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The Unintended Consequences of the Malawi Farm Input Subsidy Program on Women's Employment and Decision Making Power

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PAGE policy analysis on growth and employment

Abstract

Gender inequalities remains a key development issue across the globe.In sub-Saharan Africa, Women lag behind despite dominating labour supply in food crop production. Food production also happens to be the target for farm input subsidies in the region. Empirical evidence reveals that farm input subsidies lead to reduction in household off-farm labour provision, but with limited attention paid to the different labour effects across gender. In this paper we investigate whether farm input subsidies in Malawi affect employment between men and women differently and decision making power. We find that farm input subsidies reduce the supply of casual labour for women and while increasing the supply of labour on own farm, only amongst women. Furthermore, the subsidies lead to reduction in female decision making power. Therefore, a generic policy such as the farm input subsidy program may not be effective in reducing gender inequality, in rural agriculture economies like Malawi.

Key words : Gender, Female Labour Supply, Farm Input Subsidies, Malawi, Intrahousehold bargaining
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Executive summary

Farm Input Subsidy Programmes (FISPs) have been widely rolled out in sub-Saharan African countries with mixed results. While these programmes primarily target increased household food security through household food production, policymakers and academics anticipate unintended positive second-round welfare effects for households and the individuals comprising these households. Possible second-round effects include increased employment, reduction of gender inequalities in welfare.

In the roll-out of these programmes, not much attention is paid to the possible gendered primary or second-round effects. Gender differences in the effects of FISPs may emerge for several reasons. Men and women often have competing interests and different preferences, which prevent the household from operating as a unitary entity. While it is easy to assume that the household will operate as an unitary entity when designing public support programmes such as these, power asymmetries often result in inputs and resources being used and shared unequally between the genders.

Since women dominate the cultivation of food crops in many parts of Africa, the subsidies provided through FISPs are generally expected to improve their bargaining power inside the household. If women are in control of the harvests, they can sell part of the produce and use the resources to establish businesses and obtain credit. In a scenario where women have limited bargaining power, however, business capital and access to credit will not improve. A third possibility is that there could be no change for both men and women if rising productivity does not generate sufficient resources to buy assets or establish businesses for anyone in the household.

The study uses data from Malawi to understand the unintended gender consequences of FISPs through the Malawi Farm Input Subsidy Program (FISP) impact on women's employment and decision making. We include male outcomes to investigate if the program yields different effects between genders. We measure both participation and time spent in various types of employment, including *ganyu* (casual labour), wage jobs in the formal sector, and own farm production.

The Malawi Farm Input Subsidy Program (FISP) was established in 2006 against a backdrop of severe food shortages in the country. It has since been renewed for several growing seasons. During the last few cycles of the programme, it has mainly followed a targeted beneficiary approach – in other words, the subsidy was limited to the poorest households. More recently, the new Malawian government (which was elected in June 2020) promised to revert to the universal coverage of FISP beneficiaries. It is anticipated that the 2020 FISP will therefore expand from providing subsidised inputs to one million smallholder farmers to covering all 3.5 million smallholder farmers in Malawi.

We use data from the Malawi LSMA-ISA survey called the Integrated Household Panel Survey (IHPS). The IHPS was conducted by the Malawi National Statistical Office (NSO) with technical support from the World Bank. The survey used the 2008 Malawi Population and Housing

Census as a sampling frame. The IHPS is nationally representative and currently has 3 longitudinal waves, conducted in the years 2010, 2013 and 2016. However, due to certain limitations of the 2016 wave we only use the 2010 to 2013 waves of data.

We use econometric models that specify employment decisions, maize sales and household decision-making, as a function of living in a household that received fertilizer subsidy vouchers. We study the outcomes of different individuals in male-headed households – male heads and their female spouses. The vouchers are granted to the household head. To establish whether the effects of FISP on the outcomes of interest differ by gender, we run separate analyses for male and female spouses. We compare these groups in FISP-recipient households to the situation where they do not receive subsidies.

We find that farm input subsidies reduce female agricultural casual labour supply; the additional time is diverted to high productivity activity on their own farms that is stimulated by receipt of FISP vouchers. Men also re-allocate their labour supply, but in an inequitable way. They reduce their involvement in wage jobs, but do not spend more time in cultivating the lands.

The study highlights challenges faced by women due to unintended consequences of farm input subsidy initiatives. Specifically, both women and men are relieved from their non-household employment in response to the FISP. However only women re-invest their relieved labour into household farming. Our results show, not consistent with our hypothesis, that the FISP widens intra-household gender inequality with respect to work.

Most pertinently, the decision making power over income from crops sales *drops* for women in FISP households, while these women provide more labour on their own farms. The FISP thus imposes a labour cost on women without improving their position to make decisions on the income earned from their work. We do not find the same effects for women who head their own households. The shifts in behaviour therefore arise primarily in a context where gender imbalances exist within households, and where men are able to use their bargaining power to strengthen their positions in their households.

It is not clear why the benefits of a household-level agricultural programme – that targets the female-dominated food crop production sector and has demonstrable agricultural productivity benefits – does not benefit women to the same degree as men. Other studies have shown that a reduction of the unintended gender gaps created by farm input subsidy initiatives may require these programmes to be accompanied by gender equality sensitisation. In addition, recipient selection could be revised. Women who farm the land could be made beneficiaries instead of men who head households. Our results show that the status quo of targeting female household heads is not sufficient to alleviate gender imbalances – particularly those that arise within male-headed households. Both targeted and universal agricultural subsidy programmes will have to pay much greater attention to ensuring that female members of the household who sow the land are able to reap the benefits of these programmes.

1 Introduction

Women contribute substantially to the labour force in developing countries, but continue to face many socio-economic disadvantages relative to men. In sub-Saharan Africa, women represent approximately 50 percent of the agricultural labour force, and cultural norms assign them to own food production while men dominate in the production of cash crops (FAO, 1993; Ali et al., 2016; Geisler, 1993; Quisumbing et al., 1995). Consequently, women make significant time investments, but are less likely than men to access cash from cultivation that would allow them to pursue other economic objectives other than dietary intake. Nevertheless, the question of whether women and men benefit differently from food crop production initiatives in the region, receives inadequate attention. Empirical evidence to understand gender imbalances in food crop production is more necessary than before, considering that many sub-Saharan African governments have recently experienced an increase in policy interest and support for food production, through numerous agricultural initiatives.

One of the agricultural interventions that has regained popularity in the sub-Saharan countries, and targets food crops, is the Farm Input Subsidy Program (FISP).The FISP historically supported food production until it was abandoned in the late 1980s under the Structural Adjustment Programs (Harou, 2018). FISP re-emerged in the region in the 2000s with a new emphasis on 'smart targeting' of beneficiaries, departing from the universal coverage of the original programme (Jayne et al., 2018). The FISP aims to increase household welfare by boosting subsistence farmer cereal productivity (Karamba and Winters, 2015a). The program distributes vouchers that allow beneficiaries to obtain inorganic fertilizers and hybrid seeds at a cost that is less than the inputs' prevailing market prices (Ricker-Gilbert, 2014). However, existing evidence show that the programme has not only improved *subsistence* production, but has also resulted in increased household income (Chibwana et al., 2012; Chirwa and Andrew, 2013). This unties farmer liquidity constraints.

Empirical studies (Ricker-Gilbert et al., 2011; Karamba and Winters, 2015a; Sibande et al., 2017), reveal that the FISP achieves its intended purpose of increasing farmers' cereal productivity, though limited attention has been devoted to the gender distribution of these benefits. Amongst the few studies that examine the effects of FISP on other outcomes, Dorward et al. (2008) and Ricker-Gilbert (2014) show that the program reduces the $survivalist$ casual labour employment, possibly, in response to higher own production. However, little is known about whether men and women have different labour supply responses to the FISP, and whether shifts in bargaining power within households occur.

This paper examines the effects of the FISP on female employment (casual labour and own farm), and decision making power in Malawi. For purposes of comparison, we also examine the effects of FISP on male outcomes. The specific objectives of the paper are as follows: Firstly, we estimate the effects that FISP has on choice of employment. Secondly, we confirm that FISP leads to changes in maize sales at household level and then assess whether the FISP changes the distribution of decision making power over the usage of the earnings from the maize sales across the genders.

The paper uses two waves (2010 and 2013) of a nationally representative panel data-set from Malawi. To understand the gains within gender and between individuals living in FISP beneficiary and non-beneficiary households, we estimate male and female equations separately. Furthermore, we consider that spouses could experience different effects of the program from the rest of the household members, as they are more likely to be deciders in the households. Therefore, the study is limited to examining these effects on household heads and their spouses only.Further, observing outcomes for spouses within the same household in comparison to those in non-FISP households, enables us to interpret our results as the effects of FISP on intra-household gender inequalities in agricultural production. In addition, the paper examines females and males in male and female headed households separately because we anticipate that different household bargaining arrangements arise in these settings. Existing literature finds that male-headed households are more responsive to changes in the own farm policy initiatives relative to female headed households Dzanku (2018). We therefore emphasise results from male headed-households, but report findings for female-headed households for the sake of robustness.

We study both the extensive and intensive margin. To account for the potential endogeneity emerging from non-random selection of beneficiaries into FISP, we use binary linear models with Fixed Effects (FE) (employment, maize sales and decision making) or Tobit models with the Mundlak (1978) device to account for time invariant endogeneity and corner solutions in continuous variables (such as time use). An additional concern is time variant unobservables. However, in this paper we follow the literature which suggests that the main FISP unobservables are stable over time. These include relationship to the village leaders and social connections (Ricker-Gilbert, 2014).

We find that the FISP program reduces female but not male employment in casual labour, popularly known as $ganyu$ in Malawi. Furthermore, only females increase their household agricultural labour supply in response to the FISP. On the other hand, FISP increases sales of maize produced by households. However, the program reduces female decision making power over earnings from maize crops. Our results imply that FISP unties household liquidity constraints, so that females are less likely to work in off-farm precarious jobs. Females invest the freed up time into their own farms . However, the shift in labour supply does not change the position of women; the programme reduces their decision making power on the usage of the earnings.

The main contribution of the paper is to establish the gender dis-aggregated unintended consequences of farm input subsidies on employment and its subsequent effects on female agency. We consider these outcomes unintended because the programme was designed to enhance food security and income (Jayne et al., 2018; Chibwana and Fisher, 2011). The only FISP related study on gender was done by Karamba and Winters (2015b). These authors examine the effects of the program on maize productivity by comparing maize yields from male and female managed plots.The authors do not, however, separate individuals by household headship. Nevertheless, females living in male and female headed households could have different command over income, which translates to inequality *within* households. Our individual-level analysis therefore extends the existing literature by considering bargaining power between men and women of the same household type that face similar constraints.

In section 2 we presents literature on gender inequalities in agriculture production..Section 3 explains the Malawi FISP in detail. Section 4 describes the data, followed by the presentation of the methodology that we adopt to address our objectives. Section 5 presents and discusses the results of the paper. Finally section 6 concludes and provides policy recommendations.

2 Gender inequalities in agricultural production

The sub-Saharan literature (Meinzen-Dick et al., 2019; Mukasa and Salami, 2015; Bryceson, 2019; Doss, 2015) on gender inequalities in agricultural production mainly focuses on factors that lead to labour productivity differences between genders. These factors include, but are not limited to, education levels, access to credit, land, physical capital and labour. Labour division in farming Households becomes an important factor that could not only affect the differences in productivity across genders but also lead to differences in gains from agriculture production between men and women.

In many rural economies of the region women undertake more household chores relative to men Lenjiso et al. (2016). Men could be allocating the time saved for undertaking less household tasks to production in household farms. However,Ali et al. (2016) show that men and women devote similar time and efforts in household farms in sub-Sahara. In most cases, men allocate the spare time to off-household employment to generate cash Sikod (2007). Thus, men maximise financial gains from their labour while females are locked in the unpaid household chores and household farm work.

In the household farm production, gender differences also exist. Males dominate cash crop farming while females are confirmed to food crop production (Quisumbing et al., 1995).Nevertheless men take most decisions about the usage of farm produce, even on interventions that they are not the main labourers (Lusiba et al., 2017). Females do not have the similar privileges. This leads to gender differences in the gains from agriculture production. For instance in Uganda, Lecoutere and Jassogne (2019) finds that men control earnings from cash crops while females do not fully control the food crop harvests, despite been the largest food producers.

The dominance of females in the food production is backed by traditional expectations that females are responsible for insuring availability of adequate food for their families (Bryceson, 2019, 2006a; Ali et al., 2016). Under household food insecurity, women sometimes, undertake cultural labour to meet the household food deficits. In Zambia and Malawi, just like most east African countries, casual labour (popularly known as $ganyu$ in Malawi) involves cultivating on another household's agriculture plot to raise income for food purchases or obtain payments in kind, to feed families (Bardosh, 2015). Males also participate in the $ganyu$, however, under different objectives and working conditions to those of females.

Males work in $ganyu$ to obtain cash while females mainly work to obtain food for their families (Bryceson, 2006b). As such, the female *ganyu* is dominant during lean seasons, under desperation, to counter household food insecurity. Further, the female *ganyu* is considered less efficient because the women split their time between the job and household chores (Bryceson, 2006b). These conditions reduce female bargaining power in casual labour; women are paid less on the same job that males obtain high wages. For instance Bigler et al. (2017) show that in Rwanda, females receive 20 percent less than men for the same kind of casual job, such that a woman works 6 more days per month to match a man's income. In Malawi (Bryceson, 2006b) find that during famine females are forced to add transnational sex in their *ganyu* to compete with men. Against this background, agriculture interventions that improve household food security, such as the Farm Input Subsidy Program could reduce the need for women to participate in the precarious casual labor.

FISP aims at improving household food security through increase cereal farmer productivity. Ricker-Gilbert et al. (2013) finds that in Malawi the FISP reduces overall household participation in *ganyu* labour. Considering that the *ganyu* participation conditions are different across genders it is possible that females (but not males) whose households are food secured due to FISP leave *ganyu*. On the other hand, Sibande et al. (2017) show that the increased food security due to FISP leads households to sale maize in the market. Noting that the FISP targets food production one would anticipate females who are in charge of food production to benefit much from the FISP.This benefit is conditional on the the ability of the women to dictate how the earnings from production are used. By raising the profitability of cereal produce FISP may also attract men into the cereal produce. Whether FISP indeed leads to these gender asymmetrical outcomes (female ganyu exit and reduced decision making on earnings) remains an empirical questions that the FISP literature is yet to uncover. Therefore, we contribute to this body of knowledge by examining the effects of FISP on female employment and agency using the Malawi program as a case study.

3 The Malawi Farm Input Subsidy Program

Malawi is a landlocked country in southern Africa with a population of about 17,563,749 occupying 118,484 square kilometres of land and close to half of the country is covered by water (NSO, 2019). Agriculture contributes to 39% of GDP and and employs 85% of the labour force (Chinsinga and Chasukwa, 2018). Malawian agriculture is predominantly rain-fed with irrigated farms taking up only about 16% to 20% of the total arable land (FAO, 2015). Farming in Malawi is predominantly practised by subsistence farmers on small pieces of land.Malawi's overall context is one of high gender inequality. It ranks high on the UN's Global Gender Inequality Index and fares poor in in terms of gender equality in life outcomes (literacy, income, labour market participation), legislation and other social practices(UNDP, 2019; Torres, 2019) . The situation is worse in rural areas, due to More traditional roles of women and men and inequalities in access to land(Djurfeldt et al., 2018). The country therefore provides a compelling case to understand whether an input subsidy program that targets the female dominated food crop could assist in reducing gender inequalities in agricultural production.

