

Fertility and women's work in the context of women's economic empowerment: Inequalities across regions and wealth quintiles

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Abstract

In this paper, I examine the relationship between fertility and women's work in the context of women's economic empowerment. I consider fertility as a composite profile of a woman's age at first birth, birth intervals, and number of children. I then analyze how these fertility profiles relate to a woman's work. I also construct an "empowering-work index" as a composite measure of women's work as a combination of her work status (work or not), work location, work for whom, cash or in-kind earnings, and decision-making power earnings. In addition, I consider variation in the prevalence and association of fertility profiles and the empowering-work index by region (sub-Saharan Africa, Asia, and Latin America), wealth quintiles, and wealth quintiles within regions. I find that the poorest women in sub-Saharan Africa had high fertility rates (four or more children), but these births were often spaced >36 months. This contrasts with the richest women in Latin America who were more likely to have two children with the first birth after the age of 18. In the multivariate analysis, I find that birth spacing has a big impact on whether a woman works (wide birth spacing increases the risk of not working), and short birth spacing increases the likelihood of working in a high empowering-work situation. The number of children also has a small effect on work outcomes, with those with three or four+ children (not zero, one or two) are most likely to not work. Those women with two or three children (not zero, one or four+) are most likely to be working in a high empowering-work situation. Except for adolescent mothers with one child, maternal age at first birth had little impact on the life course work outcome for women in terms of their empowering-work index score in this low- and middle-income setting.

Introduction

Sustainable Development Goal (SDG) 5 aims to achieve gender equality and empower all women and girls. SDG Target 5.4 calls for the “recognition and value of unpaid care and domestic work”, and in this paper we address this SDG Target in two ways. One, we consider SDG Target 5.4.1 and the “proportion of time spent on unpaid domestic and care work” by considering how women with different fertility profiles will differ in their time constraint for childcare: age at first birth, how many children she has, and the birth intervals, combine to make a woman with one child born after the age of 18, different from a woman who had her first child at 15, had three more children in quick succession, and had four children before her 18th birthday. Not only will the “proportion of time spent on unpaid domestic and care work” differ for these two women, but so too will the capacity of these women to navigate their economic empowerment through paid work. In this paper, we also explore the idea that women’s unpaid work is not restricted to care and domestic work. Unpaid work and domestic work is one signal of economic disempowerment for women, but the disempowerment associated with work also extends beyond care and domestic work and depends on who she works for, where she works, and if she has cash earnings who has decision-making power over her earnings.

In this paper, I explore how different fertility profiles associate with women’s work, where work is either positioning a woman in an empowering situation or not. In this paper, I construct fertility profiles to represent a women’s family structure and create a broader vision of a women’s (unpaid) child care and domestic responsibilities (Target 5.4). I also create an empowering-work index, to provide an ordinal ranking of how empowering or disempowering a women’s work is based on who she works for, where she works, how she is paid, and if she is paid how decisions are made over her earnings.

This approach to examine the association between fertility and women’s work differs from existing approaches as it 1) combines the three elements of fertility to have a more complete view of women’s childcare responsibilities, and 2) I consider work in the context of empowerment. Moreover, 3) to address the “all” in SDG 5, I consider women across the socioeconomic gradient, to observe inequalities in fertility profiles, empowering-work index, and how these two relate for the richest and the poorest.

Research in the 1970s and 1980s emerged as the observation of the negative correlation between women’s labor force participation and fertility became apparent in the post-war era (Rosenzweig and Wolpin 1980), defying the Malthusian hypothesis of a positive relationship between income and fertility (Ahn and Mira 2002). Identification of the casual impact of fertility changes on women’s labor force participation was tested using various statistical instruments for fertility such as twins (Rosenzweig and Wolpin 1980), sibling-sex composition (Angrist and Evans 1998), and variations in fertility-related policies (Bloom, Canning et al. 2007). Clark (Clarke 2018) provides a comprehensive review of the literature on the casual impact of a decrease in the number of children on women’s labor force participation.

The explanation for this negative relationship between fertility and women’s labor force participation centered on the child quality-quantity tradeoff as returns to education investment (future wages of children) increased, and the opportunity cost of women devoting time to childcare increased as employment opportunities and wages rose for women (Galor and Weil 1996, Galor and Weil 1999, Galor and Weil 2000, Ahn and Mira 2002).

This literature emphasized that the number of children in the household was important for a woman’s labor supply decision, as was the age of the child(ren), as children under the age of six were considered more time intensive than those six or older. This literature was less concerned with the maternal age at first birth, and birth intervals, and the impact of these elements of fertility on women’s labor force participation.

Then came the observation in cross-country studies of a reversal of the correlation between fertility and women’s work back to the Malthusian prediction of a positive relationship between income and fertility, and by extension a positive correlation between fertility and women’s work (Ahn and Mira 2002). This positive correlation was attributed to sectoral shifts as economies developed and shifted out of agriculture, to manufacturing, then to services. Women’s participation in manufacturing was lower than in agriculture and services (Goldin 1995).

However, this explanation did not speak to women's choices, but rather to gender discrimination in labor demand by sector. Vere (Vere 2007) angles towards the idea of women's choice as women "having it all" – working more and having more children – within the US context. However, the concerns and motivations for women and work in developing countries differ from the developed country context. Mammen and Paxson consider women's work across the arc of economic development (Mammen and Paxson 2000) and point out that the barriers women in developed countries face within the labor market– gender wage gaps, glass ceilings – are of little relevance to women in developing countries where the majority work in the informal sector, for family members and often unpaid. Women in developing countries, who have limited access to credit, are limited in their ability to accumulate assets (including through paid work) and face discrimination with regard to inheritance laws.

In the developing country context, studies have emerged that demonstrate the impact of fertility changes on women's labor force participation. Using examples from developing countries, studies have shown that there is a negative casual impact of the number of children on women's labor force participation in Latin America (Cruces and Galiani 2007), Turkey (Gunduz-Hosgor and Smits 2008) and Bangladesh (Joshi and Schultz 2012). Using a pooled sample from sub-Saharan African countries, de Jong et al (de Jong, Smits et al. 2017) found that the number of children below age six has a significant negative effect on the woman's ability to work in the non-farm sector; it reduces the odds of employment of African mothers by 6%. Agüero and Marks (Agüero and Marks 2008) found that the number of children does not change a woman's intensity to work, but does change they type of work a woman does, as Caceres-Delpiano (Caceres-Delpiano 2012) also found. These studies in developing countries highlight that the type of work a woman does, not just if she works or not, is an important examination.

Turning now to the research on early childbearing and women's labor market opportunities, this has been studied in the US context (Geronimus and Korenman 1992, Ribar 1999). Concern rose in the 1970s as US teen pregnancy was markedly higher than in other developed countries (Kearney and Levine 2012). Intersections with welfare incentives and dependence were mixed into this discussion (Moffitt 1983).

Goldin (Goldin and Katz 2002) found that the introduction of the pill in the United States in the 1970s gave young women the opportunity to reliably complete college education. This encouraged young women to take on the challenge of studies for careers with higher income returns (medicine, law). The result of increased college completion by women was a delay in the age of marriage and first birth. As noted in a previous review (Finlay and Lee 2018), this change benefitted women if two conditions were met: first, the time gained when delaying marriage was used to invest in one's human capital (education), and/or second, social norms progressed in unison with women's increased opportunities for education and career such that men in the marriage market also came to value women's higher lifetime earnings. In the case of Malawi, a few years later (Baird, Chirwa et al. 2015) the importance of these conditions played out in a developing country context. There, in Malawi, women were incentivized to delay marriage and childbearing, but the time gained was not always used for capital investment (for example, education), and for the women who did increase their education, the men did not adjust always their preference for women with higher lifetime earning capacity, but rather still preferred homemaker partners without regarding the importance education in this role.

In the developing country context, child marriage and/or early childbearing are arising in the context of the lack of viable employment opportunities for young women. For these young women, the relation between early marriage, childbearing, and limited economic opportunity comes from many channels: lack of parent's investment in girls' education as parents see low returns (future wages) (Chakravarty 2018), teens seek subsistence survival through marriage as other opportunities are unavailable in their view (Stark 2018), and teen pregnancy can cause school drop-out and early marriage (Menon, Kusanthan et al. 2018), lack of contraception can also lead to teen pregnancy and school dropout (Miller 2011), and then higher rates of employment in the informal sector (Herrera, Sahn et al. 2016). These trade-offs in the adolescent years then have life cycle consequences (Hotz, McElroy et al. 2005) and limit a woman in her labor market outcomes across her life course.

So far, I have discussed how the number of children and age at first birth relate to women's work. In addition, birth intervals relate to women's work outcomes. In the US context, Gough (Gough 2017) outlined how there is a motherhood penalty across the reproductive life-course for women, and that short birth intervals or early childbearing that cut short education opportunities for women and limit life course labor market opportunities for women.

Across the literature that addresses fertility in the context of women's work, elements of fertility are considered in isolation. However, in this paper, I consider women within their "fertility profile". When a woman has her first birth, whether she has a second birth and if it is in close succession to the first, and then how many children she has in total will have an overall impact on women's work opportunities. Moreover, while the type of work a woman does is considered by some (Aguero and Marks 2008, Caceres-Delpiano 2012, Herrera, Sahn et al. 2016, de Jong, Smits et al. 2017), the connection between work and women's economic empowerment is not explicit.

