Understanding the Mechanism of the Return to Delayed First Birth

Jane Leber Herr
September, 2013

Over the last several decades, a rich vein of economic research has established that women with children receive lower wages than those without – the so-called "motherhood wage gap" (*e.g.*, Waldfogel, 1998). Furthermore, in light of the striking increase in the median age at first birth over the past 50 years (Chen and Morgan, 1991), a more recent literature has concluded that the timing of entry into motherhood can affect the magnitude of this effect (*e.g.*, Miller, 2011; Herr, 2013). The goal of this paper is to address the relatively unexplored question of the mechanism by which first-birth timing influences a woman's wage path.

To consider the mechanism by which first-birth timing affects wages, I consider how timing affects economic factors that theory suggests are important in driving wage growth, such as the pattern of human capital accumulation and career progression. In particular, I separately assess (*i*) the link between first-birth timing and a set of possible "mechanism" variables (*e.g.*, hours worked or number of job changes), and (*ii*) the link between these possible mechanisms and the long-run wage level. When assessing the relative importance of these potential economic pathways, I can therefore consider the extent to which a link between timing and these economic behaviors translates into an effect on subsequent wages.

Methods

Using the 1979 cohort of the National Longitudinal Survey of Youth, in previous work (Herr, 2013) I show that among women with their first birth after labor market entry, a one-year delay of first birth leads to 3.2 and 6.9 percent greater wage growth by approximately 20 years later (t_{20}), for high school and college graduates, respectively.[1] Using this same sample, in this paper I consider the following channels through which first birth timing, K_1, may influence the long-run wage level, w_{20}:

1. total hours worked by t_{20}, and the timing and magnitude of the change in labor supply at first birth;
2. the length and timing of the longest labor force gap between labor market entry and t_{20};
3. the number of times a woman exits the labor force, the timing of the first, and whether she leaves her pre-birth job at motherhood;

[1] In Herr (2013), focusing on a woman's "relative timing" of first birth – her year of first birth relative to her year of labor market entry – I find that the link between first-birth timing and the wage path is distinct for women who have their first birth before versus after labor market entry. In this paper I therefore focus my attention on the population who have their first child after they start working, which makes up the majority of women. In addition, categorizing women by their education level at labor market entry, I exclude high school drop outs because Herr (2013) finds no return to fertility delay for this group.

4. The number of job-to-job changes; and
5. Her occupational progression between labor market entry and t_{20}.

To estimate the relative importance of these economic pathways, I begin by looking at the effect of K_1 on each of these potential intermediaries, for instance assessing the effect of first-birth timing on the change in a woman's labor supply at K_1, or the probability that she leaves her pre-birth job. I then estimate each factor's relative importance by combining this information with the strength of the relationship between each "mechanism variable" and women's long-run wage level, w_{20}.

More specifically, building on the model in Herr (2013), consider estimating the following wage equation, where the wage level at t_{20} (w_{20}) is a function of the starting wage (w_0) and the timing of first birth (K_1):

$$l(w_{20}) = l(w_0) + \theta K_1 + X\beta + \varepsilon \quad (1)$$

Suppose we believe, however, that K_1 has no direct effect on wages, but instead the relationship captured in θ reflects an indirect effect through two mechanism variables, m_1 and m_2. Thus the true causal model would be

$$l(w_{20}) = l(w_0) + \lambda_1 m_1 + \lambda_2 m_2 + X\beta + \varepsilon \quad (2)$$

Given the intermediate effect of K_1 on each mechanism variable,

$$m_j = \delta_j K_1 + X\beta_j + \zeta_j, \text{ for } j = \{1,2\} \quad (3)$$

plugging Equation (3) into Equation (2), we see by rearranging that $\theta = \lambda_1 m_1 + \lambda_2 m_2$. I can therefore calculate the relative importance of each mechanism as:

$$\begin{aligned} p_j &= \lambda_j m_j / \theta \\ &= \lambda_j m_j / (\lambda_1 m_1 + \lambda_2 m_2) \end{aligned}$$

Thus the importance of each factor in driving the effect of timing on wages depends on both the strength of the initial effect of timing on the given mechanism variable, δ_j, and that variable's effect on the long-run wage level, λ_i.

Initial Results

I find that the influence of first-birth timing on women's long-run wages arises primarily through its influence on the pattern of human capital accumulation. For both high school and college graduates, the most important pathway is through the influence of K_1 on total hours worked by t_{20}, and hence general human capital accumulated by this point. Yet the effect arises in different ways for the two education groups. For high school graduates, I find that later mothers systematically reduce their hours by less at motherhood, consistent with their higher opportunity cost of time associated with their greater human capital at motherhood.

By contrast, and quite surprisingly, for college graduates I find no such link – the change in hours worked at K_1 is remarkably invariable. Instead I find that for these women, delayed first birth leads to higher wages because of the corresponding delay in the *timing* of the drop in labor supply at motherhood. For high school graduates, the influence of K_1 on the timing labor supply is irrelevant.

The second-most important pathway driving the link between first-birth timing and wages is through its influence on the incidence of labor force exits. For both education levels I find that fertility delay sharply lowers the probability that a woman leaves her pre-birth job. This lower probability may reflect either the increased opportunity cost of exiting the pre-birth job, or the increased probability of being covered by maternity leave policy. For both education levels, this subsequently leads to a significantly higher long-run wage. For high school, but not college, graduates, I also see that delayed first birth influences the wage path through lowering the number of additional labor force exits. (For college graduates, there is only a link between fertility timing and exiting *at* first birth.)

By contrast, little of the influence of K_1 on long-run wages arises from its influence on the pattern of job changes or occupational progression. If the arrival of a first child discontinuously increases the transaction costs of job search, one might anticipate that fertility delay can affect a woman's wage path by allowing her to reach a better-quality job match before the transition into motherhood. Yet although delayed first birth is associated with more job transitions, this in turn does not translate into an effect on wages. And the arrival of the first child has no effect on the occupational progression of women in both education groups. Thus the effect of K_1 on long-run wages does not come from its influence on women's job or occupational progression over time.

References

Chen, Renbao and S. Philip Morgan. 1991. Recent Trends in the Timing of First Births in the United States. *Demography*, 28(4): 513-533.

Herr, Jane. 2013. Measuring the Effect of the Timing of First Birth on Wages. Working Paper.

Miller, Amalia R. 2011. The Effects of Motherhood Timing on Career Path. *Journal of Population Economics*, 24(3): 1071-1100.

Waldfogel, Jane. 1998. Understanding the "Family Gap" in Pay for Women with Children. *Journal of Economic Perspectives*, 12(1): 137-156.