

ACCESS TO CREDIT AND SELF-EMPLOYMENT

A Master's Thesis

by

EMEL SELÇUK

Department of Economics
Bilkent University
Ankara
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To My Family and Zeynep

ACCESS TO CREDIT AND SELF-EMPLOYMENT

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EMEL SELÇUK

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I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

Asst. Prof. Çağla Ökten
Supervisor

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

Asst. Prof. Taner Yiğit
Examining Committee Member

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

Asst. Prof. Zeynep Önder
Examining Committee Member

Approval of the Institute of Economics and Social Sciences

Prof. Dr. Erdal Erel
Director

ABSTRACT

ACCESS TO CREDIT AND SELF-EMPLOYMENT

Selçuk, Emel

M.A., Department of Economics

Supervisor: Asst. Prof. Çağla Ökten

January 2006

This thesis analyzes the impact of access to credit on self-employment. It examines the influence of knowing a place to borrow on the likelihood of owning a business. The analyses are made on farm and non-farm businesses separately. The impacts of different borrowing sources are also discussed. In addition, all these analyses are differentiated between male and female self-employment. It is found that access to credit is a significant determinant of self-employment, but its impacts vary for different sources of borrowing, the sector of self-employment and the gender of the people.

Keywords: Borrowing, credit, self-employment

ÖZET

KREDİ OLANAKLARI VE SERBEST MESLEK SAHİBİ OLMAK

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Bu çalışma kredi olanaklarının serbest meslek sahibi olma üzerine etkisini incelemektedir. Borç alınabilecek bir kurum yada kişi tanımanın kişinin kendi işinin sahibi olması olasılığına etkisi araştırılmıştır. Analizler çiftlikler ve diğer işletmeler için ayrı yapılmıştır. Ayrıca, farklı kredi kaynaklarının etkileri tartışılmıştır. Tüm bu incelemelerin sonuçları erkek ve kadınlar için de ayrılmıştır. Sonuç olarak, kredi olanaklarının serbest meslek sahibi olmada önemli bir faktör olduğu saptanmış, ancak kredi kaynaklarının türüne, serbest mesleğin hangi sektörde gerçekleştirildiğine ve kişinin cinsiyetine göre sonuçların değiştiği gözlenmiştir.

Anahtar Kelimeler: Borçlanma, Kredi, Serbest Meslek

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CHAPTER 1

INTRODUCTION

The role of self-employment in the labor market has emerged as an important aspect in recent years. The self-employed constitute an important part of labor force in many countries. Since many countries consider self-employment as a possible solution to their unemployment and poverty problems, government programs have been designed to encourage people to enter into self-employment. Therefore, it becomes important to find the determinants of self-employment and the number of academic studies dealing with this issue has increased recently. There are, of course, many factors leading people to choose this employment status. The evidence shows that individual characteristics and abilities, family background, occupational status and liquidity constraints significantly affect the self-employment choice.

The studies especially concentrating on liquidity constraints imply that availability of the initial capital required to set up a business is a significant determinant of self-employment. In these studies the role of family assets, windfall gains and inheritance are examined as providing initial capital to enter into self-employment. However, people can also obtain this initial capital by borrowing. For this reason, it will be beneficial to examine access to credit as a factor affecting people to enter into self-employment. The aim of this paper is to examine the influence of access to credit on self-employment. To achieve this aim, the effect of

knowing a place to borrow on owning one's own farm or non-farm business is analyzed and also the impacts of knowing different borrowing sources are examined. Our estimation results imply that there is positive and statistically significant relation between credit access and self-employment. Also they show that different credit sources have different effects on non-farm and farm self-employment.

The thesis is organized as following: Chapter 2 describes the conceptual framework, chapter 3 gives information about Indonesian labor and credit markets, chapter 4 presents the data, methodology and the variables, the estimation results are given in chapter 5 and lastly, chapter 6 is the conclusion part.

CHAPTER 2

CONCEPTUAL FRAMEWORK

Some individuals who want to enter self-employment are liquidity constrained, since they need some capital to meet the initial costs of business start up and those who cannot raise this capital are denied access into self employment. In their article, Evans and Jovanovic (1989) try to find the answer of the question: “Do liquidity constraints hinder people from starting businesses?” This paper examines the importance of liquidity constraints by estimating a model of entrepreneurial choice in which the tightness of liquidity constraints is a parameter. In this model, an individual have to decide to either remain as a wageworker or become an entrepreneur. If his entrepreneurial earnings are greater than his earnings from remaining as a wageworker, he chooses to be self-employed. However, he faces a liquidity constraint in this choice. This constraint tells the maximum amount of capital that the entrepreneur can control. They test this model empirically and find that almost all entrepreneurs in their sample are estimated to devote less capital to their businesses than they would like to. They conclude that liquidity constraints reduce the amount of capital flowing to entrepreneurship in two ways. First, it will prevent some people from trying entrepreneurship. Second, individuals who do try entrepreneurship use less capital because of the constraint.

As Evans and Jovanovic (1989) show the existence of liquidity constraint on entrepreneurial choice, the later studies begin to search for the impact of availability of capital on this entrepreneurship decision. Blanchflower and Oswald (1998) claim that the initial capital required to set up a self-employment enterprise is often obtained through accumulation, gifts, inheritances or loans. They find that inheritance is a significant source of start-up capital and that the relationship between the size of inheritance and the propensity to be self-employed is positive until an inheritance of 12000 Pound. This also shows that availability of capital is a significant factor in self-employment choice and there is liquidity constraint on those who want to be self-employed.

Another study that shows how availability of capital influences the propensity to be self employed is the study of Uuisitalo (2001), "Homo Entreprenaurus". It examines the determinants of self-employment and transitions from salaried employment to self-employment using two sets of Finnish data from the 1990s. He claims that it is possible that wealthier parents provide capital for starting a firm. Sons of wealthier parents can potentially obtain a loan without collateral or they can inherit from their parents. He finds that parent's earnings have a positive but small impact on the probability of self-employment. Sons of wealthier parents are more likely to become entrepreneurs, pointing to potential effects of liquidity constraints. Again this study implies that providing better financial incentives or relieving liquidity constraints could have a positive impact on business start-ups, but the impact is likely to be small.

Another study dealing with the constraints on entrepreneurial activities caused by a lack of capital is Taylor (2001) “Self Employment and Windfall Gains in Britain”. This article provides new evidence on the impact of windfall gains on transitions to self-employment, survival rates of self-employment and growth of entrepreneurial activities using British Panel Data. Receiving a windfall gain reduces this liquidity constraint by providing this necessary initial capital or by providing sufficient collateral to raise it externally. Following this reasoning, he finds that the probability of entering self employment is a quadratic function of the amount of windfall payment received, reaching a peak with a payment of about 15000 Sterling. This non-linear relationship is similar to that found by Blanchflower and Oswald (1998), Evans and Jovanovic (1989) and Evans and Leighton (1989). All these studies together imply the validity of liquidity constraint hypothesis, as they find an initial positive relationship between the probability of entering self-employment and the amount of windfall payment, inheritance or family assets.

A windfall gain or family assets is not the only way of obtaining the required initial capital to start up a business. An individual who wants to be self-employed can find this initial capital by using his access to credit. He can borrow from a bank, a friend, family or some other credit source. In some countries, governments initiate micro credit programs to provide credit for poor households. Microcredit programs by providing credit and other development services to the poor households make considerable changes in a rural economy. In Khandker and Samad (1998), authors try to determine the effects of the three most important microcredit programs of Bangladesh, namely Grameen Bank, BRAC and BRDB. They find that these

programs have influenced income, production and employment in rural non-farm sector. Also they observe that self-employment grows at the expense of wage employment in the villages in which these programs have been applied. This finding gives us some insight on that access to credit is positively related to self-employment. Their study shows that if village has Grameen Bank, self-employment in non-farm activities has grown by 51%, while wage employment in farm activities decreases by 39 percent. This means microcredit programs lead to an increase in self-employment by making people switching from wage employment to self-employment.

