

The educational attainment of the children of stay-at-home mothers: evidence from the Irish Marriage Bar

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Abstract

The relationship between maternal employment and the educational attainment of children is examined using data from the third wave of The Irish Longitudinal Study on Ageing. Because maternal employment is potentially endogenous with respect to child educational attainment, instrumental variable estimation is used. In this analysis, two sets of instruments are used based on whether the mother’s employment was affected by the Marriage Bar that was in place at that time in Ireland. A Marriage Bar is the requirement that women in certain jobs must leave that job when they marry. It is found that the probability that a child completes university is 1–3 percentage points lower for each additional year of maternal employment during the first 18 years of the child’s life.

JEL classifications: J12, J16, J20.

1. Introduction

The relationship between maternal employment and child outcomes has been studied extensively in the social sciences, particularly in the fields of economics, psychology, and sociology. This research suggests that there are at least three possible channels linking these two variables. The first channel is that maternal employment increases family income, and this income can be used to purchase goods or services, such as books and educational trips, that improve child outcomes. The second channel relates to the degree of substitutability between maternal childcare and alternative (non-maternal) childcare arrangements. If non-maternal childcare is inferior to maternal childcare, maternal employment is likely to be detrimental to child outcomes. However, if non-maternal childcare is superior to maternal childcare, maternal employment may be beneficial to child outcomes. A third possible channel relates to role models and family expectations, in the sense that child outcomes are inter-generationally linked. For example, the children of highly educated mothers are more

likely to be highly educated themselves, because of family expectations. In this explanation, the contribution of maternal employment is not of central importance.

This paper is primarily concerned with the first two channels. It contributes to the growing body of research that empirically tests the relationship between maternal employment and child outcomes using data for older Irish women collected in the third wave (2014/2015) of The Irish Longitudinal Study on Ageing (TILDA). TILDA is a nationally representative study of community-dwelling individuals aged 50+ resident in Ireland. Crucially for the purpose of this study, TILDA respondents are asked a number of questions about their children. Specifically, information on each child's age, sex, and educational attainment is collected. The outcome of interest is whether a mother's child, now an adult, completed university. Maternal employment is measured by the number of years the mother worked before the child turned 18.

Probit regression is used to model the relationship between maternal employment and the probability that the child completes university. Because maternal employment is potentially endogenous, instrumental variable (IV) estimation is used to examine the direction of causation. In this analysis, two sets of instruments are used based on whether the mother's employment was affected by the Marriage Bar that was in place at that time in Ireland. A Marriage Bar is the requirement that women in certain jobs must leave that job when they marry. In 1924, the Irish government introduced a Marriage Bar for the civil service. Because the government introduced a Marriage Bar for civil servants, the policy of women leaving their jobs at marriage was legitimized, so many state-sponsored and private sector employers also adopted a similar policy. The Marriage Bar was abolished in the public sector in 1973. In 1977, legislation was introduced that made it unlawful to discriminate on the grounds of sex or marital status.

When maternal employment is assumed to be exogenous, the estimates suggest that there is no relationship between maternal employment and the probability that a child completes university. However, when employment is assumed to be endogenous, the estimates point to a negative relationship. This suggests that the more the mother worked before her child turned 18, the *less* likely it is that the child would have completed university. This finding is robust to alternative empirical specifications. This key finding is dependent on the assumption that the Marriage Bar is itself exogenous in the sense that it did not have a major effect on the employment, marriage, and fertility decisions of women. Additional analysis suggests that such endogeneity is not problematic.

This paper makes three contributions to the literature:

- i. The long-term educational attainment of the mother's child, measured in terms of the probability that the child completes university, is examined. With the exception of [Carneiro *et al.* \(2015\)](#) and [Dustmann and Schonberg \(2012\)](#), the existing literature on the effects of maternal employment does not examine the adult outcomes of the children.
- ii. The life-time labour supply of the mother is examined and linked to her children's education. There is no doubt that the first few years of life are important for child development ([Lewis and Brooks-Gunn, 1979](#)). However, much less is known about whether the mother working when the child is older has an effect on the outcomes of the child. To our knowledge, there are only two studies that have investigated the impact of maternal employment on child outcomes when a mother and her children are older ([Ruhm, 2008](#); [Bettinger *et al.*, 2014](#)).

iii. For the first time, the Marriage Bar—a policy of institutionalized legal sex discrimination—is used as a source of exogenous variation in order to help identify the direction of causation between maternal employment and child outcomes.

The remainder of the paper is organized as follows. Section 2 reviews economics-based research that has examined the relationship between maternal employment and child outcomes. Section 3 is a discussion of the Irish Marriage Bar. Section 4 introduces the TILDA data, outlines the statistical approach, and defines the variables used in regression analysis. Results are presented in Section 5. Section 6 addresses the potential endogeneity of the Marriage Bar. Conclusions follow in Section 7.

2. Previous research

Economics-based studies that have investigated the relationship between maternal employment and child outcomes fall into two main groups. The first group uses information relating to changes in the length of legal maternity leave. With this approach, administrative datasets are used to track and compare a range of outcomes between children born before and after changes in the length of maternity leave. The second group uses information collected in micro-level social surveys. With this approach, mothers' fertility and employment histories are collected and matched to the outcomes of their children. Examples of outcomes investigated in both types of studies are motor and social development scores, cognitive development test scores, and school grades. Results from both types of studies are mixed.

With respect to the first group of studies, there are two studies using Norwegian data that find positive effects of longer maternity leave on child outcomes (Bettinger *et al.*, 2014; Carneiro *et al.*, 2015). There are five studies using Canadian, German, Danish, and Norwegian data that do not find an effect of longer maternity leave on child outcomes (Baker and Milligan, 2010, 2015; Rasmussen, 2010; Dustmann and Schonberg, 2012; Dahl *et al.*, 2016). Finally, there are two studies using Swedish and Austrian data that find positive effects of longer maternity leave only among children of highly educated mothers (Liu and Skans 2010; Danzer and Lavy, 2018).

Of particular relevance to the analysis carried out in this paper are the studies by Dustmann and Schonberg (2012), Bettinger *et al.* (2014), and Carneiro *et al.* (2015). Both Dustmann and Schonberg (2012) and Carneiro *et al.* (2015) examine the outcomes of the children in adulthood. Carneiro *et al.* (2015) examine a policy introduced in Norway in 1977 that changed the length of maternity leave. They find that the increased time spent with the child resulting from this change leads to a 5% increase in the child's wages when they are 30 years of age. Dustmann and Schonberg (2012) examine policies that led to three major expansions of maternity leave in Germany between 1979 and 1992. Comparing educational and labour market outcomes of children born shortly before and after the reforms, they find no evidence that the expansions improve children's outcomes in adulthood. Finally, Bettinger *et al.* (2014) examine how a 1998 reform in Norway, which increased parents' incentives to stay home with children under the age of 3, affected the educational outcomes of the older siblings of the children affected by the reform. They find a small positive, but statistically significant, effect on older siblings' grades in secondary school.

The mixed findings of these studies are not surprising. As with the designs of all natural experiments, findings have to be considered in the institutional context of the country and period being studied. For example, one needs to consider the generosity of the existing maternity leave system before the expansion; the nature of the expansion in terms of duration and

financial generosity; whether the alternative to maternal care is formal or informal care; and, if the alternative care is formal, the costs involved. In addition, studies based on this methodology assume that mothers who give birth before and after the expansions of maternity leave have full knowledge of the welfare, maternity leave, and tax systems, and are rational agents.

In general, the second group of studies finds that maternal employment during the child's first year of life has a negative impact on child outcomes (Waldfoegel *et al.*, 2002; Baum, 2003; Berger *et al.*, 2005; James-Burdumy, 2005). However, it is less clear whether maternal employment after the first year of life has a positive or negative impact on child outcomes (Waldfoegel *et al.*, 2002; Ruhm, 2004, 2008; Schildberg-Hoerisch, 2011; Ermisch and Francesconi, 2013). There are two studies that investigate the effects of maternal employment on longer-term child outcomes (Schildberg-Hoerisch, 2011; Ermisch and Francesconi, 2013). Using data from a sample of around 1,000 children in the British Household Panel Study, Ermisch and Francesconi (2013) examine the effect of maternal employment on the probability of children obtaining upper secondary-level qualifications. They find a negative and statistically significant effect of full-time maternal employment (during the first five years of a child's life) on the probability that the child would achieve upper secondary qualifications. Using data from the German Socioeconomic Panel, Schildberg-Hoerisch (2011) do not find an effect of maternal employment when the child is less than three years of age on the probability that the child would attend academic-track secondary schooling, rather than vocational schooling.

