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SUBSIDY EFFECT ON HIRED LABOUR DEMAND FOR AGRICULTURAL HOUSEHOLDS IN TANZANIA

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ABSTRACT

Purpose: This paper intended to investigate whether agricultural households in Tanzania use their portion of income gained through compensation variation from agricultural input subsidies, as a production management strategy by outsourcing hired labour to revamp crop production.
Design/Methodology/Approach: The study employed a quantitative research approach through Fixed Effects (FE) technique using a sample of 5,347 observations. The sample consisted of three rounds of secondary panel data from 2010/2011 to 2014/2015 accessed from the World Bank-Living Standards Measurement Study-Integrated Survey for Agriculture (LSMS-ISA).
Findings: The findings were robust across seed, fertilizer and pesticide input subsidies revealing that; input subsidy has a positive effect on the demand for hired labour for agricultural households in Tanzania.
Implications/Research Limitations: Policymakers should institute policies related to agricultural input subsidy schemes to revamp agricultural production. This is because rural households in Tanzania use their portion of income gained from such subsidies to hire effective labour as an agricultural production management strategy. This initiative could be a means to address the key issue of poor labour productivity faced by the agricultural sector in Tanzania which is predominantly carried out by rural households. The limitation of this study was the lack of data before the study period which has restricted the use of the Difference in Differences (DID) approach.
Originality/Value: The study contributes to existing literature through a novel idea for Sub-Saharan Africa (SSA) on how to revamp agricultural production through a prudent practice of outsourcing hired labour for countries that adopted agricultural input subsidy schemes. This shall compensate for the contemporary labour deficit caused by rural to urban labour migration and the ongoing agricultural labour exit to non-agricultural sectors given the prevailing ineffectiveness of household labour revealed by previous studies.

Keywords: *Subsidy, hired labour, seed, fertilizer, pesticide.*

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1.0 INTRODUCTION

Tanzania is characterised by an economy heavily relying on agricultural production. Agricultural annual share of total GDP is on average 29.1% as compared to other sectors of the economy. Similarly, it absorbs 29% of total tradable export earnings. The sector employs massive rural households accounting for 65.5% of the total population (URT, 2017). However, the undertaking is predominantly practised traditionally by smallholder households in a fairly small scale farming within 0.9 to 3.0 acres (Epaphra & Mwakalasya, 2017). In the area, 70% of farming practice is executed by hand hoe while the remaining 20% and 10% is done by ox plough and by tractor respectively. The production is mostly dominated by food crops accounting for 85% of the annual total production (IPRCC, 2012).

Household farming in Tanzania has a solid background initiated by the government in 1967, six years after independence. The regime articulated the period of the socialist economy based on self-sufficiency which was declared through Tanzania's "Ujamaa" [1] policy pronounced in the so-called Arusha declaration of 1967. In this era, the new regime recognised agriculture as an engine of economic growth also termed the *backbone of the economy* (Clffe, Luttrel, Adholla, & Saul, 1975). In light of the above, emphasis was given to family farming embracing a target for each household to produce adequate food crops for family use and the surplus for food security and commercial purpose. This was made possible by the villagization program which intended to create a farm-based economy by gathering into special agricultural set-up villages, all scattered citizens who were previously dispersed by hunting and pastoralism. Ever since the labour structure had been entirely family based in which the amount of labour completely depends on family size. Similar to other developing countries, the fertility rate of rural households in Tanzania that greatly rely on a farm-based economy has been pretty high as a means to ensure the existence of sufficient labour necessary for agricultural production (Todaro & Smith, 2015). This has also been a reason for most cases where school-age children are not enrolled on schooling. Similarly, the increase in the number of drops out of school has been a remarkable issue in rural households.

However, in the past two decades, there has been a decline in family labour in most agricultural households in rural Tanzania. This is in line with occupational choice decisions of which part of household labour defected into the manufacturing sector within rural to urban migration in favour of wage labour (Oluyole, Usman, Oni, Oduwole, 2013). The labour exit from agriculture is a result of the scaling up of the manufacturing sector towards the industrialization agenda stipulated in Vision 2025. This has been one major reason for a recent setback in agricultural production in Tanzania. As a result, agricultural growth has deteriorated at a poor performance rate of four percent for the past two decades far less compared to the National Strategy for Growth and Poverty Reduction (NSGPR) goal of 10% by 2010 (WDI, 2016). To halt the adverse labour exit consequence in farming production

[1] Ujamaa is a word for Tanzanian national language meaning household hood also implying socialist economy which was implemented in 1967.