For the purposes of this paper, I focus on how a woman's work is economically empowering when she has both the ability to succeed and advance economically, and has the power to make and act on decisions (Kabeer 1999, Narayan 2002, Kabeer 2005, Golla, Malhotra et al. 2011, Kabeer 2012, Kabeer and Mahmud 2016).

Given that women's economic empowerment has these two necessary conditions, the indication of a woman working is not sufficient to declare that she is economically empowered. She must have power to act on her economic success and advancement. For this reason, in this paper, I take a more comprehensive measure of women's work as a reflection of women's empowerment (or disempowerment). Women who work in the informal sector, women who are paid in-kind rather than in cash, and women who do not have sole decision-making power over their cash earnings are considered to be working but are not as economically empowered.

Given the research from Anderson (Anderson and Eswaran 2009), who finds that earned income is more important than unearned income in enabling women's autonomy, and working outside the family business is more empowering than working in the family business, I construct an ordinal ranking of the degree of how empowering a woman's work is or is not. Not working at all ranks, the lowest, the sector of work -- agriculture or off-farm -- is not a determinant of empowerment, but rather it is who she works for, where, and the remuneration. Working outside the home for oneself, for cash, and having sole decision-making power over that cash would rank the highest in terms of work that is empowering.

Rowlands (Rowlands 1995) discusses the definition of empowerment at length and its root the concept of "power", and from this vantage Rowlands discusses how empowerment and power enable the discourse of inequality and oppression. Of relevance to my paper, Rowlands' research highlights that the examination of empowerment must also be an examination of inequality.

The consideration of "inequality" with reference to fertility turns to an examination of gender inequality. Indeed, the relationship between the number of children and labor force outcomes is a gendered issue (Del Boca, Pasqua et al. 2009), as gendered roles within households mean that women have different constraints on their time compared to male partners.

While this inequality is frequently used in the context of gender inequality (Buvinic, Das Gupta et al. 2009), others have highlighted that the intersectionality of gender inequality with socioeconomic (SES) inequality is a more accurate reading of women's heterogeneous experience (Moghadam and Senftova 2005). Kabeer (Kabeer 2012) discusses gender inequality, and highlights work from Molyneux (Molyneux 1984) who brings to the fore the importance of intersectionality with socioeconomic status and that "[w]omen's practical gender needs reflected the roles and responsibilities associated with their position within the socio-economic hierarchy, and hence varied considerably across context."

I account for this intersectionality of gender inequality and SES inequality by stratifying by wealth quintiles. This stratification approach in examining inequalities has been done by others across other dimension of inequality, for

example, Caceres-Delpiano (Caceres-Delpiano 2012) show that the impact of fertility on female labor force participation varies by birth order, job-type, education level, and urban-rural living status.

Thus, in this paper I consolidate theories and observations from a range of studies, and in the low- and middle-income country setting, to 1) consider the relationship between fertility and women's labor force participation as a decision with respect to women's economic empowerment; to do this, 2) I consider that fertility is not just the number of children, but that the elements of maternal age at first birth, birth intervals, parity and child age are all factors that weigh into women's labor market outcomes, and I consider these elements combined as "fertility profiles"; 3) I differentiate between different types of work to construct an empowering-work index; and 4) I account for within country intersectionality of gender and wealth in the fertility and work relationship, and how the prevalence and relationship between fertility and work vary across continental regions and wealth quintiles.

Methods

Study Design: I used secondary source data from 62 countries published by the Demographic and Health Surveys (DHS) and examined within country inequalities in the association of fertility and women's work across wealth quintiles. I also accounted for regional variation around the world.

Setting: In my analytic sample using 62 countries from the DHS, I represented women in low- and middle-income countries in sub-Saharan Africa (36 countries, 108 surveys, ranging from 1994 to 2016), Asia (16 countries, 39 surveys, ranging from 1993 to 2016) and Latin America (10 countries, 31 surveys, ranging from 1993 to 2015).

The 62 countries were chosen because they were represented in the DHS catalogue, and were within the low- and middle-income country criteria for selection of surveys by the DHS. Surveys in these countries had information on a woman's birth history (from which I constructed the fertility profiles), women's work (from which I constructed the empowering-work index), and the (five) wealth quintiles. These countries were within the three regions covered in this study, sub-Saharan Africa, Asia, and Latin America. I excluded North Africa and Europe, as there were fewer surveys in these regions compared to the other three and the DHS had a limited sub-set of countries within North Africa and Europe unlike the other regions.

Participants: Women aged 15-49 were interviewed for the individual recode, and I used the sample of women ages 18 to 49 years old. I restricted the lower age bound for two reasons. The first is that the age at first birth variable had a cut point at 18. Girls under the age of 18 did not have equal exposure in years, and thus I did not know if they had their first birth before or after age 18. Secondly, if I included girls under the age of 18, I would have had to include school enrollment as a credible "work" option for them. The interaction between education, fertility and work is complex, deserves separate attention (Ardington, Menendez et al. 2015), and was not central to this paper.

In the multivariate analysis I controlled for women's age, and survey year, to account for age, cohort and year effects that will impact the relationship between fertility and women's work.

Variables: I examined three measures of fertility – timing, spacing, and number of children – the three elements of fertility that are within the 1994 International Conference on Population and Development in Cairo (ICPD) definition of reproductive rights. As I built fertility profiles for women, I took Gough's (Gough 2017) example of combining parity and birth spacing, and added the element of adolescent childbearing.

Timing was measured as the age at first birth of women aged 18-49 at the time of the interview, and I constructed a categorical variable, of first birth before age 18 (taking the value of 0), and at or after age 18 (value 1). I used 18 as the cut-point as this also coincides with the typical age of high school completion. Having a child before the age of 18 may impact school completion (Ardington, Menendez et al. 2015), thus having an impact on work type (Herrera, Sahn et al. 2016). I also account for women with no children (value 2).

Spacing is measured as the number of months between the first and second birth of a child, and between the second and third births. I grouped the interval into ranges of less than 36 months, or greater than or equal to 36 months consistent with the World Health Organization guideline for healthy maternal and child health outcomes (World Health Organization 2005).

Number of children: I accounted for the number of children as 0, 1, 2, 3 or 4+ at the time of interview. As others noted (de Jong, Smits et al. 2017), it is not just the number but the age of the children that impacts women's labor force participation. I implicitly controlled for this within the multivariate analysis, with age at first birth as part of the fertility profile, and current age of the woman as a control variable.

The number of living children may be more impactful on labor force participation than children who have not survived to the time of interview. However, the interaction of infant mortality and women's labor force participation is not well understood, and it would be an over-simplification to say that an infant's death has no impact on women's labor force participation as it frees up her time. In this paper, I abstracted from this by including all births whether living or dead by the time of interview. Note that infant mortality is around 6.5% in low- and middle- income countries within this sample (Finlay, Özaltın et al. 2011).

Using three elements of fertility – maternal age at first birth, birth intervals, and number of children – I constructed fertility profiles that characterize a woman's family profile based on the timing, spacing, and number of children.

The profile began by classifying women as having had their first birth before the age of 18, or age 18 or older, or having never had a (first) birth. Women then went on to have a second birth (or not, and have only one child), and this second birth was either within 36 months of the first birth, or after 36 months of the first birth. Then I considered women who went on to have a third birth (or not), and this third birth was within 36 months of the second birth, or greater than 36 months after the second birth. I then accounted for higher order families with a category of for four children or more, or no fourth child (without consideration of the birth interval). This fertility profile yielded 23 options of family composition.

Moving now to the measurement of work. I examined four binary measures of women's work. These measures were chosen as they were available in the dataset, and the literature indicated that these particular elements of work were important indicators linked to economic empowerment.

Work: women reported if they had worked in the past year or not. I categorized this variable into a dichotomous variable that took the value of 0 if the respondent reported to have not worked in the last 12 months and took the value of 1 if she reported to have worked in the last year, currently working, or had a job but was on leave in the last seven days.

Of those women who reported to have worked in the last year, I then knew about their work location, who she worked for, and how she was paid. Not all women responded to these further work related questions, but they remained in the sample with an "unknown" category. This category is included as there are many missing values on work location, who she works for, how she is paid, and who has decision making power over her earnings. Dropping these women with missing values would put an upward bias on the number of women who are not working.

Work Location: Women reported working in the home, or outside the home. I categorized this variable into a dichotomous variable that took the value of 0 if the respondent reports to have worked in the home and took the value of 1 if she reports to have worked away from her home. I also created a category of work location unknown that took the value of 2.

Work for whom: women who reported to work for a family member, someone else, or self-employed. I categorized this variable into a dichotomous variable that took the value of 0 if the respondent reported to have worked for a family member or for someone else and takes the value of 1 if she reported to be self-employed. I also created a category of

unknown for those who said they were working, but there was missing data on who they worked for, and this took the value of 2.

Work pay: women who reported to be paid cash or in-kind. I categorized this variable into a dichotomous variable that took the value of 0 if the respondent reported that she was not paid, paid in a combination of cash and in-kind, or paid in-kind only, and took the value of 1 if she reports that she is paid cash only. I group cash payment in one category, and then the mix of cash and in-kind and in-kind only in another category. As this categorization was in relation to empowerment and agency, the mix of cash and in-kind puts a women in a vulnerable situation as the ratio of cash to in-kind may have fluctuated out of her control. I also created a category of unknown, for those who said they are working, but we do not know how they are paid. This took the value of 2.

