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Early Labour Market Disruption: Effect of Young Adult Childbearing on the Women's Labour Market Outcome

*Philip Rosenbaum**

Abstract: Work interruptions related to childbirths are expected to affect mothers' wages directly through changes in their human capital formation. This effect is proposed to be exceptionally strong for young adult childbearing women who are about to enter their working careers. This study investigates whether the long-term socioeconomic problems experienced by women with their first childbearing before turning 26 are a reflection of pre-existing disadvantages or are a consequence of the childbearing timing? The purpose is furthermore to observe whether a new combination of the best practices of earlier studies on the subject can serve as a better estimation method. This is done by applying a Sister First Difference estimator while using miscarriages as exogenous variation. This exact design has, to my knowledge, never been used before to estimate socio-economic effects of childbearing timing. I find no effects of young adult childbearing on the women's wages.

1 Introduction

When is the best time for a woman to get pregnant? Postponing motherhood may reduce the women's overall number of children, since fertility decreases with age. At the same time, there is a predominant belief that early childbearing has a negative impact on the women's educational attainments and diminishes their employment perspectives. Contrary to the common belief, this study finds no evidence that young adult childbearing has a persistent negative effect on women's wages.

I apply a Sister First Difference method on three different Sister-Samples. Each of the three samples is designed in order to shed light on different implications of young adult childbearing. The first Sister-Sample consists of sister-pairs of early and non-young adult childbearing sisters. This sample is assembled to replicate earlier studies and to show whether the same results can be obtained on Danish women. The result obtained on the basis of this sample was that the effect of young adult childbearing on wages is significantly negative in the short run (five years), but insignificant in the long run (ten years).

The Second Sister-Sample consists of young adult childbearing women and their non-young adult childbearing sisters, which have had an abortion at an early age. When using sisters with an early abortion as controls, the effect of early childbearing was very large, implying that the conscious choice of postponing the first childbirth through an abortion separates them from their early childbearing sisters.

The Third Sister-Sample contains women with early childbearing and their non-early childbearing sisters, who suffered a miscarriage at an early age. The effect of early childbearing

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disappeared when applying a Sister First Difference estimator together with using control sisters who miscarried in an early age.

These results have many implications. First of all, they show that there may remain some unobserved heterogeneity after applying a Sister First Difference method on Sister-Sample 1, implying that there remain systematic differences between the women with young adult childbearing and their sisters. This indicates that results from earlier sister-studies on early childbearing may be biased. The remaining heterogeneity is addressed in Sister-Sample 3, when I use miscarrying sisters as controls.

The main result of this study is therefore that young adult childbearing has no persistent effect on women's wages. I.e. young adult childbearing women's inferior wage outcomes are not due to having a child in an early age, but rather due to pre-existing disadvantages in social- and ability factors.

2 Literature Review

Women who delay childbirth are experiencing higher wages, which there basically can be two reasons for: 1. The mommy track where childbirth leads to a lower wage rate 2. The main reason for this is the lower human capital experienced by mothers. Becker's Household Production Theory (1965) implies that the opportunity cost of working increases when getting a child and thus the effort and productivity will decrease at the workplace. (Gronau (1974), Bronar, Stephen & Groggar (1994) and Angrist & Evans (1998)). Reverse causality where early childbearing women essentially would not have performed well at the labour market even without childbearing. Especially a drop in the human capital investments in the start twenties – both as a result of disruptions in the education or at the job - are shown to have long term negative effects on the labour market outcome (Gerster et al 2014). This effect is called Scarring and refers to the poor habits developed in periods of labour market disruptions, which catalyse persistent labour market detachment and alienation. (Ellwood (1983), Gartell (2009)).

By reversing the causality on the relation of young adult motherhood and adult wages, the timing of the first childbearing can be seen as an indicator of the women's endowed human capital and not a consequence of the time and effort motherhood cost. If there is a reverse causality, then the timing of the first childbirth might be an economic indicator for the woman's productivity and her preference towards a working career.¹ I.e. their price of time is lower than for high-productive women, which is what Gronau (1974) called the shadow-prices of early childbearing.

