AUSTRALIAN JOURNAL OF LABOUR ECONOMICS
Vol. 9, No. 4, December 2006, pp 343 - 370

Does Maternity Leave Encourage Higher Birth Rates? An Analysis of the Australian Labour Force

Leonora Risse, University of Queensland

Abstract

This paper uses data from the 2003 HILDA Survey to assess the impact of maternity leave on the incidence of pregnancy among Australian women. The empirical analysis accounts for the fact that data on maternity leave is unobserved for non-working women and applies a Heckprobit selection model to control for potential sample selection bias. The analysis finds that the availability of maternity leave can significantly elevate pregnancy rates but this effect depends on a woman's age and whether maternity leave is paid or unpaid. The findings imply that the implementation of national paid maternity leave legislation in Australia would work to encourage women to bring forward the timing of childbirths and help ease the economic pressures of the ageing population.

1. Introduction

In Australia's current climate of low birth rates, an ageing population and impending labour shortages, the link between maternity leave and fertility is a pressing issue for analysis. Potentially, the provision of maternity leave has the capacity to help halt the nation's declining birth rates and alleviate the economic and social pressures of an ageing population, by encouraging women to have children without severing their ties to the labour force. Yet despite the rich potential policy implications, there is little available evidence in Australia to either support or refute the claim that maternity leave affects birth rates. This paper helps to address this research deficit and investigate whether the availability of maternity leave encourages higher birth rates. The empirical analysis uses unit record data from the 2003 HILDA Survey to assess the impact of maternity leave provisions on the incidence of pregnancy among Australian women. The findings have direct policy implications, particularly in view of the debate over Australia's lack of national paid maternity leave legislation.[1]

Address for correspondence: Leonora Risse, School of Economics, University of Queensland, Qld 4072, Australia. Tel: 61 7 3876 0327. Email: l.risse@uq.edu.au
The author thanks Professor John Mangan of the University of Queensland for his assistance with this study.

[1] This paper uses the confidentialised unit record file from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Commonwealth Department of Family, Community Services and Indigenous Affairs (FaCSIA) and is managed by the Melbourne Institute of Applied Economic and Social Research (MIAESR). The findings and views reported in this paper, however, are those of the author and should not be attributed to either FaCSIA or MIAESR.

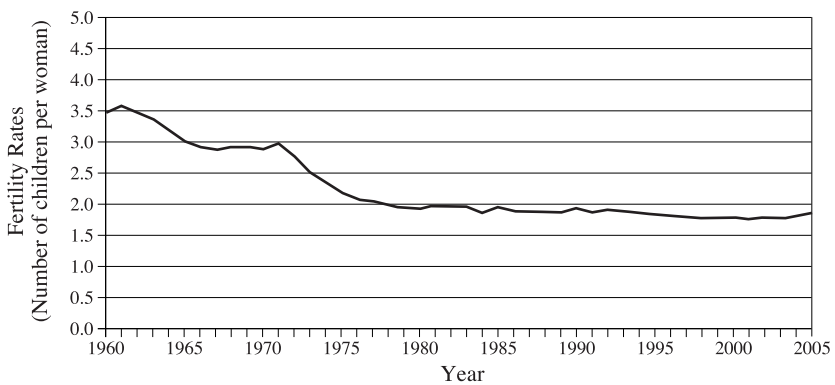
Section 2 presents a statistical picture of fertility trends and current maternity leave provisions in the Australian labour force. Section 3 outlines the theoretical framework in which the relationship between maternity leave and birth rates is analysed. Section 4 reviews previous studies into this topic. Section 5 outlines the methodology and data used in the empirical analysis. Results and analyses are presented in section 6, followed by a discussion of policy implications in the conclusion.

2. Background Setting

Trends in Fertility Rates

As in many other developed countries, Australia has experienced an ongoing decline in fertility rates over the past four decades, as illustrated in Figure 1. From a peak of 3.5 births per woman in 1961, Australia's fertility rate has progressively fallen and has been below the standard replacement rate of 2.1 births per woman since the late 1970s (ABS, 2005).[2] There is concern that if the fertility rate falls below 1.6 births per woman, the Australian population will begin to shrink in size this century (Weston and Parker, 2002).

Figure 1 - Fertility Rates (1960-2005)



Source: ABS (various years), Australian Historical Population Statistics, Cat. No. 3105.0.65.001, table 39.

The decline in fertility rates has been attributed to changes in economic and social conditions that have strengthened women's involvement in the paid labour market while reducing their attachment to the household (Campbell and Charlesworth, 2004). A higher proportion of women are establishing ties to the labour market in order to reap the returns of their educational investments, meet the higher real costs of living and gain financial independence, especially given the greater instability of economic and social conditions (HREOC, 2002a; McDonald, 2002; McDonald and Evans, 2003;

[2] 'Fertility rate' refers to the total number of children a woman would bear during her lifetime if she experienced current age-specific fertility rates at each age of her reproductive life (ABS, 2005). The 'replacement rate' is the rate at which women have sufficient children to replace themselves and their partner, equivalent to 2.1 children per woman (ABS, 2005).

Pocock, 2005). When it comes to starting a family, it is economically rational for women who seek to combine both employment and motherhood to spend several years investing in their education and working in the labour force before they have children (McDonald and Evans, 2003). Prospective parents are better equipped financially to meet the expenses of raising children if they have secured a stable income, which can be maximised by human capital accumulation. Furthermore, workers must invest time in their labour market careers in order to earn entitlement to maternity leave and other family-family policies that would better enable them to manage both employment and family roles (Evans, 2001). The propensity for women to postpone childbearing until relatively later in life means that, on average, women are having fewer children in total and a rising proportion are having no children at all (ABS, 2003).

As a consequence of falling birth rates, delayed family formation and lengthening life expectancies, Australia is challenged with the economic implications of an ageing population (Campbell and Charlesworth, 2004; Costello, 2002a). The ratio of the aged-population to the working population is forecasted to double over the next forty years (ABS, 2001). The changing composition of Australia's population elicits concern over the economy's capacity to meet future expenditure demands. The ageing of the population imposes greater demand on public funds, particularly in the form of health care and pensions (Costello, 2002a). Combined with a shrinking tax base and low national savings, these expenditure demands are predicted to reduce annual GDP by at least 0.25 percentage points by 2010.[3] The Federal Government concedes that the ageing population will push the government budget into deficit by 2017 unless tax rates are lifted or government spending is cut in the future (Costello, 2002a). As the number of retirees is set to outstrip the number of new entrants into the workforce, the economy faces imminent labour shortages which threaten to constrain future growth and weaken international competitiveness (Costello, 2002a, 2005; Mitchell and Quirk, 2005; O'Neill, 2004).

