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Essays on Financial Activities and Industrial Change: The Study Case in Vietnam

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ABSTRACT

As mentioned in the agenda 21 at the World Summit on Sustainable Development (WSSD), the world is targeting to promoting sustainable agriculture and rural development. In developing countries, rural development has been considered as a key tool to alleviate poverty. Studies over the past decades have provided important information on the related issues in the rural development and poverty alleviation process. The main purpose of this research is to study the sustainable economic development that has been recognized as one of the important elements in rural development. The specific objectives of this research were to investigate the economic structural change of Vietnam's economy and examine the financial activities of the small and medium-sized enterprise and rural households in Vietnam.

In recent years, Vietnam's economy has gained significant achievements in the development process. Being one of the poor countries before the renovation, Vietnam has successfully made a transition to a middle-income country. A large and growing body of literature has emphasized introducing or identifying leading industries is essential for poverty reduction and economic development. Besides, structural change analysis is an important tool to study the economic development and growth of any country. However, much of the literature concerns the macroeconomic approach rather than the industrial approach. Therefore, the first objectives of this paper are to examine which sectors can be considered key sectors in Vietnam over the past 15 years (2000-2015) and to investigate how structural economic change has occurred. The backward-forward linkages and decomposition approaches are applied to analyze the IO tables. The major findings are used to explain the role of some subsectors as well as reveal the trend of the economic structural change of Vietnam's economy.

The role of small and medium-sized enterprises (SMEs) in Vietnam's economy has been supported by various literature. According to the general statistics provided by Vietnam (GSO, 2014), the contribution of 415,656 Vietnamese SMEs to the state's budget is approximately 217.5 trillion VND, accounting for 41% GDP. In addition, SMEs in Vietnam provide jobs to 5.6 million people, accounting for 48.3% of total enterprise employment (GSO, 2014). The importance of SMEs to the Vietnamese economy is undeniable. Nevertheless, SMEs encounter many difficulties, such as the lack of capital, skilled labor, and financing sources. Therefore, this study conducts an empirical analysis to investigate the relationship between the capital structure as financial leverage and investment decisions by using the latest Vietnamese SME data of 2011, 2013, and 2015.

Rural households (HHs) are one important stakeholder in the rural development process. However, rural households often face challenges due to production constraints that hinder the improvement of their livelihood. Previous studies suggest that rural HHs can overcome these constraints if they are organized into groups. Acknowledging that sustainable rural development requires collaboration with local government, local organizations, and the people, this paper contributes to the literature by examining the impacts of farmers' union membership on the production and credit volume of HHs using HH-level data from rural areas in Vietnam. Propensity score matching was employed.

The main results of this research are summarized as follows: Using the Vietnam input-output table at four points and the decomposition method, we found that the agricultural sector and food sector maintained their central roles over the 15 years considered. These two sectors experienced increased total output, primarily due to changes in from final consumption demand. In addition, the textile sector also maintained a higher position in total output in Vietnam because of the increased final demand for exports. Moreover, the machinery sector grew rapidly over the last 5 years considered, due not only

to changes in final demand for investment and exports but also to technological change affecting intermediate inputs. By contrast, the wholesale and retail sector experienced a drastic decline in its final demand over the last 5 years considered due to changes in consumption, investment, and exports.

By using three Vietnam SMEs data (2011, 2013 and 2015), we found a contrary result with financial theories and previous studies that show a positive relationship between financial leverage and investment decision, suggesting that SMEs with higher financial leverage tend to seek more investment opportunities than SMEs with lower financial leverage. We also find that firms with higher financial leverage are more likely to choose external financing sources than internal ones. Our results confirm that financial theories have varying levels of applicability in the context of an emerging market, such as Vietnam.

By using the household-level data from rural areas in Vietnam, we found that farmer union membership has a significant impact on the production and credit volume of rural HHs. In particular, farmers' union membership HHs can obtain higher credit volume and attain more livestock production but less crop production than nonmember HHs. Our findings suggest that the farmer's union should enhance its activities to provide more resource accessibility, especially concerning financial services.

The results of this study add to the literature on rural development in Vietnam. This may help policymakers gain better insight into the role of different stakeholders in rural development and poverty reduction progress.

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CHAPTER 1: GENERAL INTRODUCTION

1.1. Background of the study

The concept of development has been mentioned in the Agenda for Development (A/RES/51/240) that development is a process to bring a higher quality of life to all people. The important components to maintain sustainable development are economic development, social development, and environmental development. In addition, the Sustainable Development Goals (SDGs) addresses that "*strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance, and financial services for all*". Therefore, this study focuses on sustainable economic development in Vietnam.

Rural development is one of the key tools to alleviate poverty in Vietnam. The Vietnamese government has made significant efforts to reduce poverty by implementing several programs to support a household such as the microcredit programs, providing agricultural extension services, introducing new technologies, and so on. Being one of the poorest countries in the mid-1980s, Vietnam has successfully made a transition to a middle-income country (Banker & Ungor, 2019). In recent years, Vietnam's economic structure has been transformed into industrialization and modernization by promoting comparative advantages of industries and services.

1.2. Objectives

This study aims to achieve two main objectives:

(1) Economic structure change in Vietnam: To examine which sector can be considered as key sectors in Vietnam's economy from 2000 through 2015 and investigate how the economic structural change has done.

(2) Financial activities of small and medium-sized enterprises (SMEs)and rural households in Vietnam:

a. To identify the link between corporate finance (financial leverage) and investment decisions in Vietnam's SMEs

b. To evaluate the impact of farmer union membership on rural household

1.3. Contribution of the study

This study contributes to the existing literature in the field of rural development and regarding the role of social organization in rural areas in Vietnam. Additionally, this study contributes to the existing knowledge regarding the relationship between corporate finance and investment decision in the context of emerging markets.

This study uses several methodologies to address the problem such as causal inferences, input-output decomposition analysis which has received much attention in the current research literature.

1.4. Structure of the study

This study is organized as follows: Chapter 1 will briefly introduce the context of Vietnam's economic development. Chapter 2 investigates how important a food supply chain in Vietnam is in the period of 2000-2015 using a decomposition Input-output approach. Chapter 3 contains the analysis of the correlation between corporate finance and investment decision of Small and Medium Enterprises in Vietnam using several Econometrics techniques, such as Logit, Tobit, and Fractional logit models. Chapter 4 presents the empirical estimation of the impact of farmer union membership on the production and credit volume of households using the Propensity Score Matching approach.

CHAPTER 2: HOW IMPORTANT A FOOD SUPPLY CHAIN IN VIETNAM IS IN THE PAST 15 YEARS: DECOMPOSITION INPUT-OUTPUT APPROACH (2000-2015)

2.1. Introduction

Many economists, such as Kuznets (1979), Lin and Monga (2011), Uy et al. (2013), and Vu, K.M., have emphasized the importance of economic restructuring in a country's economic development and growth. (2017). In recent years, Vietnam's economic structure has been transformed through industrialization and modernization by the promotion of comparative advantages in industries and services. After 30 years of renovation, Vietnam's economy has made significant achievements. Barker and Ungor (2019) noted that Vietnam has successfully escaped from being a low-income country and advanced to being a middle-income country.

A large and growing body of literature has investigated changes in economic structure, for example Leotief (1941), Feldman et al. (1987), Bui Trinh et al. (2012), Marconi et al. (2016), Ha, N. H. P., & Trinh, B (2018), Dempster et al. (2014), Erumban et al. (2019), Dhahri et al. (2020) and Almmeida et al. (2020). Most previous studies have used a macroeconomic approach to analyze changes in aggregate economic indicators, such as employment, the growth rate, and gross domestic product (Peter Hacks, 1989; Skolka, 1989; Schoonbeek, 1990; Pham Quang Ngoc & Mohnen, 2004 and Rahmaddi & Ichihashi, 2013). For example, Pham Quang Ngoc & Mohnen (2004) applied a multisectoral model to investigate how Vietnam's economic growth is related to structural change by using the country's input-output (IO) tables for 1989, 1996 and 2000. Similarly, K.M. V (2017) noted that structural change has a significant positive effect on GDP growth. Despite being relatively neglected in traditional economic analyses of structural change, the industrial

approach is also an essential tool for analyzing structural change. This study focuses on the industrial approach to identify the key sectors and investigate the changes in the economic structure of Vietnam by analyzing its IO tables for the period 2000-2015. Backward-forward linkages and the decomposition approach are applied to analyze the IO tables. The major findings are used to explain the role of certain subsectors and reveal the trends in the economic structure of Vietnam's economy.

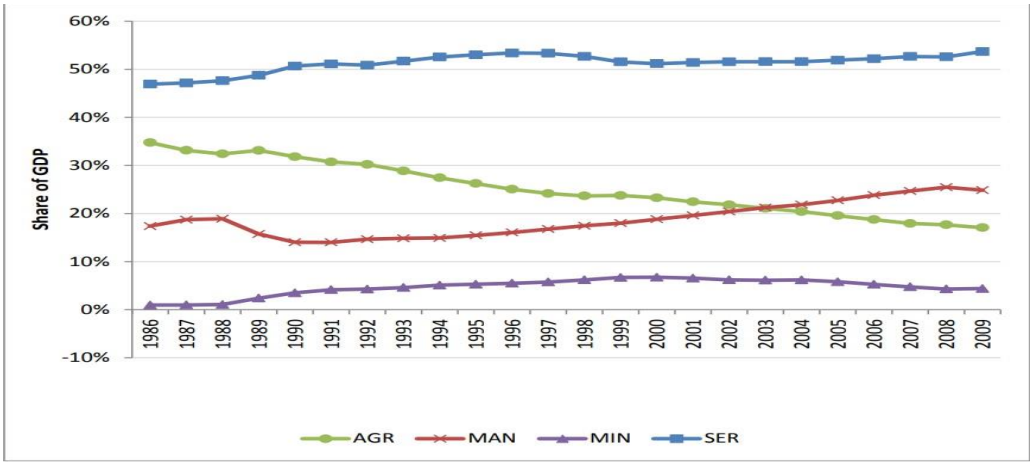
This paper makes two major contributions. First, we add to the well-established literature on structural economic change by examining the Vietnamese economy using industrial analysis. We decompose the changes in output into the change in technology and final demand for each sector. This decomposition is used to investigate the major factors corresponding to the total change in its input. Second, to the best of our knowledge, this paper is the first to employ four Vietnamese IO data tables to compare the economy's structure in three periods. Therefore, the results are expected to reflect the reality of Vietnam's structural economic change over 15 years (2000-2015).

According to the General Statistical Office (GSO) (2016), Vietnam has experienced significant structural economic change. In particular, the country has reduced its dependence on agricultural sectors and witnessed expanded contributions of the industrial and services sectors. For example, the share of the agriculture sector in GDP decreases by 6.2% (from 23.24% in 2000 to 17% in 2015); the share of the industry and construction sector decreased by 4.88% (from 38.13% to 33.25%); and the share of the services sector increased by 1.1% (from 38.63% to 39.73%).

Figure 1 illustrates the share of four main sectors in Vietnam's GDP from 1986 to 2009, namely, agriculture, manufacturing, mining, and services. The agricultural sector and

manufacturing sector exhibit the most dramatic changes. The agriculture sector accounted for 34 percent of GDP in 1986 and decreased to 17 percent in 2009. However, the manufacturing sector experienced an upward trend, starting at 17 percent in 1986 and climbing to approximately 25 percent in 2009, which far exceeds that of the agricultural sector. Moreover, the services sector represented the largest share of GDP. In particular, the services sector accounted for over 46 percent of GDP in 1986 and 54 percent in 2009. The mining and quarrying sectors showed the smallest contribution to the GDP, at less than 6 percent throughout the period.

Figure 1: Shares of GDP by Sectors, 1986–2009



Sources: Tobergte et al. (2013)

We focus on the food supply chain, as it is a key part of rural development (Marsden et al., 2000) that produces a significant amount of basic materials for other industries (Kastrinaki & Stoneman, 2011). Aramyan and Van Gogh (2014) noted that the supply chain includes processes from production to distribution. The food supply chain comprises all processes related to the production and distribution of food and drink (Kastrinaki & Stoneman, 2011). Therefore, the agricultural sector plays an important role in the food supply chain. In Vietnam, the agricultural sector continues to be the largest raw material

provider to other sectors, such as the food sector and textile sector. Moreover, the food sector buys mostly inputs from the agriculture sector (Dieu TTM, 2006)

In essence, IO describes the interlinkages among industries, households and government. A considerable literature has applied IO analysis to describe a country's economy (such as studies performed by Skolka, 1989; Franke and Kalmbach, 2005; and Marconi et al., 2016) or to investigate the interdependency among households (Hongsakhone and Ichihashi, 2019). In addition, several studies have investigated changes in Vietnam's economic structure based on IO tables, such as T. Bui et al. (2012), T. Bui & Phong N.V. (2013), Nguyen P. Thao (2014), Tran et al. (2916), Ha, N.H.P. & Trinh, B (2018). T. Bui and Kobayashi (2012) discussed the interindustry linkages among manufacturing industries and nonmanufacturing industries by using three IO tables (1989, 1996 and 2000). They reported that the manufacturing sector showed higher internal linkages than the nonmanufacturing sectors. Although much of the current research pays particular attention to the IO decomposition method, no single study exists that uses four I-O tables. Most of the previous literature uses a long-time interval (normally 5 years) to compare one period with another. This might fail to correctly interpret an economic structure, as it does not change considerably over a short period of time.

Our main findings show that the agriculture, hunting, forestry, fishing; food and beverage; and tobacco product sectors experienced the largest output gains as a result of changes in final consumption demand. We also found a substantial increase in the machinery and equipment sector, which derived from not only changes in final demand for investment and exports but also technological change in intermediate inputs. In addition, the wholesale and retail trade and repair sector experienced a dramatic decline in its final demand for consumption, investment and export over the last 5 years (2010-2015).

This paper is organized as follows: Section 1 briefly introduces the research statement and some background on Vietnam's economy. Section 2 presents the methodology. Section 3 explains the data used in this study. The empirical results are explained in Section 4. Section 5 discusses the findings. Section 6 presents concluding remarks.

2.2. Methods and Models

To identify the key sectors in the Vietnamese economy and investigate its structural transformation over the last 15 years, we analyze Vietnam's IO tables for 2000, 2005, 2010 and 2015. We aggregated the 2015 data into 34 industries to ensure that the IO tables for all years were comparable.

The basic model is:

$$X = [I - (I - \widehat{M})A]^{-1}[(I - M)F_d + EX] \quad (1)$$

Where X is total output; $[I - (I - \widehat{M})A]^{-1}$ is the Leontief inverse matrix; A is the input coefficient matrix; I is the 34x34 identity matrix; $\widehat{M}$ is a 34 x 34 diagonal matrix with diagonal elements m_i ($this\ is\ an\ import\ ratio\ which\ calculate\ by\ m_i$ = $\frac{IM_i}{Total\ of\ domestic\ demand}$); $(I - \widehat{M})$ is self-sufficient rate matrix; F_d is vector of domestic final demand; EX is vector of total export.

Backward linkage and forward linkage were introduced by Rasmussen (1956) and has become useful identification to investigate the key sectors of any economy. The backward linkage indicates the interconnection of a sector to other sectors from it purchases inputs (Miller and Blair, 1985). In the other words, it says if sector i increase 1 unit, how it influences to other sectors. The forward linkage shows the opposite direction as it indicates

the relation of a sector to the other sectors that it sells its output (Miller and Blair, 1985). The backward linkage and forward linkage have been measures by the following equations:

$$BL = \frac{\sum_i bij}{\frac{1}{n}\sum_{ij} bij} \quad (2)$$

$$FL = \frac{\sum_i bij}{\frac{1}{n}\sum_{ij} bij} \quad (3)$$

Where: bij are the inverse matrix elements $\left[I - (I - \widehat{M})\widehat{A}\right]^{-1}$, n is the number of sector (n=34).

According to the theory of IO model, the equation of output equals the matrix product of the Leontief inverse (B) and the vector of final demand (F) can be expressed as:

$$\boldsymbol{X = BF} \quad (4)$$

The change of output can be expressed in the following ways:

$$\Delta \boldsymbol{X} = (\Delta \boldsymbol{B})\boldsymbol{F_1} + \boldsymbol{B_0}(\Delta \boldsymbol{F}) \quad (5)$$

$$\Delta \boldsymbol{X} = (\Delta \boldsymbol{B})\boldsymbol{F_0} + \boldsymbol{B_1}(\Delta \boldsymbol{F}) \quad (6)$$

So:

$$\Delta \boldsymbol{X} = \boldsymbol{X_1} - \boldsymbol{X_0} = \underbrace{\tfrac{1}{2}\Delta \boldsymbol{B}(\boldsymbol{F_0} + \boldsymbol{F_1})}_{\text{Technology change}} + \underbrace{\tfrac{1}{2}\Delta \boldsymbol{F}(\boldsymbol{B_0} + \boldsymbol{B_1})}_{\text{Final demand change}} \quad (7)$$

Where: $\boldsymbol{B} = [\boldsymbol{I} - (\boldsymbol{I} - \boldsymbol{M}^{\wedge})\boldsymbol{A}]^{-1}$ is the Leontief inverse matrix, F is the vectors of final demand.

This study followed the structural decomposition method proposed by Dietzenbacher & Los (1998). In this approach, the change in total output is the summation of the change in final demand and change in technology. In the next step, we further decompose the change in final demand with respect to the change in its components, such as consumption (C), investment (I) and exports (EX).

$$\text{Final demand change} = \frac{1}{2}(\boldsymbol{B_0} + \boldsymbol{B_1})\Delta \boldsymbol{C} + \frac{1}{2}(\boldsymbol{B_0} + \boldsymbol{B_1})\Delta \boldsymbol{I} + \frac{1}{2}(\boldsymbol{B_0} + \boldsymbol{B_1})\Delta EX \quad (8)$$

2.3. Data

This paper employed Vietnam's IO tables for 2000, 2005, 2010 and 2015 published by the Organization for Economic Co-operation and Development (OECD). Vietnam's IO table presents the flows of goods and services transactions in 34 sectors in current prices (USD million). The 2000, 2005 and 2010 IO tables consist of 34 sectors, while the 2015 IO table consists of 36 sectors. To ensure that we analyzed IO tables of the same size, we adjusted the 2015 IO table to have 34 sectors. Table 1 below indicates the list of 34 sectors selected for the study.

