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Female work status and child nutritional outcome in Nigeria

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Abstract: This paper delves into the relationship between child nutritional outcome and (multiple) female work status in Nigeria from a micro perspective. The child nutritional outcome is proxied by child weight-for-age. Female work includes wage employment outside the household, household on-farm agricultural work, and household non-farm enterprise activities. Multilevel mixed-effects regression results show that female involvement in any type of work is positively and significantly associated with child weight-for-age. However, female simultaneous involvement in on-farm and non-farm work is the only female work combination positively and significantly associated with child weight-for-age. We describe the mechanism behind our findings through the lens of (positive) income effect versus (negative) childcare effect, which is consistent with two sets of further findings. On one hand, sub-sample analysis shows that female wage work significantly matters, in a non-linear fashion, for children aged two to five years (toddlers) and boys exclusively. On the other hand, female on-farm work significantly matters for children aged zero to two years (infants) and girls exclusively.

Keywords: female work status, income effect, childcare effect, child nutrition, Nigeria
JEL classification: J2, J3, I3

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1 Introduction

Worldwide, the participation of women (aged 25 to 54) in paid work has increased thanks to expanding educational opportunities and advances in their aspirations (OECD 2011; UN 2015). Across 26 OECD countries, most mothers are in paid work when children go to school, and even before their children reach three years of age (OECD 2011). Over the last decade, gender gaps in labour force participation rates have narrowed slightly in most regions, while the number of women in vulnerable employment, defined as the share of own-account and contributing family workers in total employment,[1] has also decreased over time and amounts to 46 per cent globally (ILO 2016).

Despite this medium average prevalence of, and downward trend in, vulnerable employment at the global level, the issue of vulnerable employment remains particularly acute in developing countries (where it affects over three-quarters of the employed population) and for women in particular. More specifically, the rate of vulnerable employment is still as high as 70 per cent in sub-Saharan Africa, where gender gaps in unemployment (especially for young women), paid labour force participation, vulnerable employment, pay, etc. persist (ILO 2016). Further mobilizing the female labour supply and promoting gender equality in paid and unpaid work is presented as a key element for ensuring future economic prosperity (OECD 2011; UN 2015; ILO 2016).

While such advocacy is appealing in principle and from a macro-economic perspective, there are some nuances from a micro perspective when it comes to the implications of women's work. Indeed, men and women all have multiple roles (productive, reproductive, and community management) in society (Moser 1989; Blackden and Bhanu 1999). Men are generally able to focus on a single productive role and perform their multiple roles sequentially. However, as wives, mothers, primary caregivers and workers, women perform their multiple roles simultaneously, making their labour time and flexibility much more constrained than those of their male counterparts (Blackden et al. 2006). In fact, when all paid and unpaid work is accounted for, women work longer hours per day than men (on average, 30 and 50 minutes longer per day in developed and developing countries, respectively).

The micro-level implications of an increase in labour supply at both the extensive and intensive margins for a given worker are anything but trivial. While the (positive) income effect, emerging from whether the job is paid and how much is paid, is the most obvious effect, it is not all that matters. Other job features, such as quality, working hours and their flexibility, and workplace–household proximity, are of paramount importance. As we shall see in the literature section, such features can adversely impact a range of intermediary well-being outcomes such as work–life balance, workers' own (mental) health, parent–child interaction, and time and quality of (personally provided) childcare. Such potentially adverse effects are particularly worrisome for female workers in sub-Saharan Africa. In many sub-Saharan African countries, female workers, whether part time or full time, still have to simultaneously fulfil their multiple roles as wives, mothers, and primary caregivers within their households. Furthermore, most African countries lack the good and inclusive family policies and programmes (parental paid leave, maternity paid leave, paternity paid leave, etc.) that support work–life balance for working mothers. At the end of the day, whether and how female work benefits children goes beyond the mere income effect of female work.

[1] These categories of work are typically subject to high levels of precariousness in that individuals in vulnerable employment often have limited access to social protection schemes.

This paper delves into the relationship between female work status and child nutritional outcome in Nigeria. As noted in Leslie (1988) and Basu (1996), studies documenting the 'women's work–child health and nutrition' nexus are likely to lead to inconsistent results if they do not separate the earned income, childcare (for example through breastfeeding), and age effects.

In characterizing female work status, this paper explicitly distinguishes between three types of work activities, namely: (i) wage employment outside the household, (ii) household on-farm agricultural work, and (iii) household non-farm enterprise activities. These three types of work feature different attributes that are key in documenting and understanding the impact of each type of women's work on child outcomes. For instance, all else equal, one can expect, through the income effect, that children of mothers working exclusively for a wage outside the household (to some extent) will be better off in terms of nutritional status, compared to children of non-working and incomeless mothers. Similarly, all else equal, through the food production/availability channel, children of mothers working exclusively in agriculture can be expected to be better off compared to those of non-productive mothers.

However, mothers who work too much outside the household, or who combine both, or more, types of work might be so busy that they lack enough time for personally provided childcare. If alternative childcare options are unavailable, inaccessible and unaffordable, or of low quality, children can ultimately be relatively worse off through the negative childcare effect, which is likely to attenuate the (cumulative) income and food production effects. That being said, the relative importance of both income and childcare effects is likely to change along the child age distribution. Indeed, children of different age groups have different needs. For instance, young children need relatively more parental childcare than older children, whereas older children have relatively more and costlier needs, such as food diversification, than very young children. Therefore, the income and childcare effects are likely to disproportionately benefit younger and older children, with younger children benefiting more from the childcare effect and older children benefiting more from the income effect.

The case of Nigeria in sub-Saharan Africa is interesting for a few reasons. Indeed, often referred to as the giant of Africa, Nigeria is the most populous country and the first economy in Africa. It ranks eighth among the top ten countries with the highest population and labour force worldwide (NBS 2015). Recent trends in Nigeria feature a diversification and a structural transformation of its economy from an agrarian to a tertiary service economy. Unfortunately, such 'tertiarization' transition has failed to deliver quality jobs (Ajakaiye et al. 2015). While the labour force, that is the total number of employed and unemployed persons, increased by 2.9 per cent between 2010 and 2014, the total labour force in full remunerative employment,[2] the under-employed population,[3] and the unemployed population[4] increased by an average of 2 per cent, 6.1 per cent, and 16.48 per cent over the same period (Ajakaiye et al. 2015). The incidence of unemployment, prevalence of under-employment, and scarcity of quality job opportunities are much higher for women than men (NBS 2015). According to the 2015 World Development Indicators (World Bank 2015), the unemployment rate is much higher in Northern Nigeria, where subsistence agriculture occupies two-thirds of the population, and relatively lower in Southern Nigeria, where more than half of the population engage in self-employed work.

[2] Full employment is defined as employment that involves at least 40 hours of work per week.