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most farm households have embarked on outsourcing wage labourers as a means to improve the decline in production from the prevailing labour shortage. Consequently, the level of hired labour in farm activities has been persistently increasing in many developing countries (Blanc, Cahuzac, Elyakime, & Tahar, 2008).

Employment in Agriculture and Manufacturing sectors in Tanzania

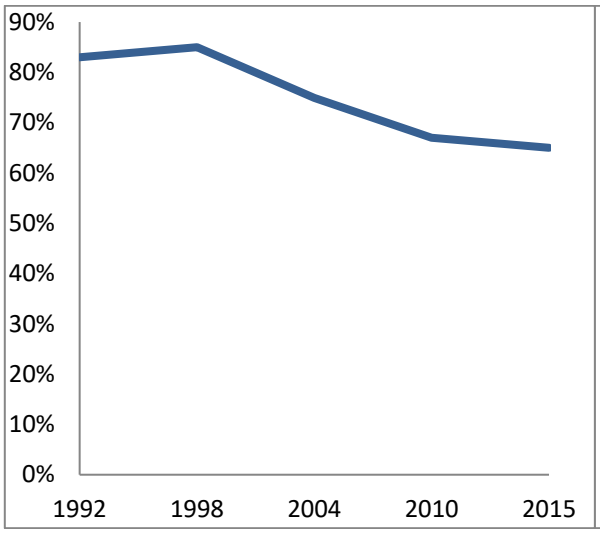

Figure 1: Employment in Agriculture (% share)

Source: WDI, 2016

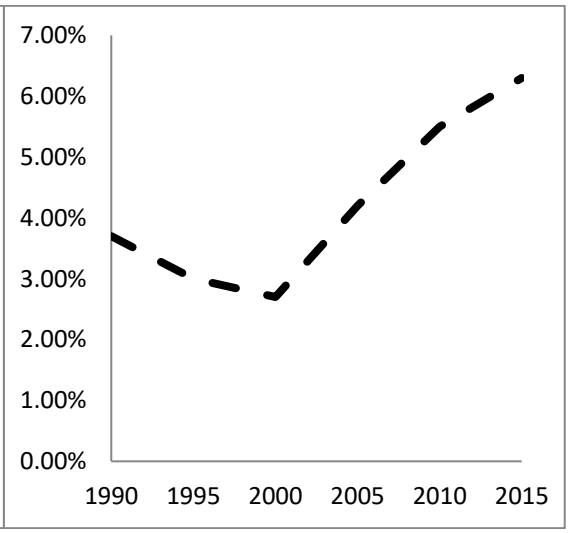

Figure 2: Employment Manufacturing (% growth)

Source: WDI, 2016

Realising the downfall of agricultural sector performance, in 2008 the government of Tanzania embarked on a subsidy scheme namely National Agricultural Input Voucher Scheme (NAIVS) with the intent to elevate agricultural sector performance. In the scheme, a subsidy of 50% is offered to farmers through a voucher enabling them to fetch half the price of improved and more productive inputs. The farmers, therefore, enjoyed savings emanating from government subsidies through agricultural inputs which boosted their financial capacity. Since the execution of the program, stylized facts indicate that hired labour has over time been increasing (see figure 3) with the associated increase in wage rates (World Bank 2017). *This pops up a question as to whether the input subsidies offered to farmers are a reason for such an increase in demand for hired labour*. Therefore, this paper attempted to address this question through an empirical analysis of the subsidy effect on labour demand for agricultural households using National Panel Survey, Integrated Survey for Agriculture (NPS-ISA) data in Tanzania.