Presented with these demographic trends, the question of whether maternity leave can affect birth rates is a highly topical issue for inquiry. Although it is estimated that one-quarter of women are likely to remain childless, Pocock (2005) notes that most instances of childlessness are voluntary. This implies that there is scope for policies to affect women's childbearing preferences and realised fertility outcomes. The effectiveness of maternity leave to elevate national birth rates lies in its capacity to influence the childbearing preferences of women in the workforce. As shown in figure 2, women in the workforce record a lower pregnancy rate than women out of the workforce. One out of 23 working women, compared to one out of 14 non-working women, report becoming pregnant within a given year (HILDA, 2003).[4]

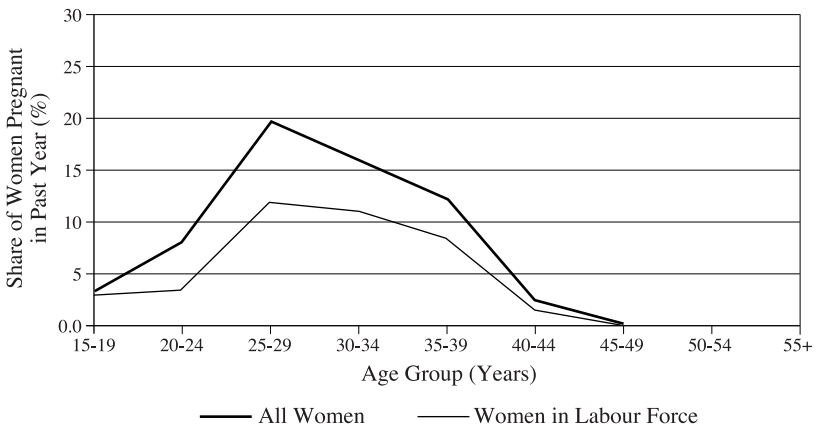
[3] Australian Industry Group, Submission to HREOC Report *Valuing Parenthood*, cited by HREOC (2002b, p.92).
[4] 'Working' refers to individuals who are full-time or part-time employed. 'Non-working' refers to individuals who are unemployed or non-participants in the labour force.

Figure 2 - Pregnancy Rates According to Labour Force Status

Source: HILDA Survey, 2003 (population weighted)

The effect of employment on fertility trends is also captured in figure 3 which compares the age-specific pregnancy rates of employed women to those of the total female population. The highest incidence of pregnancy is reported by women between the ages of 25 to 29, followed by women between the ages of 30 to 34. The gap between the pregnancy rates of employed women and the total female population persists over nearly all age-groups, but swells at the peak childbearing years.

Figure 3 - Age-Specific Pregnancy Rates



Source: HILDA Survey, 2003 (population weighted)

Maternity Leave Provisions

Under federal legislation, all permanent employees in Australia have entitlement to 52 weeks' unpaid maternity leave (*Workplace Relations Act 1996*). This provision applies to both full-time and part-time employees with at least 12 months of continuous service.

Legislated entitlement to unpaid maternity leave was extended to all long-serving casual employees covered by federal awards as an outcome of union bargaining (*Family Provisions Test Case 2001*). These entitlements have been re-endorsed in the most recent industrial legislation (*Work Choices Act 2005*). Paid maternity leave, however, is not a legislated entitlement across the labour force, which makes Australia one of only two OECD nations without such policy provisions (alongside the US), and sets Australia short of the international standards for paid maternity leave prescribed by the International Labour Organization (ILO) in the *Maternity Protection Convention* and by the United Nations (UN) in the *Convention on the Elimination of all forms of Discrimination Against Women* (*CEDAW*) (Baird and Burgess, 2003; Earle, 1999; HREOC, 2000b).[5] Legislated entitlement to paid maternity leave in Australia remains confined to the public sector, the conditions dependent on the State or Territory, as listed in table 1.

Table 1 - Paid Maternity Leave Provisions in Public Sector (as at July 2002 unless otherwise stated)

Jurisdiction	*Duration of Paid Maternity Leave*	*Eligibility Requirements*
Commonwealth	12 weeks	12 months continuous service
NSW	9 weeks	At least 40 weeks of service before birth
VIC	12 weeks	12 months continuous service
QLD	6 weeks 12 weeks (from July 2005)	12 months continuous service[1]
WA	None[2] 6 weeks (from July 2003)	n/a 12 months continuous service
SA	4 weeks 12 weeks (from May 2005)	12 months continuous service
TAS	12 weeks	12 months continuous service
NT	12 weeks	12 months continuous service
ACT	12 weeks	12 months continuous service

[1] Excludes employees of departments and statutory authorities which operate as trading enterprises
[2] Up to 6 weeks can be negotiated through the bargaining process of local Certified Agreements
Source: Senate Employment, Workplace Relations and Education Legislation Committee (2002) with updates made by author for Qld <http://www.psier.qld.gov.au/circular/docs/05/circ05_05.pdf>, WA <http://www.docep.wa.gov.au/lr/LabourRelations/Media/cir03_03.pdf> and SA <http://www.cpsu.asn.au/webnews/050505_HISTORIC_MATERNITY_LEAVE_DECISION_050504.html>

[5] The ILO (1952, 2000) prescribes the provision of 14 weeks' paid maternity leave, with payment equivalent to at least two-thirds the level of previous earnings and financed by compulsory social insurance or public funds. The UN (1979) instructs maternity leave to be implemented 'with pay or comparable social benefits and without the loss of previous employment, seniority or allowances' but does not specify the level of pay or the means of finance (Article 2(b)). Although the Australian Government ratified the *CEDAW*, it sought exemption from the obligation to provide paid maternity leave. Out of the total 163 nations who are signatories of the *CEDAW*, Australia is one of five nations which fail to endorse legislated paid maternity leave (HREOC, 2002a)

According to the HILDA Survey (2003), 44.2 per cent of women in the workforce have access to paid maternity leave and 70.6 per cent have access to unpaid maternity leave. These figures exclude women who do not know whether they have access to maternity leave. When the sample is expanded to include the 'don't know' respondents, it is computed that roughly one-third of women in the workforce have access to paid maternity leave, half have access to unpaid maternity leave, and over 20 per cent do not know. Table 2 details the distribution of paid and unpaid maternity leave entitlements among women in the Australian labour force.

Table 2 - Share of Women in Employment with Access to Maternity Leave

	Paid Maternity Leave	*Unpaid Maternity Leave*
Yes	33.8%	50.1%
No	42.6%	20.8%
Don't Know	23.6%	29.1%
Total	100%	100%

Source: HILDA Survey, 2003 (population weighted)

Maternity Leave as a Fertility Policy

There are calls for paid maternity leave to be made a legislated workplace entitlement for all employees as a means stabilising the decline in birth rates and halting the ageing of the population (Goward, 2005; HREOC, 2002a; Pocock, 2005). The Federal Government, however, has expressed doubt over the capacity for extended maternity leave provisions to significantly affect birth rates. In defence of the government's reservation towards the proposed legislation, Prime Minister John Howard has stated,

> 'We do have a declining birth rate, but you shouldn't be so naive as to imagine that introducing a paid maternity leave support of a period of 12 or 14 weeks is going to on its own suddenly reverse the declining fertility rate in this country, that is simplistic and naive in the extreme' (Howard, 2002a, online document).

> And further,
> '[T]he evidence I've seen doesn't indicate to me that it [paid maternity leave] has a measurable impact on the fertility rate' (Howard, 2002b, online document).