3. Background to the Irish Marriage Bar

A Marriage Bar is the requirement that women in certain jobs leave those jobs when they marry. In 1924, the Irish government introduced a Marriage Bar for its civil service. In 1932, coverage was extended to primary school teachers. Because the government introduced a Marriage Bar for civil servants, the policy of a woman having to leave her job at marriage was legitimized, with the consequence that many state-sponsored and private sector employers adopted a similar policy. Therefore, the practice of terminating the employment of women when they married was widespread (*The Irish Times*, 1975; Connolly, 2003). For example, local authorities, health boards, and some state-sponsored bodies had a Marriage Bar.

Most banks and other financial institutions also adopted a Marriage Bar. Other large private sector employers, such as Guinness Brewers, required female employees to leave when they married (Connolly, 2003; Muldowney, 2007). It was also common for private sector employers to include a clause in their contracts stating that employment would be terminated at marriage (*The Journal*, 2014). Evidence shows that around half of the women who had to leave their job at marriage were employed in the private sector (Mosca and Wright, 2020). About half of the women who had to leave their job due to the Marriage Bar between the 1950s and 1970s were employed in offices as clerks, typists, secretaries, telephonists, or receptionists (Mosca and Wright, 2020). The remaining half were working across a range of occupations; these included nurses, teachers, sales assistants, waitresses, factory workers, and dress-makers.

Women who had to leave work when they married often received a so-called 'marriage gratuity', which was presented to them by a member of the senior management in a spirit of congratulations (Connolly, 2003). Teachers needed a minimum of seven years of service to qualify for a marriage gratuity equal to one month's salary per year of service, or a year's

salary, whichever was the lesser (O'Leary, 1933). The practice of giving women marriage gratuities at marriage was widespread also in the private sector (Kiely and Leane, 2012).

Five reasons were given by the Department of Education for the introduction of the Marriage Bar for primary school teachers in 1932: (i) women could not satisfactorily attend to the duties of both home and work; (ii) married women restricted opportunities for other women and created social tensions if married to a farmer, shopkeeper, or teacher; (iii) maternity leave created difficulties for pupils and staff; (iv) women generally married at 31 or 32 years of age, giving the state an adequate ten years of service for its investment in training; and (v) after slight losses initially, the new regulation would be self-financing (O'Leary, 1933, p. 50).

Harford and Redmond (2019) interviewed 14 primary school teachers who had to leave their job at marriage between the 1930s and the 1950s. One important finding from this study is that all women commented on the lack of information they received on the Marriage Bar and its implications for their future careers. When asked to recall when they first heard about the Marriage Bar, none of the women interviewed could identify an exact point in time. By the time they were in training to become teachers, the Marriage Bar was firmly established and rarely questioned. In the authors' words, 'acceptance of the Marriage Bar was the norm' (Harford and Redmond 2019, p. 11). Harford and Redmond (2019, p. 6) also highlight that the decisions on education and employment (regardless of social class) were made by the whole family, or by parents, not individually by the women themselves.

In 1958, the Marriage Bar for primary school teachers was abolished. In 1970, a Commission was established by the Irish government 'to examine and report on the status of women in Irish society' (Commission on the Status of Women, 1972). Responding to the pressure for change from the Commission, the Marriage Bar was abolished in 1973 in the civil service (Russell *et al.*, 2017). Beginning in 1974, the Marriage Bar was abandoned by local authorities and health boards. In 1977, discrimination in employment on the grounds of sex or marital status was made illegal in both the private and public sectors by the *Employment Equality Act*.

4. Method

4.1 Data

In this paper, data from The Irish Longitudinal Study on Ageing (TILDA) is used. TILDA is a nationally representative study of community dwelling individuals aged 50+ resident in Ireland. The study collects information on the economic, health, and social aspects of the respondents' lives. More detail about TILDA can be found in Whelan and Savva (2013).

The Marriage Bar only affected women who worked and married. Therefore, women who never entered employment when they finished their education ($N=240$) and women who never married ($N=275$) are excluded from the sample. Because the outcome of interest is children's educational attainment, women who never had children ($N=156$) are also excluded from the sample. A discussion of the effect of the Marriage Bar on the decision to work after leaving education, to marry, and to have children is presented in Section 6. After the exclusion of women who never worked, never married, or never had children, the sample consists of 2,699 women. A total of 371 women are excluded because of missing information for at least one of the control variables used in the analysis. The final sample consists of 2,328 women and 7,846 of their adult children (aged 23 and older).

The information provided by the women in the sample about themselves and about their children is used to construct a child-level dataset. The main empirical analysis is based on this child-level dataset.

4.2. Statistical model

In the statistical analysis, it is assumed that child educational attainment is a function of maternal employment, a set of child-specific factors, and a set of mother-specific factors such that:

$$\text{Prob}(\text{UNIV}_{ik} = 1) = f(\mathbf{X}_{ik}, \mathbf{X}_k) \quad (1)$$

where the subscript i denotes the child ($i = 1, 2, \dots, N$) and the subscript k denotes the mother ($k = 1, 2, \dots, K$). Since mothers can have more than one child, $N > K$, UNIV_{ik} is a dummy variable coded 1 if the i -th child of mother k has completed university, and coded 0 if they have not. MatEmp_{ik} is a variable capturing the number of years the mother worked before the child turned 18. This is a child-specific variable, ranging between 0 and 18. \mathbf{X}_{ik} is a vector of variables relating to the children thought to affect their educational attainment. \mathbf{X}_k is a vector of variables relating to the mother thought to affect the educational attainment of her children. In our analysis, the function linking the left- and right-hand sides of Eq. (1) is assumed to be cumulative normal. Therefore, the model is estimated using probit regression.

This empirical specification assumes that maternal employment, MatEmp , is exogenous. However, there is considerable evidence suggesting that this is unlikely. In order to examine the potential endogeneity of maternal employment, IV analysis is used. This approach is widely used in economics to address potential endogeneity (see Bowden and Turkington, 2013). The approach is based on finding at least one variable—a so-called ‘IV’—that has a high correlation with the potentially endogenous variable (MatEmp), a low (preferably zero) correlation with the outcome variable (UNIV), apart from the indirect route via MatEmp , and a low (preferably zero) correlation with unmeasured variables that affect both UNIV and MatEmp . The IVs used in our analysis are described in detail in Section 4.3.4.

4.3 Variables

4.3.1 Dependent variable: child university completion TILDA respondents are asked to report the level of education attained by each of their children. They can select one of the following eight categories: (1) none; (2) some primary (not complete); (3) primary or equivalent; (4) intermediate/junior/group certificate or equivalent; (5) leaving certificate or equivalent; (6) diploma/certificate; (7) primary degree; and (8) postgraduate/higher degree. We classify a child as *having completed university* if categories (7) or (8) are chosen, and as *not having completed university* if a choice is made from categories (1)–(6). Data from the Irish Higher Education Authority show that, in Ireland, the vast majority of students complete their undergraduate studies by the age of 22 (Higher Education Authority, 2016). Therefore, only children aged 23 and above are included in the (main) analysis. These also include children aged 23 and above who have siblings aged younger than 23. Robustness checks concerned with the suitability of this age cut-off are carried out.

4.3.2 Maternal employment Maternal employment is a child-specific variable that measures the number of years the mother worked before the child turned 18. It is important to

note that detailed retrospective employment, marital, and fertility histories have not been collected in TILDA. However, there is information relating to the timing of key life events, as well as some information relating to lifetime employment. More specifically, TILDA records the following categories: (1) the year the respondent started her first regular job or business, after leaving full-time education; (2) the year the respondent married; (3) the year of birth of each child; (4) the number of years the respondent spent in employment, either as an employee or a self-employed individual, since starting her first regular job or business; and (5) the year the respondent stopped working as an employee or a self-employed individual if not working at present.