Table 1: Sectors selected for the study

No.	Sector
1	Agriculture, hunting, forestry and fishing
2	Mining and quarrying
3	Food products, beverages and tobacco
4	Textiles, textile products, leather and footwear
5	Wood and products of wood and cork
6	Pulp, paper, paper products, printing and publishing
7	Coke, refined petroleum products and nuclear fuel
8	Chemicals and chemical products
9	Rubber and plastics products
10	Other non-metallic mineral products
11	Basic metals
12	Fabricated metal products
13	Machinery and equipment
14	Computer, electronic and optical equipment
15	Electrical machinery and apparatus
16	Motor vehicles, trailers and semi-trailers
17	Other transport equipment
18	Manufacturing; recycling
19	Electricity, gas and water supply
20	Construction
21	Wholesale and retail trade; repairs

22	Hotels and restaurants
23	Transport and storage
24	Post and telecommunications
25	Financial intermediation
26	Real estate activities
27	Renting of machinery and equipment
28	Computer and related activities
29	R&D and other business activities
30	Public administration and defense; compulsory social security
31	Education
32	Health and social work
33	Other community, social and personal services
34	Private households with employed persons

2.4. Results

Table 2 displays the output structure based on the 34 sectors. The total output of the Vietnamese economy $66,545.9 million in 2000 and $570,059.6 million in 2015. The share of the agricultural sector dropped from 21.15% in 2000 to 13.07% in 2015. The share of the wholesale, retail, trade, and repairs sector also experienced a decreasing trend, from 11.56% in 2000 to 5.02% in 2015. In contrast, the share of the food products, beverage, and tobacco sector steadily increased from 11.21% to 12.42% over the 15 years considered. There was a notable increase of 3.72% in the share of the textiles, textile products, leather, and footwear sector to Vietnam GDP over the 15-year period 2000-2015.

Table 2: Total output by sectors (unit: millions of US dollars)

#	Sector	2000		2005		2010		2015	
		(Mill. USD)	Share to total output (%)	(Mill. USD)	Share to total output (%)	(Mill. USD)	Share to total output (%)	(Mill. USD)	Share to total output (%)
1	Agriculture, hunting, forestry and fishing	14074.6	21.15	22241.2	15.83	43903.9	15.32	74483.6	13.07
2	Food products, beverages and tobacco	7460.2	11.21	15584.7	11.09	30057.4	10.49	70774.2	12.42
3	Textiles, textile products, leather and footwear	3636.9	5.47	8596.8	6.12	14611.9	5.10	52396.9	9.19
4	Construction	5943.6	8.93	13031.5	9.27	29008	10.12	36622.6	6.42
5	Mining and quarrying	4006.9	6.02	8116	5.78	16755.8	5.85	31133.9	5.46
6	Wholesale and retail trade; repairs	7690.2	11.56	13873	9.87	30033.9	10.48	28630.4	5.02
7	Hotels and restaurants	2010.2	3.02	3626.4	2.58	8510.6	2.97	19801.6	3.47
8	Manufacturing; recycling	399.4	0.60	2918.4	2.08	5178.5	1.81	19482.4	3.42
9	Machinery and equipment	394.6	0.59	976.6	0.69	1712.6	0.60	16286.9	2.86

10	Computer, Electronic and optical equipment	1485.9	2.23	2641.2	1.88	9467.3	3.30	15741.1	2.76
11	Coke, refined petroleum products and nuclear fuel	91.3	0.14	152.1	0.11	5091.6	1.78	15097.1	2.65
12	Chemicals and chemical products	1449.7	2.18	3913.1	2.78	7499.3	2.62	14159.5	2.48
13	Renting of machinery and equipment	109.6	0.16	194.1	0.14	351.1	0.12	13804.4	2.42
14	Transport and storage	1590.3	2.39	3268.3	2.33	6491.9	2.27	13123.8	2.30
15	Electricity, gas and water supply	1363.5	2.05	2761.7	1.97	5673.5	1.98	12531.3	2.20
16	Fabricated metal products	567.1	0.85	3255.9	2.32	6637.7	2.32	12088.5	2.12
17	Rubber and plastics products	771.1	1.16	2756.2	1.96	6019.5	2.10	11978.2	2.10
18	Computer and related activities	109.6	0.16	194.1	0.14	351.1	0.12	10988.9	1.93
19	Motor vehicles, trailers and semi-trailers	459.1	0.69	2016.8	1.44	3351.6	1.17	10609.6	1.86
20	Basic metals	607.4	0.91	2639.5	1.88	5559	1.94	10369.2	1.82
21	Other non-metallic mineral products	1351.1	2.03	3836.3	2.73	7036	2.45	9715.3	1.70
22	Education	938.9	1.41	1662	1.18	2566.5	0.90	8982.1	1.58

23	Electrical machinery and apparatus	595.4	0.89	2349.8	1.67	4402.8	1.54	7967.8	1.40
24	R&D and other business activities	564.7	0.85	999.6	0.71	1812.2	0.63	7865.5	1.38
25	Public administration and defence; compulsory social security	1028.1	1.54	1820	1.30	3593.7	1.25	7530.8	1.32
26	Pulp, paper, paper products, printing and publishing	851.4	1.28	2200.7	1.57	3912.5	1.37	7137.9	1.25
27	Wood and products of wood and cork	297.5	0.45	1382.6	0.98	2258.2	0.79	6791.4	1.19
28	Financial intermediation	1728.3	2.60	3059.6	2.18	6257.4	2.18	5997.8	1.05
29	Other community, social and personal services	858.8	1.29	1520.2	1.08	3082.8	1.08	5649.6	0.99
30	Health and social work	467.2	0.70	827	0.59	1308.6	0.46	4931.6	0.87
31	Other transport equipment	908.1	1.36	3135.6	2.23	4912.1	1.71	4469.5	0.78
32	Real estate activities	2218.2	3.33	3926.8	2.79	7101.8	2.48	1577.8	0.28
33	Post and telecommunications	482.6	0.73	991.8	0.71	1971.2	0.69	1168.5	0.20

34	Private households with employed persons	34.4	0.05	60.9	0.04	119.3	0.04	169.9	0.03
	All sectors	**66545.9**	**100**	**140530.5**	**100**	**286601.3**	**100**	**570059.6**	**100**

Table 3 shows the backward and forward linkage results for the 34 industries in 2000, 2005, 2010 and 2015 calculated from equations (2) and (3). These linkages of an industry are meant to measure the intersectoral linkages of that industry to other industries. A backward linkage illustrates how a given industry influences other industries; forward linkage indicates how a certain industry has been influenced by other industries (Chenery and Watanabe, 1958).

According to Table 3, the agriculture, hunting, forestry, and fishing sector is the leading sector in the Vietnamese economy, as both its backward and forward linkages are greater than 1 in all periods. This implies strong connections between agriculture, hunting, forestry, and fishing and other sectors with respect to both input demand and output supply. In addition, pulp- and paper-related products is also a key sector in all periods. There was a substantial change in the food products, beverages and tobacco sector over the 15 years considered. In 2000, this sector depended on interindustry supply; in other words, it depended on all other industries. Since 2005, this sector has been considered an important sector of the Vietnamese economy.

Table 3: Backward linkage and forward linkage of Vietnam economic (2000-2015)

#	Sector	2000		2005		2010		2015	
		BL	FL	BL	FL	BL	FL	BL	FL
1	Food products, beverages and tobacco	1.439	0.892	1.483	1.152	1.442	1.060	1.426	1.383
2	Wood and products of wood and cork	1.390	0.697	1.344	0.967	1.266	0.846	1.318	0.849
3	Coke, refined petroleum products and nuclear fuel	0.884	0.570	0.819	0.568	1.127	1.082	1.274	1.383
4	Transport and storage	0.848	0.778	0.907	0.717	0.937	0.608	1.251	0.869
5	Pulp, paper, paper products, printing and publishing	1.235	1.162	1.202	1.182	1.190	1.070	1.216	1.286
6	Agriculture, hunting, forestry and fishing	1.115	3.000	1.106	2.393	1.090	2.190	1.142	1.716
7	Other non-metallic mineral products	1.036	1.011	0.917	1.149	1.098	1.053	1.102	0.878
8	Post and telecommunications	0.845	0.797	0.829	0.772	0.833	0.789	1.077	0.630
9	Basic metals	1.021	1.095	0.984	1.276	0.925	1.076	1.062	1.014
10	Chemicals and chemical products	1.031	1.249	0.910	1.422	1.052	1.214	1.058	1.142
11	Construction	1.083	0.688	1.137	1.079	1.140	1.266	1.058	0.867
12	Manufacturing; recycling	1.022	0.675	1.223	0.850	1.259	0.740	1.052	1.116
13	Rubber and plastics products	1.204	1.144	1.198	1.406	1.143	1.207	1.044	1.012
14	Hotels and restaurants	1.051	0.803	1.090	0.804	1.077	0.831	1.036	1.091

15	Motor vehicles, trailers and semi-trailers	1.036	0.779	1.158	0.681	1.026	0.681	1.025	0.790
16	Electricity, gas and water supply	0.768	1.256	0.785	1.173	0.847	1.150	0.997	1.332
17	Other transport equipment	1.053	1.048	1.235	0.782	1.095	0.751	0.958	0.670
18	Health and social work	0.835	0.670	0.816	0.625	0.814	0.640	0.957	0.601
19	Textiles, textile products, leather and footwear	0.930	0.781	0.937	0.800	0.792	0.547	0.952	0.833
20	Mining and quarrying	0.837	1.051	0.762	0.896	0.827	1.954	0.951	2.463
21	Other community, social and personal services	0.836	0.714	0.826	0.681	0.841	0.825	0.948	0.765
22	Fabricated metal products	1.067	1.050	1.190	1.366	1.079	1.273	0.945	1.138
23	Computer, Electronic and optical equipment	1.099	1.146	1.038	0.880	1.035	0.990	0.936	1.103
24	Financial intermediation	0.907	1.192	0.878	0.986	0.897	1.107	0.931	0.796
25	Renting of machinery and equipment	1.065	0.835	0.910	0.774	0.980	0.733	0.924	1.198
26	Electrical machinery and apparatus	1.063	0.808	1.104	1.060	0.982	0.785	0.921	0.795
27	R&D and other business activities	0.989	0.900	0.927	0.933	1.007	0.998	0.912	0.851
28	Wholesale and retail trade; repairs	0.947	2.284	0.976	1.986	0.980	2.023	0.887	1.453
29	Computer and related activities	1.067	0.938	0.942	0.850	0.964	0.818	0.840	0.706

30	Public administration and defence; compulsory social security	0.937	0.664	0.972	0.653	0.980	0.671	0.837	0.575
31	Education	0.829	0.731	0.851	0.661	0.868	0.666	0.810	0.594
32	Real estate activities	0.873	1.179	0.876	1.170	0.886	1.117	0.798	0.685
33	Machinery and equipment	0.995	0.754	1.050	0.687	0.887	0.605	0.789	0.849
34	Private households with employed persons	0.661	0.661	0.619	0.619	0.635	0.635	0.567	0.567

In the next step, using equation (7), we decomposed the total output change into the changes in technology and final demand over three periods: 2000-2005, 2005-2010 and 2010-2015. The results in Table 4 show that the agriculture, hunting, forestry, fishing and the food, beverage and tobacco product sectors experienced the largest output gains in all three periods. We also found that there was a substantial increase in technological change in the machinery and equipment sector, which resulted in a large change in its total output from 2000 to 2015. The wholesale and retail trade and repair sector experienced a dramatic decline in total output in the last period (2010-2015).

Furthermore, Table 4 also indicates that the food sector recorded the greatest technological change over the period 2000-2005, while it was the mining and quarrying sector over the period 2005-2010 and the textiles sector over the period 2010-2015. However, the food sector still exhibits the second-greatest technological change in the last period. Moreover, the agriculture sector had the greatest change in final demand in all three periods, followed by the food sector, the wholesale and retail sector, the textiles sectors and the construction sector. In the last 5-year period (2010-2015), there was a drastic decline in the

wholesale and retail sector's final demand. In contrast, the machinery sector presented a rapid increase in its total output and final demand.

Using equation (8), we decomposed the change in final demand into the changes in consumption, investment and exports. This indicates the extent to which changes in these factors contribute to the total change in final demand. The results are presented in Table 5. The agriculture sector had the largest change in consumption in all three periods, followed by the food sector and wholesale sector. However, the textiles sector had the greatest change in exports in all three periods. The agriculture sector and food sector still ranked highly in terms of exports. The agricultural sector had the third-largest change in exports in 2000-2005 and 2015-2010 and the second-largest change in 2005-2010. The food sector had the fifth-, fourth- and second-greatest change in exports over 2000-2005, 2005-2010 and 2010-2015, respectively. Regarding the change in investment, construction reported the largest change over the full 15-year period. The results also indicate that the growth of the machinery sector over the last 5 years considered derived from its change in final investment and export demand.

Some main findings are clear from the tables. First, the agricultural sector and food sector played important roles throughout the 15 years considered. The largest total output changes in these two sectors were primarily due to changes in final consumption demand. Second, the textile sector has become a leading sector of Vietnam's economy, and its higher position in total output has been driven by increased exports. Third, the total output of the machinery sector witnessed a significant increase over the last 5 years considered (2010-2015), which derived from both changes in final investment and export demand and technological change in intermediate inputs. Fourth, there was substantial decrease in final investment and export consumption demand for the wholesale and retail sector over the last 5-year period considered.

Table 4: Top 5 sectors with the greatest change in total output in terms of changes in technology and final demand in the period 2000-2015 (unit: millions of US dollars)

	2015-2010		2010-2005		2005-2000	
Total Output change = ΔX						
1	Food products, beverages and tobacco	40716.8	Agriculture, hunting, forestry and fishing	21662.7	Agriculture, hunting, forestry and fishing	8166.6
2	Textiles, textile products, leather and footwear	37785	Wholesale and retail trade; repairs	16160.9	Food products, beverages and tobacco	8124.5
3	Agriculture, hunting, forestry and fishing	30579.7	Construction	15976.5	Construction	7087.9
4	Machinery and equipment	14574.3	Food products, beverages and tobacco	14472.7	Wholesale and retail trade; repairs	6182.8
5	Mining and quarrying	14378.1	Mining and quarrying	8639.8	Textiles, textile products, leather and footwear	4959.9
Technology change = $\Delta B * 0.5(F_0 + F_1)$						
1	Textiles, textile products, leather and footwear	11363.68	Mining and quarrying	5379.91	Food products, beverages and tobacco	2691.46
2	Food products, beverages and tobacco	8759.41	Coke, refined petroleum products and nuclear fuel	1967.87	Construction	1981.29

3	Coke, refined petroleum products and nuclear fuel	7475.96	Construction	1426.27	Fabricated metal products	1011.27
4	Mining and quarrying	6668.34	Financial intermediation	460.56	Manufacturing; recycling	1001.68
5	Renting of machinery and equipment	6200.10	Other community, social and personal services	442.74	Basic metals	808.50
Final demand change = $\Delta F * 0.5(B_0 + B_1)$						
1	Agriculture, hunting, forestry and fishing	37872.66	Agriculture, hunting, forestry and fishing	24347.67	Agriculture, hunting, forestry and fishing	8143.92
2	Food products, beverages and tobacco	31957.38	Wholesale and retail trade; repairs	16423.73	Wholesale and retail trade; repairs	6479.96
3	Textiles, textile products, leather and footwear	26421.32	Food products, beverages and tobacco	16052.78	Food products, beverages and tobacco	5433.036
4	Construction	12143.69	Construction	14550.23	Construction	5106.61
5	Machinery and equipment	11528.08	Textiles, textile products, leather and footwear	9904.127	Textiles, textile products, leather and footwear	4510.79

Table 5: Top 5 sectors with the greatest change in final demand in terms of the change in consumption, investment and exports in the period 2000-2015

(unit: millions of US dollars)

No.	$0.5 * (B_0 + B_1)\Delta C$		$0.5 * (B_0 + B_1)\Delta I$		$0.5 * (B_0 + B_1)\Delta EX$	
2015-2010						
1	Agriculture, hunting, forestry and fishing	23876.06	Construction	8261.20	Textiles, textile products, leather and footwear	23003.43
2	Food products, beverages and tobacco	15109.74	Electrical machinery and apparatus	1315.18	Food products, beverages and tobacco	16731.11
3	Computer and related activities	9719.67	Manufacturing; recycling	1215.03	Agriculture, hunting, forestry and fishing	13478.94
4	Transport and storage	8077.21	Motor vehicles, trailers and semi-trailers	1094.89	Machinery and equipment	10223.27
5	Education	6349.82	Other non-metallic mineral products	928.99	Manufacturing; recycling	7180.30

2010-2005						
1	Agriculture, hunting, forestry and fishing	12463.21	Construction	13085.11	Textiles, textile products, leather and footwear	10615.84
2	Food products, beverages and tobacco	8064.93	Other non-metallic mineral products	1945.44	Agriculture, hunting, forestry and fishing	10484.43
3	Wholesale and retail trade; repairs	5621.18	Wholesale and retail trade; repairs	1803.90	Wholesale and retail trade; repairs	8998.63
4	Hotels and restaurants	3399.75	Agriculture, hunting, forestry and fishing	1400.01	Food products, beverages and tobacco	7679.11
5	Financial intermediation	2605.39	Mining and quarrying	1306.03	Computer, Electronic and optical equipment	4784.90
2005-2000						
1	Agriculture, hunting, forestry and fishing	4913.70	Construction	4741.17	Textiles, textile products, leather and footwear	4215.01

2	Food products, beverages and tobacco	2997.04	Other transport equipment	2239.61	Mining and quarrying	4139.39
3	Wholesale and retail trade; repairs	2039.92	Motor vehicles, trailers and semi-trailers	996.04	Agriculture, hunting, forestry and fishing	3737.31
4	Chemicals and chemical products	1594.10	Wholesale and retail trade; repairs	747.91	Wholesale and retail trade; repairs	3692.12
5	Real estate activities	1227.69	Other non-metallic mineral products	747.78	Food products, beverages and tobacco	2512.49

2.5. Discussion

The study's results show that the agriculture sector remained the most important in Vietnam's economy over the 2000-2015 period. Since the Doi Moi policy reform began in the 1980s, the agricultural sector has experienced substantial reform. According to Decree No. 10 of April 1988, household-based farming replaced collective farming activities (Tarp Finn, 2017). Although agricultural cooperatives have achieved benefits in terms of improving rural infrastructure in rural areas, this collective model was not successful at providing equal income for its members (Pham Quang Dieu, 2006). Thus, the new policies introduced under the agricultural reforms have provided farmers with the authority to manage their own farms and production. In addition, in the 1990s, the Vietnamese government implemented several agricultural reforms to reduce government control over

agricultural production, for example reduced restrictions on input trading, free domestic trade in rice, increased export quotas and reduced agricultural taxes (Tarp Finn, 2017). As a consequence, farmers had more access to production inputs and were able to sell their products freely. This might be explained by the considerable change in the agriculture sector not only in consumption but also in exports during the years 2000-2005 after these policy reforms in the agricultural sector.

Under Decree 5 of the 4th Party Congress, the Vietnamese government proposed a target to transform the "agricultural economic structure towards large commodity production that connects to processing industry with the market". Undoubtedly, agricultural activities remain a substantial role in the food supply chain in Vietnam. The agricultural sector provides significant inputs for food processing enterprises. From the data in four IO tables, we found that the agriculture sector sells its products mainly to the food products, beverages and the tobacco sector (2015 – 61%, 2010 – 46%, 2005 – 46%, 2000 – 38%). Additionally, the food sector mostly purchases inputs from the agriculture sector (approximately 50%).

