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The Challenges of Formal Sector
Employment in Indonesia**

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ABSTRACT

Women's Transitions in the Labour Market as a Result of Childbearing: The Challenges of Formal Sector Employment in Indonesia*

Although it is well established that women's labour force participation drops markedly with marriage and childbearing, surprisingly little is known about women's labour market transitions, especially in developing countries. This paper uses the Indonesian Family Life Survey to track the employment histories of over 9,000 women across a period of more than 20 years, observing them as they get married and have children. The data show that large numbers of Indonesian women drop out of the labour market as a result of marriage and childbearing. The difficulty of maintaining formal sector employment emerges as a key problem. Having worked in the formal sector prior to the birth of a first child reduces the probability of working in the year following the birth by 20 percentage points and reduces the probability of returning to the labour market thereafter by 3.6 percentage points. Further, to the extent that women do return to work, formal sector employment is associated with greater delays in returning - women are more likely to return to work in the formal sector only once their child starts primary school, while in the informal sector they return earlier. We find little evidence of women switching from the formal to the informal sector. Formal sector labour market policies such as flexible work hours; compressed work weeks; part-time work (with the same career opportunities and benefits as full-time work); the ability to work from home; and work-based childcare are likely to boost women's labour force participation, with consequent boosts to economic productivity and prosperity.

JEL Classification: J20, J16, O15

Keywords: female labour force participation, labour market transitions, economic development, childbearing

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1. Introduction

It is well established in the developed world that childbearing reduces women's labour force participation, with most studies in developing countries finding the same (Cruces and Galiani 2007; Bloom et al. 2009; Francavilla and Giannelli 2011; Cáceres-Delpiano 2012; Heath 2016).¹ Surprisingly little, however, is known about women's transitions in and out of employment and how the nature of women's work changes with the arrival of children. For example, what determines the likelihood of a woman continuing to work after she has had a child?; what factors affect the probability of a woman returning to work having left the workforce after child birth?; and how does the nature of the work women undertake change when accompanied by child-rearing?

The small literature that exists for developed countries examines the duration of career breaks (Even, 1987; Gianelli 1996; Klerman and Leibowitz 1999; Kuka and Shenhav 2020); characteristics of women that affect continuity of employment (Eckstein and Wolpin, 1989; Dex et al. 1998; Stanfors, 2006) and switching between private and public sector employment following the birth of a child (Pertold-Gebicka et al., 2016).² For developing countries there are however very few studies. An exception is Glick and Sahn (2004) which examines intertemporal female labour force behaviour in urban Guinea in West Africa. Using a two-year panel of data, they find that young children are associated with increases in women's labour market participation (which they attribute to the very low income setting and the need for income outweighing the demands of childcare). The increase in employment is concentrated in self-employment and children are associated with a higher likelihood of leaving a formal sector job. Heath (2017), using panel data covering a nine-year period,

¹ An exception to this finding is Agüero and Marks (2011) which uses 26 DHS surveys from developing countries and finds that the presence of children does not affect the likelihood of women working on average but finds negative impacts for young women and women in very low-income countries. Heath (2017) finds that in urban Ghana women's labour force participation decreases with young children but hours of work of those who remain in the labour force increase.

Nakamura and Nakamura (1992) provide a survey of literature for developed countries with subsequent studies including Shapiro and Mott (1994), van der Klaauw, (1996), Troske (2010), Kahn, Garcia-Mangialo and Bianchi (2014), Fitzenberger et al. (2013) and Goldin and Mitchell (2017).

² Even (1987) examines determinants of the length of career breaks for women in the US and finds a rapid decline in the probability of re-entering the workforce over time since birth. Eckstein and Wolpin (1989) found that work experience prior to the birth of the first child increased the probability of a woman working after the birth in the U.S. (largely due to wage effects). Stanfors (2006) shows the same importance of previous work experience in Sweden. Gianelli (1996) examines transitions between non-employment, part-time and full-time employment in Germany. Pertold-Gebicka et al. (2016) finds that first childbirth is associated with women moving from the competitive private sector to the more family-friendly public sector. They further show that this switching is largely explained by the greater family-friendliness of the public sector.

A related literature examines the impact of childcare costs on women's return to work and differences across countries associated with different policy regimes (Klerman and Leibowitz, 1990; Gustafsson et al. 1996; Gutierrez-Domenech 2005).

similarly finds that with each additional child women in urban Ghana who remain in the labour force are two percentage points more likely to be self-employed (than in formal employment). The study presents suggestive evidence that this is due to the greater job flexibility afforded by self-employment.³ Agüero and Marks (2011), using the DHS from 26 developing countries, find that having children reduces the probability of women engaging in paid, as opposed to unpaid, work.

This relatively sparse literature, highlights a particularly pressing research gap as the gains to understanding women's labour market trajectories are arguably greatest in lower-income countries, given the frequently low female labour force participation rates.

Our focus in this paper is on women's labour force participation behaviour in Indonesia. Female labour force participation in Indonesia has remained constant at around 50% over the past 20 years despite sweeping changes to the structure of the economy and the government's aim to increase gender-inclusive growth, Cameron et al. (2019). The considerable gender gap in labour force participation (LFP) widens during child-rearing years. While around 90% of men stay in work from age 25 to 55, only 50% of 25 year old women work and female labour force participation reaches its peak at 69% after the completion of child-rearing (around age 45). Married women and women with young children are less likely to work than otherwise similar single women, Cameron et al. (2019).

Using the Indonesian Family Life Survey (IFLS), we are able to track the employment histories of over 9,000 women across a period of more than 20 years, observing them as they enter the labour market, get married and have children. Specifically, we examine how individual women's labour market participation is affected by having children; which women return to the labour market after the birth of a child; what determines the length of a spell out of the labour market and how the characteristics of women's work change as they acquire additional household responsibilities. We present age profile analyses, transition matrices of women's labour market transitions and estimate discrete choice models to analyse the decision to exit the labour market following the birth of a child; the duration from childbirth to re-entry to the labour market; and the choice between non-employment, employment in the formal sector and employment in the informal sector.

³ Consistent with this, Miller (2010) finds that access to family planning at young ages is associated with a greater probability of working in the formal sector in Colombia. Francavilla and Giannelli (2011) find that family planning increases the likelihood a woman engages in paid work in India.

The IFLS data show that more than 46% of Indonesian women are not working one year after the birth of their first child. We estimate that approximately 8.5 million Indonesian women aged between 20 and 24 drop out of the labour market after having their first child.⁴ This is reflected in the widening in the gender gap in labour market participation from age twenty (Figure 1). We find that tertiary educated women are the most likely to continue working after the birth of a child, followed by women with less than a primary school education. Women whose highest education attainment is secondary school are the least likely to continue working. A woman who worked in the year prior to the birth is about 60 percentage points more likely to be working in the year after the birth than other women. Women who leave the workforce after having a child do slowly return, so that 45% of women who left the workforce are back working five years after the birth. If a woman hasn't returned to the workforce by the time her child is five years old, the probability of her doing so in the future drops so that by the time her child is ten, the probability of returning to work is negligible.

Figure 1 shows that the share of women in the formal sector also declines precipitously from about the age of twenty. Previous work using cross-sectional data has suggested that many women move from the formal sector to the informal sector when they have children, so they can better juggle household and work responsibilities. Running a small retail business from home, for example, can allow women to generate income while also looking after their child, and so avoids the need to pay for childcare, Boden (1999) and Lombard (2001). Using the IFLS as a cross-section generates results consistent with this hypothesis, however, exploiting the panel nature of the data to track individual women across time, shows that there is very little movement across formal/informal sectors. Rather, large numbers of women leave their formal sector jobs and do not engage in any form of work. Having worked in the formal sector prior to the birth of a first child reduces the probability of working in the year following the birth by 20 percentage points and reduces the probability of returning to the labour market thereafter by 3.6 percentage points.