Given the information provided in categories (1)–(5), and making a number of specific assumptions about women's employment before marriage and before their first birth, it is possible to construct a measure of maternal employment that we believe is accurate. As this measure captures the number of years the mother worked before the child turned 18, the number of years the mother did not work (home time) is 18 years minus this amount. Therefore, from a statistical point of view, it does not matter whether maternal employment or home time is included in the regression, as only the sign of the effect will be different. A document that describes exactly how maternal employment is created is available on the OUP website (see [Supplementary Material](#)).

4.3.3 Other child- and mother-specific variables The variables included in X_{ik} in Eq. (1) are limited to the year of birth and sex of the child. The vector X_k includes the mother's year of birth, four indicators of her socio-economic background when she was young (self-assessed poverty status, absence of books in childhood home, rural childhood home, and number of siblings), and years of schooling completed. The vector X_k also includes the sector and social class of the mother's employment after leaving education, as well as the mother's year of marriage, age at first birth, number of children, and an indicator variable of whether the mother also has children aged younger than 23. This second group of variables included in X_k have two properties. The first is that they are potentially endogenous; the second is that they are likely to be important determinants of the educational attainment of the children and, hence, cannot be ignored.

4.3.4 Instruments Two sets of instruments for maternal employment are used. The first uses the information provided by TILDA respondents on whether they were affected by the Marriage Bar. At Wave 3 (2014/15), female respondents were asked the specific question: 'Did you ever have to leave a job because of the Marriage Bar?' Interviewers were instructed to explain what the Marriage Bar was if the respondent did not know. In our analysis, women who answered 'Yes' to this question were assumed to be affected by the Marriage Bar. Women who answered 'No' were assumed to be unaffected by the Marriage Bar. The distribution of this variable created from TILDA is consistent with other evidence relating to the Marriage Bar (see [Mosca and Wright, 2020](#)). For example, only a small number of women ($N=16$) in the TILDA sample report being affected by the Marriage Bar after it had been abolished.

TILDA respondents were also asked when they first married. This information is used to construct the second set of IVs, which are two dummy variables. The first dummy variable is coded 1 if the woman married in 1973 or later, and coded 0 if she married before 1973. The second dummy variable is coded 1 if the woman married in 1977 or later, and coded 0 if she married before 1977. The Marriage Bar was abolished in the public sector in

1973 and, in 1977, the *Employment Equality Act* made discrimination based on sex and marriage illegal. The period 1973–77 can be thought of as a window of time that creates a potential discontinuity. Before this period, discrimination based on sex and marriage was the norm. After this period, discrimination based on sex and marriage was illegal. Clearly, the labour market for women was very different before and after this period.

Evidence suggests that few women anticipated that the Marriage Bar would be abolished (see Mosca and Wright, 2020). By the 1970s, the Marriage Bar had been a feature of life for women for over 40 years, and there was no expectation that it would be abolished. Apart from the abolition of the Marriage Bar in 1958 for primary school teachers, there had been no legislation or attempts to legislate for abolition of the Marriage Bar. The process of abolishing the Marriage Bar in the public sector was completed very quickly. In 1973, the legislation to abolish the Marriage Bar in the public sector was approved by both houses of the Irish parliament in less than one month.

Once the Marriage Bar had been abolished in the public sector, it is possible that women could have expected private sector employers to retain them at marriage. The anti-discrimination legislation took longer to pass through parliament. The anti-discrimination Bill was initiated in late 1975 and was signed into law in mid-1977. However, in the mid-1970s, it would have been over-optimistic to assume that the abolition of the Marriage Bar in the public sector would be quickly extended to the private sector. In the mid-1970s, the rights and status of women in Irish society were only beginning to change, and change took several decades. For example, the ban on contraceptives began to be lifted during the 1970s, but that ban was only fully lifted in the 1990s. Divorce was not approved by referendum until 1996, some 10 years after being rejected in a previous referendum. A constitutional ban on abortion was removed in 2018, several decades after its introduction. In other words, progress was slow.

5. Results

5.1 Descriptive statistics

Descriptive statistics for all the regression variables are presented in Table 1. With respect to the explanatory variables relating to children, the descriptive statistics are calculated at the child-level ($N_{ik} = 7,846$). Statistics are also presented separately for children whose mothers were affected by the Marriage Bar ($N = 1,515$) and for children whose mothers were not affected ($N = 6,331$). With respect to the explanatory variables relating to mothers, the descriptive statistics are calculated at the mother-level ($N_k = 2,328$). Statistics are also presented separately for mothers who were affected by the Marriage Bar ($N = 385$) and for mothers who were not affected ($N = 1,943$). The results of a test for the difference in means or proportions between the two groups of children or the two groups of mothers are shown in column (4). For variables with more than two categories, such as mother's social class, there is a test for the difference in the variables' distribution across the two groups of mothers.

Two points about Table 1 are worth making. The first is that there is a sizeable difference in the shares of children who completed university between the two groups of mothers. For children whose mothers had to leave employment because of the Marriage Bar, 49.6% completed university. This compares to 44.6% for children whose mothers did not have to leave employment because of the Marriage Bar. This is a difference of 5 percentage points, which is statistically highly significant ($p < 1\%$). The second point is that there is also a

Table 1. Means and standard deviations (in brackets) of variables used in the regression models

	(1) All observations	(2) Mother affected by Marriage Bar? Yes	(3) No	(4) p-value of test: (2) – (3) = 0
<i>Outcome variable</i>				
Child completed university	45.6%	49.6%	44.6%	<0.01
Maternal employment	7.7 (7.7)	4.4 (6.5)	8.5 (7.7)	<0.01
<i>Main control variables</i>				
<i>Child's characteristics:</i>				
Year of birth	1976 (8.6)	1972 (8.1)	1977 (8.4)	<0.01
Female	49.2%	50.7%	48.9%	>0.10
<i>Maternal background:</i>				
Year of birth	1947 (8.4)	1942 (8.0)	1948 (8.1)	<0.01
Poor family during childhood	15.9%	10.9%	16.9%	<0.01
Recalls no/few books in childhood home	37.8%	35.8%	38.2%	>0.10
Grew up in rural area	57.1%	54.8%	57.6%	>0.10
Number of siblings	5.1 (2.9)	4.8 (2.6)	5.1 (2.9)	<0.10
Years of schooling	12.0 (2.6)	12.1 (2.3)	11.9 (2.7)	>0.10
<i>Additional control variables</i>				
<i>Sector of mother's employment after leaving education:</i>				
Public sector: not teaching	23.9%	42.1%	20.3%	<0.01
Public sector: teaching	7.9%	3.6%	8.8%	
Private sector	68.1%	54.3%	70.9%	
<i>Social class of mother's employment after leaving education</i>				
Professional, managerial, technical	21.9%	20.0%	22.2%	<0.01
Non-manual	46.6%	58.4%	44.2%	
Skilled manual	12.2%	8.1%	13.0%	
Semi-skilled and unskilled manual	19.4%	13.5%	20.5%	
<i>Mother's marriage and child-bearing variables</i>				
Year of marriage	1972 (9.0)	1966 (7.5)	1973 (8.9)	<0.01
Age at first birth	26.3 (4.7)	26.6 (4.4)	26.2 (4.7)	<0.10
Number of children	3.5 (1.6)	4.0 (1.9)	3.4 (1.5)	<0.01
Has children aged <232323	10.3%	1.0%	12.1%	<0.01
Number of mothers	2,328	385	1,943	
Number of children	7,846	1,515	6,331	

Source: The Irish Longitudinal Study of Ageing (TILDA), Wave 3, 2014/2015.

Table 2. Summary of maternal labour market attachment

		(1) All	(2) Mother affected by Marriage Bar?		(3) (4) p-value of test: (2) – (3) = 0
			Yes	No	
(a)	Total work experience (years)	26.2	21.5	27.2	<0.01
(b)	Work experience as a share of potential experience (%)	60.0%	45.8%	63.0%	<0.01
(c)	Time since last job (years)	13.7	22.3	12.0	<0.01
	Number of mothers	2,328	385	1,943	

Source: The Irish Longitudinal Study of Ageing (TILDA), Wave 3, 2014/2015.

sizeable difference in maternal employment between the children of women affected by the Marriage Bar and the children of those not affected by the Marriage Bar. The mean for the children of women affected by the Marriage Bar is 4.4 years, compared to 8.5 years for children of women not affected by it. This is a difference of 4.1 years, which is also statistically highly significant ($p < 1\%$). Data from TILDA clearly support the view that the employment trajectories of mothers who were affected by the Marriage Bar differ over the lifetime from the trajectories of mothers not affected by the Marriage Bar.