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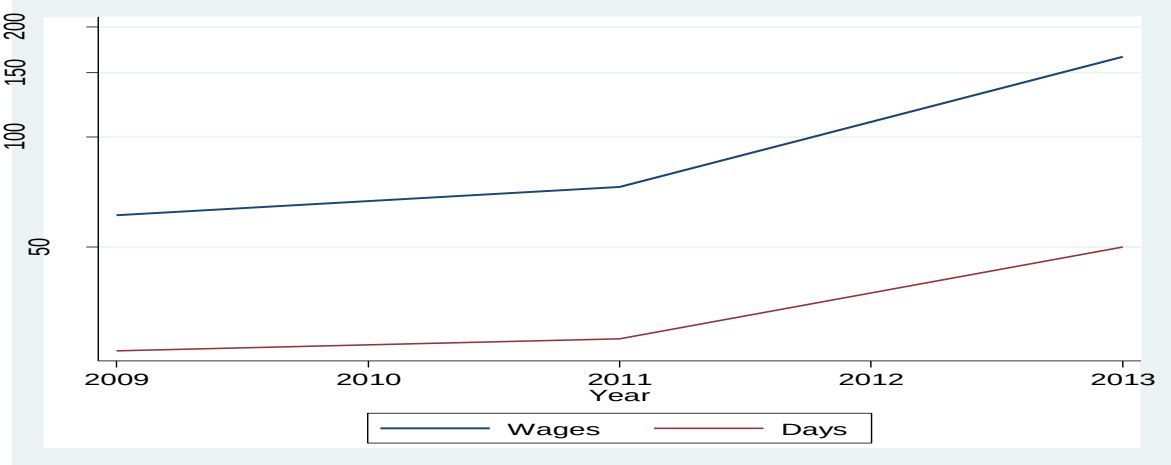

Figure 3: Annual Wages in Million TZS and Labour Days in Thousands 2009 - 2013
Source: World Bank, 2017

This paper intends to contribute to the existing body of knowledge as follows; it adds to the existing short strand of literature on whether agricultural households in Tanzania use their portion of income gained through compensation variation from agricultural input subsidies to outsource hired labour as a production management strategy to revamp crop production. This issue is of paramount importance in Tanzania which heavily relies on an agricultural economy predominantly based on traditional household farming in which household low labour productivity has been one of the key challenges. The importance is more appealing since agriculture is a pro-poor sector employing a massive rural poor accounting for more than 70% of the total population (Epaphra & Mwakalasya, 2017). This knowledge is highly needed not only by farmers but also by the government which commits huge amounts of funds to address agricultural performance impeding factors in which labour productivity is one of the key issues.

Most few existing studies in this area focused on subsidy effect on other areas including productivity, environment, food security and welfare; none has investigated on subsidy effect on hired labour demand. This paper attempts to fill the void by employing a unique dataset of three rounds of national panel coverage from the World Bank-Living Standards Measurement Study (LSMS-ISA). The dataset adequately exhibits a high quality of which the findings can be generalized to the SSA region whose countries share common economic characteristics.

The remaining parts of this paper are structured as follows; the next part presents the review of relevant literature; section three outlines the methodology employed and dataset used, section four presents the results and discussion and the last section five discusses concluding remarks, policy implications and limitations of this study.

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2.0 THEORY OF CONSUMER'S SURPLUS COMPENSATING VARIATION

The theory underpinning this study is the compensating vitiation (CV) as part of a consumer's surplus that a consumer enjoys due to a favourable price decrease in the market. This emanates from the difference between the consumer's readiness to pay and the actual amount that a consumer pays which is relatively lower compared to the initial price used to purchase a particular good. The savings accrued by the consumer as welfare gain from CV may be directed to any alternative activity such as the consumption of another good. In the case of the present study; a household that receives agricultural input subsidy enjoys an increase in purchasing power from the savings accrued from unspent income due to the subsidy he receives. To maintain the initial utility level, he will continue to consume the same input level and the excess purchasing power gained may be enjoyed by the household as a consumer's surplus. Part of this income may be used to hire labour to compensate for the labour deficit gap faced by the household. Based on the Hicksian demand function the theory is further elaborated hereunder;

Consider expenditure minimization condition in which a household is willing to give up a certain portion of his extra income gained to maintain the initial utility level after experiencing a favourable lower price level compared to the initial price in the market;
Given the price changes from P_0 to P_1; what is the lowest possible income required to get to the initial satisfaction level, U_0, at the new cheaper price $P*$ or how much income portion must a consumer give up to make himself well off as before the price change? This can be explained by the compensation variation given by;

CV $\dots. = I^1 - I^0$ ……………………………………………………..……(i)

where; I^1 is the minimized expenses required to reach satisfaction U_0 at prices P*: $E(U_0\, , P^*)\; and\; I^0$ are the minimized expenses needed to reach utility U_1 at prices P^0; $E(U_0\, , P^0)$.