Federal Treasurer Peter Costello also reveals doubt over the impact of maternity leave on fertility rates yet recognises the benefit of facilitating women's stronger attachment to the labour force:

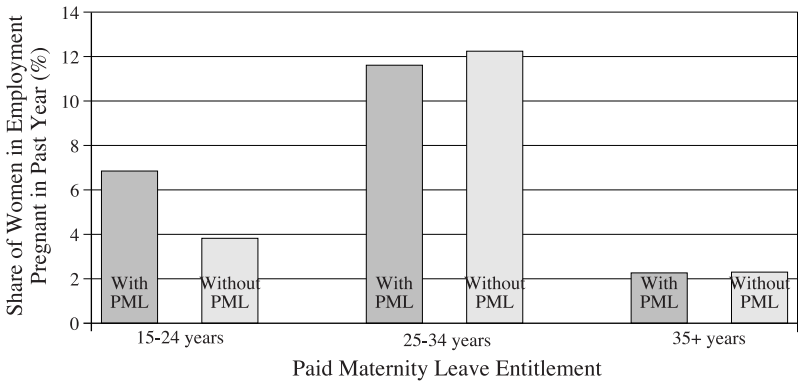
> 'To the extent that a universal maternity allowance increases female participation in the workforce or assists employers to retain a skilled workforce, there may be a case for paid maternity leave. Increased female participation in the workforce and the contribution to GDP they make, provides a stronger economic and tax base to carry the costs of an ageing population. What is unlikely, is that it would produce higher fertility rate. And it would not, in any meaningful sense, reverse the 'ageing of the population' (Costello, 2002b, online document).

Although policy-makers may not expect paid maternity leave to affect national birth rates, there is indication that Australian women's childbearing decisions can be swayed by financial motives. One year after the introduction of the $3000 'Baby Bonus' maternity payment in July 2004, Australia recorded the highest number of annual births since 1992, climbing 2.4 percentage points in a single year (ABS, 2005). Gans and Leigh (2006) provide statistical evidence that some women manipulated the timing of their births in order to receive this maternity payment.

Pregnancy Rates According to Maternity Leave Entitlement

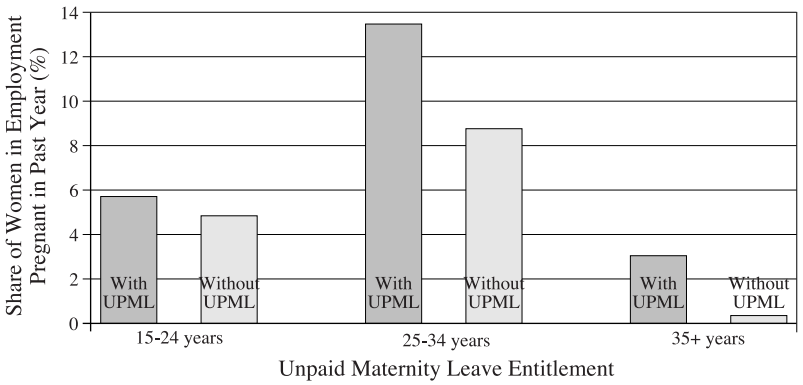
Some indication of the effect of maternity leave on fertility outcomes is presented in figures 4 and 5, which illustrate the age-specific pregnancy rates of employed women according to their paid maternity leave and unpaid maternity leave entitlements respectively. The provision of paid maternity appears to have the largest observable impact on pregnancy rates for women aged 15 to 24 years. Within this age-group, 5.2 per cent of employed women with access to paid maternity leave report becoming pregnant within the given year, compared to 3.8 per cent of those without it. Within the other age-groups, paid maternity leave appears to have little observable effect on pregnancy rates. Unpaid maternity leave, by comparison, appears to have a more discernable effect within the older age-groups. Among employed women aged 25 to 34 years, 13.4 per cent of women with access to unpaid maternity leave report becoming pregnant within a given year, compared to 8.7 per cent of those without it. Among employed women aged 35 and older, three per cent of women with access to unpaid maternity leave report becoming pregnant within a given year, compared to 0.3 per cent of those without it. This paper will test the statistical significance of these observed differences. Although the figures presented here exclude non-working women (for whom data on maternity leave is unobserved), the analysis will control for potential selectivity bias that may arise from a non-random sample.

Figure 4 - Age-Specific Pregnancy Rates of Women in Employment, According to Paid Maternity Leave Entitlement



Source: HILDA Survey, 2003 (population weighted)

Figure 5 - Age-Specific Pregnancy Rates of Women in Employment, According to Unpaid Maternity Leave Entitlement



Source: HILDA Survey, 2003 (population weighted)

3. Theoretical Framework

The decline in fertility rates, and the potential for policy to stabilise or reverse this trend, can be explained in terms of utility theory, as postulated by Becker (1960). Becker's theory considers children to be both a source of utility and a cost for parents. In past economic conditions, parents relied on children to start working and contribute to household income from an early age. In contemporary times, children spend more years in education and start work at a later age, offering less direct economic value to parents. An increasing proportion of children are remaining dependent on their parents until well into their adult life.[6] Additionally, the rising cost of education has compounded the economic burden of children on parents. As the marginal private benefit of children falls and the marginal private cost climbs, it can be theoretically predicted that parents' preference for children will decline. This is demonstrated in the observed decline in fertility rates in most developed nations, or at least the tendency for prospective parents to defer children until their income can satisfy the costs given the expected returns.

Aside from the direct cost of raising children, the decline in fertility rates can also be explained in the framework of opportunity costs. Although it may be financially advantageous for women to defer children until they have amassed several years of labour market experience and reaped the returns of their educational investments, women who invest in their education and establish labour market ties face a higher opportunity cost in deciding to have children, in terms of the labour market wages and the returns on human capital investment that are forgone during their absence from the labour force (Becker, 1960; McConnell, Brue and Macpherson, 2006; McDonald, 2002). Women who allocate more time towards education and employment before having children may be better able to afford children, yet the higher opportunity cost may deter them from doing so. Furthermore, if women have reason to defer their preference for children until later in life, realised fertility rates are further dampened by the fact that the chances of conception decrease, while the chances of miscarriage increase, as women age (Australian Infertility Support Group (AISG) 2005; Monash IVF, 2005).

[6] ABS, *Australian Social Trends*, Cat. No. 4102.0

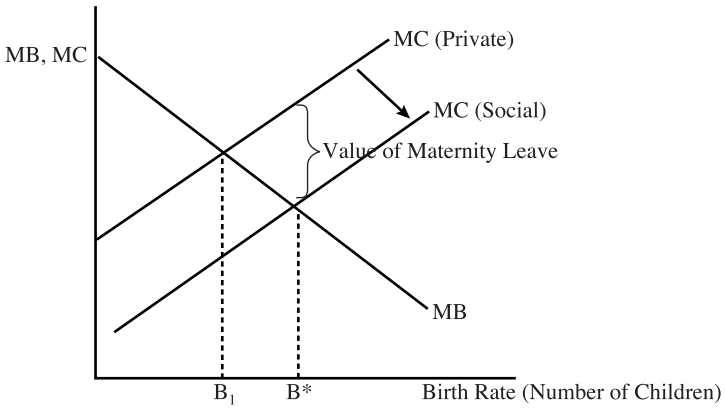
Although, in contemporary settings, children may provide relatively less net benefit to their parents, they are still of vital importance to the whole of society. Specifically, children supply the next generation of labour, human capital and tax revenue (Dex and Joshi, 1999; McDonald, 2005; O'Neill, 2004). Given the existence of these positive externalities associated with children, childbearing decisions based purely on private valuations of marginal benefits will deliver sub-optimal outcomes for society at large. The very fact that the nation's current fertility rate is below the replacement rate can be considered a sub-optimal outcome. This observed market failure may be a consequence of the economy's reliance on tax-transfer systems that have the effect of shifting the economic benefit of children from the private to the social domain. Via the public welfare system that funds aged pensions, health care and other public services, individuals who do not have children themselves can still derive social benefits from (the future taxpaying) children of others. This instance of market failure provides a case for policy intervention (Rosen, 1999). In the absence of intervention, parents bear the full cost of having children even though the whole of society shares in the intergenerational benefits. In circumstances where the social benefits of children exceed the private benefits, and/or the private costs exceed the social costs, public finance theory predicts that the realised outcome (i.e. the actual birth rate) will be below the socially optimal equilibrium.

