90%	68%	67%	102%

The Relative Earnings Position of Mothers

This section begins by presenting estimates of the average hourly earnings of mothers compared to women without children for 11 European countries, based upon data from the ECHP.² Table 1 provides descriptive statistics of the ‘unadjusted’ penalty in pay associated with motherhood among women from the first wave of the ECHP (1994). The

‘unadjusted’ family gap in pay is shown to vary across countries. The largest ‘unadjusted’ family gaps in pay for women with one child are observed in Portugal, Germany and the United Kingdom. Across all countries, the family gap in pay is generally shown to increase with the number of children in the household. Distinguishing mothers according to their age at the time of the first birth, it is clear that women who were aged 24 or under at the time of the first birth (subsequently defined as young mothers) exhibit the largest unadjusted family gaps in pay. The relative disadvantage faced by young mothers is observed across all countries, but is particularly evident in Portugal, Spain, Ireland and the United Kingdom.

² The European Community Household Panel Survey began in 1994, with the objective of interviewing a representative panel of households at annual intervals within a framework that was comparable across countries. Luxembourg is excluded from this analysis because of small sample sizes.

Why is there a penalty in pay associated with motherhood?

Comparisons of earnings presented in Table 1 therefore indicate that women with children generally earn less than those women without children. There are a number of explanations of why we may expect this to be the case. One of the main hypotheses attributed to the presence of a family gap is the lower level of human capital among mothers compared to other women. Wages are dependent on individuals' human capital. Human capital is accumulated through education, work experience and training. Women who have given birth may have experienced career breaks and could therefore have spent less time in the labour market and suffered a 'depreciation' of their professional skills. Moreover, women who expect to have children may invest less in education and on-the-job training as their expected return to such investment is lower. The human capital hypothesis may also be of particular importance in understanding the increased disadvantage faced by women who begin family formation early.

A second cause of an observed penalty in pay associated with motherhood is unobserved heterogeneity. For example, Hakim (2000) contrasts the lifestyle preferences of home centred women who give priority to their domestic role while work centred women are committed to their careers, invest in human capital and may choose to remain childless. If women who place greater emphasis on non-market activities are also more likely to have children, the lower earnings that are associated with reduced levels of motivation and commitment to paid employment among these women will create a correlation between earnings and the presence of children that is not causal.

A third possible cause of these penalties in pay is associated with mothers having stronger preferences for jobs that are compatible with family life. They may therefore be willing to trade off higher earnings to work in jobs that offer flexible work arrangements or that do not require overtime, evening or weekend work. For example, following periods of family formation women may return to part-time employment. Previous analyses have shown that part-time employment is associated with penalties in pay compared to full-time employment (Ermisch and Wright, 1993; Waldfogel, 1995; Sloane, 1994). Previous analyses have demonstrated that women display substantial downward occupational mobility over the family formation period with only limited recovery (e.g. Dex and Shaw, 1986; Elias, 1988). This downward mobility is linked to the market segmentation of part-time jobs that are concentrated within a narrow range of occupations; principally low skilled personal service work. Related to this point, gender segregation in educational choices may occur, with those women who wish to enter occupations that are more compatible with family life choosing less market-oriented courses (Brown and Corcoran, 1997; Polachek, 2003).

Identifying the separate effect of children upon earnings

The above discussion has outlined the main reasons why it may be expected that women who have children earn less than women who are childless. It would therefore be expected that the 'unadjusted' differentials presented in Table 1 could be explained in terms of differences in the personal and labour market characteristics of women with children compared to those who chose to remain childless. For example, if women have had breaks in their careers in order to have children, it would be expected that these women would have lower earnings than otherwise identical women who had uninterrupted work histories. Similarly, if women who chose to have children exhibit lower levels of educational attainment than women without children, it would be expected that the presence of children should be associated with lower earnings.

