Intra-spousal labor supply responses to price shocks in Uganda

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Abstract

Women generally face significant social and traditional gender barriers to accessing lucrative primary market work thus mostly engage in farm work. We explore the implications of coffee and banana price shocks on intra-spousal labor supply responses. Changes in crop prices have the potential of either freeing women's labor or placing extra demand on them to work on the farm. We find that very high and low coffee prices respectively displace wives labor from farm work or crowd them out of primary market work. This is on account of either husbands likely taking charge of harvesting and marketing coffee to control the increased revenue or because husbands who predominantly control coffee output are also entering the labor market. For very high and low banana prices respectively, wives either work significantly more on the farm or increase their labor supply to primary market work. These results show that regardless of whether crop prices are high or low, in most rural agricultural households, women are still not able to access lucrative primary market work except when the price of banana drops.

Key words: Crop price shocks, intra-spousal, labor supply

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1. Introduction

In typical smallholder agricultural households, social norms and traditional gender roles tend to impose more limits on women's ability to participate in different spheres of work, including in off-farm employment (Edwards and Field-Hendrey, 2002). Additionally, there tends to be marked differences between men and women in terms of what crops they produce and who controls the revenue from different crops (Duflo and Udry, 2004). Given the differences in participation in different spheres of work and control of production of different crops in rural agricultural households, we examine how a typical positive or negative crop price shock may affect intra-spousal labor supply.

It is not *ex ante* obvious how a price shock would affect intrahousehold labor supply responses as it is constrained by various factors. Apart from access to off-farm labor markets, intrahousehold labor supply also hinges on the labor supply constraints on the farm and of the local labor market conditions. For negative exogenous shocks, most studies find a reduction in farm work and an increase in off-farm labor supply. This is especially true within a collective household model (Browning et al. 2014), whereby labor supply adjustments in the household in response to a negative income shock will be such as to smooth consumption as reported by Kochar (1999) and Rose (2001). This could imply husbands increasing labor supply to off-farm market work to compensate for the loss of farm income and in turn wives increasing labor supply to farm work.

For a positive price shock, one possibility is that it would incentivize a household to increase agricultural production to reap more revenue. This might entail, for example, devoting more labor to work on the farm. This of course crucially also depends on the type of crops grown. Cultivators of perennial crops, such as coffee or banana, of which cultivation is not easily expandable, cannot respond in the short run to increased prices while this may be the case for annual crops, such as maize. Similarly, labor supply responses will differ depending on whether couples are sellers or consumers of a crop. Another, possibly more plausible strategy would be to substitute household agricultural labor by hired labor thus enabling household members to pursue off-farm employment. It is obvious that not only the choice made between these options would have very different implications for female empowerment, but that it is *ex ante* uncertain how they would affect women (Haugen and Blekesaune, 2005).

The rest of this paper is organized as follows. In section 2, a review of relevant literature on the impact of price and weather shocks on household labor supply is presented. The description of data including the definition of key shock variables are presented in section 3. This is followed by the presentation of summary statistics in section 4. The estimation strategy and regression results including robustness checks are presented in sections 5 and 6 respectively. Section 7 finally concludes the paper.

2. Literature

A large body of existing literature analyzed the effect of price shocks on the allocation of labor resources in households. For example, Beck et al (2019) analyze the effect of coffee price

shocks on labor allocation across household members using data from Vietnam from 2006 to 2014. They find that an increase in coffee prices decreases the likelihood of participating in wage work by 1.7 percentage points in coffee growing compared to non-coffee growing regions and that this result is (unsurprisingly) driven by men. Following up on Beck et al. (2019)'s study, Narciso (2020) analyses the effect of rice and coffee prices on migration in Vietnam finding that coffee price shocks increase migration in coffee growing compared to non-growing areas, but no similar effect is found for rice prices and no gender analysis is presented. Using average district level market prices of staple crops (Matooke and Cassava) and data from Uganda from 2009 to 2012, Campus and Giannelli (2016) find that increases in staple crop prices increases market labor supply for women at the expense of time devoted to non-market activities.

Among studies that have examined the impact of weather shocks on household labor resource allocations, Branco and Féres (2021) using data from 1996 and 2014 covering rural areas in North-eastern Brazil, find that the number municipality-level drought months increase the likelihood of the head of household having a secondary job by 6.15%. They further find that it reduces the fraction of family labor in agriculture and increases the share of labor in non-agricultural work. On the contrary, in an analysis combining retrospective labor data from the 1980 to 2007 with village-level temperature data from rural Mexico, Jessoe et al. (2018) show that exposure to adverse weather decreases the probability of local employment in wage work and reduces non-agricultural work overall, which is mostly driven by an increase in extreme temperatures. While farm labor is generally not affected, it depends on the timeframe of the weather shock being investigated with a reduction in farm labor visible when considering shocks affecting the key agricultural labor cycle. A recent study by Afridi et al (2022) that used monthly labor supply information (aggregated into three agricultural seasons) from India during 2010 to 2014, finds a 19% reduction in working days for women exposed to drought-like conditions (low monsoon rains) compared to men. Men reduce their paid farm work and increase their non-farm labor supply in response to adverse rains, which women are restricted to access to start with. Men are also more likely to work outside the village, to migrate and to travel a long distance for work in response to a shock than women. When exposed to adverse exogenous shocks, most studies find a reduction in farm work and an increase in off-farm labor supply as well as in migration. It has been well-established that, given social norms and informal institutions, women tend to have less possibilities to allocate their time to these activities with important implications for the intra-household labor allocation (Edwards and Field-Hendrey, 2002).

Rather than focusing on all labor supply within the household (Beck et al. 2019 and Narciso, 2020) or simply gender split between women and men (Campus and Giannelli, 2016), our analysis is focused on explaining the intra-couple allocation of labor. Given that it has been well-established that women are less able to control the proceeds from cash-crop production (Njuki et al, 2011, Fischer and Qaim, 2012), we expect important labor reallocations and re-negotiations of the time across partners within the household in response to price fluctuations of different crops. As a result, we analyze not only traditional cash crop price shocks but also non-traditional cash crop price shocks which women may be more likely to engage with,

distinguishing whether households are consumers or sellers of these crops. Empirically, our identification strategy is based on the cross-gender variation in labor supply within a couple, season and survey wave that is due to exogenous price shocks at the intensive and extensive margin. Time-variant exogenous events, other than price shocks, do not pose a threat to identification given that we compare labor supply responses (to the same shock) across gender within a couple.

3. Data

We use seven waves (2009/10, 2010/11, 2011/12, 2013/14, 2015/16, 2018/19 & 2019/20) of the Uganda National Panel Survey (UNPS) data for our analysis. We restrict the sample to households with both a husband and a wife that report to be monogamously married or living within a couple with information collected in the labor module of the survey. We do not include polygamously married couples as our focus is on intrahousehold labor allocations within couples. Additionally, since we cannot match spouses residing in different households or those in which there are no married couples (typically those headed by non-married individuals, widows, or widowers), we also exclude them from the analytical sample. This leaves a final sample of 17,126 individuals, 8,563 women and 8,563 men, within 8,563 couples of which 14.61, 12.82, 13.02, 13.96, 14.22, 16.21 and 15.16 percent are observed in 2009/10, 2010/11, 2011/12, 2013/14, 2015/16, 2018/19 and 2019/20 respectively (Table 1). With agricultural harvest data collected twice in the survey year to account for the two agricultural seasons in Uganda, we end up with 33,174 observations or data points overall in the sample.