Another study on the effect of micro credit programs on employment again is conducted with Bangladesh data. Pitt (1999), in his study, “The effect of Non-agricultural Self-employment Credit on Contractual relations and Employment in Agriculture” examines the impact of group-based credit for the poor in Bangladesh on the supply of agricultural labor. The group based micro credit programs provide production credit for non-agricultural activities to especially landless and assetless rural households. The estimates show that both female and male participation to this micro credit program leads to a significant increase in own-cultivation and increase in male hours in field crop self employment with a decline in male hours in the wage agricultural labor market. Thus, he suggests that program credit induces a substitution away from agricultural wage labor in favor of self-employment in agriculture. He emphasizes that the elasticity of latent male self-employment hours with respect to male credit is as high as 0.15.

CHAPTER 3

THE INDONESIAN SETTING

Indonesia is the fourth most populous nation in the world and it contains many different ethnic groups. Although urban centers grow in terms of their economic activity and size of their populations, Indonesia remains a largely agricultural country. There are great differences in its urban and rural settlements. The population densities are smaller in rural areas, while it reaches to 700 people per square kilometer in some urban settlements. The capital city Jakarta is the economic and political center of the country.

Compared to its situation thirty years ago as being one of the poorest countries in the world, its economy started to catch up middle income countries before the crisis. It enjoyed high economic growth rates, prior to the crisis in 1997. The share of agriculture in employment gradually declined, as the industry and service sector grew. The share of agriculture in employment declined from 55% in 1980 to 41% by 1997. The fraction of Indonesians worked in urban areas increased from a fifth in 1980, to a third in 1997. Over the same period, the share of labor force working in industry more than doubled from 8% to 19%. In the same manner, during these years, employment in the formal wage sector was rising from a quarter to a third of all jobs.

In a developing country like Indonesia, self-employed people constitute an important share of labor force. In the period of growth, there is a decrease in the percentage of self-employed men, in contrast to increase in the percentage of self-employed women. However, if we look at data for urban and rural separately, we observe that actually the percentage of self-employed men living in urban areas increased but it decreased in rural areas. The share of self-employed women in both urban and rural areas increased at that period. Compared to men, the share of self-employed women is smaller but it has considerably increasing.

Based on the study of the Center for Research and Development of the Ministry of Manpower and ILO (1986), the data indicated that the majority of employment opportunities in rural Indonesia were generated by small-scale businesses. Small industries usually are those processing agricultural products such as foods/snacks and beverages. Besides they also produce handicrafts, souvenirs/gifts, and garment products. Non-farm enterprises in rural areas are of small-scale and home-based with an average number of labor force of less than 10 persons. Small-scale industries are mainly concentrated on Java Island where the central government is located. Besides, in Java, better facilities such as marketing, transportation networks, and financial institutions are available. The island also offers these small-scale businesses more potential consumers, skilled labor, and raw materials. (Baroroh, 2001)

The developments in economy have reflected also into a significant expansion in financial services. The number and service private banks, government banks, informal credit institutions like moneylenders and rotating savings and credit

associations have improved over the past three decades. Also access to credit among poor households was increased with new credit sources such as co-operatives, neighborhood institutions and new government programs.

In August 1993, the Indonesian government initiated a large-scale poverty reduction program called IDT aiming to promote saving and credit access to poor households. This program provided assistance to poor villages. The “family welfare savings” and “family welfare business credit” schemes were introduced in 1995. These schemes aimed to provide initial capital for small business formation as one of their main objectives. They give priority to poor women in rural areas by giving an initial savings of 2000 Rupiah.

Beside these government programs, banks also provide access to credit in rural areas. The Bank Rakyat Indonesia (BRI), established in 1950, is one of the most well established banks, has a growing network of over 4000 banks that provide financial services to approximately one third of Indonesian households, mostly in rural areas. It has a special importance in rural banking services and in the development of agriculture sector.

Although formal banking and financial services grew significantly, the informal sector still plays a key role in credit provision in Indonesia. This informal credit sector mainly rely on reputation, third party guarantees, tied contracts and threat of loss of future access to credit instead of collateral to screen borrowers. Therefore, individuals can more easily borrow from family, friends, employers, moneylenders, ROSCAs or arisans. (Ökten and Osili, 2004)

While Indonesia witnessing these economic achievements and optimism about future, all were challenged by a sudden economic crisis in 1997. Dramatic shifts in economy and politics occurred with this crisis. Only a few Indonesians have been not much influenced by the crisis. For some, the impacts of crisis have been devastating but for some, the crisis brought new opportunities. Exporters, export producers and food producers especially embraced new opportunities.

According to SUKERNAS and IFLS data, over 6% of males exited from labor market and 5% entered in this crisis. There is a great mobility in the labor market. The mobility is even greater among women, one quarter of the women begin working in 1998, while they were not working in 1997. In rural areas, the fraction of men working decreased and exit rate was higher for those with no education. About one quarter of women with no education left the labor force and an equal fraction entered in 1998. Among women, it is self-employment and unpaid family work that contributed the majority of exits and also absorbed the majority of new entrants. From 1997 to 1998, in urban areas, the share of self-employed men rose from 27.2% to 28.3% and in rural areas; it increased from 49.8 to 51.5 per cent. In the number of self-employed women in urban areas, there is a 0.3 percent decrease, while there is an increase by 1.3 per cent in rural areas. (Smith et al, 2002)

Workers will have shifted into those sectors benefited from the relative increase in price of exports and foods. Over 3 out of 10 males and 4 out of every 10 female switched sectors between 1997 and 1998. About half the males who exited the private sector entered self-employment. The crisis brought a significant change in the structure of employment in Indonesia as evidenced by high rates of turnover.

The crisis also affected the credit market. The extreme volatility in exchange rate led to considerable uncertainty in financial markets. This is reflected in interest rates which quadrupled in August 1997. The banking sector fell into disarray. All this turmoil in financial sector has shaken the confidence of investors and restricted the availability of credit.

CHAPTER 4

DATA AND METHODOLOGY

4.1 The Data

The Indonesia Family Life Survey is a large-scale integrated socio-economic and health survey that collects extensive information on the lives of respondents, their households, their families, and the communities in which they live. It offers rich detail about many aspects of the lives of the respondents including their labor market activities. The first wave of IFLS was conducted in 1993 and interviewed 7,224 households in 13 provinces in Indonesia; it is representative of about 83% of the population. The second wave, IFLS2, was fielded four years later and interviews were completed with 94% of all the original households. The IFLS is rich in content. With respect to this study, the IFLS instrument contains an extensive battery of questions regarding type of work, sector of work, history of work, education, assets, family characteristics and community characteristics beside basic individual characteristics. All the variables in this study are created using IFLS2 data and they reflect the situation of respondent in 1997, before the crisis fully reflected into markets and prices.