Regarding the rapid growth of Vietnam's textile sector, the upward movement might be attributed, at least in part, to free trade agreements. During the period 2000-2015, the textile sector in Vietnam was one of the fastest growing industries and main world exporters, with annual growth of approximately 6% (WTO, 2016). Pertiwi and Sukmawani (2017) noted that Vietnam is in the second main provider of textiles and garments for the United States, the European Union and Japan. Furthermore, before independence in 1975, the textile and garment industries were fully controlled by the Vietnamese government, and the products were exported mainly to the Soviet Union (A.N. Tran, 1996). After independence, most textile firms were self-controlled rather than by government. In 2000, Vietnam signed a bilateral free trade agreement with the US, which significantly increased the export of textile and garment products to the world market. In addition, after joining the

WTO in 2007, Vietnam encountered more open markets in countries around the world, such as the United States, the European Union and China. This membership has provided numerous benefits to the textile and garment industry (CIEM, 2010). After WTO accession, Vietnam also signed several trade agreements with Australia, South Korea, and Japan under the ASEAN free trade framework. These free trade agreements significantly contributed to increasing the exports of the Vietnamese textile industry, as the results of the present study shows. These abovementioned sectors are also expected to benefit from recent signings of new trade agreements, such as the EU-Vietnam free trade Agreement (EUVFTA) and Trans-Pacific Partnership (TTP).

In Vietnam, some corporations owned by the state government continue to exercise considerable control over certain industries. For example, the Vietnam Coal and Minerals Industries Corporation (Vinacomin) dominates the Vietnamese mining industry, the Vietnam Tobacco Corporation (VINATABA) dominates tobacco products, and the Vietnam Food Association (Vinafood 1 and Vinafood2) dominates Vietnamese rice products (as shown in Table 6). However, some enterprises in the textile industry are becoming less reliant on the government (for example, Vinatex and Garco10 corporation). Therefore, challenges remain regarding the development of particular sectors under free trade. Table 6 below provides some examples of the large companies that belong to the aforementioned sectors in the Vietnamese market.

In summary, our study results are in line with previous studies on changes in Vietnam's economic structure by Dang et al. (2019) and Ha and Trinh (2018). By using two Vietnamese IO tables, 2012 and 2016, Ha and Trinh (2918) showed that the agriculture sector, food sector, oil and gas production sector and other manufacturing industries have a

large impact and meaningful impact on the input demand of other industries in the economy. In addition, despite the shift in the economic structure in recent decades, the agriculture sector and food sector remained important industries in Vietnam's economy over the period 2000-2015. However, it seems that challenges persist in the development of Vietnam's economy, as is the case in other developing countries. When a primary industry, such as agriculture, dominates the economy, a country's economic development might be vulnerable because the primary sector typically exhibits decreasing returns to scale (DRS). New technology or innovation is required to develop products; otherwise, it is difficult to expand production. Therefore, primary sectors, such as agriculture, can be a main reason that countries remain poor (Chang, 2003 and Reinert, 2007). In conclusion, another processing and manufacturing industry, such as machinery or textiles, might develop rapidly and become a leading industry in subsequent years.

Table 6: Some representatives large enterprises in the selected industries in Vietnam

Table 6: Some representative large enterprises in selected industries in Vietnam

Textiles, textile products, leather and footwear		
Textile industry	***Garment Industry***	***Footwear***
Century Synthetic Fiber Corporation	Vietnam National Textile and Garment Group (VINATEX)	Pou Yuen Vietnam Limited Liability Company
Duc Quan Investment and Development Joint Stock Company	Viet Tien Garment Corporation	TaeKwan Vina Industrial Limited Liability Company
Dam San Joint Stock Company	Garco 10 Corporation	Hwaseung Vina Limited Liability Company
Phu Bai Spinning Mill Joint Stock Company	Phong Phu Corporation	Chang Shin Viet Nam Limited Liability Company
Phong Phu Corporation	Hoa Tho Textile Garment Joint Stock Company	Pou Sung Vietnam Limited Liability Company
Food products, beverages and tobacco		
Beverages	***Food products***	***Tobacco***

		Vietnam Tobacco Corporation (Vinataba)
Saigon Beer-Alcohol-Beverage Corporation (Sabeco)	Acecook Viet Nam Joint Stock Company	Saigon Tobacco Limited Company (Vinataba)
Heineken Vietnam	Vinh Hoan Joint Stock Company	Vinataba Thang Long
Hanoi Beer, Alcohol and Beverage Corporation (Habeco)	Bien Dong Seafood Limited Liability Company	
Hanoi Liquor Joint Stock Company	Minh Phu Seafood Corporation	
	VIETNAM AGRIBUSINESS Limited	
Binh Tay Wine Joint Stock Company	liability Company	

Agriculture, hunting, forestry and fishing

Rice products	***Fishery and aquaculture***	***Wood***
Southern Food Corporation – VINAFOOD II	Minh Phu Corporation – MPC	Hoa Net Limited liability company
Northern Food Corporation – VINAFOOD I	Vinh Hoan Corporation– VHC	Nitori Furniture Vietnam
	Bien Dong Seafood Limited Liability	
Tân Thạnh An Limited Liability Company	Company	An Cuong Woodworking materials
Kien Giang Import and Export Joint Stock	International Development and	Shing Mark Vina Limited liability
Company	Corporation	Company

Tan Dong Tien Joint Stock Company	Hung Vuong Corporation – HVG	DONGWHA Corporation
Machinery and equipment		
Steel	***Automobile***	***Agricultural Machinery***
Hoa Phat Joint Stock Company	Thaco Group	Kubota Tractor Corporation
Gang Thép Thái Nguyên Joint Stock Company	Toyota	CLAAS KGaA GmbH
VISCO Joint Stock Company	Honda	Vietnam Engine and Agricultural Machinery Corporation (VEAM)
Dana Joint Stock Company	Ford	Thaco Corporation
Viet Duc Joint Stock Company	GM Vietnam	Truong Hai Auto Corporation (THACO)
Mining and quarrying		
Major Mineral Producers		
Vinacomin		
Masan resources Nui Phao		
Thach Khe (Vinacomin)		
Co Dinh (Vinacomin)		
Ta Phoi (Vinacomin)		

Source:

https://www.mordorintelligence.com/industry-reports/vietnamese-agricultural-machinery-market
https://www.statista.com/statistics/976550/vietnam-automobile-manufacturers-market-share/
https://sesprofessionals.com/overview-of-vietnams-mining-industry/
https://viracresearch.com/industry/bao-cao-chuyen-sau-nganh-det-may-viet-nam-q1-2019

2.6. Conclusions

In developing countries, introducing or identifying leading industries is essential for poverty reduction and economic development. For example, the IT industry in the United States, the automobile industry in Japan and the electronic equipment industry in South Korea are leading industries in these countries. Vietnam has grown rapidly over the past 15 years but remains a developing country. Our aim in this paper was to identify which industries are the main drivers of Vietnamese economic development by applying the decomposition method to a series of IO tables covering 15 years (2000-2015).

We found that as total output changed, food products and the agricultural sector remained in high positions, representing the top 5 of the 34 sectors considered from 2000 to 2015, which indicates that primary industry and closely related industries, such as food and beverages, still support the Vietnamese economy. As main manufacturing industries, textiles and mining were also relatively large producers over the period considered. Remarkably, the machinery sector grew rapidly over the last 5 years of the period considered, which shows that this sector might be a new driver of the Vietnamese economy in the future.

According to the backward and forward linkage effects obtained from the Leontief inverse of the 2015 table, food products and the agricultural sector have backward and forward effects that are both larger than 1, which means that the outputs of these sectors were frequently demanded by other sectors and also affected many other sectors by buying intermediate goods. These two sectors are also central in terms of linkage effects. Additionally, food products represented the most influential sector in terms of backward linkage effects in the 2010, 2005 and 2000 tables, and the agricultural sector was the most demanded in terms of forward linkage effects in these three years.

By performing a decomposition across periods, we found that the large total outputs of food products and the agricultural sector were fundamentally attributable to changes in final consumption demand. In addition, the higher position of textiles in the Vietnamese economy was due the increase in final export demand. On the other hand, the machinery sector grew rapidly over the last 5 years of the period considered, which derived from not only from changes in final investment and export demand but also from technological change in intermediate inputs. By contrast, the wholesale and retail sector experienced a drastic decline in its final consumption, investment, and export demand over the last 5 years considered.

As mentioned above, we conclude that food products and agricultural sectors remain key industries in the Vietnamese economy. However, this finding has an adverse economic policy implication. The result of mainly relying on a primary industry such as agriculture is that the country remains vulnerable in terms of economic development because the primary sector typically exhibits DRS. Many developing countries demonstrate that a reliance on the primary sector can be a cause of remaining poor since it faces serious limitations in terms of product expansion unless new technological change or product innovations/inventions emerge[1]. Therefore, the development of another manufacturing industry such as machinery, textiles or another sector should be pursued to further economic development in Vietnam.

[1] See Chang(2003) and Reinert (2007) on the historical and structural causes of poverty.

CHAPTER 3: THE LINK BETWEEN FINANCIAL LEVERAGE AND INVESTMENT DECISIONS IN VIETNAM'S SMALL AND MEDIUM-SIZED ENTERPRISES

3.1. Introduction

The relationship between the capital structure and investment decisions of enterprises is a major area of interest in the field of corporate finance. Numerous researchers have examined the determinants of investment decisions in both theoretical and empirical studies. For example, the influencing macroeconomic factors include the real exchange rate, inflation and capital flows (Binding and Dibuasu 2017; Atella 2003; Chen Fei et al 2019). Furthermore, several attempts have been made to determine the impact of firm-level factors, including accounting quality, financing constraints, management characteristics and the capital structure, on investment decisions (Myers 1977; Lang et al. 1996; Gomes 2001; H.T.Trinh et al. 2017; Xuan Vinh Vo 2018; Shu-Miao & Chih-Liang 2017; Sang-Min Cho & Sun-A Kang 2017).

Financial leverage is measured as the ratio of total debt to total assets. Basically, the greater the amount of debt, the greater the financial leverage. Hence, financial leverage is viewed as an important corporate investment policy of a company in an incomplete market due to transaction costs and asymmetric information (Aivazian et al. 2005). This study investigates the link between the capital structure as measured by financial leverage and investment decisions in Vietnam SMEs by using the comprehensive unbalanced panel data set of Vietnamese SMEs surveyed during the period 2011-2015. Econometrics techniques, such as Logit, Tobit and Fractional logit models, are applied to analyze the data. The major

obtained outcomes are used to scrutinize the correlation between financial leverage and investment decisions and the choice of financing sources.

Financial leverage has been considered a measurement of the capital structure, and its influence on investment decisions is a critical issue in corporate finance (H.T. Trinh et al. 2017). Existing financial theories propose that financial leverage is either not relevant (Modigliani & Miller 1958) or negatively related to firm's investment (Myers 1977; Lang et al. 1996; Aivazian et al. 2005 and Gome, 2001). According to the capital structure theory, Modigliani & Miller (1958) noted that in a perfect market, investment behavior is irrelevant to the capital structure of a company. These authors concluded that high leverage or a lower debt component has no bearing on a firm's market value. Instead, the market value of a firm depends on the company's profitability, cash flow and net worth. However, the corporate world is characterized by many market imperfections due to moral hazards and information asymmetry (Jensen 1986; Lang et al. 1991l; Myers and Majluf 198). In addition, the original version of Modigliani & Miller's theory did not include the important elements considered by firms in investment decisions, including taxes, transaction cost and bankruptcy cost (Frank & Goyal 2009). Since the introduction of Modigliani & Miller's work, numerous theories have been proposed, including the trade off theory (Myers 1984) and the peaking order theories (Jensen & Meckling 1976; Ross 1977; Myers & Majluf 1984). These theories oppose Modigliani & Miller's theory and suggest that companies have their own preference for different types of financing. Myers (1984) argued that companies trade off the tax benefits of debt against the cost of debt (probability of bankruptcy).

The empirical literature has challenged the leverage irrelevance theory and supports the peaking order theories proposing that firms prioritize their financing source according to the cost of financing following asymmetric information. For example, Lang et al. (1996) argued that firms with a higher debt ratio are less likely to exploit growth opportunities than

those with a low debt ratio; therefore, firms with a large debt tend to invest less despite the firms' growth opportunities. Another facet of the leverage and investment relationship is reported by Aivazian (2005), who examined the impact of financial leverage on investment decisions in Canadian publicly traded companies. Aivazian found that leverage has a significant negative impact on investment in low growth opportunity firms. However, these results were based on data from mostly developed countries, where firms have more accessibility to different sources of financing. Whether these findings apply to developing countries remains unclear.

An empirical study investigating Vietnamese SMEs listed on the Ho Chi Minh Stock Exchange (Vietstock-South Vietnam) during the period 2006-2015 conducted by Xuan Vinh Vo (2018) indicated that debt strongly restricts corporate investment. Similarly, Phan Q. T (2018) tested the relationship between firm investment and debt financing using data from both the Ho Chi Minh Stock Exchange and Ha Noi Stock Exchange from 2010 to 2016. Phan (2018) revealed that the level of debt significantly negatively impacted firm investment. Thus, higher debt in the capital structure is associated with lower investment. Nevertheless, these studies have focused on relatively large sized listed firms. Thus, limited attention has been paid to small and medium-sized firms in Vietnam.

Our main findings are summarized as follows. First, we find a positive relationship between financial leverage and investment decisions in Vietnam SMEs; this relationship is consistent with a previous study performed by H.T Trinh in 2018. Second, the results reveal that a high level of financial leverage increases access to external financing sources for new investment. The possible explanation for our findings is that Vietnam SMEs usually have insufficient internal financing sources and limited access to external financing sources. Most external financing sources involve bank lending. Therefore, firms with high financial leverage could prove that they already have access to external financing sources. Thus, firms

with high financial leverage prevail over firms with low financial leverage because they can easily obtain credit for new investment. This study contributes to the existing knowledge regarding the relationship between corporate finance and investment decisions in the context of emerging markets. Our findings provide potential suggestions to both SMEs and policy makers for improving credit accessibility by enhancing strategic planning, diversifying funding sources and reducing information asymmetry between SMEs and credit institutions.

The remainder of the paper is organized as follows: Section 2 introduces SMEs in Vietnam. Section 3 presents the data and empirical methodology. Section 4 provides the empirical results and a discussion of these results. Section 5 provides some concluding remarks.

3.2. Data and Methods

3.2.1. Data

To investigate the relationship between financial leverage and investment decisions, we rely on quantitative SME surveys conducted in 2011, 2013 and 2015 by the Central Institute for Economic Management (CIEM), the Institute of Labour Science and Social Affairs (ILSSA), the Development Economics Research Group (DERG) at the University of Copenhagen and the United Nations University World Institute for Development Economics Research (UNU-WIDER). The survey covered over 2500 enterprises in 9 provinces in Vietnam, including Ho Chi Minh City, Long An, Khanh Hoa, Lam Dong, Nghe An, Quang Nam, Hanoi, Hai Phong and Phu Tho (UNU-WIDER, 2018). The survey questionnaire remained roughly unchanged in 2011 and 2013 and included 132 questions related to enterprise characteristics, employment, operations, cost and revenue, productions, credit and loans, and environment costs. In 2015, a slight change was made in the structure of the questions pertaining to credit and finance. The questionnaire covered information regarding firm characteristics and

performance, such as owner characteristics, size of the workforce, revenues and costs, inputs, economics constraints and investment.

The enterprises surveyed are distributed in 18 sectors, such as food processing, fabricated metal products and manufacturing of wood products. The firms were selected based on data sources from the General Statistics Office of Vietnam (GSO). The included firms were private, collective, limited liability or joint stock enterprises and partnerships formally registered under the Law of Enterprises at the province level. The sampling of the survey is based on the stratified sampling technique to ensure the inclusion of all types of enterprises in each province.

For the analysis in this paper, we use an unbalanced sample of 6057 micro enterprises. The first survey round was conducted in 2011 and consists of approximately 2512 enterprises. The second round was conducted in 2013 and consists of 2542 enterprises. The final survey round was conducted in 2015 and consists of 2648 enterprises. Notably, some variables were not used, and some observations were excluded due to missing information. After reviewing the dataset, the total number of enterprises is 6057.

A summary of the statistics of the survey data and the variables used in our study is provided in Table 7. Our main variable of interest is financial leverage, which describes the ratio of debt to total assets of the enterprises in the previous survey round. Furthermore, we included other variables of which might influence to firm investment behavior, such as the size of the firms, revenue growth, profitability, physical assets and ownership, in all estimation as following previous studies (H.T. Trinh et al. 2017; Dang 2011). These firm level variables such as total asset (SIZE), physical asset (FIXED) may illustrate as collateral and capture the capability of borrowing from financial institutions. In addition, the variables that represented firm growth potential (GRR) and profitability (GROPF) are chosen because these variables have considered as an important determinant of investment decision and the

choice of financing source. The ownership status (OWN) also included in our estimation as it might be influenced to the management's decision if the firm is family owned.

Table 7: Definition and summary statistics of the variables

Code	Variables	Description/Calculation method	Number of Observations	Mean	SD
Dependent variable					
INV	New investment	Dummy variable for new investment (=1 if the firm made a new investment during the past two years; 0 otherwise)	6,057	0.5418	0.4982
EXT	External finance	Share of external financial sources for new investment financed by bank loans and other sources that charge interest	3,282	0.412	0.4466
INT	Internal finance	Share of internal financing sources or borrowing from family and friends without interest	3,282	0.5851	0.4473
FIV	Internal finance	Share of internal financing sources for new investment financed by borrowing from family and friends without interest	3,282	0.192	0.3462

RETE	Internal finance	Share of internal financing sources for new investment financed by retained earnings	3,282	0.393	0.44
Independent variables					
LEV	Financial leverage	Ratio of total debt to total assets at the end of the year of the previous survey round	6,057	0.0714	0.1797
SIZE	Size	Log of the total assets at the end of the year of the previous round	6,057	7.1718	1.7712
GRR	Revenue growth	Growth of revenue=log of revenue in the second year minus the log of revenue in the first round of the survey	6,057	-0.0159	0.2763
PROF	Profitability	Log of gross profit/revenue at the end of the year of the previous survey round	6,057	5.3614	1.4506
FIXED	Physical asset ratio	Ratio of physical assets (such as plants and machinery) to total assets at the end of the year of the previous survey round	6,057	1.4124	27.1834
OWN	Ownership	1 if family ownership; 0 otherwise	6,057	0.6217	0.4849
ND	LOCATION	1 if the enterprise is located in North Vietnam; 0 otherwise	6,057	0.4378	0.4961

CD	LOCATION	1 if the enterprise is located in Central Vietnam; 0 otherwise	6,057	0.2081	0.406
SD	LOCATION	1 if the enterprise is located in South Vietnam; 0 otherwise	6,057	0.3539	0.4782

The table 7 shows that 54% of the SMEs made new investments within three years. The ratio of the external financing sources was 41%, whereas the ratio of the internal financing sources was 59% (including borrowing from family and friends and retained earnings). However, a slight difference was observed in the ratio of financing sources among the three periods (Refer to Appendix 1). In the survey conducted in 2011, the major source used for investment was internal financial sources (including retained earnings and borrowing from family and friends), which accounted for 62% of the total, while the external financing sources accounted for 36% of the total. In the survey conducted in 2013, a slight change in this ratio was observed such that most enterprises invested using an external financing source (51%). In the survey conducted in 2015, using internal financing sources for investment outweighed the use of external financing sources by approximately 20%. These figures imply that enterprises might have preferred investing by using their own capital rather than bank loans.