These findings, along with existing evidence on how human capital depreciates with time outside the labour force (for example, see Gorlich and de Grip, 2008), point to the need for institutional change to increase the retention of women in the formal sector. Allowing

⁴ The figure of 8.5 million is calculated by applying our estimate of the average probability of leaving the labour market in the age range 20 to 24 years (the estimations underlying Figure 2) to the number of women in this age range (calculated using the proportion of the population who are women in this age category in the 2010 Census and applying this to the UN population projection for 2016).

women to work flexibly – flexible hours, part-time work, working from home – and the provision of work-based childcare are likely to increase women’s ability to remain in the formal sector (and hence the labour market). However, evidence on the effectiveness of these policies is scarce in low-income settings. Further research to establish their impacts is needed.

2. Data

The Indonesian Family Life Survey (IFLS) is a panel survey that commenced in 1993 and surveys the same household members in 1997, 2000, 2007 and 2014.⁵ It provides information on individuals, households and communities and tracks respondents as they leave households and set-up new households, for example, as a result of marriage. Of most importance for this study are the survey modules on marital and fertility histories and the labour market module - which asks respondents aged over 15 about their employment at the time of the survey and their employment history (year by year for the previous five years), including information on formality of employment, industry and occupation. Together these data allow us to track women across a 20-year period and observe their working decisions alongside their marital and fertility behaviour.

We construct a yearly panel of women aged over 15 years who are observed in the sample between 1988 and 2014.⁶ Restricting the sample to women for whom we have information on work experience before marriage (including single women), so as to be able to examine the effect of marriage and childbearing on transitions in and out the labour market, generates a sample of 9,035 women aged between 10 and 49. Of this sample, 76% get married in the years covered by the data and 66% have at least one child.

In the analyses of employment patterns, we further restrict the sample to women who first gave birth after 1991 (6161 women) so that at least three years of labour market histories are observed prior to the first childbirth. A further 599 persons were excluded due to missing information on variables used in the estimation. This results in 5562 women in the formal model which we use to analyse the decision whether to continue to work in the year after

⁵ The sample is representative of approximately 83% of the Indonesian population living in urban and rural areas across Java, Sumatra, Bali, West Nusa Tenggara, Sulawesi and Kalimantan. Attrition rates are low. 92% of original IFLS households were recontacted in the 5th survey wave with 87.8% of original households being interviewed in all 5 waves. See

<https://www.rand.org/well-being/social-and-behavioral-policy/data/FLS/IFLS/study.html>

⁶ We construct an unbalanced panel as women are not necessarily observed in every wave between 1988 and 2014. Entry and exit to the survey occur for several reasons including girls growing up and becoming eligible to enter the employment module of the survey, respondents dying and entire households migrating. In the event an entire household moves, the IFLS attempts to track the household but this is not always possible. The labour market data go back to 1988 as the first wave of the IFLS was conducted in 1993 and asked individuals about their work over the past 5 years.

childbirth. When we study the decision of returning to work after a break from employment, we focus on the 2494 women who did not work the year after first childbirth.

3. Overview of Female Labour Force Participation and Employment

The mean characteristics of our sample of women are shown in Table 1 – one year prior to, and year of, the first birth. Twenty-four percent of the sample are not educated beyond primary school. A further 25% have attended lower secondary school, 35% upper secondary and 15% have attained some tertiary education. 54% of women were working the year prior of the birth of their first child, of whom 71% were wage workers, 11% were self-employed, and the remaining 18% were unpaid workers.⁷ After the birth, only 44% were working and formal sector employment (wage workers) had fallen to 60%, with gains to self-employment (17%) and unpaid work (24%).⁸

The most common industries of employment for women are manufacturing (26% prior to first birth), wholesale, retail and hotels (21%) and community and personal services (19%). Production (24%), sales (19%) and agriculture (17%) are the most common occupations. This remains largely unchanged after the birth of the first child.

Age profile analysis and Transition Matrices

Figure 2 compares the labour force participation age profile of single women to married women without a child, married women with one child and married women with one or more children.⁹ Single women are more likely to be working than all the other groups up

⁷ The national rate of female labour force participation reported by ILO in 2014 is 51% for women aged 15 or more. The higher levels of participation in our sample likely reflect the fact that we are excluding older women and possibly that the IFLS sample is representative of only 83% of the Indonesian population (it excludes much of Eastern Indonesia).⁸ Changes from year of first birth to year of first birth are complicated by the fact that we are unable to ascertain whether the figures for year of first birth are before or after the birth. Changes are hence likely underestimates.

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⁹ To generate Figure 2 we pool the IFLS data across the survey waves and estimate a linear probability model of the following form:

$$Y_{iat} = \beta_0 + \beta_1 Age + \beta_2 Age \times Married\ With\ No\ Children_i + \beta_3 Age \times One\ Child + \beta_4 Age \times Two\ Children + \beta_5 Age \times Three\ or\ More\ Children + \beta_6 Year_t + e_i \quad (1)$$

where Y_{iat} takes the value of 1 if individual i at age a in year t is participating in the labour market (or has a formal job when we are looking to explain formality/informality of employment) and 0 otherwise; Age is a vector of indicator variables for each of the ages between 15 and 45; $Married\ With\ No\ Children_i$ is an indicator that takes the value of 1 if woman i is married and has no children at that age and 0 otherwise. The

until about age 40, where the lines converge. At age 23 (average age of first child), women with one child have a 12 ppt lower probability of working compared to married women without children. Married women without children are more likely to work than women with children up until about age 35

Figure A1 in the appendix shows that the difference between single women and women who have a child is particularly large for senior high school educated women. Smaller differences are observed for women with lower levels of education (who are less likely to be able to afford to not work) and for tertiary educated women (who can more easily afford childcare and participate in the labour market at the same rate as single women).

Figure 3 examines the age profile of formality of employment (for the sample of working women).¹⁰ The figure shows that the share of women in formal employment decreases as women get married and have children. 88% of unmarried working women are in formal employment at age 24, while only 50% of women with one child are.

The finding that the share of women in formal employment is lower for married women and women with children than for single women is consistent with women switching from formal sector employment to informal sector employment, and/or women who were working in the formal sector dropping out of the labour force. Figure 4 enables us to establish which of these is driving this occurrence by exploiting the panel nature of the data.¹¹ It shows women's transitions across the formal and informal sectors, from one year before the first child to one year after. The bars along the diagonal of the matrix represent the proportion of women who stay in the same sector after childbirth. The bars off the diagonal show the proportion of transitions between sectors. The last column of bars shows the proportion of women who are not working. The figure clearly shows a large exodus from the formal sector

Child indicators are built similarly where we account for whether the woman has one to three children at each age she is observed. The estimation also includes year fixed effects ($Year_t$).

In the figures the line for single women is a plot of β_1 (which is a vector of coefficients with each coefficient corresponding to a particular age), for married women we plot $(\beta_{1+} \beta_2)$, for married with one child $(\beta_{1+} \beta_2 + \beta_3)$ and for married with two children $(\beta_{1+} \beta_2 + \beta_3 + \beta_4)$. We have excluded the third child from the graphs to simplify the presentation. A third child has no additional effect beyond that of having a second child.

¹⁰ A woman is defined to be working if she engages in formal sector or informal sector work, where formal sector work is defined as wage work and the informal sector is defined to include self-employment and unpaid work.

¹¹ For Figure 4 we restrict the sample to women who got married and had at least one child within the sample period, i.e. we exclude women who remain single and married women who did not have a child. This generates a sample of 3,781 women for whom we have information one year before the first child, one year after the first child and three years after the first child.