[3] Under-employment is defined as employment that involves between 20 and 39 hours of work per week.

[4] Unemployment refers to pure unemployment (that is, zero hours of work) and any work involving less than 20 hours of work per week.

The remainder of the paper is structured as follows. Section 2 reviews the literature related to this paper. Section 3 presents the dataset and key variables we use and statistically describes them. Section 4 presents our empirical methodology, while Section 5 presents and discusses our main findings. Finally, we conclude the paper in Section 6.

2 Related literature

This study is indirectly related to the literature about work–life balance in that the actual characteristics of women's work (both quantitatively and qualitatively) interact with their substantive roles as wives and mothers to ultimately impact on their own, marital, households', and children's well-being through work–life balance. Although there is no commonly accepted definition of the concept of work–life balance (Adisa et al. 2014), most of the suggested definitions converge on two points: on one hand, the term 'balance' is not about equal amount of time being spent across work and family, but rather about a satisfactory level of involvement between the multiple roles in an employee's life (Osoian et al. 2011). Work–life balance matters for human resource development (Grzywacz and Carlson 2007) and is essential for a well-functioning and healthy society (Grzywacz and Bass 2003; Halpern 2005; Grzywacz and Carlson 2007).

For female workers, such a balance, though highly desirable, is hard to achieve given their triple roles as workers, wives, and mothers. Studies, mainly for developed countries, show that excessive working hours adversely impact workers' well-being, whereas the quality of work is of paramount importance for their well-being (Marmot and Brunner 2005). In the specific case of Nigeria, two studies delve into the work–life balance of Nigerian female professionals and demonstrate the intricacy and challenge of combining their multiple roles as mothers, wives, primary caregivers, and professionals in the health sector (Adisa et al. 2014) and the academic sector (Ogbogu 2013). Both studies highlight factors that contribute to greater work–life conflict and how this impacts women's performance and well-being. Next, there is wide evidence that mothers' well-being subsequently benefits children's well-being. More specifically, behind every healthy child is a healthy mother. For example, for a review of the consequences of maternal depression on child development, we refer to Surkan et al. (2011) and Herba et al. (2016).

The triple role of women as workers, wives, and mothers is key to understanding the nexus between women's work status and child outcomes. This nexus can be described through two opposing effects. On one hand, there is the expected positive income effect, in which the working woman brings income to the household and contributes to the purchase of goods, including food, health and education services, clean water, and sanitation that contribute to child development. For instance, when it comes to child health status, there is evidence that mothers' ability to seek treatment for sick children depends closely on their ability to access resources, either independently or from other members of the household (Anyangwe et al. 1994; Rashed et al. 1999; Hausmann Muela et al. 2000; Franckel and Lalou 2009).

A number of studies corroborate this positive income effect on nutritional status, including Engle (1993) for Guatemala, Blau et al. (1996) for the Philippines, Popkin et al. (1997) for China, and Jayachandran and Jarvis (1986) for 60 less-developed countries.

On the other hand, there is a potentially negative effect on child well-being in that, as mothers, women who work may be time-constrained to provide the necessary quantitative and qualitative care for their children compared to those that stay at home (Leslie 1988; Glick and Sahn 1998; Lamontagne et al. 1998). Excessive working hours reduce the time parents spend personally with their children (Yeung et al. 2001). When pre-school children are left alone, in the absence of kin

or with unreliable supervision, they are at risk of injury or accident. At the end of the day, poor-quality and non-standard jobs engender detrimental effects on children's emotional and behavioural outcomes (Strazdins et al. 2004; Strazdins et al. 2010). Children from low-income or single-mother households where mothers have the most precarious jobs are the most at risk (Han 2008). When it comes to child health and nutritional status, this time constraint applies especially to breastfeeding (Leslie 1988; McGuire and Popkin 1990; Hobcraft 2000). The length of time of exclusive breastfeeding is likely to shorten for women working in the formal sector (Yimyam et al. 1999, for Thailand), whereas it is found to be longer for women employed in the informal sector (Shapiro and Tambashe 1997, for the current Democratic Republic of the Congo). Mothers employed outside the home are less likely to exclusively breastfeed their children (Leslie 1988; Basu 1996) than non-employed mothers. Benefo and Parnell (1991) show that in Ghana women who work closer to their home are more likely to breastfeed for longer, while those who are paid have shorter breastfeeding duration. Two studies in Nigeria reveal that the resumption of work after maternity leave prevents working mothers from breastfeeding for longer (Di Domenico and Asuni 1979; Ekanem 1993). Finally, other studies also show that infants who are exclusively breastfed are subsequently less likely to have such diseases as diarrhoea, respiratory infections, and malnutrition (Huffman and Lamphere 1984; Popkin and Doan 1990).

The relative importance of the two opposing effects and the overall effect of women's work are likely to depend on the work's type and features, the level or share of female income, and the child's age. For example, paid work outside the household, as opposed to unemployment or self-employment (such as running a business from home), may provide less time for childcare, which may increase the 'negative effect'. However, the higher her share of income, the more a woman can afford childcare substitutes, which will simultaneously increase the positive effect and attenuate the negative effect. Also, the negative effect is more likely to prevail during infancy (particularly during the first six months when exclusive breastfeeding is highly recommended), whereas the positive effect is more likely to prevail during childhood when the need for food diversification requires greater income (Benefo and Parnell 1989; Abbi et al. 1991; Engle 1991).

3 Data

3.1 Dataset

This paper uses data from the third wave of the Nigeria General Household Survey Panel (henceforth GHS-Panel) that interviewed 4,581 households in 2015 to 2016.[5] We refer to the 2015–16 GHS-Panel basic information document (World Bank 2016) for information about all aspects of the GHS-Panel third wave including the survey instruments, namely the household, agricultural, and community questionnaires. The household and agricultural questionnaires, in particular, gather information that we rely on to compute the key variables described below.

3.2 Key variables

Child characteristics

The household questionnaire collects information on the health of all household members and, in particular, anthropometric data for children aged less than 84 months (less than seven years). We rely on these data, in conjunction with child age and gender, to construct a child 'weight-for-age

[5] This number corresponds to households interviewed in both post-planting and post-harvest visits.

Z-score' for all children under five years of age. Child weight-for-age Z-score is a commonly used anthropometric index of child growth and nutritional status. It is a general measure of child health that reflects acute and chronic malnutrition and illness.

Table 1 statistically describes certain characteristics, including the nutritional status, of children aged below five years (60 months). The average age of these children is 31 months, and 48.1 per cent are girls. The mean of weight-for-age Z-score is -0.765.[6] The corresponding proportions of underweight and severely underweight children[7] amount to 21.1 per cent and 9.2 per cent, respectively. In the four weeks prior to the survey, 24.3 per cent of children were sick, but only 12 per cent were inactive for that reason. In the 12 months preceding the survey, only 2.3 per cent of children under five had been hospitalized. The day before the survey, 42.9 per cent of children slept under a bednet. A marginal share (2.6 per cent) of children presently attend school, probably because they are too young for formal school.