Consider the following household expenses minimization problem;

$$\min_{x_1,x_2} p_1x_1 + p_2x_2 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots . (ii)$$

$$s.t;\; U_0 = U(x_1, x_2) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots . \dots\dots . \dots\dots\dots (iii)$$

Langrangian solution is; $L = p_1x_1 + p_2x_2 - \mu(U(x_1, x_2) - U_0) \dots\dots\dots\dots\dots\dots\dots\dots\dots (iv)$

Based on Hicksian compensated demand function, assuming that CV is in absolute value throughout this illustration expenditure minimization problems become;

$$x_1 = D_1{}^{Hicksian}(U, p_1, p_2) \quad x_2 = D_2{}^{Hicksian}(U, p_1, p_2) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (v)$$

Inserting back into; $p_1x_1 + p_2x_2$, gives the minimum expenditure function $E(U^0, p_1p_2)$
The CV is thus the area left of the Hicksian Demand curve;
Recall $CV = E(U^o, p^*) - E(U^o, p^0)$; suppose that only $p_1$changes.

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$$\int_{p^0{}_1}^{p_1{}^*} D_1{}^{Hicksian}(U^0, p_1 p_2)dp_1 = \int_{p^0{}_1}^{p_1{}^*} \frac{\partial E((U^0, p_1, p_2)}{\partial p_1} dp_1 = E(U^o, p^*) - E(U^o, p^0)$$
$$= |CV| \ldots\ldots\ldots\ldots \text{(vi)}$$

CV is a compensation variation that a consumer enjoys as a surplus that he is willing to save, give away or spend for another consumption while maintaining the original utility of the initial good he consumed.

2.1 Brief Overview of Agricultural Input Subsidies in Sub-Saharan Africa

Household labour plays a pivotal role in Sub Saharan African agricultural productivity predominantly carried out by smallholder households (Okoye, 1989). Family farming primarily uses household labour, which is composed of on average a range of one to seven household members accounting for 65 per cent of the total labour supply (Moyo, 2016). However, household labour has been untimely and inadequately supplied giving rise to the need for hired labour. Hired labour has thus gained importance in Sub Saharan Africa, particularly in Tanzania where agriculture remains the cornerstone of the economy to support the industrialization agenda which calls for adequate agricultural inputs (URT, 2017). A household decision to acquire waged labour hinges on anticipated profit versus the cost of hiring such labour. Therefore, outsourcing labour occurs when the financial profit of hiring labour is more than the anticipated labour financial cost. Previous developments recommend that the failure of the majority of households to employ on-farm labour emanates from high transaction costs (Sadoulet de Janvry, & Benjamin, 1998; FAO, 2012). Little has been done in Sub Saharan Africa under this economic contextual theme. Particularly, there is no empirical evidence of subsidy effect on hired labour demand for farm households. The reason might be due to a lack of adequate, appropriate and quality data to support studies in this area. We thus take advantage of a unique dataset from LSMS-ISA which is rich in the information needed and of high quality.

2.2 Agricultural Input Subsidies in Tanzania

In Tanzania, the agricultural input subsidies program started in 2002 after the lessons learnt from Malawi which was used to restructure its program in 2008. The new program instituted a voucher-based input subsidies program called the National Agricultural Inputs Voucher Scheme (NAIVS). The program included private agencies which received subsidy vouchers from maize and wheat farmers in exchange for agricultural inputs. Unlike the similar program which was formerly implemented in Malawi, the new program in Tanzania recorded a huge promotion of the private sector through a unique distribution logistic that was created through private agencies national wide (Minot & Benson 2009). In contrast, however, the Malawian program was solely based on government entities that side-lined the private sector which resulted in the decline of the market niche of private dealers by 58%. The programme in Tanzania spanned from 2008 to 2014 (URT, 2014).