Further evidence in support of this view is shown in Table 2. This table summarizes three measures of lifetime employment for the two groups of mothers. The first measure is ‘total work experience’, which is the self-reported number of years spent in employment. Row (a) shows that mothers who report leaving their job because of the Marriage Bar worked (on average) 21.5 years over the course of their lives compared to 27.2 years for mothers who were not affected by the Marriage Bar. This difference is statistically highly significant ($p < 1\%$). The second measure is ‘work experience as a share of potential work experience’. Potential work experience is defined as age minus age of labour market entry for mothers younger than age 65, and as 65 minus age of labour market entry for those older than 65. Row (b) shows that mothers affected by the Marriage Bar spent around 45.8% of their ‘potential working-life’ in employment. This compares to 63.0% for mothers not affected by the Marriage Bar. This difference is statistically highly significant ($p < 1\%$). The third measure is ‘time elapsed since the last job ended’. Row (c) shows that mothers affected by the Marriage Bar have not worked in the past 22.3 years. For mothers not affected by the Marriage Bar, it has been just under 12 years since they last worked. This difference is also statistically highly significant ($p < 1\%$).

Returning to Table 1, there are three points worth making about the other variables included in the regression analysis. The first point is that mothers affected by the Marriage Bar and their children are (on average) older than the mothers not affected by the Marriage Bar and their children. The average *Year of birth* for mothers affected by the Marriage Bar is six years earlier than for mothers who were not affected. The average *Year of birth* for children whose mothers were affected by the Marriage Bar is five years earlier than for children whose mothers were not affected. Both these age differences are statistically highly significant ($p < 1\%$). The second point is that mothers affected by the Marriage Bar are more likely to come from more favourable backgrounds. For example, 10.9% of mothers

affected by the Marriage Bar report they grew up in a poor family. This compares to 16.9% of mothers not affected by the Marriage Bar. This difference is statistically highly significant ($p < 1\%$). The third point is that there is only a small difference, around 0.2 years, in *Years of schooling completed* between the two groups of mothers. This difference is not statistically significant even at the 10% level.

There are also differences in the distribution of sector and social class of mother's employment after leaving education. For example, around 42.1% of mothers affected by the Marriage Bar were employed in the public sector and were not teachers. Around 3.6% were teachers and the remaining 54.3% were employed in the private sector. The corresponding figures for mothers not affected by the Marriage Bar are 20.3%, 8.8%, and 70.9%, respectively. Mothers affected by the Marriage Bar were also more likely to be concentrated in 'higher' social classes and less likely to be concentrated in 'lower' social classes. All these differences are statistically highly significant ($p < 1\%$).

In TILDA, respondents are also asked their occupation in their first job. This information is collected by an open-ended question; that is, interviewers recorded verbatim the individual's response. The authors of this paper transcribed and mapped these responses into the International Socio-Economic Index-08 (ISEI-08) (Ganzeboom *et al.*, 1992; Ganzeboom and Treiman, 2011). ISEI-08 is the most recent version of a continuous and internationally comparable measure of occupational status based on information about income, education, and occupation. This scale ranges from 10 to 89, with higher scores indicating higher status occupations. To illustrate the range, medical doctors get the highest score of 89 and kitchen helpers get the lowest score of 10. Primary school teachers get a score of 61, filing and copying clerks a score of 40, teachers' aides a score of 38, receptionists a score of 37, shop assistants a score of 31, factory workers a score of 21, and agricultural labourers a score of 14. The average ISEI-08 score for mothers is 37.7. It is 39.6 for mothers affected by the Marriage Bar and 37.3 for mothers not affected by the Marriage Bar. This is a 2.3 point difference, which is statistically highly significant ($p < 1\%$). However, even though this difference is statistically significant, it is not substantially significant. It is only a 2 point difference on a scale with a range of 79 points. In addition, the 'average' mother not affected by the Marriage Bar would be a receptionist (ISEI-08 score of 37), while the 'average' woman affected by the Marriage Bar would be a filing and copying clerk (ISEI-08 score of 40). Our understanding is that the tasks performed in these two occupations are similar.

5.2 Regression results

The regression estimates are summarized in Table 3. Columns (1) and (2) show probit regression estimates. Average marginal effects are reported. In our application, these effects summarize the impact of a one-unit change in any chosen explanatory variable on the probability of the child having completed university. Column (1) reports estimates for the specification that includes only the main controls. Column (2) reports estimates for the specification that includes the full list of controls (main + additional). Clustered standard errors are reported in parentheses. The clustering is at the level of the mother.

The IV estimates are shown in columns (3)–(10) of Table 3. Columns (3)–(6) show the first-stage and second-stage IV estimates for the model that employs as an IV the binary variable indicating whether the mother was affected by the Marriage Bar. Columns (7)–(10) show the first-stage and second-stage IV estimates for the model that employs the

dummy variables 'mother married post-1973' and 'mother married post-1977' as IVs. OLS regression is used to estimate the first-stage equation. Probit regression is used to estimate the second-stage equation. Coefficients are reported for OLS regression. Average marginal effects are reported for probit regression. Columns (3), (5), (7), and (9) report estimates for the specification that includes only the main controls. Columns (4), (6), (8), and (10) report estimates for the specification that includes the full list of controls. Clustered standard errors are reported in parentheses.

The results of columns (1) and (2) show that, when maternal employment is assumed to be exogenous, there is no association between maternal employment and the probability that the child completes university. However, the results of columns (3)–(10) generally point to a negative relationship between these two variables when maternal employment is assumed to be endogenous. The first-stage estimates of columns (3) and (4) show that whether the child's mother was affected by the Marriage Bar is an important predictor of maternal employment. The coefficient of this variable is negative, large in magnitude, and statistically significant at well below the 1% level. Specifically, having a mother who was affected by the Marriage Bar is associated with a reduction of 3.1 years in the duration of maternal employment. This association reduces to 2.4 years when the full list of controls is included. The F-statistics from the first-stage equation reported at the bottom of Table 3 confirm that the instrument is not weak (F statistics = 57.4 and 33.5, respectively).

The second-stage estimates of columns (5) and (6) indicate that an increase in maternal employment of one year leads to a reduction in the probability that a child completes university by 1.2 percentage points ($p < 5\%$). This negative effect increases to 1.4 percentage points when the full list of controls is included ($p < 5\%$). The results of the Wald test of exogeneity are also given at the bottom of columns (5) and (6). The two χ^2 values are statistically significant at conventional levels, implying that the null hypothesis that maternal employment is exogenous can be rejected at the 5% and 10% levels of statistical significance, respectively. This leads us to conclude that the IV estimates are preferred.

The first-stage estimates of columns (7) and (8) indicate that whether the mother married after 1977 is an important predictor of maternal employment. The coefficient of this variable is negative and statistically significant below the 1% level. Specifically, having a mother who married after 1977 is associated with an increase of 1.1 years in the duration of maternal employment. This association increases to 1.5 years when the full list of controls is included. However, the association between the dummy variable 'mother married post-1973' and maternal employment is considerably weaker. Although maternal employment is (on average) one third of a year longer for children of mothers who married after 1973, this association is not statically significant ($p > 10\%$). The F-statistics from the first-stage equation show that the two instruments together are relatively weak (F statistics = 3.8 and 5.2, respectively). The second-stage estimates of column (9) suggest a negative association between maternal employment and the probability that a child completes university. However, this association is not statistically significant at conventional levels ($p > 10\%$). The second-stage estimates of column (10) show that, when the full list of controls is included, an increase in maternal employment of one year leads to a reduction in the probability that a child completes university by 2.7 percentage points ($p < 1\%$).

