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An Economic Analysis of Poverty in The Agricultural Sector: A Case Study of Indonesia

A thesis presented in partial fulfilment of the
requirements for the degree of

Master of Management
in
Economics

at Massey University, Manawatū
New Zealand

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2015

Abstract

Poverty is a multidimensional aspect which involves different types of deprivation in human capabilities such as income, education, health, food and nutrition, shelter, power and human rights. Despite Indonesia being categorized as a newly industrialized country, poverty is still a major concern, especially to the large group of people engaged in the agricultural sector.

This study examines the characteristics of the poor households and the essential strategies to tackle the causes of poverty and notes policies for poverty reduction. As access to credit helps the poor to escape from poverty, this study also indicates that the characteristics can affect the households' access to credit. Furthermore, this study evaluates the impact of food-based and health care safety nets on the households' consumption expenditure. The two factors, educational level and area of employment of the household head play an important role in reducing poverty and accessing credit. A household head working in the service sector increases the household's chance to be non-poor. Meanwhile, engaging in the agricultural sector may increase the households' possibility to fall into chronic poverty and also lower the probability to get credit from formal institutions. The household heads with primary, secondary or tertiary level of education are most likely to escape from chronic poverty. Increase in years of schooling of the household heads reflects an increase in the households' creditworthiness and ability to achieve a higher income and avoid falling into poverty. Owning assets also increases the households' probability to move out from poverty and to secure formal and business credit.

The food-based (*Raskin*) and health care (*Askeskin*) safety nets in Indonesia assist the households in poverty which supplements these households' consumption expenditure. This result shows that the *Raskin* programme increases the households' consumption of rice. Although there is not enough evidence to conclude that *Askeskin* programme affects the household's consumption expenditure, a weak effect is found where it decreases the expenditure for medical services and increases the expenditure for non-medical items.

The empirical findings suggest that agricultural development is important to reduce poverty levels in Indonesia. The government should ensure the poor households' access to education and credit availability. Moreover, stabilizing food prices will be helpful to guarantee the nutrient intake of the poor, and thus can reduce poverty. These strategies should be supported by proper execution of the programmes such as targeting and integration.

Acknowledgement

The accomplishment of this thesis would not have been possible without the assistance of many people throughout my academic years.

First, I would like to express my gratitude to Allah for his guidance in finishing this thesis. Second, I owe a great debt of gratitude to Professor Rukmani Gounder, my first supervisor, for her expert supervision and remarkable comments and feedback. Thanks for giving an excellent and intellectual environment during my study at Massey University. Your knowledge, inspiration, commitment and encouragement are highly appreciated. I also thank my second supervisor, Professor Muhammad Firdaus, for his comments and encouragements. *Terima kasih*.

I wish to extend my thanks to the New Zealand Government for the postgraduate scholarship to undertake this study. Thanks also to Zhongwei Xing for his advice on econometric modelling and Dr. Farzana Gounder and Dr. Alan McGee for their writing assistance. Many thanks to the staff of the School of Economics and Finance for creating an excellent learning environment, particularly throughout my time at Massey. I would like to thank my friends for their great support and friendship: Siti Nur`Aini, Kathlia Sari Martokusumo, Ambara Saraswati Mardani, Edlyn Mae Ciano, Syma Ijaz, Bhawana Singh, Ayu Suci Wulandari, Klara Monika, Diana Krisnayodi, Fachrul Azmi, Florian, Calvin Sidjaya and Peter Cleave. Thanks to Erika Soraya, Febri Sandy, Jatnika Hermawan and Rina Kusumayanti for the support and inspirations to always pray to Allah for everything I do.

Finally, a very special thanks to my husband, Irwanto Gunawan, for his understanding, patience, love, support and prayers from the time I applied for the New Zealand Aid scholarship to my final completion time. Thank you for always being there for me. My special thanks also go to my beloved parents, Edi Premono and Sekar Wijayanti, as well as my brother, Dinar Dana Kharisma, for their unconditional love, support and prayers during my study. Also thanks to my family, Rahayu Widyastuti, for all the support and encouragement.

I dedicate this thesis to my parents and family.

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List of Abbreviations and Acronyms

ADB	Asian Development Bank
ADF	African Development Fund
AfDB	African Development Bank
Askeskin	*Asuransi Kesehatan Masyarakat Miskin* (Health insurance for the poor in Indonesia)
ATT	Average Treatment Effect on the Treated
BLT	*Bantuan Langsung Tunai* (Unconditional cash transfer programme in Indonesia)
BRI	*Bank Rakyat Indonesia* (One of government-owned bank in Indonesia)
BSM	*Bantuan Siswa Miskin* (Cash transfer for poor students in Indonesia)
BULOG	*Badan Urusan Logistik* (National Logistics Board in Indonesia)
CBN	Cost of Basic Needs
CCTs	Conditional Cash Transfers
CHNS	China Health and Nutrition Survey
EF	Equity Fund (One of health care safety nets in Cambodia)
FAO	Food and Agriculture Organization of the United Nations
FFA	Food for Asset Creation (Component of Integrated Food Security in Bangladesh)
FSVGD	Food Security Vulnerable Group Development (One of food-based safety net programmes in Bangladesh)
GDP	Gross Domestic Product
HDI	Human Development Index
HPI	Human Poverty Index
IFAD	International Fund for Agricultural Development
IFLS	Indonesian Family Live Survey
IFS	Integrated Food Security (One of food-based safety net programmes in Bangladesh)
IGVGD	Income Generating Vulnerable Group Development (One of food-based safety net programmes in Bangladesh)
ILO	International Labour Organization
IMF	International Monetary Fund
IMR	Inverse Mill's Ratio

Jamkesmas	*Jaminan Kesehatan Masyarakat* (Health guarantee for the poor, a health insurance scheme for the poor in Indonesia)
JKN	*Jaminan Kesehatan Nasional* (National health insurance in Indonesia)
JPS-BK	*Jaring Pengaman Sosial Bidang Kesehatan* (Health safety net in Indonesia)
KUR	*Kredit Usaha Rakyat* (Business credit for Small and Medium Enterprises and Cooperatives in Indonesia)
MDGs	Millennium Development Goals
ME	Marginal Effect
MIQ	Minimum Income Question
MPI	Multidimensional Poverty Index
NCMS	New Cooperative Medical Scheme (China's medical insurance)
NGOs	Non-Government Organizations
NN	Nearest Neighbour
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
OFSP	Other Food Security Programmes (One of food-based safety net programmes in Ethiopia)
OPK	*Operasi Pasar Khusus* (Special market operation, food-based social safety net in Indonesia in 1998)
PG	Poverty Gap
PKH	*Program Keluarga Harapan* (Family hope programme, one of poverty alleviation programmes in Indonesia)
PNPM Mandiri	*Program Nasional Pemberdayaan Masyarakat Mandiri* (National programme for community empowerment in Indonesia)
PPA	Participatory Poverty Assessments
PRA	Participatory Rural Appraisal
PSM	Propensity Score Matching
PSNP	Productive Safety Net Programmes (One of food-based safety net programmes in Ethiopia)
Puskesmas	*Pusat Kesehatan Masyarakat* (Community health centre in Indonesia)
Raskin	*Beras Miskin* (Subsidized rice for the poor in Indonesia)
RMP	Rural Maintenance Programme (One of food-based safety net programmes in Bangladesh)
ROSCAs	Rotating Savings and Credit Associations

RRR	Relative Risk Ratio
SCHIP	State Children's Health Insurance Programme (United States government policy on children's health service)
SFPs	Supplementary Feeding Programmes
SGP	Squared Poverty Gap
SMEs	Small and Medium Enterprises
TPDS	Targeted Public Distribution System (One of food-based safety net programmes in Bangladesh)
UNCDF	United Nations Capital Development Fund
UNDP	United Nations Development Programme
UNSD	United Nations Statistics Division
VGD	Vulnerable Group Development (One of food-based safety net programmes in Bangladesh)
VHI	Vietnam's Health Insurance
WFP	World Food Programme

Chapter 1
Introduction

1.1 Background of the Study

In almost thirty years, the number of people living in extreme poverty has decreased.[1] The Millennium Development Goals (MDGs) aims to halve the number of people living in extreme poverty by 2015. Overall this target has been met. The proportion of people living in extreme poverty has fallen from 52% in 1981 to 22.7 percent in 2008. It has been estimated that in 2010, this rate fell further to 20.6% (World Bank, 2013a). In the developing regions, the rate of extreme poverty has decreased from 47% in 1990 to 22% in 2010 (United Nations, 2013). However, 1.2 billion people still live in extreme poverty (United Nations, 2013).

Indonesia, as one of the newly industrialized South East Asian countries (Bożyk, 2006), has progressed to alleviate poverty. In March 2014, the poverty rate in Indonesia reached 11.25% (Statistics Indonesia, 2014a). Poverty is prevalent in the rural areas. The poverty rate declined to 17.6% in 2010 with a further reduction to 14.17% in March 2014. Urban poverty rate averaged at 10.7% during the 2008-2010 period, and by March 2014 the rate declined further to 8.34% (Statistics Indonesia, 2014a). Most of the poor people in developing countries live in rural areas and depend on agriculture for their livelihood (Andersen & Lorch, 1995; World Bank, 2005). In Indonesia, the proportion of agricultural workers dominates total employment. The proportion reached 41% in 2005 to 44% in 2009, and fell into 36% in 2012 (Statistics Indonesia, 2013a). Furthermore, in the same year, the rural agricultural sector engaged up to 85% of total agricultural workers (Indonesian Ministry of Agriculture, 2013).

The agriculture-related employment and activities show that poverty in Indonesia is highly associated with the rural population engaged in agricultural activities. This study analyses the determinants of poverty, with a specific focus on the agricultural sector. Secondly, the literature on poverty reduction supports the view that credit access has an important role in poverty alleviation (Hulme & Mosley, 1996; Zeller, Schrieder, Braun & Heidhues, 1997; Duong & Izumida, 2002; Egwuatu, 2008; Ahmed, Siwar & Idris, 2011; Latif, Nazar, Mehmood & Shaikh, 2011). Credit access may help poor households to improve their

[1] People living in extreme poverty means people who live on less than $1.25 a day.

condition, particularly in generating additional income and smoothing the pattern of household consumption.

Credit can be obtained from the formal and informal institutions, such as government and private banks, pawn shops and money lenders. However, not all credit applicants can secure a loan due to their creditworthiness assessment by the lenders. Poor households lack assets and are mostly self-employed. They, therefore, have low creditworthiness and also find difficulties in obtaining credit (Kashuliza & Kydd, 1996; Narayan & Petesch, 2002; Fletschner, 2009; Bhuiyan, Siwar, Islam & Rashid, 2012). In examining poverty alleviation and credit access nexus, it is important to estimate the factors which determine a household's access to credit, particularly for all households in the Western Provinces of Indonesia as well those living in the rural areas.

Thirdly, the poverty reduction policy of the Indonesian government is to assist the poor households to escape poverty. Thus, the poverty reduction strategy changed from a macro-approach to a household approach (Dartanto & Nurkholis, 2013). The poverty reduction includes subsidised rice and health insurance targeted at the poor households (Jha, Kotwal & Ramaswami, 2013). The subsidized rice program, or food-based social safety net, aims to reduce the financial burden of poor households by meeting their basic needs (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-a). The health insurance (health care social safety net) provides the poor households access to health services, thereby reducing health costs (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-b).

Several studies point out that Indonesia's poverty reduction programs (which are the subsidized rice and health insurance) have reduced poverty risk and secured staple food consumption and health service utilization of the participating households (Sumarto, Suryahadi & Widyanti, 2005; Sparrow, Suryahadi & Widyanti, 2010). Some of the studies also note the impact of the programs on the participants' consumption expenditure on rice, health as well as on other foods/non-foods such as vegetables, meats and education. Examining the effect of the program on consumption is important since consumption level is one of the key welfare indicators (World Bank, 2005). Thus, it is also vital to analyse the impact of the Indonesian poverty reduction programs on consumption expenditure of the participants.

1.2 Aims and Objectives of the Study

The aim of this study is to provide a holistic poverty analysis of the Western Provinces of Indonesia. To achieve that, the study examines poverty dynamics at the micro or household level characteristics, the households' access to credit, and the government policy impact evaluation for poverty reduction programs both for all households in general, as well as for the agricultural sector of the Western Provinces in Indonesia.

The hypotheses of this study include the following: (i) household characteristics affect the probability of not being poor; (ii) access to credit for all the Western Provinces' households and those households in the agricultural sector can alleviate poverty and; (iii) the government's poverty reduction strategies to assist the poor households can improve the households' consumption, especially those in the agricultural sector. These hypotheses are tested using the following primary research questions, (i) which household characteristics can influence Indonesia's poverty alleviation? (ii) how do the characteristics affect access to credit? (iii) how effective are the poverty reduction policies in improving the well-being of the poor?

To empirically examine the hypotheses above, a number of models are estimated for Western Provinces households and then for the agricultural households. First, the poverty dynamics model examines the factors that affect poverty status transition of the households, from poor to non-poor and vice versa. The model also specifically analyses agricultural, rural and urban households. Second, the credit access model analyses the household characteristics that can determine the households' access to credit. The second model is applied to assess credit availability of households in Western Indonesia and the agricultural households from formal and informal institutions as well as credit availability for business activities. The final model, which is the impact evaluation model, estimates the effect of food-based and health care social safety net programs in improving household consumption levels.

1.3 Data and Methodology

A quantitative approach and household level data from Indonesian Family Life Survey (IFLS) for the periods 2000 and 2007 are used in this study. The IFLS 2007 is the most updated data from the survey that can be obtained from RAND website. The IFLS is an on-going longitudinal survey in Indonesia by the RAND Corporation and covers 83% of Indonesia's population. The survey is produced in collaboration with the Indonesian

organizations to provide information and data about household behaviours. The organizations are University of Indonesia, University of Gadjah Mada and Survey METER (RAND 2010a). The survey location of IFLS mostly cover the Western part of Indonesia, that is, all provinces of Java, some provinces of Sumatra (North Sumatra, West Sumatra, South Sumatra, Lampung and Bangka Belitung), a province of Kalimantan (South Kalimantan), two provinces in Sulawesi (West and South Sulawesi), a province in Nusa Tenggara (West Nusa Tenggara) and Bali. The Eastern part of Indonesia is not covered in this survey.

Econometrics procedures are employed in this study. The poverty dynamics model uses two-stage estimation, which is probit model followed by multinomial logit model, based on IFLS 2000 and 2007 datasets. This model uses two periods of data to examine the poverty transition of households in Western Indonesia. The model estimates the probability of falling into or escaping from poverty during those two periods based on the households' characteristics. The second model, which is credit access model, utilizes a two-stage probit model to analyse the probability of obtaining credit based on the households' characteristics. The impact evaluations of poverty reduction programs by the Indonesian government are estimated using the propensity score model (PSM). The details of these methods are discussed in the relevant chapters.

1.4 Chapter Outline

This study consists of six chapters. Chapter 1 provides the background and aims of the study. Chapter 2 provides the literature review of previous studies and empirical findings on poverty impact in developing countries. It discusses poverty definitions and its measurement. The focus of this chapter is on the determinants of poverty and the linkages of poverty with access to credit and the government's poverty reduction programs.

Chapter 3 presents an empirical study about the determinants of poverty dynamics using the household level data in the case of Western Indonesia and the agricultural sector. The poverty dynamics captures the poverty transition of the households. Poverty dynamics classifies poverty into four groups, which are chronic poor, transient poor (-), transient poor (+) and non-poor.

Chapter 4 empirically examines the household level determinants of credit access in Western Provinces of Indonesia and the agricultural sector. In this chapter, the credit access is examined based on three categories, which are: credit obtained from formal institutions,

credit obtained from informal institutions and credit that is received to finance business activities.

Chapter 5 empirically tests the hypothesis that food-based and health care social safety net programs, targeted for the poor household, in Indonesia have an impact on improving consumption behaviour of the participants. The consumption behaviour, in this chapter, is defined as consumption expenditure of a household's income on food and non-food items. Food items include rice, meat and dairy products, vegetables and fruits, tofu and tempeh. Non-food items include medical care, education and household items such as soaps and anti-mosquitos.

Chapter 6 presents the conclusion of key findings from each empirical analysis and the policy implications. It also provides some suggestions for further research.

Chapter 2
Literature Review

2.1 Introduction

Poverty reduction is the world's major agenda. One of the United Nations' eight Millennium Development Goals (MDGs), initiated in 2000, is to reduce poverty by half in developing countries by 2015. Besides focusing on reducing the rate of extreme poverty (which is defined as income less than 1.25 a day), the MDGs are also concerned with the poor's livelihood conditions and their development processes, such as getting better access to drinking water, nutrition and education (see United Nations, 2013). By 2010, some of the MDG goals have been met. According to the United Nations (2013), the proportion of people living under extreme poverty has decreased from 47 percent in 1990 to 22 percent in 2010 and more than two billion people now have access to better sources of drinking water. However, despite the fact that the extreme poverty rate continues to fall, in 2013, the United Nations estimated that globally, 1.2 billion people are still living in extreme poverty (United Nations, 2013). In 2010, the United Nations Development Programme (UNDP) launched Multidimensional Poverty Index (MPI) as an index measuring poverty from multidimensional aspects (UNDP, 2010).[2]

A way to overcome poverty is to harness economic growth (Kakwani, 1993). Increasing economic growth can also help improve human development even though the linkage may not be strong (Grosse, Harttgen & Klasen, 2005). However, McKay and Sumner (2008) argue that there is not enough evidence to show the positive effect of growth on income and poverty reduction. Based on MPI, it can be seen that the poor not only lack income but are also deprived in other dimensions such as human capabilities and basic needs (see Sen, 1985; Narayan, Chambers, Shah & Petesch, 2000a; Narayan, Patel, Schafft, Rademacher & Koch-Schulte, 2000b; Laderchi, Saith & Stewart, 2003). This is because economic growth is not the only tool to overcome poverty but other factors, including better access to health and education are needed (McKay & Sumner, 2008).

In order to tackle poverty, it is important to understand thoroughly the factors causing and affecting poverty (see World Bank, 2005; Todaro & Smith, 2011, McKay & Sumner). Thus,

[2] According to UNDP (2013a), about 1.56 billion people live in multidimensional poverty which is greater than those living in extreme poverty condition. The MPI assesses poverty based on three dimensions, i.e., education, health and living standard (Alkire, Conconi & Seth, 2014).

firstly this chapter explores the definition and measurement of poverty as a multidimensional aspect, followed by a focus on the determinants of poverty at the household level. Furthermore, interventions are needed to alleviate poverty. Government plays an important role in reducing poverty by shaping and executing anti-poverty policies (see Alcock, 2006). Collaboration of government and private sector, such as improvement of access to credit, is also proven effective to reduce poverty (Narayan & Petesch, 2002). Thus, this chapter also discusses credit availability to the poor and the determinants that affect it, as well as some evidence from the impact evaluation of government's social protection programmes on household consumption expenditure.

2.2 Definition and Measurement of Poverty

Defining poverty has been a major development issue. Over time, debates on poverty have brought different understandings both of what constitutes the definition of 'poverty' and the the way poverty is measured (Hagenaars & de Vos, 1988; Laderchi et al., 2003; Lister, 2004; Alcock, 2006; Callander, Schofield & Shrestha, 2012). Poverty contains multi-dimensional aspects causing difficulties in defining it in a unified way. According to the United Nations (1998, p.1):

> Poverty is a denial of choices and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and clothe a family, not having a school or a clinic to go to, not having the land on which to grow one's food or a job to earn one's living, not having access to credit. It means insecurity, powerlessness and exclusion of individuals, households and communities. It means susceptibility to violence, and it often implies living on marginal and fragile environments, without access to clean water and sanitation.

In a broad sense, poverty involves well-being deprivation (World Bank, 2005). The World Bank defines a high status of well-being when people having enough income or resources to fulfil their needs and have enough nutrition, shelter, or even education in their life. There are two major perspectives on wellbeing deprivation, which are economic well-being and human well-being (see Narayan, et al., 2000a; Narayan et al., 2000b; Wagle, 2008).

Wagle (2008) explains that economic well-being, as a measurement of physical quality life, is indicated by having enough resources and using them for the consumption of goods and services (e.g. food, housing and clothing). Thus, people who live in poverty based on economic well-being deprivation, experience lack of resources to meet their consumption behaviour. Despite defining poverty by economic or income well-being, it is also important that "poverty can be distinguished from other dimensions of deprivation such as physical

weakness, isolation, vulnerability and powerlessness with which it interacts" (Chambers, 1995, p. 175). In other words, it is important to keep in mind the physical and psychological dimensions of people's lives in addition to the economic dimension when measuring well-being. Human well-being deprivation defines poverty as having low human capabilities to do and to be something that people value on their life. It indicates people's lack of freedom and power to make choices in life (Lister, 2004; Wagle, 2008; Wisor 2012). Human well-being encompasses the social dimensions of people's lives and takes into consideration social well-being deprivation, which highlights poverty as the inability to participate in the wider societal activities, such as political activities, labour market and neighbourhood environment (Narayan et al., 2000a; Lister 2004; Wagle 2008; United Nations, 2009).

There are three major ways in which poverty has been analysed. Poverty has been categorised as (a) having less than a certain minimum level that is objectively defined (b) having less than others and (c) as a feeling that you do not have enough to join in society (Hagenaars & de Vos, 1988). The first and second poverty definitions lead to absolute and relative poverty and the third category reflects subjective poverty based on what the households think subjectively about the level of an "economically sufficient" condition for their households to be considered as non-poor (Wagle, 2008). Absolute poverty is poverty status as a result from comparing people's living standard with an absolute minimum standard that is defined by international criteria (constant across all countries) or specifically by each country (see Ravallion, Datt & van de Walle, 1991; Lister 2004). The absolute poverty indicates the actual situation of the poor people, not by the condition of the non-poor, who lack of sufficient income to meet basic needs and physical necessities (Lister, 2004; Alcock, 2006; Deaton, 2006). On the other hand, relative poverty is poverty status as a result from comparing people's well-being with a minimum standard from the overall distribution in society, so that it will be strongly linked to what other people have (Lister, 2004; Deaton, 2006). The major approaches to analysing poverty are the monetary approach, the capability approach, the basic needs approach, the social exclusion approach and the participatory approach.

The Monetary Approach

Monetary approach concentrates on material or physical resources to satisfy basic needs. For example, as a general term, people are considered to be poor if they have no money (Narayan & Petesch, 2002). The approach is based on monetary indicators, such as threshold or minimum level of income or expenditure so they can be distinguished as poor or non-poor (see Laderchi et al., 2003; World Bank, 2005; Chambers, 2006; Wagle, 2008; Wisor, 2012).

Thus, the monetary approach is more related to poverty definition from an economic well-being deprivation definition.

The most common indicators to measure poverty using the monetary approach are income or consumption expenditure (World Bank, 2005). However, income-based measurement in the monetary approach is more problematic compared to consumption measurement. This is because the income-based approach neglects calculating the value of publicly provided goods and services accessed by individuals (Wisor, 2012). As Townsend (1962, p. 220) states "to establish a minimum income standard is meaningless unless we also show that there are some families with that income who do in fact secure a defined level of nutrition". Thus, it is more important to see how people achieve their basic needs by using their monetary resources rather than only seeing on income level. Meanwhile, the consumption-based monetary approach is a direct measurement of people's well-being achievement. It is readily observed and has smoother data compared to income-based measurement, which is relatively indirect and has seasonal variability (Meyer & Sullivan, 2003; Duclos & Araar, 2006).

The poverty line itself is the minimum cost of living for a household to attain a given level of utility or to fulfil its basic needs (Ravallion, 1998). Usually the cost of living can be indicated by the cost of consumption to meet basic needs, including food and non-food basic needs (Ravallion, 1998; World Bank, 2005).[3] The poverty line has been used to measure headcount ratio, the poverty gap index and the severity of poverty (squared of poverty gap). The headcount ratio has been widely used in measuring aggregate poverty (Kakwani, 1980; Foster, Greer & Thorbecke, 1984; Ravallion, 1996).[4] The absolute poverty line contains a fixed real value over time and space that makes it invariant (Ravallion, 1998). Relative poverty is affected and updated by standards of living distribution in the society or by the current situation of the economies such as average expenditure (Foster, 1988; Ravallion, 1998; Madden, 2000). The Minimum Income Question (MIQ) can be used as the measurement method of the subjective poverty line (Ravallion, 1998; Wagle, 2008).

[3] The food basic needs should satisfy nutrition or energy requirement for good health, such as 2,100 calories per person per day. This standard of food energy requirement is proposed by Food and Agricultural Organization of the United Nations and has been widely used (World Bank, 2005).

[4] $P_0 = \frac{1}{N}\sum_{i=1}^{N} I\ (y_i < z)$ shows the share of population who live below the poverty line where, P_0 is headcount ratio, N is the total population, $I(.)$ is an indicator that takes value 1 if the expression is true and 0 otherwise, yi is the monetary indicator used in poverty line, and z is the poverty line. In consumption expenditure-based, when household's expenditure (y_i) below poverty line (z) so $I(.)$ equals to 1 and are considered as poor. The headcount poverty ratio does not capture the greatness of poverty which focuses on how poor are the poor (for details see World Bank, 2005; Haughton and Khandker, 2009).

The poverty gap (PG) index shows the depth of poverty by measuring the average differences between poverty line and income (United Nations Statistics Divison, 2005; Chakravarty, 2009) or expenditure (World Bank, 2005; Haughton & Khandker, 2009).[5] This index measures the extent to which people's standard of living (income or expenditure) fall below the poverty line. The poverty gap gives a zero income gap for non-poor people. This indicator shows the amount of monetary resources that should be transferred to the poor in order to lift their standard of living up to the poverty line. Squared poverty gap (SPG) is a transformation of the poverty gap, by weighting the observations to be more sensitive in capturing the distribution and inequality of living standards among poor people (UNSD, 2005; World Bank, 2005; Haughton & Khandker, 2009).[6] PG and SGP complement the poverty incidence. For example, it is possible to have high poverty incidence but a lower poverty gap (less severe) as found in the context of unskilled workers in Madagascar (Haughton & Khandker, 2009).

The Capability Approach

Individual well-being is not always a matter of money and income (Sen, 1985 & 1999). Sen (1999, p.19) emphasizes that "the approach used…concentrates on factual base that differentiates it from more traditional practical ethics and economic policy analysis, such as the "economic" concentration on…*income* and *wealth*". The monetary approach fails to capture the important dimensions of poverty in term of capabilities deprivation, e.g. freedom from violence, leisure time and functioning showed by ability of individuals to transform their income into achievements (Stewart, Laderchi & Saith, 2007; Wisor, 2012).

A person's well-being can therefore be seen from the person's capabilities to achieve functioning which reflects their valuable achievements, such as being nourished and healthy (Sen, 1985 & 1999; Laderchi et al., 2003; Stewart et al., 2007), having a long life and taking part in the community (UNDP, 1997). Freedom, as a central development process, influences people to have reasons to value and achieve valuable life (Sen, 1999).[7] The functionings

[5] $P_1 = \frac{1}{N}\sum_{i=1}^{N}\frac{(z-y_i)\times I(y_i<z)}{z}$ where, P_1 is poverty gap (PG) index, $[(z-y_i)\times I(y_i<z)]$ is poverty gap, N is the total population, yi is the monetary indicator used in poverty line (income), and z is the poverty line. The equation means the poverty gap as the poverty line less actual monetary indicators (yi) for poor people.

[6] $P_2 = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{(z-y_i)\times I(y_i<z)}{z}\right)^2$ where, P_2 is squared poverty gap (SPG).

[7] The five types of freedom are the human capability to accomplish functionings i.e. political freedoms, economic facilities, social opportunities, transparency guarantees, and protective security (for details see Sen, 1999).

achievement is highly affected by economic opportunities, political rights, social powers and the qualifying situations of good health, basic education and the boost of initiatives.[8]

Low income can be a reason for deprivation in education and health; conversely, better education and health can bring better income. In association with that, Stewart et al. (2007) illustrates the role of monetary resources in the individuals' functioning (Figure 2.1). The figure demonstrates the wages and earnings received by people, from both labour market and social income, being used to attain commodities. The utilization of the commodities is influenced by the environment as well as the characteristics of both the commodities and the users of these commodities. This utilization can benefit the users by allowing them to shape their set and reach functionings.