Pay use decisions: measures who decided how her money is used, the woman herself or others. For those women paid in cash, they were asked who decides how that money is used. I categorized this variable into a dichotomous variable that takes the value of 0 if the respondent reported that she decided jointly with her husband/partner or another person. It also took the value of 0 if the respondent's husband/partner decided by himself and not jointly with the respondent, or if someone else decided alone without the respondent. The variable took a value of 1 if the respondent decided alone on how her earnings are used. I grouped the decision over cash earnings joint with her husband in the same category as no control over cash earnings, as women who are making joint decisions may feel obliged to confer the decisions of the husband rather than truly negotiate on how the cash is used. A joint decision could represent a balanced relationship, and one of equity that would be equally empowering to the woman than if she decided by herself. Or the joint decision may just be the woman validating the male-partners decision, and not a negotiation. As we do not know the relationship dynamics, in this categorization, I assume that sole decision-making power is more empowering than joint or no decision-making power. I also created a category of unknown, for those who said they were working, but we did not know who made decisions over cash earnings.

Sector of employment is available in the DHS, but I did not include it as Anderson (Anderson and Eswaran 2009) indicated that working in agriculture or non-agriculture cannot be classified as empowering or disempowering, whereas working at home, for family, payment in-kind, or no decision making power over cash earnings, can all be classified as disempowering.

Using these variables, and building on Anderson's (Anderson and Eswaran 2009) discussion of determinants of autonomy, I built an empowering-work profile. I then rank the empowering-work profiles from completely disempowered (not working), and best-possible empowering-work profile (work for self, outside or inside the home, for cash, and complete control over earnings). This is an ordinal ranking, not cardinal. Thus, the gap between disempowerment and empowerment at each increment is not captured in this index.

I stratified by wealth quintile within a country. Wealth quintile is a composite measure of household wealth at the given time and within a given country. The first principal component of a list of household assets was ranked within a survey (time/country specific), and this ranking was then divided into five equal groups assigning households to the poorest, poor, middle, rich, or richest quintiles (Filmer and Pritchett 2001).

The stratification by wealth captures the intersectionality of gender and socioeconomic status (Moghadam and Senftova 2005, Kabeer 2012). The prevalence and process of fertility and work is (hypothesized to be) not equal across the socioeconomic gradient. To use the terminology from sociology, I explored the socioeconomic status dimension of inequality. The intersectionality was with gender inequality, which underlies this study in the examination of women's experience in the labor force (Molyneux 1984, Kabeer 2012).

I also decomposed the analysis by geographic region with three regions of sub-Saharan Africa, Asia, and Latin America. I exclude North Africa and Europe, as the coverage of DHS in these regions is not as comprehensive as the other regions. The regional stratification enables us to see variation in prevalence and process of fertility and women's work around the world.

Covariates: The covariates included in the multivariate analysis are education, urban/rural living, marital status, and survey year. Education took the value of 0 if the woman had no education, 1 if she had primary, and 2 if she had secondary or higher. Urban/rural residence was a binary variable, rural took the value of 1 and urban the value of 0. Marital status was also binary, and took the value of 0 if the woman was separated, divorce or never married, and the value of 1 if married, in union, or living with a man at the time of interview. Age of the woman at interview was included and ranged from 18-49. Year of survey also enters the multivariate analysis year dummy, and ranged from 1993 to 2016.

Bias: The DHS employment data has received a lot of criticism, including from myself (Finlay, Efevbera et al. 2018). In the DHS women may have under-reported women's work effort as their definition of work may differ from the framing in the DHS. However, in this current study, we are not only interested in whether woman worked or not, but who she worked for, where she worked, how she was paid and who had control over her earnings. This broader account of work strengthens the understanding of work as empowering or not, and defers the question of whether the prevalence of women who report to have worked or not to another study.

Study size: In the pooled DHS, there were 3,624,099 women between the age of 18-49 years in Asia, Latin America, and sub-Saharan Africa.

Not all women responded to all questions regarding work within the DHS, or the employment module was not conducted in all surveys. This excluded 1,126,715 women from the sample, leaving 2,497,384 in the sample.

Of the women who responded to the work module, 71,392 women had missing information on their fertility profile, leaving 2,425,992 women.

The wealth module was not conducted in all surveys, and there was no wealth index data for 274,209 women age 18-49 years. For the multivariate analysis, this left 2,151,783 women age 18-49.

All of those women had urban/rural living status recorded, but 41,927 were missing information on marital status, and a further 16,384 women were missing information on education

The final analytic sample of 18-49-year-old women was 2,093,472.

Statistical methods: For the examination of the prevalence, I presented the sample sizes and the percent of women in each of the fertility profiles and empowering-work profiles, and then grouped the women into the empowering-work index.

I then showed how the sample of the empowering-work index and fertility profiles were distributed for the pooled sample, by region, by wealth quintile, and by wealth quintile in each of the three regions covered in this study.

For the association between fertility profiles and the empowering-work index, I estimated the relative risk of a given outcome (working or not, empowering-work index 2 or not, empowering-work index 3 or not, empowering-work index 4 or not, empowering-work index 5 or not, empowering-work index 6 or not). I applied a log binomial, random effects, regression estimation model (Zou 2004) as the outcome is not a rare event (that is >10% prevalence).

I estimated the unadjusted model, and the adjusted model including the covariates. Regressions are not weighted.

I estimated the association of fertility and work using three indicators of fertility combined as the fertility profiles, and four indicators of work combined as the empowering-work index.

$$W_{i,q,r} = \beta_1 F_{i,q,r} + \gamma X_{i,q,r} + \delta_s + \varepsilon_{i,q,r}$$

The equation that was estimated shows an indicator of whether individual (i) in wealth quintile (q) and region (r) works or not (W) (empowering-work index 2 or not, empowering-work index 3 or not, empowering-work index 4 or not, empowering-work index 5 or not, empowering-work index 6 or not) is associated with her fertility profile (F) of this same

individual (i) in wealth quintile (q) and region (r). Controls of vector X (woman’s age, marital status, education, urban/rural, survey year) and region fixed effects (s) were included in the multivariate analysis.

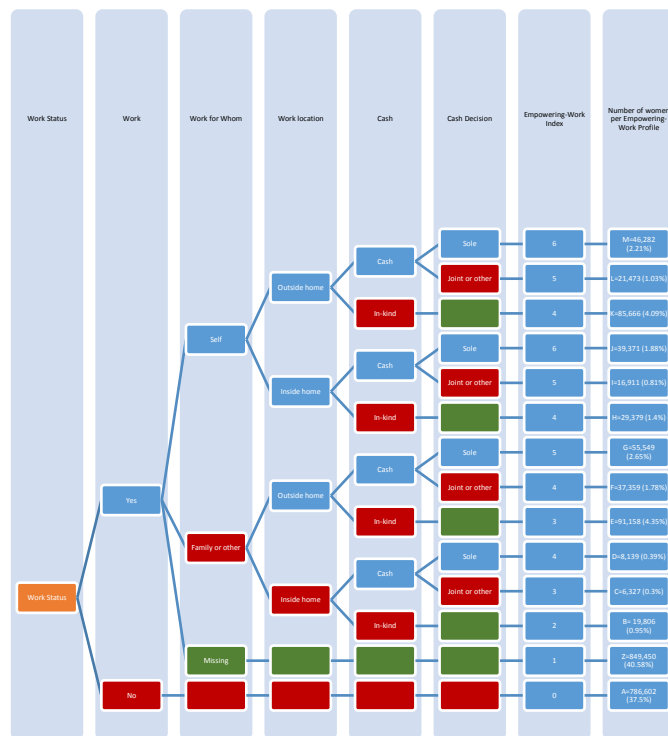
Pooled analysis captured the aggregate association of fertility profiles and empowering-work index across the sample of countries. We then estimated the association of fertility profiles and the empowering-work index by region to observe differences across regions and inequalities within regions. Regression estimates by wealth quintile capture within-country inequalities. Estimating the association between fertility profiles and the empowering-work index by region and by wealth quintile illustrates how the within-country inequality in the association may vary across regions.

Results

In the final analytic sample of 2,093,472 women, 786,602 (37.57%) women indicated that they do not work. For 849,450 (40.48%) women, we knew that they worked but we did not have information on where they work, for whom, or how they are paid. On the empowering-work index, the women who do not work ranked the lowest. We include those women who work but for whom we have further information, and they enter the index with value 1.

Figure 1 showed how the work-profiles took the value of 0 (red) to indicate a less empowering work situation (eg family or other non-family) relative to its complement which takes the value of 1 (blue) (eg self).

Figure 1: Empowering work profiles, combinations that fall within the empowering work-index (numbers 0 to 6), and number of women in each profile (letters A-M and Z).



The empowering-work index ranged from zero (not working) and the most dis-empowering work situation, to six, which indicated the work profiles with the highest degree of empowering work. Each arm of the tree represented a combination of working, work location, working for whom, payment, and payment decisions. Each arm is a profile (A-M plus Z for those with missing information), and the elements of each profile add up to a number between 0 and 6 that makes up the empowering-work index.

In Table 1a showed how the sample was divided across the empowering-work index, for the pooled sample, as well as by wealth quintile, by region, and by wealth quintile within regions.

On the empowering work index, women who work, but work for family, in the home, and are paid in-kind, ranked the lowest of the working women on the empowering-work index and scored 2. There were 19,806 (0.95%) in this category.

For a score of 3 on the empowering-work index, these could be either work-profile C “work, family, in-home, cash, others decide”, or they could be work-profile E “work, family, outside, in-kind”. This was 97,485 (4.66%) women.