Table 1: Sample characteristics

Variable	2009/10	2010/11	2011/12	2013/14	2015/16	2018/19	2019/20	Total
# Households in UNPS	2975	2716	2850	3119	3305	3176	3098	21239
# Households in sample	1251	1098	1115	1195	1218	1388	1298	8563
#hh in sample/#hh in UNPS	42.05	40.43	39.12	38.31	36.85	43.70	41.90	40.32
# individuals	2502	2196	2230	2390	2436	2776	2596	17126
Male	1251	1098	1115	1195	1218	1388	1298	8563
Female	1251	1098	1115	1195	1218	1388	1298	8563
Regional distribution (%)								
Central	0.20	0.21	0.18	0.19	0.17	0.14	0.14	0.17
Eastern	0.27	0.28	0.27	0.28	0.27	0.27	0.26	0.27
Northern	0.24	0.25	0.26	0.23	0.27	0.27	0.30	0.26
Western	0.27	0.26	0.28	0.29	0.28	0.30	0.30	0.28

Source: Based on authors calculations (UNPS 2009/10, 2010/11, 2011/12, 2013/14, 2015/16, 2018/19 & 2019/20).

The key variables used in the analysis are the household crop harvests, farmgate and international crop prices and labor participation and time allocation by individuals to different work categories. We select two crops, coffee, and banana in our analysis. According to WTO (2022) estimates, coffee is Uganda's leading agricultural export crop, earning the country about $516 million in 2020. While banana is a principal food security and cash crop which is sold

both in the local and export markets. We chose these two crops because of their gendered and unique labor requirements for cultivation and control of revenue from their marketing within households. For example, it's been documented that while women supply significant amount of labor to the cultivation of these crops, the revenue from their sale is predominantly controlled by men (Kasente, 2012, Ajambo et al, 2018, Doan and Hoffmann, 2021). This means that if prices go up, the implication for women could be on one hand a displacement of their labor since husbands will likely take over harvesting and marketing or an increase in demand for their labor if the desire is to increase production to get more revenue. And if prices go down, it could mean a freeing up of women's labor or possibly decline in opportunities for secondary work which women predominantly pursue. Therefore, any price shocks to these crops may potentially lead to gendered patterns in labor supply responses within couples which we are interested in understanding.

Additionally, we use the IMF[3] monthly commodity price data for the coffee, and banana. As the IMF data is recorded in US dollars and in different units of measurement, we convert the prices to Uganda shillings per kilogram for each crop to standardize the price data. To avoid our results being driven by general increases in domestic price levels since the first wave of the survey, we deflate all the prices across the years to constant 2010 prices[4]. We link the international price data to the year and month of interview reported in the labor questionnaire of the household survey and construct a 12-month rolling average price preceding the interview month for each of the selected crops[5]. The UNPS collects information on labor supply for household members aged ten years and above during the last 7 days. The information is collected for salaried (wage or in-kind), business and household farm work for the main or primary work and secondary work. We include secondary work not only because of its importance in aiding households to smooth consumption in the wake of income shocks but also because it tends to be a key option whenever people want to pivot away from their primary work. The labor module also contains a detailed section on unpaid domestic work including detailed information on water fetching, firewood collection, home improvements, food preparation and production, and hunting and fishing. For each of the work categories identified above, we define three labor supply measures which include participation (extensive margin), the amount of hours worked (intensive margin) and the share of hours (number of hours devoted to specific work category as a share of total hours worked by that individual) worked.

Price shock measure construction

To construct a household-level price index, we use the variation in the month of interview, the crop land share devoted to crop *c* of household *i* at interview time *t*, l_{cit}, to weight the rolling

[3] International Monetary Fund primary commodity prices. Available at https://www.imf.org/en/Research/commodity-prices

[4] This was calculated as (CPI_{2010}/ $CPI_{interview\_year}$) * $Price_{interview\_year}$ where CPI is the consumer price index and interview years are the different waves of data.

[5] This is similar to the the calculation done by Beck et al. (2019) who used a 12-month backward looking moving average of international coffee prices, matched to the month of interview in the household data to define their shock measure. While they further scaled the 12-month backward looking moving average coffee prices by its standard deviation, we used a different approach and weighted our prices by the land share allocated to each of the crops in our sample.

average prices p_{ct}. This introduces an additional source of variation between crops and households:

$$wp_{cit} = p_{ct} * l_{cit}$$

We define a positive price shock as a dummy variable which takes the value one if the weighted 12 month rolling price index is greater than the top quartile price in the interview month within a region. On the other hand, we define a negative price shock as a dummy variable which takes the value one if the weighted 12 month rolling price index is less than the bottom quartile price in the interview month within a region. Additionally, we categorize households in the sample dependent on whether they consume all the banana and/ or coffee they produce or sell part of it. Therefore, a net consumer household is one that consumers 100 percent of all the banana and/ or coffee it produces. Sellers on the other hand are households that sell a proportion of the banana and/ or coffee they produce in the market. While coffee is a traditional cash crop in Uganda and all households produce it primarily for market, there are still those that do not actually sell their produce in the market. This was documented by Andrews, Golan & Lay (2015) who showed that on average households in Uganda sell about 94% of the coffee they produce. The households that do not sell their coffee are likely those that own legacy coffee trees on family land and predominantly keep them just to meet their beverage needs.

4. Descriptive statistics

Table 1 presents key descriptive statistics comparing husbands and wives' employment across different work categories. According to the results, a significantly higher proportion of husbands than wives participated in primary market and secondary work by 26.8% and 9.1% respectively. As expected, a significantly higher proportion of wives than husbands engaged in primary farm work by 26.8%. The magnitude of difference in participation primary market work and farm work are exact opposites because individuals' participation in the two job categories are mutually exclusive. These relative dominant participation of husbands in off-farm work compared to wives' participation in farm work could be attributed to the traditional gender roles and low human capital formation of women highlighted in the introduction which generally limits their participation in the off-farm labor market. The pattern of hours worked on weekly basis, also follows the same divide between husbands and wives as in their labor participation. Husbands on one hand work significantly 11.571 and 1.451 hours in primary market and secondary work respectively more than wives. While wives work significantly more hours than husbands in primary farm work by 4.423 hours. In terms of shares of time allocated to the different off-farm and farm jobs by husbands and wives, the significant pattern reported for work participation and hours worked also holds. In terms of different sectors of employment of primary market work, there are also inequalities between husbands and wives regarding who gets to participate in relatively lucrative job categories. For example, a significantly more husbands than wives are employed in the more lucrative and stable public sector by 1.9 percentage points. While not statistically significant, still a higher proportion of wives by 2.3 percentage points are employed in private households very likely as domestic servants which in the case of Uganda would attract very low wages.