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Empirical Literature

Few similar studies have been carried out from other economies on subsidy effect in the agricultural sector including Kumbhakar & Lien (2010) who studied the influence of subsidies on-farm production efficiency in Norway farms from 1991 to 2006 and found a negative related effect between subsidies and production while a positive relation was revealed with technical efficiency. Kazukauskas, Newman & Sauer (2013) studied the association of subsidies on farm-based production in Denmark and Dutch by using micro data and revealed positive effects of subsidies on-farm production. Gorter (1993) found a positive related influence between subsidies and crops output in the United States. Zhong, Chen, & Xiao (2013) found an increased welfare effect from subsidies effect in District and Hubei China. Kim Yi & Jeremy (2016) found in Malawi that even without the political will to support subsidies distributional logistics yet the political value is realized. In the above existing short strand of literature, none of the studies has explored the subsidy effect on labour demand in the agricultural sector which is the void motivating the essence of carrying out this study.

3.0 METHODOLOGY

The theoretical framework of this study adopts with modifications the framework of Jude & Silaghi (2016) on the employment effect of FDI. To this end, we extended the model to subsidy augmented labour demand function. This is in line with the idea that subsidy as public investment in agriculture has an efficient effect on agricultural production (Singh & Woodhead, 2002). Therefore, we assumed that the household is a profit-maximizing firm on farm *i* at time *t* facing a technological constraint given by a Cobb–Douglas production function:

$$Y_{it} = A^{\gamma} K_{it}^{\alpha} L_{it}^{\beta} \quad \text{(vii)}$$

Where; *Y* is output, *K* the capital stock, *L* is labour and *A* technical progress. α and β are the elasticity of output relative to capital and labour, and γ is total factor productivity. A household uses farm inputs such that the marginal productivity of labour equals the price of labour. Thus, labour marginal revenue equals wages *(w)* where capital marginal revenue is equal to the cost of capital *(c).* Therefore;

$$\frac{\partial Y}{\partial L} = w \quad \text{(viii)}$$

and

$$\frac{\partial K}{\partial K} = c \quad \text{(ix)}$$

Substituting (vii) into (viii) and (ix) then taking the ratio of (viii) over ix) we get;

$$Y_{it} = A^{\gamma} \left(\frac{\alpha}{\beta} \frac{w_{it}}{c_{it}}\right)^{\alpha} L_{it}^{\beta} \quad \text{(x)}$$

Taking natural logarithm on both sides and rearranging the terms we obtain the following labour demand of farm *i* at time *t*;

$$lnL_{it} = \emptyset_0 + \emptyset_1 lnY_{it} + \emptyset_2 ln\frac{w_{it}}{c_{it}} \quad \text{(xi)}$$

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Where: $\emptyset_{it} = (\gamma lnA + \alpha ln\alpha - \alpha ln\beta)/(\alpha + \beta)$; $\emptyset_1 = 1/(\alpha + \beta)$ and $\emptyset_2 = -\alpha(\alpha + \beta)$
Public investment in agriculture can influence technical efficiency progress parameter *A* **(**Singh & Woodhead 2002). Thus, we assume there is an increase in technical progress over time resulting from government investment through subsidy. Thus;

$A_{it} = e^{\delta_0 T_i} SD_{it}^{\delta_1}$ ……*(xii)*
Where; *SD* is a subsidy in farm *i* at time *t,* T is time trend and $\delta_0 and\ \delta_1 > 0$ taking the natural logarithm of A_{it} and replace in equation (i) we get;
$lnL_{it} = \rho + \emptyset_1 lnY_{it} + \emptyset_2 ln\frac{w_{it}}{c_{it}} + \emptyset_3 SD_{it} + \emptyset_A T$ ……*(viii)*
Where; $\rho = -(\alpha ln\alpha - \alpha ln\beta)/(\alpha + \beta)$;$\emptyset_3 = \mu\delta_1$; $\emptyset_4 = \mu\delta_0\ and\ \mu = -\gamma/(\alpha + \beta)$
$lnL_{it} = \rho + \emptyset_1 lnY_{it} + \emptyset_2 ln\frac{w_{it}}{c_{it}} + \emptyset_3 SD_{it} + \emptyset_A T$ ……*(xiv)*