The results of Table 3 also indicate that some of the variables in X_{ik} and X_k are important predictors of child education. Turning first to the characteristics of the children, *Year of birth* of the child has a positive sign and is statistically significant ($p < 5\%$) across the different specifications. There is also a large difference by sex. Compared to males, females have

Table 3. Probit and IV regression results of the probability the child completes university

Dependent variable	(1)			(2)			(3)			(4)			(5)			(6)			(7)			(8)			(9)			(10)		
	(1)			(2)			(3)			(4)			(5)			(6)			(7)			(8)			(9)			(10)		
	Structural			First-stage IV			First-stage IV			Second-stage IV			Second-stage IV			Second-stage IV			IVs are 'Mother married post-1973' and 'post-1977'			First-stage IV			Second-stage IV			Second-stage IV		
Maternal employment endogenous?	Child completed university	No	Yes	Child completed university	No	Yes	Maternal employment	Main	Additional	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional
Controls	Main	0.001	(0.001)	Child completed university	No	Yes	Main	Main	Additional	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional
Estimator	Probit	0.001	(0.001)	Child completed university	No	Yes	Main	Main	Additional	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional
Maternal employment	Probit	0.001	(0.001)	Child completed university	No	Yes	Main	Main	Additional	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional
Child's characteristics	Probit	0.001	(0.001)	Child completed university	No	Yes	Main	Main	Additional	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional
Year of birth	Probit	0.001	(0.001)	Child completed university	No	Yes	Main	Main	Additional	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional
Female	Probit	0.001	(0.001)	Child completed university	No	Yes	Main	Main	Additional	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional
Maternal background	Probit	0.001	(0.001)	Child completed university	No	Yes	Main	Main	Additional	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional
Year of birth	Probit	0.001	(0.001)	Child completed university	No	Yes	Main	Main	Additional	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional
Poor family in childhood	Probit	0.001	(0.001)	Child completed university	No	Yes	Main	Main	Additional	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional
No/few books in childhood	Probit	0.001	(0.001)	Child completed university	No	Yes	Main	Main	Additional	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional	Child completed university	Yes	No	Maternal employment	Main	Additional

(continued)

Table 3. Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	IV is 'Mother affected by Marriage Bar'						IVs are 'Mother married post-1973' and 'post-1977'			
Dependent variable	Structural		First-stage IV		Second-stage IV		First-stage IV		Second-stage IV	
	Child completed university	Child completed university	Maternal employment	Maternal employment	Child completed university	Child completed university	Maternal employment	Maternal employment	Child completed university	Child completed university
Grew up in rural area	(0.016) 0.007 (0.015)	(0.015) 0.005 (0.014)	(0.350) −0.035 (0.323)	(0.339) 0.081 (0.319)	(0.016) 0.007 (0.015)	(0.015) 0.006 (0.014)	(0.355) −0.027 (0.327)	(0.341) 0.126 (0.322)	(0.019) 0.007 (0.015)	(0.015) 0.007 (0.014)
Number of siblings	−0.007** (0.003)	−0.003 (0.003)	0.150*** (0.057)	0.158*** (0.056)	−0.004 (0.003)	−0.001 (0.003)	0.154*** (0.058)	0.156*** (0.056)	−0.005 (0.005)	0.002 (0.003)
Years of schooling	0.054*** (0.003)	0.036*** (0.004)	0.458*** (0.064)	0.123 (0.082)	0.057*** (0.003)	0.035*** (0.004)	0.392*** (0.066)	0.077 (0.082)	0.057*** (0.003)	0.030*** (0.007)
<i>Sector of mother's employment after leaving education</i>										
Public sector: not teaching		Ref. Cat.		Ref. Cat.		Ref. Cat.		Ref. Cat.		Ref. Cat.
Public sector: teaching		0.044 (0.034)		3.581*** (0.657)		0.102** (0.041)		4.177*** (0.665)		0.143*** (0.035)
Private sector		−0.053** (0.021)		−0.329 (0.431)		−0.047** (0.021)		0.212 (0.429)		−0.033 (0.022)
<i>Social class of mother's employment after leaving education</i>										
Professional, managerial, technical		Ref. Cat.		Ref. Cat.		Ref. Cat.		Ref. Cat.		Ref. Cat.
Non-manual		0.019 (0.026)		−1.940*** (0.533)		−0.018 (0.031)		−2.319*** (0.530)		−0.052 (0.033)

(continued)

Table 3. Continued

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Structural			First-stage IV			Second-stage IV			IVs are 'Mother married post-1973' and 'post-1977'
	Child completed university	Child completed university	Maternal employment	Maternal employment	Child completed university	Child completed university	Maternal employment	Maternal employment	Child completed university	Child completed university
Skilled manual		-0.058* (0.033)		-1.533** (0.715)		-0.080** (0.034)		-1.700** (0.725)		-0.090*** (0.032)
Semi-skilled and unskilled manual		-0.103*** (0.031)		-2.531*** (0.649)		-0.139*** (0.033)		-2.743*** (0.647)		-0.153*** (0.029)
<i>Mother's marriage and childbearing variables</i>										
Year of marriage		-0.002 (0.002)		0.069* (0.036)		-0.000 (0.002)		0.031 (0.040)		0.001 (0.002)
Age at first birth		0.015*** (0.002)		-0.362*** (0.049)		0.008* (0.004)		-0.383*** (0.050)		0.001 (0.006)
Number of children		-0.014*** (0.005)		-0.741*** (0.106)		-0.025*** (0.007)		-0.793*** (0.105)		-0.032*** (0.005)
Has children aged >23		-0.043 (0.028)		0.595 (0.579)		-0.030 (0.029)		0.195 (0.606)		-0.013 (0.031)
Mother affected by Marriage Bar	-	-	-3.079*** (0.407)	-2.382*** (0.411)	-	-	-	-	-	-
Mother married post-1973	-	-	-	-	-	-	0.294	0.279	-	-

(continued)

Table 3. Continued

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	IV is ‘Mother affected by Marriage Bar’			IV is ‘Mother married post-1973’ and ‘post-1977’			IVs are ‘Mother married post-1973’ and ‘post-1977’			
	Structural			First-stage IV			First-stage IV			
	Child completed university	Child completed university	Maternal employment	Maternal employment	Child completed university	Child completed university	Maternal employment	Maternal employment	Child completed university	Child completed university
Mother married post-1977	–	–	–	–	–	–	(0.515)	(0.529)	–	–
	–	–	–	–	–	–	1.067**	1.526***	–	–
Constant	–	–	–	–	–	–	(0.492)	(0.537)	–	–
	–	–	–385.5*** (40.2)	–296.8*** (46.7)	–	–	–388.3*** (55.2)	–256.8*** (65.4)	–	–
First-stage IV statistics	–	–	57.4	33.5	–	–	3.8	5.2	–	–
Wald test of exogeneity (H0: Maternal employment is exogenous)	–	–	–	–	–	–	–	–	–	–
χ^2	–	–	–	–	4.13	3.49	–	–	0.21	5.00
p value	–	–	–	–	0.042	0.061	–	–	0.645	0.025
N of mothers	2,328									
N of children	7,846									

Source: The Irish Longitudinal Study of Ageing (TILDA), Wave 3, 2014/2015.

Notes: Standard errors clustered at the level of the mother are shown in parentheses: *p > 0.10, **p > 0.05, ***p > 0.01.

a higher probability of completing university. With respect to the socio-economic childhood characteristics of the mother when she was young, only the variable 'recollection of no or few books in the home' is consistently statistically significant below the 1% level. Recalling no books in childhood decreases the probability of her children completing university. *Years of schooling* has a positive sign and is highly statistically significant ($p < 1\%$). The results of Table 3 also indicate that children of mothers in skilled, semi-skilled, and unskilled occupations are significantly less likely to have completed university than the children of mothers in professional, managerial, or technical occupations ($p < 10\%$). Finally, *Number of children* has a negative sign and is statistically highly significant ($p < 1\%$).

5.3 Robustness checks

To consider the robustness of the estimates of maternal employment, three additional sets of regressions are estimated. The relevant estimates from these additional regressions are shown in Table 4. Columns (1) and (2) show probit regression estimates. Columns (3) and (4) show second-stage IV estimates for the model that employs the dummy variable 'mother was affected by Marriage Bar' as IV. Columns (5) and (6) show the second-stage IV estimates for the model that employs the dummy variables 'mother married post-1973' and 'mother married post-1977' as IVs. Columns (1), (3), and (5) report estimates for the specification that includes only the main controls. Columns (2), (4), and (6) report estimates for the specification that includes the full list of controls. For ease of exposition, average marginal effects and standard errors are reported as percentages. Column (7) reports the number of observations (children) in each specification.