3.2.2. Methodology

Our study has the following two main research objectives: (1) determine the impact of financial leverage on the investment decisions of Vietnam SMEs and (2) determine the effect of financial leverage on the financing sources used for new investment.

During the first stage of the estimation, we attempt to evaluate the effect of financial leverage on the investment decisions of SMEs by estimating the following equation:

$$INV_{i,t} = \alpha_0 + \alpha_1 LEV_{i,t-1} + \sum_{k=1}^{K\infty} \gamma_k X_{k,i} + \varepsilon_i \quad (1)$$

where $INV_{i,t}$ is a dependent variable referring to SME i implementing a new investment during given survey round t and zero otherwise; $LEV_{i,t-1}$ is financial leverage or the debt ratio, which is calculated as the ratio of total debt to total assets at the end of the previous year ($LEV_{i,t-1} = \frac{Total\ Debt_{i,t-1}}{Total\ aset_{i,t-1}}$); $X_{k,i}$ refers to a vector of other control variables expected to affect the decision to invest; and ε_i is the error term.

To estimate equation (1) in the first step of the analysis, we apply a logit model because the dependent variable is binary. We follow previous studies (Hall et al. 2000; H.T. Trinh et al. 2017; Dang 2011) and include the various characteristics of the enterprises, such as revenue growth, profitability, ownership, physical asset ratio and location, as explanatory variables for SME investment decisions.

We are interested in the coefficient of LEV in the model as it measures the effect of financial leverage on the decision of the enterprise to invest. Regarding the other explanatory variables, SIZE is calculated as the log of the total assets at the end of the year of the previous round. Furthermore, GROWTH captures the degree of revenue growth, which is calculated as the log of the revenue in the second year minus the log of the revenue in the first year of the survey round, and PROF represents the profitability of the firm. In addition, FIXED represents the ratio of physical assets to total assets, and OWN indicates whether the enterprise is owned by a family. Finally, ND, CD, and SD represent location dummies indicating North Vietnam, Central Vietnam and South Vietnam.

The second estimation in this study focuses on the choice of financing sources and how it is influenced by financial leverage under the condition that SMEs decide to implement a new investment in the first stage. As previously mentioned, financial leverage is an important indicator in SMEs considering financing sources for investment. However, Freeman and Le (2007) noted that Vietnam SMEs usually rely on a small number of internal funding sources due to their low profit and small business scale. Furthermore, a high financial asset is immensely acknowledged if it is considered an indication that the SME is able to borrow in credit markets. Thus, such SMEs could obtain extra credit from financial institutions, such as banks. Hence, our study expects financial leverage to be positively correlated with the share of external financing sources and negatively correlated with the share of internal financing sources.

To examine the impacts of financial leverage on the choice of financing source, we use the following equation:

$$FUND_{i,t} = \beta_0 + \beta_1 LEV_{i,t-1,} + \sum_{k=1}^{K\infty} \gamma_k X_{k,i} + \varepsilon_i \quad (2)$$

where $FUND_{i,t}$ is a dependent variable referring to the financing source. We separately estimate external (EXT) and internal (INT) sources as dependent variables. ε_i is the error term with standard properties. The other variables in equation 2 are the same as those in equation 1, but we excluded the location dummy variable.

In equation (2) in the second step, we first apply a Tobit model with an upper bound of 1 and a lower bound of 0 across the sample of SMEs that implemented a new investment in the first step because the values of the dependent variable range from 0-1. However, notably, our dependent variables represent proportional data, which, by definition, are bounded between 0 and 1. In this case, the effect of the explanatory variables tends to be nonlinear, and the variance tends to decrease as the mean approaches 0 or 1. To mitigate

these problems, we also apply the following nonlinear regression model: the fractional logit mode.

3.4. Results and discussion

The results of our study regarding the decision to invest and the choice of financing sources are shown in Tables 8-13.

Investment decisions

Table 8: Investment decisions of SMEs in Vietnam (2011-2015)

INV	2011-2015		
		Logit estimation	
LEV	6.6081***	6.4150***	6.0918***
	(0.7647)	(0.0227)	(0.7408)
SIZE	0.0240	0.0379	0.0663***
	(0.0230)	(0.0227)	(0.0234)
GRR	0.4453***	0.3799***	0.4401***
	(0.1384)	(0.1286)	(0.1414)
GRPOF	0.1626***	0.1600***	0.2057***
	(0.0302)	(0.0300)	(0.0310)
FIXED	-0.0009*	-0.0011**	-0.0009*
	(0.0005)	(0.0005)	(0.0005)
OWN	-0.1277*	-0.115*	-0.1253*
	(0.0724)	(0.0720)	(0.0733)
ND	0.6043***		
	(0.0548)		

CD		0.2206***	
		(0.0713)	
SD			-0.8806***
			(0.0625)
_cons	-1.3703***	-1.1832***	-1.2993
	(0.1878)	(0.1869)	(0.1865)
Number of observations	6057	6057	6057

Note: Values reported in parentheses are the robust standard errors (SE);

*,**, and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Table 9: Investment decisions of SMEs in Vietnam across three survey rounds (2011, 2013, and 2015) (cont.)

	2011			2013			2015		
Variables									
LEV	6.097***	6.062***	5.588***	2.784***	2.648***	2.549***	11.230***	10.826***	10.589***
	(1.18)	(1.163)	(1.127)	(1.082)	(1.072)	(1.044)	(1.539)	(1.565)	(1.515)
SIZE	-0.001	0.01	0.026**	0.076	0.047	0.107*	-0.059*	-0.025	0.002
	(0.037)	(0.036)	(0.037)	(0.065)	(0.064)	(0.065)	(0.034)	(0.035)	(0.035)
GRR	0.040**	0.357*	0.444**	0.467	0.4	0.338	0.569***	0.498***	0.564***
	(0.186)	(0.183)	(0.19)	(0.313)	(0.312)	(0.312)	(0.27)	(0.242)	(0.276)
GRPOF	0.218***	0.216***	0.168***	0.135***	.183***	0.206**	0.181***	0.157***	0.209***
	(0.049)	(0.05)	(0.051)	(0.073)	(0.072)	(0.074)	(0.047)	(0.046)	(0.486)
FIXED	0.006	0.034	0.003	0.809***	.768**	0.928***	-0.001*	-0.001***	-0.001
	(0.07)	(0.095)	(0.059)	(0.327)	(0.326)	(0.334)	(0.112)	(0.0005)	(0.0005)
OWN	-0.071	-0.043	-0.048	0.008	0.0001	0.034	-0.249*	-0.305***	-0.269***
	(0.114)	(0.113)	(0.1158)	(0.183)	(0.18)	(0.18)	(0.115)	(0.112)	(0.114)

ND	0.808***			.703***			0.379***		
	(0.088)			(0.132)			(0.086)		
CD		0.022			-0.194			0.593***	
		(0.112)			(0.155)			(0.116)	
SD			-0.9466***			-0.710***			-0.874***
			(0.098)			(0.147)			(0.1)
_cons	-1.473***	-1.256***	-1.429	-2.145***	-1.948***	-2.156***	-0.974***	-0.976***	-1.045***
	(0.296)	(0.305)	(0.299)	(0.587)	(0.577)	(0.579)	(0.297)	(0.287)	(0.292)
No. Obs	6057	6057	6057	6057	6057	6057	6057	6057	6057

Note: Robust standard errors are shown in parentheses. *** represents significance at the 1% level. ** represents significance at the 5% level.

* represents significance at the 10% level.

The results presented in Table 8 and 9 show that there was a significant positive correlation between financial leverage (LEV) and investment decisions, suggesting that SMEs with high financial leverage tend to make new investments. Thus, for every one-unit change in LEV, the log odd for seeking new investments increased by 7.56 (2011-2015). Although this result contradicts finance theory (Myers 1977; Jensen 1986) and other empirical evidence (Lang et al. 1986, Aivazian et al. 2005), it is consistent with a previous study performed by H T Trinh (2017). This result may be explained by the fact that Vietnam SMEs have limited internal financing sources and, thus, depend on external financing sources. However, these firms experience difficulty in obtaining external financing sources because of the lack of collateral or asymmetric information. Therefore, financial leverage can be considered the prior credit history of the enterprise. addition, high financial leverage implies that the firms gained the trust of previous credit institutions by their borrowing capability. Thus, SMEs with higher levels of financial leverage are likely to make new investments.

The other positive and significant variables include revenue growth (GRR) and profitability (GRPROF). The positive relationship between revenue growth and investment decisions suggests that SMEs that have high revenue growth tend to invest more, although this result is less clear in 2013. In addition, the coefficient of SME's profitability is significantly positive, suggesting that profitable firms invest more in fixed assets. There is no clear evidence regarding the correlation between the total asset (SIZE) of SMEs and investment decisions; however, we found strong evidence of this correlation after adding the location dummy variable in the estimation. Thus, the total assets variable is strongly associated with investment decisions of SMEs located in South Vietnam.

The results also indicated that the fixed asset ratio (FIXED) is negatively related to investment decisions, contradicting a previous study (H.T.Trinh et al., 2017); however, this result is less clear in 2011. Thus, the collateral required by credit institutions for borrowing is negatively associated with investment decisions. A negative correlation was found between ownership (OWN) and investment decisions of firms. Clearly, SMEs owned by households have less incentive to seek new investments.

Our study is also interested in the different investment decisions made by enterprises located in the following three regions of Vietnam: North Vietnam (including Ha Noi, Phu Tho, and Hai Phong), Central Vietnam (including Quang Nam, Quang Ngai, and Nghe An) and South Vietnam (including Ho Chi Minh City, Khanh Hoa, and Lam Dong). According to the results, the estimated coefficient of ND is positive and significant; meanwhile, the estimated coefficient of SD is negative and significant. These results imply that firms located in North Vietnam are more likely to make new investments than the firms located in the other two regions.

Choice of financing sources

The second estimation in this study investigates how financial leverage affects whether a firm chooses an internal or external financing source in making new investments. Tables 10-13 show the estimated results of the Tobit and fractional logit models of external financing sources (EXT) and internal financing sources (INT) for the surveys conducted in 2011, 2013, and 2015 and the full sample.

The results show that financial leverage (LEV) has a positive and significant impact on external financing sources (EXT) and a negative and significant impact on internal financing sources (INT) in both models. Generally, LEV can represent the accessibility of firms to external financing sources, such as banks or credit institutions. Therefore, SMEs

with higher LEV tend to use external financial sources (banks or credit institutions) to fund their new investments, while SMEs with lower LEV usually rely on internal financing sources. Our results highlight that a high LEV might help improve accessibility to external financial sources.

There are two possible scenarios in which financial leverage impacts the choice of financing sources of SMEs. On the one hand, credit institutions are unwilling to provide extra loans to SMEs with high financial leverage if they consider the firms high financial risk. Thus, these SMEs are less encouraged to acquire additional credit. On the other hand, it is probable that high financial leverage SMEs acquire external financing sources, while SMEs with lower leverage must depend on internal financing sources. Our results prove that the second scenario predominates the first scenario, supporting the pecking order theory proposed by Myers and Majluf (1984). According to their theory, when enterprises consider their sources of financing, internal sources are always considered first, followed by debt and equity. Hence, SMEs tend to use internal financing first for investment; when such sources are depleted, debt is issued; and when it is no longer sensible to issue any more debt, equity is issued.

Regarding the other factors, the results show that there is a positive and significant relationship between the total assets (SIZE) and external financing sources and a negative and significant relationship between the total assets and internal financing sources in both models; this outcome is consistent with previous studies (Bhaird and Lucey 2010; Sogord-Mira 2005). Generally, the total assets can be considered collateral for firms. Owning more collateral is expected to improve the chances of receiving credit from banks Therefore, larger firms are more likely to use external financing, while smaller firms rely on internal financing sources.

Surprisingly, the coefficient of profitability (PROF) is significantly positively associated with the choice of external financing sources and negatively associated with the choice of internal financing sources in the full sample and the survey in 2011, contradicting the pecking order theory and previous studies, but these relationships are not significant in surveys conducted in 2013 and 2015. Previous studies have revealed that there is a negative relationship between the use of external financing and firm profitability. These studies also show that when firms obtain higher profits, they are more likely to use internal financing sources than external sources. In fact, our results suggest that firm profitability has a significant impact on the choice of external financing sources because firms still rely on external financing sources even if they make high profits. In addition, there is no clear evidence supporting the relationship between revenue growth (GRR) or family ownership (OWN) and the choice of external financing sources as the coefficients of GRR and OWN are statistically nonsignificant. However, there was a significant positive correlation between revenue growth (GRR) and the choice of retained earnings and a significant negative correlation with the choice of other finance sources (FIV) in the survey conducted in 2011 and 2015 and the full sample.

Table 10: The relationship between financial leverage and the choice of financing sources (2011-2015)

	EXT		INT		RETE		FIV	
	Tobit	Flogit	Tobit	Flogit	Tobit	Flogit	Tobit	Flogit
LEV	1.653***	2.776***	-1.668***	-2.818***	-1.708***	-4.187***	0.128	0.014
	(0.156)	(0.309)	(0.156)	(0.312)	(0.152)	(0.507)	(0.148)	(0.166)
SIZE	0.169***	0.189***	-0.169***	-0.190***	-0.131***	-0.170***	-0.0001	0.033
	(0.03)	(0.031)	(0.03)	(0.031)	(0.027)	(0.031)	(0.028)	(0.037)
GRR	-0.123	-0.146	0.136	0.156	0.468***	0.591***	-0.383***	-0.604***
	(0.114)	(0.123)	(0.114)	(0.124)	(0.103)	(0.135)	(0.107)	(0.182)
GRPOF	0.086***	0.084**	-0.085**	-0.083*	0.023	0.029	-0.146***	-0.170***
	(0.034)	(0.037)	(0.034)	(0.037)	(0.031)	(0.037)	(0.033)	(0.041)
FIXED	-0.004	-0.005***	0.004	0.005***	0.034	0.02	-0.089	-0.128
	(0.006)	(0.001)	(0.007)	(0.002)	(0.05)	(0.065)	(0.061)	(0.087)
OWN	0.01	0.066	-0.0062	-0.063	0.168**	0.103	-0.268***	-0.262**
	(0.084)	(0.088)	(0.084)	(0.088)	(0.076)	(0.086)	(0.081)	(0.106)

_cons	-1.885***	-2.570***	2.864***	2.560***	1.052***	0.929***	0.309	0.003
	(0.226)	(0.233)	(0.226)	(0.233)	(0.202)	(0.239)	(0.217)	(0.275)
No. Obs	3282	3282	3282	3282	3282	3282	3282	3282

Note: Standard errors are shown in parentheses.

*** represents significance at the 1% significance level, ** represents significance at the 5% significance level, * represents significance at the 10% significance level.

Table 11: The relationship between financial leverage and the choice of financing sources (2011)

	EXT		INT		RETE		FIV	
	Tobit	Flogit	Tobit	Flogit	Tobit	Flogit	Tobit	Flogit
LEV	1.110***	2.150***	-1.137 ***	-2.224***	-1.168***	-43.142***	0.172	0.192
	(0.182)	(0.351)	(0.183)	(0.358)	(0.171)	(0.486)	(0.155)	(0.187)
SIZE	0. 080**	0. 119**	-0.085**	-0.126**	-0.065*	-0.1040**	0.013	-0.032
	(.040)	(0.047)	(0.040)	(0.047)	(0.034)	(0.045)	(0.034)	(0.059)
GRR	-0. 371**	-0.482**	0.378**	0.492**	0.412***	0.584***	-0.089	-0.174
	(0. 175)	(0. 225)	(0.176)	(0.227)	(0.145)	(0.198)	(0.137)	(0.348)
GRPOF	0. 112**	0.127**	-0.106**	-0.120**	-0.034	-0.058	-0.093**	-0.098
	(0. 047)	(0. 058)	(0.048)	(0.057)	(0.041)	(0.056)	(0.042)	(0.064)
FIXED	0.063	0. 086	-0.088	-0.065	-0.097	-0.130	0.015	0.059
	(0. 106)	(0. 124)	(0.113)	(0.125)	(0.096)	(0.128)	(0.061)	(0.162)
OWN	0.090	0.205	-0.088	-0.202	0.004	-0.114	-0.222**	-0.188
	(0. 113)	(0.136)	(0.113)	(0.136)	(0.096)	(0.127)	(0.098)	(0.163)

_cons	-1. 521***	-2.588***	2.495***	2.566***	1.322***	1.412***	-0.085	-0.798*
	(0.313)	(0.372)	(0.314)	(0.372)	(0.260)	(0.352)	(0.264)	(0.420)
No. Obs	1325	1325	1325	1325	1325	1325	1325	1325

Note: Standard errors are shown in parentheses.

*** represents significance at the 1% significance level, ** represents significance at the 5% significance level, * represents significance at the 10% significance level.

Table 12: The relationship between financial leverage and the choice of financing sources (2013)

	EXT		INT		RETE		FIV	
	Tobit	Flogit	Tobit	Flogit	Tobit	Flogit	Tobit	Flogit
LEV	1.221***	2.352***	-1.208***	-2.328***	-0.615***	-2.158*	-1.319***	-1.325***
	(0.256)	(0.776)	(0.256)	(0.772)	(0.217)	(1.232)	(0.165)	(0.491)
SIZE	0.221***	0.290***	-0.210***	-0.276***	-0.139***	-0.239***	-0.137***	-0.118
	(0.059)	(0.079)	(0.059)	(0.079)	(0.050)	(0.081)	(0.047)	(0.085)
GRR	0.050	0.076	-0.062	-0.094	0.200	0.389	0.043	-0.566**
	(0.203)	(0.085)	(0.203)	(0.264)	(0.173)	(0.337)	(0.162)	(0.276)
GRPOF	0.074	0.070	-0.081	-0.094	0.002	0.021	-0.041	-0.128
	(0.062)	(0.085)	(0.062)	(0.264)	(0.054)	(0.093)	(0.051)	(0.090)
FIXED	-0.095	-0.168	0.123	0.209	0.119	0.067	0.117	0.207
	(0.173)	(0.258)	(0.173)	(0.243)	(0.146)	(0.306)	(0.135)	(0.244)
OWN	0.161	0.227	-0.151	-0.215	0.112	0.184	0.107	-0.474**
	(0.152)	(0.188)	(0.152)	(0.187)	(0.130)	(0.188)	(0.122)	(0.215)

_cons	-1.871***	-2.895***	2.785***	2.781***	0.818**	0.776		1.243***	0.595
	(0.444)	(0.558)	(0.443)	(0.548)	(0.359)	(0.580)		(0.344)	(0.600)
No. Obs	699	699	699	699	699	699	699	699	

Note: Standard errors are shown in parentheses.