3.1 Empirical Model and Identification Strategy

To analyse the subsidy effect on labour demand, we applied panel data techniques with a similar model derived directly from the theoretical framework with some modifications to suit the variables available in the data set.
$lnHLD_{it} = \emptyset_0 + \emptyset_1 SD_{it} + \emptyset_2 lnY_{it} + \emptyset_3 lnW_{it} + \emptyset_4 lnPL_{it} + + \emptyset_5 lnHS_{it} + \delta_t + \gamma_i + Q_V + \varepsilon_T$ ……*(xv)*

where $lnHLD$ is natural logarithms of hired labour in the number of days $\emptyset_0$ is a constant term, *SD* is a dummy variable (*SD* = 1, if a farmer receives subsidy and 0 otherwise), lnY is the natural logarithm of output in kilograms, lnW is the natural logarithm of wages in Tshs, $lnPL$ is the natural logarithm of plot size in acres, $lnHS$ is the natural logarithm of household size, δ is farm specific shock which is time-variant, γ is identical farm time-invariant specific shock, Q_V is contextual village fixed shocks while *i* and *t* show farm and time respectively? We preferred Fixed Effect (F.E) approach over other panel data techniques because of its peculiar ability to account for unobservable omitted variable bias.

3.2 Data and Reliability

The dataset for executing this study is from World Bank-Living Standards Measurement Study-Integrated Survey for Agriculture (LSMS-ISA) national panel data. The LSMS is a household survey program committed to providing high-quality data by continuous enhancement of survey techniques and capacity advancement (World Bank, 2017). The dataset adopted for this study is composed of three rounds spanning from 2010/2011 to 2014/2015 financial years. It represents at the national level the cross country main agro climate zones in Tanzania dominated by agricultural production. The first subsidy innovative sampling was in the 2010/2011 Financial Year which covered 3,924 households extended to more than 409 targeted areas within Tanzania mainland and Zanzibar islands. The succeeding rounds included all the households contained in the first round in which data for household and hired labour are provided which are necessary inputs to this study. Apart from household and hired labour information which are the key variables of this study, others include; farm

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size, dummy variables for herbicides, organic fertilizers, inorganic fertilizers, seeds and fixed capital/asset at the plot level. The dataset provides adequate inputs necessary to reduce the risk of biased estimates. Farm size is established by Global Positioning System (GPS), providing a high-quality measurement of plot size as one of the variables. After data cleaning the study employed a sample of 5,317 observations.

4.0 RESULTS AND DISCUSSION

The study was made possible through the analysis of relevant variables both treatment and controls. The core variables included; the natural logarithm of total hired labour on some days as the dependent variable and three dichotomous dummy variables; seed, fertilizer and pesticide inputs. Control variables included; the natural logarithm of household size, total output in kilogram transformed by natural logarithm, the natural logarithm of wages (LnW) and the natural logarithm of plot size (LnPL).

To examine the effect of input subsidies on labour demand the analysis was divided into three stages, first; hired labour demand was regressed on seed input dummy variable controlling for total output, household size, wage rate and farm size. Each estimation was simulated by four alterations to check for model consistency and robustness of results. The results for seed, fertilizer and pesticide input subsidies are presented in the first row of Table 1, Table 2 and Table 3 respectively.

Table 1: Baseline Model on Effect of Seed Subsidy on Labour Demand - Dependent Variable ln HLD

VARIABLES	(1)	(2)	(3)	(4)
SDS	0.007***	0.007***	0.007***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
lnY	0.864***	0.864***	0.864***	0.859***
	(0.004)	(0.004)	(0.004)	(0.004)
lnHH		-0.002*	-0.002*	-0.002*
		(0.001)	(0.001)	(0.001)
lnW			0.002	0.001
			(0.001)	(0.001)
lnPL				0.243***
				(0.044)
Constant	-0.399***	-0.393***	-0.405***	-0.190***
	(0.024)	(0.024)	(0.026)	(0.047)
Village FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	5,347	5,347	5,347	5,347

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The first row of Table 1 indicates the results of this study's interest which show that seed input subsidy is throughout positive and statistically significant, meaning that seed input subsidy has

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a positive effect on the potential demand for hired labour. Thus, additional seed input subsidy granted to a farm household is associated with an increase in hired labour demand of agricultural households in Tanzania.