The Malawi Farm Input Subsidy Program (FISP) was established in 2006 against a backdrop of severe food shortages and hunger that persistently hit the country from the late 1980s until the year 2005 (Asfaw et al., 2017; World Bank, 2004). The program aims at enhancing food security and income through sustained increase in subsistence farmers' maize productivity (Dorward and Chirwa, 2011; Chibwana et al., 2012). A predecessor to FISP, with similar goals, existed until it was cancelled in the late 1980s under the Structural Adjustment Programs (SAPs). The SAPs perceived large-scale universal subsidies as unsustainable and were thought to introduce distortions to commercial input markets (IMF, 2008). Nevertheless, the main difference between the post-2006 FISP and its original version relate to beneficiary coverage. While the old FISP was universal and subsidised inputs for all farmers, the latter program has been characterised by targeting beneficiaries. The current program, as at 2019 growing season, selects resource poor farmers who have land for cultivation but who are unable to obtain inputs at market prices (Lunduka et al., 2013a; Sibande et al., 2017; Dorward and Chirwa, 2013; GoM, 2019).

The national Ministry of Agriculture (MOA) co-ordinates the implementation of the program. From 2006 until 2008, subsidies were allocated geographically, in relation to the proportions of districts under maize cultivation (Sibande et al., 2017; Karamba and Winters, 2015a; Dorward and Chirwa, 2013). Beneficiaries were therefore concentrated in the central region of the country where many maize farms are located. At this stage, the main objective was to increase access to inputs to highly productive poor farmers. After the 2008 growing season, the ministry included social protection as an objective of FISP. The post-2008 FISP policy emphasized targeting of vulnerable beneficiaries that include female-headed households, child-headed households, households taking care of the elderly and those caring for the HIV/AIDS infected (Lunduka et al., 2013a). While female-headed households were targeted, other gender dimensions – such as targeting women farmers from male-headed households – did not receive attention. Following the new approach, distribution followed the number of farm families in each district. This led to an increased number of beneficiaries in the southern region of the country that has densely populated districts.

At district level, the MOA and the Ministry of Local Government (MLoG) coordinate the distribution of beneficiaries across villages. The criteria are established separately in each district, introducing some idiosyncrasy in targeting. At village level, village leaders used to be in charge of selecting the beneficiaries until allegations of favouritism in beneficiary identification emerged. Some village heads selected their relatives, friends and families (Holden and Lunduka, 2010; Dorward et al., 2008). Government responded by directing that all beneficiaries be identified at open village forums. During these forums, the entire community selects and populates a list of agreed upon vulnerable households who are eligible to benefit from the program in a particular year (Poulton, 2012). There are no prescriptions on the number of years for which a household may remain a beneficiary of the FISP. Hence, every household has a chance of entry or exit into the program, as long as the community deems it appropriate.

The FISP voucher distribution has been marred by political interference that could have affected the effectiveness of the program. A notable concern is political patronage. The program is said to have been used to serve the political ambitions of the ruling party (Poulton, 2012). For instance, some political leaders have increased local FISP beneficiary numbers to either appease their voters or to maintain or develop a support base (Lunduka et al., 2013a). Furthermore, the programme has no sunset clause. Ruling parties therefore continue to implement the FISP for political gain, with little regard for efficiency and sustainability (Sibande et al., 2017; Poulton, 2012).

A typical FISP beneficiary package comprises four vouchers. Two are used to purchase fertilizer (basal and top dressing) while two are used to purchase seed (maize and legume). Only household heads in selected households are entitled to receive the vouchers (Chibwana et al., 2012; Karamba and Winters, 2015a; Chirwa et al., 2011). Multiple beneficiaries per household are excluded. Importantly, the recipient is not necessarily the individual who works the land, but the head of the household. Djurfeldt et al. (2018) contend that the FISP identifies a husband as the recipient which, in practical sense means the programme reinforces the norm of male smallholder head.

Over the years, the FISP package has changed and it became conditional on own contributions. According to Lunduka et al. (2013a), the package included two 50 kg bags of maize fertilizer in 2005/2006. A beneficiary household was expected to contribute 64% of the commercial fertilizer price, entailing a government subsidy of 46%İn 2006/2007, government included maize seed in the subsidy package. In 2007/2008 the package consisted of vouchers for fertilizer, maize and legumes seed, while in 2008/2009 the package added tobacco and cotton fertilizer. The 2009/2010 and 2010/2011 the FISP comprised maize seed and fertilizer, legumes seed and cotton seed. A departure from the norm occurred in the 2009/2010 agricultural season, when storage pesticides were also included in the package. Furthermore, the subsidy rate for a 50 kg bag of fertilizer was increased to about 95% of the commercial price, implying that beneficiaries had to pay only 5% (Lunduka et al., 2013b). From the 2010/2011 through to 2013/2014 growing seasons, the programme remained stable relative to the other periods. This phase included an additional legume seed voucher used to purchase one of the following: beans, cow peas, pigeon peas, ground nuts or soya (GoM, 2011, 2012, 2013, 2014). Maize fertilizer has consistently featured in all growing seasons. Furthermore, fertilizer remains the most expensive input on the list of FISP-supported inputs.

Considering that the FISP targets vulnerable households and that there is variable subsidisation for the inputs in the package, there have been some instances of credit constrained farmers who failed to redeem the full package (Ricker-Gilbert, 2010; Ricker-Gilbert et al., 2011). Secondary markets for FISP vouchers emerged, prompting some farmers to sell the vouchers instead of redeeming the inputs. Furthermore, due to the egalitarian culture of Malawian communities, some beneficiaries redeem the inputs and share them with their neighbours (Holden and Lunduka, 2010; Lunduka et al., 2013a). To reduce the formation of secondary markets, the Malawi government introduced bio-metric verification in 2018, which would bar non-beneficiaries from redeeming the vouchers bought from a secondary market (GoM, 2019).

A recent development in the FISP programme has been the new government's (elected in June, 2020) promise to revert to the universal coverage of beneficiaries(GoM, 2020a). The intended 2020 FISP should expand from providing subsidised inputs to one million smallholder farmers to covering all the smallholder farmers, estimated to be 3.5 million. To ensure effective implementation and reduce FISP voucher leakage, the 2020 programme shall demand beneficiaries to use National Identity Cards, that are linked to an electronic tracking system to redeem inputs. The initiative's name will also change from FISP to the Affordable Inputs Programme (AIP)(GoM, 2020a,b).

4 Data and Measurement of Key Variables

4.1 Data

The study uses data from Malawi to understand the unintended consequences of FISP. Malawi forms a compelling case for a study like this because it pioneered the re-introduction of the FISP in sub-Saharan Africa, and the country's FISP has been one of the most successful agricultural initiatives in the region. Several other countries, including Zambia, Tanzania, Kenya, Nigeria, Ghana, Senegal, and Ethiopia, followed Malawi's FISP success story to establish similar programs. Malawi has consistently implemented the program since 2005. In addition, Malawi together with 7 other countries in the region (Mali, Ethiopia, Burkina Faso, Niger, Nigeria, Uganda and Tanzania), conduct a series of Living Standards Measurement Survey-Integrated Surveys on Agriculture (LSMS-ISA) of which the data include indicators on the Farm Input Subsidy Programme.

This paper uses the Malawi LSMA-ISA survey called the Integrated Household Panel Survey (IHPS). The IHPS was conducted by the Malawi National Statistical Office (NSO) with technical support from the World Bank. The survey used the 2008 Malawi Population and Housing Census as a sampling frame. The IHPS is nationally representative and currently has 3 longitudinal waves, conducted in the years 2010, 2013 and 2016. However, the 2016 wave contains many split households which complicates the tracking of individuals. Households potentially split for reasons endogenous to the FISP – such as losing the subsidy – and prompt migration to regions with other circumstance that may render the survey non-representative. We therefore only use the 2010 to 2013 waves of data.

The IHPS was created by following 3,246 households from 32 districts and 204 enumeration areas from the IHS3 cross-section survey that was conducted in 2010. The 2013 wave successfully revisited and tracked a total of 3,104 original 2010 households. Twenty baseline household heads passed away, and 123 (3.78 %) remaining households attrited (Harou et al., 2017; Sibande et al., 2017). We exclude non-agricultural households and households with incomplete information from the analysis. Further, we limit our sample, for the main analysis, to male headed households.This is because previous literature Dzanku (2018) reveals that female headed households in Malawi are less responsive to own-farm agriculture policy interventions, which we confirm in the peripheral analysis of this paper.In addition, we consider that spouses could experience different effects of the program from the rest of the household members, as they are more likely to be deciders in the households. Therefore, the sample is further limited to examining these effects on household heads and their spouses only.Further, observing outcomes for spouses within the same household in comparison to those in non-FISP households, enables us to interpret our results as the effects of FISP on intra-household gender inequalities in agricultural production

The IHPS consists of four questionnaires: household, agriculture, fisheries and community. Because the FISP recipient is the head of the household, information on the FISP programme is captured in the household agricultural module at the household level. Binary indicators of whether households received any FISP voucher or not in the year t are recorded. All the dependent variables in this study are recorded in the household module; however, they are captured at both the individual and household levels, allowing us to study differences in outcomes across gender within households. Therefore, this survey contains all the necessary information required for our analysis.

4.2 Defining the treatment

The treatment dummy variable indicates whether a household head receives the FISP or not. An individual is considered as treated if they belong to a FISP recipient household. We primarily compare (wo)men in FISP households to those from non-FISP households; we then compare whether the treatment effects on the various outcomes differ by gender. In other words, are the effects significant for men and not for women and *vice versa*? Furthermore, we have limited the analysis to women with male spouses in the household. Limiting the analysis to couples is necessary because these household members receive the FISP on behalf of everyone, and are bound to make more decisions on the production process and the usage of the proceeds. Our sample shows that 54.4 % of households received FISP vouchers in 2010, dropping to 46.2% in 2013.

4.3 Defining outcomes

The study investigates the unintended consequences of the Malawi FISP on women's employment, and decision making. We include male outcomes to investigate if the program yields different effects between genders. We measure both participation and time spent in various types of employment, including $ganyu$ (casual labour) and own farm production. Information on $ganyu$ and wage jobs are enumerated at two different recall periods: whether individuals participated in the past week or in the past year, and if so, how much time was spent in the chosen employment type in the given period. Own farm production is recorded for the week before the survey only, so that annual figures are unavailable. Participation dummy variables indicate whether individuals worked in the preceding period or not. Weekly time use outcomes were captured in hours while the annual outcomes were recorded in days. We capture *household* participation in cash crop markets with a dummy variable where indicating who sold maize in the market in season t or not. We also analyse an indicator that distinguishes which individual in the household decides how earnings from household maize sales are spent.

Table 1 presents summary statistics and differences in the outcome variables for females in FISP and non-FISP receiving household. The data is pooled between the two waves. Women in FISP receiving household are significantly less involved in $ganyu$ work compared to women in non-FISP receiving households. About 8 % of women in non-FISP receiving households participate in $ganyu$ in the week before the survey compared to 5 % of women in FISP receiving households. Figures for the annual recall period are higher, with 19.2 % and 25.8% of females participate in $ganyu$ in FISP and non-FISP households respectively. Women in FISP receiv-

Table 1: Differences in outcomes between FISP and non-FISP Individuals

Variable.:	FISP	Non-FISP	t-stat
Females			
Weekly ganyu participation	0.055	0.084	-0.029**
Weekly job participation	0.013	0.033	-0.020***
Weekly agriculture participation	0.625	0.504	0.120***
Ganyu week hours	0.643	1.327	-0.683***
Job week hours	0.279	1.044	-0.765***
Agriculture week hours	9.208	7.019	2.189***
Annual ganyu participation	0.192	0.258	-0.066***
Annual job participation	0.013	0.050	-0.037***
Annual ganyu days	6.556	10.515	-3.959***
Annual job days	1.366	7.440	-6.074***
Decider	0.082	0.094	-0.013
Borrower	0.060	0.060	0.000
Business owner	0.075	0.101	-0.026*
Maize sells	0.512	0.380	0.131***
Observations	1434	1395	
Males			
Weekly ganyu participation	0.135	0.154	-0.019
Weekly Job participation	0.104	0.228	-0.125***
Weekly Agriculture participation	0.625	0.478	0.147***
Ganyu Week hours	2.540	2.904	-0.364
Job Week hours	4.010	9.535	-5.525***
Agriculture Week hours	10.095	7.436	2.659***
Annual Ganyu participation	0.326	0.344	-0.018
Annual job participation	0.144	0.278	-0.134***
Annual ganyu days	17.797	23.090	-5.293**
Annual job days	25.018	59.867	-34.849***
Decider	0.908	0.857	0.051**
Borrower	0.121	0.140	-0.019
Business Owner	0.183	0.183	0.000
Maize sells	0.538	0.401	0.137***
Observations	1395	1397	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$,

Source: IHPS 2010-2013 data

ing households spent 0.683 fewer hours in *ganyu* in the week prior to the survey compared to women from non-FISP receiving households, and the difference is significant. Furthermore, women in FISP receiving households have a significantly higher involvement in agricultural activities compared to those in non-FISP receiving households. Specifically, the table shows that FISP women spent 9.208 hours per week on own-farm work, while non-FISP women spent 7.019 hours on own-farm work in the same week.

Table 1 shows that 51.2 % of households in which women live sell maize if they receive the FISP, while only 38 % of non-FISP households in which women live sell maize. The difference in their participation is statistically significant. In terms of decision making, Table 1 shows that there are no statistically significant differences between FISP and non-FISP females. .

Table 1 presents summary statistics and the differences in the outcome variables between men in FISP and non-FISP receiving households. Overall, men residing in FISP receiving households participate less and spend less time in *ganyu* to men in non-FISP households. The trend is the same for both long recall and short recall employment periods. However, the difference in *ganyu* participation is statistically insignificant. For own farm production the opposite is observed. Specifically, 62.5% of men in FISP households participated weekly in own farm production, compared to 50.4% of non-FISP males. Further, the FISP men spent 10.1 hours per week in own-farm activity while non-FISP men spent 7.4 hours per week.These results provide preliminary evidence that the FISP does not shift male ganyu participation.

More men in FISP receiving households make decisions about the proceeds from cash crops (90.5%) compared to men in non-FISP receiving households (85.7%) and this difference is statically significant. Descriptively speaking, FISP is associated with increased male decision making over the earnings from maize sales. On the other hand, there was no association for women.

Table 2 compares outcomes for females and males in the sample. The table shows that in a seven days period females participate less in *ganyu* , relative to men, However, the females participate more in household agriculture, even though the differences with men is not statistically significant.Concerning weekly time use, women participate and spend less time in all the two types of employment relative to men. Annually, females participate more in household agriculture relative to men and the difference is statistically significant. The opposite is true with regards to *ganyu*. This concurs with the general finding that females in sub-Sahara contribute substantially in agriculture production while men dominate off-own farm employment for cash. The table also reveals that most decisions on usage of earnings are made by men.

4.4 Defining control variables

This section describes the control variables used in our econometric specifications. Because most of our controls are recorded at household, community or regional level they differ between FISP beneficiaries and non-beneficiaries but not between different members of the same household.