4.2 The Model

Since the dependent variable of owning a business is binary, we use a probit approach to estimate the general reduced form model of self-employment choice. Differently from the previous studies, we differentiate self-employment between farm and non-farm business, and estimate them separately. These equations are also estimated separately for men and women. Since there might be an endogeneity problem due to the relation between owning a business and knowing a place to borrow, we also use instrumental variable estimation. We estimate the following equation:

$$\begin{aligned} SE_i = & 1 (a_0 + a_1 \text{borrow}_i + a_2 \text{occs}_i + a_3 \text{age}_i + a_4 \text{agesqr}_i + a_5 \text{perexp}_i + a_6 \text{assets}_i \\ & + a_7 \text{assets2}_i + a_8 \text{hhsz}_i + a_9 \text{edu}_i + a_{10} \text{marstat}_i + a_{11} \text{gender}_i + a_{12} \text{urban}_i + \\ & a_{13} \text{mover}_i + a_{14} \text{migrate}_i + a_{15} \text{region dummies} + v_i \geq 0) \\ SE_i = & 1 \text{ if the person is self employed} \\ SE_i = & 0, \text{ otherwise.} \end{aligned}$$

This is our standard probit model, where 1 denotes the indicator function and $i = 1, \dots, n$, n is the number of observations. In this model, SE is self employment status, borrow is knowing a place to borrow, occs is occupational status, age is the age of the person, agesqr is the age squared, perexp is the per capita expenditure, assets is the value of family assets, assets2 is the assets squared, hhsz is the household size, edu is the total schooling years, marstat is the marital status, gender is the gender of the person, urban is living in an urban area, mover is moving in last five years, migrate is moving after age 12 for working and region dummies show the

province that person live in.

For the instrumental variable estimation we estimate the following equations,

$\text{borrow}_i = 1 \text{ (} b_0 + b_1 \text{ actsib}_i + b_2 \text{ commeet}_i + w_i \geq 0 \text{)}$ for non-farm business,

and $\text{borrow}_i = 1 \text{ (} c_0 + c_1 \text{ cmp}_i + u_i \geq 0 \text{)}$ for farm business

$\text{borrow}_i = 1$, if person knows a place to borrow

$\text{borrow}_i = 0$, otherwise

where actsib is the number of actively working siblings, commeet shows whether community meeting occurs and cmp is the participation to community meetings and w_i and u_i are the error terms.

4.3 The Variables

Self-employment: An employer is a person who operates his/her own enterprise or engages independently in a profession/trade and hires one or more employees. An own account worker also operates his/her own enterprise or engages independently in a profession/trade, but hires no employees. The employer and own account worker groups can be aggregated to give the total number of self-employed. In IFLS data set, the most appropriate variables to these definitions are the answers to the question that whether the person owns a farm or non-farm business. Since our objective is to show the relation between access to credit and self-employment, our dependent variables will be “non-farm business” and “farm business”. Non-farm business equals to 1, if the person owns a non-farm business and farm business equals to 1, if the person owns a farm business. In this way, we can examine how

knowing a place to borrow affects one owning a business, in other terms, being self-employed.

Age: Age can be considered as an index of an individuals accumulated lifetime learning. Calvo and Welisz (1980), in their study, claim that individuals acquire managerial skills through learning. Therefore, they suggest that age is a better indicator of this learning process than labor market experience. In line with this thought, Kidd (1993) argues that age is also an index of accumulation of capital that can be used to start up a business. Thus, age can be regarded as an indicator of both managerial skills and capital accumulated that is necessary to start one's own business. On the other hand, age can show an individuals attitude towards risk that is also effective in entering to self-employment. As an individual gets older than a certain age, they will be less unwilling to bear the stress and risks associated with self-employment. However, those people who are younger might be more willing to take on that risk. Self-employment studies that include an age variable generally report a significant and non-linear relationship with the propensity to be self-employed. Rates of self-employment, thus, are expected to be increasing with age, up to a certain level, but decreasing after that age.

Education: Although educational attainment is one of the major theoretical determinants of self-employment, there are many conflicting results on the relationship between education and self-employment from empirical studies. The reason of these conflicting results can be explained by that education affects propensity to be self-employed through several channels. On the one hand, education develops an individual's managerial ability and hence increases his propensity to be

self-employed. On the other hand, an individual having greater educational attainment can enter into the wage/salary sector more easily and this can avoid him in entering to self-employment. Studies by Rees and Shah (1986), Borjas (1986), Borjas and Bronars (1989) and Evans and Leighton (1989) show that a more educated person has a higher probability of choosing self-employment relative to a less educated person. However, studies of Evans (1989), de Wit and von Vinden (1989) and Kidd (1993) imply that a high level of education deters entry into self-employment. The studies that control for occupational status, a variable that is positively correlated with both educational attainment and propensity to be self-employed suggest a negative and statistically significant relationship between education and self-employment. In the light of these studies, we expect a positive relationship between schooling years and rates of self-employment until a certain degree of education, and it is expected to be negative for higher levels of education.

Occupational Status: Individuals often train for, and work in, occupations as employees before establishing their own business. Since occupations differ from each other in nature, their effects on individuals' choices on self-employment also differ. Some occupations can increase an individual's propensity to be self-employed. For example, an individual working in Sales or Hotel would be more likely to enter into self employment rather than another working as machine operator, since occupations like sales and repairs are more appropriate for contracting out and for self employment opportunities, according to Brock and Evans (1989). Brock and Evans (1989) and Evans and Leighton (1989) find that individuals employed in agriculture, sales, hotel, repairs, craft, managerial or professional occupations have a

relatively high propensity to be self-employed. Therefore, we can construct an occupational status dummy variable, which is equal to 1 for individuals formerly worked in these occupations, and we expect to find a positive relationship.

Total Assets: For an individual to enter into self-employment, first of all, he has to consider financial constraints. Availability of capital, thus, is a significant factor in models of self-employment. Evans and Jovanovich (1989) and Evans and Leighton (1989), have tested the importance of the availability of capital in transition to self-employment. To this aim, they used the net family assets to represent the net worth of an individual. A non-linear relationship between family net worth and transition to self-employment is found in both studies. Up to a certain level, there is a positive relationship but beyond this level of total assets, net worth reduces entry into self-employment.

However, in such surveys people tend to understate what they own, where as, per capita expenditure can be a better indicator of the net worth of a person. Therefore, we use per capita expenditure beside total assets to show the net worth of an individual.

Marital Status: In general, marriage is considered as an indicator of stability so it can be assumed that marriage provides an appropriate background for risky self-employment. If the person is married and his partner helps him in his business, he can choose self-employment more easily. Another side of being married is that a married couple can support each other in financing the start up of a business. Le (1999) explains that with the financial support of a spouse, a married person may be more willing to take the risk and family support may make self-employment less

demanding than it would otherwise be. Many empirical studies support these hypotheses by finding a positive relationship between marital status and the propensity to be self-employed, but this relationship is often insignificant. This implies the necessity of refinements to the marital status variable as Blanchflower and Oswald (1990) and Bernhardt (1994) show. They find a significantly positive relationship between having a spouse who works and propensity to be self-employed.

Household size: Similarly household size can be a determinant of self-employment. If household size is large, this can help the individual to choose self-employment since they can be reliable workers in family business or help the person to start up his business. Then, we expect a positive relationship between household size and self-employment. However, it can work in opposite way. As household size gets larger, the responsibilities of the individual also increase and this can avoid him from choosing risky self-employment. In this case, the relationship between household size and probability of being self-employed will be negative.

Location and Migration: Location may influence propensity to be self-employed. It is especially effective on the character of the business that the person may want to start. In our study we separate self-employment into farm and non-farm, so where the person lives is expected to be effective on this choice. The variable “urban” is equal to 1, if the person lives in an urban area, and 0, if the person lives in a rural area. This variable is expected to be negative for the farm business, while positive for the non-farm business.