(wage work). One year after the birth of their first child approximately 20% of working women have exited the labour force.¹² This is 38% of all women who were working in the formal sector prior to the birth of their first child. Consistent with the informal sector allowing women to better juggle work and family commitments, having a child does not appear to be such a handicap to being self-employed or engaging in unpaid work. Only 13% of women who were previously self-employed, and 14% of those who were unpaid workers, exit the labour force after having their first child. Figure A2 in the appendix breaks down the transition analysis by educational attainment. Tertiary educated women are more likely to remain in the formal sector than less well-educated women. Only 17% of tertiary educated women who were working in the formal sector prior to having a child, are no longer in the labour market one year later, compared to 46% of secondary educated women and 48% of women with less than secondary school education.¹³

These diagrams also clearly show that there are few movements across sectors. There is very little movement between wage work and self-employment. Only 4% of women who were working in the formal sector prior to having their first child are self-employed one year later. Most women either drop out of the labour market or, if they continue working, continue in the same sector as they worked prior to child-bearing.¹⁴

3. Estimation Method

3.1 Whether to Work or Not in the Year After First Birth

To formally model the decision whether to work or not in the year after the birth of the first child we estimate logistic models of the probability of being employed in the year after childbirth. The estimation equation is as follows:

$$\Pr(W = 1|X) = \frac{\exp(\alpha + \beta X_i)}{1 + \exp(\alpha + \beta X_i)} \quad (1)$$

where $W=1$ if the woman works and 0 otherwise. The independent variables (X) include age, ethnicity, whether the woman lives in an urban area, education and family circumstances (married, living with parents). We also include information on the women's work histories

¹² 45% of women in our sample are not working after the first child. (20% were working prior to the first child and 25% were not working before the first child.) Many Indonesian women exit the labour force when they marry, prior to the first birth, in anticipation of having a child (see Figure 2).

¹³ Table A3 in the appendix includes the numbers underlying the figures.

¹⁴ There is also very little movement across industries and occupations. Results available upon request.

(whether the woman worked in the year prior to the first childbirth, whether she worked in the formal sector in the year prior to the birth, whether she worked all three years prior to the birth). These variables are potentially important as labour market participation has been shown to be heavily determined by early job experiences (Hibbard and Pope, 1993). We also control for whether the household had a family business prior to the birth of the first child.

As age, birth cohort and year have a linear relationship with one another, we cannot include dummy variables for all three variables in the models. Our main results are estimated from models including age and year dummies. Results from alternative specifications generate similar results and are presented in Tables A1 and A2 in the appendix.¹⁵

3.2 Returning to Employment

For those women who were not working in the year following the birth of their first child, we study their decision to return to work. We estimate a discrete choice duration model using a logistic estimator with random effects to allow for individual heterogeneity. (As our data is annual, a discrete choice duration model is preferred over a continuous hazard model.)

A simple data transformation makes it possible to estimate the discrete choice hazard model using logistic regression, Jenkins (1995). To estimate this model, the sample is constructed to include observations for each individual up to the first period of employment. When the second childbirth is observed, observations in the year of the second childbirth onwards are treated as being censored (i.e. the information after the second birth does not contribute to the likelihood function of the exit rate estimation).¹⁶ The dependent variable is a binary variable (0=not working, 1=working). The estimation equation is

$$h(t)_i = \frac{\exp(\gamma f(t) + \beta X_{it} + u_i)}{1 + \exp(\gamma f(t) + \beta X_{it} + u_i)} \quad (2)$$

where $h(t)$ is the latent variable which represent the piecewise constant hazard, i.e. the probability of returning to work at time t given the person has not returned to work prior to

¹⁵ We estimated three groups of models. In the first we include year dummies (for each year from 1991 to 2013). These are our preferred models and results are presented in Table 2. In the second group of estimations we include cohort dummies (born prior to 1970, 1970-79, 1980-1989 and born after 1990) and the provincial unemployment rate to capture business cycle effects (Table A1). In the third group of estimations we include the provincial unemployment rate and a time trend (Table A2). All models include age dummies (aged under 20 years, 20-24 years, 25-29 years, 30-34 years, 35-39 years and over 40 years).

¹⁶ We treat these observations as censored as we don't know whether they would have returned to work or not had there been no second birth. In our sample, 60% of women have a second child. However, the numbers of years they are observed after the second birth is not sufficient to study returns to work after the second birth.

time t . X_{it} are the same set of explanatory variables discussed above. For $f(t)$, a function of time that shapes the baseline hazard, we use a set of dummy variables for year since first childbirth in the estimation to allow a flexible piecewise constant baseline hazard. Finally, u_i is a time-invariant individual-specific random effect capturing the unobserved characteristics of individual i . γ and β are parameters to be estimated. The random effects are assumed to be independent of the explanatory variables and normally distributed.¹⁷

3.3 Return to Formal or Informal Employment

We also estimate a discrete competing risk model using a multinomial logit estimator to examine what drives whether women return to the formal versus the informal sector. The estimating equation is:

$$h(t)_i^k = \frac{\exp(\gamma^k f(t) + \beta^k X_{it})}{1 + \exp(\gamma^1 f(t) + \beta^1 X_{it}) + \exp(\gamma^2 f(t) + \beta^2 X_{it})}; k = 1, 2 \quad (3)$$

The notation largely follows equation (2) with the superscript k representing sector specific parameters and values. For example, $h(t)_i^1$ denotes the hazard of returning to the formal sector and $h(t)_i^2$ denotes the hazard of returning to the informal sector.¹⁸

For all three models, we report mean marginal effects, i.e., evaluated at the value of each individuals' characteristics and then averaged.

4. Results

Table 2 reports the estimation results.

¹⁷ Assuming that the unobserved heterogeneity distribution is normal when it is not is unlikely to result in biased estimates of either the covariates or duration dependence (Nicoletti and Rondinelli, 2010). The independence assumption is standard and, as always, cannot be tested. An appropriate fixed effects discrete-time duration model that might relax this assumption does not exist.

¹⁸ Multinomial logit estimation relies on the assumption of the independence of irrelevant alternatives (IIA). We use seemingly unrelated estimation to test this assumption and find no evidence that it is likely to be violated. When allowing for individual heterogeneity the model fails to converge so we estimate a model without this term. Unobserved heterogeneity is found not to play a significant role in determining whether women return to work - the proportion of the total variance contributed by the panel-level variance component (individual heterogeneity) in the return to work equation is not significantly different from zero ($p=0.489$) - so may also not play an important role in the choice of sector to return to. To the extent that individual heterogeneity is important in the choice of which sector to return to, this analysis can be considered descriptive in nature

4.1 Whether to Work or Not in the Year After First Birth

Column 1 of Table 2 reports marginal effects from the logistic regression where the dependent variable equals 1 if the woman was observed to be working in the year after the birth of her first child, and 0 otherwise. The results confirm the findings from the descriptive analysis that tertiary educated women are the most likely to continue working after the birth of a child. The next most likely group to be working are those with no education (who likely do not have the luxury of being able to choose not to work). The probability of a woman working after the birth increases with age from 30 years, with women aged over 40 being 23 percentage points more likely to be working than those younger than 20. Those who live in urban areas are 5.5 percentage points less likely to be working in the year after the birth of their child than women in rural areas (consistent with women continuing to work in agriculture, most commonly on family farms).

Those who worked in the year prior to the birth are about 60 percentage points more likely to be working after the birth than women who did not. Previous work experience (within 3 years of the birth, but not in the year before the birth) also increases the probability of a woman working after the birth (by 2.8 ppts). A woman who worked in the formal sector prior to having her first child is about 20 ppts less likely to be working after having had a child than an otherwise similar woman who had been working in the informal sector. The existence of a family business increases the probability that the woman works after having had a child, by 6.6 ppts.

The decision to return to the workforce

Column 2, Table 2 presents results from the duration model of the exit to employment for those women who did not return to the workforce in the first year after childbirth.