*** represents significance at the 1% significance level, ** represents significance at the 5% significance level, * represents significance at the 10% significance level.

Table 13: The relationship between financial leverage and the choice of financing sources (2015)

	EXT		INT		RETE		FIV	
	Tobit	Flogit	Tobit	Flogit	Tobit	Flogit	Tobit	Flogit
LEV	4.253***	4.302***	-4.251***	-4.297***	-6.961***	-7.695***	1.048**	0.604
	(0.523)	(0.579)	(0.523)	(0.579)	(0.716)	(1.045)	(0.466)	(0.400)
SIZE	0.223***	0.186***	-0.219***	-0.186***	-0.196***	-0.183***	-0.010	-0.004
	(0.065)	(0.054)	(0.065)	(0.054)	(0.063)	(0.055)	(0.068)	(0.061)
GRR	0.208	0.136	-0.188	-0.134	0.642***	0.593***	-0.845***	-1.013 ***
	(0.250)	(0.197)	(0.250)	(0.197)	(0.242)	(0.218)	(0.267)	(0.312)
GRPOF	0.069	0.059	-0.072	-0.061	0.170	0.129**	-0.275***	-0.287***
	(0.072)	(0.063)	(0.072)	(0.0633)	(0.073)	(0.064)	(0.080)	(0.073)
FIXED	-0.006	-0.006***	0.006	0.006***	0.016	0.014	-0.222*	-0.214*
	(0.008)	(0.001)	(0.008)	(0.001)	(0.087)	(0.056)	(0.130)	(0.127)
OWN	0.085	-0.094	0.089	0.095	0.375**	0.278*	-0.368*	-0.251
	(0.184)	(0.149)	(0.184)	(0.149)	(0.181)	(0.153)	(0. 971)	(0.183)

_cons	-2.439***	-2.383***	3.421***	2.386***	0.752	0.448	0.789	0.503
	(0.499)	(0.407)	(0.499)	(0.407)	(0.479)	(0.416)	(0.527)	(0.489)
No. Obs	1258	1258	1258	1258	1258	1258	1258	1258

Note: Standard errors are shown in parentheses.

*** represents significance at the 1% significance level, ** represents significance at the 5% significance level, * represents significance at the 10% significance level.

3.5. Conclusion

This study analyzes how financial leverage affects investment decisions and the choice of financing sources in small and medium-sized enterprises (SME) in Vietnam using SME survey data (2011-2015). Previous theoretical studies have reported that financial leverage can have both a positive and negative impact on investment decisions. Our results contradict to the financial theory proposed by Myers (1977) and Gomes (2001), as well as empirical studies done by Lang et al. (1996) and Aivazian et al. (2005). They argued that high debt ratio implies the low growth opportunity of the firms; therefore, firms with large debt ratio are less likely to invest. Whilst, our results reveal that financial leverage is positively related to investment decisions in Vietnam SMEs. Thus, firms with higher financial leverage are more likely to make new investments to expand their enterprise. Our study opposed Modigliani & Miller's theory and suggest that companies have their own preference for making investment decisions.

Our results also showed that firms with higher financial leverage are likely to increase the use of external financing sources but decrease the use of internal financing sources for their new investments. This can be explained by the fact that high leverage enterprises might have better access to external financing sources by demonstrating their records at credit institutions. There is a transition from using internal financing sources to external financing source in the Vietnam SME context (H.T.Trinh et al. 2017). Low financial leverage implies less accessibility to external financing sources. Thus, to expand their operations, enterprises usually use internal financing sources for new investments. After the operation expands successfully, enterprises

have improved their accessibility to external financing sources, and the use of external financing sources increases their financial leverage.

Nevertheless, in contrast to previous studies (H.T.Trinh et al. 2017), our results show that firm profitability has a significant impact on the choice of external financing sources because firms still rely on external financing sources even if they make high profits, suggesting that profitable enterprises invest more in fixed assets.

According to our finding, it seems that reducing credit constraints for new investment and stimulating new investment indirectly by raising financial leverage of SMEs could be effective. Additionally, policy makers should consider implementing several policies, such as improving credit access to SMEs, alleviating information asymmetry, reducing credit constraints and directly providing subsidies to SMEs. Government can also play a role in improving knowledge of different financial institutions of which provide investment opportunities for SMEs. Also, creating an information sharing channel between investors and SMEs. Moreover, reducing the costs of trade facilitation could provide opportunities for SMEs to attract more foreign investment. Promoting SME participation in worldwide networks should also be considered.

Finally, our study is subject to certain limitations also gives insights for future research. The study was limited to focus only on SMEs in Vietnam which is one representative country in emerging economics. Therefore, it would be beneficial for comparative studies in other developing countries for future research.

CHAPTER 4: INFLUENCE OF FARMER UNION MEMBERSHIP ON THE PRODUCTION AND CREDIT VOLUME OF HOUSEHOLDS: EVIDENCE FROM FARM HOUSEHOLDS IN VIETNAM

4.1. Introduction

In low-income countries, rural development has been considered a key factor in reducing poverty, as most poor individuals live in rural areas and most household (HH) income comes from farming activities such as rice production, livestock production or agro-forestry production. However, poor individuals typically have little education, limited skills and limited opportunities to access additional services and resources, such as financial, healthcare, and other services (Duong and Izumida, 2002; Duong and Thanh, 2014; Lin, Zhang and Lv, 2019). Numerous studies have proposed that poor farmers can overcome these constraints if they are organized into groups or cooperatives (Narrod, et al., 2009;Wollni and Zeller, 2007; Mojo, Fischer and Degefa, 2017; Tran and Goto, 2019).

Consequently, agricultural cooperatives have been considered organizations that play significant socioeconomic roles. Valentinov (2007) argued that agricultural cooperatives are essential to help family farms overcome the difficulties of realizing external economies of scale and developing market competitiveness. Nuhanovic et al. (2017) revealed that agricultural cooperatives have lifted many farmers and communities out of poverty. In addition, Deriada (1995) pointed out that agricultural cooperatives are important tools for dealing with poverty in rural areas. Another viewpoint emphasizes that agricultural organizations help reduce transaction costs and improve the negotiating power of individuals (Bernard and Spielman, 2009; Francesconi and Ruben, 2012; Markelova et al., 2009; Valentinov, 2007. In contrast, there

are several papers that show the opposite case, that is, the poor performance of agricultural cooperatives in developing countries (Fischer and Qaim, 2012). In this paper, we investigate the impact of farmers' union membership on rural HHs in Vietnam to make comparisons with cases from other developing countries.

After the *doi moi* renovation in 1986, a substantial number of international and local organizations have begun operations in Vietnam, such as community-based organizations, mass organizations, professional associations, and Vietnamese nongovernmental organizations. Several reasons support the use of the farmers' union as a specific case study for evaluating the impacts of social networks on farm households. First, within the unique context of Vietnam (and its single-party government), mass organizations are party-sponsored (i.e., government-sponsored) and have very strong grassroots links and large memberships. Mass organizations have become increasingly independent since *doi moi*. In particular, the farmers' union is becoming an important organization insofar as it plays a significant socioeconomic role by providing a high level of support for poor individuals, such as by facilitating better education and healthcare services, better living conditions, and increased access to financial services. In addition, the farmers' union also plays an important role in the lending process of the rural credit program called the Vietnamese Bank for Social Policy (VBSP). In Vietnam, the VBSP was inspired by the success of the Garmeen Bank project in Bangladesh. The main purpose of the VBSP is to provide credit opportunities for low income people who have difficulty accessing other forms of credit that require collateral. Under the VBSP, loans are provided based on a group lending scheme. Village heads and the commune leaders of the four mass organizations

noted above help form a group of borrowers and monitor loans. Mass organizations also organize borrowers into credit groups to ensure repayment (Khoi, et al., 2013). In addition, groups-based borrowing helps to reduce transaction costs because it effectively ensures asymmetric information (Quach, 2005). Measuring the impact of both kinship and friendship on the probability that rural HHs in China will obtain formal and informal loans, Hong Sun et al. (2018) noted that social capital has significantly influenced the borrowing behavior of farmer HHs. Among these mass organizations, the farmers' union plays the most important role (Takashi, 2009). Second, the empirical literature linking social networks to farm households is limited, particularly in developing countries such as Vietnam. Some notable studies, including that by Giannakis, Efstratoglou and Antoniades (2018) in Cyprus, have used discrete choice model analysis to find that farmer union membership has a positive impact on the decision to work off-farm. With an objective similar to this study but focusing on different union membership, Newman et al. (2014) found that membership in high-quality networks leads to increased levels of saving. In addition, Takashi (2009) concluded that the farmers' union has played an important role in microcredit programs in Vietnam. Therefore, our study adds to this literature by providing empirical evidence of the role of social networks—and, in particular, that of the farmers' union—in rural household production and credit volume. In this paper, we focus on the impact of farmers' union membership on economic performance and financial issues.

This paper is structured as follows: a literature review and summarizes the background of farmers' unions in Vietnam will be presented in section 2. Section 3 describes the data and

variables used in the study. Section 4 explains the methodology for analysis, and section 5 presents the empirical results and interpretations. The conclusion is presented in section 6.

4.2. Context and Literature Review

The Vietnam farmers' union (VNFU), established on 14 October 1930, is a sociopolitical organization of Vietnamese farmers that is under the leadership of the Communist Party of Vietnam. For many years, the VNFU has played a key and central role in farmer movements and in building new types of rural areas. Any individual over the age of 18, regardless of sex, ethnic group or religious beliefs, who works in agricultural sectors or agricultural services, such as agriculture, forestry, fishery, salt-making, handicrafts, small industries and other fields, can become a VNFU member by voluntarily signing up and accepting the union's philosophy, rules and regulations. For farmers, the main motivation for joining the VNFU is to receive assistance in the development of their agricultural enterprises. In recent years, the VNFU has also assisted farmers in accessing credit from the VBSP. The aim of the VNFU is to guarantee loans for farmers so that they can borrow without collateral and to facilitate saving and credit groups to assist in managing repayment. The VNFU also participates in national programs related to job creation, agricultural extension and vocational training. The economic benefits associated with VNFU membership have the potential to extend beyond the stated objectives of the organization.

The first successful microcredit program was established by Professor Muhammad Yunus who worked in the Grameen Bank in Bangladesh in 1976. This program inspired other developing countries to provide loans for poor people who do not have any collateral. Under the Grameen Bank project, more than seven million poor Bangladeshian have received credit, especially woman. Since then, rural credit or microfinancing has been recognized as the key

tool for reducing poverty and improving sustainable economic wellbeing (Raihan, Osmani and Khalily, 2017). However, recent studies have shown both positive and negative impacts (Rooyen, Stewart and Wet, 2012) or no impact of rural credit or microfinance on HH income. On the one hand, Al-Shami, Razali and Rashid (2017) found that microfinance had a positive impact on the income of women borrowers in Malaysia, and Cuong (2008) showed that the Vietnamese government's credit program had a significantly positive impact on both HH income and expenditures. In addition, Mohammad et al., (2017) mentioned that microfinance program is positively corelated with the people that used health services. Furthermore, Thu and Goto (2020) indicated that microfinancing has positive impacts on households' expenditures, especially the education expenditures of minority student from the northern mountainous areas of Vietnam. Additionally, Lensink and Pham (2011) revealed a positive effect of microcredit on HH profits. These studies support the welfare effects of microfinancing. In contrast, Angelucci, Karlan and Zinman (2014) found no evidence of the transformative impact of microcredit on HH income, as loans seemed to be used mostly for investment. Luan and Bauer (2016) pointed out that credit has a significant positive effect on nonfarm income, but has no influence on farm income. He explained that the impact of credit on farm income could be limited by farming shocks such as pest infestations or crop diseases.

On the other hand, several papers have pointed out that rural credit is influenced by social institutions or groups. For example, Takashi (2009) mentioned that mass organizations are quite important in Vietnam, as they are in charge of organizing consultative meetings to select and recommend candidates for credit programs. According to him, among five organizations, i.e., the Farmers' Association, Women's Union, War Veterans' Association, Old Persons' Association and Youth Association, the Farmers' Association plays the most important role in bank loans. In addition, the number of memberships in the Farmers' Association significantly

increased after the establishment of the VBSP loan. However, he did not perform empirical analysis to prove his statement. Analyzing memberships in only the Farmers' Association and Women's Union, Newman, Tarp and Broeck (2014) found that group membership has a significant impact on HH formal savings in rural areas in Vietnam.

4.3. Materials and Methods

4.3.1 Study sites and survey approach

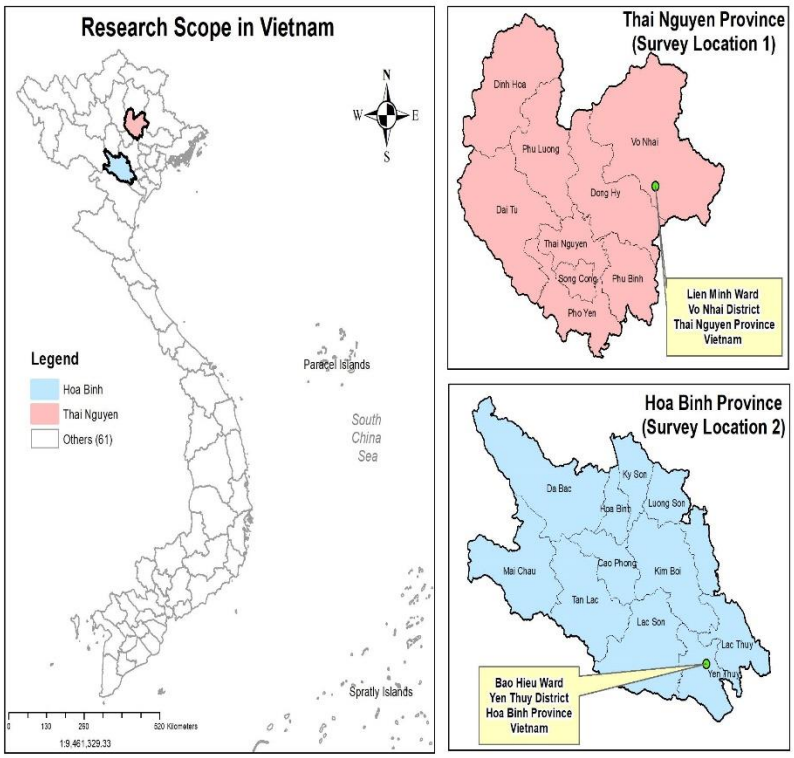
This study covered the Vo Nhai district, one of the most rural areas in Vietnam. The district was selected because a rural credit program was offered there and because this area has the highest poverty rate in the northern mountainous region of Vietnam.

Thai Nguyen Province is in the northern mountainous region of Vietnam, having a total natural land area of 3,533.2 km^2 and a population of 1,190,600 as of 2015. Thai Nguyen Province is well known for its tea industry, with tea production covering a total area of 16,000 ha. The poverty rate in Thai Nguyen Province was 11.1% in 2014, and in the Vo Nhai District, it was over 40%. According to the general statistics office, in 2016, there were 150.86 thousand households whose main activities were related to agriculture, forestry, livestock and aquaculture production, which accounted for 66.7% of total households; in contrast, the equivalent statistic for the country as a whole was 53.7%. Among all districts in Thai Nguyen Province, Vo Nhai District has the highest density of farm households (83.15%).

4.3.2 Questionnaire survey

In this study, a simple random sampling technique was applied. From the lists of HHs provided by the district offices, total of 401 households were randomly selected. There were 59 households excluded because missing information, leaving a total of 342 households in the sample size of the study. Of these, 147 households were members of farmer union, 3 were non-member of farmer union (in Bao Hieu district, Hoa Binh Province). 111 households were members of farmer union, 81 were non- member of farmer union (in Vo Nhai district, Thai Nguyen Province). We excluded Bao Hieu from the main estimation and focus only in Thai Nguyen Province with a final sample size of 192 farm HHs, which is 0.5% of the total number of farm households in the selected area. The primary data were collected through an HH survey conducted in 2015-2016. In our estimation, we assigned HHs that had no farmers' union membership to the control group, while the treatment group included membership HHs. The HH survey covered a variety of topics related to HH characteristics, access to credit and HH economic performance. To identify demographic characteristics, the respondents were asked about the HH head's age, educational level, sex, occupation, ethnicity, and poverty status. HH access to resources and credit and the HH's main production activities were also included in the survey. In terms of credit analysis, the participants were asked about the history of their loan transactions from any sources within the past 10 years.

Figure 2: The study sites



Source: diva-gis.org

4.3.3. Methodology

This study employed the propensity score matching method (PSM) to estimate the impacts of farmers' union membership on several potential outcome variables: the economic performance of HHs (average livestock production, average crop production, total income and expenditures) and the average credit volume from the VBSP program. In this study, the choice of variables related to each HH is based on the literature review (Caliendo and Kopeinig, 2008; Becker and Ichino, 2002). In addition, we selected several potential covariates from the HH characteristics that can affect both the treatment and outcome variables. A brief description of

and the assumptions concerning the control variables and variables of interest are presented in Table 14.

Table 14: Description of selected variables

Variables	Explanation	Unit
Potential covariates		
Family size	Total members in the household	Members
Sex	The gender of the HH head 1= male; 0 = female	
Age of household head	Age of household head	Years
Education of household head	The number of years in school of the household head	Years
Occupation of household head	Dummy variable for occupation of the household head; 1 for working full-time on farm, 0 otherwise	
Credit dummy	Dummy variable for credit status of HH; 1 = has borrowed money from the VBSP, 0 otherwise	
Total agricultural and forestry land holdings	Total lands owned by the HH	1000 m^2
Potential outcomes		
Livestock production	The total amount of livestock production	Million VND.
Crop production	The total amount of crop production	Million VND.
Total income	The total income of the HH in 1 month	Million VND.
Total expenditure	The total expenditure of the HH in 1 month	Million VND.
Credit volume	The total borrowing amount from VBSP	Million VND.

Studying the causal effects of farmers' union membership on the potential outcome indicators is important due to endogeneity bias. It is necessary to control for observable and unobservable characteristics in the random experiment of assigning individuals to the treatment group (Wossen et al., 2017). In this study, we employ PSM to control for endogeneity bias by matching observations in the treated HHs with similar untreated HHs (Rosenbaum and Rubin, 1983). The basic idea of PSM is to construct the counterfactual outcomes of those in the treatment group based on their propensity score using the subset of covariates. Then, the treatment effect can be estimated by taking the difference in the outcomes of the matched observations. We apply a two-step process to estimate the average treatment effects (ATEs) and average treatment effects on the treated (ATETs) for the outcome variables following the study by Tran and Goto (2019).

In the first step, the propensity score was estimated by applying a probit model, which is expressed as follows:

$$Pr(D_i = 1|X_i) = \Phi(\beta X_i) \quad (1)$$

Here, D_i denotes a binary variable.