As a form of market intervention, maternity leave policy has the capacity to help elevate birth rates by reducing the private costs associated with children and encouraging women to have one more child, or have children sooner, than they would otherwise plan. In this sense, private costs refer to the forgone labour market returns lost during a woman's absence from the workforce (Gauthier and Hatzius, 1997; HREOC, 2002b). By providing women the right to return to their former job after childbirth, maternity leave protects women against the losses associated with unemployment or the forced withdrawal from the labour force. These losses include the costs of searching for new employment or the potential drop in living standards incurred as a result of turning to welfare as a substitute for labour market income. The guarantee of job security protects against the loss of firm-specific human capital by enabling women to maintain established job matches, and reduces the depreciation of human capital by allowing women to make a faster transition back to the labour force after childbirth (Dex and Joshi, 1999; Kamerman, 2000; Ruhm 1998). The offer of paid (as opposed to unpaid) maternity leave offsets the costs of children further by financially compensating women for their forgone labour market earnings during the leave period.

A theoretical model of the effect of maternity leave on the marginal private cost of children is illustrated in figure 6. The realised birth rate (B) is an outcome of the equalisation of private marginal cost (MC) and marginal benefit (MB). The socially optimal birth rate (B*) is an outcome of the equalisation of social marginal cost and benefit. Due to the divergence between private and social valuations of marginal cost, the realised birth rate (B_1) falls short of the socially optimal rate. The provision of maternity leave offsets the private costs associated with children (by the amount of its value), generating a downward shift in the marginal private cost function and a higher preference for children. The realised birth rate increases to the optimal level and society can now reap the positive external benefits associated with children. Given that

Australia's realised birth rate does fall short of the optimal replacement rate and there is scope for current maternity leave policies to be extended to the whole of the labour force, this theoretical model is applicable to the Australian context.

Figure 6 - Effect of Maternity Leave on the Private Marginal Cost of Children



It is a distinct feature that maternity leave can achieve this impact on fertility without necessarily detracting from long-run labour supply. In comparison, other types of financial support available to women who have children (e.g. Family Tax Benefit or means-tested maternity payments) increase the private benefit of having children, but effectively also decrease the benefit of labour force participation (Earle, 1999; McDonald, 2001a). Even the flat-rate 'Baby Bonus' payment made available to all new mothers, unconditional on employment, may draw women out of the labour force as it is well-established that motherhood is associated with lower rates of labour force participation (Leibowitz and Klerman, 1995; Nakamura and Nakamura, 1994; Scutella, 2000). It is contended that these policies establish a duality of choice between motherhood and labour force involvement (Pocock, 2005). If the ultimate purpose of a fertility policy is to fortify the nation's labour supply, there is limited value in policies that encourage higher birth rates but simultaneously deter labour force participation.

In contrast to these other maternity-related policies, maternity leave establishes compatibility between motherhood and employment. This element of maternity leave is important when examining the issue of the ageing population which requires policy solutions that not merely promote population growth, but, more specifically, rebalance the relative size of the dependent population to the size of the labour force. Although the aged population comprise the bulk of the population dependent on public funding, it is the expenditure demands of all non-working dependents, relative to the size of the tax base, which are the real source of pressure on public funds (Campbell and Charlesworth, 2004). The problem of increasing dependency rates therefore requires policy solutions that foster both higher birth rates and higher labour force participation. Maternity leave policy has the capacity to jointly achieve both of these aims. As a workplace benefit, maternity leave promotes both population growth and labour supply by encouraging women to continue working after having children, rather than have

them permanently withdraw from the labour force to have children, or have them forgo children in order to pursue a labour force career. Maternity leave may also strengthen the tax base by attracting more women into the labour force in the first place (Klerman and Leibowitz, 1999; Ruhm, 1998). By helping to build women's financial independence and increase their lifetime earnings, maternity leave policy can reduce women's reliance on welfare benefits and the aged pension, which eases pressure on public funding. These long-run savings in public funds need to be taken into account when assessing the costs of a government-funded maternity leave scheme.

An additional important feature of maternity leave policy is that it targets the childbearing decisions of women who are employed and therefore more likely to be better financially equipped to raise children. There is concern that the other maternity policies (such as the lump-sum 'Baby Bonus' available to all mothers unconditional on employment) will encourage pregnancy among non-working or low-income women who cannot afford to raise children by their own financial means (Australian Medical Association Queensland (AMAQ), 2004; Grattan and Nguyen, 2004; Grimm, 2004). Financial incentives which encourage women who have no long-term income security to have children may actually worsen dependency rates and exacerbate pressure on the publicly-funded welfare system.

4. Previous Studies

To date, no known statistical research is available on the effect of maternity leave on birth rates in Australia. International studies tend to suggest that maternity leave has limited impact. Winegarden and Bracy (1995), using aggregate time-series data from 17 OECD countries (excluding Australia), find that paid maternity leave directly increases fertility rates, but also indirectly decreases fertility rates by simultaneously increasing women's labour supply.[7] As the negative indirect effect is found to outweigh the positive direct effect, the study concludes that paid maternity leave causes a net decrease in fertility rates. Gauthier and Hatzius (1997) also use aggregate time-series data to investigate the effects of maternity leave on fertility rates across 22 industrialised countries. Australia is included in the sample, but since the data is pooled, no specific effects for Australia can be identified. The results show that variations in maternity leave, in both duration and payment, have no significant impact on fertility trends. However, the insignificance may be due to the very small variation in maternity leave provisions over time. Furthermore, the effect of maternity leave on fertility may be understated by the fact that the study uses the fertility rate of the total female population as the dependent variable, rather than confining the sample to employed women only or controlling for labour force participation effects. Zhang, Quan and Van Meerbergen (1994) adopt a time-series approach using aggregate data in their study of fertility rates in Canada and find that maternity leave benefits have exerted no impact on fertility rates over time. However, the authors concede that for most of the sample period, most women were exempt from receiving maternity leave due to strict eligibility conditions, and many who were eligible did not claim the benefit due to lack of awareness or due to the perceived stigma attached to benefits administered through the unemployment insurance programme.