For a score of 4 on the empowering-work index, women could be within one of four different work-profiles: work-profile D “work, family, in-home, cash, she decide”, or, work-profile F “work, family, outside, cash, others decide”, or, work-profile H “work, self/other, in-home, in-kind”, or, work-profile K “work, self/other, outside, in-kind”. There were 160,543 (7.67%) in this category.

For a score of 5 on the empowering-work index, women could have been within one of three different work-profiles: work-profile G “work, family, outside, cash, she decide”, or, I “work, self/other, in-home, cash, others decide”, or, L “work, self/other, outside, cash, others decide”. There were 93,933 (4.49%) in this category.

Women who scored most highly on the empowering-work index had a score of 6, were either work-profile J “work, self, in-home, cash, she decide”, or, work-profile M “work, self, outside, cash, she decide”. There were 85,653 (4.09%) in this category.

Table 1a: Empowering work index, and by region

| Empowering-work index | Pooled | | sub-Saharan Africa | | Asia | | Latin America | |
|-----------------------|-----------|---------|--------------------|---------|---------|---------|---------------|---------|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| 0 | 786,602 | 37.57 | 308,620 | 31.83 | 304,365 | 48.03 | 173,617 | 35.42 |
| 1 | 849,450 | 40.58 | 436,295 | 44.99 | 212,077 | 33.47 | 201,078 | 41.02 |
| 2 | 19,806 | 0.95 | 10,605 | 1.09 | 5,865 | 0.93 | 3,336 | 0.68 |
| 3 | 97,485 | 4.66 | 34,061 | 3.51 | 39,724 | 6.27 | 23,700 | 4.84 |
| 4 | 160,543 | 7.67 | 97,289 | 10.03 | 39,114 | 6.17 | 24,140 | 4.93 |
| 5 | 93,933 | 4.49 | 30,194 | 3.11 | 22,754 | 3.59 | 40,985 | 8.36 |
| 6 | 85,653 | 4.09 | 52,600 | 5.42 | 9,772 | 1.54 | 23,281 | 4.75 |
| Total | 2,093,472 | 100 | 969,664 | 100.00 | 633,671 | 100.00 | 490,137 | 100.00 |

Note: Empowering-work index values are associated with Empowering work profiles detailed in Figure 1.

Table 1b showed that the richest (41.11%) were least likely to work compared to the poorest (35.54%). This highlighted the dependency of women in the richest households, and while they may have had their needs met (up and beyond in some cases) they did not have the autonomy of working, and complete decision making power over earnings. It then makes the task difficult to say that a woman in the richest household, and not working, is less economically empowered than a woman who lives in the poorest household and works. But to be clear, this is what the empowering-work index did, as household wealth is not a factor within the index. I did however stratify by wealth quintile, so that the empowering-work index is ranked for women within each of the wealth quintiles – comparing the low and high ranking empowering-work index values for the richest, and separately comparing the low and high ranking empowering-work index values for the poorest.

In sub-Saharan Africa, the poorest are less likely to be not working (29.05%) than the richest (36.87%). In Asia this gap between rich and poor is widest, with 39.27% of the poorest not working, and 54.58% of the richest not working. In Latin America, the gradient is opposite and the poorest and more likely to be not working (43.05%) compared to the richest (29.68%).

The stratification by wealth quintiles means that I can interpret the empowering-work index *within* a wealth quintile, rather than comparing rich to poor. For the most empowering work scenarios on the empowering-work index, in sub-Saharan Africa 7.01% of the richest had the highest rank on the empowering work index, and 3.5% of the poorest had this score. In Asia, only 1.88% of the women from the richest households had the highest ranking empowering-work

index score, and 1.08% of the poorest. In Latin America, 4.85% of the richest women had the highest empowering-work index score, and 2.61% of the poorest had this.

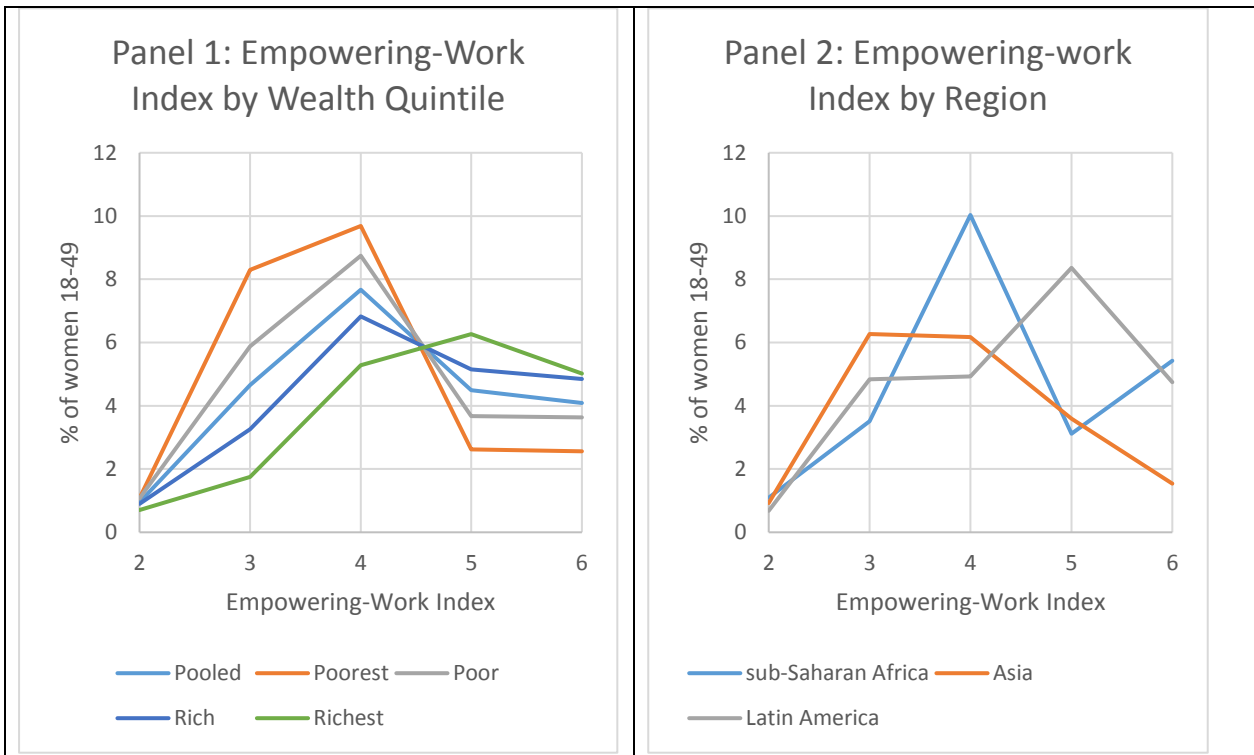
Table 1b: Empowering work index, by wealth quintile, and by wealth quintiles within regions.

| | Pooled Sample | | | | | | | | | |
|--------------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | Poorest | | Poor | | Middle | | Rich | | Richest | |
| | Freq. | Percent | Freq. | Percent | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| 0 | 145,382 | 35.54 | 145,098 | 35.69 | 150,210 | 36.80 | 158,856 | 38.31 | 187,056 | 41.11 |
| 1 | 164,502 | 40.21 | 167,905 | 41.30 | 166,832 | 40.87 | 168,821 | 40.71 | 181,390 | 39.87 |
| 2 | 4,414 | 1.08 | 4,368 | 1.07 | 4,090 | 1.00 | 3,730 | 0.90 | 3,204 | 0.70 |
| 3 | 33,966 | 8.30 | 23,884 | 5.88 | 18,155 | 4.45 | 13,511 | 3.26 | 7,969 | 1.75 |
| 4 | 39,629 | 9.69 | 35,552 | 8.75 | 33,035 | 8.09 | 28,308 | 6.83 | 24,019 | 5.28 |
| 5 | 10,738 | 2.62 | 14,941 | 3.68 | 18,402 | 4.51 | 21,342 | 5.15 | 28,510 | 6.27 |
| 6 | 10,487 | 2.56 | 14,765 | 3.63 | 17,478 | 4.28 | 20,109 | 4.85 | 22,814 | 5.01 |
| | 409,118 | 100.00 | 406,513 | 100.00 | 408,202 | 100.00 | 414,677 | 100.00 | 454,962 | 100.00 |
| sub-Saharan Africa | | | | | | | | | | |
| 0 | 54,264 | 29.05 | 51,620 | 28.82 | 55,938 | 30.72 | 61,994 | 32.33 | 84,804 | 36.87 |
| 1 | 86,462 | 46.29 | 83,118 | 46.41 | 82,174 | 45.14 | 86,207 | 44.96 | 98,334 | 42.75 |
| 2 | 2,668 | 1.43 | 2,668 | 1.49 | 2,191 | 1.20 | 1,844 | 0.96 | 1,234 | 0.54 |
| 3 | 9,342 | 5.00 | 7,823 | 4.37 | 7,305 | 4.01 | 5,948 | 3.10 | 3,643 | 1.58 |
| 4 | 24,641 | 13.19 | 22,102 | 12.34 | 20,587 | 11.31 | 16,883 | 8.81 | 13,076 | 5.69 |
| 5 | 2,876 | 1.54 | 3,475 | 1.94 | 4,486 | 2.46 | 6,582 | 3.43 | 12,775 | 5.55 |
| 6 | 6,540 | 3.50 | 8,277 | 4.62 | 9,380 | 5.15 | 12,274 | 6.40 | 16,129 | 7.01 |
| | 186,793 | 100.00 | 179,083 | 100.00 | 182,061 | 100.00 | 191,732 | 100.00 | 229,995 | 100.00 |
| Asia | | | | | | | | | | |
| 0 | 47,695 | 39.27 | 53,553 | 44.91 | 58,943 | 48.22 | 66,407 | 51.78 | 77,767 | 54.58 |
| 1 | 45,351 | 37.34 | 41,865 | 35.11 | 40,392 | 33.04 | 40,532 | 31.60 | 43,937 | 30.84 |
| 2 | 1,246 | 1.03 | 1,095 | 0.92 | 1,071 | 0.88 | 1,199 | 0.93 | 1,254 | 0.88 |
| 3 | 13,717 | 11.29 | 9,536 | 8.00 | 7,869 | 6.44 | 5,661 | 4.41 | 2,941 | 2.06 |
| 4 | 9,007 | 7.42 | 7,933 | 6.65 | 7,878 | 6.44 | 7,189 | 5.61 | 7,107 | 4.99 |
| 5 | 3,132 | 2.58 | 3,640 | 3.05 | 4,178 | 3.42 | 5,021 | 3.91 | 6,783 | 4.76 |
| 6 | 1,315 | 1.08 | 1,618 | 1.36 | 1,907 | 1.56 | 2,249 | 1.75 | 2,683 | 1.88 |
| | 121,463 | 100.00 | 119,240 | 100.00 | 122,238 | 100.00 | 128,258 | 100.00 | 142,472 | 100.00 |
| Latin America | | | | | | | | | | |
| 0 | 43,423 | 43.05 | 39,925 | 36.90 | 35,329 | 34.00 | 30,455 | 32.16 | 24,485 | 29.68 |
| 1 | 32,689 | 32.41 | 42,922 | 39.67 | 44,266 | 42.60 | 42,082 | 44.44 | 39,119 | 47.42 |
| 2 | 500 | 0.50 | 605 | 0.56 | 828 | 0.80 | 687 | 0.73 | 716 | 0.87 |
| 3 | 10,907 | 10.81 | 6,525 | 6.03 | 2,981 | 2.87 | 1,902 | 2.01 | 1,385 | 1.68 |
| 4 | 5,981 | 5.93 | 5,517 | 5.10 | 4,570 | 4.40 | 4,236 | 4.47 | 3,836 | 4.65 |
| 5 | 4,730 | 4.69 | 7,826 | 7.23 | 9,738 | 9.37 | 9,739 | 10.29 | 8,952 | 10.85 |
| 6 | 2,632 | 2.61 | 4,870 | 4.50 | 6,191 | 5.96 | 5,586 | 5.90 | 4,002 | 4.85 |
| | 100,862 | 100.00 | 108,190 | 100.00 | 103,903 | 100.00 | 94,687 | 100.00 | 82,495 | 100.00 |