In the literature, there are important works related on the immigrant's propensity to be self-employed. In these studies period of residence appears as a factor that can increase one's probability of self-employment. Borjas and Bronars (1989), Evans (1989) and Kidd (1993) analyzed the effect of the period of residence on employment choice and all found that as period of residence increases, the knowledge of the local market and customs, access to labor market and time to assess the tastes and preferences increases, so propensity to be self-employed also increases. However, in all these studies, they focused on people who migrate from different countries, while, in our study, migration is from one province to the other, not from a country to the other. This does not mean same reasoning would not work in our study. We use two different migration variables. The variable "migrate" shows whether the person moves another province after age 12 for reasons related to work. On the other hand, the variable "mover" is equal to 1 for people who move another province in last five years. We expect a positive relation between migrate and business ownership, since those people who migrate for work are expected to have more propensity to be self-employed. However, people who move in last five years, have a short period of residence in their current residence, so their propensity to be self-employed is expected to be lower.

Access to credit: In studies of self-employment, financial constraints faced by an individual are one of the main factors. An individual who wants to be self-employed, firstly, has to obtain an initial capital to start up his own business. This initial capital can be obtained through inheritance, accumulation, family assets or loans. The role of this factor has been demonstrated in several empirical studies.

Blanchflower and Oswald claim that inheritance is a significant source of start up capital and up to some certain level; the size of inheritance and propensity to be self-employed is positively related. Kidd (1993) and Bernhardt (1994) also show that the availability of capital is a significant factor in models of self-employment. Bernhardt employed three variables to measure financial resources: whether respondent's wife works, whether he owns his home and the availability of investment income.

On the other hand, several longitudinal studies of self-employment such as Evans and Jovanovich (1989) and Evans and Leighton (1989) have tested the effect of availability of capital on decision to be self-employed. They used net family assets to represent the net worth of an individual. They found that as wealth increases, importance of any initial constraint diminishes so net worth increases individuals' propensity to enter into self-employment. However, beyond a certain level, an increase in net worth reduces entry into this working status. Also Evans and Jovanovich suggest that liquidity constraint will prevent some people from trying entrepreneurship. If the liquidity constraint were removed, the average probability of becoming an entrepreneur would increase from 3.81% to 5.11%. That means liquidity constraint deters 1.3 percent of population from trying entrepreneurship.

Following this line of thought, we can consider access to credit as a way of removing liquidity constraint in entering to self-employment. An individual planning to enter into self-employment may not have sufficient financial capital to start up his business. However, if he has access to credit, then he can obtain necessary initial capital by some kind of borrowing. Thus, access to credit appears as an important factor that can affect an individual's entry into self employment, in addition to net

family assets. An individual who knows a place to borrow, or who knows people in his social environment who can give him loan is expected to be more likely to be self employed, relative to another living in a smaller community where no bank or financial institution is found. Therefore, the access to credit can be influential on decision to be self-employed.

However, there might be an endogenous regressor problem due to the fact that a person who operates his own enterprise can be aware of credit facilities better. Thus, our variable “borrow” showing person knows a place to borrow might be endogenous. Therefore, we also use instrumental variable estimation and we need some instruments for “borrow”. According to the study of Ökten and Osili (2004), participation in community meetings and number of actively working siblings are significant factors in determining one’s access to credit. For this reason, we will use these variables as the instruments for “borrow”.

CHAPTER 5

REGRESSION RESULTS

5.1 Determinants of Non-Farm Business

Knowing a place where one can borrow has a significant and positive effect on the likelihood of owning a non-farm business, as we can see in Table 3, regression 1. If a household head has information about where he can borrow, then he is 3% more likely to own a non-farm business compared to another who does not have such information.

Age is insignificant for non-farm business ownership. But age squared is negatively related to owning a non-farm business, which means, as people get older after a certain age, their likelihood of owning a non-farm business decrease. This result supports the idea that age can be an indicator of individual's attitude towards risk. Occupational status is positive and significant for owning a non-farm business. We use non-farm occupational status for non-farm business regression, which excludes agriculture related jobs from the variable we used for farm business regression. This result implies that people who formerly were employed in some specific jobs such as sales, hotel, repairs, craft, and managerial or professional occupations are more likely to own a non-farm business. Education is negative and significant for owning a non-farm business, showing that a more educated person is less likely to enter into non-farm self-employment. However, when we add education

squared to this regression, education is positive and significant, while education squared is negative and significant. As schooling years increase, the probability of owning up a farm or non-farm business also rises until a certain level, for higher years of schooling, this relation turns out to be negative. (Results not shown but available upon request)

Marital status does not matter for whether one owns a non-farm business, implying that whether the person is married or not, his decision to be non-farm self-employed does not change. Household size is not significant for owning a non-farm business. Women are 7% more likely to own non-farm business compared to men. In our sample, all individuals are household heads and women that are household heads can be more inclined to start non-farm businesses in order to look after her family.

Our regressions show that living in an urban area increases the likelihood of owning a non-farm business by 6%, as variable “urban” is positive and significant. Also, migrate is positive and significant. People who migrated after age 12 for reasons related to work are 4% more likely to own a non-farm business. Migrating to another place for working increases one’s propensity to be non-farm self-employed. However, when we look at people who moved in last five years, they are 5% less likely to own their businesses. The reason for that can be insufficient knowledge of the market in newly moved place, as it is explained in the studies about immigrants’ self-employment.

We find a positive non-linear relation between the total assets the person has and owning a non-farm business, as it is found in the previous studies. As a respondent’s family assets increase, finding initial capital will be easier, so the

person is more likely to start his own business. However, assets squared is negative significant and this indicates that a person who has assets beyond a certain amount is less likely to start his own business. Per capita expenditure is also positively related to owning a non-farm business.

Table 3 Determinants of Non-farm and Farm Business Ownership

Variables	Non-farm business (Reg1)		Farm business (Reg2)	
	Coefficients	Marginal effects	Coefficients	Marginal effects
Borrow	0.107** (-0.054)	0.031	0.064 (0.054)	0.022
Occupational status	0.423*** (-0.055)	0.138	0.469*** (0.051)	0.159
Age	0.017 (0.013)	0.005	0.055*** (0.011)	0.019
Age squared	-0.030** (0.013)	-0.009	-0.045*** (0.010)	-0.015
Per capita expenditure	0.172** (0.007)	0.005	-0.020** (0.103)	-0.007
Assets	0.019** (0.009)	0.006	0.011 (0.013)	0.004
Assets squared	-2.71* (0.0001)	-0.00008	-0.0002 (3.38E-04)	-0.00008
Household size	-0.015 (0.011)	-0.004	-0.022** (0.011)	-0.008
Education	-0.014** (0.006)	-0.004	-0.008 (0.007)	-0.003
Marital status	0.157 (0.107)	0.045	0.234** (0.105)	0.078
Gender	-0.233** (0.105)	-0.074	0.462*** (0.108)	0.146
Urban	0.205*** (0.049)	0.062	-1.100*** (0.056)	-0.352
Mover	-0.169** (0.085)	-0.048	-0.467*** (0.101)	-0.144
Migrate	0.128** (0.060)	0.039	-0.143** (0.066)	-0.048