Table 3 presents the characteristics between FISP and non-FISP individuals. Even though age of the head of household is not a *de jure* beneficiary selection criteria we include it as a

Table 2: Differences in outcomes between Females and Males

Variable.:	Females	Males	t-stat
Weekly ganyu participation	0.069	0.145	-0.075***
Weekly Job participation	0.022	0.166	-0.144***
Weekly Agriculture participation	0.566	0.552	0.014
Ganyu week hrs	0.978	2.722	-1.744***
Jobwage week hrs	0.653	6.774	-6.121***
Agriculture week hrs	8.136	8.764	-0.628*
Annual Ganyu participation	0.224	0.335	-0.111***
Annual wagejob participation	0.031	0.211	-0.180***
Annual Agriculture participation(only available in 2013)	0.953	0.914	0.039***
Annual Ganyu days	8.498	20.446	-11.948***
Annual job days	4.345	42.455	-38.110***
Decider	0.087	0.886	-0.800***
Borrower	0.06	0.131	-0.071***
Bussiness owner	0.088	0.183	-0.095***
Observations	2814	2792	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$,

Source: IHPS 2010-2013 data

control variable. This is because previous evidence (Sibande et al., 2017) found that age correlates with selection into the FISP . In this sample age ranges from 16 to 65. In support of the previous studies (Chibwana et al., 2012; Lunduka et al., 2013a; Jayne et al., 2018) we observe that FISP recipients are older (41.471 years) than non-FISP recipients (38.030 years).

To normalize the nutritional needs of different family members in a household based on age and gender, we generate the number of adult equivalents (AE). The AE stands proxy for potential household labour supply and but also dependency. A high AE level shifts households into vulnerability, and therefore influences selection into receiving FISP vouchers (Ricker-Gilbert et al., 2013).Moreover, previous research shows that larger households are more likely to receive the FISP (Kilic et al., 2015). The AE do not statistically differ between FISP and non-FISP recipients in the our sample.

We include a variable on whether the household head is chronically ill or not. This attribute also captures vulnerability which could determine communities' propensity to select a household for FISP. The same vulnerability could influence people's reliance on casual *ganyu* work, determine their access to credit and also affect their ability to establish business.

Income could simultaneously affect the decision to participate in various types of work, decisions about running a business and borrowing, as well as selection into FISP. For instance, beneficiaries could be poor people who are also prone to participate in casual labour. In the sample income is a continuous variable. Further, we convert the income into real annual-

Table 3: Differences in characteristics between FISP and Non- FISP individuals

Variable.:	FISP	Non-FISP	t-stat
Female	0.507	0.497	0.010
Age	41.471	38.030	3.441***
Age^2	1952.437	1631.030	321.407***
Ever attended school	0.770	0.807	-0.037***
Household size	5.550	5.543	0.007
Number of children below 5	0.982	1.018	-0.036
Chronically ill household head	0.081	0.076	0.005
Real annual percapita income (Malawi Kwacha)	129168.238	155799.242	-26631.004***
Adult equivalents	4.523	4.529	-0.006
Landholding (hectares)	0.911	0.754	0.157***
Rainfall (millimeters)	853.184	855.090	-1.906
Community ganyu wage rate (Malawi Kwacha)	368.827	452.569	-83.742***
Distance to the nearest road (Kilometers)	9.660	8.197	1.462***
Distance to the nearest BOMA (Kilometers)	43.765	41.771	1.994*
Distance to the nearest border (Kilometers)	40.773	43.221	-2.448**
District average maize price (Kwacha per Kilogram)	54.487	56.033	-1.547***
District fertilizer price Kwacha per Kilogram	81.177	73.545	7.632***
Tropical warm/semiarid	0.439	0.486	0.047***
Tropical warm/subhumid	0.308	0.275	-0.033**
Tropical cool/semiarid	0.111	0.113	0.002
Tropical cool/subhumid	0.142	0.125	-0.017
Year 2013	0.462	0.539	-0.077***
Northern region	0.245	0.252	-0.008
Central region	0.359	0.415	-0.056***
Southern region	0.396	0.332	0.064***
Observations	2829	2777	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$,

Source: IHPS 2010-2013 data

per-capita terms using 2010 as the base year. The data shows that that FISP targets relatively poor households. We specifically see that FISP beneficiary households have significantly MK 22631.004 less than the non recipients.

The paper also controls for the size of land holdings. This is because land could be used as collateral for obtaining credit. Previous evidence (Alwang and Siegel, 1999; Dorward and Chirwa, 2005) reveals that land holding affects household supply and demand of agricultural labour. We measure the total hectares owned by a household. In the sample, the average household land holding is higher (0.911ha) in FISP receiving households, compared to non-FISP receiving households (0.754ha). This matches the criteria that FISP requires recipients to have land for cultivation (Chibwana et al., 2012; Lunduka et al., 2013a).

We also control for the mean local $ganyu$ wage rate in a survey cluster. This accounts for community level labour demand differences which may affect decisions on participation and time use (Goldberg, 2016; Jacoby, 1993; Ricker-Gilbert et al., 2013). We observe that FISP households live in areas where community wages are high (MK 452.569) relative to the non-FISP households (MK 368.827) and the differences in local wage rates are statistically significant. These differences could arise as FISP recipients shift their labour supply to their own farms, which introduces a local scarcity of $ganyu$ labour and a subsequent increase in the price of $ganyu$ work.

To control for household level participation in, and access to markets and other opportunities, the study controls for distance to the nearest road, distance to the nearest border and distance to the nearest BOMA (a BOMA is a town within a district). Ricker-Gilbert (2014) notes that these variables are likely to influence the extent of household participation in agricultural labour markets. Our sample shows that FISP households live far away from roads on average (9.66km), and from the nearest BOMA (43.765km). However, they are closer to the nearest international border, opening up access to regional markets (40.773km). The opposite is true for non-recipients who stay closer to roads (8.197km), closer to the BOMA (41.771km) and far from a border (43.221km). FISP receiving households are therefore comparatively remote with few opportunities and limited access to wider agricultural markets. These people could also have limited business opportunities and poor access to credit.

The study also controls for climate characteristics (Rainfall and agro-ecological zones) in a community as Karamba and Winters (2015b) note that the types of crops grown and the accompanying agricultural cropping activities that occur in an area follow the precipitation levels, temperature and the nutrient content of the soil.Malawi has fewer irrigation schemes, therefore, farmers rely on annual rainfall for maize production.Differences in these climatic attributes determine the own-farm expected yields, which in turn affect the decision on casual labour participation Lewin et al. (2012); Mueller and Osgood (2009) Average rainfall is captured in cubic millimeters and we measure it at a cluster level, while agro-ecological zones are measured as dummies. There are no statistical differences in rainfall between the program treatment and control households.However, we observe that recipients reside in warm temperature areas.

Maize is a a staple food and used to pay some workers in kind in Malawi Ricker-Gilbert

(2014)). As such, empirical models of household labour supply should control for maize and fertilizer prices. Our models control for the current year's planting season maize and fertilizer prices. The data show that on average FISP receiving households were faced with lower local maize prices (MK 54.487) but higher fertilizer prices (MK 81.177) compared to individuals in non-FISP households (MK 56.033 and MK 73.545 respectively).This indicates that the programme is well-targeted at households who need subsidised fertilizer the most.

Our specifications also control for regional fixed effects. Karamba and Winters (2015a) show that there is regional heterogeneity in production due to variations in customary laws engendered within matrilocal and patrilocal systems that prescribe access, control, and ownership of land. These prescriptions likely influence the degree of male and female autonomy in decision making over agricultural activities. In this study, the region variable is dis-aggregated into Northern (predominantly patrilocal), Central (predominantly matrilocal) and Southern (predominantly matrilocal).

Finally, the estimation also controls for month of interview. In Malawi the demand and supply of own-farm and off-own-farm labour is seasonal. Both increase during the rainy season which starts from November to March. Therefore, the responses for labour provision particularly that of the last seven days could be affected by the time when the survey was conducted, hence month fixed effects were included. In the first wave the survey interviewed people from March to October,2010 while the second wave was conducted from April to November 2013(NSO, 2014).

5 Empirical Strategy

5.1 Econometric specifications

We build econometric models that specify employment decisions,maize sales and household decision-making, as a function of living in a household that received fertilizer subsidy vouchers. The unit of analysis is the individual and the vouchers are granted to the household head. To establish whether the effects of FISP on the outcomes of interest differ by gender, we run separate models for male and female spouses. The first set of models compares females in male-headed FISP households to those in non-FISP households. The second compares the female samples' male spouses in FISP households to males in non-FISP households. The general equation for a particular gender can be captured as follows.

$$y_{i,j,c,r,t} = \beta_1 FISP_{j,c,r,t} + \gamma' \mathbf{z}_{i,j,c,r,t} + \lambda' \mathbf{x}_{j,c,r,t} + \delta' \mathbf{c}_{c,r,t} + \gamma_r + \kappa_t + \varepsilon_{i,t}, \tag{1}$$

$$\varepsilon_{i,t} = \mu_i + \phi' \sigma_t, \tag{2}$$

In equation 1, y represents an outcome for an individual i in household j in community c in region r at time t. The marginal change of an outcome due to FISP is captured by the coefficient β_1. $\mathbf{z}$ is a vector of individual level controls (including age and education), while $\mathbf{x}$ contains household characteristics (including whether the head of the household is chronically ill, real annual per-capita household consumption, number of adult equivalents and landholding). $\mathbf{c}$ contains community characteristics and it includes the ganyu wage rate, distance to the nearest road, distance to the nearest BOMA and distance to the nearest border post. γ_r represents district fixed effects, while κ_t contains year and survey month fixed effects. $\varepsilon_{i,t}$ is the error term with two components. Equation2 shows that the first part of the errors, μ_j, are time constant. In the context of FISP, this part could include individual motivation, household farming ability and the degree of risk aversion (Jayne et al., 2018; Pan and Christiaensen, 2012). The second component of the error term depicts time variant shocks affecting labour supply. These errors could simultaneously affect decisions to supply labour and household participation in FISP.

To deal with potential sources of observable bias, we weight all the models in the paper by inverse propensity scores (Thus we simultaneously apply the IPW and the fixed effects models). To construct the weights, we estimate the determinants of household FISP participation using a logit model (results are shown in table A.1 of appendix A) and generate the propensity scores ($p_{i,j,c,r,t}$). We weight each observation in the treatment group by 1 and that of the control group by $\frac{1}{1-p_{i,j,c,r,t}}$ (For more details see Hirano and Imbens, 2001). In figure A.1 of appendix B, we show that the mean propensity to obtain FISP vouchers is 0.563 for the treated. Without applying the weights the mean for the control group is 0.528, while after weighting, the mean of the control group becomes 0.561. The change reveals that weighting the models could lead to reduction in bias on observable attributes.

5.2 Functional form and identification

We use two types of dependent variables. The first are binary variables taking 1 for individual or household participation and 0 otherwise. These include ganyu, household agriculture, maize sales and decision making on the earnings from maize sales. We estimate these models using Linear Probability Models (LPM) of Fixed Effects, and use robust standard errors that account for heteroscedasticity and serial correlation.

The second class of dependent variables is continuous in nature. These include number of hours in the last week spent in $ganyu$ and household agriculture, and number of days in the last year spent on ganyu. These variables are censored at zero because many individuals in our sample do not supply the particular form of labour. We therefore use the Tobit estimator for these models. It is not possible to combine standard fixed effects methods with the Tobit model, due to the problem of "incidental parameters" Wooldridge (2019). However, Mundlak (1978) and Chamberlain (1984) provide a framework for controlling for time constant heterogeneity in the Tobit model, the Correlated Random Effects Tobit (CRETobit-Mundlak). Means of all time variant controls are included alongside other controls.

The FE and CRE-Tobit models control for time invariant heterogeneity. Nevertheless, time variant unobserved attributes could also determine non-random selection into the FISP. Previous literature identifies the following unobservable factors that also determine selection into the FISP program: relationship to the village leaders (Pan and Christiaensen, 2012) and social connections (Jayne et al., 2018). Furthermore, farming ability, risk aversion and motivation contribute to the program participation (Ricker-Gilbert, 2014). We argue that these attributes do not vary significantly over time, and identify our effects by the FE and CRETobit-Mundlak specifications (Koppmair et al., 2017). Furthermore, we include many other time variant labour supply determinants. These are education levels for the head, whether the head is chronically ill or not,rainfall, community average wage rate, fertilizer prices and maize prices. Therefore, we do not anticipate significant bias in our results.

6 Estimation Results

In this section we present results obtained from estimating equation 1. The variable of interest is FISP and all the empirical findings are dis-aggregated by gender. The first subsection presents outcomes on employment, maize sales and decision making on the usage of the sales. The second subsection presents a set of robustness checks. All control variables presented in equation1 are included in all the specifications. However, in the interest of brevity, the tables only present the coefficients on FISP.

6.1 Effects of FISP on employment and decision making

Table 4: The Effects of FISP on Employment, maize sale and Decision making

Dep. Var.:	WGP		WAP		WGI		WAI		AGP		AGI		Sale	Decider	
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Sub-sample	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	All	Female	Male
FISP	-0.028*	0.024	0.055*	0.054	-0.429	0.505	1.750**	0.812	-0.077***	-0.003	-4.115**	-1.612	0.072**	-0.069***	0.039
	(0.016)	(0.022)	(0.031)	(0.033)	(0.287)	(0.547)	(0.742)	(0.799)	(0.028)	(0.030)	(1.667)	(2.924)	(0.030)	(0.030)	(0.030)
Mundlak FE					Y	Y	Y	Y			Y	Y			
All Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R^2	0.022	0.018	0.049	0.043					0.041	0.031			0.068	0.120	0.095
Observations	2731	2718	2730	2717	2731	2718	2730	2717	2731	2718	2731	2718	5449	1313	1293

NOTES: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

WGP is Weekly *Ganyu* Participation, WAP is Weekly Agriculture Participation, AGP is Annual *Ganyu* Participation, WGI is the Weekly *Ganyu* Intensity, WAI is Weekly Agriculture Intensity, AGI is Annual *Ganyu* Intensity, Sale is Sale of Maize and Decider is the decider of Maize sales

Standard errors are clustered by enumerator area and displayed in parentheses. We limit ourselves to farming households in rural areas that are headed by men. Male equations include only male household heads; female equations only include their spouses. Estimates are reweighted using inverse propensity scores (see appendix **??**). Control variables include *Age; Age*^{2}*; Education; Chronically Ill household head; log(Consumption); number of adult equivalents in the household; size of land holding; log(rainfall); log(local ganyu wage); distance to roads, BOMAs and national borders; maize and fertilizer prices; agro-climatic zone fixed effects*

Source: Own calculations using IHPS 2010-2013 data

Table A.2 presents results for the effects of FISP on *ganyu*, household agriculture, maize sales and decision making on the usage of the sales. Column (1) and (2) of the table shows outcomes from linear probability models with individual fixed effects for individual labour participation for the week preceding the survey, in year t.[1] Column (1) of the table shows that receiving FISP vouchers reduces female participation in *ganyu* by about 3 percent, while column (2) shows that FISP does not relate to male participation in *ganyu* over the short run. The results are supported by the findings of Van den Broeck and Kilic (2019), who show that females receive low wages and work in less favourable conditions in *ganyu* work. They may therefore be more willing to leave *ganyu* jobs than males, once household liquidity constrains are untied by FISP. This also supports the hypothesis that *women* substitute away from casual labour when the marginal productivity of own production increases.

[1]Note that results for all specifications are included with a full set of controls in tables **??** to **??** in Appendix A.

In column (3) of table A.2, we see that FISP shifts females into household agriculture production by 6 percent while column (4) shows that men do not follow the same pattern. The result is consistent with an earlier finding by Boserup (1976) that traditional gender roles in sub-Sahara confine females to food crop production while males invest much labour in cash crops. Considering that FISP targets inputs for maize production – the main subsistence crop in Malawi – it is not surprising that females move to own farms while males do not. While women exit casual agricultural work and men leave low-paid wage work, only women shift their labour participation into own agriculture in response to the higher productivity introduced by FISP.