Figure 2 illustrates the distribution of the 18-49 year old women across the empowering-work index, by wealth quintile (Panel 1). This graph showed that women in the poorest wealth quintile were more likely to work than the richest wealth quintile (from the area under the curve), and that the women in households of the poorest wealth quintile were more likely to work in low-ranking empowering-work profiles (low empowering-index score). Women in the richest wealth quintile were more likely to work in high-ranking empowering-work profiles (high empowering-work index score). Women across the five wealth quintiles are then distributed in-between in order of their household wealth status.

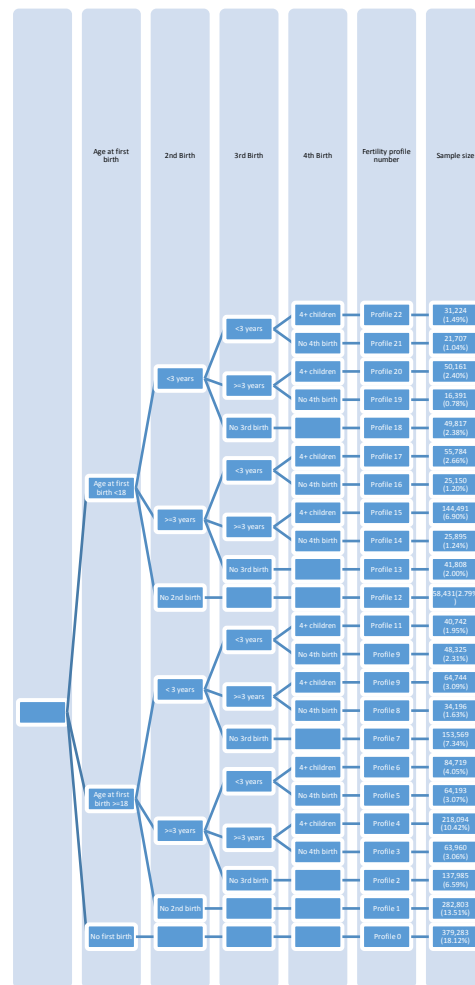
I then considered the empowering-work index by region (Figure 2 Panel 2). This chart showed that women in sub-Saharan Africa are most likely of the women across three regions to work (only 31.83% do not work), and only 35.42% of Latin American women say they do not work, and in Asia 48.08% of women do not work. Women in Asia who work were much more likely to score low on the empowering-work index compared to women in other regions, and women in Latin America rank a little higher than sub-Saharan African women in terms of working in higher ranking empowering-work profiles.

Figure 2: Empowering-Work Index by Wealth Quintile, and by Region



I now turn to the overview of the fertility profiles. In Figure 3, I showed the fertility profiles, the number of women in the sample of 18-49 year old women, and the percentage of the total of women in a single profile.

Figure 3: Fertility profiles for women aged 18-49 years old in sub-Saharan Africa, Asia and Latin America pooled.



From Figure 3 a few profiles stood out, as they represented greater than 10% percent of the sample population. Of the total sample of 2,093,472 of 18-49 year old women from sub-Saharan Africa, Asia, and Latin America, 18.12% (379,283) reported to have had no children, 282,803 (13.51%) of the women had one child only (no second birth) and they had this child at an age greater than or equal to 18. There were also many women who had more than four children, 218,094 (10.42%), the first child was born when the woman was 18 or older, and there was an interval of 36 months or more to the second birth, then 36 months or more to the third birth. This woman started her childbearing (at or) after the age of 18, and spaced her children according to the WHO guidelines.

Other profiles also stood out, and represented 5-9.99% of the sample. Profile 2 (first birth at ≥ 18 years, and a second birth ≥ 36 months, but no third birth) represented 137,985 (6.59%) women, then Profile 7 (first birth at ≥ 18 years, and second birth < 36 months, but no third birth) represented 153,569 (7.34%) women. Then women who had their first child at age < 18 , the second birth ≥ 36 months, the third birth ≥ 36 months, and then went on to have 4 or more children, this Profile 15 represented 144,491 (6.90%) women.

The profile with the fewest women in the sample was Profile 19, where the first birth is born when the woman is < 18 , then the second birth < 36 months later, the third birth ≥ 36 months later, and no fourth birth, this represented 16,391 (0.78%) of the women in the sample.

Table 2 shows how the fertility profiles vary over regions, wealth quintiles, and wealth quintiles within regions.

| | | Pooled | | sub-Saharan Africa | | Asia | | Latin America | |
|----|---|-----------|---------|--------------------|---------|---------|---------|---------------|---------|
| | | Freq. | Percent | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| 0 | No children | 379,283 | 18.12 | 179,347 | 18.50 | 93,649 | 14.78 | 106,287 | 21.69 |
| 1 | AFB>=18, no second birth | 282,803 | 13.51 | 110,303 | 11.38 | 96,200 | 15.18 | 76,300 | 15.57 |
| 2 | AFB>=18, second birth>36m, no third birth | 137,985 | 6.59 | 47,769 | 4.93 | 60,391 | 9.53 | 29,825 | 6.09 |
| 3 | AFB>=18, second birth>36m, third birth>36m, no fourth birth | 63,960 | 3.06 | 23,979 | 2.47 | 26,088 | 4.12 | 13,893 | 2.83 |
| 4 | AFB>=18, second birth>36m, third birth>36m, fourth birth | 218,094 | 10.42 | 113,675 | 11.72 | 64,013 | 10.10 | 40,406 | 8.24 |
| 5 | AFB>=18, second birth>36m, third birth<36m, no fourth birth | 64,193 | 3.07 | 21,257 | 2.19 | 26,010 | 4.10 | 16,926 | 3.45 |
| 6 | AFB>=18, second birth>36m, third birth<36m, fourth birth | 84,719 | 4.05 | 44,282 | 4.57 | 24,145 | 3.81 | 16,292 | 3.32 |
| 7 | AFB>=18, second birth<36m, no third birth | 153,569 | 7.34 | 47,356 | 4.88 | 62,269 | 9.83 | 43,944 | 8.97 |
| 8 | AFB>=18, second birth<36m, third birth>36m, no fourth birth | 34,196 | 1.63 | 13,321 | 1.37 | 11,467 | 1.81 | 9,408 | 1.92 |
| 9 | AFB>=18, second birth<36m, third birth>36m, fourth birth | 64,744 | 3.09 | 37,883 | 3.91 | 15,801 | 2.49 | 11,060 | 2.26 |
| 10 | AFB>=18, second birth<36m, third birth<36m, no fourth birth | 48,325 | 2.31 | 18,162 | 1.87 | 16,869 | 2.66 | 13,294 | 2.71 |
| 11 | AFB>=18, second birth<36m, third birth<36m, fourth birth | 40,742 | 1.95 | 24,601 | 2.54 | 9,831 | 1.55 | 6,310 | 1.29 |
| 12 | AFB<18, no second birth | 58,431 | 2.79 | 31,667 | 3.27 | 12,451 | 1.96 | 14,313 | 2.92 |
| 13 | AFB<18, second birth>36m, no third birth | 41,808 | 2 | 20,843 | 2.15 | 11,767 | 1.86 | 9,198 | 1.88 |
| 14 | AFB<18, second birth>36m, third birth>36m, no fourth birth | 25,895 | 1.24 | 11,990 | 1.24 | 7,882 | 1.24 | 6,023 | 1.23 |
| 15 | AFB<18, second birth>36m, third birth>36m, fourth birth | 144,491 | 6.9 | 87,019 | 8.97 | 30,646 | 4.84 | 26,826 | 5.47 |
| 16 | AFB<18, second birth>36m, third birth<36m, no fourth birth | 25,150 | 1.2 | 10,663 | 1.10 | 7,987 | 1.26 | 6,500 | 1.33 |
| 17 | AFB<18, second birth>36m, third birth<36m, fourth birth | 55,784 | 2.66 | 33,376 | 3.44 | 12,186 | 1.92 | 10,222 | 2.09 |
| 18 | AFB<18, second birth<36m, no third birth | 49,817 | 2.38 | 22,496 | 2.32 | 15,699 | 2.48 | 11,622 | 2.37 |
| 19 | AFB<18, second birth<36m, third birth>36m, no fourth birth | 16,391 | 0.78 | 7,852 | 0.81 | 4,643 | 0.73 | 3,896 | 0.79 |
| 20 | AFB<18, second birth<36m, third birth>36m, fourth birth | 50,161 | 2.4 | 31,981 | 3.30 | 9,721 | 1.53 | 8,459 | 1.73 |
| 21 | AFB<18, second birth<36m, third birth<36m, no fourth birth | 21,707 | 1.04 | 9,612 | 0.99 | 7,176 | 1.13 | 4,919 | 1.00 |
| 22 | AFB<18, second birth<36m, third birth<36m, fourth birth | 31,224 | 1.49 | 20,230 | 2.09 | 6,780 | 1.07 | 4,214 | 0.86 |
| | | 2,093,472 | 100 | 969,664 | 100.00 | 633,671 | 100.00 | 490,137 | 100.00 |