These studies, however, are limited by their reliance on aggregate data, which

[7] Winegarden and Bracy (1995) define 'fertility rates' as the annual number of births per 1000 women.

may veil potential differences in the effects of maternity leave on different groups of the populations. Although the use of aggregate data is useful for identifying possible correlations with aggregate trends such as the business cycle, this approach is insensitive to the individualistic nature of fertility decisions and the differences that may exist between different demographic groups. Gauthier and Hatzius (1997) themselves advise that it would be useful to test for differences in policy responsiveness between women of different incomes, education levels, marital status, labour force status and ages. Rønsen (2004a) cautions against the use of aggregate data in assessing fertility outcomes because 'the sum of individual behaviour may not necessarily reflect average individual behaviour' (p.281). Even if other factors are controlled by multivariate analysis techniques, aggregate trends represent average, not personal, responses. Hence, as Rønsen claims, 'individual level data is a better source for impact analyses' (2004a, p.281). Acknowledging the limitations of aggregate data, Rønsen (2004b) employs unit record data in his analysis of fertility rates of Norway and Finland, countries which are recognised worldwide for their comparatively generous parental leave policies. It is found that the availability of maternity leave in these countries has a positive effect on fertility, particularly with respect to the second or third child. This finding suggests that maternity leave is effective in influencing women's fertility decisions at the margin. Corroborative results for the US are offered Averett and Whittington (2001) who also adopt a microeconomic approach to fertility behaviour. The authors conclude that maternity leave policy encourages births among young working women, although this effect is only observed for women who have one child already. The paper does not differentiate between paid or unpaid leave, although the authors mention that the availability of paid maternity leave is rare for the time period of the sample.

Some indication of Australian women's response to maternity leave entitlements is offered in the results of a qualitative survey by Smyth, Rawsthorne and Siminski (2005). Based on the sample of employed mothers, the survey found that women in the public sector who have access to paid maternity leave generally report that the availability of paid maternity influenced their decision to have children. Women without access to paid maternity leave generally report that their childbearing decisions were unaffected by their lack of paid maternity leave entitlements, although the right return to their employer after a period of maternity leave was an important factor. Given the small sample of the survey, however, no generalisations can be drawn for the population as a whole.

5. Methodology and Data

Heckprobit Selection Model

A probit model is used to assess whether the availability of paid or unpaid maternity leave affects the likelihood that a woman becomes pregnant.[8] A binary-choice variable for pregnancy (*PREG*) is set as the dependent variable y_i to denote whether or not the individual reports becoming pregnant within the past year, defined as follows:

[8] The pregnancy rate (rather than birth rate) is used as the dependent variable because it captures the childbearing intentions of women who are pregnant but yet to give birth, including those who may suffer miscarriage or fetal death. In Australia, 15 to 20 per cent of pregnancies end in miscarriage (death of baby prior to 20 weeks gestation), and 7.1 per 1000 births end in fetal death (death of baby after at least 20 weeks gestation and before birth) (Laws and Sullivan, 2005; Robinson and Price, 2006).

$$y_i = PREG_i = 0 \text{ if the individual did not become pregnant in past year} \quad (1)$$
$$= 1 \text{ if the individual did become pregnant in past year}$$

The dependent variable takes the values:

$$y_i = PREG_i = 1 \text{ if } y_i^* > 0 \quad (2)$$
$$= 0 \text{ otherwise}$$

where y_i^* represents the unobserved utility associated with each observed outcome for individual *i*. This underlying utility function takes the form:

$$y_i^* = \alpha + x_i'\beta + \varepsilon_i \quad (3)$$
$$\varepsilon_i \sim N[0,1]$$

where y^* represents the unobservable variable, α is a constant term, x is the set of observable independent variables that linearly determine y^*, β is a vector of coefficients associated with x, and ε is the error term, normally distributed with zero mean and unit variance (Greene, 2003).

To assess the effect of maternity leave on the incidence of pregnancy, binary variables denoting whether or not the respondent has access to paid and unpaid maternity leave are included as explanatory variables. Potential selection bias exists, however, because data on women's maternity leave entitlements are observed only for employed women. If systematic differences exist between employed and non-employed women, regressions based on a restricted, non-random sample of employed women only will be subject to specification error and generate biased results (Greene, 2003, 2006; van de Ven and van Praag, 1981). To control for potential sample selection bias, a two-step Heckprobit selection model is applied. This technique is based on Heckman's (1979) two-step OLS sample selection model which was designed for linear outcome equations. The Heckprobit has been adapted for discrete dependent variables where both the selection equation and the outcome equation are binary choices (van de Venn and van Praag, 1981).

Whether or not data is observed for women's maternity leave entitlements depends on the individual's labour force status (*LFS*). A preliminary binary-choice equation with dependent variable d_i is constructed as the selection equation to estimate the likelihood that an individual is employed (and therefore that *PML* and *UPML* are observed) as follows:

$$d_i = LFS_i = 0 \text{ if the individual is not currently employed} \quad (4)$$
(*PML* & *UPML* missing)
$$= 1 \text{ if the individual is currently employed}$$
(*PML* & *UPML* observed)

Since the selection equation is also a probit model, it is based on a latent equation expressed as:

$$d^*_i = \theta + z_i'\delta + u_i \quad (5)$$
$$u_i \sim N[0,1]$$
$$\text{corr}\,[\varepsilon_i\, u_i] = \rho$$

where d_i^* is the unobserved variable, θ is a constant, z_i is the set of independent variables that determine d_i^*, δ is a vector of coefficients associated with z_i, u is the error term of the selection equation, normally distributed with zero mean and unit variance, and ρ denotes the correlation between the error terms of the outcome and selection equations.

Assuming the error terms ε_i and u_i are correlated, the probability of the outcome equation is estimated as:

$$\begin{aligned} \mathrm{E}\left[y_i \mid x_i, y_i \text{ is observed}\right] &= (\alpha + x_i'\beta) + \rho\phi\left(-\theta - z_i'\delta\right) / \left[1 - \Phi\left(-\theta - z_i'\delta\right)\right] \\ &= \alpha + x_i'\beta + \kappa\lambda_i \end{aligned} \tag{6}$$

where λ_i represents the inverse Mills ratio equal to:

$$\lambda_i = \phi\left(-\theta - z_i'\delta\right) / \Phi\left(-\theta - z_i'\delta\right) \tag{7}$$

and ϕ and Φ represent respectively the density and cumulative functions of the standard normal distribution.[9] The Heckprobit model (6) is equivalent to the standard probit model (3) but for the addition of a selection correction term (λ) with coefficient value κ, which is included to adjust for the non-random sample. This selection term allows for changes in the independent variables to affect both the probability that a woman becomes pregnant, given her maternity leave entitlements, and the probability that she is employed in the labour force in the first place (Greene, 2003). The log-likelihood function of the probability model with selection effects is defined as:

$$\ln L = \sum_{y_i=1, d_i=1} \ln\left[\Phi_2\left(x_i'\beta, z_i'\delta, \rho\right)\right] + \sum_{y_i=0, d_i=1} \ln\left[\Phi_2\left(-x_i'\beta, z_i'\delta, \rho\right)\right] + \sum_{d_i=0} \ln\left[1 - \Phi_1\left(z_i'\delta\right)\right] \tag{8}$$

where Φ_1 is the univariate cumulative distribution function and Φ_2 is the bivariate cumulative distribution function.[10] The first term of equation (8) refers to the observations for which the outcome and selection equation are positive values (i.e. women who are employed who did become pregnant in the past year). The second term refers to the observations for which outcome is observed but takes a zero value (i.e. women who are employed who did not become pregnant in the past year). The third term covers observations for which data in the outcome equation is missing (i.e. women who are not employed, for whom data on maternity leave is unobserved). This estimation technique overcomes some of the problems incurred with other methods of handling missing data, such as the bias created with imputation methods (Hill, Waldfogel, Brooks-Gunn and Han, 2005).