Female work characteristics (status, hours, and wage)

The household questionnaire gathers a wide range of information pertaining to labour of household members aged five years and above. This includes whether, and for how many hours, the individual was involved in: (i) a wage/salaried job outside the household, (ii) an on-farm job within the household, or (iii) a household or own-account business during the previous seven days. Wage information is further collected for salaried work. We rely on the aforementioned information to construct six key variables pertaining to female work status. The first three variables are three dummy indicators, one for each of the three types of female work. Each dummy equals one if the female was involved in the corresponding type of work over the previous seven days, and zero otherwise. Because some women were involved in multiple types of work, we also construct a categorical variable (fourth key variable) representing the female threefold work status over the three types of work. The fifth key variable represents female absolute income, while the sixth represents the female relative contribution to household total wage income, namely female wage share.

Table 1: Child characteristics

Variable	Mean	Std Dev	Min	Max	N
Age (in months)	31.423	17.571	0	60	3,076
Girl (dv)	0.481	0.5	0	1	3,076
Weight-for-age Z-score	-0.765	1.684	-5.97	4.98	2,967
Underweight (dv)	0.211	0.408	0	1	2,967
Severely underweight (dv)	0.092	0.289	0	1	2,967
Ill during last 4 weeks (dv)	0.243	0.429	0	1	3,076
Inactive during last 4 weeks (dv)	0.12	0.325	0	1	3,076
Hospitalized during last 12 months (dv)	0.023	0.149	0	1	3,076
Slept under bednet previous day (dv)	0.429	0.495	0	1	3,076
Presently at school (dv)	0.026	0.159	0	1	3,076

Source: Authors.

[6] Following recommendations from the World Health Organization (WHO), any weight-for-age Z-score lower than -6 or greater than +5 is considered to be out of plausible range. In such cases, we deleted the corresponding observations from our analysis.

[7] A child is deemed to be 'underweight' and 'severely underweight' if his or her weight-for-age Z-score is lower than -2 and -3 standard deviation from the international reference median value, respectively.

Table 2 displays the distribution of female and male threefold work status (with regard to the three types of work) over the seven days prior to the survey (Panel A), as well as some descriptive statistics of female hours of work and wage incomes (Panel B). In Panel A, work status is described in the sample of households with an (identified) adult woman and an adult man, respectively.[8] In about a third of households with an adult woman (32.02 per cent), women report that they were not involved over the previous seven days in (i) wage/salaried work outside of the household, (ii) on-farm work within the household, or (iii) an off-farm income-generating activity within the household. Another third of women (33.96 per cent) report that they were engaged exclusively in non-farm income-generating activity. Almost one-fifth of women (19.46 per cent) were engaged exclusively in on-farm work within the household. Only 5 per cent of women (4.92 per cent) report working exclusively in wage employment outside the household. The remaining women (almost 10 per cent) combined different types of work, most notably in on-farm and non-farm activities within the household.

The counterpart distribution for male threefold work status is somewhat different. Men are half as likely as women not to have been involved in any type of work (only 16 per cent against 32.02 per cent for women). They are more than twice as likely to have been involved exclusively in wage/salaried work (11.37 per cent against 4.92 per cent for women). They are 10 percentage points more likely to have been engaged exclusively in on-farm work within the household (29.69 per cent against 19.46 per cent for women). However, they are also 10 percentage points less likely to have been engaged in non-farm income-generating activities within the household (22.98 per cent against 33.96 per cent for women). Finally, 20 per cent of men combine different types of work (against 10 per cent of women).

On average, women spend 39 hours per week on wage work outside the household (N = 301), 26 hours per week on on-farm work within the household (N = 1,183), and 37 hours on non-farm, own-account, or household work (N = 1,802). The unconditional annualized female wage income amounts to 56,304 Naira, which corresponds to an unconditional female wage share of 27.6 per cent. Conditional on women working for and earning a (positive) wage (N = 298),[9] the annualized average female wage income amounts to 867,992 Naira, which represents 75 per cent of their total household wage income. This share is high because most of these women are either widowed or married to husbands with no wage income.[10] Conditional on both women and men working for and earning a (positive) wage (N = 122), the annualized average female wage income amounts to 597,012 Naira, which represents 38 per cent of their total household wage income.

Other variables

The data at hand provide a wide range of information that we use as control variables in the econometric exercise. These include, broadly speaking, parents' characteristics (age, education, health status, marital status. etc.), and household characteristics (size, composition, expenditures, food security status,[11] location, etc.).

[8] The distribution of female and male threefold work status is generally similar when the sample is restricted to households with at least one child under five years of age for whom we could compute the weight-for-age.

[9] Among the 301 women with wage work outside the household, three have reported non-positive wage earnings.

[10] More specifically, out of the 298 women, 73 (24.5 per cent) are widowed, 103 (34.56 per cent) are married to husbands with no wage income, and the remaining 122 (40.94 per cent) are married to salaried husbands.

[11] Household food security status is proxied by scores that we describe in Appendix A.

Table 2: Distribution of female and male threefold work status

Panel A. Distribution of female and male threefold work status

Threefold work status	Female # (%)	Male # (%)
No work	1,353 (32.02)	599 (16.33)
Wage work outside the household	208 (4.92)	417 (11.37)
On-farm work	822 (19.46)	1,089 (29.69)
Non-farm work	1,435 (33.96)	843 (22.98)
Wage work + on-farm work	40 (0.95)	147 (4.01)
Wage work + non-farm work	46 (1.09)	54 (1.47)
On-farm work + non-farm work	314 (7.43)	499 (13.60)
Wage work + on-farm work + non-farm work	7 (0.17)	20 (0.55)
Total	4,225 (100)	3,668 (100)

Panel B. Female and male wage income

Variable	Mean	Std. Dev.	Min	Max	N
Hours of female wage work	38.867	9.66	2	96	301
Hours of female on-farm work	25.915	15.17	1	77	1,183
Hours of female non-farm work	37.145	19.357	1	105	1,802
Female wage*	56,304.283	1,128,504.48	0	70,400,000	4,594
Female wage**	86,7992.872	4,357,483.332	480	70,400,000	298
Female wage***	59,7012.107	524,660.946	45,000	3,300,000	122
Female wage share*	0.276	0.411	0	1	805
Female wage share**	0.745	0.326	0.018	1	298
Female wage share***	0.378	0.176	0.018	0.882	122

Notes: * Unconditional. ** Conditional on female working for and earning a (positive) wage. *** Conditional on both female and male working for and earning a (positive) wage.

Source: Authors.