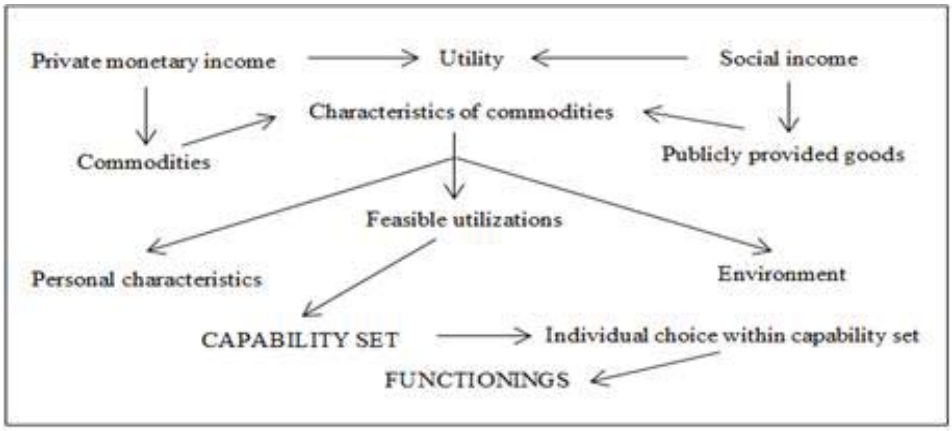

Figure 2.1. Links of Monetary Resources and Capability Approach. Adapted from Introduction: Four Approaches to Defining and Measuring Poverty (p. 16) by Stewart, F., Laderchi. C. R, & Saith, R., 2007, Basingstoke, United Kingdom: Antony Rowe Ltd. Copyright 2007 by Antony Rowe Ltd. Reprinted with permission.

The capability approach broadly brings poverty measurement in multidimensional aspects rather than only through the monetary approach. However, applying the capability approach is difficult due to lack of a specific list of minimal basic capabilities, to achieve functionings and escape from poverty (Alkire, 2002a & 2000b). However, the various lists are strongly related to education, health and affiliation with society (Nussbaum, 1999 & 2000; Qizilbash, 2002; Robeyns, 2003). The applications of the capability approach, regardless of the methods used, will be important in poverty investigation and alleviation (see Schischka, Dalziel & Saunders, 2008; Leßmann, 2011; Ataguba, Ichoku & Fonta, 2013).

[8] Functionings can be defined as outcomes or diverse things a person succeeds in doing or being something, while capabilities represent the potential functionings the person can achieve (Sen, 1993 and 1999; Laderchi et al., 2003; Robeyns, 2005; Stewart et al., 2007; Hick, 2012; Chattier, 2012).

Multidimensional Poverty Index (MPI)

The Multidimensional Poverty Index is a human poverty measurement, which indicates acute multidimensional poverty (Alkire & Santos, 2010 & 2011; UNDP, 2010). "This new measure replaces the Human Poverty Index (HPI), published since 1997" (UNDP, 2010, p. 95). The index focuses on the deprivation of three basic dimensions consisting of education, health and standard of living. MPI captures the number of people experiencing overlapping deprivations and how many deprivations they face on average in the intensity of their poverty (UNDP, 2010). The MPI uses ten indicators from three dimensions i.e. two indicators for health, two indicators for education and six indicators for living standard (UNDP, 2010). Indicators used in MPI are shown in Table 2.1. UNDP (2010) emphasizes that to be considered as multidimensionally poor, households must face deprivations in at least six indicators of the standard of living.

Table 2.1

The Indicators in Multidimensional Poverty Index

Dimension	Indicator	Deprived if
Health	Child mortality	Any child has died in the family
	Nutrition	Any child or adult is malnourished
Education	Years of schooling	No household member completing 5 years of schooling
	Child enrolment	Any school-age child does not attend school in years 1 to 8
Standard of Living	Electricity	The household has no electricity
	Drinking water	The household has no access to clean drinking water
	Sanitation	The household lack enough sanitation (shared toilet)
	Flooring	The household has dirt, sand, or dung floor
	Cooking Fuel	The household cooks with wood, charcoal, or dung
	Asset Ownership	The household at least does not own one of: radio, television, telephone, bicycle, motorcycle, or refrigerator; and does not own a car or tractor.

Adapted from "Training material for producing national human development reports: The Multidimensional Poverty Index (MPI)," by Alkire and Santos, 2011, *OPHI Research in Progress 31a*. Copyright 2011 by Oxford Poverty and Human Development Initiative (OPHI). Reprinted with Permission.

The MPI has some weaknesses according to UNDP (2010), mainly because of data constraints. First, the indicators used in MPI are not one dimension data. For example MPI indicators include outputs (e.g. years of schooling), inputs (e.g. cooking fuel) and one stock indicator (child mortality). Second, the health data is relatively weak and poor. For example, Alkire and Santos (2010, p. 14) note that "malnutrition indicators…do not reflect micronutrient deficiencies. Also…do not consider the problem of obesity". Third, the requirements to be considered as poor based on MPI make the index insensitive to minor imprecisions. Fourth, the MPI cannot capture the severity of intra-household inequalities. Fifth, the MPI does not measure inequality among the poor. Moreover, Wisor (2012, p. 104) states that "the justification for inclusion of given dimensions within the MPI is weak".

The Basic Need Approach

The basic needs approach goes beyond the monetary approach and considers the poor as individuals with a lack of basic needs fulfilment. It includes the deprivation of minimum human needs and the need for basic health, education, employment, participation and services provided by society (UNDP, 1997). It is important to note that "the basic needs approach to poverty does take some needs as fundamental", however, the shortfall of the approach is that it does not address the "higher order needs" such as aesthetic need of the need for self-transcendence (Wisor, 2012, p. 78). The problem arises when defining the list of basic needs that must be fulfilled by individuals to maintain an adequate standard of living. The problem in this approach is similar to the difficulties in defining a list of the minimum human capabilities to be achieved in the capabilities approach (Laderchi et al., 2003).

The basic needs cover two elements in defining the fundamental needs (International Labour Organization, 1976 & 1977). The first element of basic needs includes the household minimum requirements to complete private consumption, for example, enough food, clothing and shelter with adequate equipment and furniture. The second element consists of services provided by and for society, such as safe drinking water, sanitation, public transport and educational health and cultural facilities. Those elements will be highly related to employment and participation of the poor in society. Thus, achievement in basic needs, such as better education and health, will facilitate people's participation in society, strengthen future achievements and goals, which then help them to get employment and earn money (ILO, 1976).

Basic needs can be interpreted both objectively and subjectively. The absolute basic needs, from an objective point of view, form the minimum specified basic needs that are vital to be achieved by the people (ILO, 1976; Streeten, 1984). Its relative aspect considers the level of others' living in the same society. The subjective basic needs approach assumes that "consumers are better judges of their basic needs than experts, but it leaves open the demarcation of the domain of the public sector - and of policy interventions" (Streeten, 1984, p. 974). Thus the two key components are food and non-food basic needs. Those components have been used to measure the poverty line. Ravallion (1998) provides the application of measuring the poverty line using the "cost-of-basic-needs" (CBN) method

based on minimum cost to achieve adequate basic needs.[9] The method highlights that "a plausible hierarchy of "basic-needs" would then begin with survival food needs, basic non-food needs, and then basic food needs for economic and social activity" (Ravallion, 1998, p. 18). These indicators are measured in the "monetary" term to capture the cost of basic needs. The basic needs approach to poverty measurement is used in Indonesia (Statistics Indonesia, 2013b).[10]

The Social Exclusion Approach

The social exclusion approach looks at the individuals who are being excluded in society, a notion pioneered by Lenoir in 1974 to denote people who lived without protection from the welfare state (Saith, 2001; Wisor, 2012). Social exclusion is defined as "the process through which individuals or groups are wholly or partially excluded from full participation in the society in which they live" (European Foundation, 1995, cited in de Haan and Maxwell, 1998). Saith (2001, p. 3) put emphasis on the socially excluded as a condition with "the mentally and physically handicapped, the aged and invalid, drug users, delinquents, suicidal people and so on". The development of the social exclusion approach arose in industrialized countries, firstly used in Europe, then continued to be applied in developing countries through the influences of the International Labour Office (see Clert, 1999; Stewart et al., 2007).[11]

The social exclusion approach is different to the monetary and capabilities approach. The first difference is that social exclusion is a process causing a deprivation in the future (see Atkinson, 1998; de Haan & Maxwell, 1998; European Union, 2010). Wagle (2008, p. 42) points out that social exclusion approach "focuses on the relationship of a person with the broader social institutions and frameworks". Second, the social exclusion includes key characteristics in the society, for example, age, handicapped and ethnic groups. Also, the exclusion can be in many forms, such as exclusion due to disability, age, statelessness and sexuality (United Nations, 2009). These factors have been linked to the poverty conditions of

[9] The CBN method sets the upper boundary by assuming that the non-food components, such as employment, schooling, and health care, are already required before individuals take part in the society. Thus, the individuals still expend on non-food goods even if they already accomplish minimal food-energy requirements.

[10] Indonesia's poverty measure consists of two poverty lines. The food poverty line is the minimum expenditure in consuming food. The food poverty line is represented by 52 commodities (rice, tubers, fishes, meats, eggs and milk, vegetables, nuts and fats, fruits, etc.). The non-food poverty line is the minimum expenditure in consuming non-food goods which mainly captures basic needs in housing, clothing, education, and health. The non-food goods are represented by 51 commodities for urban area and 47 commodities for rural area (Statistics Indonesia, 2013).

[11] Clert (1996) mentioned that in Social Summit in Copenhagen, March 1995, the "social-exclusion" began to be officially accepted in Europe. The text based on Social Summit defined the causes of social exclusion i.e. conflict, lack of cooperation, inequality, violations of the law, discrimination, social change, and economic transformation.

the poor, who are "… in effect, excluded from ordinary living patterns, custom, and activities" (Townsend, 1979, p. 31). Wisor (2012, p. 115) argues that "poverty causes social exclusion, and social exclusion causes poverty". The approach has been used for investigating the characteristics and situation of the society or groups which have faced social exclusion (Stewart et al., 2007). Poverty and social exclusion analysis has been undertaken by Gordon et al. (2000) in the case of Britain. The study notes several indicators and space that create the occurrence of exclusion.[12] Also, a European Union (2010) study analyses labour market exclusion, education-related exclusion, housing-related exclusion and exclusion from social network and information society. The findings suggest that the differences of various exclusions contribute to societal problems and adversely impact households.

The Participatory Approach

The participatory approach was pioneered by Chambers (1994) who aimed to learn about rural life and the condition of the local people and their lack of participation. There are two reasons that make this approach different, those are, (a) the method in this approach engages the respondent actively, and (b) the participatory approach assumes that the research process will empower participants (Narayan et al., 2000a). Chambers (1994) utilised this approach to improve rural wellbeing, which he called Participatory Rural Appraisal (PRA). He defines the PRA as a method "to enable rural people to share, enhance, and analyze their knowledge of life and conditions, to plan and to act" (Chambers, 1994, p. 953). Another method, Participatory Poverty Assessments, developed by the World Bank, emphasises the involvement of the stakeholders (according to Chambers, it is rural people) in planning the follow up action (Narayan et al., 2000b). The PPA extends this method "…from project planning to input into policy making" (Laderchi, 2001, p. 5).

The application of the participatory method in accomplishing the triangulation was done by Narayan et al. (2000a). In applying this method, there are various contextual techniques used "…in triangulation i.e. verifying the information that has been obtained" (Stewart et al., 2007, p. 25).[13] It was a mix of verbal and visual techniques, i.e., small group discussions, well-being ranking, scoring, cause-impact analysis, trend analysis and in-depth interviews

[12] The indicators are exclusion due to lack of income, labour market exclusion, service exclusion and social relations exclusion. The labour market exclusion occurs because individuals are not in paid work. The service exclusion is due to lack of access to basic services. The exclusion from social relations includes non-participation in common social activities, isolation and lack of support.

[13] The contextual tools and techniques are involved in the participatory methods to understand the poverty dimension of the poor, their ability to understand and analyse their own situation (Narayan et al., 2000; Stewart et al., 2007).

with individuals or households. The limitation of this method is in the validity of collected data (see Stewart et al., 2007). It is emphasized by White and Pettit (2007, p. 257) that "an important area of criticism…is the danger that participatory research hides diversity, and can present falsely homogenous view of 'the people' whose views it represents". However, they also argue that the participatory method brings benefits by providing the true voice to be heard that is spoken from and about realities.

2.3 Determinants of Poverty

Identifying the determinants of poverty is important in alleviating poverty. Empirical evidence on the poverty determinants would be valuable in the modelling of more effective anti-poverty policies. Poverty can be caused by low economic performance of a country and through various characteristics of the poor households, such as, low income, unemployment and low level of education. These factors, which lead to lower income earnings, create difficulties for households to meet basic needs. According to Todaro and Smith (2011, p. 235), they point out that poverty is related to macro level problems (i.e., income distribution and human capital), but "…to attack poverty at its source, we need some specific knowledge of…poverty groups and their economic characteristics". The causes of poverty at the macro and micro levels are discussed next.

2.3.1 Country Level Characteristics

The poverty incidence can be determined by the conditions and characteristics of the country itself. Low economic performance (Son & Kakwani, 2004; Todaro & Smith, 2011), lack of human resources (Jung & Thorbecke, 2003), bad governance (Alcock, 2006) and inhospitable climate (McGuigan, Reynolds & Wiedmer, 2002) are macrolevel factors that lead to poverty in a country.

The low economic performance that causes poverty is mainly indicated by lower levels of economic growth. Economic growth can be beneficial for the poor (Dollar & Kraay, 2002; Dollar, Kleineberg & Kraay, 2013). "With economic growth income poverty falls and with economic contraction income poverty rises" (World Bank, 2001, p. 35). The important matter is how growth can be distributed equally and fairly to the people to bring benefits to them and that economic growth followed by equitable distribution "…is generally the most effective path to sustained human development" (UNDP, 1990, p. 3). McKay and Sumner (2008, p. 2) agree that the distributional pattern of growth is essential for the sustainability of the growth. Son and Kakwani (2004) find that faster growth can cause both slower reduction

and an increase in poverty depending on the level of inequality in the case of Asian countries. Similarly, findings in Pakistan have noted that the effect of inequality in increasing poverty is greater than the growth in overall income in reducing poverty (Zaman & Khilji, 2013). Thus, the growth-oriented anti-poverty policy must be equipped with rational income distribution.

Another theory that underlines the adverse effect of growth on the poor is the distributional context of trickle-down-effect. The trickle-down-effect points to the vertical flow of growth, that is, "the benefits of economic growth go to the rich first, and then in the second round the poor begin to benefit when the rich start spending their gains" (Kakwani, Prakash & Son, 2000, p. 6). It is therefore important to focus on how growth can be pro-poor and that the poor can actively participate and get benefit from economic activities (Kakwani & Pernia, 2000). There are measures of how the level of growth affects the poor, such as (1) 'the pro-poor growth index', i.e., measuring the degree to which growth can be considered to be pro-poor (Kakwani & Pernia, 2000), and (2) the 'poverty equivalent growth rate', i.e., measuring both the magnitude of growth and how the benefits of it can be distributed to the poor and the non-poor (Kakwani & Son, 2003).

In the context of pro-poor growth, growth itself will not be sufficient to alleviate poverty. Low economic growth can reduce job opportunities (United Nations, 2013) and will affect the poor because they lack opportunities such as jobs and public services (World Bank, 2005). McKay and Sumner (2008) provide three important policies to make growth effective, which are redistribute the benefits of growth through pro-poor public expenditure, increasing the rate of job creation from growth and broad-based sectoral growth, particularly supporting the agricultural food crop. Macroeconomic instability can also affect poverty in which unemployment, high inflation, volatility, crises and high interest rate positively relate to poverty (see Haveman & Schwabish, 1999; Ames, Brown, Devarajan & Izquierdo, 2001; Asian Development Bank, 2002; Bonilla, 2008). The policies promoting pro-poor growth within a stable macro-economy include lower transaction costs, 'good-enough' governance, providing physical access to markets and investing in the health and education (Overseas Development Institute, 2008).

A further cause of poverty is the lack of skilled labour. Low-income countries are often seen to have lower skilled human resources than developed countries (Todaro & Smith, 2011). Higher human resources can determine higher level of economic growth (World Bank, 1980). Becker (1995, p. 3) emphasizes that "poorer nations with more educated and healthier

populations managed to grow faster than average". Moreover, knowledge accumulations in the population can promote growth endogenously (see Romer, 2012). This can be seen in an empirical study of Tanzania and Zambia, which shows that expenditure in education can promote economic growth and reduce poverty (Jung and Thorbecke, 2003).

Another country characteristic that causes poverty is poor governance. Poverty is not always about the failure to meet basic needs but "…perhaps explanation should look…to the failings of…policies designed to combat it…" (Alcock, 2006, p. 39). Besides creating effective policies, governance should be good as well, it "is an essential pre-condition for pro-poor growth as it establishes the enabling regulatory and legal framework essential for the sound functioning of land, labor, capital and…markets" (ADB, 2002, p. 33). The essential elements of good governance are accountability, transparency, effectiveness and participation (see Narayan et al., 2000a; Bhatti, 2001). These qualitative factors of development, besides the protection of human rights and respect for the rule of law, are crucial (Organisation for Economic Co-operation and Development, 2001). Therefore, poor governance through corruption and political instability factors are the primary cause of poverty in Pakistan (ADB, 2002). Poor governance results in weak business confidence, worsening economic growth, declining public expenditure on basic needs and inefficiency in the delivery of public services. Empirical studies found that corruption encourages inequality and poverty (Gupta, Davoodi & Alonso-Terme, 2000), particularly in Africa (Gyimah-Brempong, 2002).

Extreme climatic conditions also cause poverty, thus inhospitable climates, such as extreme heat and humidity, generate problems in economic development (Todaro & Smith, 2011). The extreme climates in most poor countries determine the soil quality and contribute to the low productivity of crops. Moreover, extreme climatic conditions can cause discomfort to workers and weaken their health. Furthermore, global climate change brings disturbance to poor countries by increasing their vulnerabilities (World Bank, 2001) and dropping agricultural productivity followed by food security problems, since agriculture is the main sector in the developing countries (McGuigan, Reynolds & Wiedmer, 2002).

2.3.2 Household Level Characteristics

Previous discussions noted above also point out that poverty is not only about low income and expenditure, but that characteristics such as lack of skills, basic needs fulfilment including shelter, education, food and other consumption cause poverty. Poverty as a multidimensional concept is related to households' lack of education and ownership of assets

such as land, gender issues especially in female-headed households, location, poor health, lack of income and credit availability (Narayan et al., 2000a & 2000b). The African Development Bank and African Development Fund's (2004, p. 4) study point out that it is important to consider "activities in the agriculture, education, health, and infrastructure sectors not only at the national level but at the individual, household and community level as well", and to consider the household level characteristics to tackle the roots of poverty (World Bank, 2005).

The age of the household head is a key factor related to the poverty status to be considered in poverty reduction strategies (Somun-Kapetanović, Resić & Delalić, 2012). Dartanto and Nurkholis' (2013) analysis of poverty determinants in Indonesia find that the age of household heads significantly affects poverty status. Large household size is associated with higher probability of being poor or falling into poverty traps (Haddad & Ahmed, 2003; Woolard & Klasen, 2004). Dependency ratio, which is the ratio between the non-earning family members to those in the family who earn, also affect being in poverty. In the case of Cambodia, evidence shows that the larger the household size, the higher is the probability of the household being in poverty (World Bank, 2005). In line with this finding, Bayudan-Dacuycuy and Lim (2013a), find that for the case of the Philippines, a large family size which has more younger children burdens the household and increase the chances of being poor.

Lack of education and skills can trap the poor to remain in poverty (Narayan et al., 2000a). To illustrate, in Malawi, the poor could not pay school fees which leads to illiteracy and difficulties in finding proper jobs, resulting in low level jobs in casual labour, which has low wage payment (Narayan & Petesch, 2002). However, the level of education or years of schooling can decrease the probability of being poor in Indonesia (Alisjahbana & Yusuf, 2003) and in Ethiopia (Bigsten, Kebede, Shimeles & Taddesse, 2003).

The household location explains poverty incidence. Those in rural areas are more likely to be poor, as are those living in remote, low potential, marginal or weakly integrated areas dependant on agriculture, which is associated with low payment. The livelihoods of rural households mirror the "…opportunities and constraints characterizing the areas where they live (e.g., related to the natural resource base, market access opportunities, infrastructure)…" (International Fund for Agricultural Development, 2010, p. 52). For instance, McCulloch and Calandrino (2003) find that the poor in rural China, who live in difficult-to-reach areas (hilly and mountainous place), were more vulnerable to being below the poverty line.

Households engaged in the agricultural activities have low earnings compared to other sectors. Okidi and Mugambe (2002), in the case of Uganda, find that households in agricultural self-employment lived in persistent poverty for at least five years. Moreover, agricultural households have riskier and more vulnerable lives especially in relation to poverty. "Negative shocks such as crop loss, falling agricultural prices, or death and illness can therefore easily send rural households into poverty" (Dartanto and Nurkholis, 2013, p. 68). Furthermore, female-headed households also affect the probability of the households falling into poverty (Gounder & Xing, 2012). In addition, gender inequality due to lack of access to higher education causes poverty (Jacobs, 1996). Social stigma and exclusion is also a significant problem faced by women in developing countries. "In some societies, widows, divorced or abandoned women may be subject to social exclusion, isolation and harassment, making it very difficult for them to maintain a livelihood for themselves or their children" (Cagatay, 1998, p. 3). As seen in Kenya and Malawi, the female-headed household had lowest income compared to the male headed family (Kennedy, 1992).

Owning assets such as land, buildings or equipment assist the poor to escape poverty. The study of Narayan and Petesch (2002) show that Indonesian poor fishermen in rural areas had to use the wealthy fishermen's tools because they lacked such equipment and assets. This reduced their earnings as the wealthier fishermen required 50 percent payment of the earnings for borrowing the tools. Thus, assets are important resources in poverty alleviation especially for the rural and poor agricultural households. For example, Bigsten et al. (2003) empirically show that more widely cultivated land by the households significantly and positively affect their expenditure in the case of Ethiopia. A finding from Geda, Jong, Kimenyi and Mwabu (2005) indicates that improving the quality of the land owned through complementary inputs support productivity since the size of land owned was not a determinant of poverty in Kenya. Furthermore, in the case of Bolivia, owning land and livestock as agricultural assets bring better effects to most poor households in preventing poverty rather than owning motorbikes and televisions (Machicado, Heffernan & Thomson, 2012).

Credit availability is an important resource for the rural poor in low income countries (Chavan & Ramakumar, 2002) as it can affect the household welfare by providing capital and increasing their risk-bearing (Zeller et al., 1997). The lack of credit can keep the poor in poverty because of low productivity (Bhuiyan et al., 2012). For instance, in Bangladesh, micro-credit programmes significantly assisted in building assets and empowering women (Zaman; 1999). Also, Chowdhury, Ghosh and Wright (2005) point out that micro-credit

provides benefits in the long-run in reducing poverty in Bangladesh. Moreover, Shirazi and Khan (2009) empirically find that a micro-credit programme in Pakistan (i.e., Pakistan Poverty Alleviation Fund), successfully reduces poverty. Thus, credit access is a vital factor in reducing poverty.

Zeller and Sharma note that financial services can reduce poverty, however the "…financial services may have to be combined with other services and community action to make them effective" (1998, p. 26). In agreement with that, Snow (1999) states that micro-credit linked to local institutions can lead to benefits to the local community. Similar empirical findings from Cameroon shows that micro-credit positively relates to the household well-being (Baye, 2013). Baye stresses that "to be effective, however, a wide range of supporting services such as improvements in physical infrastructures and healthcare are necessary to complement access to credit…" (Baye, 2013, p. 462).

2.4 Credit Availability for the Poor

The poor in rural areas usually have insufficient access to credit which can bring consequences of malnutrition, food insecurity and low household welfare (Diagne & Zeller, 2001; Winter-Nelson & Temu, 2005). Credit smooths the pattern of household consumption and helps the rural poor to invest in their small businesses (Zeller et al., 1997; Zaman, 1999; Islam, 2007; Tang, Guan & Jin, 2010). Islam (2007, p. 71) notes that a credit scheme for the rural poor is the credit intended to help them escape from poverty "…by investing in their own enterprises". Thus, credit access is important for the poor in order to help them increase their well-being. However, the poor often fail to enter credit markets. The market imperfection, which underlies credit rationing from financial institutions and the determinants of the credit access of the poor are discussed below.

2.4.1 Market Imperfection and Failure on Accessing Credit Market

According to Narayan and Petesch (2002, p. 193), "poor people…ranked institutions according to four criteria: the institution's *importance* to people; its *effectiveness* in providing support, solving problems, or helping; people's *trust* in the institution; and….to which people have *control* (or influence) over the institution". This suggests that the poor need helpful and supportive institutions in which they can put trust and they must have sufficient control to reach and influence the institutions to get credit.

The failure of the poor to get credit can be seen from credit market imperfection theory. The market imperfections arise under credit schemes, i.e., "lenders exchange money today for a promise of money in the future…" (Hoff & Stiglitz, 1990, p. 237). The exchange makes the credit market riskier and pushes the lenders to take actions so the goods or money borrowed can be returned as promised (Hoff & Stiglitz, 1990; Bardhan & Urdy, 1999). The action can be setting of the interest rate which leads to credit rationing, asymmetric information and imperfect market.

In providing credit then financial institutions identify the borrowers because they have different ability to pay the loan and interest rate (see Stiglitz & Weiss, 1981). To identify borrowers, the institutions can collect information related to the characteristics and actions of the borrowers (by doing screening and monitoring). Moreover, institutions have a set of rules of enforcement to reduce the possibility of credit failure (Stiglitz & Weiss, 1981; Hoff & Stiglitz, 1990). To further avoid such failures, financial institutions, particularly banks, mostly depend on collateral (Hoff & Stiglitz, 1990).

Credit as financial assistance can be seen in the formal and informal sectors.[14] According to Germidis, Kessler and Meghir (1991), the formal sector refers to organized-urban oriented, institutional and monetized systems while the informal sector refers to non-institutional, traditional, rural and non-monetized systems. They note that the formal financial sector is related to "rules", "regulated", or "controlled" sectors by the government. The informal sector is rooted on traditional values and known for its flexibility, low cost, low procedure and fast responses to those who need money and are excluded from the formal sector (Germidis et al., 1991; Yaron, 1992; Srinivas & Higuchi, 1996). Germidis et al. (1991) provide three levels that represent the formal sector. These are (a) the central bank which is assigned and assumes an interventionist role in local financial institutions; (b) the composition of banks and non-bank financial institutions including commercial banks, merchant banks, development and savings banks, social security schemes and insurance companies; and (c) the capital markets. Srinivas and Higuchi (1996) note that informal fund suppliers can be friends, relatives and neighbours. Pagura and Kirsten (2006) state that commercial banks, state development banks and insurance companies are more formal than rural banks, cooperative banks and microfinance banks.

[14] The formal financial institutions are banks, government organizations, cooperatives, and non-government organizations (NGOs) (Maloney and Ahmed, 1988). However, the NGOs and village banks are more informal while self-help groups, women's associations, farmer's organizations, and indigenous savings clubs are the least formal.

The credit rationing, collateral scheme, high income preferences, costly and high procedure activities of the formal financial sector bring difficulties of access for the poor (Chowdhuryet al., 2005; Gandhimathi & Vanitha, 2010). This is because the poor have low income and assets, and therefore, are considered as high credit risk and low potential profitability (Huppi & Feder, 1990; Srinivas & Higuchi, 1996; Islam, 2007; Bhuiyan et al., 2012). Informal financial assistance can be an alternative but it is also a pressure on the poor through the high level of interest rate charged by the money-lenders (Burkett, 1989; Yaron, 1992). Chowdurry et al. (2005, p. 298) mention that besides charging the high interest rate, money-lenders from the informal sector "…tend to undervalue collateral, and often allow racist and/or sexist attitudes to guide lending decisions". According to Chowdurry et al. (2005, p. 298), the failure of formal and informal market assisting the funds reallocation to the poor led to the micro-credit institution.[15]

The micro-credit scheme started in Bangladesh as the Grameen Bank (see Hossain, 1988; Chowdurry et al., 2005). The Indonesian government set a micro-credit scheme called the *Kredit Usaha Rakyat* (*KUR*) to foster poverty alleviation. The *KUR* gives micro-credit to small and medium enterprises (SMEs) and cooperatives (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-c). The lending scheme of *KUR* is only for business credit, through government-owned banks, to SMEs and cooperatives that do not have enough collateral according to the prescribed requirements of the formal banks (Ministry of SMEs and Cooperatives of Indonesia, n.d.). Usually the requirements are associated with the legitimate documents of owning the business and the characteristics of the borrowers (Committee for Micro-credit Programme of Indonesia, n.d.).[16]

2.4.2 Factors Determining Credit Access

The characteristics of the household can affect the credit access of the poor (Kashuliza & Kydd 1996; Fletschner, 2009). Kashuliza and Kydd (1996, p. 290), in the case of Tanzanian farmers, explain that "expected farm income is suspected to be one of the major assessment criteria (by formal credit channels)…because it reflects on the capacity of borrowers to pay bank such loans". Swain (2007) agrees that the banks evaluate the loan based on expected borrowers' income from the project that is financed. Fletschner (2009) emphasizes that more wealth in the households brings expectations of higher return and higher capital demand.