Figures 5 A and B present the survival function (of continuing to not work) and the empirical hazard (of exiting non-employment) without adjusting for individual characteristics. They show that the probability of returning to the workforce drops each year since the birth. Approximately 15% of women who didn't work in the year after the birth return to work in the second, third and fourth years since the first birth so that five years after the birth approximately 45% are back working. For those who haven't returned by the time the child is at school (normally 6-7 years of age), the probability of exiting non-employment has dropped to 10%. It continues to drop so that 10 years after the birth, when just over 30% of women are still out of the workforce, the probability of them returning to work is negligible (below 5%).

The empirical hazard seems to suggest a strong negative duration dependence after four years since childbirth. A possible reason for negative duration dependence is diminishing human capital over time while out of the workforce. However, the results after controlling for individual characteristics shown in Column 2 of Table 2 show that the probability of returning to work significantly increases each year with the strongest increase at around child commencement of primary school (7 years). After that the estimates are less precise due to sample sizes but the exit rates are all higher than in the second year after the first childbirth. This suggests child caring responsibilities prior to a child entering primary school are a significant barrier to women returning to work. As the child ages and child-caring responsibilities decrease, exit rates increase (more than offsetting any impact of diminishing human capital).

The estimates in Column 2 show that probability of exiting to the workforce (given the woman did not work in the year after birth) decreases with the age of the woman. Women aged over 40 are 11 ppts less likely to return to work than women aged under 20.¹⁹ Interestingly, although we saw above that tertiary education plays an important role in determining whether a woman continues to work in the year after the birth, education does not play a significant role in the decision to return to work if the woman does not maintain employment in the first year after the birth. Living in an urban area, although associated with a higher probability of not working in the year after the birth, is associated with an increased probability of returning to work, although this effect is small (1.9 ppts). Having worked in the year prior to the birth and there being a family business both increase the probability of returning (by 7.4 and 7.6 ppts respectively). Having worked in the formal sector prior to the birth decreases the probability of returning by 3.6 ppts. In the models where we include the unemployment rate (Appendix Tables A1 and A2), higher unemployment decreases the probability of a woman returning to work but only very slightly (0.5 ppts per 1 percentage point increase in unemployment). Unobserved characteristics (random effects) seem not play a role in explaining the probability of returning to work after controlling for human capital, work history, family circumstances and local labour market. The proportion of the total variance contributed by the panel-level variance component is not significantly different from zero (p-value=0.489).

¹⁹ This could be capturing an increased propensity for women to return to work in later cohorts, although the results from the model which include a time trend (see Appendix Table A2) suggest that this effect is small (0.3 ppts per year).

4.3 Which sector to return to

Columns 3 and 4, Table 2 present the results of the discrete competing risk model in which we model the decision whether to remain out of the labour market, to re-enter to the formal sector or re-enter to the informal sector. Younger women are more likely to exit to the formal sector (from not working) than older women. Exit to the informal sector is unaffected by age. Education only plays a role in that tertiary educated women are more likely (6.9 ppts) to exit to the formal sector. The probability of exiting to a formal sector job is significantly higher in urban areas (3.3 ppts). Previous work experience increases the probability of exiting to either sector. Working in the formal sector prior to the birth of a first child increases the probability of exiting to that sector (by 4.7 ppts) and decreases the probability of joining the informal sector by 5.3 ppts (consistent with the finding above that there is little shifting across sectors). Living in a household that has a family business reduces the probability of exiting to the formal sector (by 2.6 ppts) and increases the probability of exiting to the informal sector by just over 10 ppts.

The duration (years since birth) dummies show that women were most likely to return to the formal sector at 6 and 7 years after childbirth (the time when most Indonesian children have started primary school). The pattern of exit over time to the informal sector shows that the highest probability of exit is four and five years after the birth (2 percentage points higher than two years after the birth). This further confirms that women returning to the formal sector are likely to be constrained by childcare responsibilities and is consistent with the informal sector providing the greater flexibility that is needed when one has pre-school children.

Conclusions and Policy Implications

Extrapolating our results to the entire Indonesian population suggests that 8.5 million women currently of peak first child-bearing age (20-24 years) have dropped out of the Indonesian labour market as a result of child-bearing. This is a major loss of Indonesia's productive capital. The labour market participation of tertiary educated women is the least affected by childbearing relative to women with lower levels of education. Women who were employed in the formal sector prior to the birth of their first child leave the labour market in large numbers and are less likely to return to the labour market once they have left. Very few women who leave formal sector jobs switch to self-employment. Instead, they stop working.

How can women be supported to remain in the labour market once they get married and have children? With the current data it is not possible to differentiate between women choosing not to go back to work and women who would like to work but are unable to return to work (for example, due to lack of workplace flexibility and a lack of opportunities for women with children). However, the fact that tertiary educated women (who are in general higher paid and so can afford childcare) largely remain in the labour force, that women are more likely to return to the formal sector once their childcare responsibilities diminish (when their child starts primary school) and that self-employed women largely keep working suggests that when women are able to continue to work, they often choose to do so. Primary data collection and qualitative research with women from different backgrounds would allow a closer examination of this issue. International experience also suggests that a larger proportion of women will choose to work if the conditions are right.

Policies that have been shown in other countries to increase female labour force participation by facilitating continued participation across the life cycle include flexible work conditions and work-based childcare (Del Boca, Pasqua and Pronzato, 2008; Del Boca and Locatelli, 2006; Thevenon, 2016; Subramaniam et al., 2015). Given women's culturally determined household responsibilities, flexibility in the workplace is essential to allow the juggling of these responsibilities with those of the workplace. Flexible workplace policies include allowing employees to work flexible hours; to work compressed work weeks (a shorter number of longer days); part-time work (with the same career opportunities and benefits as full-time work); and the ability to work from home. Work-based childcare provision, particularly for women without a tertiary education and for women in formal sector employment in industries such as manufacturing and wholesale/retail trade and hotels, may stem the flow of women out of work when they get married and have children.

In Indonesia the main issue appears to be that the formal sector is not equipped for, or interested in, retaining women once they have a family. Production positions in manufacturing and sales positions in wholesale/retail trade and hotels account for the largest share of female full-time jobs, followed by service and professional or managerial roles in the community and personal services sector. These industries/occupations are thus the most important source of employment for women and the ones in which many women would be positively impacted if effective work policies surrounding marriage and having children are developed.

Policies and practices that promote cultural change and encourage companies to develop policies to retain women are also likely to be important. The evidence on the effectiveness of the policies discussed above in developing countries is very limited. Further research on how to boost women's labour force participation in low-income settings is needed.

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Table 1: Descriptive statistics of IFLS sample of Women

	Mean	N		
Married	1.00	5562		
Age of marriage	21.53	5548		
Total No children	3.39	5562		
<i>Level of Education</i>				
No schooling	0.01	5562		
Elementary	0.23	5562		
Junior HS	0.25	5562		
Senior HS	0.35	5562		
Tertiary	0.15	5562		
Attending School	0.07	5562		
	Year prior 1st birth		Year of 1st birth	
	Mean	N	Mean	N
<i>Labour Force Participation</i>				
Working	0.54	5562	0.44	5543
<i>Job status</i>				
Self-employed	0.11	3009	0.17	2459
Wage worker	0.71	3009	0.60	2459
Unpaid Worker	0.18	3009	0.24	2459
<i>Occupation Main Job</i>				
Professional	0.11	3008	0.13	2458
Administrative/managerial	0.00	3008	0.00	2458
Clerical	0.12	3008	0.11	2458
Sales	0.19	3008	0.19	2458
Service	0.16	3008	0.14	2458
Agriculture	0.17	3008	0.20	2458
Production	0.24	3008	0.22	2458
Military	0.00	3008	0.00	2458
Student	0.00	3008	0.00	2458
No Classified	0.01	3008	0.01	2458
<i>Industry Main Job</i>				
Agriculture	0.18	3009	0.22	2459
Mining, quarrying	0.01	3009	0.00	2459
Manufacturing	0.26	3009	0.25	2459
Electricity, gas, water	0.01	3009	0.01	2459
Construction	0.01	3009	0.00	2459
Wholesale, retail, hotel	0.21	3009	0.20	2459
Transport, communication	0.02	3009	0.02	2459
Finance/insurance, real estate	0.09	3009	0.10	2459
Community, personal services	0.19	3009	0.17	2459
Insufficient information	0.02	3009	0.02	2459