The first set of regressions investigates the effect of maternal employment separately for sons and daughters. Theory and prior research suggest that, compared to daughters, sons are more likely to be affected by early experiences and by non-maternal child care (see Brooks-Gunn *et al.*, 2010), for a review). The results of Table 4 seem to indicate that whether the mother worked when the child was growing up has a 'more precise' effect on the probability that sons complete university compared to daughters completing university. To illustrate, the marginal effect of maternal employment for sons in the regressions of columns (3)–(6) ranges between -2.6 and -1.4 percentage points and is statistically significant at the 10% level or below in three of the four second-stage regressions. For daughters, it ranges between -2.7 and 0.5 percentage points and is statistically significant at the 10% level or below in only one of the four second-stage regressions.

The second set of regressions considers how robust the estimate of maternal employment is to varying child age cut-off. As explained in Section 4.3.1, the baseline sample includes children aged 23 and above. In the regressions of Table 4, there are four tests that examine how robust the estimate of maternal employment is to different child age cut-offs. The first test relaxes the child-age cut-off to age 22; the second restricts it to age 24; the third restricts it to age 25. The fourth test excludes children aged 23 and older who have siblings aged younger than 23. The key point about the second set of regressions shown in Table 4 is that they confirm the baseline regressions shown in Table 3.

The third set of regressions considers how robust the estimate of maternal employment is to varying the definition of maternal employment. In the baseline regressions of Table 3, maternal employment captures the number of years the mother worked before the child turned 18. In the regressions of Table 4, there are two tests that examine the robustness of the estimate of maternal employment. The first defines maternal employment as the

Table 4. Test for robustness of maternal employment marginal effects

No.	(1) Structural	(2)	(3) Second-stage IV	(4)	(5) Second-stage IV	(6)	(7) Number of children
Maternal employment endogenous?	No	No	Yes	Yes	Yes	Yes	
Controls	Main	Main + additional	Main	Main + additional	Main	Main + additional	
Estimator:	Probit	Probit	IV Probit	IV Probit	IV Probit	IV Probit	
Baseline (see Table 3)	0.1 (0.1)	<0.1 (0.1)	−1.2** (0.6)	−1.4** (0.7)	−1.0 (2.3)	−2.7*** (0.8)	7,846
Robustness:							
(1) Child sex							
Male	<0.1 (0.1)	<0.1 (0.1)	−1.4** (0.7)	−1.4* (0.8)	−1.9 (1.8)	−2.6*** (0.9)	3,985
Female	0.2 (0.1)	0.1 (0.1)	−1.0 (0.8)	−1.5 (0.9)	0.5 (4.0)	−2.7*** (1.0)	3,861
(2) Child age cut-off							
22	0.1 (0.1)	<0.1 (0.1)	−1.2** (0.6)	−1.4* (0.7)	−1.3 (2.1)	−2.8*** (0.7)	7,929
24	0.1 (0.1)	0.0 (0.1)	−1.2** (0.6)	−1.5** (0.7)	−0.5 (2.6)	−2.8*** (0.8)	7,730
25	0.1 (0.1)	0.0 (0.1)	−1.2** (0.6)	−1.4** (0.7)	−0.1 (2.6)	−2.6*** (0.9)	7,598
23 and no younger siblings	0.1 (0.1)	0.0 (0.1)	−1.3** (0.6)	−1.6** (0.7)	<0.1 (2.4)	−2.8*** (0.7)	7,240
(3) Maternal employment cut-off							
Age 16	0.1 (0.1)	<0.1 (0.1)	−1.3** (0.6)	−1.6** (0.8)	−1.1 (2.4)	−3.0*** (0.9)	7,846
Age 17	0.1 (0.1)	0.0 (0.1)	−1.2** (0.6)	−1.5** (0.8)	−1.1 (2.4)	−2.9*** (0.8)	7,846

Source: The Irish Longitudinal Study of Ageing (TILDA), Wave 3, 2014/2015.
Notes: Marginal effects and standard errors are reported as percentage. Standard errors clustered at the level of the mother are shown in parentheses: *p < 0.10, **p < 0.05, ***p < 0. 01; Dependent variable is Child Completed University.

number of years the mother worked before the child turned 16. The second defines maternal employment as the number of years the mother worked before the child turned 17. Overall, this third set of regressions confirm the baseline regressions shown in Table 3.

6. Endogeneity issues

The aim of this section is to investigate whether the presence of the Marriage Bar altered women’s behaviour by influencing their decisions relating to four key outcomes: entering employment after completing education, sector of employment, marriage, and fertility. The Marriage Bar only affected women who were in employment, who were employed in certain occupations in certain sectors, and who were married. Therefore, it is plausible to assume that, in order to avoid the Marriage Bar, women perhaps did not engage in

employment, opted only for certain jobs, or did not marry and have children. Evaluating the potential endogeneity of these decisions is important in assessing the reliability of the findings of Section 5.

6.1 Endogeneity of employment

Published aggregate data from Irish census reports (1961, 1966, 1971, 1981, 1986, and 1991) and census micro-data (1971, 1981, 1986, 1991, and 1996) are used to investigate the potential endogeneity of employment. In Ireland, censuses are taken every five years, but the census due in 1976 was cancelled. Census micro-data are drawn from the International Census Public Use Micro Samples (IPUMS). It is important to note that the 1961, 1966, and 1971 censuses were carried out before the abolition of the Marriage Bar. The 1981, 1986, 1991, and 1996 censuses were carried out after the abolition of the Marriage Bar. Therefore, one can compare trends before and after the abolition of the Marriage Bar.

Figure 1 shows the shares of single women aged 20 to 24 in employment during the period 1961–91. The trends shown in Fig. 1 suggest that the Marriage Bar did not affect women's employment decisions in the direction one would expect. If women were avoiding employment because of the Marriage Bar, one would expect to observe an *increase* in employment rates for young single women after the abolition of the Marriage Bar. However, employment rates declined after the abolition of the Marriage Bar. Regression analysis based on a simple before/after difference indicates that the decrease in employment rates in the period 1981–91 as compared to the period 1961–71 is statistically significant at the 10% level.

Figure 2 shows trends in private sector employment among women aged 20–29 between 1971 and 1996, and trends in public sector employment among single female professionals aged 20–24 between 1961 and 1991. Two points about Fig. 2 are worth stressing. The first is that, during the period in focus, the private sector share increased. In 1971, 12.0% of women aged 20–29 were employed in the private sector. This had increased to 14.5% by 1981. If the Marriage Bar had been a significant deterrent to public sector employment for women, one would expect an increase in public sector employment and a decrease in private sector employment after its abolition. Figure 2 does not indicate this. The second point is that, as a share of all female professionals, female professionals working in the public sector increased until 1971 and decreased thereafter. If the Marriage Bar had been a significant deterrent to public sector employment, one would expect an increase in public sector employment among young and single professionals after its abolition. Once again, Fig. 2 does not indicate this. Regression analysis that compares changes in trends before and after the abolition of the Marriage Bar suggests that these changes are not statistically significant at conventional levels.

6.2 Endogeneity of marriage

Published data from annual reports of Irish vital statistics and census micro-data from Ireland and other countries are used to investigate the potential endogeneity of marriage. Figure 3 shows the marriage rate and average age of marriage during the period 1957–90. If women avoided marriage because of the Marriage Bar, one would expect to observe an increase in the marriage rate after the abolition of the Marriage Bar. Figure 3 shows the opposite: the marriage rate declined after the abolition of the Marriage Bar. If women



Fig. 1. Percentage of single Irish women aged 20–24 in employment, 1961–1991. *Source:* CSOb (1961–1991).