4 Methodology

We estimate a multilevel mixed-effects linear model as described below:

$$Z - score_{ih} = \beta_{0h} + \boldsymbol{\beta_{1h}} \boldsymbol{X_{1ih}} + \epsilon_{ih} \quad (1)$$

- $Z - score_{ih}$ is the Z-score of interest (weight-for-age and height-for-age) of child i in household h;
- $\boldsymbol{X_{1ih}}$ are individual child characteristics, including child age (or year or birth), sex, and health status;

$$\beta_{0h} = \gamma_{00} + \gamma_{f01} W_{fh} + \gamma_{m01} W_{mh} + \gamma_{f02} S_{fh} + \boldsymbol{\gamma_{0k}} \boldsymbol{Z_{kh}} + \mu_{0h} \quad (2)$$

$$\beta_{1h} = \gamma_{10} + \gamma_{f11} W_{fh} + \gamma_{m11} W_{mh} + \gamma_{f12} S_{fh} + \sum_{k=3}^{K} \gamma_{1k} Z_{kh} + \mu_{1h} \quad (3)$$

Where:

- W_{fh} and W_{mh} are (set of) variables representing female and male work status in household h;
- S_{fh} represents the share of female wage relative to total wage in household h;
- $\boldsymbol{Z_{kh}}$ is a set of K-2 other variables (that is, in addition to female and male work status and wage variables of interest) that are common to all children in household h but variable across households. These include pure household characteristics—such as household size, dependency ratio, food security score—as well as other parents' characteristics such as age, education, and health status.

For the sake of simplicity, let us assume that all γ coefficients in Equation (3) and μ_{1h} are all equal to zero. This is equivalent to assuming β_{1h} as constant across all households (that is $\beta_{1h} = \beta_1, \forall\ h$). Under this assumption, plugging Equation (2) and Equation (3) into Equation (1) results in the following mixed model equation that we estimate using Stata 'mixed' command:

$$Z - score_{ih} = \gamma_{00} + \gamma_{f01} W_{fh} + \gamma_{m01} W_{mh} + \gamma_{f02} S_{fh} + \boldsymbol{\gamma_{0k} Z_{kh}} + \boldsymbol{\beta_1 X_{1ih}} + \mu_{0h} + \epsilon_{ih} \qquad (4)$$

5 Empirical results

In this section we present the empirical results from the estimation of Equation (4), with 'weight-for-age' as the dependent variable. We estimate five model specifications with different independent variables of interest. The first specification controls for three dummies indicating whether, within the household, either the adult male or the adult female is involved in each of the three aforementioned work categories. The second specification controls for work status over the three work categories, respectively, for men and women separately. This is a way to assess whether the effect of work status is neutral (or not) with respect to the worker's gender. The third specification is similar to the second specification but with further controls for female wage share and its squared term. To assess the relationship between female 'multiple work' status and child nutritional outcome, we control for a categorical variable representing (threefold) female work status over the three work categories simultaneously. Non-working women (housewives) constitute the omitted category to which the (seven) other threefold categories are compared. Results from this specification, without and with controlling for female wage share (and its squared term), are displayed in columns (4) and (5), respectively. In addition to female work status variables of interest, each specification includes other control variables such as children's characteristics, parents' background characteristics, and household characteristics.

5.1 Female work status and weight-for-age

Table 3 presents estimates of the effect of female work status on child weight-for-age. Whether there is a parent (with no distinction between father and mother) involved in (i) work for a wage outside the household, (ii) on-farm work within the household, or (iii) non-farm work within the household does not matter for child weight-for-age (column 1). However, this is likely to hide the differential impact by gender of the working parent.

Indeed, when controlling for work status dummies for men and women separately (columns 2 and 3), work status makes a considerable difference, suggesting that the association between a parent's work status and child weight-for-age, and the mechanisms driving it, differs according to the gender of the working parent. Female on-farm work and non-farm work within the household

(but not work outside the household) are positively and significantly associated with child weight-for-age (columns 2 and 3). On the contrary, male on-farm work and non-farm work (but not work outside) are negatively and significantly associated with child weight-for-age (columns 2 and 3).

Table 3: Child weight-for-age and female work status: pooled sample regression estimates

	(1)	(2)	(3)	(4)	(5)	(6)
[1em] Weight-for-age Z-score						
Female or male wage job (dv)	0.0776	0.0726				
	(0.60)	(0.53)				
Female or male on-farm job (dv)	-0.0493	-0.0509				
	(-0.50)	(-0.52)				
Female or male non-farm job (dv)	0.0477	0.0403				
	(0.50)	(0.42)				
Female wage job (dv)			0.286	1.630**		
			(1.34)	(2.39)		
Female on-farm job (dv)			0.428***	0.439***		
			(3.40)	(3.49)		
Female non-farm job (dv)			0.234**	0.236**		
			(2.39)	(2.42)		
Male wage job (dv)			-0.0680	-0.0284		
			(-0.49)	(-0.20)		
Male on-farm job (dv)			-0.276**	-0.269**		
			(-2.55)	(-2.49)		
Male non-farm job (dv)			-0.215**	-0.211**		
			(-2.08)	(-2.05)		
No female work					0	0
					(.)	(.)
Female wage work only					0.631**	1.716**
					(2.49)	(2.50)
Female on-farm work only					0.452***	0.453***
					(3.06)	(3.07)
Female non-farm work only					0.259**	0.259**
					(2.41)	(2.42)
Female wage and on-farm work					-0.0612	1.220
					(-0.11)	(1.33)
Female wage and non-farm work					-0.0288	1.091
					(-0.06)	(1.35)
Female on-farm and non-farm work					0.856***	0.855***
					(3.82)	(3.82)
No male work					0	0
					(.)	(.)
Male wage work only					-0.340*	-0.298
					(-1.65)	(-1.41)
Male on-farm work only					-0.541***	-0.529***
					(-3.13)	(-3.07)
Male non-farm work only					-0.513***	-0.506***
					(-2.94)	(-2.90)
Male wage and on-farm work					-0.583**	-0.541**

					(-2.20)	(-2.02)
Male wage and non-farm work					-0.387	-0.338
					(-1.09)	(-0.95)
Male on-farm and non-farm work					-0.636***	-0.625***
					(-3.43)	(-3.37)
Male wage and on-farm and non-farm work					-0.495	-0.473
					(-1.09)	(-1.05)
Female wage share		-0.503		-6.894**		-5.814*
		(-0.38)		(-2.29)		(-1.90)
Female wage share × female wage share		0.643		5.714**		4.854*
		(0.46)		(2.29)		(1.92)
Observations	1,871	1,871	1,871	1,871	1,871	1,871

Notes: All specifications control for child characteristics such as year of birth, sex, health status (whether the child slept under a bednet the previous night, fell sick in the last 4 weeks or had been hospitalized in the last 12 months); parents' characteristics such as mother's and father's age, education, health status (whether she or he felt sick in the last 4 weeks, was inactive due to sickness in the last 4 weeks or had been hospitalized in the last 12 months); and household characteristics such as household head marital status, household dependency ratio, food security status (food consumption score, dietary diversity score and food insecurity and access scale), and location. *t*-statistics in parentheses. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Source: Authors.