As Table 2 showed, women aged 18-49 varied in their fertility profiles across the three regions represented within the sample, sub-Saharan Africa, Asia and Latin America. In Latin America, 21.69% of the women had no children, and 15.57 had one child only and this was born when the woman was >=18. In sub-Saharan Africa, 18.50% have no children, and 11.38% have one child born when the woman was >=18 years. In Asia, they had the lowest fraction of women with no children (14.78%), but recalling that this captured the likes of Bangladesh and Pakistan which represented the ever-married sample. In Asia, 15.18% of the woman had one child and this child was born when the woman was >=18 years.

The fertility profile in sub-Saharan Africa is dominated by: Profile 0 18.50% (no children), Profile 4 11.72% (first birth at >=18, second birth >=36 months, third birth >=36 months, and went on to have four or more children), Profile 1 11.38% (first birth only >=18), and Profile 15 8.97% (first child at age <18, the second birth >=36 months, the third birth >=36 months, and then goes on to have 4 or more children).

The fertility profile in Asia is dominated by: Profile 1 15.18% (first birth only >=18), Profile 0 14.78% (no children), Profile 4 10.10% (first birth at >=18, second birth >=36 months, third birth >=36 months, and went on to have four or more

children), Profile 7 9.83% (first birth at ≥ 18 years, and second birth < 36 months, but no third birth), Profile 2 9.53% (first birth at ≥ 18 years, and a second birth ≥ 36 months, but no third birth).

The fertility profile in Latin America is dominated by Profile 0 21.69% (no children), Profile 1 15.57% (first birth only ≥ 18), Profile 7 8.97% (first birth at ≥ 18 years, and second birth < 36 months, but no third birth), and then Profile 4 8.24% (first birth at ≥ 18 , second birth ≥ 36 months, third birth ≥ 36 months, and went on to have four or more children).

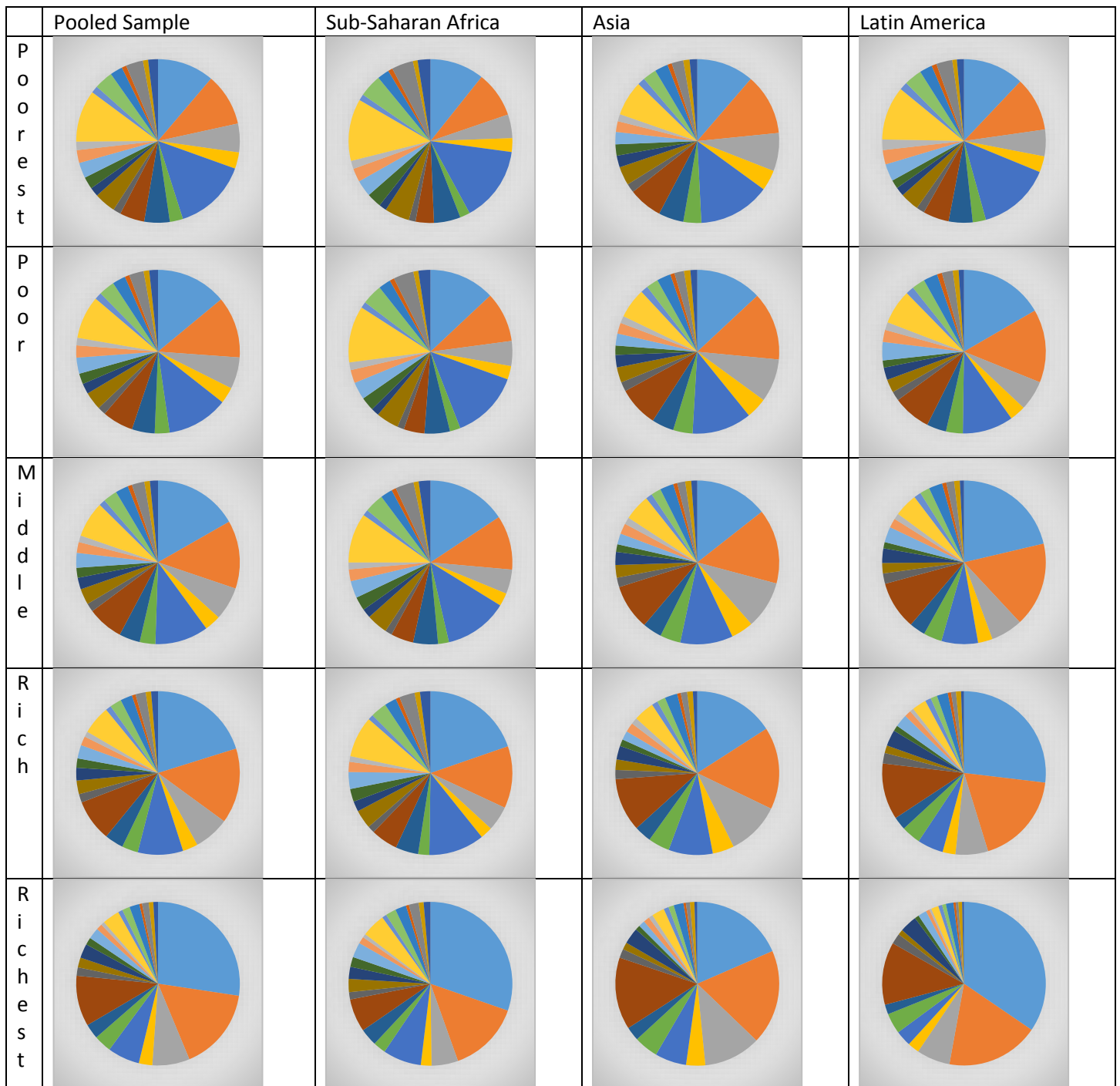
Figure 4 provided a visual representation of the distribution of fertility profiles by wealth quintiles, and by wealth quintiles across regions. The poorest were least likely to have no children (Profile 0) across all the regions. The richest in Latin America and sub-Saharan Africa were most likely to be childless.

Profile 22, a high fertility scenario with AFB < 18 , second birth $< 36m$, third birth $< 36m$, and four or more children following, was most evident for the poorest in sub-Saharan Africa. Profile 15 (AFB < 18 , second birth $> 36m$, third birth $> 36m$, fourth birth) which also sees childbearing begin young and the woman went on to have four or more children, was also most evident for the poorest in sub-Saharan Africa. Thus, in sub-Saharan Africa among the poorest, they were the ones to have the early beginning/high fertility scenarios.

For the richest in Asia, they started childbearing after the age of 18, and went on to have only one more child either < 36 months (Profile 7) or ≥ 36 months (Profile 2).

Profile 4 (AFB ≥ 18 , second birth $> 36m$, third birth $> 36m$, fourth birth) was common for the poorest in Latin America, starting their first birth after 18 and spacing subsequent births according to WHO guidelines, but still going on to have four or more children.

Figure 4: Distribution of fertility profiles, by wealth quintiles in the pooled sample, and across wealth quintiles.