The value of ρ is used to evaluate the risk of selection bias. If ρ differs significantly from zero, there is reason to reject the null hypothesis that no correlation exists and apply the selection equation. If ρ is found to be non-significant, there is no evidence of selection bias and no reason to include the selection correction term. In this latter circumstance, the standard probit will deliver the more consistent and unbiased estimates (Pastore, 2005; van de Venn and van Praag, 1981).

[9] Normalisation $s^2 = 1$

[10] Notation for equation (8) follows Painter (2000).

Data

The analysis uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Survey is one of the most comprehensive national data sets available to include individualised information on maternity leave entitlements. This study uses Wave 3 of the HILDA Survey (collected in 2003) which contains 17091 observations in total. The survey covers a sample representation of the total Australian population (Watson and Wooden, 2004).

Explanatory Variables

Binary variables denoting whether or not the individual has access to maternity leave are included as explanatory variables.[11] These variables are specified according to the individual's age-group in order to test the policy responsiveness of women of different ages. These age-specific variables are defined as:

PML 15-24 = 0 if the individual is aged 15 to 24 years and does *not* have access to paid maternity leave (9)
= 1 if the individual is aged 15 to 24 years and has access to paid maternity leave

PML 25-34 = 0 if the individual is aged 25 to 34 years and does *not* have access to paid maternity leave (10)
= 1 if the individual is aged 25 to 34 years and has access to paid maternity leave

PML 35+ = 0 if the individual is aged 35 years or older and does *not* have access to paid maternity leave (11)
= 1 if the individual is aged 35 years or older and has access to paid maternity leave

UPML 15-24 = 0 if the individual is aged 15 to 24 years and does *not* have access to unpaid maternity leave (12)
= 1 if the individual is aged 15 to 24 years and has access to unpaid maternity leave

UPML 25-34 = 0 if the individual is aged 25 to 34 years and does *not* have access to unpaid maternity leave (13)
= 1 if the individual is aged 25 to 34 years and has access to unpaid maternity leave

UPML 35+ = 0 if the individual is aged 35 years or older and does *not* have access to unpaid maternity leave (14)
= 1 if the individual is aged 35 years or older and has access to unpaid maternity leave

[11] It is acknowledged that women who report becoming pregnant within the past year may actually become pregnant *prior* to changing jobs and gaining access to maternity leave. In these circumstances, maternity leave could appear to increase the incidence of pregnancy, but mistakenly so. The data suggests, however, that such circumstances are rare: only 5.04% of women who changed jobs in the past year also report becoming pregnant in the same time period (HILDA Survey, 2003).

These age categories are intended to capture the different stages of a woman's life during which the affordability, the opportunity costs and the biological chances of having children vary. Younger women (15 to 24 years) are at their biological prime to have children but are also likely to be at the early stages of forging their labour market career. Women between the ages of 25 to 34 years are more likely to have established their labour market careers but also face lower biological chances of successfully becoming pregnant. Relatively older women (35 years and older) have had greater opportunity to establish labour market career and financially equip themselves for children, but face even lower odds of successfully becoming pregnant (AISG, 2005). This methodological design effectively tests whether women who have access to maternity leave are statistically more likely to become pregnant than all other women in employment in their same age-group who do *not* have this workforce entitlement.[12]

In addition to the maternity leave variables, the following variables are included as explanatory factors in the pregnancy model:

- ***Employment status***
  This variable distinguishes between full-time and part-time workers, designed to test whether women's fertility outcomes are affected by their degree of labour force attachment.
- ***Personal weekly wage***
  Women earning higher weekly wages would be better able to afford the explicit costs of children (all else constant). However, they also face a higher opportunity cost, in that they forgo a higher wage when they withdraw from the labour force to have children. This variable will test which of these two effects dominates.
- ***Other household income***
  This variable controls for differences in household income (excluding the individual's weekly wage) which can affect the affordability of children.
- ***Remoteness***
  This variable is intended to control for potential differences in pregnancy rates between women who reside in city/regional areas and those who reside in rural/remote areas.
- ***Relationship status***
  This variable is designed to control for differences between single women and partnered women, as it may be inferred that women in relationships have stronger childbearing intentions than single women.[13]
- ***Presence of dependent children***
  This variable attempts to control for differences in women's own childbearing intentions, as it may be inferred that women who already have dependent children are more family-oriented than those without children.[14]

[12] For example, the variable defined in (9) tests whether women in employment aged 15 to 24 years with access to paid maternity leave are more likely to become pregnant than employed women aged 15 to 24 years without paid maternity leave.
[13] 'Single' refers to women who are separated, divorced or widowed or have never married. 'Partnered' refers to women who are married or in a de facto relationship.
[14] 'Dependent' refers to children aged 15 years or younger.

- ***Education level***
  Women who have invested highly in their education may be relatively more career-oriented – rather than family-oriented – compared to women with lower educational qualifications. Women with higher educational qualifications also forgo relatively higher investment returns by interrupting their employment to have children. This variable attempts to control for these personal differences.

Descriptive statistics for the sample data are provided in table 3. Variable specifications are listed in Appendix A.

Table 3 - Descriptive Statistics of Variables

	Employed Women Only[a]		*All Women*[b]	
Variable	*Mean*	*Standard Deviation*	*Mean*	*Standard Deviation*
PREG	0.0467	0.2110	0.0571	0.0232
NSW	0.3016	0.4591	0.3135	0.4640
VIC	0.2472	0.4315	0.2420	0.4284
QLD	0.2025	0.4019	0.1960	0.3970
WA	0.0957	0.2943	0.0993	0.2991
SA	0.0851	0.2792	0.0942	0.2921
TAS	0.0317	0.1754	0.0308	0.1727
NT	0.0096	0.0976	0.0060	0.0772
ACT	0.0265	0.1605	0.0182	0.1336
Remoteness	0.3680	0.4824	0.3819	0.4859
Age	39.1597	11.5433	47.2162	18.3394
Age Squared	1666.66	912.95	2565.64	1865.66
Relationship Status	0.6340	0.4818	0.5991	0.4901
Number of Children	1.5108	1.3379	1.9707	1.5569
Number of Children Squared	4.0717	5.2710	6.3069	9.0274
Education Level	1.9250	1.2986	1.3699	1.3080
Other Household Income	6.1784	1.9705	6.2592	1.5205
Labour Force Status (LFS)	1	0	0.4294	0.4950
PML 15-24	0.0472	0.2120	—	—
PML 25-34	0.0933	0.2909	—	—
PML 35+	0.2987	0.4578	—	—
UPML 15-24	0.0847	0.2784	—	—
UPML 25-34	0.1607	0.3673	—	—
UPML 35+	0.4594	0.4985	—	—
Full-Time	0.5358	0.4988	—	—
Wage	5.7825	1.7295	—	—
Presence of Children	0.3829	0.4862	—	—
Number of observations	2079		4842	

[a] Based on sample of observations used in the outcome equation. [b] Based on sample of observations used in the selection equation.