Table 1: Husbands and wives' employment across different work categories – general

	Men	Women	Difference in means	Standard error
Participation				
Primary market work	0.42	0.15	0.268***	0.005
Primary farm work	0.58	0.85	-0.268***	0.005
Secondary work	0.30	0.21	0.091***	0.005
Hours worked				
Total	33.14	24.54	8.599***	0.227
Primary market work	16.44	4.87	11.571***	0.235
Primary farm work	12.35	16.77	-4.423***	0.161
Secondary work	4.37	2.92	1.451***	0.103
Share of hours worked				
Primary market work	0.36	0.12	0.235***	0.005
Primary farm work	0.49	0.73	-0.240***	0.005
Secondary work	0.11	0.08	0.029***	0.002
Primary market work sector				
Public sector	0.13	0.11	0.019*	0.009
Private sector	0.51	0.51	-0.004	0.013
NGO	0.03	0.02	0.006	0.004
Private household	0.33	0.36	-0.023	0.012
Observations	29671			

Source: Based on authors calculations (UNPS 2009/10, 2010/11, 2011/12, 2013/14, 2015/16, 2018/19 & 2019/20). * p < 0.10, ** p < 0.05, *** p < 0.01

Table 2a summarizes husbands and wives' employment across different work categories dependent on share of banana output sold. The results in Table 2a show that for both net banana consumer and seller households, husbands' participation and number of hours worked in primary market work is significantly higher than that of wives. The difference between the two lies in the magnitude of the means. For example, while in both net banana consumer and seller households, significantly more husbands than wives participate in primary market work, the magnitude of the difference between the two is larger in the former by 26 percentage points compared to 23.9 percentage points in the later. Similarly, in both net banana consumer and seller households, significantly more wives than husbands participated in primary farm work, the magnitude in the former is 26% compared to 23.9% in the later. The same trend of differences between both husbands and wives and across net banana consumer and seller households in terms of participation in work can also be seen in their hours worked in different work categories. One possible explanation for the large gap between husbands and wives within net banana consumer households compared to seller households is that in net banana consumer households, wives are likely more constrained. This is perhaps why for wives that participate in primary market work, quantitatively more of those in banana seller households work in the lucrative public sector than those in net banana consumer households.

Table 2a: Husbands and wives' employment across different work categories dependent on marketing of banana

	Net banana consumer				Banana seller			
	Men	Women	Difference in means	Standard error	Men	Women	Difference in means	Standard error
Participation								
Primary market work	0.39	0.13	0.260***	0.009	0.37	0.13	0.239***	0.011
Primary farm work	0.61	0.87	-0.261***	0.009	0.63	0.87	-0.239***	0.011
Secondary work	0.31	0.19	0.124***	0.009	0.29	0.21	0.079***	0.011
Hours worked								
Total	33.49	24.84	8.646***	0.413	34.78	28.54	6.245***	0.485
Primary market work	15.93	4.63	11.302***	0.429	15.20	4.92	10.278***	0.515
Primary farm work	12.95	17.55	-4.601***	0.292	15.45	20.32	-4.869***	0.385
Secondary work	4.61	2.66	1.949***	0.189	4.13	3.32	0.806***	0.233
Share of hours worked								
Primary market work	0.33	0.10	0.227***	0.008	0.31	0.10	0.210***	0.010
Primary farm work	0.51	0.76	-0.250***	0.009	0.55	0.77	-0.218***	0.011
Secondary work	0.12	0.07	0.045***	0.004	0.10	0.08	0.016***	0.005
Primary market work sectors								
Public sector	0.13	0.12	0.010	0.016	0.15	0.20	-0.058**	0.022
Private sector	0.47	0.47	0.001	0.024	0.41	0.38	0.029	0.030
NGO	0.02	0.01	0.014*	0.007	0.04	0.04	-0.001	0.012
Private household	0.38	0.40	-0.025	0.024	0.41	0.38	0.027	0.030
Observations	8930				5949			

Source: Based on authors calculations (UNPS 2009/10, 2010/11, 2011/12, 2013/14, 2015/16, 2018/19 & 2019/20). * p < 0.10, ** p < 0.05, *** p < 0.01

Table 2b summarizes husbands and wives' employment across different work categories dependent on share of coffee output sold. The overall results show that work participation and hours devoted by husbands and wives to different categories of work follow the same gendered divide as seen for banana. However, one interesting trend that emerges here is that the gap between wives and husbands in terms participation and hours worked in the different job categories is bigger in coffee selling than in net coffee consumer households.

Table 2b: Husbands and wives' employment across different work categories dependent on marketing of coffee

	Net coffee consumer				Coffee seller			
	Men	Women	Difference in means	Standard error	Men	Women	Difference in means	Standard error
Participation								
Primary market work	0.34	0.12	0.226***	0.014	0.34	0.10	0.242***	0.011
Primary farm work	0.65	0.88	-0.225***	0.014	0.66	0.90	-0.243***	0.011
Secondary work	0.29	0.16	0.130***	0.015	0.31	0.20	0.113***	0.012
Hours worked								
Total	30.23	21.85	8.383***	0.668	34.12	26.97	7.156***	0.512
Primary market work	13.93	3.76	10.173***	0.678	14.04	3.91	10.136***	0.521
Primary farm work	12.54	16.16	-3.618***	0.470	15.39	19.88	-4.490***	0.384
Secondary work	3.76	1.93	1.828***	0.273	4.70	3.20	1.506***	0.250
Share of hours worked								
Primary market work	0.29	0.10	0.192***	0.013	0.28	0.08	0.205***	0.009
Primary farm work	0.53	0.73	-0.199***	0.016	0.57	0.80	-0.232***	0.011
Secondary work	0.11	0.06	0.043***	0.007	0.11	0.08	0.034***	0.005
Primary market work sectors								
Public sector	0.16	0.15	0.012	0.031	0.16	0.18	-0.018	0.026
Private sector	0.44	0.30	0.139**	0.042	0.47	0.52	-0.047	0.035
NGO	0.03	0.03	0.001	0.014	0.03	0.00	0.026*	0.011
Private household	0.37	0.52	-0.152***	0.042	0.34	0.30	0.040	0.033
Observations	3172				5507			

Source: Based on authors calculations (UNPS 2009/10, 2010/11, 2011/12, 2013/14, 2015/16, 2018/19 & 2019/20). * p < 0.10, ** p < 0.05, *** p < 0.01

Table 3a and 3b provide additional descriptive statistics on household characteristics including the regional distribution of the households for coffee and banana producers respectively. For each of the crops, the households are further separated into net consumer and seller households. The results show that in general, prevalence of poverty is higher, and per capita consumption is lower in households that are net banana and coffee consumers compared to those who sell some of their output. This may be attributed to the likelihood that households that generally sell their output have the advantage of extra resources at their disposal to facilitate more consumption and hence higher prospects for being out of poverty (reference). Explain why?