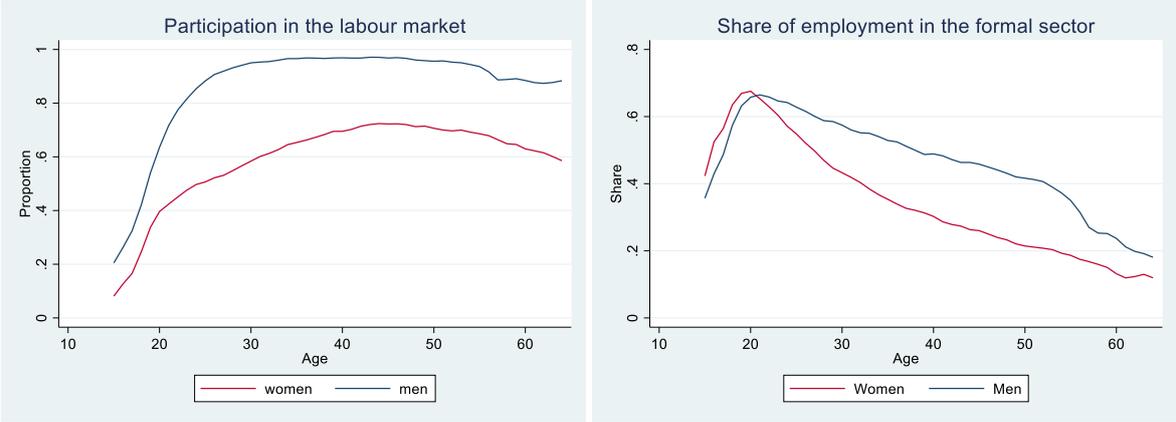
Table 2. Labour Market Re-entry Estimation Results (Marginal Effects)

Dependent Variable:	Working in year after birth (0/1)	Duration to exit to labour market	Exit destination (base = no exit)	
			Exit to the Formal Sector	Exit to the informal sector
	(1)	(2)	(3)	(4)
Estimation method	Logistic regression	Duration model w. random effects	Multinomial Logit	
Sample	All women	All women not working in the year after the birth		
Age (base=under 20 years)				
20-24 years	0.005 (0.017)	-0.014 (0.030)	-0.023 (0.028)	0.007 (0.019)
25-29 years	0.016 (0.019)	-0.064** (0.031)	-0.073** (0.029)	0.005 (0.019)
30-34 years	0.069** (0.028)	-0.059* (0.033)	-0.070** (0.030)	0.006 (0.021)
35-39 years	0.117** (0.055)	-0.061 (0.041)	-0.106*** (0.032)	0.042 (0.030)
40 years and above	0.232*** (0.090)	-0.110** (0.047)	-0.077* (0.043)	-0.033 (0.027)
Education (base=no education)				
Primary education	-0.112** (0.056)	-0.025 (0.049)	0.014 (0.036)	-0.026 (0.035)
Junior High Education	-0.086 (0.057)	-0.015 (0.049)	0.012 (0.036)	-0.014 (0.035)
Senior High Education	-0.049 (0.057)	-0.012 (0.050)	0.021 (0.036)	-0.021 (0.035)
Tertiary education	0.131** (0.058)	0.019 (0.053)	0.069* (0.040)	-0.036 (0.037)
Urban residence	-0.055*** (0.012)	0.019* (0.010)	0.033*** (0.007)	-0.014* (0.007)
Currently married	-0.002 (0.065)	-0.226*** (0.047)	-0.219*** (0.044)	0.102*** (0.007)
Living with parents	-0.002 (0.012)	-0.005 (0.010)	0.022** (0.008)	-0.026*** (0.007)
Work experience (base=no work in the 3 years prior to the birth)				
Worked in the year prior to the birth	0.594*** (0.014)	0.074*** (0.022)	-0.007 (0.019)	0.064*** (0.016)
Worked in the 3 years prior to the birth but not the year before	0.028* (0.014)	0.061*** (0.013)	0.043*** (0.012)	0.023*** (0.009)
Family Business the year prior first birth	0.066*** (0.012)	0.076*** (0.010)	-0.026*** (0.007)	0.102*** (0.007)
Formal sector employment before birth	-0.193*** (0.012)	-0.036* (0.020)	0.047* (0.026)	-0.053*** (0.011)
Years since childbirth (base=2)				
3		0.016 (0.012)	0.015* (0.009)	0.003 (0.008)
4		0.033** (0.014)	0.010 (0.011)	0.024** (0.010)
5		0.031* (0.017)	0.010 (0.013)	0.022* (0.013)
6		0.045** (0.022)	0.030* (0.018)	0.016 (0.015)
7		0.077**	0.058**	0.022

		(0.030)	(0.026)	(0.020)
8		0.041	0.035	0.006
		(0.040)	(0.035)	(0.025)
9		0.074	0.007	0.055
		(0.054)	(0.042)	(0.039)
10		0.040	0.078	-0.017
		(0.069)	(0.07)	(0.037)
11		0.109	0.089	0.035
		(0.095)	(0.086)	(0.067)
12		0.049	0.055	0.008
		(0.101)	(0.088)	(0.071)
13		0.089	0.002	0.082
		(0.092)	(0.060)	(0.080)
sigma_u		0.006		
		(0.029)		
rho		0.00001		
		(0.00011)		
Year dummies included:	Yes	Yes	Yes	
Number of observations	5562	6638	6638	
Number of individuals	5562	2494	2494	

Notes: Controls for ethnicity (Javanese, Sundanese, other) were also included. P-value for LR test of rho=0 is 0.489

Figure 1. Age profile of the labour force participation and formality of employment by gender, percentage



Source: Pooled data from IFLS 1,2,3,4 and 5 for all individuals aged 15 to 64 for whom employment history data is available. Authors' calculations.