Lampung	-0.286** (0.133)	-0.077	0.110 (0.134)	0.039
Jakarta	-0.460*** (0.124)	-0.116	-1.141*** (0.197)	-0.273
Bali	-0.252** (0.120)	-0.069	-0.217* (0.121)	-0.072
North Sumatra	0.120*** (0.117)	-0.143	-0.421*** (0.115)	-0.132
West Sumatra	-0.366*** (0.130)	-0.095	-0.960*** (0.140)	-0.244
South Sumatra	-0.310** (0.129)	-0.082	-0.339*** (0.130)	-0.108
West Java	-0.397*** (0.098)	-0.106	-0.764*** (0.101)	-0.223
Central Java	-0.318*** (0.098)	-0.087	-0.211** (0.099)	-0.071
East Java	-0.396*** (0.099)	-0.106	-0.766*** (0.100)	-0.225
Yogyakarta	-0.462*** (0.118)	-0.117	0.234** (0.116)	0.085
South Kalimantan	-0.306** (0.128)	-0.081	-0.066 (0.128)	-0.022
South Sulawesi	-0.301** (0.122)	-0.080	-0.322*** (0.123)	-0.103
Constant	-0.554 (0.342)		-1.860*** (0.320)	
# of observations	4276		4276	
Log likelihood	-2231.322		-2115.0201	

5.2. Determinants of Farm Business

Knowing a place where one can borrow is insignificant on the probability of owning a farm business. This shows that knowing somewhere to borrow has no significant impact on owning a farm business.

Age is positive and significant for owning a farm business up to some certain age. After that age, one's likelihood of owning a farm business decreases, as age squared is negative and significant. Occupational status is positive and significant for farm business, as we expect. People who formerly worked in some specific jobs such as agriculture, sales, hotel, repairs, craft, and managerial or professional occupations are 16% more likely to own a farm business. Education that we measure by

schooling years is negative but insignificant for owning a farm business. When we add education squared, education turns out to be positive significant and education squared is negative significant. (Results not shown but available upon request)

Married people are 8% less likely to start a farm business. Similarly, as household size gets larger, people are less likely to start their own farm business. This is in contrast to our expectations that as household size get larger; people can more easily have a farm business by the help of the household members. This might be due to the fact that as household size gets larger, the responsibilities of the individual also increase and this can avoid him from choosing risky self-employment. Men are 14.6% more likely to own a farm business relative to women, in contrast to the situation in non-farm business. This can be due to the character of the farm business. Being farm self-employed may require working with physical strength, thus this kind of work can be more appropriate for men. People who move to another place in last five years are 14% less likely to own a farm business, as farm business requires working on a farm or land. The variable “migrate” showing whether individual migrated after age 12 for reasons related to work is negative and significant in farm business regressions, since people generally move to urban areas for looking job, so those people are less likely to own a farm business. As our estimation results show, people who live in urban areas are 35% less likely to own a farm business.

Both total assets and assets squared are insignificant for owning a farm business. This shows us that farm businesses are generally labor intensive and the amount of one's assets does not affect significantly his probability of owning a farm

business. However, per capita expenditure is negative and significant, showing that as one's expenditure increases, his probability to choose farm self-employment decreases.

5.3 The Impact of Different Borrowing Sources

In order to observe the impact of different sources of borrowing, we separate the variable "borrow" into its components: bank, cooperative, lender, family, arisan and saving borrowing program. We can see the regression results in Table 4, regression 1 and regression 2.

Table 4 Borrowing sources in non-farm and farm business

Variables	Non-farm business (Reg1)		Farm business(Reg2)	
	Coefficients	Marginal effects	Coefficients	Marginal effects
Bank	0.213*** (0.053)	0.063	-0.012 (0.055)	-0.004
Cooperative	-0.156*** (0.057)	-0.045	0.010 (0.061)	0.003
Money Lender	0.249*** (0.070)	0.079	-0.208*** (0.078)	-0.070
Family	-0.045 (0.048)	-0.013	0.153*** (0.048)	0.054
Saving borrowing program	0.017 (0.073)	0.005	0.093 (0.077)	0.033
Arisan	-0.348 (0.349)	-0.090	-0.120 (0.338)	-0.040
Occupational status non-farm	0.420*** (0.055)	0.137	0.469*** (0.051)	0.159
Age	0.019 (0.013)	0.006	0.054*** (0.011)	0.019
Age squared	-0.032** (0.012)	-0.009	-0.045*** (0.010)	-0.015
Per capita expenditure	0.016** (0.007)	0.005	-0.002* (0.001)	-0.007
Assets	0.017* (0.009)	0.005	0.013 (0.013)	0.005
Assets squared	-0.0002* (0.0001)	-0.00007	-0.0003 (0.0003)	-0.0001
Household size	-0.014 (0.010)	-0.004	-0.022** (0.011)	-0.008
Education	-0.015** (0.006)	-0.005	-0.007 (0.007)	-0.003

Marital status	-0.166 (0.108)	0.047	-0.226** (0.105)	0.075
Gender	-0.245** (0.106)	-0.078	0.467*** (0.108)	0.147
Urban	0.192*** (0.049)	0.058	-1.088*** (0.056)	-0.348
Mover	-0.172** (0.085)	-0.048	-0.464*** (0.101)	-0.143
Migrate	0.125** (0.060)	0.038	-0.140** (0.066)	-0.047
Region Dummies	Yes		Yes	
Constant	(0.124)		(0.126)	
	-0.631* (0.345)		-1.857*** (0.322)	
# of observations	4276		4276	
Log likelihood	-2216.1754		-2107.8387	

Notes: Figures in parenthesis are standard errors *significant at 10% ** significant at 5%
***significant at 1%

Knowing a bank to borrow is significantly and positively related to start a non-farm business but it is insignificant for farm business. A person who knows a bank where he can borrow is 6% more likely to own a non-farm business, while this does not affect the likelihood of his owning a farm business. This implies that access to credit from a bank increases one's propensity to be non-farm self-employed but not to be farm self-employed.

Knowing a cooperative to borrow is negatively related to own a non-farm business, while it is insignificant for owning a farm business. Cooperatives are generally related to agriculture and if the person knows a cooperative that he can borrow from, then this means he is interested in agriculture rather than a non-farm business. However, knowing such a cooperative does not have a significant effect on owning a farm business.

Lenders are important informal credit sources in Indonesia. Knowing a lender to borrow is significantly related to both owning a non-farm and farm businesses.

However, knowing a lender increases one's likelihood of owning a non-farm business by 8% but decreases his likelihood of owning a farm business. This can imply that knowing a lender means the person is not interested in farm related jobs.

According to our regression results, family is a credit source increasing one's probability to own a farm business, as family is positively and significantly related to owning a farm-business. Here we see that while knowing some place to borrow is not significant, if the person can borrow from his family, this increases the likelihood of owning a farm business by 5%. For the farm self employment, only the loan from family is significant among other borrowing sources. However, whether the person can borrow from his family does not have a significant impact on person's likelihood of owning a non-farm business, as family is insignificant in non-farm business regression.

Another crucial result of the regressions is that knowing neither a saving-borrowing program nor an arisan is significant for owning one's own business. This is valid for both farm and non-farm businesses. This result reveals that arisan and saving borrowing programs are not influential credit resources to lead people to be self-employed.

When we divide "borrow" into its components, we observe the importance and different impacts of different borrowing sources clearly. Knowing a bank and a lender turns out to be significant for owning a non-farm business, where as only the family is a significant borrowing source for owning a farm business.

5.4. Men and Women

Per capita expenditure is insignificant for women to own a non-farm business, while it is positive and significant for men owning a non-farm business. For women, total assets are negative and significant, implying that as the wealth of a woman increases, her propensity to be non-farm self-employed will be lower. In contrast, for men, total assets are positively related to owning a non-farm business up to some certain amount. Education has also different impacts on men and women. While it is negative and significant for men to own their non-farm business, it is insignificant for women. All these results can be seen in Table 5, regression 1 and 2.