Beyond female working status outside the household (that is, whether working or not), the potential (relative) wage income from that work is of paramount importance. Both may interact in influencing child outcomes through the income and childcare mechanisms discussed earlier. When it comes to female work outside the household, the results differ according to whether female wage share is controlled for (column 3) or not (column 2). Two remarks emerge from controlling for female wage share and its squared term (column 3). First, the relationship between female wage share and child weight-for-age proves to be significant, non-linear, and U-shaped. Intuitively, as women start working outside the household, and potentially contribute positively to wage income, the time they devote to childcare is likely to reduce in line with the time they spend working outside the household. At lower wage income, the relative female-earned income may not be high enough to significantly matter through the positive 'income effect' and outweigh the negative 'childcare effect'. Still, the 'income effect' is likely to become relatively more important as female wage share increases.[12]

Second, upon controlling for female wage share, the positive coefficient associated with female work outside the household increases fivefold and becomes statistically significant. It is the only one to change to such a significant extent. Clearly, its previous estimate (in column 2) was downward biased due to omitting female wage share. While the three female work statuses all matter positively and significantly for child weight-for-age, it is worth noting that they do so to very disproportionate extents. In column 3, the coefficient associated with female work outside the household is almost four times larger than that associated with female on-farm work within the household, which is itself almost twice as large as that of female non-farm work within the household.

In the last two columns of Table 3, we test whether and how different types of female work interact in their association with child weight-for-age. Three main findings emerge. First, unlike for women

[12] According to the estimate coefficients associated with female wage share and its squared term in column 3, the overall association between female wage share and child weight-for-age becomes positive from female wage share = 0.60.

who are not involved in any of the three types of work (baseline category: housewives), the involvement of women in one category of work only, regardless of its type, is positively and significantly associated with child weight-for-age (columns 4 and 5). In particular, the coefficient associated with female (sole) work outside the household is larger when further controlling for female wage share (column 5), but unlike previously, it is also significant even without controlling for female wage share (column 4).

Second, though each type of work matters individually, combinations of multiple types of work are generally no longer significant except for the combination of on-farm and non-farm work within the household. More specifically, women who combine work outside the household with any other work within the household are not significantly more likely than housewives to benefit child weight-for-age. This is consistent with the idea that combining work outside—potentially subject to a large (positive) income effect and a large (negative) childcare effect—with on-farm or non-farm work within the household—potentially subject to a small (positive) income effect and small (negative) childcare effect—makes the underlying mechanisms interact in such a way that the (combined) negative childcare effect is large enough to offset the (combined) positive income effect.

However, when the multiple work combination involves work within the household, the associated coefficient is positive and significant. Indeed, the combined negative childcare effect is not necessarily additive, particularly when women are able to combine work(s) within the household with childcare. At the end of the day, the combined negative childcare may remain either insignificant or not large enough to outweigh the (potentially larger) combined positive income effect. Hence the finding that a combination of female on-farm and non-farm work benefits child weight-for-age.

5.2 Further insights into the income effect *versus* childcare effect

As discussed earlier, the overall effect of female work status results from the interaction of a positive income effect and a negative childcare effect. We suggest interpreting the findings from the previous section from the angle of this mechanism. Exploring this mechanism in a formal way would require further detailed income and time use data, which we do not have.[13] In this sub-section, we propose an alternative twofold exercise to get further insights into the interaction between the income and childcare effects mechanisms.

Child weight-for-age and female work status by child age group

As discussed in the literature section, the relative importance of the two opposing effects, and therefore the overall effect, is likely to switch along the child age distribution. More specifically, the income effect is expected to be less important during infancy and more important during childhood, whereas the childcare effect is expected to be more important during infancy and less important during childhood.

To document whether female work status is associated with child weight-for-age in a way that is consistent with the aforementioned arguments, we run previous regressions separately for (i) the sample of children under two years of age (referred to as infants) and (ii) the sample of children between two and five years of age (referred to as toddlers). Table 4 presents the regression results

[13] For example, we have no data on income from on-farm and non-farm activities, and we lack time use data to assess the time devoted to childcare.

based on the pooled sample (columns 1 and 2), infants' sub-sample (columns 3 and 4), and toddlers' sub-sample (columns 5 and 6).

Four interesting findings emerge. First, while the coefficient associated with female work outside the household is positive and significant in the pooled sample (column 1), it proves to be insignificant in the infants' sub-sample but significant in the toddlers' sub-sample, suggesting that the pooled sample results were exclusively driven by the sub-sample of toddlers. Likewise, the non-linear (convex) relationship between female wage share and child weight-for-age observed from the pooled sample results (columns 1 and 2) proves to be exclusively significant for the sub-sample of toddlers (columns 5 and 6), and not for the sub-sample of infants (columns 3 and 4). Second, the coefficient associated with female non-farm work within the household is still significant for the sub-sample of infants, but not for that of toddlers. Third, when considering only the infants' sub-sample, only female work within the household (either exclusively on-farm or exclusively non-farm, or both combined) remains positively and significantly associated with child weight-for-age (column 4). Fourth, for the sample of toddlers, child weight-for-age is positively and significantly associated with female exclusive work outside the household and with any combination of two types of work, most notably when female work outside of the household is part of the combination (column 6).

Table 4: Child weight-for-age Z-score and female work status: heterogeneity by child age group

	Pooled sample		Infants' sample		Toddlers' sample	
	(1)	(2)	(3)	(4)	(5)	(6)
[1em] Weight-for-age Z-score						
Female wage job (dv)	1.630**		0.993		2.440***	
	(2.39)		(1.12)		(2.73)	
Female on-farm job (dv)	0.439***		0.586***		0.336**	
	(3.49)		(3.52)		(2.12)	
Female non-farm job (dv)	0.236**		0.302**		0.168	
	(2.42)		(2.36)		(1.37)	
No female work		0		0		0
		(.)		(.)		(.)
Female wage work only		1.716**		0.993		2.616***
		(2.50)		(1.12)		(2.88)
Female on-farm work only		0.453***		0.656***		0.306
		(3.07)		(3.42)		(1.62)
Female non-farm work only		0.259**		0.324**		0.185
		(2.42)		(2.30)		(1.37)
Female wage and on-farm work		1.220		0.111		2.594**
		(1.33)		(0.10)		(2.05)
Female wage and non-farm work		1.091		0.393		1.970**
		(1.35)		(0.35)		(1.96)
Female on-farm and non-farm work		0.855***		1.051***		0.729**
		(3.82)		(3.45)		(2.75)
Female wage share	-6.894**	-5.814*	-4.757	-2.429	-9.684**	-9.486**
	(-2.29)	(-1.90)	(-1.19)	(-0.59)	(-2.49)	(-2.42)
Female wage share × female wage share	5.714**	4.854*	4.684	2.718	7.265**	7.186**.
	(2.29)	(1.92)	(1.40)	(0.79)	(2.30)	(2.27)
Observations	1,871	1,871	995	995	868	868