In column (5) and (6) of Table A.2 we presents results for the factors that affect the number of hours spent in employment in the past week in year t. We obtain the estimates using the CRE-Tobit-Mundlak. T reveal that both genders do not adjust number of working hours in $ganyu$ due to the FISP. Linking the result to the earlier observation that females reduced participation in $ganyu$ while joining household agriculture, this result implies that females opted to completely leave $ganyu$ rather than to reduce working time in that sector.

Column (5) of Table A.2 shows that females work 2 more hours per week on household farms due to FISP while in column(6) we observe no relationship between male hours spent in own farm and FISP. Together, the results reveal that women reduce hours of worked substituting this time towards own farm production. One of the reasons that farming households engage in off-farm wage employment in Malawi is to obtain income for purchasing farm inputs (Dzanku, 2018). The availability of the subsidised fertilizer through FISP therefore reduces the amount of off-farm hours of work required to purchase sufficient fertilizer for their own crops. Male wage labour is therefore less essential to the success of the own farm. Social perception in sub-Saharan Afria suggest that when budget and time constraints are alleviated, females mostly redistribute time to other tasks while men may take complete rest Boserup (1976). Moreover, Arora and Rada (2020) find that men reduce time spent in their jobs if the woman is able to cover for the household needs. Our results suggest that the productivity shift introduced by FISP was supported by female labour.

Because employment patterns fluctuate in any given week with the availability of jobs in various sectors, we re-estimate the labour supply equations using an annual recall. Annual recall questions were only asked for $ganyu$, and agriculture participation-only for the 2013 wave. We therefore are not able to estimate long recall household agricultural labour models. Longer recall questions have the advantage that they contain relatively fewer zeroes (non-participants) on time use in our sample. Some individuals may not have worked in the past week, but did participate in various forms of employment throughout the year. However, long recall questions could be more prone to measurement errors than the short recall questions. Farmers are likely to over- or under-estimate the number of days that they worked due to difficulties in remembering their activities for a whole year.

Column (7) and (8) of Table A.2 present the findings on the factors that affect labour participation in the last year. We again estimate linear probability models with individual fixed effects. The outcome confirms that females move out of $ganyu$ in response to receiving the FISP. The reduction of 8 percentage points is larger than for the shorter recall estimates, highlighting the importance of considering labour choices over an entire season. As before, column (8) displays no significant changes in male participation in $ganyu$. Column (9) and (10) report findings on the number of days spent working in $ganyu$ over the last year. Column (9) emphasised that on average women in FISP households reduced their time spent in $ganyu$ by 4 days in comparison to females in the control group. However, column (10) shows that males living in FISP households do not experience changes in $ganyu$ hours. Regardless of the recall period, our results point towards *women* reducing their casual labour supply.

These results explain and extend previous findings on the effects of FISP on employment. For instance, Ricker-Gilbert (2014) also estimates the factors that affects labour supply using annual recall period questions in Malawi. His results reveal that FISP does not relate to household $ganyu$ participation while it reduces $ganyu$ participation only for a sub-sample of households that were already supplying $ganyu$ labour before the FISP was introduced. In this paper, we observe that FISP reduces $ganyu$ participation only amongst females. Furthermore, Ricker-Gilbert finds that FISP reduces the average annual households $ganyu$ labour supply by 3 days, a result which is consistent with our findings. Therefore, this study complements Ricker-Gilbert's findings by examining the effects of FISP on $ganyu$ at individual level and introducing important gender differences that occur within households. Our results unravel that the Ricker-Gilbert outcome was primarily driven by females.

Combining the results from the two recall periods imply that some females in FISP households leave $ganyu$ in the short-run and join household farming. Those already in own household farming increase the number of days spent in their gardens. Some females return to $ganyu$ in the long-run but they work fewer hours relative to females from non-FISP households. Together, the findings reflect the seasonality of $ganyu$ work in Malawi. The demand for farm casual labour in the country peaks during the rainy season, a time when own-farm labour demand also rises Orr et al. (2009). Our results suggest that FISP beneficiaries choose to work on their own farms to provide a full labour complement to the subsidised fertilizer investment during peak season, but continue to move back to casual farm work after the rainy season. The largest concern is that men, as shown in the short-run, do not invest hours to help females in household agricultural production. Hence, the burden of increased demand for own farm labour due to FISP investment could fall entirely on women.

Column (11), (12) and (13) of Table A.2 show linear probability models with individual fixed effects for households' participation in the maize market and individuals' decision making on the usage of these earnings by women and men, respectively. Column (11) shows that FISP raises households' probability of selling maize by 7%. The result is closer in magnitude to the estimates of Sibande et al. (2017) (5%). Access to fertilizer increases maize productivity, allowing farmers to enter the market for cash crops with new surpluses.In column (12) and (13) of table ?? we present findings for individual decision making on the use of the earnings from maize sales amongst females and males respectively. We find that FISP reduces the probability that women make decisions about the usage of earnings from maize sales by 7%. We do not see any relationship between the program and decision making for males. Therefore, Men in FISP households cold be gaining decision making power over females, however, the increase is not enough to significantly differ from men in non-FISP households.

The results build on what Ricker-Gilbert et al. (2011) find, that the program increases farm net-crop-income. Our findings extend this literature by showing that the increased profitability in maize production due to FISP reduces female decision making power over incomes from cash crops, despite greater levels of time investment in this activity. Men may be increasing control over the earnings from the more productive FISP crops. Alternatively, the women who shifted their labour from $ganyu$ to own farm production may be spouses who had lower decision making power to begin with. However, existing literature supports our finding that the FISP inadvertently raised and not reduced gender inequality. Dolan (2001) finds that pushing female produced food crops into commercial enterprises raises male interest and control over earnings. Further, Adams et al. (2019) finds that increased earnings on a female cultivated crop associates with increased male control over ownership and management of the farm, while limiting females to labour provision (Kang et al., 2020; Adams et al., 2019). Moreover, Adams et al. (2019) show that the effects of male control on earnings dissipate only in communities where Non-governmental Organisations intervene with women empowerment sensitisation campaigns.

6.2 Robustness checks

This section interrogates the robustness of our findings. First, We report results on factors that affect alternative time use, which represent other outcomes that are influenced by changing gender dynamics. Second, we re-estimate our main findings using a sample of female-headed households to assess whether these women face the same disadvantages as those who live in male-headed households. We excluded results on males in female headed households since their sample was too small to conclude any result on. Third, we examine the effects of the FISP wage employment on borrowing and business ownership. Finally, we repeat estimations for ganyu employment in maleheaded household on a sample that is restricted to the same interv

6.2.1 Alternative time use

In Malawi, women usually collect firewood or fetch water (Maarten van Klaveren et al., 2009). The results, in table A.4 in appendix A show that the program does not change these patterns, and therefore does not introduce new inequalities along this dimension. The results emphasise that the FISP introduces *labour* re-allocation towards the highly productive household agriculture, but does not influence other time use.

6.2.2 Female-headed households

Up to now our analysis was limited to intra-household impacts across gender in male-headed households[2]. In appendix B we re-examined the impact of FISP on employment, entrepreneurship, financial inclusion and decision making power using a sample of female-headed households. We hypothesise that if women live in female-headed households, they do not have to contend with the same bargaining dynamics as women who live in male-headed households.

We re-estimated all equations in tables B.1 to B.7. Consistent with our expectations, we find no significant relationship between the FISP program and employment, entrepreneurship, financial inclusion, maize sales and decision making power on the sales.

6.2.3 Employment in wage jobs, borrowing and business ownership

Even though our sample comprises individuals from farming households, it is expected that some of these farmers participate in wage employment. We examined the impact of FISP on wage employment. The results (in appendix A.3) revealed that only men temporarily (in the short run) move out of wage jobs due to FISP.

We then examined whether FISP affects borrowing and ownership of business. Knowing that FISP increases sales for maize (Sibande et al., 2017) one would anticipate that the earnings can be invested in business and produce second-round effects on borrowing due to the businesses. Nevertheless, these spillovers are conditional on the FISP generating large enough income to start business. Across both genders, we find no significant effect of FISP on borrowing or business ownership.While FISP increases maize productivity, the proceeds from FISP are insufficient to invest into other off-farm businesses or to serve as collateral for formal loans.

These results are supported by existing literature, which showed that the FISP only improves short-run consumption, but not the accumulation of assets (Ricker-Gilbert, 2010). While our expectation was that women's shift towards work with higher marginal productivity could also generate new capital for entrepreneurial diversification, our results imply that FISP does not have large enough effects to catalyse this process of diversification and/or formalisation for *either* men or women. With the advent of village banks in Malawi (Ksoll et al., 2016), easier entry into informal credit markets could potentially change this relationship. However, we leave this possibility for future research.

6.2.4 Results for individuals interviewed in the same agricultural season

The IHS panel survey was conducted across different months of the year. These ranged from March to November. Across these months demand for labour in agriculture production differs. We categorised the months by agricultural activities that happen across them to create seasons.

[2]Note that we also estimated the the heterogeneous effects of FISP on all outcomes along culture (matrilocal and patrilocal systems of marriage settlement) and found counter-intuitive results which we need to further probe in detail outside this paper;women were less empowered in the pro-female-matrilocal regions.

We then keep only individuals that were interviewed in the same season across the waves. We do this to make FISP estimates free from seasonal changes in labour demand and supply.

The results presented in Appendix C.8 reveal that females leave $ganyu$ and reduce days spent in the $ganyu$ in the long-run.However, the short-run $ganyu$ outcomes are insignificant.The agriculture output is insignificant. Further, households that receive FISP sell maize and the decision making on the usage of the earnings reduces for females.

In Appendix C.9 we observe that only males leave wage jobs in the short-run, a result consistent with what we observed in non-matched sample. in this table we observe that the FISP increases borrowing amongst males while having no effects on business ownership amongst both genders.

7 Conclusions and policy implications

Malawi's overall context is one of high gender inequality. It ranks high on the UN's Global Gender Inequality Index and fares poor in in terms of gender equality in life outcomes (literacy, income, labour market participation), legislation and other social practices(UNDP, 2019; Torres, 2019) . The situation is worse in rural areas, due to More traditional roles of women and men (Djurfeldt et al., 2018). These traditional roles confine females and males to labour roles that vary in benefits and the degree to which one can personally use the benefits. Often women are at a disadvantage. The question that emerges is whether policies that target female labour such as Farm Input Subsidy Programs (FISP) on food crop production, can spillover and reduce the gender inequalities.

There is a scholarly consensus that farm input subsidies raise household agricultural productivity and therefore untie household liquidity constraints. A key concern is whether these benefits are leveraged to have second-round welfare effects, that are equally distributed across genders. Given that women dominate cultivation of food crops, the subsidies are expected to improve their intra-household bargaining power. These anticipated benefits remain crucial particularly amongst women in male-headed households, whose autonomy is constrained by competing interests of their spouses.

Limiting the focus to females and their spouses, to capture the intra-household changes in gender inequality, our study finds asymmetric benefits of Farm input subsidies across gender. The FISP reduce female agricultural casual labour supply; the additional time is diverted to high productivity activity on their own farms. Men also re-allocate their labour supply, but in an inequitable way. They reduce their involvement in wage jobs, but do not spend more time in cultivating the lands. The study highlights challenges faced by women due to the unintended consequences of farm input subsidy initiatives. Specifically, both women and men are relieved from their non-household employment in response to the FISP. However only women re-invest their relieved labour into household farming. Our results show that FISP widens intra-household gender inequality with respect to work.

FISP households are more likely to enter the cash crop market, yet there are no indications that households use the their cash to diversify into non-farm business activity or to borrow capital for the purposes of entrepreneurship. These results suggest that the positive productivity shock from the FISP is insufficient to have spillover effects beyond farm activities.

Most pertinently, decision making power of income from cash crops *drops* for women in FISP households, who also provide more labour on their own farms. The FISP thus imposes a labour cost on women without improving their position to make decisions on the income earned from their work. We do not find the same effects for women who head their own households. The shifts in behaviour therefore arise primarily in a context where intra-household gender imbalances exist, and where men are able to use their bargaining power to strengthen their positions in their households.

It is not clear why the benefits of a household-level agricultural programme – that targets the female-dominated food crop production sector and has demonstrable agricultural productivity benefits – does not benefit women to the same degree as men. We know high levels of gender inequality, both in metropolitan and rural areas, in Malawi may form a binding constraint. Other studies have shown that a reduction of the unintended gender gaps created by farm input subsidy initiatives may require these programmes to be accompanied by sensitisation. In addition, recipient selection could be revised. Women who farm the land should be made beneficiaries instead of men who head households. Our results show that the status quo of targeting household heads is not sufficient to alleviate gender imbalances – particularly those that arise *within* male-headed households. Both targeted and universal agricultural subsidy programmes will have to pay much greater attention to ensuring that female members of the household who sow the land are able to reap the benefits of these programmes.

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Appendices

A Additional result for male-Headed Households

A.1 Inverse Propensity Score re-weighting

The paper controls for observable bias in the relationship between FISP and the outcomes (employment, entrepreneurship and financial inclusion, and decision making power) using Inverse Propensity Score (IPS) re-weighting. The initial step of the IPS involved selecting the determinants of receiving FISP. All these covariates were obtained from the baseline sample (2010 wave), as the propensity score methods demand using $ex\ ante$ characteristics as the independent variables. We used previous literature Karamba and Winters (2015a); Harou (2018); Sibande et al. (2017); Chibwana et al. (2010); Chirwa (2010) on the FISP beneficiary identification to select the characteristics. Only those relevant to our outcomes in the paper were chosen.

Older people are *de facto* more likely to be select into FISP receipt as they are socio-economically vulnerable. Their age affects their ability to work longer hours in $ganyu$ or wage jobs in the labour market. The educated adapt better to modern agricultural technology. Therefore, the poor and educated are more likely to receive the FISP because the programme targets productive *poor* farmers. In addition, the educated have better access to labour market jobs, credit, and are more likely to own businesses, because of their access to capital(Dolinsky et al., 1993).

Poverty, represented by household consumption is another important determinant of participation in both FISP and casual labour. Household size also determines vulnerability, and therefore eligibility for FISP and likelihood to participate in casual labour. FISP also demands that beneficiaries have land for cultivation(Chibwana et al., 2012). The farmers that have more land are also less likely to participate in casual labour relative to those with less. This is because they invest more labour supply in their own farms. Agro-ecological zones are associated with microclimates and crop types. Part of the FISP vouchers are distributed based on land area under *maize* cultivation(Karamba and Winters, 2015a). The southern region of Malawi is densely populated and therefore obtains more FISP coupons followed by the central and finally the northern region. Population density also affects demand, supply and the price of both off and on farm labour.

The second step of the method involved generating propensity scores from the FISP participation equation. We regressed FISP on its determinants using a logit regression. We then created weights from the propensity scores. The weights assign 1 to the treatment observations and a fraction of 1 minus the score to the control group (Karamba and Winters, 2015a). All estimates in this paper are propensity score re-weighted. This process matches the distribution for the controls to that of the treatment, so that further differences could only emerge from unobserved factors. Figure A.1 shows that reweighting across treatment and control achieves balance in the distribution of propensity scores. The Inverse Propensity Weights method has advantages over matching or stratification blocking because it uses the entire, as opposed to a limited matched sample.

Table A.1 presents the results of the logit model of participation in the FISP programme that is used to generate propensity scores for male-headed households.