Legend to show the Fertility profile number matching to the pie chart position and color

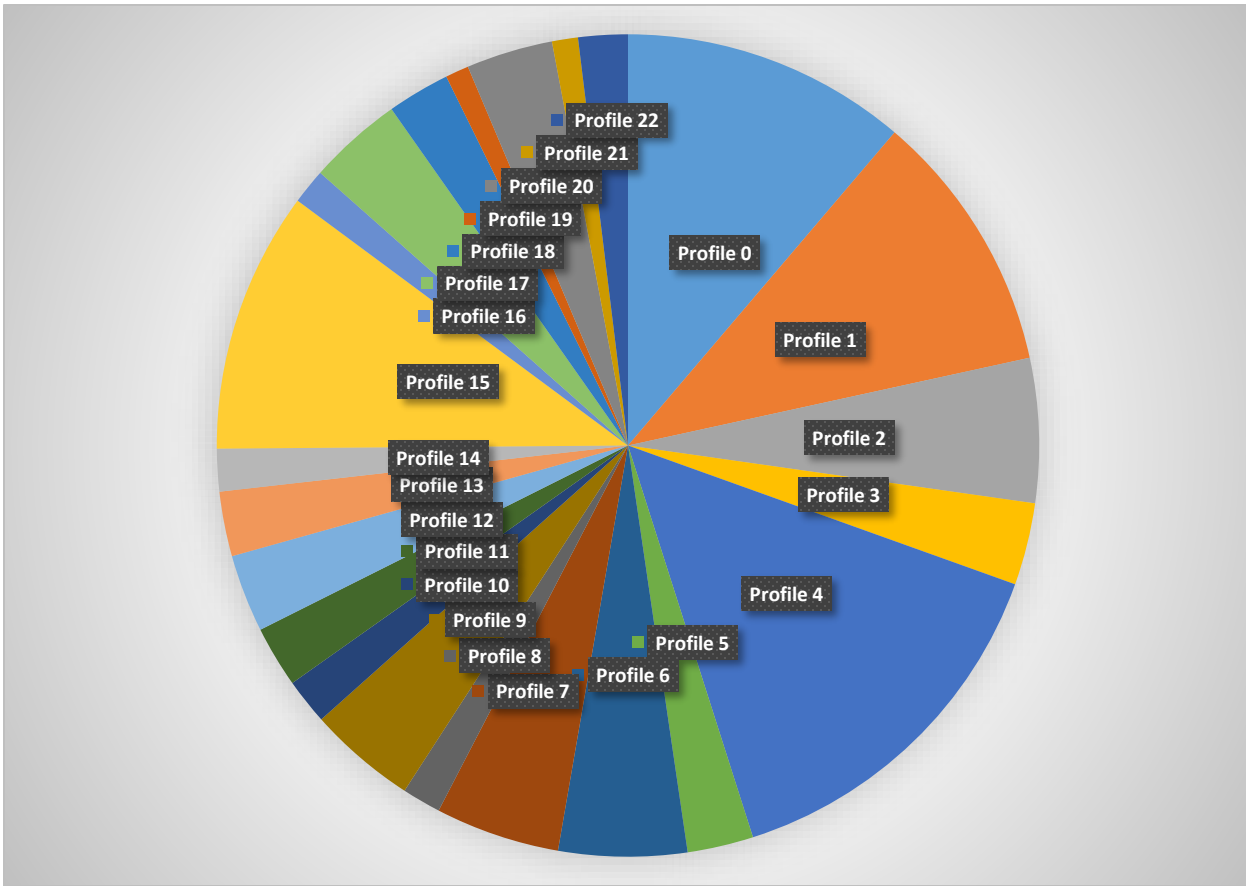


Figure 5 then showed how the univariate results of the relative risk, and the multivariate results of the adjusted relative risk of fertility profiles associated with not working (lowest rank on the empowering work index). The reversal of the ordering of the fertility profiles in not working when I conducted the multivariate analysis, showed the importance of age, education, urban/rural living, and wealth quintiles and regions, in determining the relationship between fertility and women's work.

Figure 5: Univariate and Multivariate regression results. The relative risk (unadjusted and adjusted) of “Not Working” in Panel 1, and relative risk (unadjusted and adjusted) of “Empowering-Work Index 6” in Panel 2.



For women who indicated they do not work, women who had one child, but this child was born before the age of 18, are 20% less likely (adjusted relative risk (ARR) 0.805 95% CI 0.797, 0.814) to not work (that is, they are more likely to be working), than women who have no children. This was the multivariate (adjusted) relative risk, so this result held independent of age, marital status, education, household wealth quintile, survey year, and region. For those women with the fertility profile of one child born before the age of 18 (AFB<18, no 2nd, Fertility Profile 12), they were also less likely than women with no children to be working in a type of job that scored highly (Empowering-Work Index 6), with ARR 0.884 (95% CI 1.005, 1.071), as shown in Figure 5 Panel 2.

It was women who have their age at first birth after the age of 18, and then have two more children in quick succession, but no fourth child (AFB>=18, 2nd <36m, 3rd <36m, no 4th+, Fertility Profile 10), who have the highest adjusted relative risk of working in the high empowering work (Empowering-Work Index 6) and are 29.1% (95% CI 1.235, 1.350) more likely that women with no children to work in this empowering work situation.

Indeed, considering Figure 5 Panel 2, except for women who had one child and this child being born when they were less than 18, women who had children are more likely to work in a high empowering work situation (empowering-work index 6) than women with no children – independent of age, marital status, education, wealth quintile, and region. Women with two or three (not one, nor women with four or more) – born in quick succession (fertility profiles 10, 18,

21, 7, 5), or at least one of the children born in quick succession (fertility profiles 8, 14, 19) – independent of whether the first birth was before or after age 18 – had the highest relative risk (positive opportunity) of working in the highest empowering-work situation. Women with four children, independent of age at first birth, and spacing, (fertility profiles 17, 11, 15, 6, 16, 22, 20, 9, 4) had a higher relative risk (positive opportunity) of working in the highest empowering-work situation compared to women with no children, but a lower relative risk than those women who had two or three children tightly spaced.

Looking at Figure 5 Panel 1, women who started childbearing after the age of 18, had wide birth intervals, and had four or more children (fertility profile 4) had the highest relative risk of not working (ARR 1.134 95% CI 1.124, 1.144) compared to women who had no children. Similarly, those who had three children, but the first child was born after age 18 and the next two were widely spaced (fertility profile 3) had a high adjusted relative risk of not working (ARR 1.133 95% CI 1.121, 1.146) compared to women with no children.

Conclusions

In this paper, I attempted to bring together literature from a number of domains to examine the association of fertility and women's work within the context of women's economic empowerment. Work centering on developed countries was concerned with the positive correlation between the number of children and women's labor force participation, and great effort has been made to understand the causal impact of an additional child on women's labor force participation. We learn from this literature that an additional child will decrease women's labor force participation. Most of these studies were conducted in the developed country context, but a few authors found the same in developing countries.

In a separate domain, there was concern of the relatively high rates of teen childbearing in the United States, and how this limited women's education and early career opportunities. These findings translate the developing country context where child marriage, early childbearing, education, and work opportunities are of great concern.

Birth intervals were shown in other studies to impact life course work outcomes for women. Each of these elements of fertility were shown to have a significant impact on women's work. However, because each of the elements of fertility were studied in isolation, we could not get a full picture of how a woman's fertility profile is associated with her labor force participation. Moreover, not all work can be said to empower women, and this distinction was seldom addressed in the literature on fertility and women's work. Thus, in this paper, I addressed this shortcoming by building an "empowering-work index," in which I took into account whether a woman worked, where she worked, who she worked for, how she was paid, and how much decision-making power she had over the cash earned.

As these two measures of fertility profiles and empowering-work index, were new, I indicated in detail how the fertility and work profiles differed by region, by wealth quintile, and by wealth quintile within in regions.

Asian women were the least likely to work, but of those who did, they engaged in work that ranked low on the empowering-work index compared to women in sub-Saharan Africa and Latin America. The poorest women, in the pooled sample, were most likely to work, and their work scored low on the empowering-work index compared to the richest women who worked less, but if they did work it ranked higher on the empowering work index.

The poorest women in sub-Saharan Africa had high fertility rates (four or more children), but these births were often spaced >36 months in accordance with the WHO recommendations. Many women in sub-Saharan Africa started childbearing early <18 years, but also many started their childbearing after age 18. This contrasted with the richest women in Latin America who were more likely to have two children with the first birth after the age of 18, and the second birth either <36 month or >36 months, but limiting the total number of children to two.

The unadjusted correlation was confounded by regional differences and differences across the wealth quintiles. Furthermore, marital status, the age of the women, education levels, urban/rural living, and survey year all confounded the association of the fertility profiles with the empowering-work profile. Overall, the pooled multivariate results

showed that women with one child and born before the age of 18 are most disadvantaged in the labor market – most likely to be working, but that work least likely to be in a highly empowering-work situation. We also saw that for women with more than one child, the age at first birth has little impact on work outcomes. Rather, birth spacing has a big impact on whether a women works (wide birth spacing increases the risk of not working), and short birth spacing increases the likelihood of working in a high empowering work situation. The number of children also has a small effect on work outcomes, with those with three or four+ children (not zero, one or two) are most likely to not work. Those women with two or three children (not zero, one or four+) are most likely to be working in a high empowering-work situation.

This analysis has shown the variation in fertility profiles across regions and wealth quintiles. Moreover, this paper presents a new measure of women’s work in the context of women’s economic empowerment, and notes that the poorest are in the least empowering work situations, as is also true for women in South Asia.