[15] Micro-credit is "…essentially the dispersion of small collateral-free loans to groups of jointly liable borrowers in order to foster income generation and poverty reduction through enhancing self-employment" (Chowdurry et al., 2005, p. 298).

[16] For example, Bank Mandiri (government-owned bank) facilitates the micro-credit that look at the age of the borrowers as well (Committee for Micro-credit Programme of Indonesia, 2014).

Moreover, it can bring good impressions to the money-lenders as a lower level of credit risk. Evidence from Iran shows that "by increasing total revenue…ability of farmers in providing collateral and costs of receiving credit increase and…probability of access to credit increases" (Bakhshoodeh & Karami, 2008, p. 69).

Owning assets benefit the poor since they can use the assets as collateral to get credit. Pham and Izumida (2002) state that collateral is required and important in order to get credit from the formal institutions. Assets, such as land and physical capital owned by households may bring a higher return to capital. This suggests that owning assets increases both the probability of accessing funds (Fletschner, 2009) and the loan amount received by households (Duy, D'Haese, Lemba, Hau & D'Haese, 2012). In agreement with that, "total farm size cultivated has been one of the major criteria the banks and intermediaries have used in their provision of credit to farmers" (Kashuliza & Kydd, 1996, p. 289). In the case of Malawi, Diagne (1999) finds that the landholding size is significant in getting the households access to credit. She also emphasizes that composition of the household assets is more important than its total value in helping them access the credit.

Besides the income and assets of the poor, the education level can also influence the credit accessibility. In Tanzania, Kashuliza and Kydd (1996) state that farmers with higher levels of education are expected to have better knowledge of the importance of credit to them and the procedures of getting credit. Otherwise, the less educated famers tend to be ignorant of formal credit and sceptical of its role. Fletschner (2009) describes that higher education attainment highly relates to the better access of credit and awareness of the poor about financial opportunities. Moreover, higher education is assumed to bring easiness for the borrowers in visiting the financial institutions and following the process of accessing credit (such as in negotiations and meetings).

Nguyen's (2007) study notes that in Vietnam, education of the household head has a U-shape relationship with borrowing activities. The household heads with primary and secondary school graduates borrow more, compared with household heads who never attended school and those that graduated from university do less borrowing. The highly-educated group have more capabilities and opportunities and get better jobs and wage levels while the uneducated household heads reflect low levels of skills and abilities. Similarly, Bakhshoodeh and Karami (2008) find that in Iran farmers' literacy significantly impacts their accessibility to credit.

Another determinant of credit access is gender. Empirical study in Gambia shows that more male members of cooperatives borrow money compared to women members. It is because the cooperative sees the male members as more eligible to receive credit (Zeller, Braun, Johm & Puetz, 1994). Okurut (2006) finds that among the poor, being male positively relates to credit access from formal institutions and females have more credit access from informal and semi-formal institutions. Fletschner (2009) finds that women have a high probability to be credit constrained than men under the same socio-economic conditions. Location of the household can be counted as affecting factors in accessing credit (Kedir, 2003). Duy, D'Haese, Lemba, Hau and D'Haese (2012) emphasize that distance to the market centre and house location represents the capability of the household to search for credit. In case of farmers in Iran, those "…farmers who live in remote areas have less access to the loans". In addition, increased distance to the bank branches had a negative effect for credit accessibility (Bakhshoodeh & Karami, 2008, p. 69).

Areas of work, particularly in the agricultural areas, also affect the access of household to credit due to credit rationing from the financial institutions (Dohcheva, 2009). Credit rationing is highly related to asymmetric information and imperfect conditions of the credit market (see Stiglitz & Weiss, 1981; Hoff & Stiglitz, 1990). The rural areas in Bulgaria are restricted from credit markets because of asymmetric information, thus "rural credit rationing relates to limited credit access for farmers at a price stated by the lenders" (Dohcheva, 2009, p. 58).

2.5 Safety Nets and Poverty Reduction

Beside the characteristics of poor households and their ability to successfully obtain credit, governments in many developing countries are required to play an active role in decreasing poverty and insecurity of the poor. The poverty reduction strategies in some countries have reduced the poverty level (Bibi, 2001; Jalal & Frongillo, 2013). These strategies include schemes of social protection and safety net programmes (see Sumarto & Bazzi, 2011; Food and Agriculture Organization of the United Nations, World Food Programme & International Fund for Agricultural Development, 2012; International Monetary Fund, 2013). Generally, "safety nets can…reduce poverty in the short term and, when coupled with the longer-term approach of social protection programmes, these contribute…to a broader development strategy" (Adato, Ahmed & Lund, 2004, p.1). The empirical study in the case of Bangladesh shows that safety net programmes successfully tackle poverty (Pradhan, Mohd & Sulaiman, 2013).

For poverty reduction, the safety nets affect the consumption expenditure of the poor (Gupta, Schiller & Ma, 1999; United Nations Capital Development Fund & United Nations Development Programme, 2012). Food-based and health care programmes are key components of safety nets, which are important to the poor's nutrition intake and basic needs fulfilment (Adato et al., 2004). Studies find that the two programmes improve the poor's consumption behaviour (see Bitrán & Giedion, 2003; Sumarto et al., 2005; Gentilini, 2007). The section below focuses on the issues of safety nets and social protection, and its impact evaluation based on food-based and health care programmes on the household consumption.

2.5.1 Safety Nets for Social Protection Programmes

Social protection refers to the actions and strategies to help the poor escape from poverty by improving their deprivation and capability (Norton, Conway & Foster, 2001; OECD, 2009) and reducing their vulnerability through risk management (OECD, 2009). The studies emphasize human capital development to break the inter-generational diffusion of poverty. The role of social protection programmes include (a) protecting the most vulnerable citizens who do not gain from economic growth and (b) contributing to economic growth through human development and empowering the poor, particularly in managing risks (FAO et al., 2012). The social protection strategies consist of several policies highly related to social insurance schemes, labour market interventions and social safety net programmes (see Sabates-Wheeler & Devereux, 2006; UNCDF & UNDP, 2012; IMF 2013).[17]

Social insurance is based on insurance schemes through which "…individuals or households protect themselves against risk by combining to pool resources with a larger number of similarly exposed individuals or households" (Norton et al., 2001, p. 10). These are contributory programmes purposed to reduce risk for the poor livelihood due to shocks (FAO et al, 2012; UNCDF & UNDP, 2012). Labour market policies are purposed to protect the poor when they are entering the market, or in other words, the policies prevent the exclusion and discrimination in the market (UNCDF & UNDP, 2012). Safety nets "…includes any public actions to support poor and vulnerable persons and increase their ability to manage risk" (Ruelle & Rockmore, 2011, p. 1).[18] The safety nets are usually

[17] The policies under social protection strategies can vary among countries but in general relates to social insurance, labour market policies and social safety net programmes (FAO, 2012; UNCDF, 2012).
[18] Safety nets are social assistance programmes or social transfer to the poor (UNCDF, 2012)

intended for short-term impact (Adato et al., 2004) particularly when shocks have occurred in an economy (Norton et al., 2001; Shepherd, Marcus & Barrientos, 2004).[19]

The safety nets transfers include conditional and unconditional cash transfers, food-based programmes (such as food distribution, food for education, food for work, food stamps and subsidies programme) and social health insurance (Adato et al., 2004; Ruelle & Rockmore, 2011). World Bank (2008a) categories the types of safety nets into three major groups, which are cash, non-cash and other programmes. The cash programmes provide transfers in cash, i.e., unconditional cash transfer and conditional cash transfers (CCTs).[20] The non-cash programmes include food-based programmes (food transfer), training opportunities (vocational and skill training), fee waivers for health and education facilities and price subsidies for energy or housing. The other programmes include public works, micro-credit and other income generation activities, such as job creation.

Food-Based Safety Nets

The provision of food-based safety nets can vary among low-income countries (see Jha et al., 2013). The programmes under food-based safety nets are food stamps, supplementary feeding programmes (SFPs), food for work programmes and emergency feeding (Rogers & Coates, 2002).[21] The SFPs are intended to provide supplement energy and other nutrition missing from the diet schemes of those who actually need particular nutrition (Gillespie, 1999; Rogers & Coates, 2002). The common programmes in SFPs are supplementary feeding of pregnant women and children, rehabilitation feeding for malnourished children and school feeding for children at school by providing meals and snacks (Rogers & Coates, 2002). The food for work programme is food-based interventions in relation to job creation which provides food as a work incentive. Emergency feeding is proposed to prevent hunger of the poor when the public and private institutions fail to protect them.

The food-based safety net programmes have been vastly implemented in the Asian countries, as seen for instance in Bangladesh and Indonesia. Bangladesh experienced shifting policies from the untargeted subsidized food prices to targeted food distribution (del Ninno, Dorosh

[19] Yet it is important to understand that "well designed safety nets can…be an important part of a social protection approach, if their existence is well known before the crisis hits" (Shepherd et al., 2004, p. 12).

[20] The unconditional cash transfers include family/child allowance and non-contributory pensions for the elderly and disable people. The conditional cash transfers provide cash transfers to the poor households under certain conditions, such as ensuring that the children regularly attend school and receive adequate preventive health care.

[21] Rogers and Coates (2002) define food stamp programmes similar with cash transfer but instead of giving cash the programmes give a coupon or voucher that may be used for the purchase of food or to get discounted price. They also provide the programmes description of food for work programmes and emergency feeding.

& Subbarao, 2005; Jha et al., 2013). The main programme is Targeted Public Distribution System (TPDS) covering food grain distribution to the poor (del Ninno et al., 2005). The other important programmes are food ration targeted at poor women programmes, or Vulnerable Group Development (VGD) programmes, and Food for Education under the similar scheme with conditional cash transfer (Jha et al., 2013).[22] In Indonesia, the food transfer programme (called *Raskin*) provides subsidized rice targeted to particular households which are considered as poor (Jha et al., 2013). Besides that, *Raskin* is also implemented for vulnerable groups, such as the disabled, senior citizens and orphans (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-a).

Health Care Safety Nets

The World Bank (2003) notes that the need for health care safety nets arise due to the tendency of government behaviour to minimize budgets and increase demands resulting from charging of user fees for government health facilities. This brings inequity and inefficiency especially for those people who cannot afford the user fees. Thus, health care services in many developing countries require fee waivers permit for the poor to get free health services while the exemptions are given for certain health services to all people (Bitrán & Giedion, 2003).

Examining this type of safety nets in the case of Cambodia show experiences of the Calmette Hospital model and the equity fund (EF) programme (Bitrán & Giedion, 2003). The Calmette Hospital (the National Hospital) provides free health services which are reimbursed by the government.[23] The EF finances the cost of health services provided as either at free or discount prices to the poor. In Indonesia, the evolution of health care assistance was started in 1994 by giving health cards, (*kartu sehat*), which changed to health insurance for poor household (*Askeskin*) in 2005 and reformed to individual-based insurance called health guarantees for the poor (*Jamkesmas*) in 2008. Under the *Jamkesmas* schemes, the government reimbursed the health cost of poor patients visiting the hospitals (Suryahadi, Yumna, Raya & Marbun, 2010). The health care safety nets scheme under the National Health Insurance (*JKN*) started in 2014 extended the health care assistance. *JKN* is based on the insurance principles shifting the reimbursement scheme to a regular fee payment scheme where the government covers the health insurance fees on behalf of the poor (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-b).

[22]The households receive food grain rations if they send their children to primary schools.
[23] The reimbursement is based on a fixed payment per hospitalization.

2.5.2 Food-based and Health Care Safety Nets and Household Consumption

The social protection schemes were to reduce, prevent and cope with the vulnerabilities that negatively affect wellbeing, consumption and investments (Shepherd et al., 2004). These safety nets were to lessen the negative effects of short-term macroeconomic policies on the consumption behaviour of the poor (Gupta et al., 2002). The poor will not succeed in improving their economic livelihoods if they do not have "…robust safety nets to bolster their incomes and stabilize their consumption…" (UNCDF & UNDP, 2012, p. 15). The theories underlying the positive relationship between food transfer and consumption are noted in Engel's law and neoclassical microeconomic consumption behaviour (see Gentilini, 2007). The food transfer contributes to the household's real income or their purchasing power by freeing up the income (Rogers & Coates, 2002). In the case of health care safety nets, the demand of health care as normal goods theory is the background to the health care safety nets impact. It shows that exemptions and fee waivers can reduce the price of health care faced by the poor and thus increase their per capita demand for the services (Bitrán & Giedion, 2003). It is assumed that the safety nets may reduce the expenditure of the poor for particular given foods and health services. The reduction brings flexibility for the poor to use income. This may cause various impacts, for example the poor can consume more of certain types of food and access health services or reallocate their money to other foods or goods.

Ali and Adams (1996) study on the food subsidy system in Egypt note that it had a non-targeted policy.[24] The empirical result shows the policy positively affected the poor, even though it was non-targeted food subsidy policy. On bread and wheat flour subsidy, the resulted extra income would lead people to consume other goods rather than bread and wheat flour, so consumption of these food decreases. The indirect effect shows that subsidy increases the consumption of other goods rather than the subsidized good itself.

Sumarto et al., (2005), in examining the impact of social food net programmes in Indonesia, note that the subsidized rice programme for the poor led to a higher total consumption level. The subsidised rice programmes brought direct effects on household welfare. The study suggests that safety net programmes protect households from crisis conditions by securing their staple food intake.

Ahmed, Quisumbing, Nasreen, Hoddinott and Bryan (2009) examine the impact of food and cash transfers on the food security for poor in Bangladesh. They focused on four food

[24] It is simply a general food subsidy. The subsidy policy was implemented for bread, wheat flour, sugar, and oil.

security schemes of the Vulnerable Group Development (VGD) programme: (1) Income-Generating VGD (IGVGD), (2) Food Security VGD (FSVGD), (3) Food for Asset Creation (FFA) component of the Integrated Food Security (IFS) programme and (4) Rural Maintenance Programme (RMP). The schemes mostly gave rice and wheat flour as the food transfer scheme. The results show that the schemes significantly increased food expenditure as a large part of the households' consumption of products that included other food. They conclude that food expenditure increased due to an effect of food and cash transfer, because people consumed other food products.

The effect of health insurance on household consumption behaviour has been examined by Amponsah (2009). The study finds that in the context of Ghana, the insured households significantly reduced their expenditure share on food and increased their expenditure share for non-food items. Moreover, a household with health insurance had more money to spend on other items because their medical care cost is already covered by the health insurance. Amponsah also notes that the health insurance programme for the poor households reduced the food expenditure share. This reflected the increase in the income of the poor to increase their total consumption.

Leininger, Levy and Schanzebach (2010) examine the effect of the United States government policy on children's health service on the well-being of the poor household. The programme, State Children's Health Insurance Programme (SCHIP), significantly affected the consumption of targeted households. The result is in line with Amponsah (2009) that SCHIP caused a lower health care spending and higher total consumption. The programme improved the well-being of near-poor households by increasing their total consumption. Those households, therefore, reallocated their consumption from medical care to other goods –which were mostly for transportation and retirement spending (Leininger et al., 2010).

A similar result in the case of China was found by Ying and Du (2012) on the effect of medical insurance on durable goods consumption. Using the China Health and Nutrition Survey (CHNS) data, they find that the insured households have a significantly higher level of consumption of other goods, that is, durable goods, such as, washing machines, televisions, electric fans, electric cookers, cameras, telephones and refrigerators. Another study on the effect of China's medical insurance by Bai and Wu (2013) on the New Cooperative Medical Scheme (NCMS) impact on household consumption behaviour shows that NCMS increased consumption of non-medical items for the insured households.

2.6 Significance of the Study

This current study on Indonesia will provide empirical evidence of the impact of poverty determinants in Indonesia as well that on the agricultural households, by considering poverty in a multidimensional framework. Theoretically, the study contributes to the poverty literature and the factors affecting poverty conditions at the household level in developing countries. Empirically, the study will estimate the poverty conditions in Indonesia, with a deeper analysis of the population engaged in the agricultural sector and policies to overcome poverty problems. In particular, the analysis will consider the household level characteristics, micro-credit availability and safety nets programmes for poverty reduction in Indonesia. This study also enriches Indonesia's policy implications as well as lessons for other developing countries. Moreover, it can assist the government agencies, policy makers, development institutions and other interested groups to design and improve the poverty reduction strategies to be more effective and responsive in the post – 2015 Millennium Development Goals.

2.7 Summary and Conclusion

Poverty with its multidimensional aspects indicates the level of deprivation due to the lack of education, health, nutrition, shelter, power, freedom and human rights. The approaches in poverty measurement include the monetary, the capabilities, the basic needs, the social exclusion and the participatory approaches.

The monetary approach measures poverty from income and consumption perspectives that can use various statistical techniques. The capabilities approach includes deprivation in human capabilities to attain something that people value (such as, health and education). The basic needs approach sees poverty as the failure in meeting the basic needs similar to that of capabilities approach but goes beyond the monetary approach. The social exclusion approach focuses on the poor being excluded from society. The participatory approach then focuses on the poor's perceptions of what constitutes poverty and lack of participation sees them falling in poverty trap.

Studies find that the causes of poverty in the country level are the low economic performance, lack of human resources, poor governance and inhospitable climate. On the other hand, from the household level, some household head and household characteristics affect poverty, such as household head's age, gender, educational levels, and areas of employment. Household's location and assets ownership are also affecting poverty. Those

household head and household characteristics also affect the economic opportunity of the poor, including their access to credit. The last aspect of the analysis shows that the safety nets can lessen the short-term adverse effect of macroeconomic shocks and improve the poor household's income and consumption behaviour. The following chapters present the empirical analysis of poverty issues in terms of the causes of poverty, the determinants of credit access, and impact evaluation of social safety net programmes on households' consumption for the case of households in Western Provinces of Indonesia and agricultural sector.

Chapter 3

Determinants of Poverty Dynamics in Western Provinces of Indonesia: Some Empirical Results

3.1 Introduction

The poverty reduction is still a major issue in Indonesia. Even though the poverty rate has been reduced from 19.14% in 2000 to 11.47% in 2013 (Statistics Indonesia, 2104b), the target to reduce poverty in Indonesia to meet the Millennium Development Goals by 2015 is a high priority. This study focuses on the poverty determinants in the case of Indonesia which would be useful in assisting the policy makers in alleviating poverty. The econometric methodology, the multinomial logit estimation, is then applied to investigate the household level determinants of poverty dynamics. The estimated results in the probabilistic term of the households are explained to be either in chronic poor, transient poor or not poor during the 2000-2007 period.

Understanding the causes of poverty is important to help decision makers implement vital poverty reduction policies from the individual, household and country level characteristics. In order to tackle poverty from its roots, it is important to consider the key aspects related to the reasons why people fall below the poverty line. In association with the causes of poverty, household level data obtained from the survey give "…a rich source of data on economic behaviour and its links to policy" (Deaton, 1997, p.2). The household survey collects data on outcomes related to the conditions that affect people's living standards such as nutrition level, expenditure and income patterns, educational attainment, and health.

This study uses basic needs poverty line as the threshold level to distinguish between the poor and non-poor households. The outline of this chapter is set out as follows: a brief literature review in sections 3.2 and 3.3 provides an overview of economic, social and poverty issues in Indonesia. Section 3.4 presents the data and methodology, followed by empirical results in section 3.5, and the conclusion in section 3.6. Using spell approach, the models estimated in this study apply several households' demographic and socio-economic characteristics as the determinants of poverty dynamics, which may reflect the causes and its impact on the households' poverty status transition from 2000 to 2007.

3.2 Brief Literature Review

Many researchers have utilized household survey data to analyse poverty in diverse ways. The World Bank (2005) study notes that to analyse the determinants of poverty, the independent variable can be the poverty conditions indicated by income and expenditure per capita. Meanwhile, the dependent variables are the characteristics of the individual or the household that might affect the poverty condition. Some examples are Kennedy and Peters' (1992) study about the relationship of household characteristics, nutrition intake and earnings of the household in Kenya and Malawi, and Gounder and Xing's (2012) examination of the monetary (income) and non-monetary poverty (health) factors of poverty reduction in the context of Fiji. Gounder and Xing found that education has a positive and significant impact on the tendency of people to engage in health prevention activities and to obtain good housing facilities. However, while formal education benefits households through additional skills and reduces poverty, it cannot sustainably prevent people with only primary education from falling into poverty.

The other poverty determinant analysis is the dynamic aspect which has a time dimension to it (World Bank, 2005). There are some people who are vulnerable and experiencing poverty status transition. In other words, they are either falling into poverty or moving out of poverty during the period concerned (Alwang, Siegel & Jorgensen, 2001; Bayudan-Dacuycuy & Lim, 2013b).The two approaches to examine poverty dynamics are "components approach" and "spell approach" (Yaqub, 2000). The components approach focuses on the permanent components of a household's welfare – it is the income or consumption aspect that distinguishes the household from its transitory variations. The components approach uses short and long run concepts of welfare. The short run welfare approach varies around typical long run (permanent) welfare indicated by consumption expenditure or income due to short term shock such as macroeconomic condition, illness, and natural disaster (Jalan and Ravallion, 1998; Yaqub, 2000). "The permanent component is defined as the inter-temporal average of the welfare indicator…averaged over several years" (Yaqub, 2000, p. 2). Over time, the permanent component of welfare indicator is just *permanent* while the transitory component is the difference between the level of short run welfare indicator and the permanent component (Yaqub, 2000). In the component approach (influenced by the depth of poverty), the term 'chronic poor' is used for households who have the permanent component of their living standard below the poverty line (McKay & Lawson 2003).

The spell of poverty approach is the amount of movement into and out of poverty and the duration the people are out of poverty (Bane & Ellwood, 1983). This spell approach focuses on people crossing poverty lines as they transition into and out of poverty (Yaqub, 2000; Hulme & Shepherd, 2003). Since the approach focuses on the number of spells of poverty that people experience, there will be different people identified as chronic and transitory poor (see Yaqub, 2000). In other words, 'chronic poor' means persistent poverty as the household's expenditure per capita per month is below the poverty line over the time of the observation period. On the other hand, 'transient poor' can be divided into 'churning poor' and 'occasionally poor'. 'Churning poor' is when the household's expenditure per capita per month is usually located near the poverty line, but can sometimes be below or above the poverty line. 'Occasionally poor' refers to the household's expenditure per capita per month as being above the poverty line but the household has experienced at least one period below the poverty line within an observation period. 'Non-poor' refers to those whose expenditure per capita per month remains above the poverty line in all observation periods (Hulme & Shepherd 2003).[25]

Several studies have utilized individual and household level data to explain the poverty dynamic factor using various methods. Jalan and Ravallion (1998) used the household panel data in the post-reform period in the case of rural China. They measured the transient poor from variability in consumption level of the household based on the concept of component approach. Finnie and Sweetman (2003) used the variation of on individual's income as the indicator of poverty dynamics and fixed panel model to analyse the poverty dynamics.

Bhide and Mehta (2004) used the spell approach with the household level data and the binary probit model to estimate the causes of changes in poverty status of the household in rural India. The same method had been employed by Bokosi (2007) to examine the determinants of movement into and out of poverty using household data in Malawi. Using the bivariate logit model, Neilson, Contreras, Cooper and Hermann (2008) and Mberu, Ciera, Elungata and Ezeh (2014) examined the poverty dynamics in Chile and Nairobi, respectively. Dartanto and Nurkholis (2013) employed the ordered logit model to investigate the household level factors on poverty dynamics in the case of Indonesia. The multinomial logit method had been applied to examine the determinants of poverty transition, particularly

[25] In a region where poverty problem is mostly due to chronic poor conditions, the redistributing assets that provide basic physical and human capital infrastructure, are some of the appropriate strategies to alleviate poverty. Otherwise, if the problem centre is characterized by transient poverty, the better strategy is a set of safety net programmes to help the poor reduce their vulnerability and improve their situation to a non-poor condition (Hulmer & Shepherd, 2003; Alisjahbana & Yusuf, 2003).

during the trade reform period in rural Vietnam (Justino, Litchfield & Pham, 2008). Bayudan-Dacuycuy and Lim (2013b) applied both probit and multinomial logit to investigate this issue in the case of the Philippines.

Various characteristics of the household head are used as the influencing factors of poverty transition. Verner (2008) notes that the elder household heads tend to be more likely to experience poverty than the younger group. The education level increases the productivity of the poor in the case of Sargodha City in Pakistan (Awan, Iqbal & Waqas, 2011). Moreover, Muyanga, Jayne and Burke (2013) note that educated household heads improve their asset accumulation which can improve their welfare dynamics. The absence of males in the family can lead to the absence of an income source (Sen, 2003). Thus, the female-headed family will more likely be poor compared to the male headed family. According to study in by van Edig and Schwarze's (2011), female-headed households in the Central Sulawesi, Indonesia, have a tendency to be more chronically poor.

The employment area of the household head also influences the household's poverty estimation. Haddad and Ahmed (2003) show that working in manufacturing, community, recreation and other non-farm sectors cause a lower probability for the household in Egypt to experience chronic poverty compared to the households working in the agricultural sector. In the case of Vietnam, those household heads with a white collar job and in the non-agricultural sector bring a higher probability of moving out from poverty (Glewwe, Gragnolati & Zaman, 2002). The larger size of the households and the large number of young children (dependency burden) are found to have a higher chance of falling into chronic and transient poverty in Indonesia (Alisjahbana & Yusuf, 2003). This is because larger family sizes and higher numbers of young children affect the poverty status of the household by increasing their probability to be vulnerable and chronically poor (Widyanti, Suryahadi, Sumarto & Yumna, 2009; Hyder & Sadiq, 2010).

McCulloch and Calandrino (2003) find that in the case of rural Sichuan households, having assets of a higher value significantly lowers the level of vulnerability. Moreover, You (2011), who evaluates the poverty transition using the spell approach in rural China, finds similar results that land ownership as an asset is one of the major reasons that the households shift out of poverty.

Getting access to credit is a substantial factor for the households to shift out of poverty. Bayudan-Dacuycuy and Lim (2013b, p. 391) explain that poverty status transition is highly

related to the household vulnerability, as they elaborate that "…changes in socio-economic status such as job loss, lower wages and death of a household member can be focused on as sources of vulnerability, the improvement of coping mechanisms such as insurance and access to credits may prevent one from being poor". Hulme, Moore and Shepherd (2001) empirically find that in Bangladesh, microcredit successfully improves the households to shift their condition from always poor to transient poor.

This study, in the case of analysing poverty dynamics in the Western Provinces in Indonesia, uses the disaggregated demographic and socio-economic household characteristics to examine poverty conditions. The multinomial logit model is used in considering the categorical dependent variables, which are chronic poor, transient poor and non-poor (using spell approach). Further analysis includes estimating poverty levels of the rural-urban as well as those households in the agricultural sector.

3.3 Indonesia's Economic, Social, and Poverty Issues

Since Indonesia's independence in 1945, the government experienced a number of development challenges which interfere with the country's social and economic development process. The nation faced political instability, economic and environment vulnerability, and limited access to the global market. As a newly independent country, Indonesia also experienced food price volatility, budget deficit and low levels of infrastructure. The 1997-1998 Asian crisis had an adverse economic and social impact. The crisis was followed by the instability of an aging president and an upcoming election. All these issues led to political instability and various chaotic situations in Indonesia (van Zanden & Marks, 2012). The greatest impact from the Asian crisis saw a higher level of poverty headcount which doubled to almost 28% while Gross Domestic Product (GDP) fell by 14% in 1998 (Hofman, Rodrick-Jones & Thee, 2004). Indonesia also experienced the global economic crisis (2008), that added to the economic vulnerability conditions, particularly in foreign trade performance (van Zanden & Marks, 2012).

The 1967 to 1997 period saw a rapid economic growth based on export-led strategies by increasing the role of manufacturing and service sectors (van Zanden & Marks, 2012). The poverty rate reduced from 23.4% in 1999 and 19.1% in 2000 (Statistics Indonesia, 2014b). The impact of the global economic crisis in 2008-2009 on Indonesia was more modest than the impact of the Asian crisis (van Zanden & Marks, 2012). Even now, "Indonesia is the

16th largest economy in the world and the biggest economy in the Association of Southeast Asian Nations…" (ADB, 2014, p. 1).