Additionally, D_i =1 if an HH is a member of the farmers' union, and D_i =0 if an HH is not a member of the farmers' union.

X_i is a vector of HH characteristics

Φ represents the standard normal cumulative distribution function.

To find the best matching quality and to obtain a balanced sample with respect to the selected covariates after matching, we selected different models to estimate the propensity score. Each model consists of a different set of variables. The details of the variables selected are provided in Table 3.

Next, the propensity score was estimated by the selected probit model. Then, these propensity score will be matched based on the one-to-one nearest neighbor matching technique (0.01 caliper). Treated units that have no control units within the specific caliper are excluded from the estimation. Furthermore, in our estimation, a control observation can be used for matching more than once.

In the next step, we treat selected covariates as pseudo-outcome variables and estimate pseudo-ATETs based on them to check the balance of each model following Imbens and Rubin (2015). Good matching is expected to have pseudo-ATETs that close to zero and statistically nonsignificant, which means that the un-confoundedness assumption is plausible. The model with the best balancing property will be chosen to estimate the ATEs and ATETs in the next step.

In the second step, each selected model will be used to estimate the ATEs (equation 2) and ATETs (equation 3) as follows:

$$\text{ATE} = \text{E}(Y_1 - Y_0) = E(Y_1|D = 1) - E(Y_0|D = 0) \quad (2)$$

$$\text{ATET} = \text{E}(Y_1 - Y_0 | D = 1) = E(Y_1 | D = 1) - E(Y_0 | D = 1) \quad (3)$$

where Y_1 and Y_0 are potential outcomes, and D denotes a treatment indicator. However, in our dataset, we can observe only $E(Y_1 | D = 1)$, and $E(Y_0 | D = 1)$ is unobserved; thus, it is a counterfactual term that is calculated by taking the average of the outcomes of the matched control group.

We employed PSM because it is a popular method used to adjust for confounding in observational studies. PSM has several advantages over simple regression. Whereas the PSM technique creates groups of treatment and control groups that have similar propensity score, regression estimates the outcomes for unmatched households. Furthermore, PSM mitigates the effects of self-selection bias that are associated with the observable covariates (Rosenbaum and Rubin, 1983).

To confirm the consistency of the results, we employed other matching methods such as the inverse probability weighted (IPW) method and regression adjusted (RA) methods. While PSM matched the treatment and comparison group observations based on a propensity score, IPW estimators were used to estimate the probability weights to compute weighted averages of the outcomes for each treatment level. The contrasts of these weighted averages provided the estimates of the ATEs. Meanwhile, RA estimates were used to separate the regression models

of the outcomes on selected covariates for each treatment level. Then, the RA was employed to measure the averages of the predicted outcomes for each subject and treatment level. The treatment effect was calculated based on the contrasts of the treatment averages for the specific predicted outcomes.

4.4. Results and discussion

4.4.1 Descriptive statistics

The mean differences values for the selected variables of FU's member HHs and nonmember HHs was reported in Table 2. Most HH heads who hold Fu's membership have a higher educational level than do the nonmember HH heads. Additionally, member HH heads are younger and more likely to be female than nonmember HH heads. The HHs in the control group owned more farmland than those in the treatment group. These differences present an imbalance in the selected covariates, which suggests self-selection problems.

Regarding the outcome variables, the HHs in the treatment group have higher mean values in livestock production, expenditure and credit volume than do the control HHs. For instance, the average credit volume of the treatment HHs is 4.3 million VND higher than that of the control HHs. However, the treatment units present a no significantly higher mean value for livestock production and crop production, and a lower mean value for total income than the control units. For the other covariates, there is not statistically significant different among treatment and control groups.

Regarding whether to participate in the farmers' union, HHs usually have different self-selections. The mean difference in the outcome variables between the treatment and control groups might lead to biased conclusions regarding the treatment effect. Despite the fact that PSM cannot control for self-selection bias, we selected several sets of covariates to estimate the Propensity score then test the consistency of the impacts results by using different models and different matching algorithms.

Table 15: The mean difference of households without farmers' union membership (Treatment) and with farmers' union membership (Control)

Variables	Treatment Group			Control Group			Difference (T-C)		
	Obs	Mean	S.D	Obs	Mean	S.D	Mean		S.E
Potential covariates									
Family size	111	4.126	0.128	81	4.283	1.259	-0.157		0.192
Sex	111	0.963	0.017	81	0.987	0.012	-0.023		0.023
Age of the HH head	111	45.585	0.964	81	48.283	1.251	-2.698	*	1.554
Educational level of the HH	111			81					
head		9.324	0.226		8.259	0.254	1.065	***	0.343
Occupation dummy	111	0.792	0.386	81	0.925	0.029	-0.133	***	0.051
Credit dummy	111	0.657	0.045	81	0.74	0.048	-0.083		0.067
Total agricultural and	111			81					
forestry land holdings		45.06	3.229		46.835	5.073	-1.774		5.753

Potential outcome							
Livestock production (Mill. VND)	26.987	2.467	21.956	2.82	5.030		3.761
Crop production (Mil. VND)	2.559	0.220	2.442	0.250	0.117		0.335
Total income (Mill. VND)	3.692	0.251	3.695	0.28	-0.003		0.381
Total expenditures (Mill. VND)	3.246	0.16	2.798	0.148	0.448	*	0.225
Credit volume (Mill. VND)	16.378	1.56	12.000	1.349	4.378	**	2.156

Data source: The author's calculations from the Household Survey from 2016-2017. ***, ** and * represent significance at the 1%, 5% and 10% levels, respectively; 100 USD = 2,233,000 VND (in 2016)

4.4.2 Impacts of FU's membership

To estimate the impacts of FU's membership we follow the procedure in section 3.3. Caliendo and Kopeinig (2008) mentioned that propensity score modeling cannot be used to predict the selection of individuals into treatment and control groups but rather to balance the selected covariates. Therefore, we found two models (out of eight models) had the most balanced samples after matching; the results are shown in Table 3. The mean difference in the covariates, such as the age of the HH head, the educational level of the HH head, and the occupation dummy, is significantly different before matching and become nonsignificant after matching. For almost all of the covariates, the mean difference also decreases almost to zero except for the total agricultural and forestry land holdings, but this difference is still nonsignificant. This result implies that the balance of the samples is improved.

Table 16: Balance checking before and after matching.

	Before matching		**After matching**			
	N= 192		Model 1		Model 2	
	Mean	SE	Mean	SE	Mean	SE
Family size	-0.157	0.192	**-0255**	**0.287**	**-0.167**	**0.251**
Sex	-0.023	0.023	**0.023**	0.03	-0.044	0.030
Age of the HH head	-2.698*	1.554	**0.337**	1.55	**1.411**	0.343
Educational level of the HH head	1.065***	0.343	**0.000**	0.302	**-0.011**	0.327

Occupation dummy	-0.133***	0.051	**-0.011**	0.045	**0**	0.049
Credit dummy	-0.083	0.067	**-0.046**	0.088	**-0.055**	0.083
Total agricultural and forestry land holdings	-1.774	5.753	7.638	8.691	**3.362**	6.687

Note: In model 1, total agricultural and forestry land holdings was excluded in the propensity score model (probit model). In model 2, sex was excluded in the propensity score model.

A caliper of 0.01 is applied for one-to-one nearest neighbor matching based on the estimated propensity score.

***, ** and * represent significance at the 1%, 5% and 10% levels, respectively.

After matching, the ATEs and ATETs for the potential outcomes have been calculated following Eqn. (2) and Eqn. (3). The results are shown in table 4. First, the ATE results show that farmers' union membership has positive effects on livestock production. In particular, membership HHs have production amounting to more than 9.121 million VND (11.556 million VND in model 2). Second, membership HHs obtain higher credit volume than nonmember HHs. There is one possible explanation for this result: HHs that have farmers' union membership can obtain a relatively high volume of credit to improve their production; therefore, the HH production of member HHs is significantly higher. Our results are consistent across all models.

Moreover, the ATE results from the different matching methods shown in Table 5 also confirm the consistency of the results. In other words, farmers' union membership has a significant impact on the livestock production and credit volume of HHs. The findings of the study point out the importance of related social factors, i.e., farmer union membership, on the rural households (Giannakis, Efstratoglou and Antoniades, 2018). Our findings provide further evidence in support of Takashi's conclusions (2009), wherein he stated that the farmers' union plays important roles in microcredit loans. He pointed out that the number of households with farmers' union membership changed significantly after 1996 when the VBSP loans began. Therefore, our results support the notion that the farmers' union could be effective in increasing loan volume and livestock production.

Additionally, the ATET estimator for the outcome variables reveal that farmer's union membership has a positive effect on livestock production and credit volume. Similar to the ATE results, this finding implies that farmers' union membership significantly contributes to HH production. However, there is some inconsistency between two models; we found a significant impact of membership on livestock production in model 2, but a nonsignificant impact in model 1. Nevertheless, the ATET results show a significant impact of membership on credit volume in model 1 and a nonsignificant impact in model 2. In addition, the ATET results are not consistent using the different matching methods.

We found no evidence of an impact of FU membership on other potential outcomes such as crop production, total income and HH expenditures.

In our analysis, both PSM and linear regression agree on the statistical significance on the impact of farmers' union membership on HHs' livestock production and credit volume after controlling for several covariates.

In summary, the study estimation results show that farmers' union membership has a significant impact on the credit volume (consistently), crop production (inconsistently) and livestock production (consistently) of HHs. Specifically, the positive impact of farmers' union membership on livestock production and credit volume proves that farmers' union membership has important economic benefits for union members and their HHs. We do not intend to say that members of the farmers' union are using their power to allocate credit favorably to themselves. Since members of the farmers' union have a higher level of education, they are generally regarded as more creditworthy. In addition, there is a certain correlation between level of education and membership status, which can influence the use of credit in household production.

Table 17: The results of PSM estimation (unit: millions of VND)

	ATE				**ATET**			
	Model 1		**Model 2**		**Model 1**		**Model 2**	
	ATE	SE	ATE	SE	ATET	SE	ATET	SE
Livestock production	**9.121***	**4.302**	**11.556*****	**4.010**	7.502	4.614	**10.431****	**4.654**
Crop production	-0.267	0.427	0.190	0.426	-0.345	0.447	0.024	0.477
Total income	-0.478	0.442	0.040	0.482	-0.567	0.490	-0.269	0.548
Expenditure	0.278	0.273	0.171	0.286	0.138	0.307	0.258	0.329
Credit volume	**6.678*****	**2.398**	**4.243***	**2.381**	**6.046****	**2.818**	3.7	3.245
	150 matches		157 matches		80 matches		85 matches	

A caliper of 0.01 is applied for one-to-one nearest neighbor matching based on the estimated propensity score.

***, ** and * represent significance at the 1%, 5% and 10% levels, respectiv

Table 18: Results of ATE estimation: Impact of membership on HHs (unit: millions of VND)

Membership (1 vs 0)	PSM		NN-MATCH		IPW		RA	
	ATE	S.E	ATE	S.E	ATE	S.E	ATE	S.E
Livestock production	**7.098***	**4.186**	**6.593***	**3.901**	**7.310****	**3.565**	**6.162***	**3.513**
Crop production	0.548	0.346	0.211	0.340	0.339	0.346	0.191	0.322
Total income	0.006	0.430	-0.260	0.405	0.096	0.474	-0.183	0.407
Expenditure	0.126	0.265	0.164	0.3261	0.498	0.340	0.256	0.296
Credit volume	**5.235****	**2.278**	2.094	2.324	**3.302***	**1.952**	**4.048****	**1.949**

Note: In this PSM estimation, all the covariates (family size, sex, age, education level, occupation dummy, credit dummy, total land) are included when estimating the propensity score.

***, ** and * represent significance at the 1%, 5% and 10% levels, respectively.

Table 19: Results of ATET estimation: Impact of membership on HHs (unit: millions of VND)

Membership (1 vs 0)	PSM		NN-MATCH		IPW		RA	
	ATET	S.E	ATET	S.E	ATET	S.E	ATET	S.E
Livestock production	**4.717****	**4.648**	5.123	4.044	**8.315****	**3.772**	5.613	3.562
Crop production	0.777**	0.371	**0.671***	**0.375**	0.554	0.414	0.359	0.351
Total income	-0.098	0.51	0.146	0.448	0.378	0.604	-0.053	0.462
Expenditure	0.242	0.332	0.303	0.310	0.498	0.340	0.256	0.296
Credit volume	**3.3**	**2.097**	2.827	2.560	3.097	2.056	**4.194****	**2.049**

Note: In this PSM estimation, all the covariates (family size, sex, age, education level, occupation dummy, credit dummy, total land) are included when estimating the propensity score.

***, ** and * represent significance at the 1%, 5% and 10% levels, respectively.

4.5. Conclusion

Whereas the previous literature has principally focused on the impact of microcredit on households' welfare, this study aimed to examine whether farmers' union membership plays an important role with regard to the production and the access to microcredit of farm households in rural areas of Vietnam. A household survey was implemented in Vo Nhai district in Thai Nguyen province where the poverty rate has been recorded as relatively high in the northern mountainous region of Vietnam. We use the PSM to examine the impacts of farmers' union membership as well as other matching methods and linear regression for checking the consistency of the results. We found that farmer's union membership improved the livestock production and increased the credit volume of rural households.

In particular, the ATE estimator results show that membership in farmers' unions is positively impacts to the livestock production and credit volume of member HHs. In other words, HHs with farmers' union membership can obtain higher credit volumes and generate greater livestock production than nonmember HHs. The impact on credit volume is clear and shows a significant effect. Meanwhile, the ATET estimator results were not consistent. The results implied that HHs that are better off in terms of both credit volume and production are more likely to join farmers' unions. This finding suggests that farmers' unions bring potential benefits in certain areas to farm HHs. Even though this result may seem obvious; however, to the best knowledge, it has not been considered in the previous studies. It can be explained by the fact that the FU's membership HHs increased their livestock production more significantly than

nonmember HHs. In fact, this results support for the view that rural households are considering certain objectives in response to collective action (Tarrow, 2003).

The difference in the results originates from a difference in the matching method and the different PSM models. This discrepancy might be a limitation of this study's methodology.

In conclusion, our estimates indicate that farmers' union membership has significant impacts on HHs' production and credit volume. Therefore, the economic benefits associated with farmer union membership have the potential to extend beyond the stated objectives of the organization. Our findings provide empirical evidence to support the influence of farmers' union membership on HHs production. This finding adds to the previous literature on the importance of social organizations, especially the farmers' union in Vietnam. The results of this study may help policy makers gain better insight into the impacts of local organizations in rural development. We suggest that the farmers' union should enhance its activities to provide more resource accessibility, especially with regard to financial services. Moreover, further investigating the interaction effects of other local organizations and rural households in different regions can help to draw a potential policy and supporting policy of social organization in the rural development process in Vietnam.

CHAPTER 5: SUMMARY OF THE STUDY

5.1. Main findings

This study focuses on sustainable economic development in Vietnam regarding the economic structural change and financial activities subjects. We relied on the Vietnam IO data (2000, 2005, 2010, and 2015), Vietnam SMEs data (2011, 2013, and 2015), and a household survey data (conducted in 2016 and 2017) for our analysis.

The results in Chapter 2 revealed that the agricultural sector and food sector are still important sectors in the period of 2000-2015 which indicates the primary industry and the most related industry like food and beverage are still supporting the Vietnamese economy. The linkage effects from the Leontief inverse pointed out that the food sector and agricultural sector have strong linkage effects which implied that these two sectors have becoming key industries of Vietnam's economy in 2015. The results also showed that the total outputs of food products and the agricultural sector mainly came from final demand change by consumption. Meanwhile, both final demand change by investment and export and technological change by intermediate inputs were contributing to the change of the machinery sector. We also found that the wholesale and retail sector was dramatically reduce its consumption, investment, and export in the last 5 years (2010-2015).

The results in Chapter 3 were contradicted to the financial theory proposed by Myers (1977) and Gomes (2001), as well as empirical studies done by Lang et al. (1996) and Aivazian et al. (2005). They argued that a high debt ratio implies the low growth opportunity of the firms; therefore, firms with large debt ratios are less likely to invest. Whilst, our results reveal that financial leverage is positively related to investment decisions in Vietnam SMEs.

Thus, firms with higher financial leverage are more likely to make new investments to expand their enterprise. Our study opposed Modigliani & Miller's theory and suggest that companies have their own preference for making investment decisions. In addition, we also found that SMEs with higher financial leverage is likely to increase the use of external financing sources but decrease the use of internal financing sources for their new investments. This can be explained by the fact that high leverage enterprises might have better access to external financing sources by demonstrating their records at credit institutions. There is a transition from using internal financing sources to external financing sources in the Vietnam SME context (H.T.Trinh et al. 2017). Low financial leverage implies less accessibility to external financing sources. Thus, to expand their operations, enterprises usually use internal financing sources for new investments. After the operation expands successfully, enterprises have improved their access to external financing sources, and the use of external financing sources increases their financial leverage.

The result in Chapter 4 emphasized the roles of a social organization in a rural household in Vietnam. We specifically found that farmer union membership; as a representative of the mass organization; have a positive impact on the production and credit volume of rural households by using a data from the household survey in rural areas of the mountainous region of Vietnam.

5.2. Implication

Our results in chapter 2 suggest that food products and the agricultural sector are still important industries in the Vietnam economy. Nevertheless, this also shows a hinder problem as an economic policy implication. Since the country's economy mostly relied to

the agricultural industry, it needs to develop innovation technology to expand production; otherwise, a country might be remained staying poor because of a decreasing return to scale of production. Thus, like many developing countries, other manufacturing industries such as machinery, textile, and other sectors might be the next leading industry of the Vietnam economy.

According to our findings from chapter 3, it seems that reducing credit constraints for new investment and stimulating new investment indirectly by raising the financial leverage of SMEs could be effective. Additionally, policymakers should consider implementing several policies, such as improving credit access to SMEs, alleviating information asymmetry, reducing credit constraints, and directly providing subsidies to SMEs. The Government can also play a role in improving knowledge of different financial institutions which provide investment opportunities for SMEs. Also, creating an information-sharing channel between investors and SMEs. Moreover, reducing the costs of trade facilitation could provide opportunities for SMEs to attract more foreign investment. Promoting SME participation in worldwide networks should also be considered.

Lastly, our estimates in chapter 4 indicated that farmers' union membership has significant impacts on HHs' production and credit volume. Therefore, the economic benefits associated with farmer union membership have the potential to extend beyond the stated objectives of the organization. Our findings provide empirical evidence to support the influence of farmers' union membership on HHs production. This finding adds to the previous literature on the importance of social organizations, especially the farmers' union in Vietnam. The results of this study may help policymakers gain better insight into the impacts of local organizations in rural development. We suggest that the farmers' union should enhance its activities to provide more resource accessibility, especially with regard

to financial services. Moreover, important policy evidence could be generated by further investigating the interaction effects of other local organizations and rural households in different regions.