The relationship between the fertility profiles and the empowering-work index highlights that the number of children has a bearing on the degree of empowerment a woman’s gains from her work. Having two or three children, shorter birth intervals enhance a woman’s empowering-work situation. Thus it is not so much the number of children that limits female labor force participation, but the type of work that this leads to. In my sample, having two or three children associated with more empowering work. Short birth intervals, while having a negative impact on maternal and child health, had a positive association with a woman’s empowering-work index. The quick succession of children may have limited her when the children were young, but unlike a woman with longer birth intervals the total time she cares for very young children is less across her life course and, thus, the number of years in which she is disadvantaged in her choice of work is fewer.

This paper has made a number of important contributions to our understanding of how fertility and women’s work are associated in the context of women’s economic empowerment. This analysis informs SDG 5 of gender equality and empower *all* women and girls, and being able to observe the inequalities in the association of fertility and empowering-work, with the consideration of unpaid work beyond care and domestic duties and the impact on women’s economic empowerment, and how the degree of empowerment in a woman’s work situation is correlated with her fertility profile.

References

- Aguero, J. M. and M. S. Marks (2008). "Motherhood and female labor force participation: Evidence from infertility shocks." American Economic Review **98**(2): 500-504.
- Ahn, N. and P. Mira (2002). "A note on the changing relationship between fertility and female employment rates in developed countries." Journal of Population Economics **15**(4): 667-682.
- Anderson, S. and M. Eswaran (2009). "What determines female autonomy? Evidence from Bangladesh." Journal of Development Economics **90**(2): 179-191.
- Angrist, J. D. and W. N. Evans (1998). "Children and their parents' labor supply: Evidence from exogenous variation in family size." American Economic Review **88**(3): 450-477.
- Ardington, C., A. Menendez and T. Mutevedzi (2015). "Early childbearing, human capital attainment and mortality risk: Evidence from a longitudinal demographic surveillance area in rural-KwaZulu-Natal, South Africa." Economic development and cultural change **63**(2): 281-317.
- Baird, S., E. Chirwa, C. McIntosh and B. Özler (2015). "What happens once the intervention ends? The medium-term impacts of a cash transfer programme in Malawi." 3ie Impact Evaluation Report **27**.
- Bloom, D. E., D. Canning, G. Fink and J. E. Finlay (2007). "Fertility, Female Labor Force Participation, and the Demographic Dividend." PGDA Working Paper **25**.
- Buvinic, M., M. Das Gupta and U. Casabonne (2009). "Gender, Poverty and Demography: An Overview." World Bank Economic Review **23**(3): 347-369.
- Caceres-Delpiano, J. (2012). "Can We Still Learn Something From the Relationship Between Fertility and Mother's Employment? Evidence From Developing Countries." Demography **49**(1): 151-174.
- Chakravarty, D. (2018). "Lack of Economic Opportunities and Persistence of Child Marriage in West Bengal." Indian Journal of Gender Studies **25**(2): 180-204.
- Clarke, D. (2018). "Children and their parents: A review of fertility and causality." Journal of Economic Surveys **32**(2): 518-540.
- Cruces, G. and S. Galiani (2007). "Fertility and female labor supply in Latin America: New causal evidence." Labour Economics **14**(3): 565-573.
- de Jong, E., J. Smits and A. Longwe (2017). "Estimating the Causal Effect of Fertility on Women's Employment in Africa Using Twins." World Development **90**(C): 360-368.
- Del Boca, D., S. Pasqua and C. Pronzato (2009). "Motherhood and market work decisions in institutional context: a European perspective." Oxford Economic Papers-New Series **61**: 1147-1171.
- Filmer, D. and L. H. Pritchett (2001). "Estimating wealth effects without expenditure data - or tears: An application to educational enrollments in states of India." Demography **38**(1): 115-132.
- Finlay, J. E., Y. Efevbera, J. Ndikubagenzi, M. Karra and D. Canning (2018). "Reframing the Measurement of Women's Work in the Sub-Saharan African Context." Work, Employment and Society **First Online**.
- Finlay, J. E. and M. A. Lee (2018). "Identifying Causal Effects of Reproductive Health Improvements on Women's Economic Empowerment Through the Population Poverty Research Initiative." The Milbank Quarterly **96**(2): 300-322.
- Finlay, J. E., E. Özaltın and D. Canning (2011). "The association of maternal age with infant mortality, child anthropometric failure, diarrhoea and anaemia for first births: evidence from 55 low- and middle-income countries." BMJ Open **1**(2).
- Galor, O. and D. N. Weil (1996). "The gender gap, fertility, and growth." American Economic Review **86**(3): 374-387.
- Galor, O. and D. N. Weil (1999). "From Malthusian stagnation to modern growth." American Economic Review **89**(2): 150-154.
- Galor, O. and D. N. Weil (2000). "Population, technology, and growth: From Malthusian stagnation to the demographic transition and beyond." American Economic Review **90**(4): 806-828.
- Geronimus, A. T. and S. Korenman (1992). "The socioeconomic consequences of teen childbearing reconsidered." Quarterly Journal of Economics **107**(4): 1187-1214.
- Goldin, C. (1995). The U-Shaped Female Labor Force Function in Economic Development and Economic History. Investment in Women's Human Capital and Economic Development. T. P. Schultz, University of Chicago Press: 61-90.
- Goldin, C. and L. F. Katz (2002). "The power of the pill: Oral contraceptives and women's career and marriage decisions." Journal of Political Economy **110**(4): 730-770.

Golla, A. M., A. Malhotra, P. Nanda and R. Mehra (2011). "Understanding and Measuring Women's Economic Empowerment: Definition, Framework and Indicators." International Center for Research on Women (ICRW).

Gough, M. (2017). "Birth spacing, human capital, and the motherhood penalty at midlife in the United States." Demographic Research **37**: 363-415.

Gunduz-Hosgor, A. and J. Smits (2008). "Variation in labor market participation of married women in Turkey." Womens Studies International Forum **31**(2): 104-117.

Herrera, C., D. Sahn and K. Villa (2016). Early Fertility and Labor Market Segmentation: Evidence from Madagascar. 2016 Annual Meeting, July 31-August 2, 2016, Boston, Massachusetts, Agricultural and Applied Economics Association.

Hotz, V. J., S. W. McElroy and S. G. Sanders (2005). "Teenage childbearing and its life cycle consequences - Exploiting a natural experiment." Journal of Human Resources **40**(3): 683-715.

Joshi, S. and T. P. Schultz (2012). "Family planning and women's and children's health: long term consequences of an outreach program in Matlab, Bangladesh." IZA Discussion Paper No. 5164. **no. 6551, May, 2012**: <http://ftp.iza.org/dp6551.pdf>.

Kabeer, N. (1999). "Resources, Agency, Achievements: Reflections on the Measurement of Women's Empowerment." Development and Change **30**(3): 435-464.

Kabeer, N. (2005). "Gender equality and women's empowerment: A critical analysis of the third millennium development goal 1." Gender & Development **13**(1): 13-24.

Kabeer, N. (2012). "Women's Economic Empowerment and Inclusive Growth: Labour Markets and Enterprise Development." IDRC Discussion Paper **29/12**.

Kabeer, N. and S. Mahmud (2016). Measuring women's work—more vexing than you might think. Let's Talk Development. T. W. Bank. Washington DC, The World Bank. **2017**.

Kearney, M. S. and P. B. Levine (2012). "Why is the teen birth rate in the United States so high and why does it matter?" J Econ Perspect **26**(2): 141-166.

Mammen, K. and C. Paxson (2000). "Women's work and economic development." Journal of Economic Perspectives **14**(4): 141-164.

Menon, J. A., T. Kusanthan, S. O. C. Mwaba, L. Juanola and M. C. Kok (2018). "'Ring' your future, without changing diaper - Can preventing teenage pregnancy address child marriage in Zambia?" Plos One **13**(10): 17.

Miller, A. R. (2011). "The effects of motherhood timing on career path." Journal of Population Economics **24**(3): 1071-1100.

Moffitt, R. (1983). "An economic model of welfare stigma." American Economic Review **73**: 1023.

Moghadam, V. M. and L. Senftova (2005). "Measuring women's empowerment: participation and rights in civil, political, social, economic, and cultural domains." International Social Science Journal **57**(184): 389-412.

Molyneux, M. (1984). "Mobilisation without emancipation? Women's interests, state and revolution in Nicaragua." Critical Social Policy **4**(10): 59-71.

Narayan, D. (2002). "Empowerment and Poverty: A Sourcebook." PREM World Bank.

Ribar, D. C. (1999). "The socioeconomic consequences of young women's childbearing: Reconciling disparate evidence." Journal of Population Economics **12**(4): 547-565.

Rosenzweig, M. R. and K. I. Wolpin (1980). "Life-cycle labor supply and fertility - causal inferences from household models." Journal of Political Economy **88**(2): 328-348.

Rosenzweig, M. R. and K. I. Wolpin (1980). "Testing the quantity-quality fertility model - use of twins as a natural experiment." Econometrica **48**(1): 227-240.

Rowlands, J. (1995). "Empowerment examined." Development in Practice **5**(2): 101-107.

Stark, L. (2018). "Poverty, Consent, and Choice in Early Marriage: Ethnographic Perspectives from Urban Tanzania." Marriage and Family Review **54**(6): 565-581.

Vere, J. P. (2007). "'Having It All' no longer: Fertility, female labor supply, and the new life choices of generation X." Demography **44**(4): 821-828.

World Health Organization (2005). Report of a technical consultation on birth spacing. Maternal, newborn, child and adolescent health. W. H. Organization. Geneva.

Zou, G. (2004). "A modified poisson regression approach to prospective studies with binary data." Am J Epidemiol **159**(7): 702-706.