This section therefore presents estimates of the penalty in pay associated with motherhood *after having controlled* for differences in the labour market and personal characteristics of mothers compared to women without children. To identify the presence of penalties in pay associated with motherhood multivariate statistical techniques were utilised, which allow for a range of factors that may be expected to influence earnings to be controlled for simultaneously. From these statistical models, 'adjusted' differentials can be derived. The purpose of this exercise was to consider whether the 'unadjusted' differentials presented in Table 1 disappear after having controlled for other factors or whether the presence of children has a separate and additional effect upon the earnings of women.³

Estimates of the 'adjusted' penalty in pay associated with motherhood are presented in Table 2. The asterixes indicate the presence of statistically significant results. The largest penalties in pay associated with motherhood are estimated to occur in Germany, Denmark, the United Kingdom and Ireland. In Germany, the presence of 2, and 3 or more children is associated with a penalty in pay of 12%. In Denmark, the presence of 2, and 3 or more children is associated with a penalty in pay of 8% and 13% respectively. In Ireland, the presence of 2, and 3 or more children is associated with a penalty in pay of 12%, and 18% respectively. In the United Kingdom, the presence of 2, and 3 or more children is associated with a penalty in pay of 12%, and 15% respectively. Smaller family gaps in pay are shown to exist both in Spain and Portugal where the presence of 1 child is associated with a 5% to 6% reduction in gross hourly earnings and the presence of 2 children is associated with a 7% reduction in hourly earnings.

³ Specifically, family status variables were introduced into a traditional human capital wave function where the natural logarithm of gross hourly wages is modelled as a function of human capital variables, variables that account for family status and controls for industry sector. A fixed effects estimation procedure was utilised in order to control for unobserved heterogeneity. The samples for each country consist of unbalanced panels, where each woman who enters the panel between the ages of 16 to 40 is observed up to 6 times between 1994 and 1999.

Table 2: Adjusted Estimates of the Family Gap in Pay

Country	One Child	Two Children	Three Children
Germany	-0.04	-0.12**	-0.12**
Denmark	-0.03	-0.08**	-0.13**
Netherlands	0.05**	0.00	0.04
Belgium	0.02	-0.02	-0.05
France	-0.03	-0.04	-0.03
Ireland	-0.05*	-0.12**	-0.18**
Italy	-0.01	-0.01	-0.07
Greece	0.07**	0.11**	0.07
Spain	-0.05**	-0.07**	-0.04
Portugal	-0.06**	-0.07**	-0.07

Cross National Comparisons and Implications for Policy

The current approach of cross-national comparative studies of women's role in society is to seek to identify typologies of societies that have similar institutional profiles in order to develop hypotheses regarding how these institutional differences can mould behaviour and choices (Hakim, 2000). The relatively large penalties in pay associated with motherhood that have been shown to prevail in the UK and Germany may be indicative of the institutional arrangements in these countries. The liberal welfare state of the United Kingdom emphasises individual freedom: the provision of day care and after school facilities enabling mothers to work full-time is lacking. In Germany, family services are also under-developed. Within this conservative regime, social policy measures have encouraged motherhood and the traditional family model. The German tax system still punishes the dual full-time earner marriage and rewards wives who do not work, or work part-time.

The absence of penalties in pay associated with motherhood in France, Italy and the Netherlands can also possibly be viewed in the context of institutional arrangements within these countries. Within France, publicly funded crèches, day care institutions and after school childcare facilities have developed to enable mothers to work full-time. Similarly, Italy has adopted a policy of universal pre-school enrolment for children starting at age three. This combines with low levels of direct income assistance to encourage the commitment of women to continuous paid employment around periods of family formation. Within the Netherlands, legislation led to a rapid expansion of childcare facilities during the 1990s. Relatively small penalties in pay estimated for Southern Europe generally may be indicative of the importance of informal care networks. Our findings suggest that the use of indicators of family friendly policies in cross-country studies could bring some light to the relative importance of aspects of such institutional settings. However, country specific characteristics, such as social and cultural factors, which are not easily observed and accounted for, are likely to matter significantly in explaining the family gap in pay.

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