¹ Of course childbirth cannot be planned to the minute, but on average it is possible to time the childbirth in accordance to the women's career plan.

3 Empirical Approach

My empirical strategy is an extension of the methods originally used in the young mother empirical literature and it is specifically designed to elicit the true effects of having a child as a young adult.

There have been two main approaches designed in order to cope with the family heterogeneity and the individual unobserved heterogeneity respectively.² The first approach designed to account for family heterogeneity is the within-family estimates. I.e. comparing sisters where one gave birth in her youth while the other did not. The idea is that the remaining differences between the sisters' socioeconomic outcomes primarily will be due to the difference in their age at first childbirth (Geronimus & Korenman (1992) (Hoffman et al. (1993), Rosenzweig and Wolpin (1995) and Holmlund (2004)).

The second approach is to exploit exogenous variations or institutional changes in order to account for individual unobserved heterogeneity. The most relevant for this study was originally conducted by Hotz et al. (1997) & (2005), who studied teenage pregnancies, while Miller (2011) studied effects of motherhood timing on career paths, both using miscarriages as an instrument. They looked at early childbearing mothers and compared them with other women who conceived at the same age but underwent a miscarriage and therefore postponed childbearing.

I will estimate the effect of young adult childbearing on the women's yearly wage, by applying a within-family method on three different Sister-Samples of Danish women. The idea is to apply a combination of the two econometric approaches described above. The within-family approach will cope with the unobserved family heterogeneity and conditioning the control sisters – the sisters of the young adult mothers – on having had an abortion or a miscarriage in as a young adult, should work as exogenous variation ensuring a random assignment of the sisters to the control and treatment group. Furthermore, I control for the women's general health history. All together this novel method will remove the biases that otherwise could have poisoned the results.

3.1 Sister First Differences as a Mean of Removing Bias

Being able to collect information about individuals and their families allows me to organize the dataset in a panel structure. The panel consist of two sisters per family. The sisters have family invariant variables as well as family variant variables.

² There have been used other identification strategies, which are less relevant for this study, and arguably less precise. E.g. Matching method (Simonsen & Skipper 2006)

One way to deal with unobserved heterogeneity is by applying a sister first difference model. Its differencing transformation has a very pleasing application in this situation. I withdraw the sister values from each other:

$$y_{ij} = \gamma YM_{ij} + \beta_1 X_{1j} + \beta_2 F_j + \alpha_j + \mu_{ij} \quad (1)$$

Where YM_{ij} is a dummy indicating young adult childbearing, X_{ij} is the family and individual variant variables - such as the woman's age, number of diagnosis, F_j is the family invariant variables – such as region of residence in adolescence, immigration status, parents' education. Let α_j be the unobserved family heterogeneity variable. Unobserved heterogeneity is the same for all members of the same family- e.g. parental involvement.³ If α_j is ignored and it is correlated with the other explanatory variables, the OLS estimates are bound to be biased. μ_{ij} is the new idiosyncratic error term. Only the difference between the sisters will remain after withdrawing y_2 from y_1 :

$$\Delta y_j = \gamma \Delta YM_j + \beta_1 \Delta X_j + \Delta \mu_j \quad (2)$$

Equation (3) is the reduced model, where; $y_j = y_{1j} - y_{2j}$, $\Delta YM_j = YM_{1j} - YM_{2j}$, $\Delta X_j = X_{1j} - X_{2j}$, and $\Delta \mu_j = \mu_{1j} - \mu_{2j}$. This transformation removes all the family invariant variables - both the observable, F , and the unobservable, α .⁴ All of the unobserved heterogeneity will be removed if it only consists of the sisters' shared environment.

3.1 Methodologically Advantages and Limitations

Using sisters may provide a good way of accounting for unobserved family background characteristics, but heterogeneity certainly also exist within families. Siblings may vary in unobservable factors. Such as their endowments or in the extent and fashion in which their parents invest in the sisters (Berhman & Taubman (1986), Ejrnæs & Portner (2004) and Black (2005)).