5.3. Limitations of the study

Some limitations have been drawn from this dissertation. First, the study is limited to the case in Vietnam. It would be more beneficial for comparative studies with other countries with a similar economic structure for future research. Second, the discrepancy in results originate from the difference in the matching method in chapter 2 is another limitation. The PSM might not be a good method to mitigate self-selection bias into farmer union membership. Thus, several approaches are applied to further checking the robustness of the study's results.

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APPENDICES

Appendix 1. Individual report on TAOYAKA Onsite Team project:

I. Introduction

There are many challenges that not only Kita Hiroshima, but other rural communities are facing such as depopulation, aging society, the decline of farmland and so on. For many years, young people tend to flee from rural village and move to big city for education or jobs. This common trend is happening across all rural areas in Japan recently. Therefore, Japan is slowly becoming unbalance country with majority of the population are in the urban cities such as Tokyo, Osaka and Nagoya…. In addition, the disappearance of farmland is a big problem that need to be working on. In some rural regions, the farmland has declining caused by the rural population is shrinking and aging. The remaining farms are run by elderly farmers and they might stop farming soon when they get older.

In our onsite team project, we try to investigate the current structure of the agriculture activities as well as the most difficulties that faced by the local farmers and suggest solution for these problems.

Our project aimed to achieve the following outcomes:

II. Study area

Kita-hiroshima town is a town in Yamagata District, Hiroshima Prefecture, Japan. Kita-hiroshima was formed on February 1, 2005 from the merger of the towns of Chiyoda, Geihoku, Oasa and Toyohira which are all from Yamagata district.

Kitahiroshima is classified as a mountainous area of an altitude of 200m~1223m located in the northern part of Hiroshima prefecture with a land area of 646.24 km² consisting 7.6% of

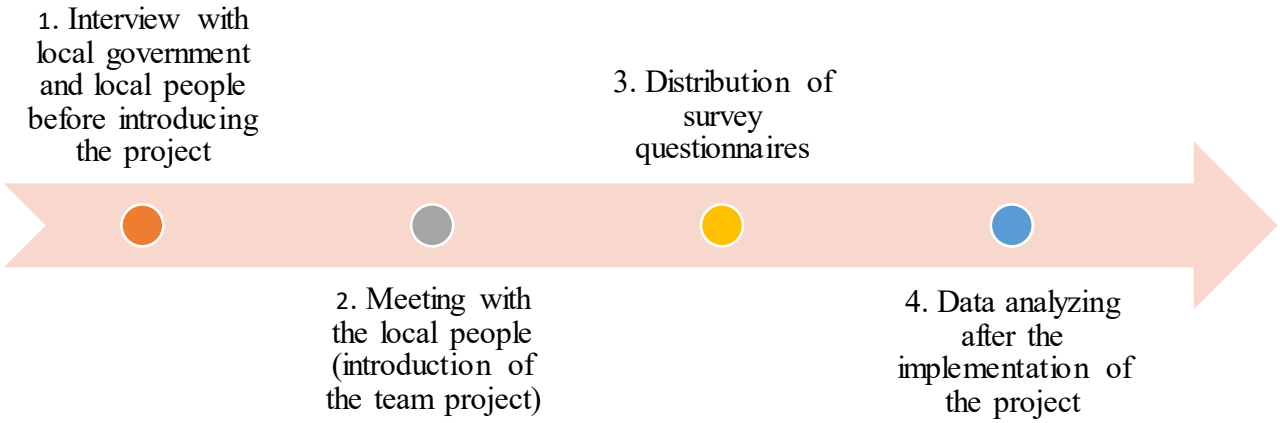
the prefecture. As of 2018 census, Kita-hiroshima houses 18,840 people and 8,591 households (Kitahiroshima Town Official Website, October 2018).

Figure **1**: Location of Kita Hiroshima
(Source: https://www.town.kitahiroshima.lg.jp/site/teijuu-joho/)

III. Methodology

Social course is responsible for investigating the current structure of the agriculture activities as well as the most difficulties that faced by the local farmers by questionnaire survey. After conducting a survey, we are able to identify the various challenges that local farmers are facing then propose a potential solution. Understanding the local people willingness to join a new project is also important for the success of the project. After the implementation of the project, a survey will be conducted to study the impact of the project on the production of the farm as well as the other aspect of local people's life.

Figure 1: Data Gathering and Survey Method



IV. Results

The result in table 1 describes the descriptive statistics of 63 respondents in Kita Hiroshima. The average age of respondents is relatively high (65 years old). This represent for the typical aging population in this region. According to the table, more than 65% of respondents are working as farmer or related to agricultural activities, while 35% of respondents are working in other sectors.

Table 1: The descriptive statistics of respondent in Kita Hiroshima Prefecture

Variable	Number of observations	Average	Minimum	Maximum
Age (years)	63	65.31	28	85
Gender (1= male, 0=female)	63	0.90	0	1
Number of HH member	61	2.90	1	6
Occupation (1=farmer, 0=otherwise)	60	0.65	0	1
Farmland size (ha)	57	14.96	0.03	174.01

The questionnaire also asked respondent about the main problem in the community that they think are important. Overall, aging population was the most fundamental problem followed by depopulation and no successor of the farm, 24% 22% and 20% respectively. Besides, the attack of wild animals in the farmlands was also a big problem (Figure 2).

In addition, figure 3 presents the most pressing issues of the household. 37% of respondents were stressed by the low profit from farming. The second most pressing issue was that they worried no one will take care of their farm after they are getting older (20%), followed by the loss of their crop due to animal attacked.

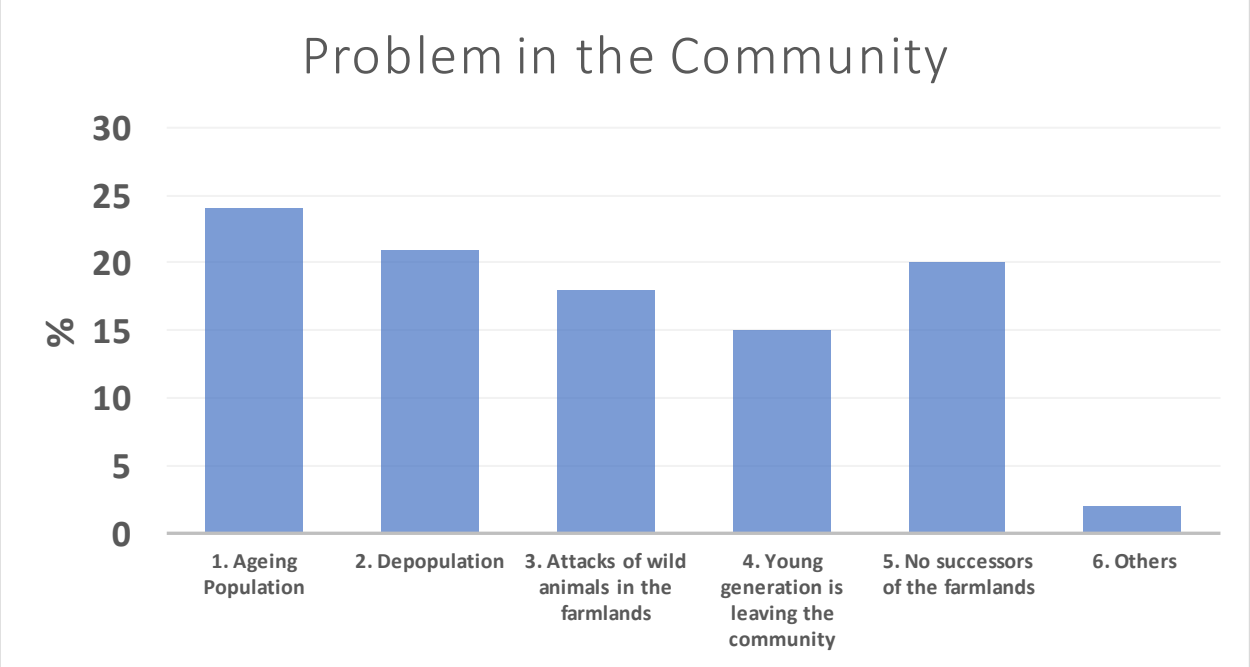


Figure 2: The main problems that community is facing

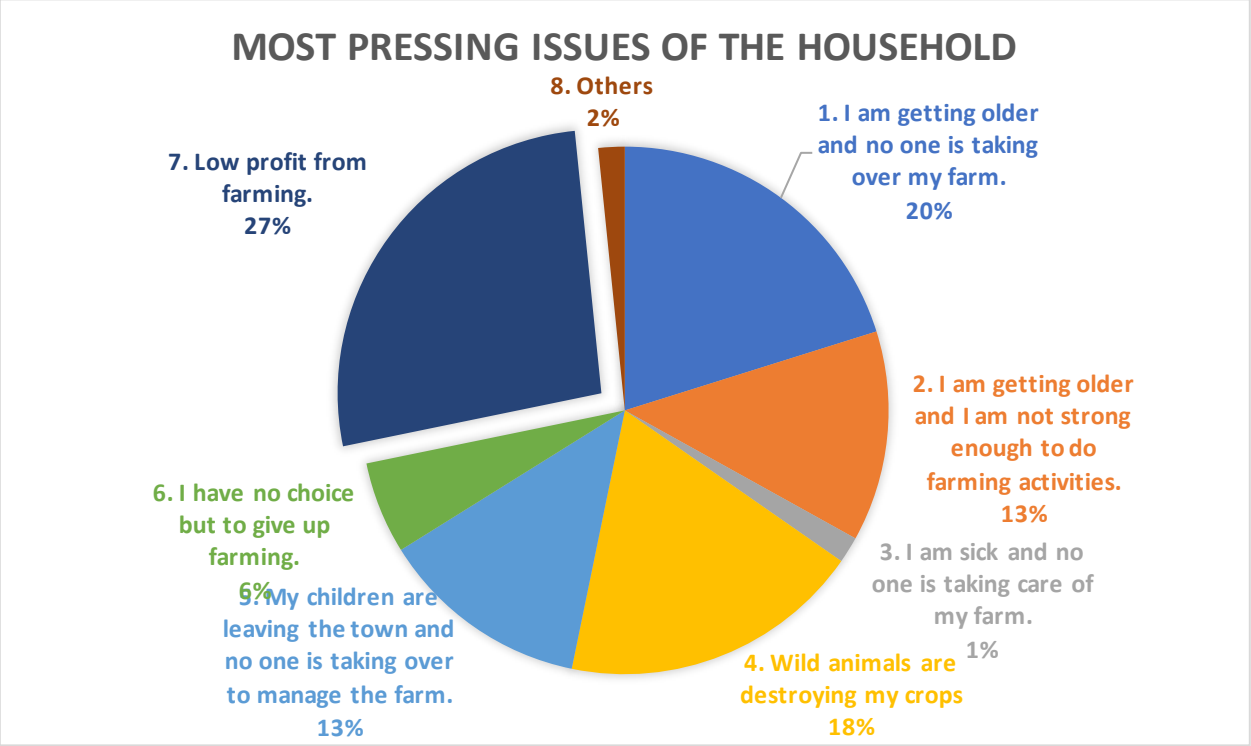


Figure 3: The most pressing issues of the household worries the most

Figure 4 and 5 indicates the main health problems that respondents were experiencing when they do farming activities. Overall, they responded that their hands are very weak, and it is difficult for them to carry the heavy things; especially during harvesting season. The other main physical limitations are either their whole body, back or legs.

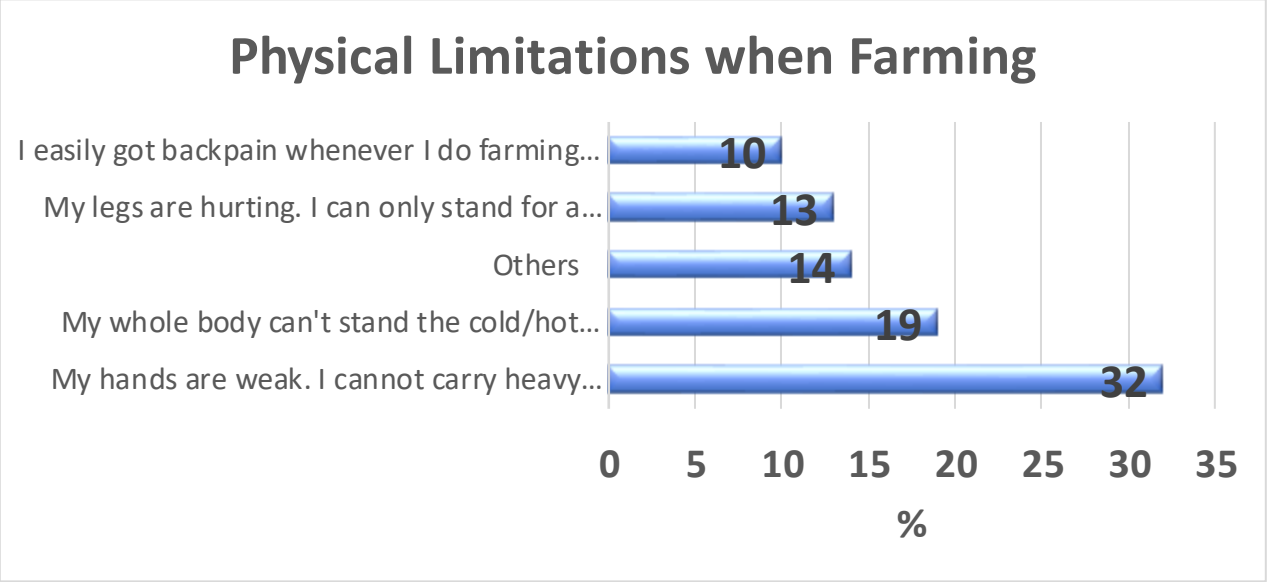


Figure 4: The main physical limitations when do farming

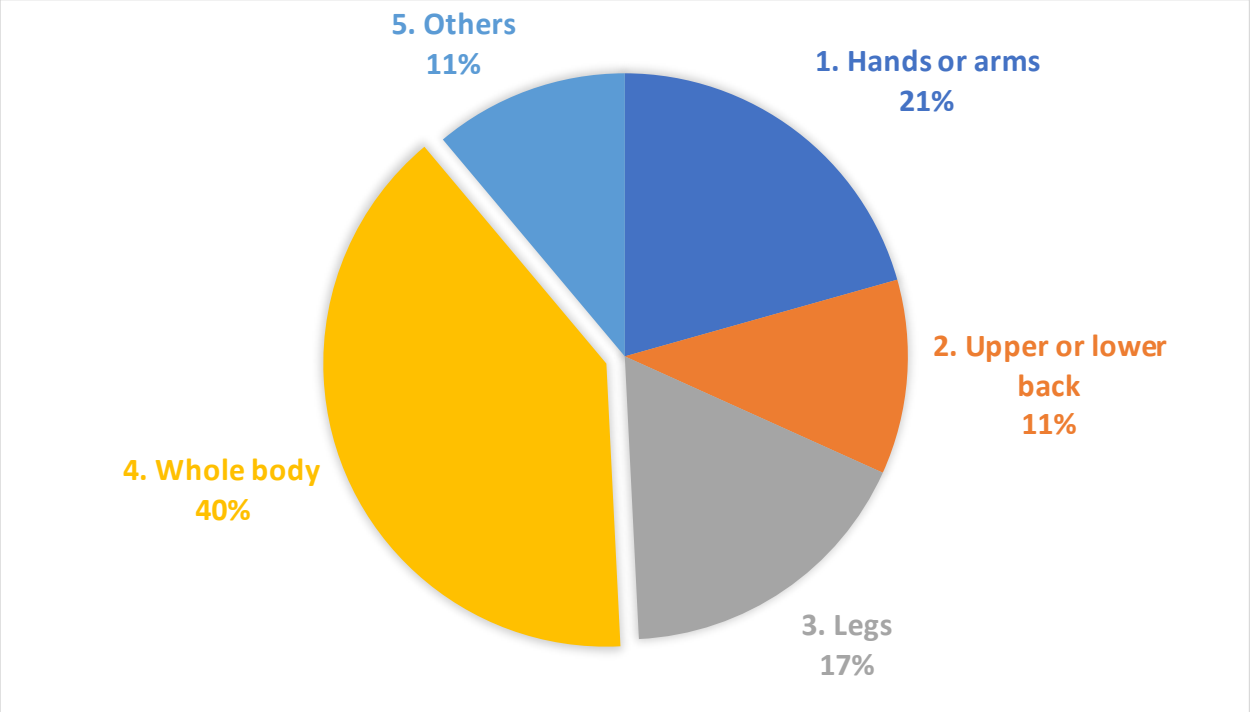


Figure 5: Which part of the body that most pain when do farming?

Regarding the willingness to try new agricultural assistive tools that are helpful, 61% respondents agreed to try if it's affordable and safe (Figure 6). Thus, easy to use and affordable are two crucial factors when designing any new assistive tools.

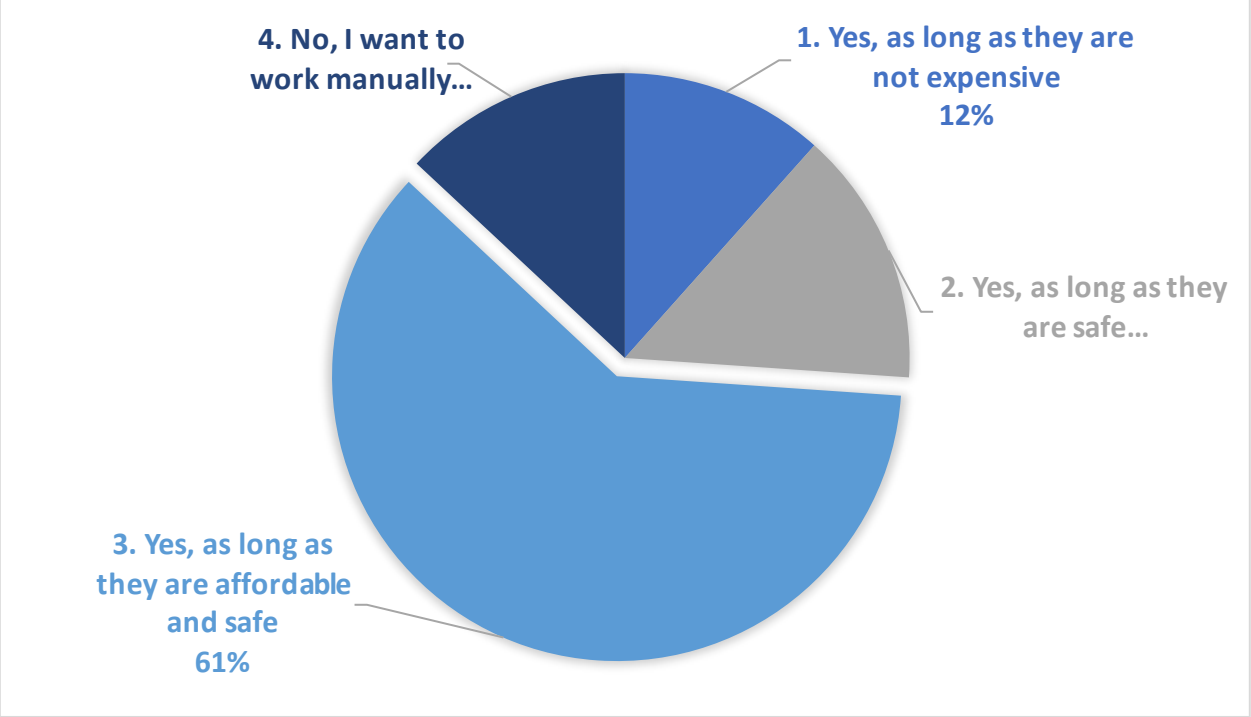


Figure 6: If there are new agricultural assistive tools that are helpful for you, would you want to utilize them?