Table A.1: Logit Model of FISP participation in male-headed households used to estimate propensity scores

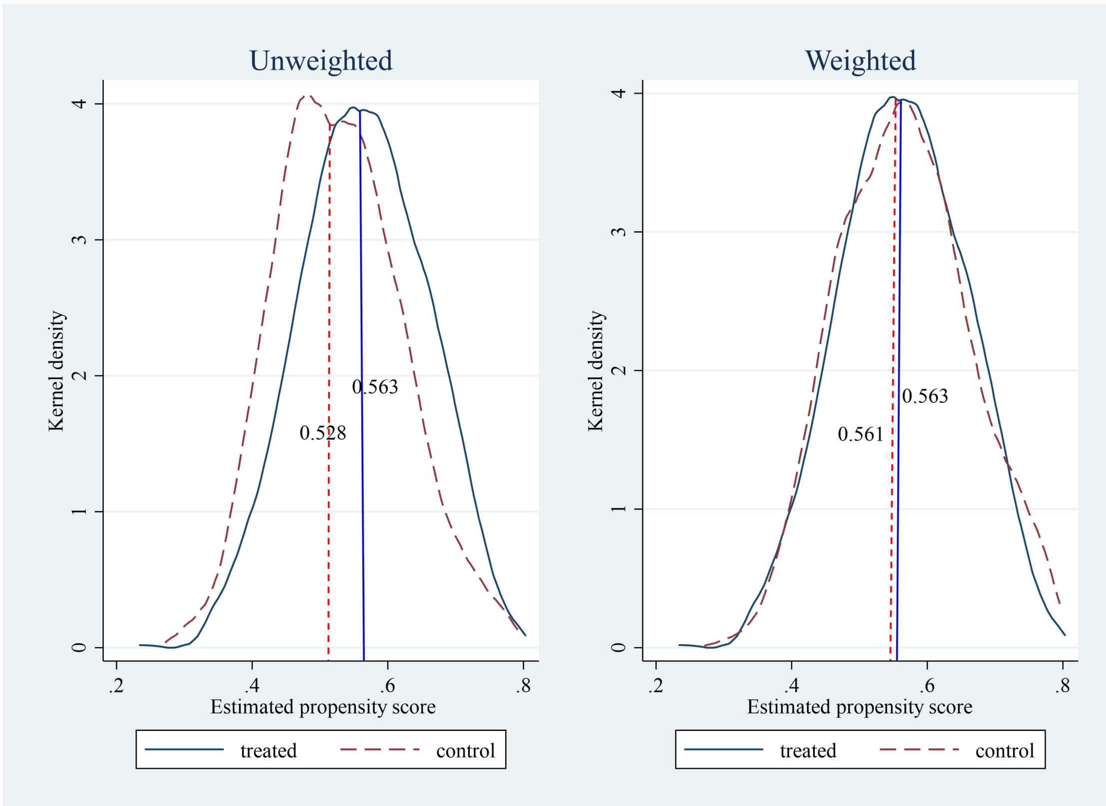
Dep. Var.:	FISP
Age of the head	0.005***
	(0.001)
Educated head	0.078***
	(0.028)
Household size	-0.014***
	(0.004)
log (Consumption)	-0.118***
	(0.015)
Land holding	0.073***
	(0.017)
Tropic-cool/semiarid	-0.066
	(0.044)
Tropic-warm/subhumid	-0.044
	(0.035)
Tropic warm/semiarid	-0.083**
	(0.039)
Central region	0.053
	(0.034)
Southern region	0.086***
	(0.030)
Observations	2,798

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$,

Robust standard errors in parentheses

Source: IHPS 2010 data

Figure A.1: The Kernel density distribution of propensity scores between the treated(FISP) and control(non-FISP) households



A.2 Full results for male-headed households presented in the main text

Tables ?? to ?? show the models presented in tables A.2 to ?? with full sets of controls.

Table A.2: The Effects of FISP on Employment, maize sale and Decision making

Dep. Var.:	WGP		WAP		WGI		WAI		AGP		AGI		Sale	Decider	
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Sub-sample	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	All	Female	Male
FISP	-0.028*	0.024	0.055*	0.054	-0.429	0.505	1.750**	0.812	-0.077***	-0.003	-4.115**	-1.612	0.072**	-0.069***	0.039
	(0.016)	(0.022)	(0.031)	(0.033)	(0.287)	(0.547)	(0.742)	(0.799)	(0.028)	(0.030)	(1.667)	(2.924)	(0.030)	(0.030)	(0.030)
Age	-0.005	- -0.003	- -0.005	- 0.032**	-0.133	0.107	-0.455	0.625	0.002	-0.016	0.339	-1.997	-0.003	0.022	-0.011
	(0.013)	(0.013)	(0.017)	(0.016)	(0.189)	(0.371)	(0.453)	(0.493)	(0.015)	(0.018)	(1.078)	(1.733)	(0.015)	(0.020)	(0.029)
Age^2	0.000	0.000	-0.000	-0.000*	0.002	0.001	0.003	-0.006	-0.000	0.000	-0.002	0.024	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.004)	(0.005)	(0.005)	(0.000)	(0.000)	(0.011)	(0.017)	(0.000)	(0.000)	(0.000)
Education	0.009	-0.004	0.019	0.022	0.183	0.020	1.479	1.149	0.045	-0.096	1.712	-8.622*	0.037	0.018	-0.084
	(0.024)	(0.040)	(0.059)	(0.059)	(0.339)	(0.955)	(1.229)	(1.619)	(0.037)	(0.060)	(1.978)	(4.975)	(0.030)	(0.036)	(0.069)
Chronically ill head	-0.035	0.009	-0.057	-0.036	-0.345	-0.213	-1.219	-0.377	0.016	0.080*	0.262	3.657	-0.053	-0.034	-0.049
	(0.037)	(0.032)	(0.059)	(0.046)	(0.494)	(1.019)	(1.245)	(1.410)	(0.042)	(0.043)	(2.807)	(5.027)	(0.045)	(0.055)	(0.067)
log (Consumption)	-0.042**	-0.001	0.059*	0.098***	-0.606**	-0.128	1.100	2.432***	-0.050	0.022	-3.502***	1.006	0.076***	-0.002	0.006
	(0.019)	(0.024)	(0.032)	(0.035)	(0.280)	(0.507)	(0.781)	(0.862)	(0.031)	(0.032)	(1.712)	(2.646)	(0.027)	(0.033)	(0.039)
Adult Equivalents	-0.009*	0.001	0.009	0.006	-0.094	0.061	0.172	0.212	-0.007	0.002	-0.426	0.726	-0.006	0.004	-0.008
	(0.005)	(0.007)	(0.011)	(0.012)	(0.086)	(0.206)	(0.263)	(0.292)	(0.009)	(0.011)	(0.531)	(1.034)	(0.009)	(0.012)	(0.014)
Land holding	0.002	0.010	0.011	0.007	-0.145	0.580	0.673*	0.464	0.006	-0.002	-0.672	-0.621	0.029	-0.009	0.006
	(0.006)	(0.012)	(0.017)	(0.017)	(0.205)	(0.469)	(0.381)	(1.224)	(0.014)	(0.013)	(1.242)	(2.209)	(0.022)	(0.011)	(0.013)
Time	0.000	0.001	0.001	0.000	0.001	0.015	0.028	0.046***	-0.001	-0.001	0.001	0.013	-0.000	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.007)	(0.011)	(0.018)	(0.017)	(0.001)	(0.001)	(0.039)	(0.055)	(0.001)	(0.001)	(0.001)
Log Rainfall	-0.243	0.029	-0.771	-0.978	-2.952	-5.943	-2.286	-10.115	-0.358	0.762	-24.021	23.404	1.697**	-0.107	-0.466
	(0.259)	(0.395)	(0.811)	(0.001)	(4.500)	(9.623)	(13.979)	(16.910)	(0.485)	(0.561)	(31.084)	(53.800)	(0.512)	(0.607)	(1.160)
log wage	-0.006	0.011	-0.021	0.001	-0.107	0.160	-0.817	0.149	0.020	0.015	0.950	2.149	-0.016	-0.038	0.009
	(0.017)	(0.019)	(0.038)	(0.038)	(0.247)	(0.481)	(0.712)	(0.802)	(0.025)	(0.026)	(1.715)	(2.513)	(0.027)	(0.034)	(0.034)
Dist. to road	0.003	-0.005	0.004	0.004	0.044	-0.091	0.113	0.122	0.009*	0.010	0.387	0.529	0.007	-0.024***	0.021**
	(0.003)	(0.005)	(0.006)	(0.006)	(0.046)	(0.102)	(0.139)	(0.156)	(0.005)	(0.008)	(0.253)	(0.555)	(0.007)	(0.009)	(0.009)
Dist. to BOMA	-0.000	-0.000	-0.001	-0.001*	-0.003	-0.003	-0.049**	-0.034	-0.001	-0.001	-0.075*	-0.125*	0.001	0.002**	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.009)	(0.014)	(0.021)	(0.021)	(0.001)	(0.001)	(0.038)	(0.069)	(0.001)	(0.001)	(0.001)
Dist. to borderpost	0.000	0.001	-0.000	-0.001	-0.004	0.020	-0.026	-0.017	-0.000	0.000	-0.036	-0.023	0.001	0.001*	-0.001*
	(0.000)	(0.001)	(0.001)	(0.001)	(0.010)	(0.016)	(0.024)	(0.023)	(0.001)	(0.001)	(0.043)	(0.073)	(0.001)	(0.001)	(0.001)
Maize prices	-0.000	-0.001	0.003	0.003	0.011	-0.010	0.025	0.008	0.000	-0.000	0.021	-0.027	0.002	-0.002	0.000
	(0.001)	(0.002)	(0.003)	(0.003)	(0.019)	(0.035)	(0.046)	(0.055)	(0.002)	(0.002)	(0.103)	(0.182)	(0.002)	(0.003)	(0.003)
Fertilizer prices	-0.000	-0.000	-0.000	-0.000	-0.001	-0.002	0.006	-0.003	0.000	-0.000	0.009	-0.026	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.004)	(0.006)	(0.006)	(0.000)	(0.000)	(0.013)	(0.023)	(0.000)	(0.000)	(0.000)
Tropic-cool/semiarid	0.053	-0.054	-0.114	-0.178	-0.747*	0.194	-0.493	2.160*	-0.001	-0.052	-2.632	-2.126	0.144	0.606**	-0.409
	(0.103)	(0.132)	(0.142)	(0.163)	(0.423)	(0.736)	(1.015)	(1.283)	(0.141)	(0.220)	(2.177)	(3.647)	(0.145)	(0.295)	(0.275)
Tropic-warm/subhumid	0.035	-0.071	0.214	-0.062	-0.301	-0.014	-2.128***	-0.607	0.174	0.221*	-1.141	0.551	0.064	0.037	0.007
	(0.096)	(0.085)	(0.142)	(0.157)	(0.330)	(0.545)	(0.780)	(0.943)	(0.157)	(0.128)	(1.818)	(2.818)	(0.107)	(0.170)	(0.181)
Tropic warm/semiarid	0.009	0.048	0.063	0.065	-0.636*	-0.089	-1.878**	-0.566	-0.007	0.177	-0.976	0.307	0.168	0.389	-0.272
	(0.111)	(0.120)	(0.155)	(0.178)	(0.374)	(0.616)	(0.921)	(1.208)	(0.168)	(0.164)	(1.953)	(3.066)	(0.161)	(0.263)	(0.224)
Year 2013	0.038	-0.043	0.003	-0.204**	-0.078	-1.404	0.936	-2.518	0.034	-0.037	-1.928	-4.449	-0.034	0.090	-0.031
	(0.035)	(0.048)	(0.083)	(0.090)	(0.699)	(1.130)	(1.543)	(1.770)	(0.057)	(0.064)	(3.781)	(5.818)	(0.059)	(0.078)	(0.080)
Northern region	0.042	-0.230	0.317	0.492**	0.154	-0.218	-0.693	-0.896	-0.093	-0.193	6.993**	12.788***	-0.508**	-0.564**	0.516**
	(0.083)	(0.177)	(0.225)	(0.235)	(0.461)	(0.859)	(1.248)	(1.573)	(0.188)	(0.221)	(2.784)	(4.331)	(0.251)	(0.247)	(0.229)
Central region	0.023	-0.136	-0.095	0.072	0.836**	-0.591	-0.927	-1.711*	-0.036	-0.216	8.084***	4.500	-0.494***	-0.089	-0.007
	(0.043)	(0.124)	(0.159)	(0.220)	(0.329)	(0.579)	(0.869)	(0.968)	(0.170)	(0.175)	(1.786)	(2.998)	(0.150)	(0.090)	(0.123)
Constant	2.436	0.064	5.223	4.862					3.203	-4.666			-12.146***	0.576	4.277
	(1.761)	(2.611)	(5.575)	(5.104)					(3.311)	(3.888)			(3.560)	(4.112)	(7.659)
Mundlak FE					Y	Y	Y	Y			Y	Y			
All Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R^2	0.022	0.018	0.049	0.043					0.041	0.031			0.068	0.120	0.095
Observations	2731	2718	2730	2717	2731	2718	2730	2717	2731	2718	2731	2718	5449	1313	1293

NOTES: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

WGP is Weekly *Ganyu* Participation, WAP is Weekly Agriculture Participation, AGP is Annual *Ganyu* Participation, WGI is the Weekly *Ganyu* Intensity, WAI is Weekly Agriculture Intensity, AGI is Annual *Ganyu* Intensity, Sale is Sale of Maize and Decider is the decider of Maize sales

Standard errors are clustered by enumerator area and displayed in parentheses. We limit ourselves to farming households in rural areas that are headed by men. Male equations include only male household heads; female equations only include their spouses. Estimates are reweighted using inverse propensity scores (see appendix **??**). Control variables include *Age; Age^2; Education; Chronically Ill household head; log(Consumption); number of adult equivalents in the household; size of land holding; log(rainfall); log(local ganyu wage); distance to*