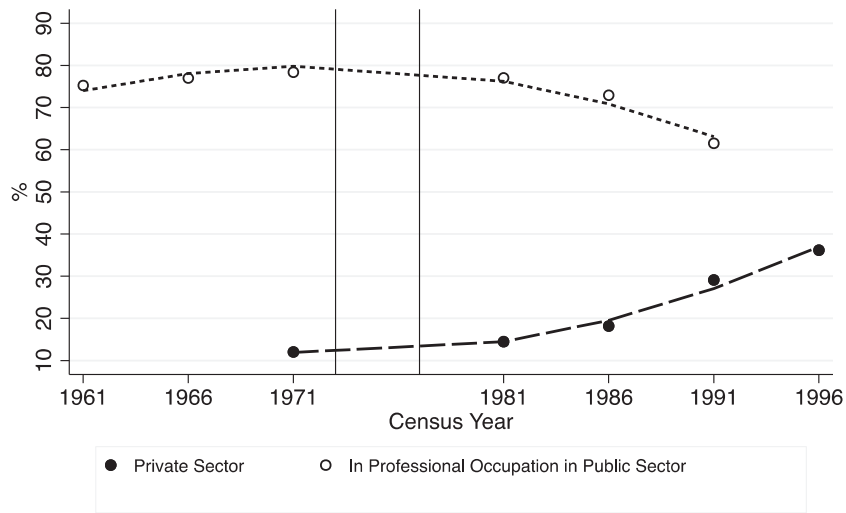
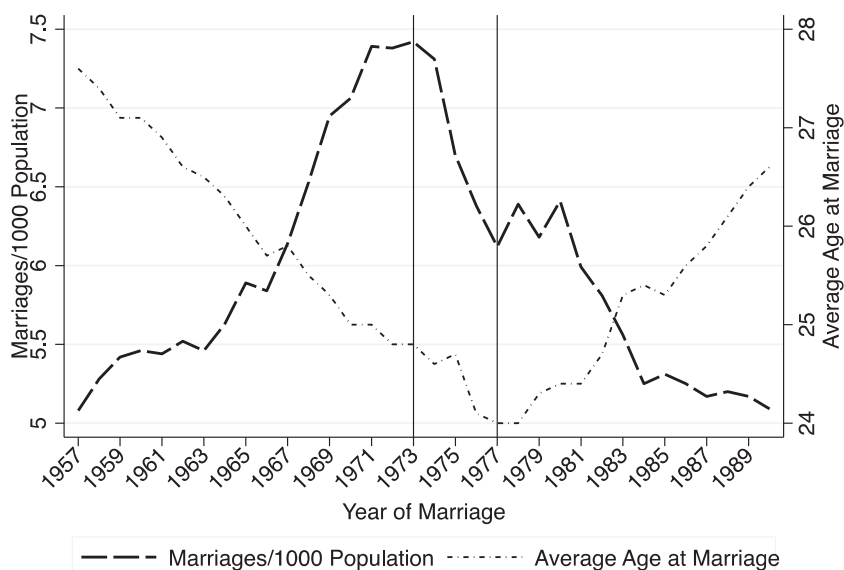


Fig. 2. Percentage of Irish women aged 20–29 employed in the private sector, 1971–1996 and percentage of single Irish women aged 20–24 employed in a professional occupation in the public sector, 1961–1991. *Source:* CSOb (1961–1991); IPUMS International (2020), 1971, 1981, 1986, 1991 and 1996 Irish Censuses.



Note: 1973 = Abolition of Marriage Bar; 1977 = Introduction of Employment Equality Act

Fig. 3. Marriage rate and average age at marriage by marriage cohort, Irish women, 1957–1990. Source: CSOa (1957–1990).

anticipated the abolition of the Marriage Bar, then one would expect to observe an increase in the marriage rate in the years preceding the abolition of the Marriage Bar. However, the increase in the marriage rate began during the late 1950s, long before women could have anticipated the ending of the Marriage Bar over 20 years later.

If women postponed marriage when the Marriage Bar was in place, one would expect to observe a decrease in the average age at marriage after the abolition of the Marriage Bar. However, as Fig. 3 shows, the opposite is the case: the average age at marriage increased after the Marriage Bar was abolished. A Wald test for a structural break in the marriage rate and average age at marriage shown in Fig. 3 was carried out. Not surprisingly, this test does identify a structural break in both series. The estimated break is 1972 for the marriage rate and 1977 for average age at marriage, around the time the Marriage Bar was abolished and that sex and marriage discrimination was made illegal. However, as noted, both trends changed in the *opposite* direction to that expected if the Marriage Bar had been a determinant of marriage behaviour.

Figure 4 shows trends by year of birth in the share of women who never married for women born between 1930 and 1980 for Austria, France, Italy, Portugal, and Spain, as well as Ireland. These other countries are predominately Catholic countries and so are meaningful comparators for Ireland. Figure 4 is based on census data compiled by IPUMS (2020). The figure shows clearly that the trends in the share of women who never married are remarkably similar across the six countries. For all these countries, the share of women who never married remained constant and relatively low for women born between the 1930s and the 1950s and then increased rapidly for women born in the 1960s and 1970s. For Ireland, a structural break is detected in 1967. The Marriage Bar was abolished

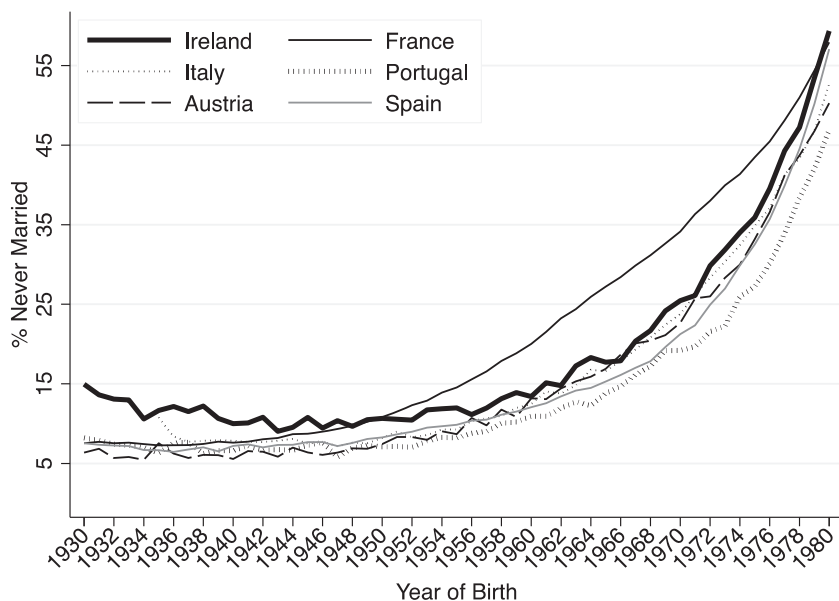


Fig. 4. Percentage of women who never married by birth cohort, Ireland, Austria, France, Italy, Portugal, and Spain, 1930–1980. *Source:* IPUMS International (2020), 2011 Census for Ireland, Austria, France, Italy, Spain and Portugal.

between 1973 and 1977, when the women born in 1967 were age 6 and 10, respectively. Therefore, the structural break in the series for Ireland cannot be, in any sensible way, attributed to the Marriage Bar.

6.3 Endogeneity of fertility

Census micro-data from Ireland and aggregate data from the World Bank fertility database for Ireland and other countries are used to investigate the potential endogeneity of fertility. Figure 5 shows trends in childlessness and fertility by year of birth for Irish women born between 1930 and 1970. Figure 6 compares trends in the total fertility rate for Ireland, Austria, France, Italy, Portugal, and Spain. Unsurprisingly, Fig. 5 shows that the share of women who remained childless in Ireland decreased and then slightly increased. The average number of children born per woman slightly increased and then decreased steadily. Structural breaks for the two trends are detected in 1952 and 1944, respectively. Figure 6 shows that the other five predominately Catholic countries also experienced a sharp decrease in the total fertility rate between 1960 and 2016. A structural break for Ireland is detected in 1989. These figures generate no evidence to suggest that fertility behaviours in Ireland were influenced by the Marriage Bar.