Table 3a: Household characteristics dependent on marketing of banana

	Net banana consumer	Banana seller	Difference in means	Standard error
Household size	6.39	6.44	-0.048	0.057
Per capita consumption	45.80	55.99	-10.196***	1.219
Poor household	0.27	0.15	0.120***	0.009
Parcel size (ha)	1.69	2.46	-0.769**	0.238
Coffee	0.26	0.18	0.085***	0.007
Banana	0.74	0.82	-0.085***	0.007
Central	0.29	0.22	0.071***	0.010
Eastern	0.26	0.14	0.121***	0.009
Northern	0.12	0.07	0.055***	0.007
Western	0.33	0.58	-0.250***	0.011
Observations	8117			

Source: Based on authors calculations (UNPS 2009/10, 2010/11, 2011/12, 2013/14, 2015/16, 2018/19 & 2019/20). * p < 0.10, ** p < 0.05, *** p < 0.01

Table 3b: Household characteristics dependent on marketing of coffee

	Net coffee consumer	Coffee seller	Difference in means	Standard error
Household size	6.40	6.45	-0.050	0.076
Per capita consumption	32.46	53.59	-21.129***	1.484
Poor household	0.37	0.17	0.202***	0.013
Parcel size (ha)	2.61	2.29	0.320	0.470
Coffee	0.12	0.50	-0.382***	0.011
Banana	0.88	0.50	0.382***	0.011
Central	0.13	0.40	-0.272***	0.013
Eastern	0.29	0.18	0.113***	0.012
Northern	0.31	0.02	0.291***	0.009
Western	0.26	0.40	-0.139***	0.014
Observations	4708			

Source: Based on authors calculations (UNPS 2009/10, 2010/11, 2011/12, 2013/14, 2015/16, 2018/19 & 2019/20). * p < 0.10, ** p < 0.05, *** p < 0.01

5. Empirical model

We estimate the effect of positive and negative crop price shocks on the intrahousehold labor allocation between husbands and wives using the within Couple-Fixed-Effects-Estimator. This allows us to exploit more explicitly the within couple variation in both participation and hours of time allocated to different jobs when exposed to shocks. The results from this estimation are superior in the sense that they explicitly capture the differential in time allocation within a couple in the same household. Additionally, the within Couple-Fixed-Effects-Estimator can address possible endogeneity bias due to, for example, differentials in physical capacity within a couple in the same household necessary for most work options which tends to involve a lot of physical work. Our estimation equation is written as below.

$$y_{ijt} = \alpha + \beta_1 \boldsymbol{x}_t^c + \beta_2 f_{it} + \beta_3 (\boldsymbol{x}_t^c \times f_{it}) + \beta_4 \boldsymbol{g}_{ijt} + \eta_j + \boldsymbol{\gamma}_t + \varepsilon_{ijt}$$

Where **y** is the time allocation by the husband or wife *i* within couple *j* at time *t* to the different job categories: primary market work, primary farm work, and secondary work. By construction, primary market and farm work are mutually exclusive. Therefore, an increase in time allocation to one means an equivalent decrease in time allocation to the other. y_{ijt} is taken as the labour time allocation to different off-farm and on-farm activities at the intensive (number of hours) and the extensive (propensity to participate in an activity) margin. $\boldsymbol{x}$ is the crop price shock variable. We cannot estimate β_1 in the within Couple-Fixed-Effects specification because it does not vary for couples within the same household. It is, therefore, dropped in the estimation. $\boldsymbol{f}$ takes the value of one if the individual *i* is the spouse and zero if *i* is the husband. To analyze the differences in husbands' and wives' time allocation to different jobs, we interact the shock variable with *f*. Another important variable to note here is $\boldsymbol{g}$ which is a vector of characteristics such as education of *i* but in this setting vary within *j*. This variation allows us to examine the comparative advantages of educational achievement between spouses and how this affects their time allocation to undertake more lucrative off-farm jobs. $\boldsymbol{\eta}$ is the within couple fixed effects. $\boldsymbol{\gamma}$ comprises a set of wave dummy variables and $\boldsymbol{\varepsilon}$ is the error term.

6. Regression results

6.1 Transmission of international prices to farm gate prices

Table 4a summarizes the results of estimation of the correlation of international prices to farmgate prices for coffee and banana. The results show that there is a significant positive correlation between international coffee and banana prices to farmgate prices. This is consistent with the findings of Musumba and Gupta, (2013) who document that there is a transmission of international prices to growers' prices in Uganda. In table 4b, the sample is restricted only to sellers and the results are still significant and positive with a noticeable increase in the magnitude of the coefficients. In both estimations, in addition to the household controls and fixed effects, we also include an interaction of district and interview month fixed effects to account for seasonal and spatial variation of prices. Since the survey data is collected over a period of several months, households whose data is collected at the start of the season, are likely to face low prices due to increased supply of crop output. Similarly, households whose data is collected at the end of the season are likely to face high prices due to decreased supply of crop output. Additionally, prices generally tend to vary markets. Therefore, the inclusion of district and interview month fixed effects is expected to account for these differences. Some extra points on marketing of coffee and banana respectively.

Table 4a: Transmission of international crop prices to farm gate prices.

	Log farmgate coffee price	Log farmgate banana price
International price	0.0352***	0.0046***
	(0.0054)	(0.0004)
HH controls	Yes	Yes
HH fixed effects	Yes	Yes
District x interview month fixed effects	Yes	Yes
Observations	3205	6357
R-squared	0.370	0.271

Robust standard errors clustered at commune level are reported in the brackets. The dependent variable is the Log Farm-gate price per kilogram of each crop as listed in the column head. * p < 0.10, ** p < 0.05, *** p < 0.01. Other control variables included: gender, age, and education.

Table 4b: Transmission of international crop prices to farm gate prices – sample restricted to sellers

	Log farmgate coffee price	Log farmgate banana price
International price	0.0403***	0.0046***
	(0.0062)	(0.0006)
HH controls	Yes	Yes
HH fixed effects	Yes	Yes
District x interview month fixed effects	Yes	Yes
Observations	2607	2846
R-squared	0.421	0.329

Robust standard errors clustered at commune level are reported in the brackets. The dependent variable is the Log Farm-gate price per kilogram of each crop as listed in the column head. * p < 0.10, ** p < 0.05, *** p < 0.01. Region FE includes east, central, northern, and western. The other control variables included in the regression include gender, age, and education.

6.2 Gender differences in work – general results

Table 5 summarizes the results for the estimation of the impact of respective positive and negative coffee price shocks on the gender differences in hours worked within households. The results show that for positive price shocks, there is a significant reduction in the number of hours worked in total and in secondary work by 1.696 and 1.609 hours per week respectively. The significant reduction in the number of total hours worked in general and that allocated to secondary work by wives suggests that their labor is being substituted/ displaced. This could be explained by the fact that with coffee, the main work is usually harvesting, and the person (husband) who controls the revenue (Doan and Hoffmann, 2021), will likely take over harvesting thus wives get pushed out from their predominant work in agriculture. Similarly, most opportunities for secondary work in agriculture possibly in harvesting coffee also revert to the owners typically husbands because that gives them absolute control over revenue.