Male counterpart work status variables included	Yes	Yes	Yes	Yes	Yes	Yes
Child characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Parents' characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Male counterpart work status variables include a dummy for male wage work, a dummy for male on-farm work, a dummy for male non-farm work, and a categorical variable representing male threefold work status. Controlled child characteristics include year of birth, sex, health status (whether the child slept under a bednet the previous night, fell sick in the last 4 weeks or had been hospitalized in the last 12 months). Controlled parents' characteristics include mother's and father's age, education, health status (whether she or he fell sick in the last 4 weeks, was inactive due to sickness in the last 4 weeks or had been hospitalized in the last 12 months). Controlled household characteristics include household head marital status, household dependency ratio, food security status (food consumption score, dietary diversity score, and food insecurity and access scale), and location fixed effects. *t*-statistics in parentheses. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Source: Authors.

Overall, this sub-sample analysis for infants and toddlers sheds light on the relationship between female work status and child nutritional outcome through the lens of income and childcare mechanisms discussed earlier. This relationship proves to be different depending on the work type and the age group of the children. Types of work that are more likely to be incompatible with or reduce female personal time devoted to childcare, such as work outside the household, do not benefit very young children (under two years of age). These children, who need particular childcare from their mothers, benefit more from female work within the household, which is, in principle, relatively more compatible with childcare. Relatively older children (from two to five years of age) need relatively less childcare, are more adaptable to alternative childcare by a third person (as opposed to mother-provided childcare), and have relatively costly needs for their livelihood. As a consequence, they benefit more from female work outside the household, which is likely to be salaried. In line with this, the higher the female relative wage, the more women are able to independently afford the aforementioned children's needs, and the more this benefits older children.

Child weight-for-age and female hours of work

The time women spend working is likely to reduce the time they spend personally providing childcare. All else equal, the more hours women spend working, the fewer hours they devote to childcare. This is likely to be the case particularly when it comes to female work outside the household, which is relatively less compatible with childcare when compared to female work within the household.

Assuming that female work generates some income but reduces the amount of time available for childcare, one should expect the income and childcare effects to switch in their relative importance along the distribution of female hours of work. More specifically, both the positive income and negative childcare effects are expected to increase with female hours of work. The negative childcare effect should be relatively small at lower levels of female hours of work, as women may still manage to combine work and childcare. Thus, a marginal increase in female hours of work is likely to result in a positive net effect on child outcome, with the positive income effect outweighing the negative childcare effect. However, at higher levels of female hours of work, the childcare effect is likely to be large since women may face time constraints that prevent them from personally providing childcare. If childcare provided by a third party is unavailable or unaffordable, a marginal increase in female hours of work is likely to result in a negative net effect on child outcome, with the negative childcare effect outweighing the positive childcare effect. In sum, the net relationship between female hours of work and child outcome would then be non-linear and concave.

We test this relationship by regressing child weight-for-age on female hours of (wage, on-farm and non-farm) work, along with their squared terms and other control variables. Table 5 presents pooled sample results from four specifications. The first specification (column 1) controls for female hours of work for each of the three types of work, along with other control variables. Next, the second specification (column 2) is similar to the first one but further controls for the squared female hours of work, for each of the three types of work. The third specification (column 3) is similar to the second specification but further controls for interaction terms between female hours of work.[14] The fourth and last specification (column 4) is similar to the third specification but further controls for female–male hours of work interactions, by type of work.[15]

From column 1, female hours of wage work are positively and significantly associated with child weight-for-age. When controlling for the square of female hours of wage work (column 2), the relationship between female hours of wage work and child weight-for-age is still significant but non-linear (concave). This finding is robust to including further interactions (columns 3 and 4) This is consistent with the aforementioned argument that the net effect of female hours of work on child outcome (weight-for-age) is positive below a certain threshold and becomes negative above that threshold. According to the estimates in column 2, this threshold amounts to 35.85 hours per week.[16] As a reminder, the average and median of female hours of wage work amount to 38.86 hours and 40 hours per week, respectively. This means that more than half of women in the sample are beyond the aforementioned threshold.

The relationship between female on-farm work and child weight-for-age is significant but linear (columns 1 and 2), whereas that between female hours of non-farm work and child weight-for-age is positive and significant in column 1 but no longer significant in subsequent specifications. As discussed earlier, on-farm and non-farm work fundamentally differ from wage work outside the household, in view of their relatively low potential to generate an income and relatively high likelihood to be compatible with childcare. This arguably underlies the finding that their respective relationships with child weight-for-age are not consistent with the aforementioned 'income effect versus childcare effect' argument.

[14] More specifically, these interactions are female hours of wage work × female hours of on-farm work, female hours of wage work × female hours of non-farm work, female hours of on-farm work × female hours of non-farm work. There is no case for female hours of wage work × female hours of on-farm work × female hours of non-farm work.

[15] More specifically, these interactions are female hours of wage work × male hours of wage work, female hours of on-farm work × male hours of on-farm work and female hours of non-farm work × male hours of non-farm work.

[16] According to the estimates in columns 3 and 4, the corresponding threshold amounts to 33.02 and 35.46 hours per week.

Table 5: Child weight-for-age Z-score and female hours of work

	(1)	(2)	(3)	(4)
[1em] Weight-for-age Z-score				
Female hours of wage work	0.0302**	0.0968**	0.105***	0.122***
	(2.13)	(2.47)	(2.66)	(2.80)
Female hours of wage work × female hours of wage work		-0.00135*	-0.00159**	-0.00172**
		(-1.83)	(-2.11)	(-2.26)
Female hours of on-farm work	0.0161***	0.0361***	0.0348**	0.0326**
	(3.87)	(2.60)	(2.25)	(2.07)
Female hours of on-farm work × female hours of on-farm work		-0.000507	-0.000480	-0.000624
		(-1.51)	(-1.33)	(-1.62)
Female hours of wage work × female hours of on-farm work			-0.00242	-0.00261
			(-1.16)	(-1.24)
Female hours of non-farm work	0.00618***	0.00892	0.00956	0.0105
	(2.58)	(1.30)	(1.32)	(1.44)
Female hours of non-farm work × female hours of non-farm work		-0.0000577	-0.0000661	-0.0000561
		(-0.48)	(-0.53)	(-0.45)
Female hours of wage work × female hours of non-farm work			-0.000778	-0.000800
			(-1.45)	(-1.49)
Female hours of on-farm work × female hours of non-farm work			0.000190	0.000220
			(0.53)	(0.62)
Female wage share	-4.966*	-6.878**	-5.891**	-3.985
	(-1.91)	(-2.42)	(-2.03)	(-1.11)
Female wage share × female wage share	4.322*	5.821**	5.150**	2.829
	(1.94)	(2.41)	(2.10)	(0.80)
Observations	1,871	1,871	1,871	1,871
Male hours of (wage, on-farm and non-farm, respectively) work included	Yes	Yes	Yes	Yes
'Female hours–male hours' interactions included	No	No	No	Yes
Child characteristics	Yes	Yes	Yes	Yes
Parents' characteristics	Yes	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes	Yes