Table 5 Borrowing Sources for Non-farm and Farm Business, male and female

Variables	Non-farm business		Farm Business	
	Male (Reg1)	Female (Reg2)	Male(Reg3)	Female(Reg4)
Bank	0.201*** (0.056)	0.385** (0.166)	-0.004 (0.058)	-0.086 (0.185)
Cooperative	-0.178*** (0.059)	-0.005 (0.218)	0.037 (0.063)	-0.373 (0.280)
Money Lender	0.238*** (0.075)	0.303 (0.208)	-0.202** (0.083)	-0.108 (0.236)
Family	-0.038 (0.051)	-0.084 (0.151)	0.128** (0.052)	0.317** (0.159)
Saving borrowing program	0.039 (0.077)	-0.059 (0.238)	0.084 (0.082)	0.177 (0.262)
Arisan	-0.126 (0.377)		0.147 (0.386)	
Occupational status	0.411*** (0.060)	0.497*** (0.145)	0.476*** (0.054)	0.453*** (0.164)
Age	0.021 (0.014)	0.025 (0.039)	0.059*** (0.012)	-0.024 (0.035)
Age squared	-0.035** (0.014)	-0.028 (0.033)	-0.048*** (0.012)	0.008 (0.029)
Per capita expenditure	0.252*** (0.008)	-0.024 (.025)	-0.020* (0.011)	-0.009 (0.033)
Assets	0.023** (0.009)	-0.069* (0.035)	0.017 (0.014)	0.188 (0.179)
Assets squared	-3.07e-04* (1.70e-04)	4.32e-04 (4.77e-04)	-3.62e-04 (4.22e-04)	-5.34e-02 (4.10e-02)
Household size	-0.016 (0.012)	0.002 (0.028)	-0.024** (0.011)	-0.029 (0.033)

Education	-0.016** (0.007)	-0.007 (0.023)	-0.008 (0.007)	-0.003 (0.028)
Marital status	-0.201 (0.147)	-0.269 (0.192)	-0.249* (0.131)	0.141 (0.216)
Urban	0.175*** (0.053)	0.261* (0.148)	-1.127*** (0.060)	-0.781*** (0.169)
Mover	-0.173* (0.091)	-0.178 (0.246)	-0.494*** (0.109)	-0.135 (0.301)
Migrate	0.143** (0.061)	-0.546 (0.390)	-0.133** (0.068)	-0.181 (0.527)
Region Dummies	Yes	Yes	Yes	Yes
Constant	-0.956** (0.393)	-0.960 (1.141)	-1.572*** (0.358)	0.883 (1.081)
# of observations	3727	544	3727	509
log likelihood	-1924.4453	-271.67063	-1842.0364	-240.7570

Notes: Figures in parenthesis are standard errors *significant at 10% ** significant at 5%

***significant at 1%

There is a significant and positive relation between knowing a place to borrow and owning a non-farm business for women, while it is insignificant for men. However, when we consider different sources of borrowing, we see that only knowing a bank has a significant effect on women' owning a non-farm business, but for men, knowing a lender is also positive and significant, as we can see in Table 5, regression1 and 2. This result indicates that lender, as a source of informal credit does not have significant effect, which it has on men, on women owning their own non-farm business.

Knowing a place to borrow is insignificant for both men and women in farm business regressions. If we look at the influence of different credit sources on owning a farm business, family is the only positive significant source of borrowing for both men and women. Lender is also significant for men in farm business, but its effect is negative. (Table5, regression 3 and 4) Knowing a lender for a man decreases his likelihood of owning a farm business.

5.5. Instrumental Variable Estimation

As it is possible to exist an endogeneity problem due to the relation between owning one's own business and knowing a place to borrow, we use instrumental variable estimation. It is possible that a person who established his own business will better know where he can borrow from and this can cause endogeneity in our regressions. Therefore we instrument the "borrow" variable with some other variables that are closely related to knowing a place to borrow but not related to one's owning his own business. These instrumental variables are number of actively working siblings that person has and community meeting participation. According to the study of Ökten and Osili (2004), occurrence of and participation in community meetings and number of actively working siblings are significant factors in determining one's access to credit. However, our regressions show that occurrence of community meetings and number of actively working siblings are insignificant to one's owning his non-farm business and community meeting participation is insignificant to one's owning his farm business. (These results are shown in Appendix C and D) Therefore, these variables are very suitable to use as instruments for knowing a place to borrow.

The regression 1 in Table 6 show that when we instrument borrow variable by using community meeting occurrence and number of actively working siblings to avoid endogeneity problem, the result, that knowing a place to borrow is positive and significant for owning non-farm business, does not change. Thus we can conclude that knowing a place to borrow increases one's likelihood of being non-farm self-

employed. Similarly, when we instrument borrow with community meeting participation, it is significant for owning farm business, as we can see in Table 6, regression 2. These instrumental variable estimations show that the significant relation between knowing a place to borrow and owning one's own business does not only stem from that a person who owns a business knows credit sources better.

Table 6 Instrumental variable estimation of Farm and Non-farm business

Variables	Reg1	Reg2
	Non-farm business	Farm business
Borrow	0.944*** (0.354)	0.920** (0.459)
Occupational status	0.390*** (0.057)	0.490*** (0.052)
Age	0.014 (0.013)	0.046*** (0.012)
Age squared	-0.024* (0.013)	-0.034*** (0.012)
Per capita expenditure	0.007 (0.008)	-0.020 (0.010)
Assets	0.015 (0.009)	-0.005 (0.011)
Assets squared	-0.0002 (0.0001)	-0.0002 (0.0002)
Household size	-0.013 (0.011)	-0.016 (0.010)
Marital status	-0.050 (0.110)	-0.216** (0.103)
Gender	-0.247** (0.113)	0.362*** (0.114)
Education	-0.030*** (0.009)	-0.035*** (0.013)
Migrate	0.112* (0.061)	-0.159** (0.064)
Urban	0.150*** (0.052)	-1.148*** (0.057)
Mover	-0.180** (0.089)	-0.456*** (0.097)
Region Dummies	Yes	Yes
Constant	-1.025** (0.397)	-2.242*** (0.378)
# of Observations	4044	4044
Log likelihood	-2119.193	-2248.175

Notes: Figures in parenthesis are standard errors *significant at 10% ** significant at 5%
***significant at 1%

5.6. Interaction Variables

We also look at the interaction between borrow and the other variables like age, education, gender, occupational status, urban, mover, assets and marital status. For non-farm business ownership, the interaction variables borrowurban and borrowoccupational status are significant only. A similar result achieved for farm business ownership; borrowurban, borrowoccupational status and additionally borrowmover are significant.