Figure 2. Age profile of female labour force participation, probability

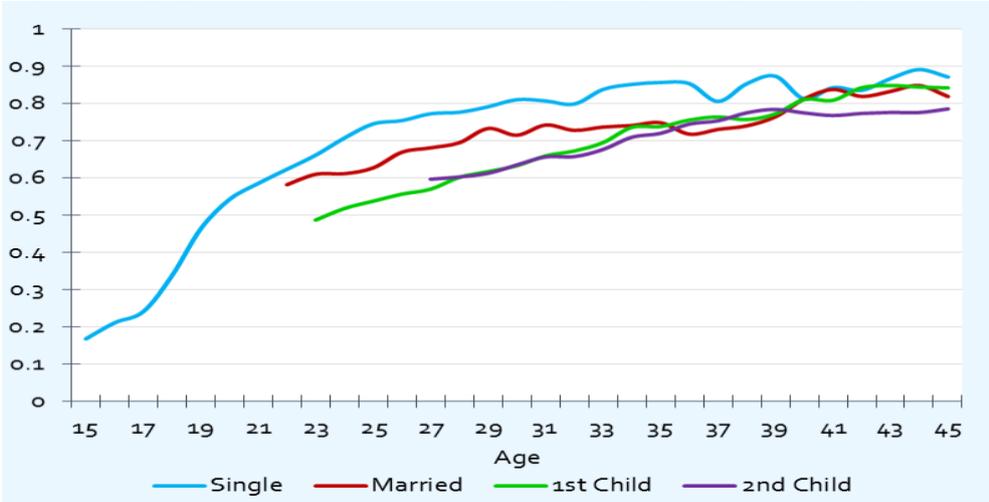


Figure 3. Age profile of formality, probability

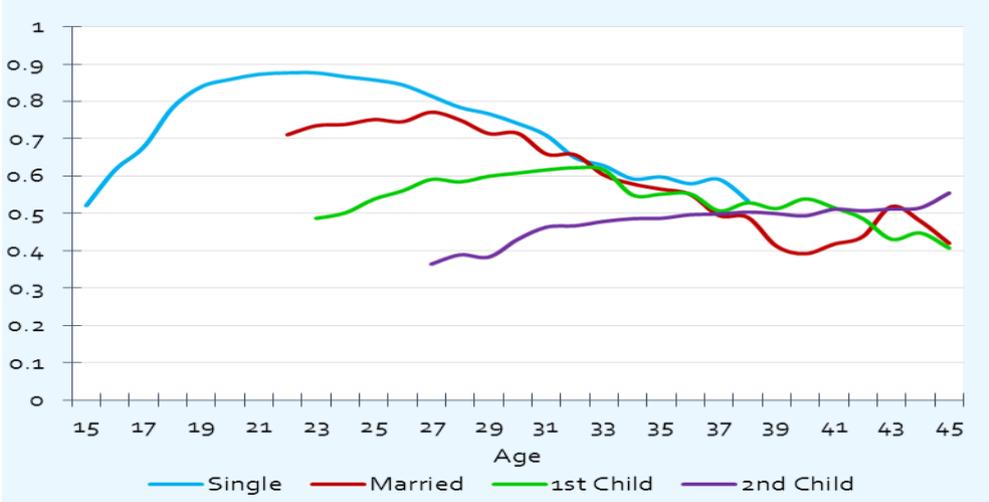


Figure 4. Transitions across job status – 1 year before to 1 year after birth of first child

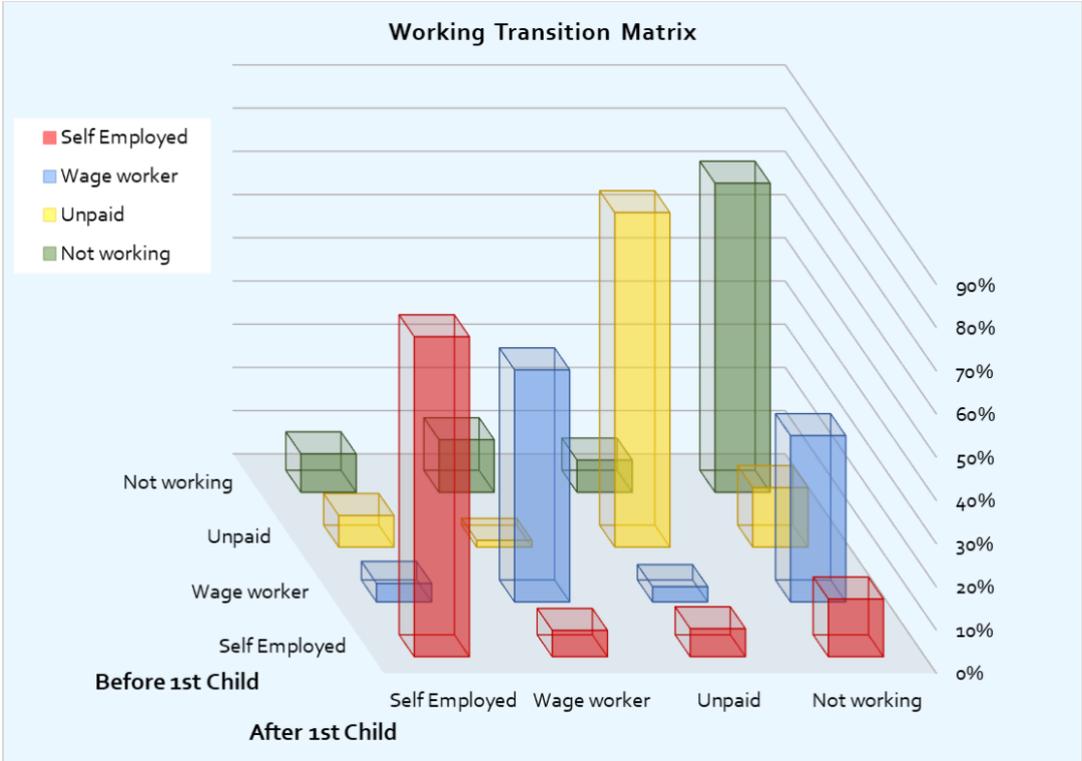
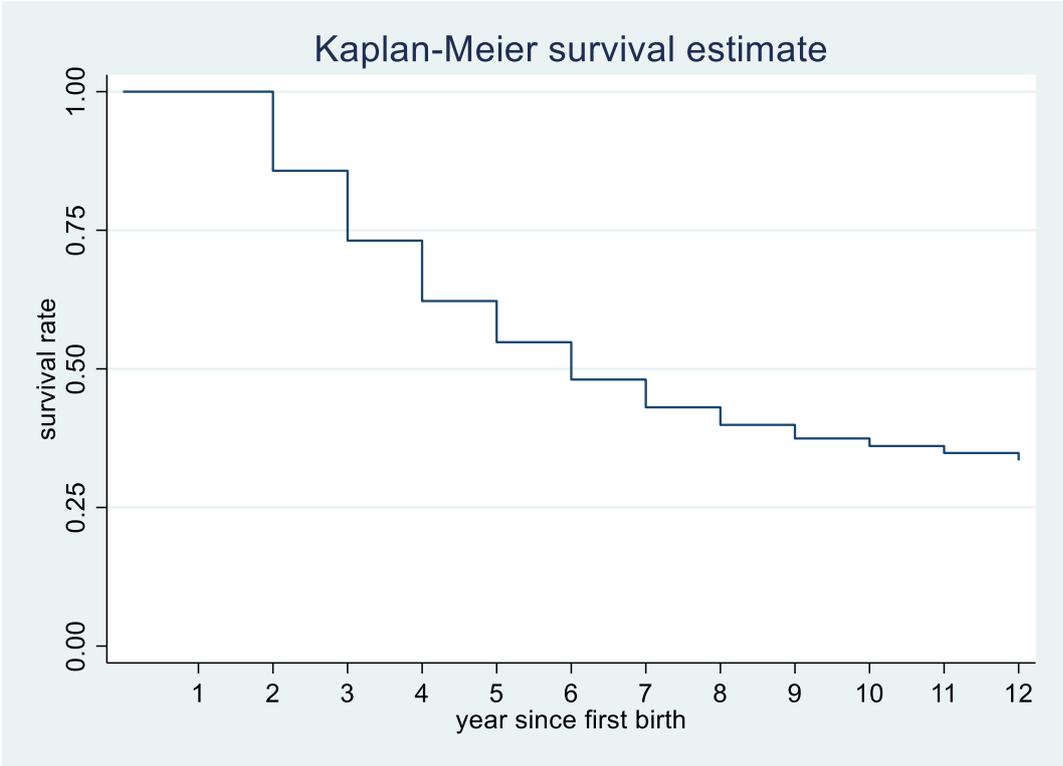
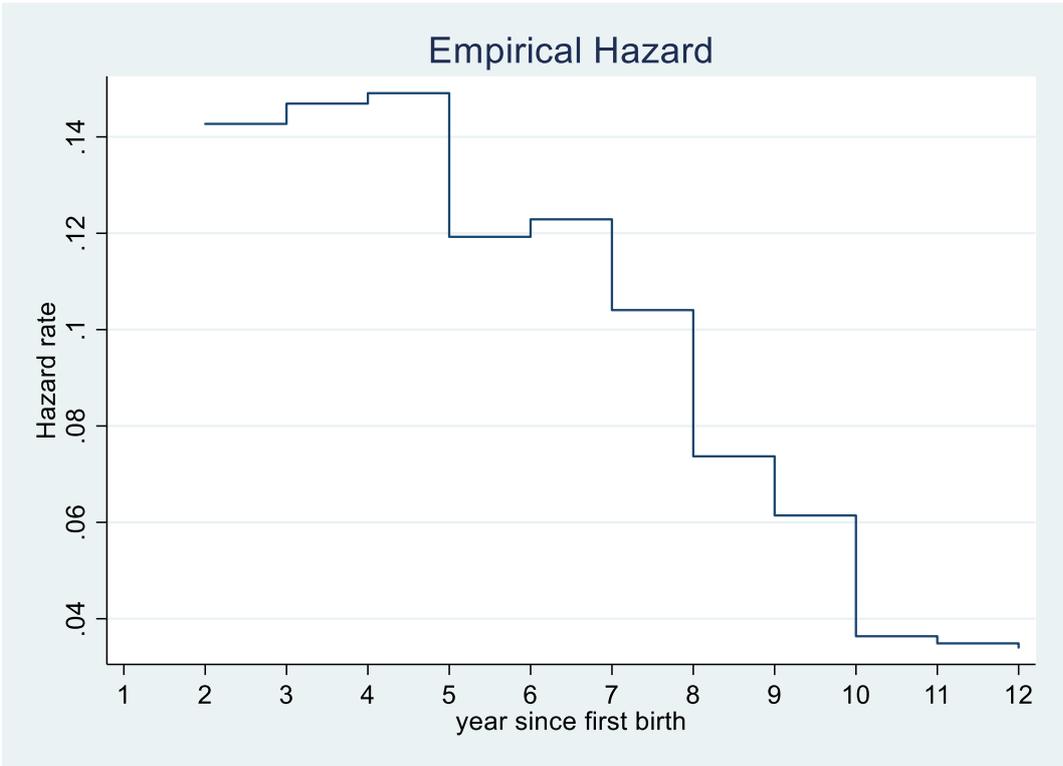