3.2 Sample Selection

As described, the populations in this study consist of three Sister-Samples. The control sisters in all three Sister-Samples have not had childbirth as a young adult, where the sisters in the second sample had an abortion and in the third sample had a miscarriage as a young adult. Of course random experiments are the golden standard, but have the advantages explained in more details in the following sections.

³ Some studies have proposed that parental involvement differs between their children. Hence the parents are more involved in their first born life than in the rest of their children. This phenomenon will be discussed further later.

⁴ Notice that the intercept does not appear in this model, because it also is removed through the transformation.

3.2.1 Designing the Sister-Samples

Young adult childbearing women are not randomly selected. One cannot claim that young adult childbearing is an exogenous event, implying that the event of getting a child in an early age is highly correlated with other life choices that influence socioeconomic variables. This evidently leads to selection bias problems.

To deal with the selection bias and the unobserved heterogeneity, the regression studies are performed on three different and carefully selected samples. All the samples consist of sister-pairs where one sister had a young adult childbearing - before turning 26 - and other sister did not. This is also the only restriction on Sister-Sample 1. In Sister-Sample 2 the non-early childbearing sisters are further restricted by having had an induced abortion before turning 26. In Sister-Sample 3 the non-early childbearing sisters are restricted by having had a miscarriage before turning 26. The sister-pair is placed in Sister-Sample 2 if the non-early childbearing sister had both an early abortion and a miscarriage in a young age.

Differentiating between abortions - as a conscious termination of pregnancies - and miscarriages - as a random termination of pregnancies - can have interesting suggestions.

Sister-Sample 2: The selection effect of Sister-Sample 2 is predictively ambiguous. One factor is that both sisters became pregnant as a young adult. This indicates some kind of shared lifestyle between the two of them. On the other hand, the conscious choice of getting an abortion may indicate a discrepancy in the sisters' life planning. The choice of postponing childbearing at an early age may indicate that the woman evaluates and prefers differently (e.g. education and career) than her sister with young adult childbearing. The question is which of these two opposing factors is the dominant? Or are any of these two factors even present? Is it a bigger lifestyle indicator to get pregnant in an early age than it is to choose to terminate the pregnancy?

Sister-Sample 3: The selection effect of Sister-Sample 3 is relatively one-sided, since miscarriages are not a result of a conscious decision the distribution of miscarriage occurrences can be seen as random. Because of this randomness in the pregnancy outcomes many of the selection problems disappear since the unobserved variables no longer can be systematically unevenly distributed and create unbiased estimates. But is it that simple, and is miscarriages a perfect exogenous variation?

Unsuitably, doubts on the randomness of miscarriages exist and are probably reasonable. Where the selection of Sister-Sample 2 tends to homogenise the women through their shared lifestyle at the time of pregnancy, the selection of Sister-Sample 3 may in fact do the opposite. One could suspect that women with inferior general health and unhealthy lifestyle during the pregnancy miscarry more frequently. It might be that miscarriages are unconscious occurrences but indirectly induced by the women's behaviour, which also influences the labour market

outcomes and therefore will be problematic. It is generally perceived that people with health problems generally perform worse at the labour market and if the women who miscarry generally experience health problems, it will be difficult to distinguish whether the labour market performance is due to women's miscarriages or their poor health conditions (Smith (2009)). It is therefore of great importance to incorporate a health variable that captures the systematic health deviation between the sisters.

If health problems are properly incorporated and there exist no other systematic differences between the sisters, the Within-Family method on Sister-Sample 3 will be suitable for examining the effect of early childbearing. The exogenous variation and the sister first difference will satisfy the conditions - described above – that are needed to obtain an unbiased and consistent estimator.

4 Preliminary Conclusion

The young adult childbearing women have lower adult wages than the average women; nevertheless it is not because of their young adult childbearing, but rather due to their pre-birth backgrounds, attributes and circumstances. Hence, the main result of this study is that young adult childbearing does not have a persistent effect on women's wages.

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