Notes: 'Female hours–male hours' interactions refer to interaction of female hours of work and male hours of work for each type of work. Controlled child characteristics include year of birth, sex, health status (whether the child slept under a bednet the previous night, fell sick in the last 4 weeks or had been hospitalized in the last 12 months). Controlled parents' characteristics include mother's and father's age, education, health status (whether she or he fell sick in the last 4 weeks, was inactive due to sickness in the last 4 weeks, or had been hospitalized in the last 12 months). Controlled household characteristics include household head marital status, household dependency ratio, food security status (food consumption score, dietary diversity score, and food insecurity and access scale), and location fixed effects. *t*-statistics in parentheses. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Source: Authors.

5.3 Is there a gender bias?

Does the relationship between female work and child weight-for-age depend on child gender? We address this question by running similar regressions for the sub-samples of girls and boys separately. Appendix Table B1 presents the results from regressing child weight-for-age on female hours of work, for several sub-samples defined by child gender and group age. The displayed results correspond to the pooled sample of all children aged under five (column 1), the sub-sample of all boys under five (column 2), sub-sample of all girls under five (column 3), sub-sample of all infants under two (column 4), sub-sample of boys under two (column 5), sub-sample of girls under two (column 6), sub-sample of all toddlers between two and five (column 7), sub-sample of boys between two and five (column 8), and sub-sample of girls between two and five (column 9).

Our findings point to systematic heterogeneity by child gender. Broadly speaking, we find that boys benefit from female wage work, whereas girls benefit from female on-farm work. More specifically, whenever female hours of wage work significantly matter for child weight-for-age irrespective of child gender (that is in columns 1 and 7), they prove to be significant for boys exclusively (columns 2 and 8). Girls seem not to benefit significantly from female hours of wage work (columns 3 and 9). On the contrary, whenever female hours of on-farm work significantly matter for child weight-for-age irrespective of child gender (that is in columns 1 and 4), they prove to be significant for girls exclusively (columns 3 and 6). Boys seem not to benefit significantly from female hours of on-farm work (columns 2 and 5).

6 Conclusion

Vulnerable employment remains acute in developing countries, and more particularly in sub-Saharan Africa. Women still suffer from gender gaps in unemployment, paid labour force participation, vulnerable employment, and pay, etc. In this regard, further mobilizing the female labour supply and promoting gender equality in paid and unpaid work is presented as a key element for ensuring future economic prosperity. Such advocacy is appealing from a macro-economic perspective. However, from a micro-economic perspective, the implications of female work are not trivial. As is the case for male workers, female labour supply is associated with a positive income effect related to whether and how much the job is paid. Still, as wives, mothers, primary caregivers and workers, females' labour time and flexibility are more likely to be constrained than those of their male counterparts. Thus, features of female work such as number of jobs, working hours, and workplace–household proximity, can adversely impact a range of child outcomes (health, nutrition, etc.) through intermediary outcomes such as childcare, parent–child interaction, etc.

Using data from the third wave of the Nigeria General Household Survey Panel, this paper delved into the nexus between female work status and child nutritional outcome. The paper explicitly distinguished between three types of work, namely wage employment outside the household, household on-farm agricultural work, and household non-farm enterprise activities. We ran multilevel mixed-effects linear regressions to estimate the relationship between child weight-for-age and a set of female work variables, including female work status over each type of work (dummy indicator for female involvement in each type of work), female threefold work status over the three types of work (categorical variable), and female hours of work on each type of work.

The benchmark pooled results show that child weight-for-age is positively and significantly associated with female wage work, female on-farm work, and female non-farm work. Unlike for women not working at all, female exclusive involvement in wage work, on-farm work, and non-farm work is associated with higher child weight-for-age. Female simultaneous involvement in on-farm and non-farm work is the only female work combination that is positively and significantly associated with child weight-for-age.

To get further insights on the income and childcare effects, we ran two sets of additional regressions. On one hand, sub-sample analysis showed that the positive and significant association between child weight-for-age and female wage work is exclusively driven by the toddlers' sub-sample (two to five years of age), whereas the association between child weight-for-age and female on-farm and non-farm work is mostly driven by the infants' sub-sample (zero to two years of age). We argued that these findings are consistent with the expectation that the relative importance of the income and childcare effects switches along the child age distribution. Indeed, younger children need relatively more parental childcare than older children, whereas older children have relatively

more and costly needs, such as food diversification, than younger children. Therefore, younger children are expected to benefit more from the childcare effect, whereas older children are expected to benefit more from the income effect. This argument is consistent with our sub-sample findings.

On the other hand, further regressions controlling for female hours of wage, on-farm and non-farm work, along with their squared terms, showed that the association between child weight-for-age and female hours of wage work is significant and positive, but non-linear (concave). This means that below a certain threshold of female hours of wage work outside the household, child weight-for-age increases with female hours of wage work outside the household, whereas above that threshold, child weight-for-age decreases with female hours of wage work outside the household. According to our estimates, this threshold ranges between 33 and 36 hours per week, which is below the average and median hours of female wage work per week (38.86 and 40, respectively). We argued that this finding is consistent with the expected interaction between the income and childcare effects along the distribution of female hours of wage work outside the household. Indeed, at lower levels of female hours of work outside the household, the negative childcare effect is likely to be relatively small (and outweighed by the positive income effect), as women may still manage to combine work and childcare. Yet, at high levels of female hours of work outside the household, the negative childcare effect is likely to be large (and to outweigh the positive income effect) since women may face time constraints that prevent them from personally providing childcare. This holds particularly if childcare provided by a third party is unavailable, unaffordable, or of lower quality. Finally, our findings also showed that boys benefit from female wage work outside the household, whereas girls benefit from female on-farm work.