Social Indicators of Indonesia

The Human Development Index (HDI) ranking of Indonesia at 121st out of 186 countries in 2012. The Gender Inequality Index (captures the loss achievements in reproductive health, empowerment and labour market participation) ranked at 106th out of 148 countries suggest a need for actions to address human development and inequality. According to the Multidimensional Poverty Index (MPI), Indonesia's MPI value of 0.095 in 2007 is higher than the Philippines (0.064) and Viet Nam (0.017) (UNDP, 2013a). Based on monetary poverty, the poverty rate of Indonesia in 2013 indicate 11.47%, a decline from 19.1% in 2000 (Statistics Indonesia, 2014b).

Employment Sector of Indonesia

Figure 3.1 shows Indonesia's employment absorption by sector during the 2000-2012 period. For total employment, the share of employment in the industrial sector has slightly increased from 17.4% in 2000 to 21.67% in 2012. On average, agriculture has absorbed a higher employment level at 41.75%. However the employment absorption for agriculture has decreased particularly from 40.3% in 2008 to 35.1% in 2012. During the period 2008-2012, the service sector successfully replaced the agricultural sector as the sector that absorbs the highest level of employment, with 40.8% in 2008 to 43.2% in 2012. The fast development of the service sector indicates an increasing percentage of educated and skilled workers in the education, trade and health sectors (from 3% to 5% during 2005-2010) which is one of the factors that encourages a higher proportion of employment in the service sector.

Moreover, the role of trade in the service sector, tourism and trend of migrant workers have increased the employment level in this sector. The 7.1 million jobs created in the service export activities have been greater than the jobs created in the manufacturing exports, which encompasses less than 5 million jobs (Manning & Aswicahyono, 2012). The tourism receipts in Indonesia generate foreign exchange earnings that is about half the value of all services exports in 2010. The movement of migrant workers also resulted in large remittances inflows to the country. The remittances directly go to the workers' families which can help improve their welfare. Indonesia has become a major migrant labour supplier to Malaysia, Saudi Arabia, Hong Kong, Taiwan and Singapore. Indonesia is ranked as the 20th largest recipient of remittances (Manning & Aswicahyono, 2012).

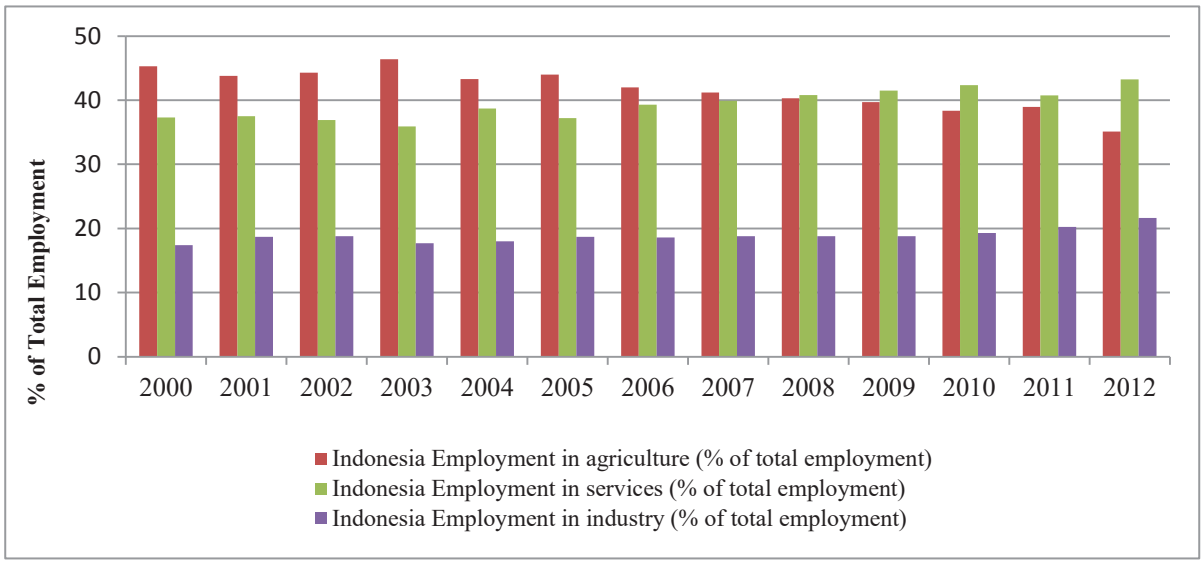

Figure 3.1. Employment Proportion of Indonesia by Sector 2000-2012. Adapted from http://data.worldbank.org/data-catalog/world-development-indicators. Copyright 2014 by World Bank. Reprinted with permission.

Education Factor of Indonesia

In order to tackle poverty and increase human capital, Indonesia has developed educational policies to enhance literacy and facilitate a skilled work force. In 1984, the Indonesian government implemented the compulsory six-year education plan. Because of its success in increasing enrolment rates in primary schools, the government continued this system into compulsory nine-year education plan that was introduced in 1994. The nine years compulsory education is based on the 'World Declaration on Education for All in Jomtien' that highlights the importance of primary education (Kristiansen and Pratikno, 2006; Firmansyah and Sumarno, 2013). Overall, the high average number of school participation rates increased further since the implementation of this programme (Ministry of National Education of Indonesia, 2012). From 2013, Indonesia's Ministry of National Education introduced a twelve-year compulsory education plan (Damarjati, 2012). The Indonesian government has introduced various educational programmes to support poor families such as *Bantuan Siswa Miskin* (*BSM*) for all school levels. To students at tertiary level, the Ministry of National Education provides educational scholarships called *Bidik Misi* which targets only the most outstanding students (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-d).

In order to execute faster poverty alleviation, the government of Indonesia has implemented several targeted programmes for the poor and near poor (Secretariat of the National Team for The Acceleration of Poverty Reduction, 2011).[26] The programmes are organized into four clusters (Secretariat of the National Team for The Acceleration of Poverty Reduction, 2011; n.d.-e). The first cluster is the family-based integrated social assistance poverty alleviation programmes. This cluster aims to assist the poor to fulfil the key basic needs of the poor, including food, education, health service, sanitation and clean water. The programmes in this cluster include the conditional cash, unconditional cash and in-kind transfer programmes, those are, health insurance (*Jamkesmas*), Family Hope programme (*PKH*), subsidized rice targeted for the poor (*Raskin*) and the cash transfers for poor students programme (*BSM*). The second cluster is a community empowerment-based poverty alleviation programmes.[27] The central programme under this cluster is the National Programme for Community Empowerment (*PNPM Mandiri*) which encourages the poor to develop their potential, abilities and resources. The last cluster comprises of the small and micro enterprise empowerment poverty alleviation programmes. This cluster provides access to strengthening the economic environment surrounding the enterprises, that is, (1) providing a financial assistance, (2) opening access to financial and products markets; and (3) providing counselling to improve the poor's entrepreneurship skills.

The Indonesian government uses poverty line as a threshold level to distinguish the poor and non-poor people/households (Statistics Indonesia, 2013b). The poverty line is based on basic needs approach that measures the minimum expenditure per capita per month to cover basic needs. The basic needs poverty line consists of food poverty line and non-food poverty line. The food poverty line is minimum expenditure in consuming food basic needs, which is equivalent to adequate nutrition of 2,100 calories per person per day. On the other hand, the non-food poverty line is minimum expenditure in consuming non-food goods which mainly captures basic needs in housing, clothing, education, and health (Statistics Indonesia, 2013b). The food poverty line is represented by 52 commodities (rice, tubers, fishes, meats, eggs and milk, vegetables, nuts and fats, fruits, etc.). Meanwhile, the non-food poverty line is represented by 51 commodities for urban area and 47 commodities for rural area.

[26] The near poor category refers to the poor with expenditure per capita per month slightly above the poverty line. They are vulnerable to negative shock that can cause them to become temporarily poor.

[27] In this cluster, the poor communities begin to realize their potential abilities to help them escape poverty.

The poverty incidence in 2000 and 2007 for both the National level and Western Indonesia is shown in Table 3.1. Within the national region, the poverty incidence in the Western provinces of Indonesia is smaller than at the National level in 2000 and 2007 period. Both at the National level and in the Western area, the proportion of urban poor people is lower than the rural area. Further details for the Western Provinces poverty condition include: in 2000 there was 16.36% of poor urban. This figure declined to 9.39% in 2007. Similarly, the rural poor households, which comprised of 18.54% in 2000 decreases to 11.65% in 2007. At the national level, the incidence of poverty was 17.8% in 2000 and 10.74% in 2007.

Table 3.1

Poverty Incidence of National Level and Western Provinces in Indonesia 2000 and 2007

Region	2000 (%)		2007 (%)		Change (%)	
	National Level	Western Area*	National Level	Western Area*	National Level	Western Area*
Urban	14.60	16.36	12.52	9.39	-2.08	-6.97
Rural	22.38	18.54	20.37	11.65	-2.01	-6.89
National	19.14	17.8	16.58	10.74	-2.56	-7.06

Note. Adapted from http://www.bps.go.id/eng/tab_sub/view.php?kat=1&tabel=1&daftar=1&id_subyek=23&notab=7. Copyright 2014 by Statistics Indonesia. Reprinted with permission. *Author's calculation for Western Provinces based on IFLS data 2000 and 2007

Table 3.2 presents the poverty status transition in the panel households IFLS data between 2000 and 2007. The chronic poor category shows 4.73% of the households who are always poor. The percentage of households who are non-poor in 2000 but poor in 2007 (Transient poor (-)) is 5.87%. The percentage of non-poor households in 2007 after previously being poor in 2000 is 13.07%. This shows that the total percentage of Transient poor (+) and Transient poor (-) is greater than Chronic poor, indicating that poverty in Indonesia has decreased. The category of non-poor households between 2000 and 2007 was 76.33%.

Table 3.2

Poverty Status Transition, Western Provinces, 2000 and 2007

Transition From 2000 to 2007	Percentage*
Chronic Poor	4.73
Transient poor (-) (Non-Poor in 2000 and Poor in 2007)	5.87
Transient poor (+) (Poor in 2000 and Non-Poor in 2007)	13.07
Non-Poor	76.33

Note. *Author's calculation based on IFLS data 2000 and 2007.

Figure 3.2 shows the food, schooling and medical consumption expenditure by income decile in 2007. The first decile is the poorest household group and the tenth decile is the wealthiest household category based on the expenditure level per capita per month in the

household.[28] Overall, the food, schooling and medical consumption expenditure have the same pattern between 2000 and 2007 period. The food consumption expenditure is the largest proportion of the total expenditure among all deciles. The food proportion expenditure declines from the first to the tenth decile, suggesting that the poorest households' expenditure on food is the highest compared to other household deciles. The proportion of schooling and medical consumption expenditures to total expenditure is not high in comparison to food expenditure. However, it reveals that the higher the income decile, the higher is the amount of expenditure on education and health by the households. The poorer households (deciles 1 to 3) spend substantially less on education and health compared to the higher-income deciles.

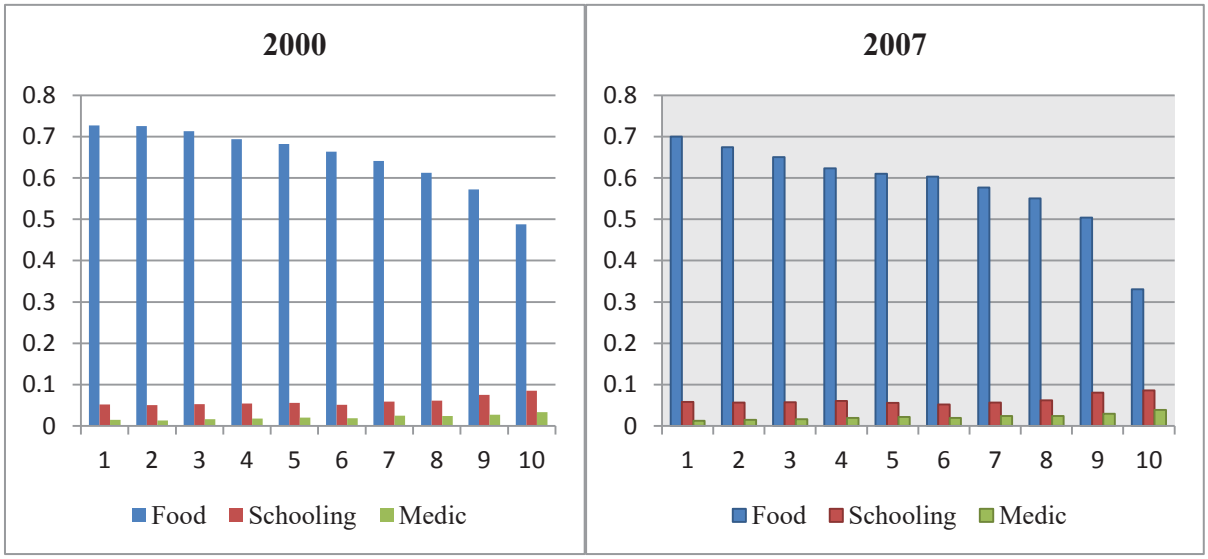

Figure 3.2. The Food, Schooling and Medical Expenditure by Income Decile, 2000 and 2007 (%). Author's calculation based on IFLS data 2000 and 2007.

3.4 Model Specification, Data and Methodology

This section presents the models, data and methodology utilised to estimate Indonesia's poverty status movement of the households using the household head's characteristics and household characteristics for the period 2000 and 2007. The poverty estimation of spell approach noted earlier, the variables that explain the poverty dynamics and the related econometric issues for this analysis are discussed in detail.

[28] The expenditure level is used as the well-being indicator as it can give information on how people meet their basic needs by using their monetary resources (Wisor, 2012).

3.4.1 Model Specification

The factors affecting the probability of Indonesian households between 2000 and 2007 that fall in or move out of poverty are examined using the spells approach. There are four categories that represent the poverty status as the dependent variable, those are, chronic poor, transient poor (-), transient poor (+) and non-poor. Concerning these multi-categories of dependent variables, the multinomial model for categorical data is used. The model is different from the ordinary binary model. In this study's model, the dependent variable must be multinomially distributed whereas in the binary model, the dependent variable is Bernoulli or binomially distributed (Cameron & Trivedi, 2010).

The multinomial logit model is "the simplest model…because computation is simple and parameter estimates are easier to interpret than in some other multinomial models" (Cameron & Trivedi, 2010, p. 498). The analysis utilised here follows the method used by Herrera and Rorbaud (2005) as well as Bhatta and Sharma (2006). The multinomial logit is a more preferable method for analysis because "…although poverty status is based on an underlying welfare measure…defined on an interval scale, it is not always appropriate to assume that chronic poverty represent a higher level of deprivation than transient poverty…" (Bhatta & Sharma, 2006, p. 11). Moreover, the multinomial logit models used in this study have multi-categories of the dependent variables with the same independent variables that may have different impact on each poverty status transition (Herrera & Rorbaud, 2005). The independent variables included in the models are based on previous studies and the determinants of poverty dynamics in the case of Indonesia.[29] The multinomial logit model equation based on Cameron and Trivedi (2010) can be expressed as follows:

$$p_{ij} = \Pr(y_i = j) = F_j(X_i, \theta), \;\; j = 1, \dots, m, \;\; i = 1, \dots, N \qquad (3.1)$$

The model specification for the determinants of poverty dynamics include the multinomial logit model. Where $p_{ij} = \Pr(y_i = j)$ is the outcome probability of individual i at alternative or category j. In this study, the model uses the poverty status transition of the household i (poverty dynamics) between 2000 and 2007 as independent variable (y_i), that is, 1 = chronic poor, 2 = transient poor (-), 3 = transient poor (+), and 4 = non-poor. In general, equation (3.1) is considered to analyse the probability of a household being in one of the poverty status transitions within a set of demographic and socio-economic characteristics. The

[29] See studies by Alisjahbana and Yusuf (2003), Herrera and Rorbaud (2005), Bhatta and Sharma (2006), Xing (2010), Bayudan-Dacuycuy and Lim (2013b), and Dartanto and Nurkholis (2013).

outcome probability (p_{ij}) is a function of regressors X_i, that is, a vector of a household's demographic, socio-economic, shocks and policy variables that explain the impact experienced by a household in 2000 and a vector of changes in variables between 2000 and 2007, which may determine the household transition status of poverty dynamics for this period.

Equation (3.2) below specifies the measurement of the probability of the household's poverty status transition (p_{ij}) by multinomial logit model. It depends on regressors X_i and the coefficient of the regressors (β_j).The probability (p_{ij}) takes the value $0 < p_{ij} < 1$. The estimated coefficients of this categories in the model will be set to zero, named the base category. Thus, the coefficients from the other categories are interpreted with respect to the base category coefficient.

$$p_{ij} = \frac{\exp(X'_i\beta_j)}{\sum_{l=1}^{m}\exp(X'_i\beta_l)} \tag{3.2}$$

The base category is the chronic poor, thus equation (3.2) can be rewritten as equation (3.3) where the β_1, the "chronic poor" coefficient, is equal to zero. The coefficient of other categories ($\hat{\beta}_j$) can be viewed as parameters of binary logit estimation between the transient poor category and non-poor category relative to chronic poor.

$$\Pr(y_i = j | y_i = j \text{ or } 1) = \frac{\Pr(y_i=j)}{\Pr(y_i=j)+\Pr(y_i=1)} = \frac{\exp(X'_i\beta_j)}{1+\exp(X'_i\beta_j)} \tag{3.3}$$

However, the interpretation can be easier and helpful if the coefficients are transformed to odds ratio or relative risk ratio (RRR). The relative risk ratio of being in transient poor and non-poor category rather than chronic poor is specified by

$$\frac{\Pr(y_i=j)}{\Pr(y_i=1)} = \exp(X'_i\beta_j) \tag{3.4}$$

3.4.2 Data and Methodology

To distinguish between the poor and non-poor household by monetary approach, the consumption expenditure or income data is commonly utilised (World Bank, 2005). However, the consumption expenditure is preferable because expenditure is a direct measurement of people's well-being achievement. Moreover, income approach is usually

more problematic due to its inability to capture the basic needs fulfilment (see Townsend, 1962; Meyer & Sullivan, 2003; Duclos & Araar, 2006; Wisor, 2012). This study follows the method to differentiate the poor and non-poor households by comparing the expenditure per month per capita in the household to cover the cost of basic needs.

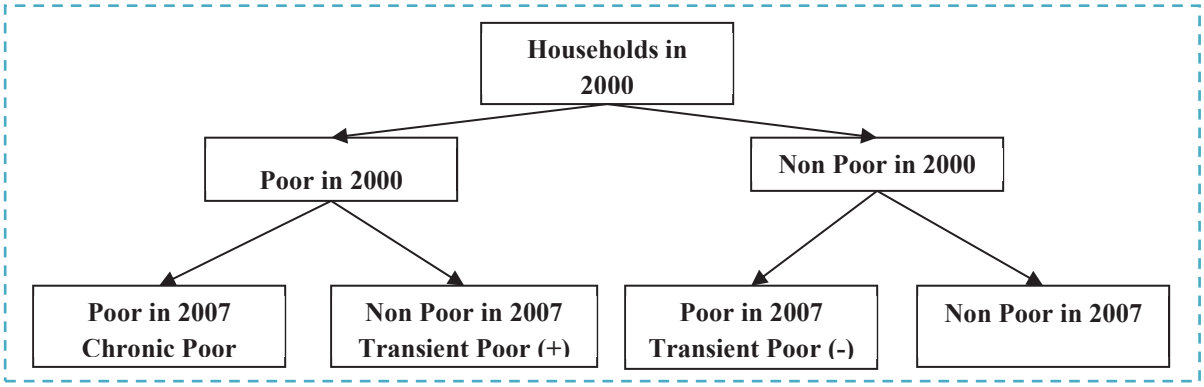

Figure 3.3. Structure of Poverty Status Transition for Indonesia's Western Provinces.

This analysis uses panel data from the Indonesian Family Life Survey (IFLS) data which consists of the same households sample between 2000 and 2007. Firstly, the households are classified into poor and non-poor groups in 2000 based on whether per capita expenditure per month in the household can meet the minimum cost of food and non-food basic needs. The household panel data then are disaggregated to four categories of poverty dynamics those are, chronic poor, transient poor (-), transient poor (+), and non-poor. The chronic poor shows the households who are always poor in 2000 and 2007 while non-poor is for the households who never fall into poverty during that time. The transient poor (-) expresses the households who are not poor in 2000 but temporarily poor in 2007, otherwise the success movement of the households to temporarily move out from poverty is described by the transient poor (+). The structure of household panel data and its poverty status is shown in Figure 3.3.

Since this study utilizes the household panel data, there is a necessary preliminary data checking for attrition bias (Bhatta & Sharma, 2006; Bayudan-Dacuycuy & Lim, 2013b). The bias is related to the selectivity bias which "results from using non randomly selected samples to estimate behavioral relationships as an ordinary specification error or "omitted variables" bias" (Heckman, 1979, p. 153). To address this, the study follows the procedures used by Heckman and also Bayudan-Dacuycuy and Lim (see Heckman, 1979; Bayudan-Dacuycuy & Lim, 2013b). The first step involves probit estimation to obtain the Inverse Mill's Ratio (IMR), followed by adding the IMR variable in second step model, which is

multinomal logit model, to test for the bias correction.[30] The variable definitions and descriptive statistics of the variables used in this study are presented in the Appendix, Tables A.3.1 and A.3.2, respectively.

3.5 Empirical Results

The empirical results of Indonesia's poverty dynamics in the case of the Western Provinces are presented in three stages. The first stage reports the results for each poverty status, which are *Chronic poor*, *Transient poor (-),Transient poor (+)* and *Non-poor*. The second and the third stages, respectively, present the results by rural and urban areas and for those of the agricultural households.

3.5.1 Results for Determinants of Poverty Dynamics

The estimated results of the poverty dynamics are presented in Table 3.3. that presents the relative risk ratio (RRR), interpreted as the odds ratio in the binary logistic model, in comparison with the base category. If the estimated value of RRR is greater than one, the probability of the households to be in *Transient poor (-), Transient poor (+)* or *Non-poor* will be higher too. The *Chronic poor* status is the base category, that is, the RRR interpretation in respect to the probability of being in the chronic poor group. The estimated Wald $\chi 2_{(105)}$ value at 1021.41 indicates that at least one of the regressors' coefficients is not equal to zero. The Pseudo-R^2 value and the insignificant Hosmer-Lemeshow goodness of fit test (the estimated value of $\chi^2_{(24)}$) indicate a good fit to the data.

The results for the correlation between the household head's age and poverty transition status shows that in the *Non-Poor model*, the *Age_head* has a significant positive impact while the squared age (*Sqage_head*) has a significant negative impact. This indicates that age of the household head influences the household probability to be *Non-Poor*, which has an inverted U-shape relationship (see Rodriguez, n.d. for details). The effect of household head age increases the probability of the household in the *Non-Poor* up to the age of 50 years old. After that it will decrease the probability in the *Non-Poor* group.[31] The results shows that having a household head younger than 50 years old is beneficial to reduce poverty. People

[30] In running the probit and multinomial logit model, this research uses longitudinal households' weight that has been provided in IFLS data 2000, so that the estimates that are weighted reflect the Indonesian population in 13 IFLS Provinces (Strauss, Beegle, Sikoki, Dwiyanto, Herawati and Witoelar, 2004). The IFLS sample is based on a sample of households living in 13 provinces in Java, Sumatra, Bali, West Nusa Tenggara, Kalimantan and Sulawesi (Strauss, Witoelar, Sikoki, and Wattie, 2009). Those are mostly Western Provinces of Indonesia.

[31] The age peak is calculated based on the coefficient of the *Age_head* and *Sqage_head* in the estimated model.

younger than 50 years old usually have better health condition which positively supports their productivity. Meanwhile, the elderly (older than 50 years old) may have poor health and declining ability (Xing, 2010) and thus have lower productivity. This finding is similar with Verner (2008) and Dartanto and Nurkholis (2013). They highlight that households with an older head tend to experience greater poverty than those households with younger heads. It is because many households are born poor mainly due to inadequate assets. They then fail to accumulate sufficient amount of assets, and when reaching old age most of the assets are depleted (Verner, 2008).

Table 3.3

Results for Poverty Dynamics in Western Indonesia 2000-2007

Variable	Transient Poor (-)			Transient Poor (+)			Non-poor		
	Zstat	P>z	RRR	Zstat	P>z	RRR	Zstat	P>z	RRR
Cons	-0.820	0.411	0.109	-0.840	0.403	0.145	-1.130	0.258	0.087
Variables in 2000									
age_head	1.170	0.243	1.082	0.720	0.469	1.042	2.650	0.008***	1.148
sqage_head	-1.210	0.225	0.999	-0.810	0.420	1.000	-2.830	0.005***	0.999
female_head	-0.870	0.385	0.768	0.330	0.740	1.092	-0.240	0.808	0.941
Primary	1.100	0.272	1.335	2.170	0.030**	1.602	3.750	0.000***	2.133
secondary	1.590	0.111	1.807	1.820	0.069*	1.806	5.040	0.000***	4.580
Tertiary	0.100	0.922	1.113	-0.830	0.405	0.406	2.120	0.034**	5.935
Hhsize	-1.520	0.128	0.683	-0.420	0.674	0.913	-3.810	0.000***	0.459
Sqhhsize	0.730	0.467	1.014	-0.230	0.816	0.996	1.880	0.061*	1.030
Depratio	1.340	0.179	1.200	1.050	0.293	1.122	0.430	0.666	1.045
Rural	1.760	0.078*	1.641	1.390	0.165	1.419	4.290	0.000***	2.759
Agri	0.290	0.775	1.105	-0.610	0.539	0.829	-0.100	0.923	0.973
Manu	0.310	0.758	1.123	0.030	0.975	1.010	0.820	0.412	1.272
Services	0.620	0.533	1.231	0.910	0.363	1.293	2.910	0.004***	2.146
Landanb	1.350	0.176	1.428	0.190	0.852	1.045	0.930	0.353	1.221
TANBlivest	0.560	0.574	1.004	-1.270	0.204	0.957	0.490	0.624	1.004
TANBvehi	1.130	0.260	1.009	0.110	0.912	1.001	2.440	0.015**	1.018
Durgoods	1.090	0.278	1.331	0.900	0.369	1.213	3.940	0.000***	2.185
Housesize	1.410	0.158	1.004	2.940	0.003***	1.006	3.050	0.002***	1.006
TAFB	0.530	0.598	1.001	0.190	0.850	1.000	0.550	0.580	1.001
TANFB	1.260	0.208	1.009	1.470	0.141	1.011	2.200	0.028**	1.016
Electric	1.070	0.285	1.522	3.050	0.002***	2.704	4.980	0.000***	4.566
SSNhc	-0.950	0.342	0.815	-1.010	0.311	0.832	-2.430	0.015**	0.668
SSNfb	-0.540	0.592	0.876	-1.760	0.078*	0.693	-4.640	0.000***	0.408
healthdisrup	-3.240	0.001***	0.965	-2.830	0.005***	0.977	-2.420	0.015**	0.981
Credit	0.820	0.413	1.251	0.780	0.435	1.200	2.490	0.013**	1.703
remittances	2.600	0.009***	1.743	0.620	0.534	1.118	3.140	0.002***	1.671
Change variables in 2000-2007									
Δelectric	1.060	0.289	1.657	3.640	0.000***	4.210	4.620	0.000***	5.652

(continued)

Table 3.3 (continued)

Variable	Transient Poor (-)			Transient Poor (+)			Non-poor		
	Zstat	P>z	RRR	Zstat	P>z	RRR	Zstat	P>z	RRR
Δempsect	0.740	0.457	1.333	2.250	0.025**	2.123	1.720	0.085*	1.710
Δhhsize	3.700	0.000***	1.206	-6.680	0.000***	0.738	-6.060	0.000***	0.781
Δcredit	0.710	0.479	1.280	1.440	0.149	1.545	2.200	0.028**	1.862
Δrural	-1.000	0.318	0.702	-2.230	0.026**	0.481	-2.020	0.043**	0.573
Δfemhead	1.000	0.317	1.410	1.890	0.059*	1.701	1.630	0.104	1.555
ΔTAFB	-0.760	0.450	0.845	2.230	0.026**	1.519	1.090	0.276	1.211
ΔTANFB	-0.590	0.552	0.866	1.270	0.204	1.295	1.820	0.069*	1.412
IMR	1.040	0.299	9.972	1.070	0.286	8.573	1.880	0.060*	35.941
No. of obs.					8273				
Pseudo-R^2					0.1638				
Wald $\chi 2_{(105)}$					1021.41***				
$\chi 2_{(24)}$					23.945				

Note. * the variable is significant at 10%, ** the variable is significant at 5%, *** the variable is significant at 1%. The base category is *Chronic poor* group.