Table 7 Interaction Variables in Non-farm Business

Variables	With Borrow-occupational status	With Borrow-urban
Borrow	0.185*** (0.060)	0.221*** (0.067)
Borrowoccupational status	-0.405*** (0.125)	
Borrowurban		-0.303*** (0.104)
Occupational status	0.734*** (0.110)	0.419*** (0.054)
Age	0.016 (0.013)	0.017 (0.013)
Age squared	-0.029** (0.012)	-0.030** (0.012)
Per capita expenditure	0.017** (0.007)	0.017** (0.007)
Assets	0.021** (0.009)	0.020** (0.009)
Assets squared	-2.84e-04* (1.52e-04)	-2.79e-04* (1.55e-04)
Household size	-0.015 (0.010)	-0.015 (0.010)
Education	-0.013** (0.006)	-0.014** (0.006)
Marital status	-0.160 (0.107)	-0.160 (0.107)
Gender	-0.240** (0.105)	-0.236** (0.105)
Urban	0.199*** (0.049)	0.441*** (0.094)
Mover	-0.166* (0.085)	-0.167* (0.085)
Migrate	0.131** (0.060)	0.127** (0.060)
Region Dummies	Yes	Yes

Constant	-0.592*	-0.637*
	(0.343)	(0.344)
# of observations	4276	4276
Log likelihood	-2226.116	-2227.097

Table 8 Interaction Variables in Farm Business

Variables	With Borrowoccupational status	With Borrowurban	With Borrowmover
Borrow	0.164*** (0.055)	0.135** (0.060)	0.089 (0.055)
Borrowoccupational status	-0.614*** (0.078)		
Borrowurban		-0.321*** (0.118)	
Borrow mover			-0.520** (0.230)
Occupational status	0.650*** (0.056)	0.472*** (0.051)	0.467*** (0.051)
Age	0.055*** (0.011)	0.055*** (0.011)	0.055*** (0.011)
Age squared	-0.045*** (0.010)	-0.045*** (0.010)	-0.045*** (0.010)
Per capita expenditure	-0.013 (0.010)	-0.020* (0.010)	-0.021** (0.010)
Assets	0.016 (0.014)	0.013 (0.013)	0.011 (0.013)
Assets squared	-3.28e-04 (4.05e-04)	-2.77e-04 (3.68e-04)	-2.55e-04 (3.40e-04)
Household size	-0.024** (0.011)	-0.022** (0.011)	-0.022** (0.011)
Education	0.005 (0.007)	-0.008 (0.007)	-0.008 (0.007)
Marital status	-0.227** (0.106)	-0.236** (0.105)	-0.235** (0.105)
Gender	0.404*** (0.109)	0.461*** (0.108)	0.468*** (0.108)
Urban	-1.036*** (0.057)	-0.852*** (0.105)	-1.101*** (0.056)
Mover	-0.454*** (0.101)	-0.464*** (0.101)	-0.074 (0.199)
Migrate	-0.125* (0.066)	-0.143** (0.066)	-0.139** (0.066)
Region Dummies	Yes	Yes	Yes
Constant	-2.007*** (0.322)	-1.924*** (0.321)	-1.885*** (0.320)
# of observations	4276	4276	4276
Log likelihood	-2084.0645	-2111.394	-2112.5063

Notes: Figures in parenthesis are standard errors *significant at 10% ** significant at 5%
***significant at 1%

i. Interaction between borrow and occupational status

The interaction between knowing a place to borrow and occupational status is significant for both non-farm and farm business ownership. As Table 7 and Table 8, regression 1 implies, this variable has a negative sign for both and this indicates that if the person knows a place to borrow, this will decrease the effect of occupational status on propensity to be self-employed, or vice versa. In these regressions, borrow is more significant to owning a business. This might be due to the fact that the negative effect of occupational status on borrow is captured by this interaction variable and thus, the significance of borrow increases.

ii. Interaction between borrow and urban

The interaction between knowing a place to borrow and living in an urban area is shown by the variable “borrowurban”. We expect that a person living in an urban area has a better access to credit relative to another living in a rural area. Borrowurban is negative significant for both non-farm and farm business ownership, showing that “borrow” and this variable decrease each other’s effects on business ownership, as we can see in Table 7, regression 2 and Table 8, regression 2. Similar to the case in borrowoccupational status, borrow is more significant in these regressions, too. Again, adding this interaction variable captures the negative effect of urban on borrow, and so borrow becomes more significant.

iii. Interaction between borrow and mover

Interaction variable “borrowmover” is insignificant for owning a non-farm business, while it is negative significant for farm business ownership, as we can see in Table 8, regression 3. This implies that knowing a place to borrow and moving in last five years decrease each other effects on owning farm business.

5.7 Community Fixed Effects

Community fixed effect regressions show that when we account for fixed effects of community on access to credit, individuals own access to credit is still positive and significant for farm and non-farm business, as we can see in Table 9.

Table 9 Community Fixed Effects Regression for Non-farm and Farm Business

Variables	Non-farm	Farm
Borrow	0.195*	0.243**
	0.105	0.105
Occupational status	0.564***	0.532***
	0.103	0.105
Age	0.028	0.116***
	0.026	0.022
Age squared	-0.051**	-0.096***
	0.025	0.021
Per capita expenditure	0.023	-0.009
	1.46E-07	2.15E-07
Assets	0.041**	0.129***
	0.020	0.038
Assets squared	-5.73E-04	-2.90E-03**
	4.49E-04	1.45E-07
Household size	-0.026	-0.012
	0.021	0.021
Marital status	-0.401*	-0.283

	0.205	0.207
Gender	-0.495**	0.804***
	0.200	0.214
Education	-0.022*	-0.0002
	0.013	0.014
Migrate	0.242**	-0.390***
	0.117	0.14
Mover	0.084	-0.407
	0.232	0.315
# of Observations	3738	3180
Log likelihood	-1506.742	-1388.367

Notes: Figures in parenthesis are standard errors *significant at 10% ** significant at 5%
***significant at 1%

CHAPTER 6

CONCLUSION

In this paper, we try to analyze the impact of access to credit on self-employment. We examine its impact on farm and non-farm self-employment separately. We try to find the impact of different borrowing sources on one owns a business. We also distinguish between male and female self-employment.

The resulting estimates show that knowing a place to borrow significantly increases one's likelihood of owning a non-farm business, but not the likelihood of owning a farm-business. However, when we analyze the impact of borrowing sources separately, we observe that ability to borrow from family is positively related to own a farm business. These analyses also imply that knowing a bank and a lender to borrow increases the probability of being non-farm self-employed.

When we look at the impacts of different borrowing sources on men and women self-employment, these results are different. For women, knowing a bank increases her likelihood of owning a non-farm business, while ability to borrow from family increases her likelihood of owning a farm business. For men, both knowing a bank and a lender are positively related to own a non-farm business and only family is positively and significantly related to own a farm business.

We also take into account a possible endogeneity problem due to the relation between awareness of borrowing sources and owning one's own business. Therefore,

we also make an instrumental variable estimation. However, the resulting estimates show that even if there is endogeneity in borrow variable, our main conclusion that access to credit have a significant and positive impact on self-employment does not change. Knowing a place to borrow in instrumental variable estimation is still positive and significant to be self-employed.

Another important result we achieve is related to the interaction between knowing a place to borrow and the other determinants of self-employment. We try to examine how access to credit and other determinants of self-employment affect each other and we observe that its interaction with occupational status, living in an urban area and moving in last five years are negative significant. This implies that these variables and knowing a place to borrow decrease each other's effects on self-employment.

All these results indicate that different borrowing sources have different impacts on self-employment depending on the sector of employment and the gender of the person. However, it is clear that access to credit is a significant factor in determining self-employment status.