Figure 5A. Proportion of women remaining out of work by years since first birth



Note: The sample includes women who had a break of employment in the year after their first childbirth. Hence, by definition, the survival rate is 100% for first year after birth.

Figure 5B. Probability of returning to work given not having returned to work prior



**Table A1. Labour Market Re-entry Estimation Results (Marginal Effects)
Models with Cohort Fixed Effects and Unemployment Rate**

Dependent Variable:	Working in year after first birth (0/1)	Duration to exit to labour market	Exit destination (base = no exit)	
			Exit to the Formal Sector	Exit to the informal sector
	(1)	(2)	(3)	(4)
Estimation method	Logistic regression	Duration model w. random effects	Multinomial Logit	
Sample	All women	All women not working in the year after the birth		
Age (base=under 20 years)				
20-24 years	0.005 (0.017)	0.007 (0.028)	0.000 (0.023)	0.006 (0.019)
25-29 years	0.005 (0.021)	-0.021 (0.029)	-0.031 (0.024)	0.008 (0.020)
30-34 years	0.048 (0.030)	-0.009 (0.032)	-0.019 (0.026)	0.009 (0.022)
35-39 years	0.090 (0.057)	-0.001 (0.044)	-0.056* (0.031)	0.051 (0.034)
40 years and above	0.196** (0.095)	-0.047 (0.054)	-0.012 (0.052)	0.024 (0.032)
Education (base=no education)				
Primary education	-0.112** (0.055)	-0.027 (0.050)	0.007 (0.039)	-0.020 (0.034)
Junior High Education	-0.084 (0.055)	-0.023 (0.050)	0.001 (0.039)	0.011 (0.034)
Senior High Education	-0.047 (0.055)	-0.018 (0.050)	0.012 (0.039)	0.019 (0.034)
Tertiary education	0.133** (0.057)	0.012 (0.053)	0.059 (0.043)	0.032 (0.036)
Urban residence	-0.056*** (0.012)	0.020** (0.010)	0.034*** (0.007)	-0.013* (0.007)
Currently married	0.008 (0.065)	-0.239*** (0.049)	-0.228*** (0.046)	0.004 (0.028)
Living with parents	0.000 (0.012)	-0.008 (0.010)	0.019*** (0.008)	-0.026*** (0.007)
Work experience (base=no work in the 3 years prior to the birth)				
Worked in the year prior to the birth	0.591*** (0.014)	0.059*** (0.022)	-0.012 (0.019)	0.054*** (0.015)
Worked in the 3 years prior to the birth but not the year before	0.024* (0.014)	0.065*** (0.014)	0.048*** (0.013)	0.022** (0.009)
Family Business the year prior first birth	0.063*** (0.012)	0.071*** (0.010)	-0.028*** (0.007)	0.099*** (0.007)
Formal sector employment before birth	-0.193*** (0.012)	-0.023 (0.021)	0.057** (0.027)	-0.048*** (0.011)
Unemployment Rate	0.002 (0.002)	-0.005*** (0.002)	-0.002* (0.001)	-0.002** (0.001)
Cohorts (base=born 1970-1979)				
Pre-1970	-0.002 (0.032)	0.026 (0.028)	0.014 (0.023)	0.007 (.019)
1980-1989	-0.047*** (0.014)	0.025** (0.011)	0.024*** (0.008)	0.002 (0.008)
Post-1989	-0.034	0.083***	0.079***	0.004

	(0.021)	(0.022)	(0.018)	(0.015)
Years since childbirth (base=2)				
3		0.020*	0.017*	0.004
		(0.011)	(0.009)	(0.008)
4		0.036**	0.010	0.027**
		(0.014)	(0.011)	(0.011)
5		0.040**	0.014	0.026**
		(0.018)	(0.014)	(0.013)
6		0.065***	0.040**	0.025
		(0.024)	(0.019)	(0.017)
7		0.098***	0.071**	0.028
		(0.032)	(0.028)	(0.021)
8		0.051	0.043	0.009
		(0.042)	(0.037)	(0.026)
9		0.081	0.011	0.057
		(0.056)	(0.043)	(0.040)
10		0.045	0.088	0.020
		(0.070)	(0.073)	(0.035)
11		0.092	0.092	0.016
		(0.093)	(0.087)	(0.057)
12		0.052	0.069	0.003
		(0.103)	(0.095)	(0.063)
13		0.106	0.020	0.076
		(0.097)	(0.069)	(0.079)
sigma_u		0.006		
		(0.029)		
rho		0.000		
		(0.000)		
Year dummies included?	No	No	No	
Number of observations	5562	6638	6638	
Number of individuals	5562	2494	2494	

Notes: Controls for ethnicity (Javanese, Sundanese, other) were also included. P-value for LR test of rho=0 is 0.489