The education of the household head is highly correlated to the poverty status. The *primary* and *secondary* education variables are significant in both *Transient poor (+)* and *Non-poor* groups, while *tertiary* education is only significant in *Non-Poor* group. The household head with primary education has a higher probability to temporarily exit poverty and be in *Transient poor (+)* group at factor of 1.602. The value is even higher for the household heads with secondary education, which is 1.806 times more likely to temporarily exit poverty (in the *Transient poor (+)* group) than being trapped in the *Chronic poor* condition. The primary, secondary and tertiary education levels, respectively, increase the households' probability of not falling into poverty by 2.133, 4.580 and 5.935 times. The results reflect that the higher the level of education of the household head, the higher probability of the household to move out from poverty and to be in the non-poor group. These results correspond with the findings of most studies (Glewwe et al., 2002; Alisjahbana & Yusuf, 2003; Bigsten et al., 2003; Sen, 2003; Awan et al., 2011; Gounder & Xing, 2012; Dartanto & Nurkholis, 2013; Muyanga et al.; 2013) for various developing countries. The higher educational levels increase the ability and productivity of the household, particularly the poor, thus it can break the vicious circle of poverty (Awan et al, 2011). Moreover, higher levels of education support the household head for better job opportunities and higher income earnings (Gounder & Xing, 2012; Dartanto & Nurkholis, 2013), as well as increase the probability of their descendants to get higher education (Xing, 2010) which indeed will increase the family's well-being.

The household size (*hhsize*) has a significant negative impact, while the squared coefficient (s*qhhsize*) has a significant positive impact in the *Non-poor* model. This suggests that an increase in family size, up to 13 people, decreases the probability to be non-poor. The study, therefore, indicates that having a family consisting of more than 13 members increases the probability of being non-poor.[32] These results present an U-shape relationship between household size and poverty status transition. An increase in the number of family members, with fixed income, would reduce the consumption level per capita in the house and decrease the household's well-being, as also confirmed by Dartanto and Nurkholis (2013). However, as the number of family members continues to increase, it then has an opposite effect. The very large family size can support the household and be potential income earners through participation in the workforce, which thus increases the probability of being non-poor (Xing, 2010).

Employment in the service sector (*services)* is a vital determinant of the poverty status transition. It increases the probability of a household to be in the non-poor group and exit chronic poor condition at factor of 2.146. The household head involvement in the agricultural (*agri*) and manufacturing (*manu*) employment sectors also serve as indicators even though the variables are insignificant. The coefficient for household heads engaged in the manufacturing sector, in *non-poor* group, is positive. It notes that those in the manufacturing sector may be in the non-poor group (see also Xing, 2010). In the *non-poor* group, the coefficient for household heads in the agricultural sector is negative which indicates that those who work in the agricultural sector tend to be chronically poor. Similar findings of the impact of the agricultural sector and poverty are also discussed by some prior studies (see Sen 2003; Dartanto & Nurkholis, 2013).

The rural location coefficient (*rural*) shows a positive and significant impact in the *Transient poor (-)* and *Non-poor* groups. The RRR value is greater than one which suggests that those households in the rural area have a higher probability of being in the *Transient poor (-)* than in the *Chronic poor* group by 1.641 times. Furthermore, the estimated probability is higher for rural households to be in the *Non-poor* group by 2.759 times compare to their probability to be in the *Chronic poor* group. The results support the finding that non-poor rural households in the 2000 and 2007 period can avoid chronic poverty. The rural areas can support the households' likelihood of exiting chronic poverty.

[32] The peak of the household size is calculated by author based on the coefficient of the *Hhsize* and *Sqhhsize* in the estimated model.

This finding cannot be ignored as it has substantial impact on a larger proportion of the population. Due to rural-urban migration, the urban poverty in Indonesia is increasing and projected to surpass rural poverty by 2020 (World Bank, 2013b). The proportion of rural poor was higher than in urban poor between 2000 and 2007 (see Table 3.1), however, according to Statistics Indonesia (2014b), the number of urban poor increased faster than in rural areas. In 2000, the number of poor people from the urban area was 12.31 million. It further increased to 13.56 million in 2007. In contrast, in the rural area, 26.43 million people were poor in 2000 but in 2007 the number decreased to 23.61 million people.

Urbanization grew rapidly in Indonesia causing higher urban poverty (UNDP, 2013b; World Bank, 2013b). Job opportunities became the major reason for moving to urban areas (Dartanto & Nurkholis, 2013). However, it also caused a growth in slum areas in the cities (UNDP, 2013b), which led to increasing challenges for the people and the local government in terms of jobs and providing adequate infrastructure and services, e.g., housing, water, sanitation and transportation (World Bank, 2008b; UNDP, 2013b). The World Bank (2008b, p.7) highlights that "while access is typically higher in urban areas than rural, it can still be extremely low for the urban poor, of inadequate quality, and unaffordable". Thus urban poor relates to low skills, low wages, high unemployment, the spatial location of slums and inadequate infrastructure.

Owning asset, either household or business asset, mostly increases the probability to be less poor. Increase in vehicle value (*TANBvehi*) by Rp. 100,000 (USD10) significantly gives the household 1.018 times higher probability to be in the *Non-poor* group instead of being chronically poor. The same effect occurs if the households own durable goods (*durgoods*), those are, jewellery and house appliances, which cause a 2.185 times greater probability of being non-poor rather than chronically poor. The durable goods support the household to obtain cash and smooth their consumption expenditure if negative shocks affect them. The larger house size (*housesize*) by one square meter (1 m^2) significantly leads to exiting poverty and be non-poor at factor of 1.006. For business asset, an increase of Rp. 100,000 in the value of non-farm business asset (*TANFB*) increases the household's probability to be non-poor by the factor of 1.016. The findings support previous studies of the assets-poverty reduction relationship (e.g Bigsten et al., 2003; McCulloch & Calandrino, 2003; Bokosi, 2007; Mills & Mykerezi, 2009; Kristjanson, Mango, Khrisna, Radeny & Johnson 2010; You, 2011; Machicado et al., 2012).

The households with access to electricity (*electric*) have a higher tendency at a factor of 2.704 and 4.566, respectively, to escape from poverty and to be non-poor. The access to electricity can efficiently assist the family in their business and work, as well as support children's education at home. Foster and Tre (as cited in Dartanto & Nurkholis, 2013) note that the unit cost of electricity as lighting source can be cheaper than lighting with candles or oil lamp. Thus, electricity can help the households to reallocate their expenditure from other energy consumption to more relevant resources. Receiving social safety nets both of health care (*SSNhc*) and food based safety nets (*SSNfb*) reduces the probability of the households to be non-poor by 0.668 and 0.408 times relative to the *Chronic poor* group.[33] Receiving food based safety nets (*SSNfb*) also reduces the tendency to exit poverty by 0.693 times relative to the *Chronic poor* group. This implies that obtaining the social safety nets increases the probability to remain in chronic poor conditions. Even though the programs fail to assist the poor escape from poverty, these are still vital programs to provide to the poor. Gupta et al. (1999) notes that social safety nets help the poor households to meet their basic needs.

One additional day disrupted by health problems per month (*healthdisrup*) increases the probability of being chronically poor. In the *Non-poor* group, this health problem reduces the probability to be non-poor by factor of 0.981. These also reduce the probability to be in *Transient poor (-)* and *Transient poor (+)* groups at factor of 0.965 and 0.977, respectively. This suggests that negative health shocks cause disruption, it brings the households to be chronically poor. Households obtaining financial assistance through credit programme(*credit*) have higher possibility by 1.703 times to be in the *Non-poor* group instead of falling into the *Chronic poor* group. This positive effect of credit access is in line with the findings from Zaman (1999), Islam (2007), Tang, Guan, and Jin, (2010), Hulme et al. (2001) and Bayudan-Dacuycuy and Lim (2013b).

Households receiving domestic remittances from families/friends (*remittances*) tend to have higher probability to move from *Chronic poor* to *Transient poor (-)* and *Non-poor* condition by a factor of 1.743 and 1.671 respectively. Although remittances successfully assist households to avoid being chronically poor, they do not assist the households to escape being in the *Transient poor (+)* group. A possible explanation is that remittances recipient households are mostly transient poor households with high risk to fall into poverty. However, the effect of domestic remittances shows that households can benefit from this

[33] *Jamkesmas* is the health care social safety net which was previously named *health cards* (kartu sehat) in 1994, then changed into *health insurance for poor household* (Askeskin) in 2005, and reformed to *health guarantees for the poor* (*Jamkesmas*) in 2008. Meanwhile *Raskin* is a type of food based social safety net in Indonesia.

flow to improve their consumption level and prevent them from being trapped in chronically poor condition (see also studies by Prakash (2009), McDonald and Valenzuela (2012) and Gounder (2014)).

Changing the condition of the household from not having electricity access in 2000 to having it in 2007 (*Δelectric)* escalates the probability of escaping poverty and being non poor each by a factor of 4.210 and 5.652 relative to the chronic poor conditions. Changing employment sector from agricultural in 2000 to non-agricultural in 2007 (*Δempsect*) also gives 2.123 times greater probability to move out from poverty and 1.710 times greater probability to be a non-poor household. The impact of increasing household size (*Δhhsize*) between the years 2000 to 2007 is consistent with the U-shape relationship discussed earlier. Increasing the household size from 2000 to 2007 increases the probability of the household to remain in the *Transient poor (-)* group by a factor of 1.206 than to be in chronic poor condition. However, this can also reduce the household's probability to temporarily escape poverty and be non-poor at a factor of 0.738 and 0.781, respectively. The transition condition of the households from having no credit access in 2000 but then getting the access in 2007 (*Δcredit*) significantly increases the tendency of being non-poor by 1.862 times than being chronically poor.

The movement of the family from rural to urban area between 2000 and 2007 tends to reduce the probability of temporarily exiting poverty (at a factor of 0.481) and being non-poor (at a factor of 0.573) relative to the *Chronic poor* group. This is consistent with the previous discussion that urbanization challenges the immigrants causing the probability for them to fall into urban poverty. Although the gender of the household head does not appear significant in all models, the transition of household heads from male in 2000 to female in 2007 (*Δfemhead*) successfully escalate their probability to temporarily exit from poverty (*Transient poor (+))* at factor of 1.701 than being trapped in chronic poverty. The possible reason is because Indonesia's government provides social protection programs to support and empower women to actively participate in the economic activities (Syukri, 2013).[34]

Households with an increase in total value of farm business assets (*ΔTAFB*) have higher probability to temporarily move out of poverty (1.519 times greater). Furthermore, an increase in total value of non-farm business assets (*ΔTANFB*) increases the probability to be

[34] An example is the National Programme for Community Empowerment (*PNPM Mandiri*) and Family Hope Programme (*PKH*) that were available since 2007 (World Bank, 2012a; Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-f). According to Syukri et al. (as cited in Syukri, 2013), the *PNPM Mandiri* programmes are considered as successful micro-credit programmes in order to increase households' income. Meanwhile, *PKH* is a conditional cash transfer which targets women as the main recipient.

non-poor at factor of 1.412. It suggests that increasing the real value of assets owned, particularly business assets, by households can prevent them from being chronically poor.

As the results indicate, location and household heads' employment sector affects poverty differently. The section below examines the poverty dynamics for the rural, urban and agricultural households.

3.5.2 Results for Determinants of Poverty Dynamics: Urban and Rural Areas

The estimated results of poverty dynamics for households in urban areas is presented in Table 3.4. The model presents the RRR value as the odds ratio which is interpreted in comparison with the base category, that is, the *Chronic poor* group. The significant estimated value of Wald $\chi 2_{(99)}$ indicates that at least one of the regressors' coefficients is not equal to zero. The insignificant Hosmer-Lemeshow goodness of fit test ($\chi 2_{(24)}$) of the modes suggests that it fits well to the data.

Table 3.4

Results for Poverty Dynamics in Western Indonesia 2000-2007 (Urban Area)

Variable	Transient poor (-)			Transient poor (+)			Non-poor		
	Zstat	P>z	RRR	Zstat	P>z	RRR	Zstat	P>z	RRR
Cons	0.820	0.410	34.762	0.490	0.627	5.392	0.480	0.629	5.093
				Variables in 2000					
age_head	-0.960	0.339	0.899	-0.580	0.559	0.946	0.290	0.771	1.027
sqage_head	0.980	0.329	1.001	0.460	0.649	1.000	-0.380	0.705	1.000
female_head	0.440	0.659	1.209	0.210	0.830	1.083	0.250	0.799	1.092
Primary	-0.080	0.939	0.960	0.340	0.737	1.165	0.980	0.329	1.530
Secondary	1.840	0.066*	2.967	1.930	0.053*	2.769	3.940	0.000***	7.146
Tertiary	-0.370	0.713	0.590	-0.360	0.716	0.630	1.770	0.077*	6.686
Hhsize	-0.920	0.358	0.764	-0.570	0.567	0.870	-2.860	0.004***	0.532
Sqhhsize	0.590	0.558	1.013	-0.030	0.976	0.999	1.070	0.287	1.017
Depratio	-1.120	0.262	0.736	0.750	0.455	1.170	-1.170	0.242	0.797
Agri	-1.370	0.171	0.413	-1.350	0.177	0.491	-1.600	0.109	0.449
Manu	-0.290	0.772	0.860	-0.760	0.450	0.713	-0.220	0.826	0.913
Services	-0.010	0.995	0.997	0.610	0.545	1.273	1.400	0.161	1.673
Landanb	1.400	0.162	2.043	1.210	0.226	1.775	2.080	0.038**	2.611
TANBlivest	0.310	0.756	1.053	-0.630	0.530	0.868	0.340	0.736	1.057
TANBvehi	0.710	0.476	1.005	-0.730	0.466	0.994	1.590	0.111	1.011
Durgoods	0.280	0.776	1.144	0.080	0.935	1.029	1.860	0.063*	1.838
Housesize	-0.030	0.978	1.000	0.990	0.322	1.002	0.950	0.340	1.002

(continued)

Table 3.4 (continued)

Variable	Transient poor (-)			Transient poor (+)			Non-poor		
	Zstat	P>z	RRR	Zstat	P>z	RRR	Zstat	P>z	RRR
TAFB	1.750	0.080*	1.003	0.940	0.349	1.002	1.420	0.157	1.002
TANFB	0.370	0.708	1.002	0.910	0.362	1.005	1.610	0.106	1.008
electric	0.380	0.706	1.627	1.390	0.164	3.022	2.260	0.024**	6.901
SSNhc	-1.540	0.124	0.581	-1.130	0.260	0.720	-2.620	0.009***	0.495
SSNfb	-0.400	0.687	0.843	-0.850	0.394	0.739	-3.070	0.002***	0.354
healthdisrup	-1.750	0.081*	0.969	-0.960	0.339	0.987	-1.000	0.315	0.987
credit	-0.210	0.836	0.925	0.140	0.889	1.048	0.790	0.432	1.281
remittances	0.660	0.509	1.275	0.150	0.883	1.047	-0.320	0.752	0.912
	Change variables in 2000-2007								
Δelectric	10.110	0.000***	1,288,426	18.990	0.000***	7,506,662	18.010	0.000***	10,500,000
Δempsect	-0.290	0.769	0.776	-0.060	0.950	0.961	0.590	0.557	1.434
Δhhsize	3.060	0.002***	1.251	-4.440	0.000***	0.724	-4.380	0.000***	0.749
Δcredit	0.340	0.735	1.168	0.170	0.862	1.072	-0.270	0.786	0.900
Δfemhead	-0.770	0.443	0.667	0.180	0.860	1.075	0.250	0.800	1.100
ΔTAFB	-0.270	0.789	0.891	0.790	0.430	1.319	-0.350	0.729	0.890
ΔTANFB	-0.450	0.655	0.858	1.500	0.135	1.547	1.660	0.096*	1.582
IMR	-0.310	0.753	0.407	-0.050	0.958	0.875	0.440	0.659	2.890
No. of obs	3776								
Pseudo-R^2	0.2222								
Wald $\chi2_{(99)}$	4420.79***								
$\chi2_{(24)}$	14.991								

Note. * the variable is significant at 10%, ** the variable is significant at 5%, *** the variable is significant at 1%. The base category is *Chronic poor* group.

The estimated results for households in the rural area is then showed in Table 3.5. The model also presents the RRR and uses the *Chronic poor* group as the base category. The estimated results in Table 3.5 also shows the significant estimated value of Wald $\chi2_{(102)}$, which means that at least one of the regressors' coefficients is not equal to zero. The insignificant Hosmer-Lemeshow goodness of fit test ($\chi2_{(24)}$) shows a good fit to the data.

Table 3.5

Results for Poverty Dynamics in Western Indonesia 2000-2007 (Rural Area)

Variable	Transient poor (-)			Transient poor (+)			Non-poor		
	Zstat	P>z	RRR	Zstat	P>z	RRR	Zstat	P>z	RRR
Cons	-0.570	0.567	0.143	-0.510	0.608	0.226	-0.060	0.950	0.847
	Variables in 2000								
age_head	1.200	0.231	1.109	0.640	0.524	1.047	1.900	0.058*	1.130
sqage_head	-1.270	0.203	0.999	-0.670	0.504	1.000	-2.070	0.038**	0.999

(continued)

Table 3.5 (continued)

Variable	Transient poor (-)			Transient poor (+)			Non-poor		
	Zstat	P>z	RRR	Zstat	P>z	RRR	Zstat	P>z	RRR
female_head	-1.210	0.226	0.611	0.440	0.658	1.175	-0.260	0.798	0.917
Primary	1.100	0.269	1.388	2.280	0.022**	1.763	3.440	0.001***	2.208
secondary	0.010	0.989	1.007	0.210	0.832	1.090	2.670	0.008***	2.659
Tertiary	0.610	0.541	2.312	-11.910	0.000***	0.000	1.690	0.091*	5.977
Hhsize	-1.370	0.171	0.588	-0.430	0.669	0.865	-3.490	0.000***	0.333
Sqhhsize	0.650	0.518	1.021	0.020	0.988	1.000	2.200	0.028**	1.058
Depratio	1.960	0.050*	1.345	0.370	0.708	1.048	0.650	0.515	1.078
Agri	0.630	0.531	1.306	-0.380	0.702	0.869	0.240	0.814	1.083
Manu	0.070	0.947	1.038	0.070	0.946	1.031	0.430	0.670	1.196
Services	0.430	0.670	1.225	0.230	0.818	1.097	2.060	0.039**	2.120
Landanb	0.770	0.440	1.267	-0.410	0.683	0.894	-0.050	0.957	0.987
TANBlivest	0.500	0.620	1.016	-1.170	0.243	0.948	-0.390	0.699	0.987
TANBvehi	0.710	0.476	1.011	0.780	0.433	1.011	2.070	0.038**	1.027
Durgoods	0.750	0.454	1.268	0.540	0.588	1.153	2.740	0.006***	1.932
Housesize	1.840	0.066*	1.006	3.000	0.003***	1.009	3.400	0.001***	1.010
TAFB	0.350	0.723	1.000	0.110	0.910	1.000	0.520	0.600	1.001
TANFB	2.020	0.043**	1.035	1.880	0.060*	1.033	2.450	0.014**	1.042
Electric	0.910	0.363	1.465	2.590	0.009***	2.548	4.050	0.000***	3.850
SSNhc	-0.560	0.576	0.859	-0.830	0.407	0.823	-1.730	0.083*	0.690
SSNfb	-0.860	0.392	0.786	-2.250	0.024**	0.592	-4.620	0.000***	0.374
healthdisrup	-2.920	0.003***	0.961	-3.160	0.002***	0.968	-2.530	0.011**	0.977
Credit	0.760	0.449	1.329	0.460	0.649	1.160	1.890	0.058*	1.740
remittances	2.410	0.016**	1.885	0.390	0.694	1.093	3.290	0.001***	1.959
Change variables in 2000-2007									
Δelectric	0.820	0.413	1.495	2.970	0.003***	3.443	3.880	0.000***	4.511
Δempsect	1.100	0.271	1.637	2.480	0.013**	2.728	1.760	0.079*	1.951
Δhhsize	2.470	0.013**	1.181	-5.000	0.000***	0.743	-4.530	0.000***	0.790
Δcredit	0.850	0.393	1.605	1.670	0.095	2.243	2.620	0.009***	3.257
Δrural	-0.750	0.456	0.764	-2.030	0.042**	0.503	-1.620	0.105	0.633
Δfemhead	1.420	0.155	1.831	2.030	0.043**	2.103	1.650	0.099*	1.798
ΔTAFB	-0.520	0.604	0.877	2.230	0.026**	1.621	1.370	0.171	1.317
ΔTANFB	-0.440	0.658	0.866	0.590	0.553	1.180	1.200	0.231	1.360
IMR	0.530	0.599	4.498	0.470	0.638	3.280	0.610	0.541	3.993
No. of obs	4497								
Pseudo-R^2	0.1561								
Wald $\chi2_{(102)}$	6467.10***								
$\chi2_{(24)}$	21.080								

Note. * the variable is significant at 10%, ** the variable is significant at 5%, *** the variable is significant at 1%. The base category is *Chronic poor* group.

The analysis in this sub chapter discusses the results in both urban and rural areas. The age of the household head is insignificant for urban households. However, the variables are a vital determinant of poverty status transition for rural households. The *age_head* has a

significant positive effect, while the *sqage_head* has a significant and negative effect. It captures an inverted U-shape relationship to the probability of the rural households to be non-poor. An increase in age of the household head up to 50 years old increases the probability to be non-poor.[35] However, as the rural household head grows older than 50 years, the household's likelihood of being non poor decreases.

In the case of urban households, the household heads with secondary level of education increases the probability of being non-poor by factor of 7.146. Moreover, those with tertiary education increase the probability of being non-poor at a factor of 6.686. Meanwhile, the rural household heads who increase the probability to be non-poor are the ones who attended primary, secondary and tertiary educations. Those educational levels give a 2.208, 2.659 and 5.977 times higher probability, respectively, to be non-poor than to be trapped in chronic poverty.

The effect of household size is different both in urban and rural households. An increase in the number of urban family members lowers the probability of the households to be non-poor at a factor of 0.532. Meanwhile, the family size gives a U-shape relationship to the poverty status transition of rural households. An increase in the family size, up to 10 people, reduces the probability of being non poor.[36] When the family becomes very large (more than 10 people), it then increases the probability to be non-poor. This implies that a higher number of family members helps to get additional earnings. In the case of the rural area, where people mostly depend on the agricultural sector, higher number of family members will increase the number of workers on the farm.

In the case of rural households, dependency ratio (*depratio*) contributes to a higher probability of the households to be temporarily poor instead of being chronically poor at a factor of 1.345. It suggests that dependency ratio increases the probability of the household to be in better off group. This condition occurs mostly in rural and agricultural households which usually have young family members entering the workforce as agricultural workers without high education degree. In the poor households, family members who graduated from high school (already aged more than 15 years old) tend to immediately looking for jobs and work to improve the family's economic condition. Workers with low education level then have low productivity (see Sen, 2003) and tend to be vulnerable. Thus, besides increasing

[35] The peak of age is calculated based on the coefficient of the *age_head* and *sqage_head* in the estimated model for rural households.
[36] The peak of household size is calculated based on the coefficient of the *hhsize* and *sqhhsize* in the estimated model for rural households.

the dependency level in the households, young household members can also be potential income earners which then increases the probability of the households to move out from the *Chronic poor* group to be temporarily poor (*Transient poor(-)).* However, because the young household members are also vulnerable, they fail to further increase the households' probability to temporarily exit from poverty (*Transient poor (+))* or be non-poor *(Non-poor*).

Household heads working in the agricultural, manufacturing and service sectors do not affect the probability of exiting poverty in the case of urban households. In the case of rural households, household heads involved in the agricultural and manufacturing sectors are also insignificant in increasing the probability of being non-poor. However, headed by a worker in the service sector, the rural households' probability to be non-poor increases at a factor of 2.120.

Assets ownership by urban and rural households gives a higher probability to be in the non-poor groups. Land owned (*landanb*) by urban households increase the probability to be in the *Non-poor* group at a factor of 2.611. Durable goods ownership gives a 1.838 times higher probability of urban households to be non-poor rather than to be chronically poor. In the case of rural households, the house size significantly improves the well-being of the households through providing 1.006 times, 1.009 times and 1.010 times higher probability to be in the temporarily poor (*Transient poor (-)*), temporarily move out from poverty *(Transient poor (+))* and non-poor (*Non-poor*), respectively, than to be in the *Chronic poor* group. An increase in vehicle value (*TANBvehi*) and non-farm business *(TANFB*) by Rp. 100,000 increases the rural households' probability to be non-poor by factor of 1.027 and 1.042, respectively. Owning durable goods by rural households also contributes a 1.932 times higher probability of being in *Non-poor* group.

Effect of electricity access, both on rural and urban households, shows the same conclusion. Access of electricity increases urban households' probability at 6.901 times greater to be non-poor than to fall into chronic poverty. In the case of rural households, electricity access significantly causes 2.548 times greater tendency to temporarily escape poverty and 3.850 times greater probability to be non-poor.

Receiving food based (*SSNfb*) and health care *(SSNhc*) social safety net decreases households' probability to be non-poor both in rural and urban areas. The *SSNfb* decreases the probability of urban households of being in the *Non-poor* group by factor of 0.354, while

the *SSNhc* decreases the households' probability of being non-poor by factor of 0.495. The *SSNfb* also decreases the rural household's probability to temporarily exit poverty (*Transient poor (+))* and be non-poor *(Non poor*) at a factor of 0.592 and 0.374, respectively. Furthermore, rural households who receive *SSNhc* have a 0.690 times lower probability to be in the *Non-poor* group.

An increase in one day of health problems per month tends to make urban and rural households chronically poor. In the case of urban households, the health disruption is significant only in *Transient poor (-)* group. The disruption reduces the urban households' probability to be temporarily poor by factor of 0.969. This reflects that the disruption causes a higher probability to urban households to be chronically poor (*Chronic poor*) than to be temporarily poor (*Transient poor (-)).* The health disruption is also significant in the case of rural households. It reduces the rural households' probability to be temporarily poor *(Transient poor (-))*, temporarily exit from poverty *(Transient poor (+))* and be non-poor (*Non-poor)* at a factor of 0.961, 0.968 and 0.977, respectively, which means the probability to be chronically poor increases.

Rural households who obtain credit have 1.740 times greater probability to be non-poor than be chronically poor. Receiving domestic remittances also significantly improve the rural households' poverty status. The rural households who receive remittances tend to be temporarily poor *(Transient poor (-))* and non-poor (*Non-poor)* than chronically poor at a factor of 1.885 and 1.959, respectively. However, the credit access and remittances do not significantly affect the economic condition of urban households.

Households who do not have electricity access in 2000 then have it in 2007 (*Δelectric)* reduces the probability of being chronically poor for urban and rural households. It increases the probability of urban households to be temporarily poor *(Transient poor (-))*, temporarily exit from poverty *(Transient poor (+))* and be non-poor (*Non-poor).* In the case of rural households, it raises the probability of the households to temporarily exit from poverty and be non-poor. A change in the employment sector of the household heads affects the rural households only. The rural household heads who change their working area from agricultural (in 2000 period) to non-agricultural sector (in 2007 period) results in a 2.728 and 1.951 times greater probability to temporarily exit poverty and be in the *Non-poor* group, respectively.

The increase of urban household size from 2000 to 2007 period increases the probability of the household to be in the *Transient poor (-)* group by a factor of 1.251 than to be in chronic

poor condition. However, this also reduces the household's probability to be in the *Transient poor (+)* and *Non-poor* groups at a factor of 0.724 and 0.749, respectively. The rural households with an increase of household size from 2000 and 2007 also experience the same thing with urban households. It increases the likelihood of the rural household to be in the *Transient poor (-)* group by a factor of 1.181, while it also decreases the probability to be in the *Transient poor (+)* and *Non-poor* groups by factor of 0.743 and 0.790, respectively.

The rural households with no credit access in 2000 but who received credit in 2007 have a 3.257 times higher probability to be in the *Non-poor* group than be in chronic poor condition. However, this is not significant for urban households. The results are related to a programme called Credit for Business Programme (*KUR*) which has national coverage including the rural part of Indonesia.[37] A shifting household heads' gender from male in 2000 to female in 2007 significantly increases the households' probability to temporarily move out from poverty and be non-poor, although it appears only on rural households. The rural female household heads benefit from government's social protection programs, particularly the National Programme for Community Empowerment (PNPM Mandiri) and Family Hope Programme (*PKH*).[38]

The increasing value of non-farm business asset (*ΔTANFB)* from 2000 to 2007 period escalates the urban households' probability to be non-poor than to be in chronic poverty at a factor of 1.582. However, the *ΔTANFB* is not significant for rural households. The business assets that affect poverty status transition of rural households are farm business assets. An increasing value of farm business asset (*ΔTAFB)* owned by rural households from 2000 to 2007 period causes a higher probability to temporarily move out from poverty (*Transient poor (+))* at a factor of 1.621. Urbanization between 2000 and 2007 period (*Δrural*) positively reduces the rural households' probability to temporarily exit poverty at a factor of 0.503. The finding agrees with the previous discussion that households' movement from rural to urban areas tends to increase their probability to be chronically poor.