For negative price shocks, a significant reduction in number of hours worked in primary market work and increase that in secondary work by 2.368 and 1.582 hours per week respectively. Since by construction, participation in market work is mutually exclusive with participation in primary farm work, these results show that wives significantly increasing time allocation to

primary farm work. A possible explanation could be that with low prices, both husbands and wives labor is released from coffee production. However, due to low human capital coupled with traditional and social gender norms, they end up being crowded out from the primary market work and thus allocate that free time to primary market work and secondary work. for the other results, members within a couple that possess primary education as expected work significantly fewer hours in total and in primary market work when households experience either positive or negative price shocks. Meanwhile those that possessed post-secondary education worked significantly more hours in total and in primary market work. This could be attributed their possession of higher human capital.

Table 5: Gender differences in hours of work within households

	Positive price shock			Negative price shock		
	Total work	Primary market work	Secondary work	Total work	Primary market work	Secondary work
Wife x Coffee shock	-1.696*	-0.738	-1.609***	1.067	-2.368**	1.582***
	(0.952)	(1.107)	(0.508)	(1.072)	(1.196)	(0.517)
Wife	-8.948***	-11.734***	-1.843***	-9.629***	-11.314***	-2.634***
	(0.676)	(0.777)	(0.340)	(0.665)	(0.769)	(0.353)
Age	-0.259***	-0.250***	-0.109***	-0.258***	-0.245***	-0.109***
	(0.054)	(0.057)	(0.029)	(0.054)	(0.057)	(0.029)
Primary	-2.172**	-3.348***	-0.705	-2.216**	-3.380***	-0.744
	(0.888)	(1.009)	(0.499)	(0.885)	(1.006)	(0.498)
Post-secondary	7.089***	15.672***	0.770	7.086***	15.442***	0.814
	(2.316)	(2.666)	(0.994)	(2.324)	(2.670)	(0.993)
Constant	47.416***	27.785***	10.239***	47.386***	27.567***	10.251***
	(2.493)	(2.663)	(1.364)	(2.487)	(2.656)	(1.358)
N	6512	6509	6510	6512	6509	6510
r2	0.114	0.165	0.024	0.114	0.166	0.024

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6 summarizes the results for the estimation of the impact of respective positive and negative banana price shocks on the gender differences in hours worked within households. The results show that for positive price shocks, wives significantly reduce the number of hours allocated to primary market work and increase that to secondary work by 2.889 and 1.205 hours per week respectively. Since a significant reduction in the number of hours worked in primary market work translates into an equivalent number of hours worked in primary farm work, one explanation for this trend is that the positive price shock is incentivizing households to increase production thus the demand for more farm labor. As highlighted at the outset of the paper, typically the burden of provision of household agricultural labor falls on women; volume can be increased in the short term, women increasing time allocation to farm work. The increased time allocation to primary farm work, could also suggest that there are more opportunities for secondary work. This may explain why wives also increase time allocation to secondary work. The labor supply responses to positive price shocks for coffee and banana are entirely opposite and this variation could be explained by the labor requirements for the management of the two

crops. Coffee typically has one harvest in a year and picking the ripe cherries usually requires minimum effort. However, banana on the other hand, typically is harvested from the plantation throughout the year and is a labor-intensive exercise because the stems must be cut to get the banana and as a management practice to create space for new smaller stems to grow. While both coffee and banana are perennial crops and one would argue that a household could not possibly increase production in the short run to take advantage of the high prices, at least for banana, there are several operations that farmers could still undertake to increase production in the short run thus the increased number of hours allocated to primary farm work by wives. For example, farmers could undertake more mulching, de suckering (removing tiny plants that sprout around the main banana sucker that compete for nutrients), propping plants so that fruiting banana doesn't fall off, trimming old dry leaves, weeding etc.

For negative banana crop price shocks, wives significantly increase their number of hours worked in primary market work and reduce that in secondary work by 2.165 and 0.988 hours per week respectively. Possible explanation could be that their labor is released. Considering that a lot of secondary work opportunities in rural areas are also in agriculture, mostly doing weeding or harvesting during peak time, low prices could also depress demand for secondary workers. The likely reduced demand for secondary work explains why wives significantly reduce the number of hours worked in secondary work.

Table 6: Gender differences in hours of work within households

	Positive price shock			Negative price shock		
	Total work	Primary market work	Secondary work	Total work	Primary market work	Secondary work
Wife x Banana shock	-1.139	-2.889***	1.205***	-0.022	2.165***	-0.988**
	(0.845)	(0.969)	(0.414)	(0.717)	(0.831)	(0.392)
Wife	-9.621***	-12.764***	-2.104***	-9.873***	-13.940***	-1.593***
	(0.523)	(0.596)	(0.273)	(0.531)	(0.607)	(0.266)
Age	-0.289***	-0.273***	-0.072***	-0.292***	-0.270***	-0.074***
	(0.049)	(0.052)	(0.026)	(0.049)	(0.052)	(0.026)
Primary	-1.999***	-2.481***	-0.772**	-1.985***	-2.429***	-0.795**
	(0.654)	(0.757)	(0.338)	(0.654)	(0.757)	(0.338)
Post-secondary	-2.372	2.493	-0.527	-2.312	2.529	-0.538
	(1.572)	(1.801)	(0.723)	(1.570)	(1.795)	(0.721)
Constant	49.722***	30.571***	8.394***	49.839***	30.373***	8.495***
	(2.223)	(2.362)	(1.166)	(2.218)	(2.360)	(1.178)
N	11986	11980	11982	11986	11980	11982
r2	0.107	0.167	0.017	0.107	0.166	0.017

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category. * p < 0.10, ** p < 0.05, *** p < 0.01

6.3 Gender differences in work: sample conditioned on share of output sold

We re-run the estimations in table 5 and 6 by splitting the sample of couples into those belonging to net consumer or seller households[6]. The results for coffee in table 7a show that

[6] See section 2 for a full description of how net food consumer and seller households are defined.

for positive price shocks, the significant decrease in wives time allocation to secondary work as seen in table 5 is predominantly driven by those in seller households. This is consistent with the argument advanced earlier that the reduction in wives time allocation to secondary work or indeed total hours worked under positive price shock is driven by husbands who control coffee revenue basically stepping in to do harvesting themselves because it allows them to have absolute control over the revenue. By doing this, the usual opportunities for secondary work which are typically in agriculture thus disappear. Consequently, wives significantly reduce their number of hours allocated to secondary work. The results for banana in table 7b show that for positive price shocks, the significant decrease in wives time allocation to primary market work as seen in table 6 is predominantly driven by those in net consumer households. The significant increase in wives time allocation to secondary work on the other hand is driven by both those in consumer and seller households.