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APPENDICES

Appendix A: Table of Descriptive Statistics

Variable	Observations	Mean	Std. Dev.
Non-farm business	5340	0.236	0.425
Farm business	5340	0.328	0.469
Borrow	4674	0.737	0.439
Bank	4674	0.555	0.496
Cooperative	4674	0.292	0.454
Money lender	4674	0.120	0.325
Family	4674	0.372	0.483
Saving borrowing			
Program	4674	0.112	0.316
Arisan	4674	0.004	0.066
Occupational status	5645	0.596	0.490
Age	4724	50.253	13.020
Age squared/100	4724	26.948	14.024
Per capita			
Expenditure	4891	2.030	2.951
Assets	5340	0.022	0.066
Assets squared	5340	48.786	648.585
Education	5109	5.379	4.234
Marital status	4724	0.868	0.337
Household size	5352	5.428	2.348
Gender	4724	0.877	0.327
Urban	5645	0.415	0.492
Mover	5645	0.125	0.331
Migrate	5638	0.178	0.382
Community meeting			
Participation	4674	0.229	0.420
Community meeting			
Occurrence	4418	0.636	0.481
Borrow *Occupational			
Status	4674	0.158	0.364
Borrow*Urban	4674	0.342	0.474
Borrow*Mover	4674	0.061	0.240
Lampung	5645	0.040	0.196
Jakarta	5645	0.094	0.292
Bali	5645	0.047	0.213
West Nusa Tenggara	5645	0.060	0.237
North Sumatra	5645	0.080	0.272
West Sumatra	5645	0.044	0.206
South Sumatra	5645	0.048	0.215
West Java	5645	0.149	0.356
Central Java	5645	0.129	0.336
East Java	5645	0.143	0.350
Yogyakarta	5645	0.068	0.253
South Kalimantan	5645	0.044	0.205
South Sulawesi	5645	0.047	0.213

Appendix B: Definition of Variables

Variables	Definition
Dependent Variables	
Non farm business	Respondent owns a non-farm business
Farm business	Respondent owns a farm business
Independent Variables	
Borrow	Respondent knows a place to borrow
Bank	Respondent knows a bank where he can borrow
Cooperative	Respondent knows a cooperative where he can borrow
Lender	Respondent knows a lender where he can borrow
Family	Respondent can borrow from his family
Saving borrowing program	Respondent knows a saving borrowing program where he can borrow
Arisan	Respondent knows an arisan where he can borrow
Occupational status non-farm	Respondent formerly employed in one of hotel, sales, repairs, crafts, managerial or professional occupation
Occupational status	Respondent formerly employed in one of agriculture, hotel, sales, repairs, crafts, managerial or professional occupation
Age	Age of respondent in 1997
Age squared	Age of respondent in 1997 squared
Per capita expenditure	Per capita expenditure of the respondent/ 10^6
Assets	Value of respondent's family assets/ 10^7
Assets squared	Value of respondent's family assets squared/ 10^{14}
Household size	Household size of the respondent
Education	Total schooling years of the respondent
Marital status	Respondent is not married
Gender	Respondent is male

Urban	Respondent lives in an urban area
Mover	Respondent moved in another place in last five years
Migrate	Respondent moved in another place after age 12 for reasons related to work
Instruments	
Active siblings	Number of respondent's actively working siblings
Community meeting	Community meetings occur
Community meeting participation	Respondent participates in community meetings
Interaction Variables	
Borrowoccupational status	Respondent knows a place to borrow and formerly employed in one of hotel, sales, repairs, crafts, managerial or professional occupation
Borrowurban	Respondent knows a place to borrow and live in an urban area
Borrowmover	Respondent knows a place to borrow and moved in last five years
Region Dummies	
Lampung	Respondent lives in Lampung
Jakarta	Respondent lives in Jakarta
Bali	Respondent lives in Bali
North Sumatra	Respondent lives in North Sumatra
West Sumatra	Respondent lives in West Sumatra
South Sumatra	Respondent lives in South Sumatra
West Java	Respondent lives in West Java
Central Java	Respondent lives in Central Java
East Java	Respondent lives in East Java
Yogyakarta	Respondent lives in Yogyakarta
South Kalimantan	Respondent lives in South Kalimantan
South Sulawesi	Respondent lives in South Sulawesi

Appendix C: Instruments and First Stage Regression for Non-farm Business

Variables	Non-farm business	Borrow
Community meeting	-0.047	0.290***
occurrence	0.050	0.050
Number of actively	0.0003	0.009*
working siblings	0.012	0.012
Occupational status	0.406***	0.114*
	0.056	0.066
Age	0.020	0.013
	0.013	0.012
Age squared	-0.032**	-0.022**
	0.013	0.011
Per capita	0.018**	0.080***
expenditure	0.007	0.013
Assets	0.018*	0.011
	0.009	0.011
Assets squared	-0.0002*	-8.86e-05
	1.67e-03	1.72e-03
Household size	-0.011	0.005
	0.011	0.011
Marital status	0.074	0.041***
	0.110	0.106
Gender	-0.154	0.254
	0.108	0.107
Education	-0.010	0.077**
	0.006	0.007
Migrate	0.131**	0.081***
	0.061	0.069
Urban	0.193***	0.149
	0.050	0.055
Mover	-0.166*	0.095
	0.089	0.099
Lampung	-0.283**	-0.270*
	0.135	0.144
Jakarta	-0.500***	-1.091***
	0.129	0.141
Bali	-0.224*	-0.012
	0.122	0.145
North Sumatra	-0.613***	-0.088
	0.120	0.131
West Sumatra	-0.358***	-0.230
	0.135	0.154
South Sumatra	-0.332**	-0.911***
	0.130	0.136
West Java	-0.417***	-0.670***
	0.100	0.111
Central Java	-0.304***	0.034
	0.100	0.115
East Java	-0.408***	-0.819***
	0.100	0.109
Yogyakarta	-0.429***	-0.396***
	0.121	0.132
South Kalimantan	-0.311**	-0.417***
	0.130	0.142

South Sulawesi	-0.334***	-0.187
	0.126	0.141
Constant	-0.527	-0.064
	0.353	0.344
Log likelihood	-2122.3135	-1939.7889

Appendix D: Instruments and First Stage Regression for Farm Business

Variables	Farm business	Borrow
Community meeting participation	-0.002	0.135**
	0.061	0.062
Occupational status	0.466***	-0.143***
	0.050	0.051
Age	0.055***	0.023*
	0.011	0.011
Age squared	-0.046***	-0.032***
	0.010	0.010
Per capita expenditure	-0.019*	0.073***
	0.010	0.013
Assets	0.011	0.012
	0.013	0.010
Assets squared	-2.69e-04	-1.76e-04
	3.56e-04	1.31e-04
Household size	-0.022**	0.008
	0.011	0.010
Marital status	0.235**	0.013
	0.105	0.102
Gender	0.468***	0.308***
	0.108	0.103
Education	-0.007	0.083***
	0.006	0.007
Migrate	-0.141**	0.073
	0.066	0.067
Urban	-1.098***	0.106*
	0.056	0.055
Mover	-0.466***	0.065
	0.101	0.093
Lampung	0.105	-0.261*
	0.134	0.142
Jakarta	-1.161***	-1.152***
	0.197	0.134
Bali	-0.217*	0.075
	0.121	0.143
North Sumatra	-0.424***	-0.236*
	0.115	0.127
West Sumatra	-0.964***	-0.255*
	0.140	0.147
South Sumatra	-0.358***	-0.985***
	0.129	0.134
West Java	-0.776***	-0.661***
	0.101	0.108
Central Java	-0.209**	0.060
	0.099	0.114
East Java	-0.783***	-0.872***
	0.099	0.107

Yogyakarta	0.230**	-0.371***
	0.118	0.131
South Kalimantan	-0.072	-0.453***
	0.128	0.140
South Sulawesi	-0.326***	-0.245
	0.123	0.135
Constant	-1.834***	0.042
	0.319	0.327
# of observations	4276	4276
Log likelihood	-2092.2692	-2115.7327