**Table A2. Labour Market Re-entry Estimation Results (Marginal Effects)
Models with Time Trend and Unemployment Rate**

Dependent Variable:	Working in year after birth (0/1)	Duration to exit to labour market	Exit destination (base = no exit)	
			Exit to the Formal Sector	Exit to the informal sector
	(1)	(2)	(3)	(4)
Estimation method	Logistic regression	Duration model w. random effects	Multinomial Logit	
Sample	All women	All women not working in the year after the birth		
Age (base=under 20 years)				
20-24 years	0.008 (0.017)	-0.010 (0.030)	-0.019 (0.027)	0.006 (0.018)
25-29 years	0.019 (0.019)	-0.055* (0.031)	-0.068** (0.028)	0.008 (0.019)
30-34 years	0.075*** (0.028)	-0.048 (0.033)	-0.063** (0.029)	0.009 (0.021)
35-39 years	0.130** (0.055)	-0.046 (0.041)	-0.100*** (0.031)	0.050 (0.031)
40 years and above	0.234*** (0.091)	-0.084 (0.051)	-0.063 (0.045)	-0.022 (0.031)
Education (base=no education)				
Primary education	-0.112** (0.055)	-0.034 (0.051)	0.003 (0.041)	-0.021 (0.034)
Junior High Education	-0.088 (0.055)	-0.029 (0.052)	0.002 (0.041)	0.011 (0.034)
Senior High Education	-0.050 (0.055)	-0.027 (0.052)	0.006 (0.041)	0.019 (0.034)
Tertiary education	0.129** (0.057)	0.002 (0.055)	0.051 (0.044)	0.032 (0.035)
Urban residence	-0.054*** (0.012)	0.020** (0.010)	0.034*** (0.007)	-0.013* (0.007)
Currently married	0.009 (0.065)	-0.244*** (0.049)	-0.233*** (0.046)	0.004 (0.028)
Living with parents	0.001 (0.012)	-0.009 (0.010)	0.019** (0.008)	-0.027*** (0.007)
Work experience (base=no work in the 3 years prior to the birth)				
Worked in the year prior to the birth	0.591*** (0.014)	0.055** (0.022)	-0.014 (0.019)	0.053*** (0.015)
Worked in the 3 years prior to the birth but not the year before	0.024* (0.014)	0.062*** (0.014)	0.045*** (0.013)	0.023** (0.009)
Family Business the year prior first birth	0.064*** (0.012)	0.072*** (0.010)	-0.027*** (0.007)	0.099*** (0.007)
Formal sector employment before birth	-0.192*** (0.012)	-0.021 (0.021)	0.057** (0.027)	-0.047*** (0.011)
Unemployment Rate	0.001 (0.002)	-0.005*** (0.002)	-0.003** (0.001)	-0.002** (0.001)
Time trend	-0.001 (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.000 (0.001)
Years since child birth (base=2)				
3		0.019 (0.012)	0.016* (0.009)	0.004 (0.008)
4		0.033** (0.014)	0.008 (0.011)	0.027** (0.011)

5		0.036**	0.011	0.027**
		(0.018)	(0.013)	(0.013)
6		0.059**	0.035*	0.026
		(0.024)	(0.019)	(0.017)
7		0.091***	0.064**	0.028
		(0.032)	(0.027)	(0.022)
8		0.044	0.035	0.010
		(0.041)	(0.035)	(0.026)
9		0.072	0.004	0.057
		(0.054)	(0.041)	(0.040)
10		0.032	0.073	-0.020
		(0.068)	(0.069)	(0.035)
11		0.074	0.072	0.016
		(0.089)	(0.080)	(0.057)
12		0.033	0.048	-0.003
		(0.097)	(0.085)	(0.063)
13		0.079	0.02	0.075
		(0.091)	(0.059)	(0.078)
<hr/>				
sigma_u		0.010		
		(0.034)		
rho		0.000		
		(0.000)		
<hr/>				
Yead dummies included	No	No	No	
Number of observations	5562	6638	6638	
Number of individuals	5562	2494	2494	

Notes: Controls for ethnicity (Javanese, Sundanese, other) were also included. P-value for LR test of rho=0 is 0.489

Table A3: Transitions across job status – before 1st child to 1 year after birth of first child - by level of education

Full Sample		After First Child			
		Self Employed	Wage worker	Unpaid	Not working
Before First Child	Self Employed	74%	6%	6%	13%
	Wage worker	4%	54%	4%	38%
	Unpaid	7%	2%	77%	14%
	Not working	9%	12%	7%	72%
Less than Secondary Education		After First Child			
		Self Employed	Wage worker	Unpaid	Not working
Before First Child	Self Employed	80%	5%	4%	11%
	Wage worker	3%	41%	9%	48%
	Unpaid	5%	2%	77%	16%
	Not working	10%	9%	8%	73%
Secondary School Education		After First Child			
		Self Employed	Wage worker	Unpaid	Not working
Before First Child	Self Employed	73%	4%	8%	15%
	Wage worker	6%	45%	4%	46%
	Unpaid	8%	2%	79%	11%
	Not working	8%	10%	9%	73%
Tertiary Education		After First Child			
		Self Employed	Wage worker	Unpaid	Not working
Before First Child	Self Employed	66%	17%	7%	10%
	Wage worker	2%	80%	1%	17%
	Unpaid	24%	0%	53%	24%
	Not working	8%	29%	1%	62%

Figure A1. Age profile of female labour force participation by level of education

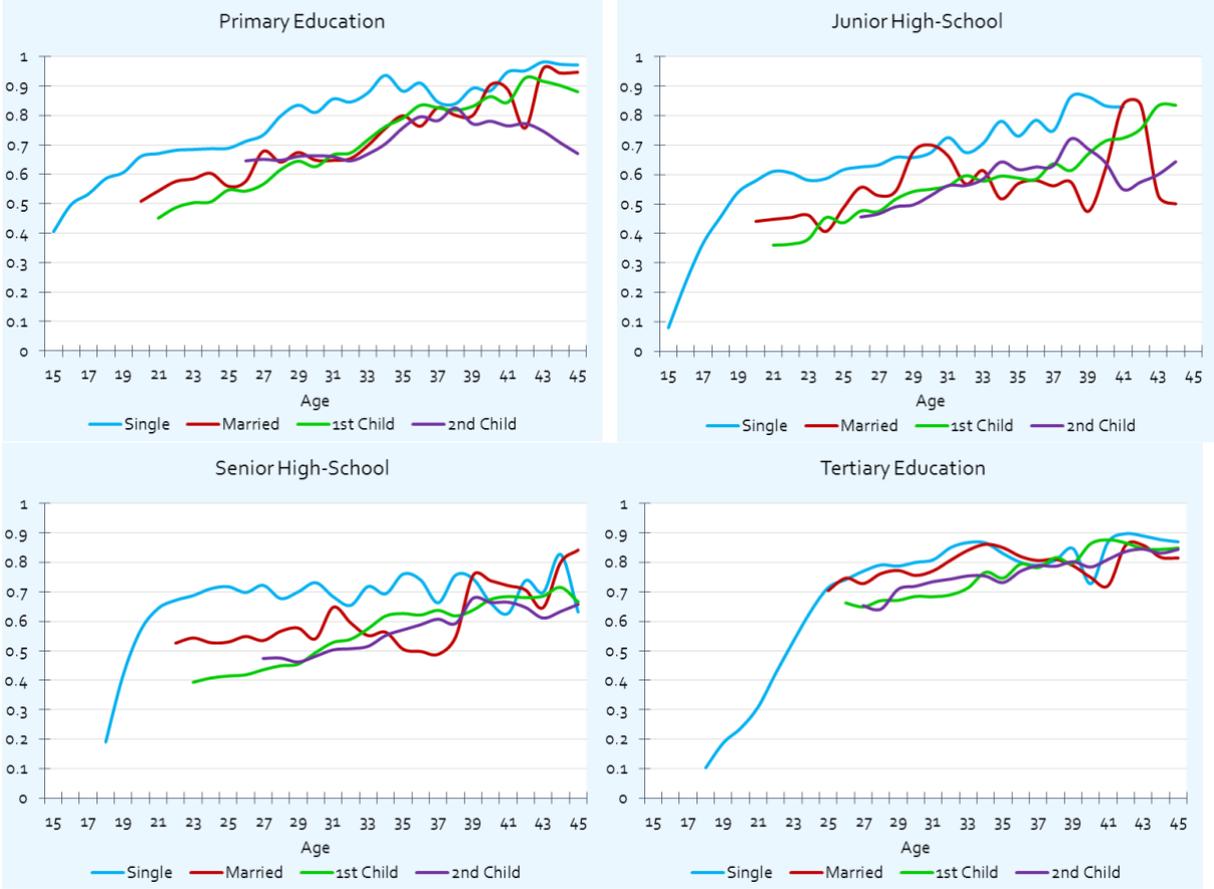


Figure A2 - Transitions across job status – before 1st child to 1 year after birth of first child - by level of education