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Appendix A. Food security indexes

Food Consumption Score (FCS) and Food Consumption Groups (FCGs)

The FCS is the core indicator of consumption recommended by the World Food Program. It is a composite score based on dietary diversity, food consumption, and relative nutritional importance of different food groups. It is calculated using the frequency of consumption of different food groups consumed by the household during the seven days before the survey. Section 10C of the third wave GHS-Panel household questionnaire collects information on the frequency (number of days) of aggregate consumption of 11 food groups over the past one week. From these data, we follow the first four standard calculation steps[17] to compute the FCS. At step five, we translate the continuous variable 'FCS' into a categorical variable 'FCGs' using the typical standard thresholds.[18]

Household Dietary Diversity Scale (HDDS)

The HDDS is a proxy indicator to measure the household food access and recommended by the UN Food and Agriculture Organization (FAO). It is somewhat similar to FCS but does not use frequency information, nor food group weights. It represents just the number of different foods or food groups consumed over a given reference period. We use the same data from Section 10C of the third wave GHS-Panel household questionnaire (with a seven-day recall period) to calculate the HDDS. Following the standard procedure to compute the HDDS, we leave out two food groups, namely 'sugar or sweet' and 'condiments/spices'.

Household Food Insecurity and Access Scale (HFIAS)

The HFIAS is a continuous measure of food insecurity in the household in a given period of reference. It is designed to measure household anxiety and uncertainty about the household food supply, insufficient quality (including variety and preferences of the type of food), and insufficient food intake and its physical consequences. Section 12 of the third wave GHS-Panel household questionnaire asks nine 'frequency-of-occurrence' questions (number of days) pertaining to food security within the household over the past seven days. We use this information to compute the HFIAS score for each household as the total of days that the household faced these nine events/situations. As such, our score ranges between 0 and 63. The lower the HFIAS score, the less food insecurity the household experienced, and the higher the HFIAS score, the more food insecurity the household experienced.

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[17] Step 1: Using standard seven-day food frequency data, group all the food items into specific food groups. (Since Section 11 of the questionnaire groups food items into 11 food groups, we had to regroup food items into the 9 standard food groups as recommended by the World Food Program.)

Step 2. Sum all the consumption frequencies of food items of the same group, and recode the value of each group above 7 as 7.

Step 3. Multiply the value obtained for each food group by its weight and create new weighted food group scores.

Step 4. Sum the weighted food group scores, thus creating the food consumption score (FCS).

[18] If $0 < FCS < 21 \Rightarrow$ FCG == 'poor'. If $21.5 < FCS < 35 \Rightarrow$ FCG == 'borderline'. If $FCS > 35 \Rightarrow$ FCG == 'acceptable'.

Appendix B. Child weight-for-age and female hours of work: pooled sample, by child age and gender sub-groups

Table B1: Child weight-for-age Z-score and female hours of work

	Pooled sample			Infants' sub-sample			Toddlers' sub-sample		
	All	Boys	Girls	All	Boys	Girls	All	Boys	Girls
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Weight-for-age Z-score									
Female hours of wage work	0.105***	0.156***	0.0961	0.0670	0.0902	0.0963	0.124***	0.198***	0.110
	(2.66)	(3.45)	(1.12)	(0.76)	(0.77)	(0.65)	(2.74)	(3.78)	(0.99)
Female hours of wage work × female hours of wage work	-0.00159**	-0.00193**	-0.00256	-0.000913	-0.000820	-0.00249	-0.00172**	-0.00241***	-0.00270
	(-2.11)	(-2.39)	(-1.36)	(-0.47)	(-0.34)	(-0.72)	(-2.24)	(-2.92)	(-1.18)
Female hours of on-farm work	0.0348**	0.0307	0.0361*	0.0625***	0.0407	0.0787***	0.0166	0.0143	0.00405
	(2.25)	(1.49)	(1.78)	(3.03)	(1.27)	(3.02)	(0.85)	(0.58)	(0.14)
Female hours of on-farm work × female hours of on-farm work	-0.000480	-0.000435	-0.000523	-0.00102**	-0.000457	-0.00146**	-0.000151	-0.000247	0.000180
	(-1.33)	(-0.90)	(-1.11)	(-2.10)	(-0.58)	(-2.41)	(-0.34)	(-0.44)	(0.27)
Female hours of wage work × female hours of on-farm work	-0.00242	-0.00195	-0.00430	-0.00429*	-0.00231	-0.00767**	-0.000627	-0.00178	-0.00291
	(-1.16)	(-0.80)	(-1.53)	(-1.70)	(-0.77)	(-2.14)	(-0.22)	(-0.50)	(-0.76)
Female hours of non-farm work	0.00956	0.00414	0.0162*	0.00951	0.000514	0.0168	0.00528	0.000278	0.0114
	(1.32)	(0.43)	(1.69)	(1.00)	(0.04)	(1.33)	(0.58)	(0.02)	(0.83)
Female hours of non-farm work × female hours of non-farm work	-0.0000661	0.000104	-0.000265	-0.0000311	0.000111	-0.000155	0.0000109	0.000230	-0.000275
	(-0.53)	(0.63)	(-1.59)	(-0.19)	(0.47)	(-0.69)	(0.07)	(1.12)	(-1.17)
Female hours of wage work × female hours of non-farm work	-0.000778	-0.00135**	-0.00110	-0.000846	-0.00123	-0.000367	-0.000697	-0.00137*	-0.00119
	(-1.45)	(-2.03)	(-1.20)	(-1.06)	(-1.22)	(-0.21)	(-1.20)	(-1.84)	(-1.16)

Female hours of on-farm work × female hours of non-farm work	0.000190	-0.0000503	0.000929*	-0.0000134	-0.000323	0.000963	0.000395	0.000410	0.000851
	(0.53)	(-0.11)	(1.65)	(-0.03)	(-0.55)	(1.15)	(0.89)	(0.74)	(1.19)
Female wage share	-5.891**	-13.32***	3.657	-3.411	-9.711*	4.894	-7.694**	-18.41***	1.772
	(-2.03)	(-3.54)	(0.89)	(-0.86)	(-1.80)	(0.82)	(-2.06)	(-3.44)	(0.28)
Female wage share × female wage share	5.150**	11.64***	-3.007	3.664	8.857**	-2.956	6.011*	15.82***	-1.992
	(2.10)	(3.61)	(-0.87)	(1.09)	(1.98)	(-0.56)	(1.95)	(3.41)	(-0.40)
Observations	1,871	958	913	995	505	490	868	452	416
Male hours of (wage, on-farm and non-farm, respectively) work included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
'Female hours–male hours' interactions included	No	No	No	No	No	No	No	No	No
Child characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parents' characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: 'Female hours–male hours' interactions refer to interaction of female hours of work and male hours of work for each type of work. Controlled child characteristics include year of birth, sex, health status (whether the child slept under a bednet the previous night, fell sick in the last 4 weeks or had been hospitalized in the last 12 months). Controlled parents' characteristics include mother's and father's age, education, health status (whether she or he fell sick in the last 4 weeks, was inactive due to sickness in the last 4 weeks or had been hospitalized in the last 12 months). Controlled household characteristics include household head marital status, household dependency ratio, food security status (food consumption score, dietary diversity score, and food insecurity and access scale) and location fixed effects. *t*-statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors.