POLICY BRIEF

The Effect of Fertility on Women's Labour Supply in West Africa

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Abstract

This study sought to identify and analyse the effect of childbirth on female labour supply, specifically that of married women with at least one young child under 6 years of age. The number of children is the result of a decision that turns out to be endogenous. To take this endogeneity into account, the study used twins as an instrument. Accordingly, we estimated an instrumented Probit model given that female labour supply is measured by two different binary variables. Based on Demographic and Health Survey (DHS) data from five countries (Benin, Cote d'Ivoire, Ghana, Nigeria, and Senegal), the study's key findings are the

following: (i) the effect of fertility on female labour supply is not uniform across all the countries considered, and (ii) the relationship between fertility and female labour force participation is sensitive to the measure of participation used to measure it. Based on our findings, we make the following key recommendations: (i) put in place policies to encourage the transition of women from traditional jobs that are quite vulnerable to more formal jobs and (ii) implement corrective measures so that young children are no longer a penalty for women's access to formal jobs.

Introduction

Women's participation in economic activities is an important aspect of their empowerment and well-being. This empowerment entails their participation in less traditional activities, ones that go beyond agricultural work, family employment, and domestic production. There has been a downward trend in fertility in developing countries in recent decades (United Nations, 2002). According to Heath & Jayachandran (2017), an increase in female labour force participation and a reduction in gaps (between boys and girls) in school enrolment rates are two important recent trends that have been observed in most developing countries. Research has highlighted the negative effect of education on fertility through different channels (Rindfuss & Bumpass, 1980; Basu, 2002; Güneş, 2013).

Staying within the rationale of human capital theories which have been developed in various versions (Becker, 1962; Arrow, 1973; Spence, 1973; Stiglitz, 1975), a higher level of education creates more employment opportunities and thus improves the chances of participating in the labour market. In this perspective, higher levels of women's education and lower fertility rates on their part predispose them to better employment opportunities.

In developing countries, and in Africa in particular, women are more likely to work at home, on family farms, or to be self-employed in activities where they can manage their time more flexibly (Younger, 2006). Women are underrepresented in wage employment in both the developed and the developing countries. Recent literature suggests that gender plays a role in the labour market. First, there is gender segregation in the labour market (Borrowman and Klasen, 2020). Second, uneven distribution of time of homework (or care economy) between males and females affect labour market choices. Gendered social norms also affect labour market choices (Fox and Thomas, 2016). In this regard, Schaner & Das (2016) have shown that in Indonesia women leave wage employment due to family-related reasons and to childcare burdens. Female labour supply behaviour has important implications for several other phenomena such as marriage, fertility, divorce, family income distribution, and the gender wage gap (Killingsworth & Heckman, 1986).

In addition to the traditional division of labour in a household that is reflected in gender roles, there is evidence that women can increase their labour supply to compensate for shock-related losses in household income. For example, based on data from Senegal, Comblon & Marazyan (2017) found that in the case of a shock manifested in a chronic illness of an adult male household member, girls and women were more likely to work, especially when the man was working. This led the authors to suggest that traditional gender roles could be ignored to compensate for a household's income loss. Such a suggestion points to not only the potential additional income but also the extra welfare that could be gained by a household by even slightly modifying the traditional division of labour to allow for more female labour supply.

Several studies conducted in developed countries found that fertility had a negative impact on women's labour supply (Angrist & Evans, 1998; Heath & Jayachandran, 2016). The question arises therefore of whether the same findings can be made in developing countries. The relevance of such a question lies in the differences that exist between labour markets in developed and developing countries. For Younger (2006), it is important for policy makers in Africa to understand the relationship between demographic transition and differences in time allocation, hence the relationship between fertility and labour supply in a poverty-reduction perspective. According to the author, increasing women's employment opportunities or improving their wages can lead to a significant reduction in fertility, since women will choose to spend less time raising their children and more time working. This in turn will lead to income gains for the household and, ultimately, to poverty reduction.

What is the effect of fertility on women's labour supply? The present study seeks to identify and analyse the effect of births on married women's labour supply in a sample of developing countries. According to Gündüz-Hoşgör & Smits (2008), given the high significance of actions in favour of women's empowerment, it is important to deepen our understanding of the factors that promote or inhibit female employment in developing countries. The present study is an empirical one which focuses on a sample of five member countries of the Economic Community of West African States (ECOWAS): Benin, Côte d'Ivoire, Senegal, Ghana, and Nigeria.

The present study's contribution is three-fold: (i) the study uses a country-specific estimation which enables it to highlight differences in effect by country; (ii) it uses two measures of female labour force participation to capture the possible specificities of occupational status; and (iii) it enables a comparison between French- and English-speaking countries belonging to the same economic space. Our study leads to differentiated effects according to the two groups of countries (French-speaking and English-speaking). To our best knowledge, there is no study on these specific countries before.

Trends in fertility and female labour force participation

Women are much more likely to work as self-employed in the informal sector, than to earn a regular salary from formal work. In the formal sector, women occupy 4 out of 10 jobs and earn on average two-thirds of what their male colleagues earn (*BAD*, 2015). Globally, the gender wage gap is estimated at 23%; in other words, women earn 77% of what men earn. Even when hourly rates are taken account of (since women work shorter hours than men), women still face a wage gap of 10% or more in countries for which data are available. These gender wage gaps cannot be explained by differences in education or age alone; they are also related to the undervaluing of women's work and skills in female-dominated occupations, to discriminatory practices, and to the need for women to take career breaks to be able to take on other responsibilities, especially after the birth of a child (*OIT*, 2016).

Women in Africa do most of the agricultural work, they own a third of all businesses. Beyond their income-generating activities, they are the main drivers of the domestic economy and family welfare and play an indispensable – but often unrecognized – leadership role in their communities and countries. Yet, across the African continent, women face a range of barriers to realising their full potential: from restrictive cultural practices and discriminatory laws to highly segmented labour markets. Eliminating gender inequality and empowering women could increase the productive potential of a billion Africans and would significantly boost the continent's development potential (*BAD*, 2015).

One of the consequences of the burden of domestic production and childcare on women is that they are relegated to vulnerable employment. Table 1 highlights the comparative fertility rate in the five countries included in the study.

The table 1 shows the total fertility rate over the last ten years. Total fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates of the specified year.

The table 1 show that the birth per women has declined over the last ten year but the mean of fertility rate on the five countries (4.86) still high compared to that of the world (2.45) and approximately the same of that of Sub-Saharan Africa (4.91) on the same period. The average labour force participation (labour force participation rate is the proportion of the population ages 15 and older that is economically active: all people who supply labour to produce goods and services during a specified period) in the five countries is over that of the world (41.72) and under that of Sub-Saharan Africa (61.35). At the same time, the

average rate of vulnerable employment (Vulnerable employment is contributing family workers and own-account workers as a percentage of total employment) of women is over that of world (45.49) and that of Sub-Saharan Africa (83.75). It is important to identify the empirical relation between fertility and women participation to labour market.

Table 1: fertility rate

Years	Benin	Côte d'Ivoire	Ghana	Nigeria	Senegal
2000	5.962	5.87	4.826	6.106	5.448
2001	5.889	5.793	4.753	6.083	5.365
2002	5.82	5.713	4.681	6.06	5.292
2003	5.754	5.63	4.612	6.036	5.232
2004	5.691	5.545	4.548	6.011	5.185
2005	5.632	5.46	4.49	5.985	5.149
2006	5.576	5.376	4.438	5.958	5.124
2007	5.522	5.296	4.392	5.93	5.107
2008	5.469	5.221	4.35	5.902	5.094
2009	5.416	5.152	4.311	5.872	5.081
2010	5.362	5.088	4.273	5.839	5.064
2011	5.305	5.029	4.234	5.802	5.039
2012	5.246	4.974	4.192	5.758	5.005
2013	5.183	4.92	4.146	5.709	4.96
2014	5.116	4.867	4.095	5.653	4.905
2015	5.047	4.813	4.041	5.592	4.841
2016	4.977	4.759	3.984	5.526	4.77
2017	4.906	4.704	3.926	5.457	4.697
2018	4.836	4.649	3.87	5.387	4.625
2019	4.767	4.593	3.816	5.317	4.556

Source: World Development Indicators

Table 2 shows that women are more involved in vulnerable employment than men (referring to the mean in table 2). In African societies, women are generally oriented towards domestic production, employment in agriculture, and small-scale income-generating activities, rather than towards paid work. The question is to know how women's fertility can affect the level of women's labour market participation or the quality of their labour market integration. By relating the women's fertility rate to vulnerable employment across all the five countries, a strong positive correlation can be observed (for instance 0.97 for Ghana and Senegal). This correlation means that the more children a woman must care for, the more likely she is to be employed in family employment or to be self-employed.