V. Conclusion

After analyzing the data, we are able to identify the various challenges that local farmers are facing such as the physical limitation when doing farming and the attacking of wild animal to the crops. We proposed a technical solution to solve these challenges that most farmer are facing. Firstly, providing new and improved assistive tools to improve and reduce chances of muscle fatigue and stress for farmer. Secondly, developing a detection and tracking device system to track the movement of wild animals to that farmer can use the data to take an evasive action. These solutions are expected to be used by not only farmer in Kita Hiroshima but also farmer in other rural areas of Japan.

Appendix 2: A survey under the Onsite Team Project of and with the support from Hiroshima University TAOYAKA Leading Graduate School Program

Code: _____

[Name: Optional] _____

Age of Head of the Household (HH): _____

Gender of HH Head: 1. Male 2. Female

Total number of household members: _____

Occupation of HH head: _____

No. of managed farmland in hectares: _____

Instruction: Check the box that corresponds your answer. You can choose one or more answers.

1. What are the problems that your community is facing?

- □ Ageing population
- □ Depopulation
- □ Attacks of wild animals in the farmlands
- □ Young generation is leaving the community
- □ No successors of the farmlands
- □ Others: _____

2. What is the most pressing issue in your household that worries you the most?

- □ I am getting older and no one is taking over my farm.

- □ I am getting older and I am not strong enough to do farming activities.
- □ I am sick and no one is taking care of my farm.
- □ Wild animals are destroying my crops (Please proceed to no. 3 and no. 4)
- □ My children are leaving the town and no one is taking over to manage my farm.
- □ I have no choice but to give up farming.
- □ Low profit from farming
- □ Others: _____

3. How often you face wild animal invasion
   - □ Every day
   - □ During Planting and Harvest Season
   - □ Others _____
4. Does fencing around farmlands stops the animal invasion
   - □ Yes
   - □ To some extent
   - □ No
5. I do farming because:
   - □ It is my primary source of income.
   - □ It has been in my family for several years now.
   - □ I love to farm and it is part of my everyday life.

□ Others: _____

6. Do you think farming is a very important livelihood in your community?

□ Yes, because

_____

□ No, because

_____

7. Until what age do you want to do farming activities?

□ 60-65 years old

□ 65-70 years old

□ 75-80 years old

□ As long as I want to

8. As you age, what certain health problems are you experiencing that hinder your farming activities?

□ My hands are weak. I cannot carry heavy things.

□ My legs are hurting. I can only stand for a limited time.

□ My whole body can't stand the cold/hot weather.

□ I easily get backpain whenever I do farming activities.

□ Others: _____

9. Have you had injuries while doing agricultural work?

□ YES

If yes, what kind? _____

□ NO

10. Which time is very difficult to do farming?

□ Plantation

□ Irrigation

□ Fertilizing

□ Harvesting

□ Others. Please specify _____

11. Until to what extent do you want to use your body for farming?

□ I want my hands to still continue do farming

□ I want my legs to be strong so I can continue do farming

□ I want my body as healthy as possible so I can still manage my farmland despite my old age

12. What activities do you do during non-farming season such as winter season?

□ Community assembly

□ Join local festival such as : _____

□ Others: Please specify

13. If there are new agricultural assistive tools that are helpful for you, would you want to utilize them?

- □ Yes, as long as they are not expensive
- □ Yes, as long as they are safe
- □ Yes, as long as they are affordable and safe
- □ No, I want to work manually.
- □ No, I want to use the tools that I already have.
- □ I don't know.

14. What are the factors you want to consider if these tools are introduced for farming?

- □ Affordable
- □ Portable
- □ Safe
- □ Easy to use
- □ Not heavy
- □ Others: _____

15. Do you think that new agricultural assistive tools can improve your everyday life?

- □ Yes, because they ease my workload.
- □ No, I don't think so.
- □ Other reason: _____

16. What do you think is the local culture that best describes your community?

- □ Rice farming
- □ Strong community ties
- □ Other: _____

17. Do you think that younger generation needs to know more about farming?

- □ Yes, younger generation needs to know about farming.
- □ Yes, but younger generation is going out to live in more urbanized area.
- □ It depends on their willingness to know.

18. What are the things that still make you proud that you live in Kita-hiroshima?

- □ We have a very unique culture.
- □ I have strong connection towards my farmland.
- □ I have good relationship with other community members.
- □ Other: _____

Appendix 3: Household survey Questionnaire in Vietnam

Name of village	
Household No.	
Name of respondent	
Gender:	
Date	

Section 1: Household Roster

No	Name	Age	Gender	Educ. Level	Marital status	Occupations	Ethnic group
1							
2							
3							
4							

ID Code:
Gender: 0 = Male, 1 = Female
Marital Status: 1 = single, 2 = married, 3 = divorced/separated, 4= spouse died
Education level: 0 = None, 1 = primary school, 2= secondary school, high school, 3= college, 4 = higher
Occupations: 1= government employee; 2= daily wage earner; 3= monthly worker; 4= farmer
5= self-employee; 6 = Not working (61 = seeking and/or available for work; 62 = attended school;
63 = retired person; 64 = remittance receipient; 65 = not able to work due to disability)
Ethnic group: 1= Kinh, 2= Nung, 3= Tay, 4= Dao, 5= Mong, 6= Hoa, 7= San Chay, 8= Other

SECTION 2: ECONOMIC ACTIVITIES (in the past 3 months)

2.1 SELF and WAGE EMPLOYMENT

Member's Name	What economic activities did you do? Beside this. What other activities did you do?	**1** Where did you do this activity?	**2** What was your major field of economic activities you engage?	**3** If you were engaged in agricultural sector, what was your employment status?	**4** If you were engaged in non-agri sector, what was your work status?

ID Code:

1 = where did you work? (11= in the village, 12 = outside the village (write the name))

2 = what was your major field of economic activities you engaged in? (21= agriculture, 22 = non-agriculture)

3 = If you were engaged in agricultural sector, what was your employment status? (31= day labourer, 32 = self-employed, 33 = employer, 34 = employee

4 = If you were engaged in non-agricultural sector, what was your work status? (41 =day labourer, 42 = self-employed, 43 = employer, 44 = employee

2.2 DAILY WAGE

Daily wage									
Member's Name	**1** Were you paid on a daily basis	**2** what was the daily wage in cash in the past 3 months	**3** Did you receive payment in kind?	**4** What type of in-kind payment did you receive?	**5** How much did you receive per day?	**6** What type of org do/did you work for?	**7** What is your gross remuneration per month?	**8** What is your total net take home remuneration monthly after all deduction?	**9** What is the total value of in kind or other benefit your received over the past 3 months?

ID Code:

1= Were you paid on a daily basis? (1= Yes, 2 = No (go to Q 6))

2= What was the daily wage in cash in the past 3 months? (21 = highest, 22 = lowest, 23 = average))

3= Did you receive payments in kind? (31 = Yes, 32 = No (next activity/next person))

4= What type of in-kind payments did you receive? (41 = rice, 42 = wheat/corn, 43 = meal, 44 = other)

ID Code:

6 = What type of organization do/did you work for?

1= Government organization

6= NGOs

2= Autonomous body
3= Private office
4= Private mill/factory
5= Local government (village office)
7=Household
8=Other (specify)

SECTION 3:
MICROFINANCE STATUS

1. Has anyone in your household taken a loan so far?	Yes (Case 1) Go to 2 and 3 No Go to 4
2. Which program of VBSP did you borrow money from?	(code) (code) (Code)
3. When did you join each program in VBSP?	
4. Is anyone in your household taking loan from other MFIs?	Yes (Case 2) No (Case 3)
5. Is anyone in your household taking informal credit/loan?	Yes (Case 2) No Go to Q

6. If your household belong to **case 1**, please answer these questions?

	1	**2**			**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Household member's name (ID if have)	When did you start?	Purpose of loan? (You can choose up to 3)			Amount (VND)	Loan term (month)	Interest rate (%)	Repayment method?	From which program?	Through which association? If any?	Do the repayment process now? (1= Yes, 0=No)	When did you join the saving and lending group?	How much do you have to deposit monthly under the group's regulation? (if any)	How many times do you deposit per year?	How much do you deposit each time?
		2.1	2.2	2.3											

2. Purpose of loan	**6. Repayment method**	**7. VBSP's Programs**		**8. Association**
1= Agricultural activity	1= monthly	1= Poor Households Program	6= Safe water and Rural Sanitation Program	1= Farmer association
2= Livestock breading	2= quarterly	2= Near-poor Household program	7= Extremely Disadvantaged Ethnic Minority program	2= Women's Union
3= Forestry activity	3= yearly	3= Disadvantaged student program	8= Housing support Program for the Poor	3== War veterans Association
4= Fishery activity	4= at the end of loan term	4= Job Creation Program	9= Others (Specify)	4= Old Person's Association
5= Self business	5= other (specify)	5= Program for Business and Production Household Living in Extremely Disadvantaged Areas and Communes		5= Young Union
6= Education				
7= Health				
8= House building		0= informal loan		
9= Buying durable goods				
10= Others (specify)				

7. If your household belong to **case 2**, please answer these question

	1a	**2**			**3**	**4**	**5**	**6**	**8**	**9**	**10**	**11**	**12**
Household member's name (ID if have)	Which MFIs and other source did you borrow money? (code)	Purpose of loan? (You can choose up to 3)			Amount (VND)	Loan term (month)	Interest rate (%)	Repayment method?	Through which association? If any?	Do the repayment process now? (1= Yes, 0=No)	When did you join the saving and lending group?	How much do you have to deposit monthly under the group's regulation? (if any)	How many times do you deposit per year?
		2.1	2.2	2.3									

8. If your household belong to case 3, please answer these question

	1b	**2**	**3**	**3**	**4**	**5**	**6**	**7**	**8**
Household member's name (ID if have)	Have you ever taken a loan so far? (0= No, If yes, please specify code)	When did you start borrowing?	Purpose of loan? (Code)	Amount (VND)	Loan term (month)	Interest rate (%)	Repayment method?	Do the repayment process now? (1= Yes, 0=No)	Why don't you join any MFIs/ VBSP program? (Code)

Other lending sources: 1a, 1b	**8. Main reason**
1. Agribank	1. Did not meet requirement
2. NGO Micro finance institutions (NGO MFIs)	2. Did not need to borrow
3. Other Commercial bank	3. Complicated procedure
4. Private money lender	4. Other
5. Friends	
6. Relatives	
7. Other	

SECTION 4. Have you joined any association in your place?

13.1 If yes, what is the association and the purpose of this association? [ ] (1= Yes, 0= No)

13.2 How do you judge the association activities? [ ] (5= Excellent, 4= good, 3= satisfactory, 2= unsatisfactory, 1= very poor)

13.3 If not, do you want to join any association? [ ] (1= Yes, 2= No)

13.4 What association would you like to join?

13.5 What do you expect from joining this association?

SECTION 5: HOUSEHOLD LANDHOLDING

5.1. Landownership in 2015-2016

No.	Category	Area (Ha)	Ownership (Yes=1, No=0)	Name of the crop	Main Production (kg)	Price/kg
1	***Forest land***					
	1. Cultivated					
	2. Uncultivated					
	3. For Lending					
2	***Agricultural land***					
	1. Cultivated					
	2. Uncultivated					
	3. For Lending					
3	***Residential land***					
4	***Other, specify***					
5	***Total land owned***					

SECTION 6: ASSET AND SAVING

1. Type of house (code)		

1= concrete, 2= Wood, 3= Clay, 4= Other (specify)

2. Production assets **Ownership**: 1= Sole ownership, 2= joint ownership, **Purchased or gift**: If purchased, specify price; if gifted, encode 0

		No. of units	**Ownership (code)**	**Year of purchased**	**Purchased or gift (code)**
1	Truck				
2	Threshing machine				
3	Plough machine				
4	Others				

3. Durable goods

		No. of units	**Ownership (code)**	**Year of purchased**	**Purchased or gift (code)**
1	Car				
2	Motorbike				
3	Bicycle				
4	Television				
5	Refrigerator				
6	Gas stove				
7	Cell phone				

SECTION 7: AGRICULTURE - CROP PRODUCTION (In the past 3 months)

7.1 From agro-forestry and crop production

If Yes, please fill in the table below, if No, (do not fill in the table below)

	1	**2 (3+4+5)**	**3**	**4**					**5**	**6**	**7 (2*6)**
Crop/products	**Area of Production**	**How much in total of total production?**	**Own use**	**Sold**					**Still On stock**	**Price per unit**	**Total value**
				Quantity	*Unit price*	*Place*	*Distance*	*To whom (*)*			
	Ha	*Kg*	*Kg*	*Kg*					*Kg*	*VND*	*VND*
Rice											
Corn											
Sugarcane											
Potato											
Onion											
Garlic											
Tomato											
Green banana											
Papaya											
Chili											
Jackfruit											
Bean											
Pineapple											
Melon											
Orange											

(*) At farm =1; Village market =2 outside the village = 3; Others = 4

7.2 costs for agro-forestry and crop production (In the last 3 months)

Inputs	Cost (VND)
Seeds	
Fertilizers	
Pesticides and herbicides	
Hired labour	
Hired machine	
Transport	
Payment for land rental	
Own use inputs	
Others (extension fee, etc), specify	
Total	

SECTION 8: FORESTRY PRODUCTION (In the past 3 months)

8.1 From forestry production

If Yes, please fill in the table below, if No, (do not fill in the table below)

	1		2	3 (4+5+6)	4	5					6	7	8 (2*6)
products	**Where to collect?**		**Area of Production (if any)**	**How much in total of total production?**	**Own use**	**Sold**					**Still On stock**	**Price per unit**	**Gross value**
	1.1 Forest type (code)	1.2Ownership (code)				*Quantity*	*Unit price*	*Place*	*Distance*	*To whom (*)*			
			Ha	*Kg*	*Kg*	*Kg*	VND		*km*		*Kg*	*VND*	*VND*
Timber													
Bamboo													
Bamboo Shoot													
Mushroom													
Firewood													
Other, specify													

1.1 Forest Type: 1= assigned production forests; 2= Non-assigned production forests, 3= Community forests, 4= Other, specify

1.2 Ownership: 1= Yes, 2= No

(*) At farm =1; Village market =2 outside the village = 3; Others = 4

8.2 Production costs for agro-forestry and crop production

Inputs	**Cost (VND)**
Seeds	
Fertilizers	
Pesticides and herbicides	
Hired labour	
Hired machine	
Transport	
Payment for land rental	
Own use inputs	
Others (extension fee, etc), specify	
Total	

SECTION 9: LIVESTOCKS PRODUCTION (In the last 3 months)

9.1 From livestock's Production If Yes, please fill in the table below, if No, (do not fill in the table below)

Livestock		**1**	**2**	**3**					**4**	**5**	**6 (2+3+4)**	**7 (5*6)**
		Unit	**Own use**	**Sold**					**Still On stock**	**Price per unit**	**Production**	**Total value**
				Quantity	*Unit price*	*Place*	*Distance*	*To whom (*)*				
Cow	Meat	kg										
	Breeder	individual										
Buffaloes	Meat	kg										
	Breeder	individual										
Pig	Meat	kg										
	Breeder	individual										
Goat	Meat	kg										
	Breeder	individual										
Duck	Meat	kg										
	Egg	egg										
Chicken	Meat	kg										
	Egg	egg										
Horses	Meat	kg										
	Breeder	individual										
Other		kg										

(*) At farm =1; Village market =3 outside the village = 3; Others = 3

9.2 Production costs for livestock production

	1	2	3	4	5	6= 2+3+4+5
Livestock	**Breeder (VND)**	**Purchased feed/fodder (VND)**	**Veterinary services (VND)**	**Input from own farm (VND)**	**Other costs (VND)**	**Total cost**
Cow						
Buffaloes						
Pig						
Goat						
Duck						
Chicken						
Horses						
Other						

SECTION 10: AQUACULTURE PRODUCTION (In the last 3 months)

	1	2	3					4	5 (2+3+4)	6(4*5)	7	8(6-7)
Type of fish	**Unit**	**Own use**	**Sold**					**Price per unit (VND)**	**Total catch or production**	**Gross value**	**Costs**	**Net Income**
			Quantity	*Unit price*	*Place*	*Distance*	*To whom (*)*					
	kg											
	kg											
	kg											
	kg											
	kg											
	kg											

SECTION 11: OTHER PRODUCTIONs

Type of income	Total amount received	From Who
Total		

SECTION 12: HOUSEHOLD MONTHLY EXPENDITURE

Items	Quantity (Kg)				Price/Unit	Total value (vnd)
	Home Produced	Purchased	Gifts/Kind wages/loan	Code[1]		
I. Cereals/crops						
1. Rice						
2. Maize						
3. Wheat						
4. Soybean						
5. Groundnut						
6. Sesame						
7. Others (specify)						
II. Fruits and Vegetables						
1. All vegetables (chilli, onion, garlic, etc)						
2. Fruits (pumpkin, cucumber, etc)						
III. Milk and Milk Products						
1.Milk						
2. Butter						
IV. Other Food Items						
1.All spices (salt, pepper, etc.)						
2. Sweets, biscuits, etc						
3. Tea, coffee, sugar, etc						
4. Meat/fish/chicken/eggs						
5. All types of edible oils (soybean, etc)						

V. Non-Food Items						
1.Alcohol, Beer, etc						
2.Tobacco, cigarettes, etc						
3. Minor household articles						
4. Kerosene						
5. Firewood, etc						
6. All types of cosmetics (hair oil, soaps, toothpaste, detergent, etc)						
7. Electricity and Water charges						
8. Clothing and shoes						
9. Furniture (tables, chair, etc)						
10. Watch, TV, fan, etc						
11. Vehicles (motorbike, car, etc)						
12. Medical expenses (fees)						
13. Education expenses (fees)						
14. Taxes (house, land, vehicles, etc)						
15. Travel/Petrol, vehicle maintenance, etc						
16. Ceremonies (marriage, donation...)						
17. Entertainment (telephone bills, drinking, gambling…)						
VI. Other purchases						
1. Land						
2. Livestock						
3. Farm implements & machinery repairs						
4. Stationery, post, etc						
5. Others (specify)						

Note: Code[1]- 1= Kind wages, 2 = Gift from agency, 3 = Gift from individual or relative, 4 = Loan