4.1 Robustness Checks

The second and third subsequent regressions were carried out upon replacing seed with fertilizer and pesticide input subsidies respectively while keeping the same structure of the baseline model. Similarly, the results in Table 2 conform to Table 1 results showing a consistently positive and significant (see the first row) effect of fertilizer input subsidy on hired labour demand, meaning that fertilizer input subsidy has a positive effect on the potential demand for hired labour. Thus, additional fertilizer input granted to a farm household is associated with an increase in hired labour demand for agricultural households in Tanzania.

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Table 2: Effect of Fertilizer Subsidy on Labour Demand - Dependent Variable ln HLD

VARIABLES	(1)	(2)	(3)	(4)
FSD	0.016**	0.016**	0.016**	0.017**
	(0.008)	(0.008)	(0.008)	(0.008)
lnY	0.863***	0.863***	0.863***	0.858***
	(0.004)	(0.004)	(0.004)	(0.004)
lnHH		-0.002*	-0.002*	-0.002*
		(0.001)	(0.001)	(0.001)
lnW			0.002	0.001
			(0.001)	(0.001)
lnPL				0.244***
				(0.044)
Constant	-0.391***	-0.386***	-0.397***	-0.181***
	(0.024)	(0.024)	(0.026)	(0.047)
Village FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	5,347	5,347	5,347	5,347

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

The last analysis was drawn from the pesticide effect on hired labour demand. The results are presented in Table 3. Similarly, the results throughout the first row indicate a positive and significant effect of pesticide effect on hired labour demand, meaning that pesticide input subsidy has a positive effect on the potential demand for hired labour.

Table 3: Effect of Pesticide Subsidy on Labour Demand - Dependent Variable ln HLD

VARIABLES	(1)	(2)	(3)	(4)
PSS	0.061***	0.060***	0.059***	0.059***
	(0.017)	(0.017)	(0.017)	(0.017)
lnY	0.864***	0.864***	0.860***	0.860***
	(0.004)	(0.004)	(0.004)	(0.004)
lnHH		-0.002*	-0.002*	-0.002*
		(0.001)	(0.001)	(0.001)
lnW			0.001	0.001
			(0.001)	(0.001)
lnPL			0.240***	0.240***
			(0.044)	(0.044)
Constant	-0.399***	-0.393***	-0.193***	-0.193***
	(0.024)	(0.024)	(0.047)	(0.047)
Village FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	5,347	5,347	5,347	5,347

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Thus, additional fertilizer input granted to smallholder farmers is associated with an increase in hired labour demand of smallholder farmers in Tanzania. The results substantiate the two former analyses on seed and fertilizer input subsidies' effect on hired labour demand.

5.0 CONCLUSION

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This paper intended to examine the subsidy effect on hired labour demand for Tanzanian farm households. Its motivation is built on the increase in demand for hired labour of Tanzanian farm households emanating from replacing household labour shortage with hired labour. The shortage is geared by occupational choices which entice household labour to exit from agriculture to off-farm activities expecting greener pastures. Stylized facts indicate that since the commencement of the agricultural input subsidy scheme in 2008/2009 in Tanzania, hired labour demand by farm households had over time been increasingly associated with the increase in wage rate payable to hired labour. This prompted the need for this study to investigate whether the increase in demand for hired labour is partly contributed by the additional financial capacity gained from savings accrued by the farm households from the agricultural input subsidy scheme. The intent is to establish whether farm households use compensating variation techniques from savings they enjoy as a production management strategy to revamp their agricultural production. Despite the previous studies which were limited to subsidy effect on household environment, production and welfare gain, this study contributes to the existing literature that farmers in Tanzania re-invest the surplus they gain from subsidy effect in outsourcing labour necessary to revamp agricultural production.

The findings reveal that input subsidy has a positive and statistically significant effect on agricultural households' demand for hired labour in Tanzania. This was empirically evident across three different input subsidies namely; seed, fertilizer and pesticide offered to Tanzanian maize and rice farmers. The intuition is that more financial capacity is built for farmers through savings accrued from input subsidies. Given the household labour shortage and low household labour productivity, farmers wisely address the issue by using such savings to outsource hired labour which has been confirmed by previous studies to be more productive to boost agricultural production.

However, this study was constrained by data limitation where data unavailability before the NAIVS precluded the use of the difference in difference (DID) strategy which could provide more sturdy results.

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