[37] According to Secretariat of the National Team for The Acceleration of Poverty Reduction (n.d.-c), the implementation of the *KUR* involves 19 Banks including 13 Regional Development Banks which mostly take care of rural credit.

[38] Those programmes are also intended to reach and overcome the poverty in rural area (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-c; Nazara and Rahayu, 2013). The *PNPM Mandiri* has a specific programme to empower the local community in rural areas called Rural PNPM. Moreover, the *PKH* programme, from the first time, is intended to reach all areas in Indonesia including rural areas.

3.5.3 Results for Determinants of Poverty Dynamics: Agricultural Households

This sub chapter discusses the poverty dynamics determinants with a focus on agricultural households. The estimated result is presented in the Table 3.6. The significant Wald $\chi 2_{(96)}$concludes that at least one of the regressors' coefficients is not equal to zero. The insignificant Hosmer-Lemeshow goodness of fit test ($\chi 2_{(24)}$) in agricultural households model reveals that the model fits to the data.

Consistent with the previous results, the variable *hhsize* in the case of agricultural households gives a U-shape relationship on the probability of being non-poor. An increase in the number of family members up to 11 people significantly reduces the probability of being non-poor. A very large household size, of more than 11 people, increases the households' probability to be non-poor.[39] A household head with tertiary education has a higher probability of the household to be in the *Non-poor* group than in the *Chronic poor* group at a factor of 458,084. However, a household head with tertiary education has a higher probability to be temporarily poor (*Transient poor (-))* at a factor of 19,563.3. It also causes a lower probability to temporarily exit from poverty (*Transient poor(+))* at a factor of 0.368. Although the result varies in the *Transient poor* group, it shows that the non-poor agricultural households with tertiary-educated household head (*Non-poor* group) can avoid chronic poverty in 2000 and 2007.

Table 3.6

Results for Poverty Dynamics in Western Indonesia 2000-2007 (Agricultural Households)

Variable	Transient poor (-)			Transient poor (+)			Non-poor		
	Zstat	P>z	RRR	Zstat	P>z	RRR	Zstat	P>z	RRR
Cons	-0.730	0.463	0.049	-0.520	0.602	0.182	-0.180	0.859	0.587
				Variables in 2000					
age_head	1.040	0.298	1.130	0.310	0.753	1.030	1.100	0.272	1.100
sqage_head	-1.190	0.235	0.999	-0.410	0.682	1.000	-1.300	0.193	0.999
female_head	-0.980	0.328	0.636	0.170	0.868	1.068	-0.710	0.478	0.769
primary	-0.560	0.574	0.831	0.310	0.755	1.092	0.710	0.478	1.195
secondary	0.110	0.910	1.064	-0.250	0.806	0.887	1.580	0.114	1.928
tertiary	8.660	0.000***	19,563.3	-2.040	0.041**	0.368	24.12	0.000***	458,084.7
hhsize	-1.350	0.176	0.598	-0.590	0.557	0.839	-3.290	0.001***	0.385
sqhhsize	0.670	0.506	1.021	0.000	0.999	1.000	1.930	0.054**	1.046
depratio	1.030	0.301	1.237	0.900	0.367	1.153	-0.330	0.742	0.953

(continued)

[39] The household size peak is calculated based on the coefficient of the *hhsize* and *sqhhsize* in the estimated model for agricultural households.

Table 3.6 (continued)

Variable	Transient poor (-)			Transient poor (+)			Non-poor		
	Zstat	P>z	RRR	Zstat	P>z	RRR	Zstat	P>z	RRR
Rural	2.600	0.009***	2.703	2.130	0.033**	1.984	4.260	0.000***	3.465
Landanb	0.770	0.441	1.298	-0.240	0.808	0.928	-0.390	0.696	0.898
TANBlivest	0.210	0.831	1.006	-1.280	0.201	0.937	-0.650	0.513	0.980
TANBvehi	-0.530	0.599	0.992	0.100	0.919	1.001	1.100	0.271	1.013
durgoods	1.730	0.084*	1.932	1.480	0.138	1.577	3.700	0.000***	2.776
housesize	0.570	0.570	1.002	2.410	0.016**	1.007	2.300	0.022**	1.007
TAFB	3.280	0.001***	1.005	2.570	0.010**	1.004	3.270	0.001***	1.004
TANFB	0.210	0.832	1.003	0.390	0.700	1.004	1.250	0.212	1.013
Electric	0.590	0.555	1.298	1.750	0.079*	1.975	2.950	0.003***	2.798
SSNhc	-0.470	0.639	0.859	0.140	0.888	1.040	-0.460	0.642	0.890
SSNfb	-0.900	0.369	0.747	-1.990	0.047**	0.583	-4.060	0.000***	0.360
healthdisrup	-0.730	0.465	0.985	-0.590	0.555	0.991	0.100	0.922	1.001
Credit	1.720	0.086*	2.267	1.060	0.287	1.603	2.670	0.008***	2.901
remittances	2.250	0.024**	1.987	1.010	0.313	1.301	3.020	0.003***	2.035
Change variables in 2000-2007									
Δelectric	1.200	0.228	1.870	2.520	0.012**	3.132	3.310	0.001***	3.986
Δempsect	1.600	0.110	1.907	2.670	0.008***	2.618	2.250	0.025**	2.119
Δhhsize	2.020	0.043**	1.172	-4.540	0.000***	0.733	-3.590	0.000***	0.800
Δcredit	-1.270	0.202	0.434	0.860	0.390	1.470	1.430	0.152	1.796
Δrural	-0.820	0.410	0.634	-1.040	0.301	0.596	-0.870	0.385	0.688
Δfemhead	1.950	0.051*	2.463	2.270	0.023**	2.470	1.930	0.053*	2.084
ΔTAFB	0.130	0.894	1.039	1.760	0.079*	1.551	1.090	0.278	1.283
ΔTANFB	-0.880	0.379	0.715	-0.040	0.966	0.986	0.210	0.835	1.064
IMR	0.340	0.736	3.413	-0.040	0.970	0.892	0.420	0.676	3.103
No. of obs	2662								
Pseudo-R^2	0.1371								
Wald $\chi2_{(96)}$	2660.42***								
$\chi2_{(24)}$	22.986								

Note. * the variable is significant at 10%, ** the variable is significant at 5%, *** the variable is significant at 1%. The base category is *Chronic poor* group.

The agricultural households who live in rural areas tend to move out from chronic poverty. Those households have a 2.703, 1.984 and 3.465 times higher to be temporarily poor, temporarily move out from poverty, and to be non-poor, respectively. Owning durable goods helps the agricultural households by increasing the probability of temporarily being poor (at a factor of 1.932) and being non-poor (at a factor of 2.776) than being chronically poor. An increase in house size by one square meter also increases their probability of temporarily escaping poverty and being non-poor, both at a factor of 1.007. An increase in value of farm business assets by Rp. 100,000 escalates the agricultural household's probability to be temporarily poor, temporarily move out and be non-poor at a factor of 1.005, 1.004 and 1.004, respectively, than to be in chronic poverty.

Having electricity access for agricultural households increases their probability to temporarily exit poverty and be non-poor by factor of 1.975 and 2.798, respectively. The agricultural households who obtain food based social safety nets (*SSNfb*) tend to be chronically poor. It reduces their probability to be in the *Transient poor (+)* at a factor of 0.583 and the *Non-poor* group at a factor of 0.360. Credit access and obtaining domestic remittances increase the probability of agricultural households to be temporarily poor by factor of 2.267 and 1.987, respectively. The credir access and remittances also add higher probability to be non-poor by factor of 2.901 and 2.035, respectively.

Agricultural households that get electricity access in 2007, and had no access in 2000, have a 3.132 and 3.986 times higher probability to temporarily escape poverty and be non-poor, respectively. Change in the employment sector from agriculture in 2000 to non-agriculture sector in 2007 increases the households' likelihood to temporarily move out from poverty (by factor of 2.618) and also be non-poor (by factor of 2.119). An increase of household size between 2000-2007 period increases the probability of the agricultural household to be in the *Transient poor (-)* group by a factor of 1.172 than to be in chronic poor condition. This also reduces the household's probability to be in *Transient poor (+)* and *Non-poor* groups at a factor of 0.733 and 0.800, respectively. The results agree with findings in the previous sub chapters 3.51 and 3.5.2.

A change in the agricultural household head from male in 2000 to female in 2007 (*Δfemhead*) increases the probability to be temporarily poor at a factor of 2.463, to be temporarily out from poverty at a factor of 2.470 and to be non-poor by factor 2.084 than be trapped in chronic poverty. It then confirms that female heads can bring the family out from chronic poverty. The agricultural households who experience positive asset accumulation in farm business asset (*ΔTAFB*) during 2000-2007 have 1.551 times greater probability to exit poverty.

3.6 Conclusion

This chapter examines the possible determinants which can affect the poverty status transition (poverty dynamics) of households in the Western Provinces of Indonesia. The determinants are classified as socio-economic characteristics of the households in 2000 and changes of some of those characteristics between 2000 and 2007. The results are estimated by using the data from Indonesia Family Life Survey (IFLS) for the period 2000 and 2007 using two-stage estimation, probit and then multinomial logit model, as the method.

The empirical results found that educational levels of the household head are among the most important factors in reducing poverty. The household heads with primary, secondary or tertiary education successfully avoid chronic poverty. The urban household heads with secondary and tertiary level education escalate the households' chance to be non-poor. In the case of rural households, primary, secondary and tertiary education are important to keep the households out from chronic poverty. Tertiary educational level is also found to be important for agricultural households since the household heads with tertiary education remain non-poor. This implies that, to eradicate poverty, providing education particularly to the poor households are important.

The family size is also important to assist households in being non-poor. The large household size members can be potential income earners in the households. Thus, in this case, education and skills are also vital to help them obtain better job opportunities which then help the households to be non-poor. Moreover, female-headed households successfully avoid being in chronic poverty. This result implies that suggests that woman empowerment programmes play significant role to alleviate poverty in Indonesia. Such programmes should continue to be provided.

Access to credit is found to be essential to help the households avoid chronic poverty. The households with access to credit successfully have a higher chance to be non-poor. It implies that the government should make credit to be more accessible to poor households. The government should also ensure that the credit programmes cover rural areas in Indonesia, where such programmes provide the biggest benefit. Moreover, although in the results food-based and health care safety net programs fails to affect households' poverty status transition to be non-poor, such assistance from the government is still important. However, to improve the effectiveness, the government should improve the targeting and monitoring schemes.

Finally, areas of employment have an important role in affecting the poverty condition of the households. In general, the households which rely on the service sector have a higher probability to be non-poor. Even though working in the agricultural sector is insignificant in affecting households' poverty status transitions, the finding that it tends to make the households stay in chronic poverty is important. Since most of those employed in Indonesia are involved in the agricultural sector, this sector should be a focus area of the government to alleviate poverty.

Appendix 3.1

Variable Definition and Descriptive Statistics

The data used in this study is national household survey data, named Indonesian Family Life Survey (IFLS) data. It is an on-going longitudinal survey in Indonesia which is intended to provide data for studying household behaviours. The survey data is mainly maintained and collected by RAND Corporation, an organization based in the USA, in collaboration with the University of California, Los Angeles (UCLA), Demographic Institute of University of Indonesia, Centre for Population and Policy Studies (CPPS) of the University of Gadjah Mada, and Survey METER which is the Indonesian non-governmental research institution (RAND 2010a). The IFLS is based on a sample of households representing the Indonesian population living in 13 of the nation's 26 provinces in 1993 (Strauss et al., 2009). The locations in conducting the survey are Java, Sumatra, Bali, West Nusa Tenggara, Kalimantan and Sulawesi (Figure A.3.1). The IFLS1 sampling scheme used stratified sampling in provinces and followed by randomly sampling within provinces. Those areas were chosen because they contain approximately 83 percent of the Indonesian population.

Figure A.3.1. The Location of Sample in Indonesian Family Life Survey. Adapted from http://www.rand.org/labor/FLS/IFLS.html. Copyright 2014 by RAND. Reprinted with Permission.

The IFLS has been conducted four times during 1993-2007 that is, the IFLS1 in 1993/1994, IFLS2 and IFLS2+ in 1997/1998, IFLS3 in 2000, and IFLS4 in 2007. This study utilizes the most recent survey data in 2000 (IFLS3) and 2007 (IFLS4). The sample sizes in the IFLS1 are 7,224 households. In IFLS 2, 10,400 households were interviewed with re-contact rate of 95.3% of IFLS1 households. Furthermore, the households interviewed in IFLS4 are 13,535 households with re-contact rate was 93.6% of IFLS1 households (Strauss et al., 2009; RAND, 2010b). Even though the survey does not cover the east part of Indonesia and all provinces in the west part, but by considering the large household sample, the data will still be useful to give information at the household level. The detail survey location included in IFLS are Java (all provinces), Sumatra (only North Sumatra, West Sumatra, South Sumatra, Lampung and Bangka Belitung), Kalimantan (only South Kalimantan), Sulawesi (only West and South Sulawesi), Nusa Tenggara (only West Nusa Tenggara), and Bali. This is also useful for the analysis of the poverty dynamics in Indonesia. In the present study, various

socio-economic and demographic indicators as suggested in the literature are used. The list of variables that is not suggested in the literature is also included in the study based on hypotheses and the socio-economic characteristics of the Indonesian households. The list of variables, that are used in probit and multinomial logit models, and their definitions is shown in Appendix Table A.3.1 and Appendix Table A.3.2, while the descriptive statistics are presented in Appendix Table A.3.3, Appendix Table A.3.4, Appendix Table A.3.5, Appendix Table A.3.6.

Table A.3.1

Variable Definition: Stage One Probit Model

Variables	Definition
Dependent	
panelhh	The household participate in the entire survey, which are IFLS 2000 and 2007 (1=yes, 0=no)
Independent Variables in 2000	
age_head	Age of the household head (years)
sqage_head	Squared age of the household head
female_head	Gender of the household head (1=female, 0=male)
primary	The household head education level (1=primary, 0=otherwise)
secondary	The household head education level (1=secondary, 0=otherwise)
tertiary	The household head education level (1=tertiary, 0=otherwise)
hhsize	Number of household members (people)
sqhhsize	Squared number of household members
depratio	Dependency ratio = (age less than 15+age 65 and above)/age 15 and below age of 65
rural	Location of the household (1=rural, 0=urban)
agri	The household head works in agricultural sector (1=yes, 0=no)
manu	The household head works in manufacturing sector (1=yes, 0=no)
services	The household head works in service sector (1=yes, 0=no
landanb	Land ownership as non-business asset (1=yes, 0=no)
TANBlivest	Total value of livestock as household asset (hundred thousand rupiah)
TANBvehi	Total value of vehicle as household asset (hundred thousand rupiah)
durgoods	Durable goods ownership as non-business asset (1=yes, 0=no)
housesize	House size as non-business asset (m^2)
TAFB	Total value of asset farm business (hundred thousand rupiah)
TANFB	Total value of asset non-farm business (hundred thousand rupiah)
electric	Access electricity for lighting (1=yes, 0=no)
SSNhc	The household gets health card or *Jamkesmas* (1=yes, 0=no)
SSNfb	The household receives *Raskin* (1=yes, 0=no)
healthdisrup	Daily activities disrupted by health problems for all family members (days/month)
credit	The household has credit access (1=yes, 0=no)
remittances	The household receives domestic remittances (1=yes, 0=no)
childschool	The household has children aged two to eight years old that are in school (1=yes, 0=no)

Table A.3.2

Variable Definition: Stage Two Multinomial Logit Model

Variables	Definition
Dependent	
Povstat	Poverty status transition of the household based on basic needs poverty (1=chronic poor, 2=transient poor (-), 3=transient poor (+), 4=non-poor)
Independent Variables in 2000	
age_head	Age of the household head (years)
sqage_head	Squared age of the household head
female_head	Gender of the household head (1=female, 0=male)
Primary	The household head education level (1=primary, 0=otherwise)
Secondary	The household head education level (1=secondary, 0=otherwise)
Tertiary	The household head education level (1=tertiary, 0=otherwise)
Hhsize	Number of household members (people)
Sqhhsize	Squared number of household members
Depratio	Dependency ratio = (age less than 15+age 65 and above)/age 15 and below age of 65
Rural	Location of the household (1=rural, 0=urban)
Agri	The household head works in agricultural sector (1=yes, 0=no)
Manu	The household head works in manufacturing sector (1=yes, 0=no)
Services	The household head works in service sector (1=yes, 0=no
Landanb	Land ownership as non-business asset (1=yes, 0=no)
TANBlivest	Total value of livestock as household asset (hundred thousand rupiah)
TANBvehi	Total value of vehicle as household asset (hundred thousand rupiah)
Durgoods	Durable goods ownership as non-business asset (1=yes, 0=no)
Housesize	House size as non-business asset (m^2)
TAFB	Total value of asset farm business (hundred thousand rupiah)
TANFB	Total value of asset non-farm business (hundred thousand rupiah)
Electric	Access electricity for lighting (1=yes, 0=no)
SSNhc	The household gets health card or *Jamkesmas* (1=yes, 0=no)
SSNfb	The household receives *Raskin* (1=yes, 0=no)
Healthdisrup	Daily activities disrupted by health problems for all family members (days/month)
Credit	The household has credit access (1=yes, 0=no)
Remittances	The household receives domestic remittances (1=yes, 0=no)
Change Independent Variables in 2000-2007	
Δelectric	Change in access to electricity for lighting (1=access in 2007 but not in 2000, 0=other)
Δempsect	Change in employment sector of HH head (1=agri to non-agri, 0=other)
Δhhsize	Change in the number of HH members (people)
Δcredit	Change in credit access (1=access in 2007 but not in 2000, 0=other)
Δrural	Change in the location of the HH (1=rural to urban, 0=other)
Δfemhead	Change in the household head gender (1=male in 2000 change to female in 2007, 0=other)
ΔTAFB	Household have positive change in total value of asset farm business (1=yes, 0=other)
ΔTANFB	Household have positive change in total value of asset non-farm business (1=yes, 0=other)
IMR	Inverse Mills Ratio

Table A.3.3

Descriptive Statistics: Western Indonesia

Variable	Chronic Poor		Transient Poor (-)		Transient Poor (+)		Non-poor	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
panelhh	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
age_head	49.08	14.24	49.08	15.27	48.58	14.69	47.01	13.50
sqage_head	2611.25	1476.07	2641.50	1622.24	2575.55	1560.48	2392.51	1353.47
female_head	0.16	0.37	0.17	0.37	0.16	0.37	0.16	0.36
primary	0.59	0.49	0.58	0.49	0.63	0.48	0.50	0.50
secondary	0.09	0.29	0.14	0.35	0.14	0.34	0.28	0.45
tertiary	0.01	0.07	0.01	0.09	0.00	0.05	0.06	0.25
hhsize	5.25	2.00	4.23	1.84	5.29	2.02	4.33	1.89
sqhhsize	31.61	24.11	21.25	17.21	32.02	25.02	22.35	19.84
depratio	0.98	0.84	0.86	0.83	0.93	0.82	0.66	0.68
rural	0.69	0.46	0.73	0.45	0.68	0.46	0.65	0.48
agri	0.51	0.50	0.53	0.50	0.47	0.50	0.35	0.48
manu	0.13	0.34	0.12	0.32	0.13	0.33	0.12	0.33
services	0.22	0.41	0.24	0.43	0.28	0.45	0.43	0.50
landanb	0.13	0.34	0.20	0.40	0.14	0.35	0.19	0.39
TANBlivest	0.25	2.75	0.63	5.07	0.11	1.19	0.32	7.53
TANBvehi	2.19	9.80	4.03	16.12	3.26	16.71	29.40	156.41
durgoods	0.73	0.44	0.79	0.41	0.80	0.40	0.90	0.30
housesize	59.74	37.36	67.54	56.14	74.76	130.93	84.87	75.64
TAFB	48.23	331.50	85.32	384.64	66.01	270.91	128.53	495.99
TANFB	2.12	10.64	4.34	19.44	5.46	30.26	42.05	315.56
electric	0.80	0.40	0.83	0.38	0.84	0.36	0.91	0.28
SSNhc	0.33	0.47	0.27	0.45	0.27	0.44	0.19	0.40
SSNfb	0.66	0.48	0.62	0.49	0.57	0.50	0.39	0.49
healthdisrup	8.44	13.58	4.65	7.12	6.13	8.64	4.96	7.76
credit	0.15	0.36	0.16	0.37	0.16	0.36	0.24	0.42
remittances	0.64	0.48	0.71	0.46	0.65	0.48	0.69	0.46
Δelectric	0.09	0.28	0.10	0.30	0.12	0.32	0.07	0.25
Δempsect	0.06	0.23	0.08	0.27	0.10	0.30	0.08	0.27
Δhhsize	-0.52	1.84	0.38	1.84	-1.30	1.94	-0.63	1.80
Δcredit	0.06	0.24	0.08	0.28	0.09	0.29	0.11	0.31
Δrural	0.07	0.26	0.06	0.23	0.05	0.21	0.07	0.25
Δfemhead	0.09	0.29	0.10	0.30	0.16	0.37	0.13	0.34
ΔTAFB	0.31	0.46	0.29	0.46	0.35	0.48	0.30	0.46
ΔTANFB	0.20	0.40	0.20	0.40	0.25	0.43	0.28	0.45
childschool	0.38	0.49	0.27	0.45	0.33	0.47	0.27	0.45

Table A.3.4

Descriptive Statistics: Urban Households

Variable	Chronic Poor		Transient Poor (-)		Transient Poor (+)		Non-poor	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
panelhh	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
age_head	49.58	13.15	48.39	14.76	47.35	13.77	46.48	13.34
sqage_head	2629.68	1345.67	2557.67	1559.01	2430.89	1404.25	2338.50	1313.22
female_head	0.16	0.37	0.21	0.41	0.18	0.39	0.16	0.37
primary	0.72	0.45	0.57	0.50	0.62	0.49	0.37	0.48
secondary	0.11	0.31	0.30	0.46	0.25	0.43	0.44	0.50
tertiary	0.01	0.11	0.01	0.10	0.01	0.09	0.12	0.33
hhsize	5.56	2.19	4.57	2.01	5.60	2.22	4.51	1.98
sqhhsize	35.67	29.07	24.87	19.65	36.25	30.77	24.20	21.88
depratio	0.82	0.79	0.65	0.69	0.89	0.85	0.57	0.58
rural	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
agri	0.29	0.46	0.16	0.37	0.17	0.37	0.09	0.29
manu	0.23	0.42	0.23	0.43	0.16	0.37	0.16	0.37
services	0.34	0.48	0.44	0.50	0.52	0.50	0.63	0.48
landanb	0.07	0.25	0.13	0.34	0.11	0.31	0.19	0.39
TANBlivest	0.05	0.30	0.10	1.06	0.03	0.28	0.35	12.07
TANBvehi	4.07	14.65	8.52	25.51	3.94	20.41	57.97	251.39
durgoods	0.85	0.36	0.88	0.32	0.88	0.32	0.95	0.22
housesize	65.01	45.72	73.28	81.36	79.43	204.49	93.33	94.03
TAFB	13.25	53.39	66.73	271.96	23.89	85.57	80.06	389.10
TANFB	5.03	17.30	7.19	28.79	10.45	44.57	79.97	497.90
electric	0.95	0.22	0.96	0.19	0.94	0.24	0.98	0.13
SSNhc	0.42	0.50	0.30	0.46	0.30	0.46	0.16	0.37
SSNfb	0.64	0.48	0.54	0.50	0.52	0.50	0.25	0.43
healthdisrup	8.72	11.78	5.10	7.08	7.28	9.49	5.05	7.84
credit	0.22	0.42	0.24	0.43	0.23	0.42	0.29	0.45
remittances	0.79	0.41	0.79	0.41	0.77	0.42	0.68	0.47
Δelectric	0.00	0.00	0.01	0.11	0.05	0.22	0.01	0.12
Δempsect	0.07	0.25	0.03	0.18	0.04	0.21	0.04	0.18
Δhhsize	-0.46	2.05	0.69	2.13	-1.35	2.03	-0.65	1.94
Δcredit	0.12	0.33	0.13	0.34	0.13	0.34	0.11	0.31
Δrural	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Δfemhead	0.10	0.31	0.07	0.25	0.15	0.36	0.14	0.35
ΔTAFB	0.15	0.36	0.14	0.35	0.18	0.39	0.12	0.33
ΔTANFB	0.26	0.44	0.26	0.44	0.32	0.47	0.33	0.47
childschool	0.43	0.50	0.29	0.45	0.35	0.48	0.28	0.45

Table A.3.5

Descriptive Statistics: Rural Households

Variable	Chronic Poor		Transient Poor (-)		Transient Poor (+)		Non-poor	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
panelhh	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
age_head	48.86	14.72	49.34	15.47	49.15	15.07	47.30	13.58
sqage_head	2603.13	1532.99	2672.67	1646.82	2642.28	1624.34	2421.89	1374.17
female_head	0.17	0.38	0.15	0.36	0.15	0.36	0.15	0.36
primary	0.53	0.50	0.58	0.49	0.63	0.48	0.57	0.49
secondary	0.09	0.28	0.08	0.27	0.09	0.28	0.20	0.40
tertiary	0.00	0.04	0.01	0.09	0.00	0.00	0.03	0.18
hhsize	5.12	1.91	4.10	1.76	5.14	1.90	4.24	1.84
sqhhsize	29.83	21.40	19.91	16.04	30.07	21.62	21.34	18.56
depratio	1.05	0.85	0.94	0.87	0.95	0.81	0.72	0.73
rural	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
agri	0.61	0.49	0.66	0.47	0.62	0.49	0.49	0.50
manu	0.09	0.28	0.07	0.26	0.11	0.31	0.10	0.30
services	0.16	0.37	0.16	0.37	0.17	0.38	0.33	0.47
landanb	0.16	0.37	0.22	0.42	0.16	0.37	0.19	0.39
TANBlivest	0.34	3.30	0.83	5.89	0.15	1.43	0.29	2.88
TANBvehi	1.36	6.50	2.36	10.29	2.95	14.71	13.87	52.35
durgoods	0.68	0.47	0.75	0.43	0.77	0.42	0.87	0.34
housesize	57.42	32.87	65.39	43.08	72.61	76.23	80.27	63.00
TAFB	63.64	395.60	92.24	419.11	85.42	320.47	154.88	543.62
TANFB	0.83	5.19	3.28	14.45	3.17	20.19	21.44	133.44
electric	0.74	0.44	0.78	0.42	0.80	0.40	0.88	0.33
SSNhc	0.29	0.46	0.27	0.44	0.25	0.43	0.21	0.41
SSNfb	0.66	0.47	0.65	0.48	0.59	0.49	0.47	0.50
healthdisrup	8.32	14.32	4.48	7.15	5.60	8.18	4.92	7.72
credit	0.12	0.33	0.13	0.34	0.12	0.33	0.21	0.41
remittances	0.58	0.49	0.68	0.47	0.60	0.49	0.69	0.46
Δelectric	0.13	0.33	0.13	0.34	0.15	0.36	0.10	0.30
Δempsect	0.05	0.22	0.09	0.29	0.12	0.33	0.10	0.30
Δhhsize	-0.55	1.75	0.27	1.70	-1.28	1.89	-0.61	1.72
Δcredit	0.04	0.19	0.07	0.25	0.08	0.26	0.11	0.31
Δrural	0.10	0.31	0.08	0.27	0.07	0.25	0.11	0.31
Δfemhead	0.08	0.28	0.11	0.31	0.16	0.37	0.13	0.33
ΔTAFB	0.37	0.48	0.35	0.48	0.43	0.50	0.39	0.49
ΔTANFB	0.17	0.38	0.18	0.38	0.21	0.41	0.26	0.44
childschool	0.36	0.48	0.27	0.44	0.32	0.47	0.27	0.44

Table A.3.6

Descriptive Statistics: Agricultural Households

Variable	Chronic Poor		Transient Poor (-)		Transient Poor (+)		Non-poor	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
panelhh	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
age_head	50.41	14.64	50.61	14.84	50.25	14.66	49.12	13.51
sqage_head	2753.76	1539.18	2780.93	1587.91	2739.64	1611.01	2595.35	1397.68
female_head	0.17	0.37	0.14	0.35	0.14	0.35	0.12	0.33
primary	0.60	0.49	0.56	0.50	0.64	0.48	0.60	0.49
secondary	0.07	0.26	0.09	0.28	0.08	0.27	0.15	0.36
tertiary	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.13
hhsize	4.96	1.96	4.03	1.74	5.08	1.92	4.20	1.80
sqhhsize	28.42	22.25	19.25	14.83	29.49	22.37	20.86	18.46
depratio	1.00	0.79	0.85	0.81	1.00	0.83	0.68	0.68
rural	0.83	0.38	0.92	0.28	0.89	0.31	0.91	0.29
agri	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
manu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
landanb	0.17	0.37	0.26	0.44	0.18	0.38	0.19	0.39
TANBlivest	0.46	3.84	0.99	6.62	0.18	1.64	0.43	3.79
TANBvehi	1.75	8.10	1.78	7.74	2.86	16.15	11.05	65.08
durgoods	0.63	0.48	0.76	0.43	0.76	0.43	0.86	0.35
housesize	57.90	35.68	63.82	44.65	76.11	87.75	79.09	65.14
TAFB	38.23	68.53	120.48	499.82	85.41	278.87	181.96	630.31
TANFB	1.26	8.81	1.79	10.71	2.35	12.28	12.55	134.87
electric	0.71	0.46	0.73	0.44	0.76	0.43	0.82	0.39
SSNhc	0.26	0.44	0.25	0.43	0.25	0.43	0.22	0.42
SSNfb	0.64	0.48	0.63	0.48	0.56	0.50	0.48	0.50
healthdisrup	5.78	9.26	4.03	7.05	5.68	7.99	4.91	7.60
credit	0.07	0.26	0.12	0.33	0.10	0.30	0.17	0.38
remittances	0.56	0.50	0.66	0.47	0.61	0.49	0.69	0.46
Δelectric	0.14	0.35	0.17	0.38	0.18	0.38	0.14	0.35
Δempsect	0.11	0.32	0.15	0.35	0.21	0.41	0.22	0.41
Δhhsize	-0.54	1.82	0.18	1.69	-1.29	1.89	-0.62	1.72
Δcredit	0.07	0.25	0.04	0.19	0.08	0.28	0.10	0.29
Δrural	0.05	0.22	0.04	0.20	0.04	0.21	0.06	0.23
Δfemhead	0.07	0.26	0.12	0.32	0.16	0.37	0.13	0.34
ΔTAFB	0.41	0.49	0.40	0.49	0.46	0.50	0.43	0.49
ΔTANFB	0.17	0.37	0.15	0.35	0.18	0.39	0.21	0.41
childschool	0.34	0.47	0.26	0.44	0.31	0.46	0.23	0.42

Chapter 4

Determinants of Access to Credit for Poverty Reduction

4.1 Introduction

As one form of financial support, access to credit plays an important role in alleviating poverty for the households. It can generate additional income (Hulme & Mosley, 1996; Duong & Izumida, 2002; Egwuatu, 2008). It may also assist the households to smoothen their consumption and increase their likelihood of better access to health and educational services (Ahmed et al., 2011; Latif et al., 2011). Furthermore, it reduces a household's vulnerability when facing financial shocks such as illness, death and theft (Kurfi, 2008; Shetty, 2010), and increases women's participation in decision-making (Panjaitan-Drioadisuryo & Cloud, 1999).