Table A.3: Effects of FISP on Wage Job, Borrowing and Business Ownership

Dep. Var.:	WJP		WJI		AJP		AJI		Borrower		Ownership	
Sub-sample	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
FISP	-0.005	-0.033*	-0.221	-1.631	-0.005	-0.031	-0.702	-8.981	-0.001	0.025	0.018	0.014
	(0.006)	(0.017)	(0.192)	(1.035)	(0.006)	(0.021)	(1.458)	(5.899)	(0.015)	(0.018)	(0.018)	(0.020)
Age	0.004	0.014	0.226*	0.742	-0.001	0.015	-0.532	3.901	0.019**	0.019*	0.010	-0.012
	(0.004)	(0.010)	(0.127)	(0.673)	(0.004)	(0.012)	(0.901)	(3.863)	(0.008)	(0.011)	(0.009)	(0.012)
Age^2	-0.000*	-0.000	-0.003**	-0.007	0.000	-0.000	0.006	-0.032	-0.000**	-0.000*	-0.000	0.000
	(0.000)	(0.000)	(0.001)	(0.007)	(0.000)	(0.000)	(0.011)	(0.042)	(0.000)	(0.000)	(0.000)	(0.000)
Education	-0.007	0.026	-0.234	1.923	0.001	0.040*	-0.939	23.188*	0.026	0.033	-0.022	0.101***
	(0.008)	(0.021)	(0.292)	(2.107)	(0.011)	(0.024)	(1.671)	(12.171)	(0.019)	(0.048)	(0.025)	(0.036)
Chronically ill head	0.009	0.004	0.133	0.098	0.021	0.009	2.203	3.768	-0.017	0.053	0.012	0.024
	(0.013)	(0.033)	(0.242)	(1.689)	(0.017)	(0.033)	(1.782)	(9.421)	(0.026)	(0.040)	(0.032)	(0.048)
log (Consumption)	0.001	-0.024	0.018	-0.856	0.017	0.024	1.422	3.719	-0.006	-0.003	-0.012	0.067***
	(0.006)	(0.019)	(0.157)	(0.967)	(0.013)	(0.021)	(1.070)	(5.464)	(0.015)	(0.019)	(0.018)	(0.024)
Adult Equivalents	0.001	-0.010	-0.008	-0.335	0.006	-0.002	0.638	-0.782	-0.007	0.008	-0.002	-0.002
	(0.002)	(0.008)	(0.057)	(0.323)	(0.004)	(0.007)	(0.453)	(1.984)	(0.006)	(0.009)	(0.007)	(0.007)
Land holding	0.006*	-0.016	-0.353**	-0.712	-0.002	-0.015*	-0.213	-5.737	0.002	-0.016	-0.058**	0.001
	(0.004)	(0.013)	(0.147)	(0.673)	(0.003)	(0.009)	(0.453)	(1.984)	(0.006)	(0.011)	(0.029)	(0.010)
Time	0.001**	0.000	-0.003	-0.096***	-0.001**	-0.001	-0.089***	-0.638***	-0.000	0.000	-0.002**	-0.002**
	(0.000)	(0.001)	(0.004)	(0.017)	(0.000)	(0.001)	(0.029)	(0.098)	(0.001)	(0.001)	(0.001)	(0.001)
Log rainfall	0.081	-0.733	0.028	-13.395	-0.211	-0.622	-13.786	-112.823	0.157	1.204**	-0.133	1.431***
	(0.140)	(0.534)	(2.144)	(16.234)	(0.300)	(0.424)	(17.871)	(92.694)	(0.273)	(0.532)	(0.302)	(0.482)
Log wage	-0.006	-0.014	-0.129	-0.575	-0.019**	-0.022	-2.810**	-5.087	-0.026*	0.014	-0.020	-0.010
	(0.009)	(0.025)	(0.168)	(0.812)	(0.009)	(0.026)	(1.117)	(5.095)	(0.015)	(0.018)	(0.017)	(0.022)
Dist. to Road	-0.005	-0.007	-0.074**	-0.365**	-0.002	-0 .010**	-0.143	-2.451**	0.001	-0.002	0.006	-0.002
	(0.004)	(0.006)	(0.033)	(0.169)	(0.002)	(0.004)	(0.248)	(1.031)	(0.003)	(0.004)	(0.004)	(0.003)
Dist. to BOMA	-0.000	0.000	-0.001	0.001	0.000	-0.000	0.024	-0.082	0.000	-0.000	-0.000	0.000
	(0.000)	(0.001)	(0.004)	(0.032)	(0.000)	(0.001)	(0.019)	(0.173)	(0.000)	(0.000)	(0.000)	(0.001)
Dist. to Border	-0.000	-0.000	-0.001	-0.004	-0.000	-0.001*	0.000	-0.111	0.000	-0.000	0.000	0.001
	(0.000)	(0.001)	(0.004)	(0.029)	(0.000)	(0.001)	(0.015)	(0.161)	(0.000)	(0.000)	(0.000)	(0.001)
Maize price	-0.000	0.002	-0.007	0.044	0.000	0.001	-0.063	0.049	0.002*	0.003*	0.003***	0.002
	(0.000)	(0.001)	(0.011)	(0.060)	(0.001)	(0.002)	(0.072)	(0.351)	(0.001)	(0.001)	(0.001)	(0.002)
Fertilizer Price	-0.000	0.000	-0.000	0.000	0.000	0.000	0.012	-0.004	0.000**	0.000**	0.000*	-0.000
	(0.000)	(0.000)	(0.001)	(0.008)	(0.000)	(0.000)	(0.009)	(0.047)	(0.000)	(0.000)	(0.000)	(0.000)
Tropic-cool/semiarid	-0.003	-0.065	-0.231	-6.478**	-0.011	0.120	-2.334	-34.662***	0.075	-0.092	-0.143	0.054
	(0.030)	(0.171)	(0.269)	(1.697)	(0.030)	(0.150)	(2.623)	(9.439)	(0.078)	(0.137)	(0.104)	(0.114)
Tropic-warm/subhumid	-0.049	0.039	0.111	-1.875*	-0.012	-0.053	3.489**	-14.826**	0.062	-0.022	-0.053	0.035
	(0.043)	(0.130)	(0.188)	(0.989)	(0.047)	(0.144)	(1.645)	(5.847)	(0.060)	(0.074)	(0.079)	(0.078)
Tropic warm/semiarid	-0.014	-0.192	-0.114	-3.777***	-0.027	-0.219	2.422	-21.640***	-0.035	-0.109	-0.286**	-0.113
	(0.036)	(0.174)	(0.198)	(1.175)	(0.037)	(0.166)	(1.656)	(6.688)	(0.096)	(0.103)	(0.126)	(0.107)
Year 2013	0.010	-0.053	0.303	-1.974	0.011	-0.051	5.308**	-10.589	0.032	-0.051	-0.023	-0.018
	(0.014)	(0.049)	(0.355)	(2.052)	(0.021)	(0.055)	(2.449)	(11.693)	(0.034)	(0.038)	(0.041)	(0.060)
Northern region	-0.069	-0.013	0.179	-3.862**	0.180	-0.019	0.320	-34.156***	-0.033	-0.189	-0.039	-0.193
	(0.061)	(0.175)	(0.336)	(1.768)	(0.148)	(0.145)	(1.919)	(9.472)	(0.075)	(0.215)	(0.232)	(0.190)
Central region	-0.034	0.059	0.382*	0.227	0.076	0.113	0.714	-7.731	0.014	0.043	0.294	0.130
	(0.033)	(0.094)	(0.226)	(1.163)	(0.068)	(0.079)	(1.279)	(6.642)	(0.049)	(0.103)	(0.180)	(0.159)
Constant	-0.499	5.263			1.268	4.075			-1.346	-8.682**	1.002	-10.038***
	(0.951)	(3.626)			(2.066)	(2.972)			(1.902)	(3.530)	(2.089)	(3.296)

Notes. WJP is Weekly Job Participation, WJI is weekly Job Intensity, AJP is Annual Job participation, AJI is annual Job Intensity.Ownership is for business owner or entrepreneur while Borrowing is a person who took credit

A.3 Additional results on alternative time use

Table A.4: Linear probability models of alternative time use in male-headed households

Dep. Var.:	Collecting Water		Fetching Firewood	
Sub-sample	Female	Male	Female	Male
FISP	0.016	-0.008	-0.011	0.042
	(0.038)	(0.011)	(0.016)	(0.054)
Age	-0.002	0.001	-0.003	-0.061*
	(0.022)	(0.007)	(0.009)	(0.032)
Age^2	-0.000	0.000	0.000	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)
Education	-0.019	0.009	0.003	-0.006
	(0.053)	(0.021)	(0.023)	(0.081)
Chronically ill head	0.028	-0.011	-0.002	0.074
	(0.062)	(0.016)	(0.021)	(0.098)
log (Consumption)	-0.042	0.033**	0.040**	-0.022
	(0.039)	(0.013)	(0.016)	(0.055)
Adult Equivalents	-0.013	-0.005	-0.000	0.034*
	(0.013)	(0.004)	(0.006)	(0.018)
Land holding	0.001	0.004	0.007	-0.030
	(0.017)	(0.006)	(0.009)	(0.047)
Time	0.001	-0.000	0.000	0.004***
	(0.001)	(0.000)	(0.000)	(0.001)
Log of rainfall	0.212	-0.078	-0.597**	-0.632
	(0.726)	(0.199)	(0.278)	(1.131)
log of wage	-0.021	-0.002	-0.024	-0.033
	(0.036)	(0.012)	(0.015)	(0.055)
Dist to the road	0.011*	0.000	-0.001	0.011
	(0.007)	(0.002)	(0.003)	(0.009)
Distance to BOMA	-0.002*	-0.000	0.000	0.003*
	(0.001)	(0.000)	(0.001)	(0.002)
Distance to borderpost	-0.000	-0.000	0.001	0.004**
	(0.001)	(0.000)	(0.001)	(0.002)
Maize price	-0.009***	0.000	0.001	0.009**
	(0.002)	(0.001)	(0.001)	(0.004)
Fertilizer price	0.000	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Tropic-cool/semiarid	0.105**	-0.050***	-0.011	-0.018
	(0.051)	(0.018)	(0.024)	(0.081)
Tropic-warm/subhumid	0.028	0.011	0.002	-0.036
	(0.040)	(0.013)	(0.018)	(0.066)
Tropic warm/semiarid	0.126***	-0.014	-0.010	-0.039
	(0.044)	(0.014)	(0.020)	(0.077)
Year 2013	0.252***	-0.034	-0.059*	-0.326***
	(0.078)	(0.027)	(0.036)	(0.115)
Northern region	0.036	0.020	0.048	0.380***
	(0.061)	(0.022)	(0.029)	(0.096)
Central region	-0.049	0.035**	0.037*	0.044
	(0.041)	(0.014)	(0.019)	(0.061)
Interview month	Y	Y	Y	Y
Individual FE	Y	Y	Y	Y
Observations	2,719	2,718	2,716	2,727

NOTES: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
WGP is Weekly *Ganyu* Participation, WAP is Weekly Agriculture Participation, AGP is Annual *Ganyu* Participation, WGI is the Weekly *Ganyu* Intensity, WAI is Weekly Agriculture Intensity, AGI is Annual *Ganyu* Intensity, Sale is Sale of Maize and Decider is the decider of Maize sales
Standard errors are clustered by enumerator area and displayed in parentheses. We limit ourselves to farming households in rural areas that are headed by men. Male equations include only male household heads; female equations only include their spouses. Estimates are reweighted using inverse propensity scores (see appendix **??**). Control variables include *Age; Age^2; Education; Chronically Ill household head; log(Consumption); number of adult equivalents in the household; size of land holding; log(rainfall); log(local ganyu wage); distance to roads, BOMAs and national borders; maize and fertilizer prices; agro-climatic zone fixed effects*
Source: Own calculations using IHPS 2010-2013 data

B Results for Female-Headed Households

This section shows results for female-headed households only. The same specifications as in tables A.2 to ?? are repeated using this different sub-sample. Because there are only few male spouses in these households, the analysis is limited to women heads.

Table B.1: Logit Model of FISP participation in female-headed households used to estimate propensity scores

Dep. Var.:	FISP
Age of the head	0.005***
	(0.001)
Educated head	0.078***
	(0.028)
Household size	-0.014***
	(0.004)
log (Consumption)	-0.118***
	(0.015)
Land holding	0.073***
	(0.017)
Tropic-cool/semiarid	-0.066
	(0.044)
Tropic-warm/subhumid	-0.044
	(0.035)
Tropic warm/semiarid	-0.083**
	(0.039)
Central region	0.053
	(0.034)
Southern region	0.086***
	(0.030)
Observations	2,798

NOTES: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

WGP is Weekly *Ganyu* Participation, WAP is Weekly Agriculture Participation, AGP is Annual *Ganyu* Participation, WGI is the Weekly *Ganyu* Intensity, WAI is Weekly Agriculture Intensity, AGI is Annual *Ganyu* Intensity, Sale is Sale of Maize and Decider is the decider of Maize sales

Standard errors are clustered by enumerator area and displayed in parentheses. We limit ourselves to farming households in rural areas that are headed by women. Female equations only include household heads. Estimates are reweighted using inverse propensity scores (see appendix B.1). Control variables include *Age; Age*^{2}*; Education; Chronically Ill household head; log(Consumption); number of adult equivalents in the household; size of land holding; log(rainfall); log(local ganyu wage); distance to roads, BOMAs and national borders; maize and fertilizer prices; agro-climatic zone fixed effects*

Source: Own calculations using IHPS 2010-2013 data

Table B.2: Linear probability Models of participation in various types of labour in the past seven days in female-headed households

Dep. Var.:	Ganyu	Wage Job	Own Agriculture
Sub-sample	Female	Female	Female
FISP	-0.031	-0.019	-0.022
	(0.031)	(0.016)	(0.047)
Age	-0.007	0.007	-0.010
	(0.017)	(0.008)	(0.021)
Age^2	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Education	0.038	0.019	-0.054
	(0.048)	(0.021)	(0.060)
Chronically ill head	-0.004	-0.016	-0.037
	(0.029)	(0.015)	(0.060)
log (consumption)	-0.035	0.042**	0.003
	(0.031)	(0.017)	(0.047)
Adult Equivalent	-0.015	-0.003	-0.024
	(0.012)	(0.006)	(0.016)
Land holding	-0.016	-0.037**	0.119***
	(0.027)	(0.018)	(0.038)
Time	0.001	-0.002*	0.001
	(0.001)	(0.001)	(0.002)
log of rainfall	0.197	-0.849*	-0.400
	(0.596)	(0.482)	(1.238)
log of wage	-0.051*	0.024	-0.008
	(0.027)	(0.015)	(0.052)
Distance to the road	0.001	0.002	0.005
	(0.008)	(0.004)	(0.010)
Distance to BOMA	0.001	0.000	-0.001
	(0.001)	(0.000)	(0.002)
Distance to borderpost	0.001	0.000	-0.000
	(0.001)	(0.001)	(0.002)
Maize price	-0.003	0.001	0.005]
	(0.002)	(0.002)	(0.003)
Fertlizer price	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)
Tropic-cool/semiarid	0.812	-0.007	-0.195
	(0.502)	(0.096)	(0.418)
Tropic-warm/subhumid	0.577*	0.	-0.220
	(0.334)	(0.069)	(0.236)
Tropic warm/semiarid	0.850***	-0.038	-0.246
	(0.301)	(0.071)	(0.270)
Year 2013	0.136	-0.044	-0.167
	(0.087)	(0.043)	(0.115)
Northern region	0.021	0.349*	-0.080
	(0.299)	(0.179)	(0.806)
Central region	-0.066	0.501***	-0.125
	(0.320)	(0.191)	(0.342)
Constant	-0.697	4.795	3.416
	(4.198)	(3.272)	(8.392)
Interview month	Y	Y	Y
Individual FE	Y	Y	Y
Observations	1,298	1,298	1,298
R^2	0.054	0.120	0.058
Number of id	670	670	670

NOTES: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

WGP is Weekly *Ganyu* Participation, WAP is Weekly Agriculture Participation, AGP is Annual *Ganyu* Participation, WGI is the Weekly *Ganyu* Intensity, WAI is Weekly Agriculture Intensity, AGI is Annual *Ganyu* Intensity, Sale is Sale of Maize and Decider is the decider of Maize sales

Standard errors are clustered by enumerator area and displayed in parentheses. We limit ourselves to farming households in rural areas that are headed by women. Female equations only include household heads. Estimates are reweighted using inverse propensity scores (see appendix B.1). Control variables include *Age; Age^2; Education; Chronically Ill household head; log(Consumption); number of adult equivalents in the household; size of land holding; log(rainfall); log(local ganyu wage);*

Table B.3: Tobit of hours spent in various types of labour in the past seven days in female-headed households