Table 7a: Gender differences in hours of work within households in response to positive coffee price shock conditional on share of output sold

	Total work		Primary market work		Secondary work	
	Consumer	Seller	Consumer	Seller	Consumer	Seller
Wife x Coffee shock	-3.052	-1.646	-5.962	-1.110	0.888	-1.344**
	(5.045)	(1.102)	(5.868)	(1.276)	(1.974)	(0.591)
Wife	-10.728***	-8.838***	-11.674***	-11.748***	0.897	-2.083***
	(3.726)	(0.786)	(3.856)	(0.900)	(1.559)	(0.413)
Age	-0.620**	-0.220***	-0.394*	-0.242***	0.018	-0.106***
	(0.252)	(0.063)	(0.235)	(0.066)	(0.131)	(0.035)
Primary	1.159	-2.160**	3.863	-4.056***	-1.516	-0.364
	(3.642)	(1.042)	(4.002)	(1.198)	(1.020)	(0.569)
Post-secondary	16.349	5.364**	20.145	13.512***	0.777	0.912
	(12.943)	(2.515)	(12.514)	(3.022)	(7.141)	(1.206)
Constant	55.663***	46.687***	27.286**	28.236***	2.527	10.166***
	(12.607)	(2.902)	(11.780)	(3.059)	(6.257)	(1.616)
N	276	4,825	276	4,822	276	4,823
fixed effects	167	2,729	167	2,727	167	2,727
within-R2	0.118	0.113	0.179	0.166	0.014	0.025

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category listed in the column head. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7b: Gender differences in hours of work within households in response to positive banana price shock conditional on share of output sold

	Total work		Primary market work		Secondary work	
	Consumer	Seller	Consumer	Seller	Consumer	Seller
Wife x Banana shock	-1.735	-0.457	-3.688***	-2.113	1.173**	1.133*
	(1.243)	(1.183)	(1.414)	(1.393)	(0.568)	(0.627)
Wife	-11.517***	-7.115***	-14.312***	-10.897***	-2.769***	-1.294***
	(0.794)	(0.700)	(0.876)	(0.866)	(0.401)	(0.360)
Age	-0.404***	-0.132*	-0.383***	-0.160**	-0.102***	-0.022
	(0.070)	(0.068)	(0.077)	(0.072)	(0.036)	(0.035)
Primary	-3.147***	-0.620	-3.641***	-0.622	-0.786	-1.055**
	(1.000)	(0.898)	(1.105)	(1.091)	(0.530)	(0.447)
Post-secondary	-2.641	-1.503	-1.038	7.781***	-0.584	-0.509
	(2.382)	(2.138)	(2.686)	(2.522)	(1.025)	(1.162)
Constant	55.900***	41.550***	37.471***	22.710***	9.996***	6.016***
	(3.192)	(3.109)	(3.499)	(3.318)	(1.610)	(1.599)
N	5,994	5,326	5,993	5,321	5,993	5,323
fixed effects	3,475	2,999	3,475	2,997	3,475	2,997
within-R2	0.133	0.075	0.185	0.142	0.027	0.011

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category listed in the column head. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

While the results in table 5 do not show any significant increase in wives' total number of hours worked, once the sample is segregated, the results show that for negative coffee price shocks, wives in seller households significantly increase their total number of hours worked per week (Table 8a). The significant increase in the number of hours allocated to primary market work by wives under negative banana price shocks as seen in Table 6 is primarily driven by those in consumer households (table 8b). Relatedly, the significant decrease in wives time allocation to secondary work is driven by those in consumer households.

Table 8a: Gender differences in hours of work within households in response to negative banana price shock conditional on share of output sold

	Total work		Primary market work		Secondary work	
	Consumer	Seller	Consumer	Seller	Consumer	Seller
Wife x coffee shock	7.947	2.782**	1.258	-1.072	0.264	1.724***
	(4.810)	(1.310)	(5.435)	(1.449)	(1.671)	(0.666)
Wife	-13.510***	-9.902***	-12.851***	-11.786***	0.938	-2.825***
	(3.868)	(0.769)	(3.714)	(0.893)	(1.811)	(0.412)
Age	-0.584**	-0.221***	-0.316	-0.238***	0.006	-0.106***
	(0.235)	(0.063)	(0.227)	(0.066)	(0.122)	(0.035)
Primary	0.111	-2.165**	3.998	-4.139***	-1.605*	-0.383
	(3.523)	(1.037)	(4.124)	(1.193)	(0.943)	(0.564)
Post-secondary	16.207	5.503**	18.677	13.441***	1.033	0.995
	(12.847)	(2.525)	(11.972)	(3.032)	(7.065)	(1.200)
Constant	54.611***	46.705***	23.466**	28.120***	3.152	10.157***
	(11.553)	(2.892)	(11.222)	(3.052)	(5.837)	(1.605)
N	276	4,825	276	4,822	276	4,823
fixed effects	167	2,729	167	2,727	167	2,727
within-R2	0.139	0.114	0.170	0.166	0.012	0.025

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category listed in the column head. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 8b: Gender differences in hours of work within households in response to negative banana price shock conditional on share of output sold

	Total work		Primary market work		Secondary work	
	Consumer	Seller	Consumer	Seller	Consumer	Seller
Wife x Banana shock	0.480	-0.165	2.946**	1.425	-1.223**	-0.176
	(1.043)	(1.037)	(1.159)	(1.295)	(0.559)	(0.570)
Wife	-12.065***	-7.171***	-15.958***	-11.669***	-2.174***	-1.017***
	(0.789)	(0.743)	(0.886)	(0.875)	(0.377)	(0.384)
Age	-0.409***	-0.132*	-0.377***	-0.158**	-0.106***	-0.022
	(0.071)	(0.068)	(0.077)	(0.072)	(0.037)	(0.035)
Primary	-3.146***	-0.607	-3.643***	-0.556	-0.784	-1.088**
	(1.000)	(0.898)	(1.106)	(1.090)	(0.531)	(0.450)
Post-secondary	-2.545	-1.494	-0.984	7.801***	-0.580	-0.526
	(2.382)	(2.135)	(2.688)	(2.504)	(1.026)	(1.155)
Constant	56.109***	41.535***	37.187***	22.597***	10.194***	6.066***
	(3.197)	(3.103)	(3.511)	(3.317)	(1.653)	(1.593)
N	5,994	5,326	5,993	5,321	5,993	5,323
fixed effects	3,475	2,999	3,475	2,997	3,475	2,997
within-R2	0.132	0.075	0.184	0.142	0.027	0.010

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category listed in the column head. * p < 0.10, ** p < 0.05, *** p < 0.01

6.4 Robustness checks

We use alternative definition of labor variable; work participation on the extensive margin to estimate the effect of price shocks on within couple labor supply responses. Again, the results are stable and consistent with those in the preceding sections. For positive coffee price shocks: wives significantly decrease participation in secondary work and under negative coffee price shocks, they significantly reduce participation in primary market work and instead increase participation in secondary work (Table 9). These results are consistent with those reported in section 5.2 and 5.3. For positive banana price shocks, wives significantly increase participation in secondary work by 4.41 percentage points and for negative banana price shocks, wives significantly increase participation in primary market work by 3.33 percentage points and reduce participation in secondary work by 4.2 percentage points (Table 10). Once again, these results are consistent with those reported in section 5.2 and 5.3.