An access to credit is gained through formal and informal institutions which may apply varying criteria to assess the creditworthiness of applicants. Consequently, not all credit applicants can secure loans, for instance, the households with lower income, who lack assets may find difficulty in obtaining credit (Kashuliza & Kydd, 1996; Fletschner, 2009). Moreover, the age, educational level and type of employment area, can affect the applicants' access to credit (Duong & Izumida, 2002; Anggraeni, 2009). Thus, when discussing the alleviation of poverty in the Indonesian context, this study examines the factors that are vital for households' access to credit in Western Provinces of Indonesia. Extending the model for poverty reduction, this study evaluates the determinants of access to credit of the agricultural households. The empirical analysis is applied to examine the determinants of households' access to credit from the formal and informal sectors and also for the households' access to credit for business activities.

This chapter is organised as follows: an introduction and a brief literature review related to households' access to credit. The next section presents the overview of access to credit in Indonesia. Section 4.3 discusses the data, variables used and two-stage probit model as the methodology for the estimation of the determinants of households' access to credit, followed by the empirical results for the Western Provinces in Indonesia and also for the agricultural households. The final section presents the conclusions.

4.2 Literature Review of Access to Credit

Formal and informal financial institutions are important sources of credit in developing countries. Formal institutions are usually organized, urban-oriented, with limited access to rural areas and excessive regulation (Germidis et al., 1991). They include large commercial banks, development funds, rural banks, insurance companies, cooperatives and microfinance groups (Germidis et al., 1991; Pagura & Kirsten, 2006). The formal financial sector involves legal procedures to provide financial support to the monetised modern sector.[40].

In contrast, the informal financial sector has a few rules. It conducts cash and non-cash credit transactions, which are based on confidence and good faith between the lender and debtor. Schreiner (2001) and Fitri, (2006) describe them as non-legal informal activities which are located outside of the formal sector. They are often traditional-oriented practices, which may function differently from one region to another in the same country. Informal institutions include moneylenders, landlords, Rotating Savings and Credit Associations (ROSCAs), indigenous savings clubs, and self-help organizations (Germidis et al., 1991; Pagura & Kirsten, 2006). As such, the individuals and institutions are readily accessible, have easily understood regulations, provide rapid processing of requests and fast access to credit (Germidis et al., 1991). Ghate (1992) notes that the informal sector is more flexible in its use of collateral and it adapts to local needs and provides a wide range of short-term lending and borrowing functions.

Despite its flexibility, some elements of the informal sector are sometimes viewed as monopolistic and exploitative (Chakrabarty & Chaudhuri, 2001; Fitri, 2006). For example, moneylenders are often accused of charging high interest rates to their clients (Robinson, 2001). However, it is suggested that such practices have led to the growth of formal institutions, microfinance institutions and microcredit programmes, which in principal give collateral-free loans at reasonable rates of interest (Chowdhury et al., 2005).

There are two main types of credit, those are, non-production and production credit (Fitri, 2006). The non-production credit is used for consumption purposes such as food and providing help during life events such as child birth, education, marriage, home-building, old age, and the cost of funerals. This type of credit may also be needed during emergencies to meet unanticipated costs due to injury, sickness, death, natural disaster and employment loss. The second type of credit, production credit, refers to loans taken to fund opportunities

[40] The monetised modern sector uses money as a unit of measure, a means for exchange and reserve.

which may provide additional income in the future. For example, to fund job and business opportunities (Matin, Hulme & Rutherford, 2002; Fitri, 2006).

The distinction between production and consumption credit can be applied to formal and informal credit. In the case of Indonesia, formal credit from the banks and microfinance institutions is mostly used for business activities and is therefore production credit (World Bank, 2010). Often the purpose of the loan is important since formal institutions may apply different rules for the production and consumption credit. For example, investment and working capital loans by the Indonesian cooperatives require collateral. In contrast, informal credit is used to cover consumption needs and collateral may not be required (World Bank, 2010). The informal institutions such as ROSCAs, or *Arisan* in Bahasa Indonesia, have been set up to meet the consumption needs of rural households in Indonesia (Fitri, 2006). In the case of Pakistan, the informal credit lenders are generally not concerned about the purpose of the loan (Manig, 1990).

In the case of Kenya, Biggs, Raturi and Srivastava (2002) analysed the relationships between ethnic networks and credit access of Kenyan firms. Their main finding was that ethnicity does not significantly affect access to credit, but being a member of a particular ethnic group does influence the access to informal credit. Okten and Osili (2004) find that, in the case of Indonesia, social networks, such as participation in community meetings, significantly increase the probability of the household obtaining credit. They also note that a higher per capita expenditure of a household equates to a higher probability of the household obtaining credit. Another finding shows that rural households has a higher chance of receiving credit compared to urban families. Fletschner (2009) employed the semi-cooperative household model to analyse men and women's credit status in rural Paraguay. The main finding suggests that women have higher probability of being credit constrained compared to men.

Anggraeni (2009) examined coconut farmers' access to credit, in Riau, Indonesia. She finds that the farmers depended on a vertical relationship with Chinese traders to give them access to credit and market. The horizontal social network among farmers provides another source of credit and access to new markets, thereby reducing their dependency on Chinese traders. By employing logit estimation, she also investigated the determining factors that influence a farmer's chance of obtaining credit from Chinese traders. The results suggested that older farmers, farmers who have small landholdings and farmers with no additional business, such as non-farming business, are more likely to have reduced access to credit.

4.3 An Overview of Access to Credit in Indonesia

This section discusses access to credit by the Indonesian households in the Western Provinces in 2007 and compares access to credit for all reported households with that of agricultural households. The analysis is based on the Indonesian Family Life Survey (IFLS) data. Figure 4.1 shows the proportion of formal and informal credit obtained by households in the Western Provinces in Indonesia in 2007-2008.[41]

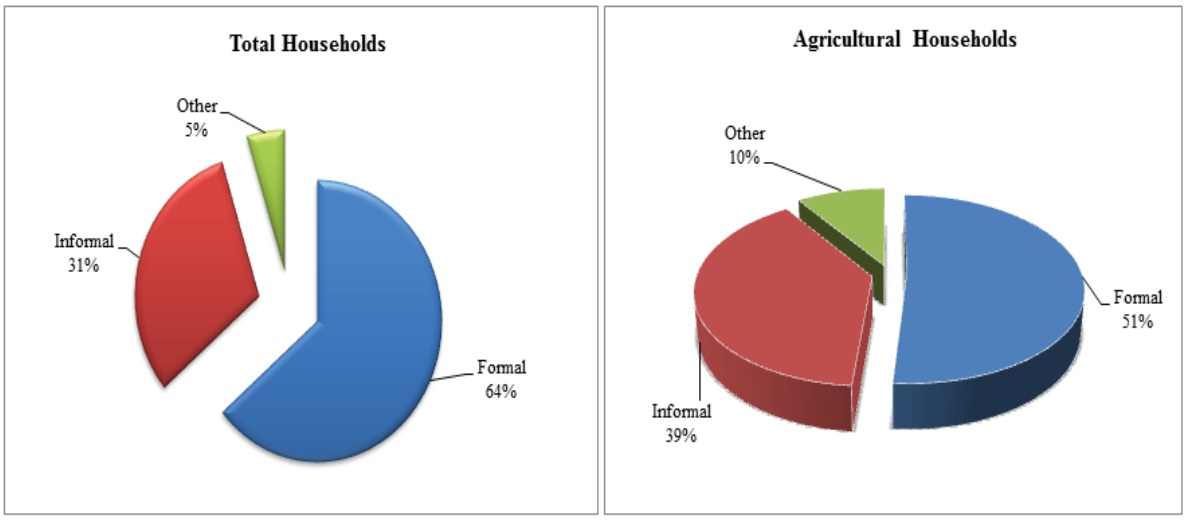

Figure 4.1. Credit Obtained from Formal and Informal Sectors: Western Provinces, 2007-2008. Author's calculation based on IFLS data 2000 and 2007.

According to the overall figures, 64% of all Indonesian households in the Western part of Indonesia obtained credit from the formal sector, 31% from the informal sector and 5% obtained credit from other sources. In the case of agricultural households, 51% obtained credit from the formal and 39% from the informal sector and 10% from other sources. This suggests that the formal sector is accessible and is used more often. However, the results also imply that some of the households still access the informal credit. This is because informal credit is more flexible in terms of rules, procedures, interest rates, collateral requirements, maturity periods and debt rescheduling, which can reduce transaction cost (Ghate & Das-Gupta, 1992). In the case of the agricultural sector in Indonesia, it is found that credit from

[41] The proportion of formal and informal credit obtained by households is in respect of the total number of households who receive credit. In the case of households in Western Provinces of Indonesia, the share is in respect of the total households who receive credit. In the case of agricultural household, the share is in respect of total agricultural households in Western Indonesia who receive credit. The agents in the formal and informal sector are based on the categorical list of agents in the IFLS data. The agents in the formal sector are commercial banks, cooperative banks, government banks, agricultural banks and non-bank financial institutions. The informal sector lists employers, landlords, shopkeepers, Non-Government Organizations (NGOs), neighbourhood associations, ROSCAs, small farmers groups, offices and pawn shops.

the informal sector is more flexible with simple collateral requirements than that of the formal sector (Ashari, 2009).

Table 4.1 outlines the proportion of total and agricultural households in Western Indonesia, who obtained formal and informal credit in 2007-2008.[42] The government banks have the largest share of formal sector credit to all households at 26.651%. The agricultural households mostly gained credit from government banks, and its share is about 24.68%. The government bank, *Bank Rakyat Indonesia (BRI)*, has a wide range of services at the village level and is committed to providing micro credit (Robinson, 2002; Baskara, 2013).

Table 4.1

The Proportion of Credit Obtained by Households in Western Indonesia 2007-2008 in the Formal and Informal Sectors

	Sources of Credit	All Households* (%)	Agricultural Households* (%)
Formal Sector	Commercial Bank	12.12	8.73
	Cooperative Bank	23.02	15.76
	Government Bank	26.61	24.68
	Agricultural Bank	0.28	0.12
	Non-bank Financial Institution	1.76	2.04
Informal Sector	Employer	3.63	6.46
	Landlord	0.35	0.78
	Shopkeeper	1.94	4.29
	NGOs	3.64	2.17
	Neighbourhood Associations	4.00	5.04
	ROSCA	3.43	6.38
	Small Farmers Group	1.09	3.92
	Moneylender	8.00	6.89
	Office	3.44	1.65
	Pawn Shop	1.86	1.57
Other		4.83	9.51
Total Households		100	100

Note. *Author's calculation based on the Indonesian Family Life Survey 2007-2008.

In the case of the informal credit, moneylenders are the main suppliers of informal credit. Among those who receive credit, 8% of all households and 6.89% of the agricultural households in Western part of Indonesia obtain it from moneylenders. Despite the fact that credit from moneylenders can be expensive, they enable borrowers to borrow small amounts of money and collect repayments at convenient times (Rowlingson, 1994).

[42] In the case of households in Western Provinces of Indonesia, the share is in respect to total households who receive credit. In the case of agricultural households, the share is in respect of total agricultural households who receive credit.

The credit obtained by the households can be categorized by purpose related to funding for business or non-business activities. The non-business activities, which are listed in the IFLS, include 16 activities.[43] Business activities include those related to agriculture, manufacture and services.[44] However, for the purpose of this study, business credit refers to agricultural business activities only and credit used to finance non-business activities is called non-business credit.

Table 4.2 shows the proportion of credit obtained by households in Western Indonesia and in the agricultural sector, based on the purpose of the credit which is to finance non-business or business activities.[45] Both types of credit are mostly obtained through the formal sector. In the case of non-business credit, 59.58% of all households and 47.56% of all agricultural households receive credit from the formal sector. In the case of business activities, 71.49% of all households and 64.32% of all agricultural households receive credit from the formal sector.

For the non-business credit from the formal sector, it is seen that 25.05% of all households obtain credit from cooperative banks, and 22.37% of the agricultural households receive credit from the government banks. As for business credit from the formal sector, government banks represent the main source of business credit for both household groups. The results show that 35.08% of total households and 32.63% of the agricultural households received business credit from government banks. The Government of Indonesia supports a micro-credit programme intended to fund business activities, which is called *Kredit Usaha Rakyat* (*KUR*). Through the government banks, *KUR* provides micro-credit for small and medium enterprises (SMEs) and cooperatives (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-c; Ministry of SMEs and Cooperatives of Indonesia, n.d.).

[43] In the IFLS 2007-2008, the non-business activities include birth, death, marriage, dowry, social ceremony, buying household goods, medication, education, home renovation, buying a new house, daily expenses, funding rotating savings and credit association (Arisan or ROSCA), helping household members or friends, buying or repairing vehicles, debt repayment and transport costs.

[44] The business activities listed in the IFLS 2007-2008 are buying agricultural inputs, buying or repairing agricultural tools, buying land, buying cattle, buying inputs for poultry, fishing business, buying/repairing *becak* (commercial tri-cycle), buying/repairing boat and fishing nets.

[45] In the case of total households in Western Indonesia, the share is calculated in respect to the total households who receive credit in order to fund the business and non-business activities. For the agricultural households, the share is calculated in respect of the total number of agricultural households who receive the non-business and business credit.

Table 4.2

The Proportion of Credit Obtained by Households in Western Indonesia 2007-2008: Disaggregation by Purpose of Credit

	Sources of Credit	Non-business Activities*		Business Activities*	
		All Households (%)	Agricultural Households (%)	All Households (%)	Agricultural Households (%)
Formal Sector	Commercial Bank	10.44	6.56	15.19	16.21
	Cooperative Bank	25.05	15.84	19.33	15.48
	Government Bank	21.97	22.37	35.08	32.63
	Agricultural Bank	0.20	0.15	0.42	0.00
	Non-bank Financial Institution	1.92	2.64	1.47	0.00
	Total Formal Credit Application	59.58	47.56	71.49	64.32
Informal Sector	Employer	4.53	6.40	2.00	6.67
	Landlord	0.20	1.01	0.62	0.00
	Shopkeeper	2.63	4.96	0.67	2.01
	NGO	2.79	2.19	5.17	2.10
	Neighbourhood Association	4.63	6.03	2.86	1.62
	ROSCAs	4.26	7.39	1.91	2.90
	Small Farmers Group	0.96	2.81	1.34	7.75
	Moneylender	8.26	7.57	7.52	4.53
	Office	4.96	1.90	0.65	0.81
	Pawn Shop	2.30	1.63	1.05	1.37
	Total Informal Credit Application	35.52	41.89	23.80	29.76
Other		4.89	10.55	4.71	5.92
Total Households		100	100	100	100

Note. *Author's calculation based on the Indonesian Family Life Survey 2007-2008.

In the case of informal credit, moneylenders are the main suppliers of non-business credit. Around 8.26% of the total households and 7.57% of agricultural households received credit from the moneylenders. In order to fund business activities, most of the overall households still get credit from moneylenders (7.52%), but in the case of the agricultural households, they receive loan mainly from small farmers groups (7.75%). This implies that in Western Indonesia, small farmers' groups or associations financially assist the agricultural households who wish to expand their businesses.

4.4 Model Specification, Data and Methodology

This section discusses the determinants of household access to credit in Indonesia which include the household characteristics and household head characteristics. For instance, the age and educational level of the head of a household, the size of a household, the participation of a household in local community meetings and asset ownership of a

household are included. The models, methodological approach, data used and related econometric issues are also discussed.

4.4.1 Model Specification

In analysing the factors that affect a household's access to credit, in 2007, probit regression analysis will be used. The probit regression employs a dichotomous dependent variable, which takes value of either 0 or 1 (Gujarati, 2004). A value of 1 indicates a household successfully obtaining credit, whereas a value of 0 refers to a household which is credit constrained and does not receive credit. In general, the credit availability reflects various socio-economic variables that may affect the credit status of a household. The probit model takes the following basic form (Wooldridge, 2013):

$$p_i = \Pr(y = 1|X) = P(y^* > 0|X_j) = G(X_j\beta_j), \;\; j = 1, \dots, j, \;\; i = 1, \dots, i \qquad (4.1)$$

Where, $p_i = \Pr(y = 1|X)$ is the observed dependent variable, that is, probability of a household i of being successfully granted credit ($y = 1$). The p_i depends on an unobserved latent variable, which is y^*. The latent variable then is determined by independent variables (X_j) which consist of socio-economic factors related to the head of the household and characteristics of that household (Gujarati, 2004). In conclusion, the outcome probability (p_i) is a function of household and household head socio-economic characteristics (X_j). The estimation of y^* is shown as follows (Wooldridge, 2013):

$$y^* = \beta_0 + \beta_j X_j + e, \qquad y = 1[y^* > 0] \qquad (4.2)$$

The function of $y = 1[y^* > 0]$ shows that the larger the value of y^* than zero, the higher the probability of a household obtaining credit. The probability of a household obtaining credit (p_i) can be computed from the standard normal cumulative distribution function, which is shown by a function of $G(X_j\beta_j)$ in equation (4.1) (Gujarati, 2004). The standard normal cumulative distribution function in the probit model is expressed as follows (Cameron & Trivedi, 2010):

$$G(X_j\beta_j) = \Phi(X_j\beta_j) = \int_{-\infty}^{X_j\beta_j} \emptyset(z)dz \qquad (4.3)$$

The independent variables included in this study are based on socioeconomic data from the Indonesian Family Live Survey. In addition, this study follows the variables used by Okten and Osili (2004).

In the probit model, the magnitudes of β_j is not quite informative, thus to analyse the effect of household and household head socio-economic characteristics (X_j) on the household's probability to get credit, the marginal effect (ME) can be used (Cameron & Trivedi, 2010; Wooldridge, 2013). The ME reflects the change in the household's probability of obtaining credit if there is a unit change in the value of explanatory variables. Equation (4.4) presents the estimated ME in probit model (Cameron & Trivedi, 2010):

$$ME = \frac{\partial p_i}{\partial X_j} = \emptyset\left(X_j\beta_j\right)\beta_j \tag{4.4}$$

4.4.2 Data and Methodology

The empirical analysis in this chapter is based on the IFLS conducted in 2007-2008. This study focuses on the fourth and latest survey that provides the most updated household level data, especially related to the households' borrowing history data. The dependent variable takes a value of 1 if the household is granted credit, otherwise it takes value of 0. This analysis disaggregates the dependent variables into three types of categories. The first dependent variable takes a value of 1 if the household is granted credit from formal institutions, otherwise it takes a value of 0. The second dependent variable refers to a household which has successfully secured loan from an informal institution and is allocated a value of 1. In the third model, the dependent variable has a value of 1 if the household receives credit to finance the business activities. These three categories are centred around a household's access to credit in terms of all households in Western Provinces of Indonesia (the full sample) and for the agricultural households.

According to the data in the IFLS, not all households applied for credit. This is important information, since a household's access to credit can be observed only if the household applies for credit. As a result, households which did not receive credit were not automatically viewed as those which experienced credit constraints. Applying the probit model without considering this factor will lead to selection bias in the estimated model (Okten & Osili, 2004). This bias, known as the "omitted variable bias", results from using non-random samples in estimating the model (Heckman, 1979). To overcome this problem, a new explanatory variable, Inverse Mill's Ratio (IMR), is added to the probit model (see Heckman, 1979; Okten & Osili, 2004).

The use of a two-stage probit model in this study is more appropriate than a one-stage model estimation. The first stage involves a probit model to generate the IMR. In this stage, the

decision of a household to apply for credit is analysed. The dependent variable takes a value of 1 if the household applied for credit, otherwise the variable takes a value of 0. The model uses the household head and household characteristics as the explanatory variables, which mostly are the same variables used in the second stage. Also, the model contains at least one explanatory variable that is not in the second-stage (StataCorp, 2013).

In the second-stage of the probit model, the dependent variable takes a value of 1 if the household has applied for and is granted credit, otherwise it takes a value of 0. This stage examines whether the household is being credit constrained or not, conditional on its characteristics. The IMR generated from the first model is included as an additional explanatory variable in this model.[46] Okten and Osili (2004) emphasise that by including the IMR in the second-stage, an unbiased estimation of variables of interest can be obtained. If the IMR in the probit model is statistically significant, it indicates the selection bias and needs to be corrected by the IMR. The sign of the IMR coefficient indicates the correlation between the unobservable variable in the selection and the outcome equation (Lin, 2007).

To measure the goodness of fit, the outcome model employs Pseudo-R^2 ($\tilde{R}^2$), Pearson and Hosmer-Lemeshow goodness of fit statistics. An insignificant result from the test value of Pearson and Hosmer-Lemeshow statistics indicates that the estimated model appears to fit well (Hosmer & Lemeshow, 2000; StataCorp, 2013). The definition of the variables used in the second-stage probit model is presented in Table 4.3. The variables used in the first-stage and the second-stage probit model are presented in Appendix Table A.4.1. and Appendix Table A.4.2. The descriptive statistics are shown in Appendix Table A.4.3 and Appendix Table A.4.4.

The success of the household in securing credit might be influenced by the characteristics of households and households' head. The characteristics for a household head include age, age squared, gender, marital status, educational level and religion (Muslim takes a value of 1). The characteristics of a household consist of variables such as participation in local community meetings, the number of economically active members in the household, the household member who applies for credit (takes a value of 1 if the household head), household size, household size squared and location of the household (rural or urban). In

[46] In running the two-stage probit model, this research uses cross-section analysis households' weight that has been provided in IFLS data 2007-2008, so that the estimates that are weighted reflect all households living in IFLS provinces in Indonesia. The IFLS sample is based on a sample of households living in 13 provinces in Java, Sumatra, Bali, West Nusa Tenggara, Kalimantan and Sulawesi (Strauss et al., 2009). Those are mostly Western Provinces of Indonesia.

addition, there are other variables such as household expenditure per capita, business ownership (farm or non-farm business) and the ownership of assets.

There are a number of social factors which influence a households' access to credit. These include who is the head of the household related to their age, gender, education level, marital status, religion and nature of their employment. Duong and Izumida note that (2002, p. 327) "the age of a household head may reflect the experiences of the head". They also find that in the case of Vietnam, an older household head increases the household's chances of being granted credit from formal lending institutions. However, as a household head grow older, her/his creditworthiness may reduce which then decreases the household's probability to successfully obtain credit. According to Anggraeni (2002), older applicants might be perceived as having a lower creditworthiness related to a decreasing ability to pay and physical health as their age increases.

A male-headed household has a higher creditworthiness. The male applicants tend to be favoured over females, because often the male is seen as more eligible (Zeller et al., 1994). Generally, the applicants with higher levels of education have better access to credit (Kashuliza & Kydd, 1996; Fletschner, 2009). A married head of a household suggests a sound family network (Johar & Rammohan, 2006) which can also increase a household's access to credit. It also implies that the household head will get support from the family to repay the loan. In the case of Indonesia, a Muslim household head is considered easier to get credit as he/she represents the most popular religion in Indonesia (Okten & Osili, 2004). Finally, borrowers who work in the agricultural sector, in rural areas, with limited access to financial institutions can have lower access to credit (Dohcheva, 2009).

In addition to the social factors outlined above, the financial status of the household is considered. These include income level and ownership of assets. Its location and participation in local community meetings, the number of economically active members in the household and the household size are also considered. An applicant with a high level of income can expect better access to credit because of their ability to repay their loan (Kashuliza & Kydd, 1996; Swain, 2007). However, the use of income as the indicator of financial position can be replaced by per capita expenditure of the household. The per capita expenditure approach can measure deprivation of the households more accurately than the income approach (Wisor, 2012). It suggests that the higher the per capita expenditure of a household, the higher is the consumption level of the household to meet its basic needs, which indicates a higher level of financial position. Asset ownership such as land, can also

ease access to credit (Anggraeni, 2009; Fletschner, 2009). In contrast, poor households with low income and a lack of assets are considered as high credit risks and can find it difficult to get credit (Bhuiyan et al., 2012).

The applicants, who live in rural areas, might have lower access to credit (Bakhshoodeh & Karami, 2008). This may be caused by their location, which may be far away from the market centre and financial institutions. A household which participates in local community meetings suggests that they have a good social network and reputation. This participation reflects "a high level of caring, or commitment to the community, which reduces the incentive for opportunistic behaviour and may lower the probability of loan default" (Okten & Osili, p. 1233, 2004). A large number of economically active members in a household implies additional financial resources within the family, which could serve as a form of collateral and help access to credit. A large size of a household also captures economic resources available to the household, which then has the same expected impact with the number of economically active members in the household (Okten & Osili, 2004).

In order to examine the determinants of access to credit, several methods have been used in various studies. Biggs et al. (2002), in a study based in Kenya, analysed the relationships between ethnic networks and access to credit of Kenyan firms by utilizing probit model estimation. Moreover, Duong and Izumida (2002) used probit estimation in examining access to formal credit in rural Vietnam. Okten and Osili (2004), with a focus on the effect of social networks, empirically examined individual access to credit in Indonesia using a three-stage probit model.

4.5 Empirical Results

The empirical results report the determinants of household access to credit based on certain conditions and specific socioeconomic characteristics. More specifically, this section analyses the estimated marginal effects of different household characteristics on the probability to obtain formal, informal and business credit. The results are elaborated in two parts. The first relates to the full sample of all households in Western Indonesia and the second relates specifically to the agricultural households.

4.5.1 The Determinants of Access to Credit: Western Provinces

The results for the determinants of Western Indonesian households' access to formal, informal and business credit are presented in Table 4.3. The credit from both formal and

informal sources can be divided into non-production and production credit. Business credit refers to production credit only, as it is intended to fund business activities in the agricultural, manufacturing and service sectors. The Pearson and Hosmer-Lemeshow (H-L) goodness of fit test values a relatively good fit. The Pearson goodness of fit test statistic for formal, informal and business credit model is 12,602.36, 12,291.58 and 12,472.69, respectively. The H-L goodness of fit test statistic has a value of 2.44 for the formal credit model, 11.54 in the informal credit model and for the business credit model with a value of 28.19. The estimated Pseudo-R^2 in the formal credit model is 0.3124, 0.2085 in the informal credit model and 0.2827 in the business credit model.