Dep. Var.:	Ganyu	Wage Job	Own Agriculture
Sub-sample	Female	Female	Female
FISP	-0.766	-0.649	-0.120
	(0.475)	(0.503)	(0.959)
Age	0.033	0.564*	-0.210
	(0.249)	(0.338)	(0.454)
Age^2	-0.002	-0.005*	0.003
	(0.002)	(0.003)	(0.004)
Education	0.213	0.968	-0.568
	(0.611)	(0.925)	(1.342)
Chronically ill head	-0.220	-0.074	-0.812
	(0.589)	(0.557)	(1.322)
log (consumption)	-0.409	1.377***	0.661
	(0.522)	(0.497)	(0.954)
Adult Equivalents	-0.315*	0.079	-0.032
	(0.185)	(0.223)	(0.369)
Land holding	-0.368	-1.310**	1.790*
	(0.482)	(0.604)	(0.976)
time	-0.001	-0.036***	0.053**
	(0.011)	(0.010)	(0.022)
log of rainfall	6.261	-6.246	8.803
	(9.231)	(5.870)	(19.844)
log of wage	-1.041**	0.041	1.016
	(0.529)	(0.404)	(1.054)
Distance to the road	-0.020	-0.052	0.116
	(0.129)	(0.081)	(0.288)
Distance to BOMA	0.010	0.006	-0.038
	(0.022)	(0.019)	(0.035)
Dist to borderpost	0.005	0.009	-0.035
	(0.023)	(0.019)	(0.040)
Maize price	-0.052	0.031	0.117
	(0.040)	(0.034)	(0.077)
Fertilizer price	-0.004	0.000	-0.001
	(0.004)	(0.004)	(0.008)
Tropic-cool/semiarid	-0.671	-0.452	-3.794**
	(0.834)	(0.817)	(1.550)
Tropic-warm/subhumid	0.465	-0.759	-3.319***
	(0.643)	(0.719)	(1.211)
Tropic warm/semiarid	0.402	-0.731	-3.586***
	(0.742)	(0.702)	(1.343)
Year 2013	2.450*	-1.582	-4.811**
	(1.278)	(1.047)	(2.443)
Northern region	1.386	-2.075**	1.213
	(0.976)	(0.965)	(1.863)
Central region	0.993	-0.716	0.025
	(0.650)	(0.581)	(1.199)
Interview month	Y	Y	Y
Mundlak controls	Y	Y	Y
Observations	1,298	1,298	1,298

NOTES: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

WGP is Weekly *Ganyu* Participation, WAP is Weekly Agriculture Participation, AGP is Annual *Ganyu* Participation, WGI is the Weekly *Ganyu* Intensity, WAI is Weekly Agriculture Intensity, AGI is Annual *Ganyu* Intensity, Sale is Sale of Maize and Decider is the decider of Maize sales

Standard errors are clustered by enumerator area and displayed in parentheses. We limit ourselves to farming households in rural areas that are headed by women. Female equations only include household heads. Estimates are reweighted using inverse propensity scores (see appendix B.1). Control variables include *Age; Age*^{2}*; Education; Chronically Ill household head; log(Consumption); number of adult equivalents in the household; size of land holding; log(rainfall); log(local ganyu wage); distance to roads, BOMAs and national borders; maize and fertilizer prices; agro-climatic zone fixed effects*

Source: Own calculations using IHPS 2010-2013 data

Table B.4: Tobit Models of days spent in various types of labour in the past one year in female-headed households

Dep. Var.:	Ganyu	Wage Job
Sub-sample	Female	Female
FISP	-1.123	-2.671
	(2.632)	(2.645)
Age	0.171	2.244*
	(1.277)	(1.329)
Age^2	-0.012	-0.022*
	(0.012)	(0.013)
Education	-4.131	4.453
	(3.910)	(4.009)
Chronically ill head	0.114	-0.611
	(3.466)	(3.350)
log (consumption)	-6.143**	5.408**
	(2.719)	(2.703)
Adult Equivalents	-0.899	1.818*
	(1.020)	(1.072)
Land holding	-1.045	-5.559*
	(2.431)	(2.926)
Time	0.133**	-0.244***
	(0.064)	(0.057)
log of rainfall	-111.613*	9.292
	(63.461)	(34.575)
log of wage	-3.545	-1.501
	(2.776)	(2.127)
Distance to the road	0.603	-0.598
	(0.644)	(0.428)
Distance to BOMA	-0.140	0.046
	(0.114)	(0.108)
Dist to borderpost	-0.109	-0.002
	(0.123)	(0.104)
Maize price	0.041	0.141
	(0.205)	(0.170)
Fertilizer price	-0.037*	0.012
	(0.022)	(0.019)
Tropic-cool/semiarid	-6.038	-5.252
	(4.583)	(4.820)
Tropic-warm/subhumid	1.331	-3.046
	(3.860)	(3.697)
Tropic warm/semiarid	0.249	-2.336
	(4.079)	(3.585)
Year 2013	5.506	-4.453
	(6.282)	(5.252)
Northern region	7.701	-14.166***
	(5.249)	(5.157)
Northern region	6.235*	-6.788*
	(3.288)	(3.535)
Interview month	Y	Y
Mundlak FE	Y	Y
Observations	1,298	1,298

NOTES: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
WGP is Weekly *Ganyu* Participation, WAP is Weekly Agriculture Participation, AGP is Annual *Ganyu* Participation, WGI is the Weekly *Ganyu* Intensity, WAI is Weekly Agriculture Intensity, AGI is Annual *Ganyu* Intensity, Sale is Sale of Maize and Decider is the decider of Maize sales
Standard errors are clustered by enumerator area and displayed in parentheses. We limit ourselves to farming households in rural areas that are headed by women. Female equations only include household heads. Estimates are reweighted using inverse propensity scores (see appendix B.1). Control variables include *Age; Age^2; Education; Chronically Ill household head; log(Consumption); number of adult equivalents in the household; size of land holding; log(rainfall); log(local ganyu wage); distance to roads, BOMAs and national borders; maize and fertilizer prices; agro-climatic zone fixed effects*
Source: Own calculations using IHPS 2010-2013 data

Table B.5: Linear Probability Models of days spent in various types of labour in the past year in female-headed households

Dep. Var.:	Ganyu	Wage Job
Sub-sample	Female	Female
FISP	-0.026	-0.027
	(0.041)	(0.016)
Age	0.002	0.013
	(0.015)	(0.010)
Age^2	-0.000	-0.000
	(0.000)	(0.000)
Education	-0.085	0.010
	(0.055)	(0.032)
Chronically ill head	0.025	-0.027
	(0.047)	(0.022)
log (Consumption)	-0.094**	0.040**
	(0.041)	(0.018)
Adult Equivalent	-0.009	0.009*
	(0.019)	(0.005)
Land holding	-0.029	-0.032
	(0.044)	(0.022)
Time	0.003*	-0.002*
	(0.001)	(0.001)
log of rainfall	-0.923	-0.060
	(0.640)	(0.353)
log of wage	-0.062*	-0.004
	(0.035)	(0.022)
Distance to the road	0.002	-0.003
	(0.008)	(0.010)
Distance to BOMA	-0.002	0.000
	(0.002)	(0.000)
distance to borderpost	-0.002	0.000
	(0.002)	(0.001)
Maize price	0.001	0.002
	(0.003)	(0.002)
Fertilizer price	-0.000	0.000
	(0.000)	(0.000)
Tropic-cool/semiarid	1.176***	-0.008
	(0.359)	(0.111)
Tropic-warm/subhumid	0.558*	0.000
	(0.317)	(0.117)
Tropic warm/semiarid	0.829***	-0.004
	(0.294)	(0.083)
Year 2013	0.115	-0.023
	(0.090)	(0.046)
Northern region	0.057	0.241
	(0.165)	(0.193)
Central region	-0.583***	0.457**
	(0.154)	(0.227)
Constant	7.989*	-0.460
	(4.570)	(2.465)
Interview month	Y	Y
Mundlak controls	Y	Y
Observations	1,298	1,298
R-squared	0.083	0.091
Number of id	670	670

NOTES: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
WGP is Weekly *Ganyu* Participation, WAP is Weekly Agriculture Participation, AGP is Annual *Ganyu* Participation, WGI is the Weekly *Ganyu* Intensity, WAI is Weekly Agriculture Intensity, AGI is Annual *Ganyu* Intensity, Sale is Sale of Maize and Decider is the decider of Maize sales
Standard errors are clustered by enumerator area and displayed in parentheses. We limit ourselves to farming households in rural areas that are headed by women. Female equations only include household heads. Estimates are reweighted using inverse propensity scores (see appendix B.1). Control variables include *Age; Age^2; Education; Chronically Ill household head; log(Consumption); number of adult equivalents in the household; size of land holding; log(rainfall); log(local ganyu wage);*

Table B.6: Linear probability models of maize sales and decision making on earnings in female-headed households

Dep. Var.:	Sell maize	Decider
Sub-sample	Female	Female
FISP	0.072**	-0.079
	(0.030)	(0.070)
Age	-0.003	-0.102**
	(0.015)	(0.045)
Age^2	0.000	-0.000
	(0.000)	(0.000)
Education	0.037	0.167
	(0.030)	(0.120)
Chronically ill head	-0.053	-0.134
	(0.045)	(0.099)
log (Consumption)	0.076***	0.010
	(0.027)	(0.085)
Adult Equivalent	-0.006	-0.061**
	(0.009)	(0.024)
Land holding	0.029	0.059
	(0.022)	(0.074)
Time	-0.000	-0.002
	(0.001)	(0.002)
log of rainfall	1.697***	0.645
	(0.512)	(1.776)
log wage	-0.016	0.262***
	(0.027)	(0.098)
Distance to the road	0.007	0.015
	(0.007)	(0.029)
Distance to BOMA	0.001	-0.005
	(0.001)	(0.004)
Distance to borderpost	0.001	-0.003
	(0.001)	(0.005)
Maize price	0.002	0.004
	(0.002)	(0.004)
Fertilizer price	0.000	0.000
	(0.000)	(0.001)
Tropic-cool/semiarid	0.144	0.229
	(0.145)	(0.322)
Tropic-warm/subhumid	0.064	-0.224
	(0.107)	(0.228)
Tropic warm/semiarid	0.168	
	(0.161)	
Year 2013	-0.034	0.214
	(0.059)	(0.155)
Northern region	-0.508**	
	(0.251)	
region2	-0.494***	
	(0.150)	
Constant	-12.146***	0.627
	(3.560)	(12.350)
Month FE	Y	Y
Individual FE	Y	Y
Observations	5,449	494
R-squared	0.068	0.345
Number of id	2,794	363

NOTES: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Standard errors are clustered by enumerator area and displayed in parentheses. We limit ourselves to farming households in rural areas that are headed by women. Female equations only include household heads. Estimates are reweighted using inverse propensity scores (see appendix B.1). Control variables include *Age; Age^2; Education; Chronically Ill household head; log(Consumption); number of adult equivalents in the household; size of land holding; log(rainfall); log(local ganyu wage);*

Table B.7: Linear probability models of maize sales and decision making on earnings in female-headed households

Dep. Var.:	Borrower	Owner Business
Sub-sample	Female	Female
FISP	0.023	0.028
	(0.026)	(0.028)
Age	0.021*	0.013
	(0.011)	(0.013)
Age^2	-0.000*	-0.000
	(0.000)	(0.000)
Education	0.034	0.058
	(0.028)	(0.038)
Chronically ill head	0.043	-0.062*
	(0.038)	(0.034)
log	-0.014	0.036
	(0.026)	(0.031)
Adult Equivalents	-0.015	0.003
	(0.013)	(0.012)
Land holding	0.024	0.026
	(0.035)	(0.026)
Time	-0.001*	-0.002*
	(0.001)	(0.001)
log rainfall	0.927	0.826
	(0.714)	(0.537)
log of wage	-0.008	0.024
	(0.034)	(0.032)
Distance to the road	0.000	0.007
	(0.009)	(0.007)
Distance to BOMA	0.003**	-0.001
	(0.001)	(0.001)
Distance to borderpost	0.003***	-0.001
	(0.001)	(0.001)
Maize price	0.003	0.005**
	(0.002)	(0.002)
Fertilizer	0.001***	0.000
	(0.000)	(0.000)
Tropic-cool/semiarid	0.370	0.287
	(0.368)	(0.431)
Tropic-warm/subhumid	0.394	0.175**
	(0.311)	(0.086)
Tropic warm/semiarid	0.604**	0.025
	(0.298)	(0.193)
Year 2013	0.020	-0.088
	(0.052)	(0.080)
Northern region	0.077	-0.408
	(0.194)	(0.524)
Central region	-0.007	-0.015
	(0.333)	(0.233)
Constant	-7.209	-6.472*
	(4.861)	(3.699)
Observations	1,298	1,298
R-squared	0.102	0.068
Number of id	670	670

NOTES: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Standard errors are clustered by enumerator area and displayed in parentheses. We limit ourselves to farming households in rural areas that are headed by women. Female equations only include household heads. Estimates are reweighted using inverse propensity scores (see appendix B.1). Control variables include *Age; Age*^{2}*; Education; Chronically Ill household head; log(Consumption); number of adult equivalents in the household; size of land holding; log(rainfall); log(local ganyu wage); distance to roads, BOMAs and national borders; maize and fertilizer prices; agro-climatic zone fixed effects*

Source: Own calculations using IHPS 2010-2013 data

C Results with Matched Agricultural Season

Table C.8: The effects of FISP on Employment and Decision making: Results with matched agricultural season