7. Conclusion

This paper has examined the relationship between maternal employment and the educational attainment of children. Data for older Irish women and their adult children collected

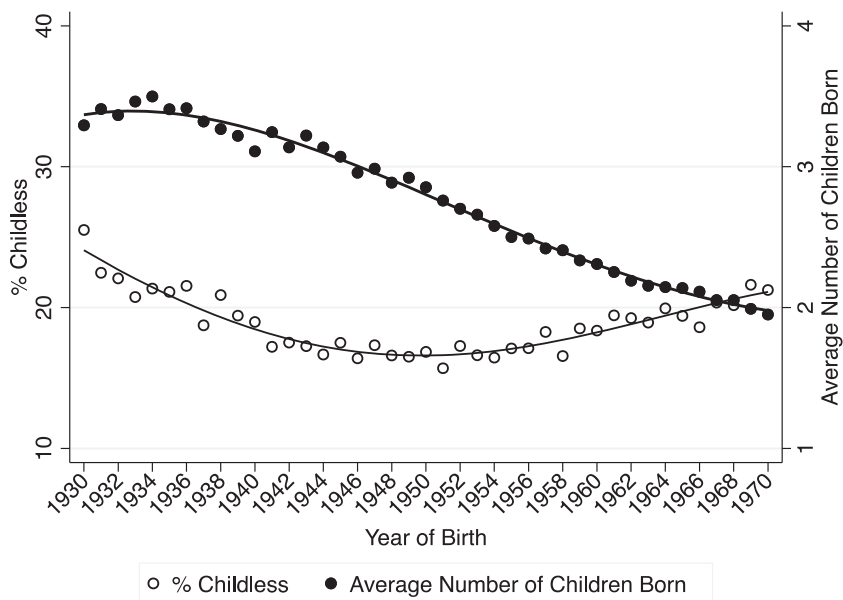


Fig. 5. Percentage of childless women and average number of children born by birth cohort, Ireland, 1930–1970. Source: [IPUMS International \(2020\)](#), 2011 Irish Census.

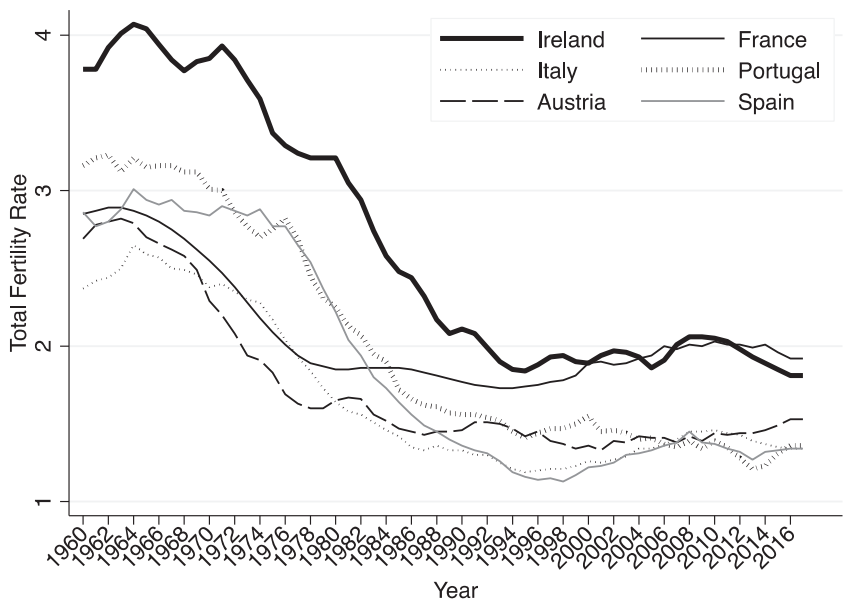


Fig. 6. Total fertility rate by year, Ireland, Austria, France, Italy, Portugal, and Spain, 1960–2017. Source: [World Bank, 2020](#).

in the third wave of TILDA was used. As maternal employment is potentially endogenous with respect to child educational attainment, instrumental variable estimation was used. In this analysis, two sets of instruments were used based on whether the mother's employment was affected by the Marriage Bar in Ireland. These estimates generally pointed to a negative relationship between maternal employment and the probability that a child completes university. It was found that the probability that a child completes university is 1–3 percentage points lower for each additional year of maternal employment during the first 18 years of the child's life.

The findings in this paper are dependent on a set of assumptions being correct with respect to issues such as the potential endogeneity of occupation, marriage, and education choice, socio-economic differences between women affected and not affected by the Marriage Bar, and response bias. We believe that the empirical evidence presented in this paper supports the view that suggests that these issues are not a serious concern. However, to address these issues in a convincing manner, one would need detailed micro-level data for different birth cohorts that would allow one to compare the experience and behaviour of women 'before' and 'after' the Marriage Bar was abolished. Given that TILDA is a single-birth cohort study, it cannot be used in this way. In addition, this dataset would need to have information about whether a woman was affected by the Marriage Bar for those women in the 'before abolition' cohorts. We are not aware of any such data for Ireland. In fact, we believe that TILDA is the only dataset that has collected such information for any country.

Our results are in line with the results of some of the key studies that have investigated the effects of maternal employment on child educational attainment. For example, [Ermisch and Francesconi \(2013\)](#) find that the probability that a child achieves upper secondary qualifications is 3 to 11 percentage points lower for each additional year of maternal employment during the first five years of the child's life. [Carneiro *et al.* \(2015\)](#) find that the probability of dropping out from high school is 2 percentage points lower for the children of mothers who were eligible for 4 months of paid maternity leave and 12 months of unpaid leave as compared to children of mothers who were eligible for 12 weeks of unpaid leave. [Bettinger *et al.* \(2014\)](#) find that the average school grade at age 10 of children whose mother was at home at the time to care for younger siblings, due to being eligible for the so-called Cash-for-Care allowance, was 1.2 points higher than for children whose mother was not eligible for the allowance.

Mothers affected by the Marriage Bar spent more time at home, and, most likely, more time with their children compared to women not affected by the Marriage Bar. Unfortunately, there is no information in TILDA relating to how mothers, working or not, spent time with their children. Therefore, it is important that future research examines how working and non-working mothers differ in terms of how they spend their time with their children. One suspects the impact of a mother spending one hour reading to a child will differ from the impact of a mother spending one hour with a child while the child plays a video game or watches television. A working mother has less time to spend with her children, but she may spend that time in a way that is better for her children than a mother who is not facing the same constraint.

Much of the research concerned with the effects of maternal employment on both early-life and later-life child outcomes assumes that one of the opportunity costs of mothers not working includes having less income to purchase goods and services that have a positive impact on child outcomes. By definition, the Marriage Bar affected family income because the

women affected withdrew from the labour market. However, the loss of income for the families of the women affected by the Marriage Bar may not have been as large as one might first think. There are at least two explanations for this. First, women who had to resign when they married received a gratuity from the organization or company for which they were working (Connolly, 2003). Second, until 1980, the Irish tax system treated married couples as a single unit for tax purposes, meaning that the income of both spouses was aggregated. Compared to two cohabiting single persons, a married couple received a subsidy if one person (usually the wife) was not earning, or earning a very low income. If the wife's earnings were greater, the couple faced a substantial tax penalty (Russell *et al.*, 2017). Therefore, the negative effects of the loss of mother's income may not have been very large.

Finally, future research should also investigate the role of fathers in more detail. For example, a father may work more to compensate for the loss of income caused by a mother leaving employment. Or, if a mother is working, and hence has less time available to spend with her children, the father may increase the time he spends with them. In other words, there is possibly some degree of substitutability between mother's time, father's time, and earned income. Therefore, in order to understand more fully what determines child outcomes, the quantity and quality of the time that fathers spend with their children should also be considered.

Supplementary material

[Supplementary material](#) is available on the OUP website. The main data used in the analysis is from The Irish Longitudinal Study on Ageing (TILDA). TILDA-files can be downloaded free-of-charge from the Irish Social Science Data Archive (www.ucd.ie/issda/), Gateway to Global Aging, (www.g2aging.org/) and the Interuniversity Consortium for Political and Social Research (www.icpsr.umich.edu/icpsrweb). Researchers will also need to apply to the TILDA Statistics and Data Management Team, based at Trinity College Dublin (email: tilda@tcd.ie), for access to variables not included in these publicly available files.

Additional data used in the analysis are from the Integrated Public Use Microdata Series, International (IPUMS) dataset. Permission to access this data can be obtained by registering at the Minnesota Population Center, University of Minnesota (ipums@umn.edu). Data was also compiled from various publications of the Irish Central Statistics Office and the World Bank.

The [supplementary material](#) includes a number of documented STATA do files. These files provide: (i) further information relating to the access of these data sources; (ii) a detailed description of all variables used in the regression analysis, and in the analysis of endogeneity; and (iii) a description of how the TILDA data was transposed from mothers to children. When possible, files of underlying raw data are also included.

Queries relating to this [supplementary material](#) (or to any aspect of the paper) should be directed, in the first instance, to the corresponding author (Irene.Mosca@mu.ie).

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