Table 9: Gender differences in work participation within households

	Positive price shock		Negative price shock	
	Primary market work	Secondary work	Primary market work	Secondary work
Wife x Coffee shock	0.0029	-0.0519**	-0.0714***	0.0642***
	(0.0209)	(0.0221)	(0.0234)	(0.0236)
Wife	-0.2723***	-0.1224***	-0.2536***	-0.1512***
	(0.0151)	(0.0155)	(0.0147)	(0.0154)
Age	-0.0052***	-0.0038***	-0.0050***	-0.0038***
	(0.0011)	(0.0013)	(0.0011)	(0.0013)
Primary	-0.0806***	-0.0476**	-0.0809***	-0.0488**
	(0.0200)	(0.0201)	(0.0199)	(0.0201)
Post-secondary	0.3304***	0.1323***	0.3247***	0.1347***
	(0.0513)	(0.0502)	(0.0513)	(0.0502)
Constant	0.6324***	0.5200***	0.6275***	0.5213***
	(0.0540)	(0.0616)	(0.0538)	(0.0614)
N	6512	6512	6512	6512
r2	0.217	0.055	0.219	0.056

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor participation in each occupational category. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Gender differences in work participation within households

	Positive price shock		Negative price shock	
	Primary market work	Secondary work	Primary market work	Secondary work
Wife x Banana shock	-0.0250	0.0441**	0.0333**	-0.0420**
	(0.0192)	(0.0196)	(0.0162)	(0.0169)
Wife	-0.2791***	-0.1117***	-0.2928***	-0.0916***
	(0.0116)	(0.0120)	(0.0119)	(0.0122)
Age	-0.0039***	-0.0013	-0.0038***	-0.0014
	(0.0011)	(0.0011)	(0.0011)	(0.0011)
Primary	-0.0723***	-0.0442***	-0.0718***	-0.0451***
	(0.0151)	(0.0154)	(0.0151)	(0.0154)
Post-secondary	0.1387***	0.0588*	0.1383***	0.0587*
	(0.0358)	(0.0342)	(0.0358)	(0.0341)
Constant	0.6213***	0.3984***	0.6164***	0.4034***
	(0.0482)	(0.0518)	(0.0482)	(0.0521)
N	11992	11987	11992	11987
r2	0.214	0.036	0.215	0.036

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor participation in each occupational category. * p < 0.10, ** p < 0.05, *** p < 0.01

7. Conclusion

Women in rural agricultural households often face a lot of constraints in accessing off-farm market work and therefore mostly engage in on-farm agricultural work. In this paper we have examined the ex-post effect of very high or low coffee and banana price on intra spousal labor supply responses within a household. The results show that very high coffee prices displace women's labor from farm work on account of husbands likely taking charge of harvesting and marketing coffee to control the increased revenue. For very high banana prices on the other hand, it's the opposite with wives significantly working more on the farm possibly to increase production to reap more revenue from the increased prices. For low coffee prices, wives appear to be crowded out of primary market work possibly because husbands who predominantly control coffee output are also entering the labor market. On the other hand, low prices of banana in. These results show that regardless of whether crop prices are high or low, in most rural agricultural households, wives or indeed women are still not able to access lucrative primary market work except when the price of banana (food crop) drops. This means that in rural agricultural households, price extremes either displace women from on-farm work related to profitable crops or increase demand for their labor on-farm to work on profitable crops. Therefore, within the existing structural household constraints, exogenous price changes may not contribute much to increasing women's participation in lucrative primary market work.

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Appendix

Table A1: Gender differences in share of hours worked within households.

	Positive price shock		Negative price shock	
	Primary market work	Secondary work	Primary market work	Secondary work
Wife x Coffee shock	0.021	-0.038***	-0.081***	0.035***
	(0.018)	(0.011)	(0.021)	(0.011)
Wife	-0.236***	-0.039***	-0.210***	-0.057***
	(0.014)	(0.007)	(0.013)	(0.007)
Age	-0.004***	-0.002***	-0.004***	-0.002***
	(0.001)	(0.001)	(0.001)	(0.001)
Primary	-0.062***	-0.017	-0.062***	-0.018*
	(0.018)	(0.010)	(0.018)	(0.010)
Post-secondary	0.292***	0.010	0.287***	0.011
	(0.047)	(0.020)	(0.047)	(0.021)
Constant	0.519***	0.234***	0.515***	0.234***
	(0.047)	(0.032)	(0.047)	(0.032)
N	6509	6510	6509	6510
r2	0.199	0.027	0.203	0.026

Cluster-robust standard errors are reported in the brackets. The dependent variable is the share of labor time allocated to each occupational category. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A2: Gender differences in share of hours worked within households.

	Positive price shock		Negative price shock	
	Primary market work	Secondary work	Primary market work	Secondary work
Wife x Banana shock	-0.042**	0.024***	0.042***	-0.025***
	(0.018)	(0.009)	(0.015)	(0.008)
Wife	-0.246***	-0.039***	-0.266***	-0.028***
	(0.011)	(0.006)	(0.011)	(0.006)
Age	-0.004***	-0.001*	-0.004***	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
Primary	-0.053***	-0.017**	-0.052***	-0.017**
	(0.014)	(0.007)	(0.014)	(0.007)
Post-secondary	0.093***	0.013	0.093***	0.013
	(0.033)	(0.016)	(0.033)	(0.016)
Constant	0.552***	0.166***	0.547***	0.170***
	(0.044)	(0.026)	(0.043)	(0.026)
N	11980	11982	11980	11982
r2	0.199	0.016	0.199	0.017

Cluster-robust standard errors are reported in the brackets. The dependent variable is the share of labor time allocated to each occupational category. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A3a: Gender differences in work participation within the household in response to positive coffee price shock conditional on share of output sold

	Primary market work		Secondary work	
	Consumer	Seller	Consumer	Seller
Wife x Coffee shock	-0.095	-0.002	0.098	-0.039
	(0.113)	(0.024)	(0.120)	(0.025)
Wife	-0.249***	-0.278***	-0.020	-0.141***
	(0.079)	(0.017)	(0.075)	(0.018)
Age	-0.006	-0.005***	0.006	-0.004***
	(0.005)	(0.001)	(0.006)	(0.001)
Primary	-0.007	-0.096***	-0.110	-0.040*
	(0.100)	(0.022)	(0.077)	(0.023)
Post-secondary	0.313	0.294***	0.061	0.101*
	(0.328)	(0.061)	(0.282)	(0.059)
Constant	0.578**	0.658***	0.015	0.557***
	(0.261)	(0.061)	(0.323)	(0.068)
N	276	4,825	276	4,824
fixed effects	167	2,727	167	2,727
within-R2	0.190	0.225	0.047	0.061

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category listed in the column head. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A3b: Gender differences in work participation within the household in response to positive banana price shock conditional on share of output sold

	Primary market work		Secondary work	
	Consumer	Seller	Consumer	Seller
Wife x Banana shock	-0.038	-0.012	0.053*	0.038
	(0.028)	(0.028)	(0.029)	(0.028)
Wife	-0.308***	-0.247***	-0.140***	-0.088***
	(0.017)	(0.017)	(0.017)	(0.017)
Age	-0.005***	-0.003*	-0.002	-0.000
	(0.002)	(0.001)	(0.002)	(0.002)
Primary	-0.091***	-0.046**	-0.053**	-0.036*
	(0.023)	(0.021)	(0.023)	(0.022)
Post-secondary	0.054	0.255***	0.073	0.044
	(0.050)	(0.056)	(0.049)	(0.052)
Constant	0.725***	0.515***	0.455***	0.339***
	(0.070)	(0.069)	(0.075)	(0.073)
N	5,997	5,327	5,996	5,324
fixed effects	3,475	2,997	3,476	2,997
within-R2	0.235	0.188	0.052	0.026