6. Results and Analysis

The results of the probit selection model for pregnancy rates are presented in table 4. The $\chi 2$ test statistic indicates that all variables are jointly significant. The significance test for ρ verifies the need to run a selection equation to include non-working women in the estimation sample in order to prevent biased and inconsistent coefficient estimates.

Table 4 - Probit Results for Pregnancy Rates with Labour Force Status Selection Equation

Variable	*Coefficient*	*t-statistic*	*Marginal Effect*
PML 15-24	0.3855	1.9403 *	0.1147
PML 25-34	0.1102	0.8911	0.0328
PML 35+	– 0.0605	– 0.5172	– 0.0180
UPML 15-24	0.3858	2.1657 **	0.1148
UPML 25-34	0.4435	3.0335 ***	0.1320
UPML 35+	0.0264	0.2193	0.0079
Full-Time	– 0.0869	– 1.0568	– 0.0259
Wage	– 0.0400	– 1.7656 *	– 0.0119
Other Household Income	0.0179	0.5821	0.0053
Remoteness	– 0.0591	– 0.7148	– 0.0175
Relationship Status	0.3769	2.7532 ***	0.1087
Presence of Children	0.3556	3.7861 ***	0.1105
Education Level	– 0.1183	– 2.6157 ***	– 0.0352
Constant	– 1.0137	– 3.1772 ***	
Selection Equation LFS			
NSW	– 0.0729	– 1.3315	
VIC (base group)			
QLD	– 0.0466	– 0.7614	
WA	– 0.0847	– 1.1303	
SA	– 0.0159	– 0.9787	
TAS	– 0.0420	– 0.3328	
NT	0.2045	0.8027	
ACT	0.2685	1.8387 *	
Remoteness	0.0953	2.0637 **	
Age	0.1578	14.9379 ***	
Age Squared	– 0.0020	17.3051 ***	
Relationship Status	0.0622	1.2112	
Number of Children	– 0.2772	7.2673 ***	
Number of Children Squared	0.0184	2.7574 ***	
Education Level	0.2399	13.8244 ***	
Other Household Income	– 0.0794	– 4.9161 ***	
Constant	– 2.1501	– 9.3671 ***	
λ (Selectivity correction term)	– 1.1841	– 4.4653 ***	
ρ (Error correlation coefficient)	– 0.8287	– 9.9789 ***	
Model Criteria			
Total number of observations	4842		
Censored observations	2763		
Uncensored observations	2079		
Log Likelihood	– 2702.60		
Wald χ^2	97.34 (13 df)		
Prob > χ^2	0.0000		
Akaike Information Criterion (AIC)	5467.20		
Baynesian Information Criterion (BIC)	5668.24		
Selectivity Test (ρ=0)			
χ^2 (1 df)	14.25		
Prob > χ^2	0.0002		

***1 % significance, **5 % significance, *10 % significance.

The results indicate that pregnancy rates can be elevated by the provision of maternity leave, depending on a woman's age-group and whether maternity leave is paid or unpaid. Young women (15 to 24 years) are responsive to both the availability of paid and unpaid maternity leave. Women of this age-group are 11 per cent more likely to become pregnant if offered either of these workplace benefits. Women between the ages of 25 to 34 years are responsive to the availability of unpaid – but not paid – maternity leave. Women in this age-group are 13 per cent more likely to become pregnant if provided unpaid maternity leave. Women aged 35 years or older prove to be affected by neither type of entitlement.

The results are interpreted in light of the benefits that each type of maternity leave offers: both types of maternity leave grant women the right to return to their job after the maternity period; paid maternity leave offers the added value of financial compensation, although unpaid maternity leave is usually available for a longer duration (HREOC, 2002a). Given the finding that women aged 15 to 24 years are influenced by both paid and unpaid maternity leave, it appears that younger women's pregnancy decisions are affected by both financial and time factors. Among older women, however, different priorities emerge. Given the finding that women aged 25 to 34 are responsive to unpaid but not paid maternity leave, it appears that the childbearing decisions of women in this age-group depend not so much on financial factors, but more on the generosity of the leave period and the element of job security. Women in this age-group are likely to have amassed greater labour force experience, workplace seniority and financial security than younger women. This may explain why they are less affected by the offer of financial compensation (only offered by paid maternity leave) and more affected by the element of job security and the amount of time they are allowed to take off from work time (the only benefits offered by unpaid maternity leave). For women aged 35 years and older, the benefits offered by existing maternity leave provisions prove to be insignificant in their childbearing decisions. Restricted by the shortening biological opportunity to have children, older women have less choice in the timing of their pregnancies. Should they choose to have children at their age, they must have them now irrespective of their maternity leave entitlements.

Collectively, the findings suggest that the availability of maternity leave does not so much affect women's decisions concerning whether or not to have children, but more so the timing of their childbirths. The finding that paid maternity leave has a statistically significant effect on the pregnancy rates of young women suggests that this entitlement serves to encourage women to bring forward the timing of their children. By encouraging women to have children sooner rather than later in life, such policy would in turn help to slow down the ageing of the population. The capacity for paid maternity leave policy to boost aggregate fertility rates is further supported by indications that women who have children sooner in life have more children in total (Gauthier and Hatzius, 1997; McDonald, 2001b).

The other coefficient results indicate that pregnancy rates are also affected by a woman's wage level, education level and relationship status, and the presence of dependent children. Women with higher educational qualifications or wages are less likely to become pregnant than women with lower education or wages. These findings accord with the theory that women who make large human capital investments and

reach high wage levels face a higher opportunity cost in having children, which reduces their likelihood of doing so. The inverse relationship between pregnancy rates and women's wage and education levels may also reflect women's personal preference for employment over children, as it may be assumed that women who are more career-oriented than family-oriented are likely to make larger human capital investments and reach higher wage levels than women without such career aspirations. Women in married or de facto relationships are more likely to become pregnant than single women, and women with dependent children are more likely to become pregnant than women without such family. These findings accord with the assumption that women in partnered relationships and those already with young children are more likely to have a preference towards raising a family.

7. Policy Implications and Conclusion

This paper has discussed the theoretical rationale behind the nation's falling fertility rate and examined the capacity for maternity leave to stabilise this trend by reducing the private costs associated with having children. Since maternity leave is conditional on employment, this paper has argued that maternity leave can achieve this affect with lesser risk of reducing labour supply than alternative fertility policies (such as the 'Baby Bonus' payment). Although these alternative financial incentives may appear to promote fertility, there is a risk that these types of policies also discourage labour force participation (Earle, 1999; McDonald, 2001a). An additional advantage of maternity leave is that it targets the childbearing decisions of women who have some degree of financial security (as wage-earners), in contrast to other maternity payments which may have the greatest appeal to those women in the lowest income brackets who are the least able to afford children. These alternative maternity policies may in fact worsen dependency rates in the long-term.

Is there justification to expand current maternity leave provisions? Given the capacity for maternity leave to target the problem of sub-optimal birth rates without necessarily reducing labour supply, the policy warrants consideration. This paper provides evidence that the provision of maternity leave does elevate pregnancy rates, depending on the age of the recipient and whether maternity leave is paid or unpaid. Existing paid maternity leave provisions are found to have a significant positive impact on the pregnancy rates of women aged 15 to 24 years, while existing unpaid maternity leave provision are found to significantly impact the pregnancy rates of women aged from 15 to 34 years. Existing policy proves to have no effect on the pregnancy rates of women aged 35 years and older.