Table 2: Proportion of vulnerable employment for women and men in the 5 countries in the sample

Years	Benin		Côte d'Ivoire		Ghana		Nigeria		Senegal	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
2000	95.1	84.1	93.5	72.7	88.6	76.3	91.6	85.5	86.2	75.0
2001	94.9	83.6	93.7	73.8	88.3	75.8	91.9	86.0	85.1	73.7
2002	94.8	83.4	93.5	73.8	87.9	75.3	92.0	86.0	84.8	72.9
2003	94.8	83.2	93.3	73.9	87.5	74.8	91.1	84.6	84.3	72.3
2004	94.8	83.3	92.9	73.4	87.1	74.2	90.3	83.2	83.3	71.2
2005	94.7	83.1	92.6	73.2	86.7	73.7	89.7	82.4	82.6	70.5
2006	94.8	83.1	92.2	72.7	86.0	72.2	89.5	82.1	82.0	69.7
2007	94.8	83.1	91.9	72.3	85.6	71.6	89.1	81.5	80.7	68.7
2008	94.9	83.2	91.3	71.6	85.3	70.8	88.5	80.5	80.1	67.9
2009	94.8	83.0	90.7	70.8	85.0	70.3	88.4	80.3	79.2	66.9
2010	94.7	82.9	90.4	70.8	84.3	69.1	87.1	78.3	78.3	66.0
2011	94.8	83.0	89.8	70.8	82.4	66.6	85.9	76.6	77.2	64.8
2012	94.8	83.0	88.8	69.1	81.3	64.7	86.5	76.9	76.3	63.7
2013	94.6	82.7	86.7	68.5	80.6	63.3	87.1	77.1	75.6	62.9
2014	94.3	82.4	85.9	67.1	79.6	62.2	86.9	76.9	74.4	61.7
2015	94.1	81.9	85.7	66.0	79.3	61.8	87.4	77.6	73.3	60.7
2016	94.1	82.1	85.1	64.6	79.2	61.8	87.5	78.1	72.5	60.0
2017	93.8	81.6	82.7	64.3	78.3	60.5	86.6	76.8	71.5	59.3
2018	93.6	81.3	81.5	62.9	77.4	59.4	85.7	75.6	70.7	58.7
2019	93.1	80.6	80.4	61.5	76.7	58.4	85.2	74.9	69.8	58.1
Mean	94,515	82,73	89,13	69,69	83,355	68,14	88,4	80,045	78,395	66,235

Source: World Bank data

Economic analysis of women's labour supply

According to Nicoletti et al. (2018), previous increase in female labour force participation has declined over the past decades, while the proportion of mothers working full-time has increased in Norway. In the developing countries, there are still many barriers to women's labour supply, especially for married women. The barriers include the education level and fertility rate; the latter remains high compared to that in other regions of the world, although it is on a downwards trend. Using Mexican and Argentinean data, Cruces & Galiani (2007) found that there was a negative relationship between women's having more than two children and their labour supply. Using "preference for the sex of the child" as an instrument for the endogeneity of fertility, the authors found an effect that was robust for the different estimation techniques they used, namely the OLS and the instrumental variables. While analysing the effect of fertility on women's labour supply in Sub-Saharan Africa, Jong et al. (2017) used

"giving birth to twins" as an instrument for the number of children and found that the number of young children was negatively associated with women's participation in non-farm employment. This finding indicates a negative causal effect of fertility on women's employment opportunities in Africa.

Dayıoğlu & Kırdar (2010) have shown that women's fertility behaviour is very important in their labour force participation decision since children influence the opportunity costs of labour. The authors found, in the case of Turkey, that women who had at least one child participated less in the labour market, especially in urban areas. For their part, Hupkau & Leturcq (2017) found mixed effects. Using "time of conception of the first child" as an exogenous variation of the probability of having more children, the authors found that having more children decreased the probability of holding sustainable jobs but did not reduce the labour supply of high- and medium-skilled mothers. Their results indicated that among the highly qualified women it is those who tended to have only one child who were most attracted by the labour market. The authors' explanation for such findings is that these seem to stem from unobserved attributes that negatively affect labour market outcomes and the probability of the woman remaining in a relationship with the father of her first child, which in turn negatively affects the probability of having a second child. The mixed results show that family size is not a determinant of highly qualified women's employment. This means that the effect of fertility on women's labour supply is not linear.