Dep. Var.:	WGP		WAP		AGP		WGI		WAI		AGI		Sale	Decider	
Sub-sample	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Seller	Female	Male
FISP	-0.024	0.038	0.034	0.048	-0.095***	-0.009	-0.508	1.037	1.169	0.443	-4.341**	0.184	0.051**	-0.067*	0.031
	(0.020)	(0.030)	(0.039)	(0.039)	(0.033)	(0.035)	(0.351)	(0.811)	(1.045)	(1.089)	(2.210)	(4.000)	(0.023)	(0.038)	(0.042)
Age	-0.011	0.002	0.012	0.028	-0.009	-0.006	-0.299	-0.101	-0.244	0.349	0.168	-2.737	0.007	-0.008	0.009
	(0.012)	(0.020)	(0.025)	(0.023)	(0.020)	(0.023)	(0.249)	(0.515)	(0.614)	(0.687)	(1.402)	(2.245)	(0.014)	(0.020)	(0.029)
Age^2	0.000	-0.000	-0.000	-0.000	0.000	0.000	0.003	0.000	0.002	-0.002	0.000	0.026	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.005)	(0.006)	(0.006)	(0.013)	(0.021)	(0.000)	(0.000)	(0.000)
Education	0.014	0.076	0.038	0.047	0.071	-0.014	0.501	2.799**	0.186	-0.648	5.576**	6.189	0.066*	0.008	-0.128
	(0.032)	(0.052)	(0.064)	(0.065)	(0.048)	(0.071)	(0.433)	(1.226)	(1.404)	(1.803)	(2.751)	(6.271)	(0.038)	(0.051)	(0.094)
Chronically ill head	0.003	-0.013	-0.082	-0.052	0.038	0.072	0.415	-0.387	-0.503	-0.308	1.118	0.641	0.012	-0.005	-0.092
	(0.038)	(0.040)	(0.066)	(0.063)	(0.058)	(0.062)	(0.593)	(1.538)	(1.951)	(2.050)	(3.637)	(6.986)	(0.049)	(0.065)	(0.093)
log consumption	-0.060***	0.013	0.052	0.090**	-0.023	0.071*	-0.940***	0.336	0.854	2.167*	-1.226	4.086	0.107***	0.003	0.020
	(0.022)	(0.026)	(0.041)	(0.039)	(0.040)	(0.037)	(0.354)	(0.700)	(1.022)	(1.135)	(1.978)	(3.461)	(0.025)	(0.037)	(0.046)
Adult Equivalents	-0.004	0.005	0.010	0.007	-0.009	0.001	-0.028	0.081	0.395	0.423	-0.490	-0.149	-0.010	0.010	-0.022
	(0.006)	(0.008)	(0.013)	(0.013)	(0.010)	(0.013)	(0.116)	(0.278)	(0.371)	(0.430)	(0.720)	(1.361)	(0.008)	(0.014)	(0.019)
Land holding	0.003	0.043	0.012	0.018	0.014	-0.010	-0.271	0.547	0.575	0.448	-3.624*	-3.616	0.068**	-0.012	0.021
	(0.011)	(0.027)	(0.032)	(0.030)	(0.031)	(0.035)	(0.343)	(0.646)	(0.861)	(0.953)	(1.945)	(3.209)	(0.031)	(0.024)	(0.028)
Time	0.000	0.001	0.001	-0.001	0.000	-0.001	-0.007	-0.002	0.055**	0.057***	-0.019	-0.026	-0.001	-0.002	0.001
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.009)	(0.015)	(0.023)	(0.021)	(0.046)	(0.070)	(0.001)	(0.001)	(0.001)
log rainfall	0.113	-0.161	-1.439	-1.082	-0.154	1.676*	0.877	2.108	-18.851	-16.050	-40.374	96.124	2.426***	-0.411	-1.043
	(0.429)	(0.541)	(0.999)	(0.887)	(0.744)	(0.886)	(9.219)	(17.968)	(26.884)	(30.871)	(52.306)	(89.737)	(0.579)	(1.408)	(1.566)
log wage	0.004	0.027	-0.038	-0.019	0.001	0.028	0.088	0.220	-0.591	-0.325	2.735	3.602	-0.048**	-0.038	0.053
	(0.017)	(0.027)	(0.043)	(0.037)	(0.032)	(0.033)	(0.354)	(0.801)	(1.060)	(1.242)	(2.267)	(3.692)	(0.023)	(0.036)	(0.041)
Dist. to the road	0.005	-0.003	0.001	0.010	0.008	0.013	0.041	-0.067	0.161	0.239	0.325	0.846	0.010	-0.051**	0.037*
	(0.005)	(0.006)	(0.008)	(0.007)	(0.006)	(0.008)	(0.055)	(0.131)	(0.181)	(0.181)	(0.293)	(0.729)	(0.007)	(0.020)	(0.021)
Dist. to BOMA	-0.000	-0.001	0.001	-0.000	-0.001	-0.00**	0.004	-0.027	-0.054	-0.065	-0.061	-0.223**	0.001	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.009)	(0.020)	(0.049)	(0.059)	(0.054)	(0.097)	(0.001)	(0.001)	(0.001)
Dist. to border post	-0.000	0.000	0.001	0.000	-0.000	-0.001	-0.003	-0.000	-0.048	-0.079	-0.032	-0.128	0.003***	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.008)	(0.020)	(0.055)	(0.065)	(0.044)	(0.093)	(0.001)	(0.001)	(0.001)
Maize price	0.001	-0.002	0.003	0.003	0.001	-0.000	0.028	-0.007	0.062	0.049	0.106	0.104	0.004**	-0.001	0.001
	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.024)	(0.048)	(0.063)	(0.075)	(0.134)	(0.233)	(0.002)	(0.002)	(0.003)
Fertlizer price	0.000	-0.000	0.000	-0.000	0.000	-0.000	0.002	0.001	0.000	-0.004	0.007	-0.025	0.000**	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.006)	(0.008)	(0.008)	(0.016)	(0.029)	(0.000)	(0.000)	(0.000)
Tropic-cool/semiarid	0.212	-0.032	-0.119	-0.202	0.133	-0.168	-0.188	0.731	0.103	-0.654	-3.570	0.525	0.100	0.922***	-0.748***
	(0.158)	(0.163)	(0.180)	(0.182)	(0.170)	(0.371)	(0.473)	(0.972)	(1.407)	(1.558)	(2.996)	(4.939)	(0.160)	(0.176)	(0.181)
Tropic-warm/subhumid	0.018	-0.154	0.137	-0.008	0.254	0.247	-0.711*	-0.669	-1.823*	-2.756**	-1.194	0.711	0.049	0.133	-0.096
	(0.146)	(0.114)	(0.184)	(0.175)	(0.173)	(0.208)	(0.384)	(0.690)	(0.961)	(1.100)	(2.128)	(3.515)	(0.122)	(0.275)	(0.225)
Tropic warm/semiarid	0.019	0.033	-0.028	-0.024	0.145	0.269	-0.492	-0.645	-2.302**	-4.390***	0.083	1.855	0.181	0.918***	-0.751***
	(0.183)	(0.191)	(0.198)	(0.196)	(0.210)	(0.321)	(0.402)	(0.800)	(1.165)	(1.309)	(2.497)	(4.119)	(0.180)	(0.204)	(0.195)
Year 2013	0.009	-0.005	-0.047	-0.147*	0.013	-0.048	-0.193	-0.796	-0.413	-2.250	-5.514	-6.219	-0.059	0.090	-0.078
	(0.035)	(0.056)	(0.086)	(0.088)	(0.067)	(0.075)	(0.756)	(1.643)	(2.137)	(2.432)	(4.512)	(7.444)	(0.048)	(0.065)	(0.069)
Northern Region	0.094	-0.062	0.100	0.403	0.058	-0.310	-0.588	-0.536	-2.278	-1.998	9.212***	18.975***	-0.408	0.072	-0.126
	(0.137)	(0.238)	(0.336)	(0.354)	(0.226)	(0.384)	(0.584)	(1.155)	(1.742)	(1.969)	(3.571)	(5.693)	(0.256)	(0.291)	(0.263)
Central Region	0.024	-0.229	-0.408	-0.190	0.087	-0.380	0.279	-0.646	-1.126	-0.934	7.316***	3.117	-0.488***		
	(0.087)	(0.233)	(0.262)	(0.314)	(0.129)	(0.307)	(0.349)	(0.795)	(1.146)	(1.205)	(2.140)	(3.852)	(0.166)		
Mundlak FE							Y	Y	Y	Y	Y	Y			
Constant	0.072	1.124	9.596	5.990	1.438	-11.641*							-17.593***	3.092	7.716
	(2.929)	(3.694)	(6.845)	(6.111)	(5.165)	(6.033)							(3.947)	(9.506)	(10.377)
Observations	1,909	1,914	1,909	1,914	1,909	1,914	1,702	1,707	1,702	1,707	1,702	1,707	3,823	919	916
R-squared	0.019	0.029	0.020	0.028	0.024	0.039							0.074	0.120	0.101
Number of id	975	975	975	975	975	975							1,950	629	625

Key: WGP is Weekly *Ganyu* Participation, WAP is Weekly Agriculture Participation, AGP is Annual *Ganyu* Participation, WGI is the Weekly *Ganyu* Intensity, WAI is Weekly Agriculture Intensity, AGI is Annual *Ganyu* Intensity, Sale is Sale of Maize and Decider is the decider of Maize sales

NOTES: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

WGP is Weekly *Ganyu* Participation, WAP is Weekly Agriculture Participation, AGP is Annual *Ganyu* Participation, WGI is the Weekly

Table C.9: The effects of FISP on Employment,Entrepreneurship and Financial Inclusion: Results with matched agriculture season

Dep. Var.:	WJP		WJI		AJP		AJI		Borrower		Owner	
Sub-sample	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
FISP	-0.006	-0.034	-0.209	-2.464*	-0.003	-0.035	-0.543	-11.262	0.010	0.049**	0.001	0.004
	(0.008)	(0.024)	(0.254)	(1.437)	(0.010)	(0.026)	(1.526)	(8.065)	(0.016)	(0.025)	(0.020)	(0.026)
Age	0.005	0.024*	0.195	1.818*	-0.002	0.020	-0.706	6.826	0.017**	0.019	0.009	-0.011
	(0.005)	(0.014)	(0.128)	(0.950)	(0.007)	(0.015)	(0.870)	(5.370)	(0.008)	(0.014)	(0.010)	(0.016)
Age^2	-0.000*	-0.000	-0.003*	-0.016	0.000	-0.000	0.009	-0.062	-0.000*	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.001)	(0.010)	(0.000)	(0.000)	(0.010)	(0.058)	(0.000)	(0.000)	(0.000)	(0.000)
Education	0.004	0.023	0.248	3.577	0.006	0.017	0.619	23.958	0.025	0.080	-0.027	0.047
	(0.008)	(0.028)	(0.300)	(2.527)	(0.014)	(0.031)	(1.935)	(15.790)	(0.021)	(0.050)	(0.030)	(0.042)
Chronically ill head	0.009	0.053	0.294	3.709	0.031	0.074*	3.565*	21.592*	-0.004	0.045	0.055	0.008
	(0.016)	(0.039)	(0.456)	(2.281)	(0.023)	(0.042)	(1.908)	(12.608)	(0.030)	(0.048)	(0.035)	(0.053)
log consumption	-0.008	-0.031	-0.193	-1.816	0.014	-0.002	0.019	-1.868	-0.004	-0.022	-0.021	0.049*
	(0.007)	(0.024)	(0.189)	(1.436)	(0.016)	(0.027)	(1.012)	(7.719)	(0.017)	(0.026)	(0.020)	(0.029)
Adult Equivalent	-0.001	-0.016*	0.076	-0.385	0.006	-0.004	1.337***	0.591	-0.006	0.004	-0.008	-0.012
	(0.003)	(0.008)	(0.069)	(0.470)	(0.005)	(0.007)	(0.456)	(2.706)	(0.007)	(0.011)	(0.008)	(0.009)
Land holding	0.019***	0.003	0.686***	0.525	-0.001	-0.011	-0.383	-3.970	0.019	-0.017	0.011	-0.000
	(0.007)	(0.021)	(0.255)	(1.102)	(0.008)	(0.020)	(0.957)	(5.617)	(0.012)	(0.028)	(0.017)	(0.028)
Time	0.001*	0.000	-0.001	-0.070***	-0.001**	-0.001	-0.076***	-0.445***	-0.000	0.000	-0.002*	-0.002**
	(0.000)	(0.001)	(0.004)	(0.023)	(0.000)	(0.001)	(0.027)	(0.130)	(0.001)	(0.001)	(0.001)	(0.001)
Lon rainfall	0.194	-0.429	-0.601	-5.181	0.253	0.459	47.977*	-50.206	-0.217	2.077***	0.194	1.581**
	(0.265)	(0.549)	(4.081)	(33.947)	(0.290)	(0.489)	(27.007)	(197.362)	(0.427)	(0.664)	(0.446)	(0.643)
log wage	-0.010	-0.007	-0.169	1.153	-0.021*	-0.006	-3.391***	3.462	-0.027	-0.001	-0.016	-0.031
	(0.010)	(0.026)	(0.204)	(1.314)	(0.013)	(0.027)	(1.180)	(8.147)	(0.018)	(0.024)	(0.019)	(0.027)
Dist. to the road	-0.006	-0.012**	-0.089**	-0.388*	-0.002	-0.008	-0.106	-2.360*	0.003	-0.004	0.009**	-0.001
	(0.004)	(0.006)	(0.035)	(0.214)	(0.001)	(0.005)	(0.207)	(1.357)	(0.003)	(0.005)	(0.004)	(0.004)
Dist. to BOMA	-0.000	0.000	0.001	0.016	0.000	-0.000	0.011	0.002	0.000	0.000	-0.001	0.001**
	(0.000)	(0.001)	(0.004)	(0.049)	(0.000)	(0.001)	(0.018)	(0.248)	(0.001)	(0.000)	(0.000)	(0.001)
Dist. to border post	-0.000	0.000	0.002	0.012	-0.000	-0.001	0.015	-0.066	0.001	-0.000	0.000	0.002**
	(0.000)	(0.001)	(0.003)	(0.042)	(0.000)	(0.001)	(0.019)	(0.226)	(0.000)	(0.001)	(0.000)	(0.001)
Maize price	-0.001	0.002	-0.016	0.114	-0.000	0.002	-0.073	0.159	0.001	0.003*	0.004***	0.001
	(0.001)	(0.001)	(0.014)	(0.084)	(0.001)	(0.002)	(0.067)	(0.489)	(0.001)	(0.002)	(0.001)	(0.002)
Fertilizer price	-0.000	0.000	-0.002	-0.006	0.000	-0.000	-0.001	-0.033	0.001***	0.000*	0.000**	-0.000
	(0.000)	(0.000)	(0.002)	(0.010)	(0.000)	(0.000)	(0.009)	(0.060)	(0.000)	(0.000)	(0.000)	(0.000)
Tropic-cool/semiarid	0.009	0.146	0.076	-5.244**	0.036	0.263	1.474	-30.997***	-0.013	-0.051	-0.212	0.074
	(0.023)	(0.161)	(0.357)	(2.125)	(0.028)	(0.172)	(2.749)	(11.891)	(0.097)	(0.122)	(0.129)	(0.120)
Tropic-warm/subhumid	-0.014	0.055	0.305	0.234	0.035	-0.014	3.041	-4.900	0.134	0.055	-0.082	0.071
	(0.024)	(0.142)	(0.305)	(1.310)	(0.034)	(0.166)	(2.066)	(7.700)	(0.094)	(0.088)	(0.077)	(0.107)
Tropic warm/semiarid	0.026	0.054	0.045	-2.384	0.004	-0.218	2.907	-23.562***	-0.078	-0.097	-0.450***	-0.065
	(0.027)	(0.173)	(0.281)	(1.544)	(0.029)	(0.201)	(2.312)	(8.976)	(0.128)	(0.136)	(0.153)	(0.140)
Year 2013	0.029	-0.064	0.614	-4.995*	0.031	-0.101*	4.477**	-18.695	0.058	-0.053	-0.039	0.026
	(0.020)	(0.053)	(0.451)	(3.023)	(0.028)	(0.061)	(2.280)	(16.729)	(0.035)	(0.047)	(0.041)	(0.057)
Northern Region	-0.147	-0.023	0.223	-2.710	0.307	0.048	-0.983	-37.122***	0.010	-0.414**	0.033	-0.216
	(0.111)	(0.247)	(0.374)	(2.353)	(0.246)	(0.221)	(1.749)	(12.666)	(0.111)	(0.175)	(0.212)	(0.247)
Central region	-0.051	-0.180	0.298	0.614	0.169	0.181	-1.247	-1.700	0.047	-0.010	0.418*	0.028
	(0.053)	(0.137)	(0.236)	(1.586)	(0.140)	(0.125)	(1.186)	(8.982)	(0.069)	(0.084)	(0.230)	(0.255)
Mundlak FE			Y	Y			Y	Y				
Constant	-1.103	2.930			-1.857	-3.403			1.128	-14.278***	-1.312	-10.683**
	(1.798)	(3.774)			(2.047)	(3.381)			(2.912)	(4.477)	(3.038)	(4.341)
Observations	1,909	1,914	1,702	1,707	1,909	1,914	1,702	1,707	1,909	1,914	1,909	1,914
R-squared	0.027	0.029			0.035	0.048			0.075	0.039	0.079	0.044
Number of id	975	975			975	975			975	975	975	975

Key: WJP is Weekly Job Participation, WJI is Weekly Job Intensity, AJP is Annual Job Participation, AJI Annual Job Intensity, Borrower for who takes the credit and Owner who own an enterprise

NOTES: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

WGP is Weekly *Ganyu* Participation, WAP is Weekly Agriculture Participation, AGP is Annual *Ganyu* Participation, WGI is the Weekly *Ganyu* Intensity, WAI is Weekly Agriculture Intensity, AGI is Annual *Ganyu* Intensity, Sale is Sale of Maize and Decider is the decider of Maize sales

Standard errors are clustered by enumerator area and displayed in parentheses. We limit ourselves to farming households in rural areas that are headed by men. Male equations include only male household heads; female equations only include their spouses. Estimates are