The measured impact of maternity leave on pregnancy rates of women in employment can be computed using the marginal effects estimated in the Heckprobit model. Listed in table 5, the age-specific pregnancy rates are predicted under the condition that all women in the age-group have access to the respective type of maternity leave.[15] If all employed women aged 15 to 24 years were provided paid maternity leave, their average annual pregnancy rate would increase from 3.29 per cent to 3.54 per cent, all other factors constant. This is approximately equivalent to five additional

[15] Computations control for women who already have access to maternity leave.

births per 2000 employed women in this age-group per year. The provision of unpaid maternity leave would increase the annual pregnancy rate of employed women aged 15 to 24 years from 3.29 per cent to 3.45 per cent, and that of employed women aged 25 to 34 years from 11.21 per cent to 11.51 per cent, all other factors constant.[16]

Table 5 - Effect of Maternity Leave on Pregnancy Rates of Women in Employment

	15-24 years	*25-34 years*	*35+ years*
Share of Women with PML	33.67%	46.15%	47.17%
Share of Women with UPML	55.90%	79.49%	70.44%
Marginal Effect of PML	0.1147 *	0.0328	– 0.0180
Marginal Effect of UPML	0.1148 **	0.1320 ***	0.0079
Observed Pregnancy Rate	3.29%	11.21%	2.08%
Predicted Pregnancy Rate if all women were provided PML[a]	3.54% *	not sig	not sig
Predicted Pregnancy Rate if all women were provided UPML[b]	3.45% **	11.51% ***	not sig
Sample size	787	694	2263
Population size (extrapolated by weights)	1002281	844219	2365656

[a]Controls for those women who already have access to PML (i.e. marginal effects only applied to the proportion of women who do not have PML). [b]Controls for those women who already have access to UPML (i.e. marginal effects only applied to the proportion of women who do not have UPML). Computations for predicted pregnancy rates available in Appendix B. ***1 % significance, **5 % significance, *10 % significance.

The finding that paid maternity leave has a statistically significant effect on the pregnancy rates of women in the youngest age-group suggests that national paid maternity leave legislation would encourage women to bring forward the timing of children and help to slow down the ageing of the population. Indications that birth rates rose in response to the newly-introduced 'Baby Bonus' payment corroborate this paper's finding that women's pregnancy decisions are responsive to financial motives. Unlike the 'Baby Bonus', however, the provision of paid maternity leave reduces the risk that the gains in fertility will come at the expense of workforce participation.

This paper contributes to current understanding about the potential role of maternity leave as a policy that jointly sustains both labour supply and population growth. The findings affirm that expansions to Australia's existing paid maternity leave provisions could boost aggregate fertility rates and help alleviate the economic pressures of the ageing population. With existing paid maternity leave provisions already below international standards, there is scope for expansions to be made to Australia's paid maternity leave policy that will deliver improved economic outcomes for both individuals and the nation.

[16] All other marginal values were found to be insignificant and thus would effect no statistically significant change.

Appendix A

Variable Specifications

Variable Name	*Description*	*Specification*
PREG	Pregnant within last year	0 = No 1 = Yes
NSW	Resident of New South Wales	0 = No 1 = Yes
VIC	Resident of Victoria	0 = No 1 = Yes
QLD	Resident of Queensland	0 = No 1 = Yes
WA	Resident of Western Australia	0 = No 1 = Yes
SA	Resident of South Australia	0 = No 1 = Yes
TAS	Resident of Tasmania	0 = No 1 = Yes
NT	Resident of Northern Territory	0 = No 1 = Yes
ACT	Resident of Australian Capital Territory	0 = No 1 = Yes
Remoteness	Geographical classification ranked by level of remoteness	0 = City or Regional 1 = Rural or Remote
Age	Age of respondent	Years
Age Squared	Age squared of respondent	Years squared
Relationship Status	Relationship status	0 = Single (Separated or Divorced or Widowed or Never Married) 1 = Couple (De facto or Married)
Number of Children	Number of dependent children (aged 15 years or younger)	Number of children
Number of Children Squared	Number of dependent children (aged 15 years or younger) squared	Number of children squared
Education Level	Highest educational qualification	0 = Below Year 12 1 = Year 12 2 = Vocational or Trade Certificate 3 = Undergraduate Degree 4 = Postgraduate Degree
Other Household Income	Other weekly household income	Log of other weekly household income ($)
Labour force status (LFS)	Employed in labour force	0 = No (Non-participant or Unemployed) 1 = Yes (Employed)
PML 15-24	Respondent has access to paid maternity leave (aged 15-24 only)	0 = No 1 = Yes

Appendix A (continued)

Variable Specifications

Variable Name	*Description*	*Specification*
PML 25-34	Respondent has access to paid maternity leave (aged 25-34 only)	0 = No 1 = Yes
PML 35+	Respondent has access to paid maternity leave (aged 35 or older only)	0 = No 1 = Yes
UPML 15-24	Respondent has access to unpaid maternity leave (aged 15-24 only)	0 = No 1 = Yes
UPML 25-34	Respondent has access to unpaid maternity leave (aged 25-34 only)	0 = No 1 = Yes
UPML 35+	Respondent has access to unpaid maternity leave (aged 35 or older only)	0 = No 1 = Yes
Full-time	Employment status	0 = Part-time 1 = Full-time
Wage	Personal weekly wage	Log of personal weekly wage ($)
Presence of Children	Presence of dependent children (aged 15 years or younger)	0 = No 1 = Yes

[a]Australian Standard Classification of Occupations, ABS Cat. No.1220.0. [b]Australian Standard Geographical Classification, ABS Cat. No. 1216.0.

Appendix B

Computation of Predicted Pregnancy Rates (as appears in table 5)

Effect of Paid Maternity Leave:

$$\hat{P}_{PMLj} = P_j[\,1 + M_{PMLj}(1 - S_{PMLj})] \tag{15}$$

where

$\hat{P}_{PMLj}$ = Predicted pregnancy rate of women in employment in age-group j if all were provided paid maternity leave (all else constant)

P_j = Observed pregnancy rate of women in employment in age-group j given S_j

M_{PMLj} = Marginal effect of paid maternity leave on the pregnancy rates of women in employment in age-group j

S_{PMLj} = Share of women in employment in age-group j who already currently have access to paid maternity leave

Appendix B

Computation of Predicted Pregnancy Rates (as appears in table 5) (continued)

Effect of Unpaid Maternity Leave:

$$\hat{P}_{UPMLj} = P_j[\,1 + M_{UPMLj}(1 - S_{UPMLj})] \qquad (16)$$

where

$\hat{P}_{UPMLj}$ = Predicted pregnancy rate of women in employment in age-group *j* if all were provided unpaid maternity leave (all else constant)

P_j = Observed pregnancy rate of women in employment in age-group *j* given S_j

M_{UPMLj} = Marginal effect of unpaid maternity leave on the pregnancy rates of women in employment in age-group *j*

S_{UPMLj} = Share of women in employment in age-group *j* who already currently have access to unpaid maternity leave

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