With the aim of accounting for the endogeneity of fertility and employment decisions, Longwe et al. (2013) used "the unmet need for family planning" as an instrument for the number and spacing of recent births and found that these two variables had negative effects on women's labour supply. Interaction analysis showed that the most highly educated women and those living in urban areas suffered the most from this negative. This led the authors to suggest that investment in birth control techniques could improve women's wage-employment opportunities. Benefo & Pillai (2003) found that the presence of children under the age of five in a household reduced the probability of participating in the labour market in Ghana. In contrast, Baah-Boateng et al. (2013) reported a complementary relationship between women's labour supply and their having young children. In other words, women with children were more likely to participate in the labour market.

It seems that the empirical relationship between fertility and women's labour supply is not yet fully understood in the literature and that the magnitude of its effects is still subject to debate. For example, Salamaliki et al. (2013) found that women's labour supply and fertility were in an indirect bidirectional causal relationship both in aggregate terms and in specific age groups. However, Agüero & Marks (2008) were less affirmative about the effect of fertility on female labour force participation: they showed that for women who did not actively control their fertility, having a child was not a barrier to their labour supply. They pointed out that their results were consistent

with the hypothesis that an increase in women's labour supply in Latin America could be attributed to a decrease in family size. Thus, in their opinion, policies that focused exclusively on family planning were unlikely to increase women's labour supply.

In the same vein, using the two instruments commonly reported in the literature (the sex of the first two children and giving birth to twins), Aaronson et al. (2020) made three main findings by using a compiled data set of 441 censuses and surveys from between 1787 and 2015: first, the effect of fertility on women's labour supply is small and indiscernible in the case of low-income women but large and negative in the case of high-income ones. Secondly, that effect is robust across time in developed countries and cross-sectionally in developing countries. Thirdly, the results are robust in relation to other instruments, to different demographic groups, to different education level groups, to redefinitions of the labour supply base, and to different specifications and data. For the authors, these results are consistent with a negative substitution effect related to an increase in wage rates due to changes in the structure of formal non-agricultural jobs held by women depending on their country's level of development.

Data source

The data used in the present study come from the Demographic and Health Survey (DHS), which is representative of household surveys. This type of survey is conducted in several developing countries by national institutes of statistics and is a reliable basis for information collected on households and individuals. This information concerns all the members of the households surveyed, but part of the survey focuses on women aged 16 to 49 years and collects detailed information about the latter.

Conclusion and policy implications

The present study has analysed the effect of fertility on female labour force participation in Benin, Senegal, Côte d'Ivoire, Ghana, and Nigeria. Methodologically, it used instrumental variables to correct for the endogeneity bias of the fertility decision. The target population consisted of married women aged 18-49 with at least one dependent child under 6 years of age. Labour force participation was measured by two binary variables: one that considered both paid and unpaid work and a second one that considered only paid non-farm employment. Using these two different measures of labour force participation has enabled the study to test the robustness of the effects and to highlight possible contextual specificities. The key findings from the study are the following: (i) the effect of fertility on female labour supply is not uniform across all the countries considered, and (ii) the relationship between fertility and female labour force participation is sensitive to the measure of participation used to measure it.

Based on our findings, we make the following policy recommendations:

(1) *For Benin, Senegal, and Côte d'Ivoire:* It would be important to put in place policies to encourage the transition of women from traditional jobs that are quite vulnerable to more formal jobs. Also put in place corrective measures so that young children are no longer a penalty for women's access to formal jobs.

(2) *For Ghana:* Even if fertility does not seem to be an obstacle for women, it would be good for public policies to reassure themselves that women benefit from equitable access to the labour market in the same proportions as men.

(3) *For Nigeria:* Put in place incentive measures to encourage and promote the participation of married women with young children in charge of the labour market.

Future studies could look at the costs of motherhood on women's labour supply by considering aspects such as the number of children, the inter birth interval and childcare. This will provide other explanations for the different relationships between fertility and women's participation in the labour market.

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