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category listed in the column head. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A4a: Gender differences in work participation within the household in response to negative coffee price shock conditional on share of output sold

	Primary market work		Secondary work	
	Consumer	Seller	Consumer	Seller
Wife x Coffee shock	0.029	-0.061**	0.032	0.078***
	(0.107)	(0.028)	(0.093)	(0.029)
Wife	-0.271***	-0.264***	-0.016	-0.169***
	(0.076)	(0.017)	(0.084)	(0.017)
Age	-0.005	-0.005***	0.005	-0.004***
	(0.005)	(0.001)	(0.007)	(0.001)
Primary	-0.006	-0.098***	-0.121	-0.040*
	(0.101)	(0.022)	(0.077)	(0.023)
Post-secondary	0.291	0.291***	0.090	0.105*
	(0.323)	(0.061)	(0.274)	(0.059)
Constant	0.518*	0.655***	0.084	0.558***
	(0.266)	(0.061)	(0.327)	(0.068)
N	276	4,825	276	4,824
fixed effects	167	2,727	167	2,727
within-R2	0.185	0.227	0.041	0.064

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category listed in the column head. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A4b: Gender differences in work participation within the household in response to negative banana price shock conditional on share of output sold

	Primary market work		Secondary work	
	Consumer	Seller	Consumer	Seller
Wife x Banana shock	0.058***	0.015	-0.061***	0.011
	(0.022)	(0.026)	(0.023)	(0.027)
Wife	-0.332***	-0.253***	-0.112***	-0.082***
	(0.017)	(0.017)	(0.018)	(0.017)
Age	-0.005***	-0.003*	-0.002	-0.000
	(0.002)	(0.001)	(0.002)	(0.002)
Primary	-0.091***	-0.046**	-0.053**	-0.037*
	(0.023)	(0.021)	(0.023)	(0.022)
Post-secondary	0.052	0.255***	0.074	0.043
	(0.051)	(0.056)	(0.049)	(0.052)
Constant	0.712***	0.514***	0.466***	0.340***
	(0.070)	(0.069)	(0.076)	(0.073)
N	5,997	5,327	5,996	5,324
fixed effects	3,475	2,997	3,476	2,997
within-R2	0.237	0.188	0.053	0.025

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category listed in the column head. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A5a: Gender differences share of hours worked within households in response to positive coffee price shock conditional on share of output sold

	Primary market work		Secondary work	
	Consumer	Seller	Consumer	Seller
Wife x Coffee shock	-0.098	0.018	0.016	-0.037***
	(0.103)	(0.021)	(0.057)	(0.012)
Wife	-0.202***	-0.239***	0.036	-0.046***
	(0.069)	(0.016)	(0.035)	(0.009)
Age	-0.005	-0.004***	0.003	-0.003***
	(0.004)	(0.001)	(0.003)	(0.001)
Primary	0.061	-0.080***	-0.073	-0.015
	(0.089)	(0.020)	(0.046)	(0.012)
Post-secondary	0.388*	0.247***	-0.076	0.014
	(0.229)	(0.056)	(0.146)	(0.025)
Constant	0.426*	0.535***	-0.015	0.253***
	(0.230)	(0.052)	(0.152)	(0.037)
N	276	4,822	276	4,823
fixed effects	167	2,727	167	2,727
within-R2	0.190	0.205	0.033	0.032

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category listed in the column head. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A5b: Gender differences share of hours worked within households in response to positive banana price shock conditional on share of output sold

	Primary market work		Secondary work	
	Consumer	Seller	Consumer	Seller
Wife x Banana shock	-0.052**	-0.033	0.017	0.032**
	(0.025)	(0.026)	(0.013)	(0.013)
Wife	-0.273***	-0.219***	-0.050***	-0.030***
	(0.015)	(0.016)	(0.008)	(0.008)
Age	-0.005***	-0.003**	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Primary	-0.078***	-0.019	-0.026**	-0.013
	(0.021)	(0.020)	(0.011)	(0.010)
Post-secondary	0.014	0.198***	0.005	0.018
	(0.047)	(0.050)	(0.023)	(0.023)
Constant	0.651***	0.463***	0.180***	0.153***
	(0.061)	(0.065)	(0.039)	(0.033)
N	5,993	5,321	5,993	5,323
fixed effects	3,475	2,997	3,475	2,997
within-R2	0.223	0.169	0.029	0.010

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category listed in the column head. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A6a: Gender differences share of hours worked within households in response to negative coffee price shock conditional on share of output sold

	Primary market work		Secondary work	
	Consumer	Seller	Consumer	Seller
Wife x Coffee shock	0.011	-0.066**	-0.001	0.042***
	(0.092)	(0.026)	(0.046)	(0.013)
Wife	-0.219***	-0.219***	0.038	-0.065***
	(0.066)	(0.015)	(0.038)	(0.009)
Age	-0.004	-0.004***	0.003	-0.003***
	(0.005)	(0.001)	(0.003)	(0.001)
Primary	0.065	-0.081***	-0.074*	-0.016
	(0.090)	(0.020)	(0.044)	(0.012)
Post-secondary	0.363	0.243***	-0.072	0.016
	(0.224)	(0.056)	(0.145)	(0.025)
Constant	0.362	0.534***	-0.005	0.252***
	(0.235)	(0.052)	(0.157)	(0.036)
N	276	4,822	276	4,823
fixed effects	167	2,727	167	2,727
within-R2	0.183	0.207	0.033	0.033

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category listed in the column head. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A6b: Gender differences share of hours worked within households in response to negative banana price shock conditional on share of output sold

	Primary market work		Secondary work	
	Consumer	Seller	Consumer	Seller
Wife x Banana shock	0.063***	0.027	-0.029***	-0.006
	(0.020)	(0.023)	(0.011)	(0.012)
Wife	-0.302***	-0.232***	-0.038***	-0.022***
	(0.016)	(0.016)	(0.009)	(0.008)
Age	-0.005***	-0.003**	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Primary	-0.078***	-0.018	-0.026**	-0.014
	(0.021)	(0.020)	(0.011)	(0.010)
Post-secondary	0.013	0.198***	0.006	0.017
	(0.047)	(0.050)	(0.023)	(0.023)
Constant	0.639***	0.461***	0.188***	0.154***
	(0.061)	(0.065)	(0.040)	(0.033)
N	5,993	5,321	5,993	5,323
fixed effects	3,475	2,997	3,475	2,997
within-R2	0.224	0.169	0.031	0.008

Cluster-robust standard errors are reported in the brackets. The dependent variable is the labor time allocated to each occupational category listed in the column head. * p < 0.10, ** p < 0.05, *** p < 0.01