The *Ecoact* variable, which represents the number of economically active members of the household, shows that an increase by one person in number of economically active members of the household increases its probability of obtaining formal credit by 0.63%. This implies that the wealthier the household, indicated by the large number of economically active household members, the greater the chance of the household to apply and secure credit from the formal institutions. The variable appears insignificant in the informal and credit business models. The variable *PM* measures the participation of a household in community meetings and its involvement in social networks. Overall, the results indicate that this variable does not have a strong effect on the probability of a household of securing credit. Furthermore, the interaction variable between participation in community meetings and per capita expenditure of a household (*PMexpend*) does not appear to significantly influence a household's access to credit in all three models.

The position of an applicant in a household significantly influences the probability of it obtaining credit. If the applicant is the head of the household (*Head*), the chance of the household obtaining formal credit increases by 51.15%, informal credit by 26.71% and business credit by 25.05%. This suggests that the head of the household is viewed as an eligible and responsible person, which increases his/her creditworthiness. A married household head (*Married*) significantly increases the probability of the household of obtaining informal credit by 0.92%. It seems to imply that having family networks (noted in Section 4.4), as indicated through marital status, are helpful when seeking informal credit. The gender of a household head (*Femalehhd)* does not significantly affect the household's probability of obtaining credit. However, the signs of the variables give indication that female household heads may lower the household's probability to obtain formal credit. A household headed by a female may have a higher chance to access informal and business credit.

Table 4.3

The Results of Households' Access to Credit

Variable	Formal Credit		Informal Credit		Business Credit	
	Z-stat	ME	Z-stat	ME	Z-stat	ME
Ecoact	2.220**	0.0063	-0.750	-0.0015	0.750	0.0012
PM	1.170	0.0165	-0.900	-0.0109	0.320	0.0027
PMexpend	-0.770	-2.92E-10	0.880	1.03E-10	0.200	1.83E-10
Head	31.290***	0.5115	18.370***	0.2671	16.810***	0.2505
Femalehead	-0.460	-0.0035	1.290	0.0043	0.910	0.0025
Married	-1.060	-0.0072	2.450**	0.0092	-1.010	-0.0039
Muslim	1.050	0.0080	-0.910	-0.0057	0.130	0.0006
Agri	-3.66***	-0.0253	2.110**	0.0130	0.480	0.0023
Nonagri	-0.210	-0.0020	-0.930	-0.0057	-0.980	-0.0053
Yos	4.460***	0.0036	-7.060***	-0.0037	0.870	3.84E-04
Agehhd	1.920*	0.0026	-1.800*	-0.0016	-0.420	-3.25E-04
Sqagehhd	-1.750*	-2.66E-05	1.470	1.46E-05	0.110	9.25E-07
Hhsize	1.450	0.0114	-1.330	-0.0063	0.400	0.0017
Sqhhsize	-1.790*	-0.0012	1.730*	0.0007	-0.980	-3.81E-04
Rural	0.540	0.0032	-1.680*	-0.0070	1.940*	0.0067
Farmbus	-0.470	-0.0031	-0.860	-0.0039	2.220**	0.0091
Nonfarmbus	1.380	0.0116	-2.220**	-0.0110	6.980***	0.0526
Expend	0.790	6.56E-11	-0.250	-2.46E-11	-0.670	-5.81E-10
House	2.190**	0.0130	-0.430	-0.0019	1.820*	0.0065
Vehi	4.530***	0.0298	-4.100***	-0.0222	-0.650	-0.0027
Land	3.020***	0.0206	-2.030**	-0.0085	2.080**	0.0080
Jewl	2.910***	0.0130	-1.210	-0.0037	1.710*	0.0044
IMR	-0.680	-0.0302	-2.980***	-0.0825	-1.200	-0.0293
No of obs.	12400		12400		12400	
LR $\chi^2_{(23)}$	2572.97***		1037.29***		1537.58***	
Log likelihood	-2831.49		-1968.86		-1950.29	
Pseudo-R^2	0.3124		0.2085		0.2827	
Pearson $\chi^2_{(12376)}$	12602.36*		12291.58		12472.69	
H-L $\chi^2_{(8)}$	2.44		11.54		28.19***	

Note. The H-L indicates the Hosmer-Lemeshow goodness of fit test. * the variable is significant at 10%, ** the variable is significant at 5%, *** the variable is significant at 1%.

The insignificant result from variable *Muslim* shows that religion of a household head does not affect the household's probability to get credit. A head of the household who works in the agricultural sector (*Agri*) has a positive effect on the household's probability to get informal credit by 1.30%, but it significantly reduces the households' probability when seeking formal credit by 2.53%. A household head who works in the non-agricultural sector (*Nonagri*) does not significantly lead to the household's access to credit from the formal, informal and business sector credit. Interestingly, this result suggests that agricultural

households have easier access to secure credit from the informal rather than the formal sector.

The variable *Yos* shows that one additional year in school of the household head has a positive effect of 0.36% on the probability of the household obtaining credit from the formal sector. However, in the case of informal credit, it reduces the household's probability to obtain the credit by 0.37%. This implies that educational level of the household head, an important aspect of human capital potential of the household, has a positive influence when seeking credit from formal lending institutions. It may also suggest that the higher the educational level of the household head, the greater awareness there is of possible formal lending institutions and a higher level of confidence to deal with the formal application process. The estimated *Yos* marginal effect, although it is positive, is not significant for the business credit model.

The age of the head of the household (*Agehhd*) is significant and positive for the formal credit model. Meanwhile, the estimated marginal effect of squared age of the household head (*Sqagehhd*) is significant and negative. This implies that the effect of the household head's age has an inverted U-shape relationship. The older household head up to 48 years old increases the probability of the household obtaining credit from formal lending institutions. As the household head grows older more than 48 years old, the household's probability to get the formal credit decreases.[47] These results suggest that longer working life leads to access to formal credit where repayment is more likely over time. In the case of informal credit, the *Agehhd* variable is significant with a negative sign. However, the *Sqagehhd* appears to have a weak positive sign. This implies that the household head younger than 55 years old decreases the probability of the household to obtain credit from informal sector. The elderly (older than 55 years old) then may increase the household's probability to get informal credit.[48]

The size of a household (*Hhsize*) has a weak positive impact in the formal credit model. Meanwhile the squared of household size (*Sqhhsize*) has a significant and negative effect. The effect of household size shows an inverted U-shape relationship. The household size up to 5 people may increase the probability of the household obtaining formal credit. The larger number of household members more than 5 people then significantly reduces the

[47] The peak of age is calculated based on the coefficient of the *Agehhd* and *Sqagehhd* in the estimated model for formal credit.
[48] The peak of age is calculated based on the coefficient of the *Agehhd* and *Sqagehhd* in the estimated model for informal credit.

household's probability to obtain formal credit.[49] In the case of informal credit, the *Hhsize* variable is not statistically significant. However, the squared of household size (*Sqhhsize*) has a significant and positive sign for the informal credit model with a value of 0.07%. Both of *Hhsize* and *Sqhhsize* variables appear insignificant when obtaining business credit.

Households located in the rural area have a lower probability of obtaining informal credit by 0.7%, whereas it does not significantly affect formal credit. Moreover, being located in a rural area helps a household to obtain business credit by 0.67%. These findings support the view from Robinson (2001) and Baskara (2013) as some government banks, such as *Bank Rakyat Indonesia* (*BRI*), offer micro-credit services such as *KUR* programme and cover rural areas of Indonesia, which increase access to business credit.

Non-farm business ownership significantly reduces the probability of the household to secure informal credit by 1.10%. Informal credit covers various types of loan, however it mostly covers only small loans (Brata, 2004). It usually also has a high interest rate, particularly when the credit is from informal moneylenders (Robinson, 2001). Thus, business owners may be more aware to access credit from formal institutions to obtain larger loans at lower interest rate. Farm business ownership then increases the probability of the household in obtaining business credit by 0.91% and non-farm business by 5.26%. A perception that a non-farm business has a higher return compared to that of a farm business may result in an easier access for non-farm business owners to obtain business credit.

The *Expend* variable (per capita expenditure of a household per month) indicates economic sources available in the household. This variable is expected to increase the probability of a household to obtain credit (see Okten & Osili, 2004). Based on the result, the variable *Expend* does not significantly influence a household's access to credit. However, the positive sign of estimated *Expend* marginal effect in the formal credit model and negative sign of it in the informal credit model suggest that a household with higher level of *Expend* may have a higher probability to access credit from formal institutions. A poor household, which has lower level of *Expend,* then has a higher likelihood to access informal credit. Krishnamurti noted that the poor households mostly depend on self-financing and financial assistance from the informal sector as they usually lack access to formal credit or microfinance institutions (as cited in Susila, 2007). An interesting finding shows that the poor households have a higher probability to obtain business credit, as the sign of estimated *Expend* marginal effect

[49] The peak of the household size is calculated by author based on the coefficient of the *Hhsize* and *Sqhhsize* in the estimated model for formal credit.

is negative. This may be a result of the *KUR* programme from the government which is targeted to poor people and small and micro enterprises. The *KUR* programme is intended to increase the productivity of the enterprises and job opportunities which then results in more income for the poor household (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-c).

Another important variable is the ownership of assets. House, vehicle, land and jewellery ownerships (indicated by *House, Vehi*, *Land* and *Jewl* variables) by a household increases the household's probability in obtaining formal credit by 1.30%, 2.98%, 2.06% and 1.30%, respectively. Vehicle and land ownership reduces the household's probability to obtain informal credit by 2.22% and 0.85%, respectively. In the case of business credit, the house, land and jewellery ownership also adds the household's probability to get the credit by 0.65%, 0.80% and 0.44%, respectively. The results imply that a household which owns assets has a higher probability to access and secure formal and business credit. Meanwhile a poorer household, which does not have assets, has a higher probability to access credit from the informal sector. This also may be the case as households with assets ownership tends to approach formal institutions rather than informal sectors.

4.5.2 The Determinants of Access to Credit: Agricultural Households

The determinants of an agricultural households' access to formal, informal and business credit, in the case of Western Indonesia, are presented in Table 4.4. The business credit in this study refers to production credit obtained by the agricultural households to fund agri-business activities.

The estimated Hosmer-Lemeshow (H-L) goodness of fit values indicates that the results relatively fit well with the model, even though the results for the estimated Pearson values show a weak goodness of fit. The Pearson goodness of fit test statistic is 3,536.35 for formal credit model, 3,556.4 for informal credit model and 6,473.05 for business credit model. The H-L goodness of fit test statistic has a value of 7.56, 17.77 and 12.23 for the formal credit, informal credit and the business credit models, respectively. The conventional test for the goodness of fit criteria also show relatively good fit to the model in terms of Pseudo-R^2 in the formal credit model of 0.2974, 0.2342 in the informal credit model and 0.2668 in the business credit model.

In the case of agricultural households, an increase by one person in the number of economically active members of a household (*Ecoact*) increases a household's probability of

getting formal credit by 1.11%. A higher number of economically active household members shows a greater economic resource for the family that increases the probability of an agricultural household in obtaining credit from formal institutions. In contrast, a large number of economically active household members decreases its probability of obtaining informal credit by 0.73%. The result also indicates that when the number of economically active members of a household increases, the chance of agricultural households to apply for and borrow from the informal credit sector decreases. However, this variable does not have any significant marginal impact on the probability of getting agri-business credit.

Table 4.4

The Results of Agricultural Households' Access to Credit

Variable	Formal Credit		Informal Credit		Agri-business Credit	
	Z-stat	ME	Z-stat	ME	Z-stat	ME
Ecoact	2.550**	0.0111	-1.850*	-0.0073	1.310	0.0032
PM	-0.090	-0.0022	0.060	0.0012	1.530	0.0116
PMexpend	0.270	2.12E-10	0.430	7.50E-09	0.230	3.55E-09
Head	12.510***	0.4249	8.380***	0.3304	3.920***	0.1821
Femalehead	-2.810***	-0.0228	1.540	0.0134	-1.600	-0.0078
Married	-0.960	-0.0150	1.250	0.0108	-0.970	-0.0108
Muslim	-0.010	-3.65E-04	0.450	0.0074	-0.770	-0.0322
Yos	0.980	0.0024	-1.460	-0.0030	1.610	0.0028
Agehhd	1.800*	0.0028	-2.520**	-0.0032	1.570	0.0016
Sqagehhd	-1.700*	-2.85E-05	2.280**	3.18E-05	-1.690*	-1.95E-05
Hhsize	1.130	0.0173	-1.270	-0.0153	1.250	0.0119
Sqhhsize	-1.420	-0.0021	1.580	0.0018	-1.250	-0.0011
Rural	-0.380	-0.0080	0.150	0.0022	-0.740	-0.0146
Farmbus	-0.640	-0.0141	0.870	0.0102	1.040	0.0076
Nonfarmbus	0.940	0.0238	-1.370	-0.0169	0.290	0.0038
Expend	0.150	6.46E-11	-0.410	-7.07E-09	-0.250	-3.78E-09
House	1.030	0.0109	0.480	0.0044	1.200	0.0057
Vehi	1.100	0.0110	-1.860*	-0.0189	0.790	0.0044
Land	1.450	0.0340	-2.120**	-0.0179	1.090	0.0215
Farmland	0.430	0.0045	-1.320	-0.0129	0.620	0.0034
Jewl	1.210	0.0159	-0.580	-0.0059	1.410	0.0134
IMR	-0.010	-0.0012	-1.430	-0.1046	0.990	0.0567
No of obs.	3398		3398		3398	
LR $\chi^2_{(22)}$	534.22***		345.49***		258.88***	
Log likelihood	-630.97		-564.81		-355.74	
Pseudo-R^2	0.2974		0.2342		0.2668	
Pearson $\chi^2_{(3375)}$	3536.35**		3556.4**		6473.05***	
H-L $\chi^2_{(8)}$	7.56		17.77**		12.23	

Note. The H-L indicates the Hosmer-Lemeshow goodness of fit test. * the variable is significant at 10%, ** the variable is significant at 5%, *** the variable is significant at 1%.

The participation of a household in community meetings (*PM*) does not affect the probability of an agricultural household of securing credit. However, in the case of business credit model, it appears to have a weak impact which increases the household's probability to get business credit by 1.16%. The interaction coefficient between the participation in community meetings and per capita expenditure of a household (*PMexpend*) also does not significantly influence an agricultural household's access to credit in all three models. The estimated coefficient of marital status and religion of a household head (which are *Married* and *Muslim*) do not appear to affect the probability of an agricultural household in obtaining credit.

If the applicant is the head of an agricultural household (*Head*), the probability of obtaining formal loan increases by 42.49%. In addition, the variable also positively contributes to a household's probability of obtaining informal credit by 33.04% and agri-business credit by 18.21%. The results indicate that a head of an agricultural household is regarded as an eligible and a responsible person, and this increases the creditworthiness of the household. A female head of an agricultural household (*Femalehhd*) significantly decrease the household's probability of obtaining formal credit by 2.28%. The estimated coefficient of *Femalehhd* for informal credit shows a weak and positive effect on an agricultural household's probability of securing the credit by 1.34%. In the case of business credit, the *Femalehhd* variable also has a weak and negative effect by 0.78% on an agricultural household's probability to get business credit.

The years of schooling of a household head (*Yos*) makes a weak negative contribution of 0.30% to the probability of the agricultural household obtaining informal credit. The variable also has a weak and positive impact by 0.28% in increasing the agricultural household's probability to get agri-business credit. However, this variable is not significant in the case of a formal credit model. This implies that higher educational level of a household head is useful to secure agri-business credit. Agricultural households are usually poor (based on results in Chapter 3). Thus the members are sometimes considered as high-risk applicants with low creditworthiness. The higher educational level of a head of agricultural household acts as a guarantee that the household has an ability to run an agri-business, which can increase the creditworthiness and help in obtaining agri-business credit.

The age of the household head (*Agehhd)* has a positive significant sign while the age squared of a household head (*Sqagehhd*) has a significant and negative sign. This suggests that a household head younger than 48 years old has a higher probability for the agricultural

household to get formal credit. The older household head more than 48 years old then decreases the probability in obtaining formal credit. This suggests that an agricultural household's probability in obtaining credit from the formal sector declines as age of the household head increases.[50] In the case of informal credit, a household head younger than 50 years old has a lower probability for the agricultural household to obtain credit from informal sector. The older household head more than 50 years old has an impact in increasing the agricultural household's probability to get informal credit.[51] The *Agehhd* appears to have a weak and positive impact while the *Sqagehhd* has a significant and negative impact in the agri-business credit model. This indicates that the weak effect of household head age increases the agricultural household's probability to get agri-business credit up to 40 years old. After that it significantly reduces the agricultural household's probability in securing agri-business credit.[52]

The household size of agricultural households (*Hhsize*) does not affect the probability of the households in getting credit from all three models. The squared of household size (*Sqhhsize*) appears insignificant in affecting the agricultural households' chance to get formal and agri-business credit. However, the *Sqhhsize* has a weak positive effect for the informal credit model with a value of 0.18%. Location in rural areas (*Rural*), as well as farm and non-farm business ownerships variables, do not affect the agricultural households' probability to secure formal, informal and agri-business credit.

The expenditure of a household per capita per month (*Expend*) does not significantly influence the household's access to credit in the three models. However the signs of the estimated *Expend* marginal effect, which are positive in the formal credit model and negative in informal and agri-business credit model, suggest that the poor agricultural households have higher probability to access informal and agri-business credit. Vehicle ownership (*Vehi*) appears insignificant in formal and agri-business credit. Nevertheless, it has a significant impact in decreasing the agricultural household's probability to get informal credit by 1.89%. Land ownership (*Land*) has a weak effect in increasing the agricultural household's probability to secure formal credit by 3.4%, and a statistically significant effect in reducing the agricultural household's chance to get informal credit by 1.79%. The results imply that the poor agricultural household, which does not have vehicle and land, has a

[50] The peak of age is calculated based on the coefficient of the *Agehhd* and *Sqagehhd* in the estimated model for formal credit in the case of agricultural households.
[51] The peak of age is calculated based on the coefficient of the *Agehhd* and *Sqagehhd* in the estimated model for informal credit in the case of agricultural households.
[52] The peak of age is calculated based on the coefficient of the *Agehhd* and *Sqagehhd* in the estimated model for agri-business credit in the case of agricultural households.

higher chance to access informal credit. The *Land* and *Vehi* variables are not significant in the agri-business credit model. House, farming land and jewellery ownerships (indicated by *House, Farmland* and *Jewl* variables) by an agricultural household does not significantly affect the agricultural household's probability of obtaining formal, informal and agri-business credit.

4.6 Conclusion

This chapter examines the households' socioeconomic characteristics that affect their access to formal, informal and business credit in the Western Provinces of Indonesia. The results are estimated by using Indonesia Family Life Survey (IFLS) data in 2007-2008 and using two-stage probit model as the method. The empirical findings show that if the household head is the one who asks for credit, the household's probability to get formal, informal and business credit increases. This result is significant for households in Western Indonesia and the agricultural sector. Moreover, a household headed by an agricultural worker has lower probability to obtain formal credit. Many of agricultural households are poor (see Dartanto & Nurkholis, 2013). Thus, the government should provide easy-to-access credit programme for agricultural households, as financial assistance through credit can be helpful to alleviate poverty.

A female household head significantly gives lower probability for the agricultural household in obtaining formal and business credit. This suggests that a household headed by a female has lower creditworthiness than a household with a male household head. The results imply that the government also needs to put a specific focus to open credit access to female-headed households, especially in agricultural sector, to help them moving out from poverty.

The educational level of a household head affects the household's access to credit. In the case of Western Indonesia, an educated household head increases the household's probability to get formal credit. In contrast, an increase in the educational level of a household head reduces the household's probability to access informal credit. For agricultural households, the educational level of a household head has a weak effect in reducing the household's probability to obtain informal credit. Even though the impact is weak, an educated household head is found to be helpful for the agricultural household in securing business credit. The results show that the educational level of the household heads increases the creditworthiness of households in Western Indonesia and the agricultural sector which then assists them to obtain formal and business credit. The results also indicate that an

educated household head may become more aware of credit from the formal sector. Thus, education programmes are important to help the households, particularly for the poor households, in accessing credit, obtaining information and then escaping poverty.

In the case of Western Indonesia, house, vehicle, land and jewellery ownership by a household plays an important role in increasing its probability to get credit from formal institutions. The ownership of house, land and jewellery also significantly escalates the household's chance to obtain business credit. Those assets can act as collaterals which are helpful for a household in securing credit. Vehicle and land ownership show negative effects in the informal credit model, which imply that a household without those assets has a higher probability to access informal credit. For the agricultural households, land ownership appears to have a weak impact in increasing their probability to obtain formal credit. An agricultural household, which has no vehicle and land, is also found to have a higher chance to access informal credit. In this case, a micro-credit programme that gives a collateral-free credit is vital to be provided by the government, particularly for the poor households in Western Indonesia and, more specifically agricultural households, so they can have a better access to credit.

Appendix 4.1

Appendix Table A.4.1 presents the variables used in the first-stage of selection model. The model is then estimated by probit regression.

Table A.4.1

List of Variables in Stage One Probit Model

Variable	Definition
Dependent Variables	
Hhbo	if household applies for a loan (1=yes, 0=otherwise)
Independent Variables	
Ecoact	Number of economically active members of household (person)
PM	At least one household member in the family participates in community meeting
Femalehhd	1 = household head is female, 0=otherwise
Married	1 = household head is married, 0=otherwise
Muslim	1 = household head is muslim, 0=otherwise
Agri	If household head works in agricultural sector (1=yes, 0=otherwise)
Nonagri	If household head works in manufacturing and service sector (1=yes, 0=otherwise)
Yos	Years of schooling (years)
Agehhd	Age of the household head (years)
Sqagehhd	Squared age of household head
Expend	Per capita expenditure per month (Rupiah)
Hhsize	Number of household members (people)
Sqhhsize	Squared number of household members
Rural	Location of household (1=rural, 0=urban)
Farmbus	Owner of farm business in the family (1=yes, 0=no)
Nonfarmbus	Household own non-farm business (1=yes, 0=no)
House	Owning house (1=yes, 0=no)
Vehi	Owning vehicle (1=yes, 0=no)
Land	Owning land (1=yes, 0=no)
Farmland	Owning farming land (1=yes, 0=no)
Jewl	Owning jewellery (1=yes, 0=no)
Hitsevshocks04_06	if household experienced at least one shock during 2004 to 2006 (1=yes, 0=otherwise)
IMR	Inverse Mill's Ratio

Appendix 4.2

Appendix Table A.4.2 presents the variables used in the second-stage of selection model. The model is then estimated by probit regression.

Table A.4.2

List of Variables in Stage Two Probit Model

Variable	Definition
Dependent Variables	
Formcre	If household receives a loan from formal institutions (1=yes, 0=otherwise)
Informcre	If household receives a loan informal institutions (1=yes, 0=otherwise)
Bucred	If household receives a loan to fund business activities (1=yes, 0=otherwise)
Agbucred	If household receives a loan to fund agri-business activities (1=yes, 0=otherwise)
Independent Variables	
Ecoact	Number of economically active members of household (person)
PM	At least one HH member in the family participates in community meeting
PMexpend	Interaction variable between participation in community meetings and per capita expenditure of a household
Head	Head of household applies for a loan (1=yes, 0=otherwise)
Femalehhd	If household head is female (1=yes, 0=otherwise)
Married	If household head is married (1=yes, 0=otherwise)
Muslim	If household head is Muslim (1=yes, 0=otherwise)
Agri	If household head works in agricultural sector (1=yes, 0=otherwise)
Nonagri	If household head works in manufacturing and service sector (1=yes, 0=otherwise)
Yos	Years of schooling (years)
Agehhd	Age of the household head (years)
Sqagehhd	Squared age of household head
Hhsize	Number of household members (people)
Sqhhsize	Squared number of household members
Rural	Location of household (1=rural, 0=urban)
Farmbus	Owner of farm business in the family (1=yes, 0=no)
Nonfarmbus	Household own non-farm business (1=yes, 0=no)
Expend	Per capita expenditure (Rupiah)
House	Owning house (1=yes, 0=no)
Vehi	Owning vehicle (1=yes, 0=no)
Land	Owning land (1=yes, 0=no)
Farmland	Owning farming land (1=yes, 0=no)
Jewl	Owning jewellery (1=yes, 0=no)
IMR	Inverse Mill's Ratio

Appendix 4.3

Appendix Table A.4.3 presents the descriptive statistics of all the variables used in this study, in the case of Western Indonesia.

Table A.4.3

Descriptive Statistics: Western Indonesia

Variable	Full Sample		Applicants		Grantess of Formal Credit		Grantess of Informal Credit		Grantess of Business Credit	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Hhbo (1= if applied for credit)	0.16	0.37	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Formcre (1= if granted formal credit, given that applied)	0.62	0.49	0.62	0.49	1.00	0.00	0.00	0.00	0.72	0.45
Informcre (1= if granted informal credit, given that applied)	0.31	0.46	0.31	0.46	0.00	0.00	1.00	0.00	0.24	0.43
Bucred (1= if granted business credit, given that applied)	0.34	0.48	0.34	0.48	0.40	0.49	0.27	0.44	1.00	0.00
Ecoact	1.34	0.95	1.55	0.91	1.59	0.91	1.47	0.91	1.63	0.91
PM	0.80	0.40	0.91	0.29	0.91	0.28	0.89	0.31	0.92	0.27
PMexpend ($x10^{-6}$)	1.02	12.10	1.29	8.20	1.10	5.32	1.60	11.60	0.89	2.27
Head	0.09	0.28	0.53	0.50	0.53	0.50	0.53	0.50	0.53	0.50
Femalehead	0.23	0.42	0.17	0.38	0.15	0.36	0.22	0.41	0.18	0.38
Married	0.75	0.43	0.82	0.38	0.83	0.38	0.81	0.39	0.81	0.39
Muslim	0.92	0.26	0.92	0.27	0.92	0.26	0.91	0.29	0.92	0.27
Agri	0.29	0.45	0.24	0.43	0.19	0.39	0.30	0.46	0.28	0.45
Nonagri	0.49	0.50	0.61	0.49	0.66	0.47	0.54	0.50	0.61	0.49
Yos	7.39	4.69	8.26	4.50	9.06	4.57	6.77	4.03	8.08	4.38
Agehhd	42.99	15.27	42.54	12.51	42.69	12.08	42.55	13.16	42.80	12.24
Sqagehhd	2081	1451	1966	1166	1968	1127	1983	1226	1981	1147
Hhsize	3.36	1.73	3.86	1.63	3.88	1.55	3.84	1.78	3.81	1.52
Sqhhsize	14.29	15.10	17.57	15.59	17.42	14.76	17.91	16.81	16.85	13.25
Rural	0.53	0.50	0.48	0.50	0.47	0.50	0.49	0.50	0.57	0.50
Farmbus	0.34	0.47	0.32	0.47	0.31	0.46	0.32	0.47	0.42	0.49
Nonfarmbus	0.37	0.48	0.50	0.50	0.53	0.50	0.43	0.50	0.74	0.44
Expend ($x10^{-6}$)	2.06	26.40	1.85	12.80	1.74	13.10	1.95	12.40	1.01	2.36
House	0.73	0.45	0.78	0.41	0.79	0.40	0.76	0.43	0.84	0.37
Vehi	0.65	0.48	0.77	0.42	0.85	0.36	0.65	0.48	0.79	0.41
Land	0.38	0.48	0.42	0.49	0.45	0.50	0.35	0.48	0.53	0.50
Jewl	0.53	0.50	0.59	0.49	0.64	0.48	0.50	0.50	0.62	0.48
Farmland	0.28	0.45	0.29	0.45	0.29	0.45	0.26	0.44	0.37	0.48
Hitsevshocks04_06	0.02	0.14	0.04	0.19	0.03	0.18	0.04	0.20	0.03	0.18

Appendix 4.4

Appendix Table A.4.4 presents the descriptive statistics of all the variables used in this study, in the case of agricultural households.

Table A.4.4

Descriptive Statistics: Agricultural Households

Variable	Full Sample		Applicants		Grantess of Formal Credit		Grantess of Informal Credit		Grantess of Agri-business Credit	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Hhbo (1= if applied for credit)	0.14	0.34	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Formcre (1= if granted formal credit, given that applied)	0.51	0.50	0.51	0.50	1.00	0.00	0.00	0.00	0.64	0.48
Informcre (1= if granted informal credit, given that applied)	0.39	0.49	0.39	0.49	0.00	0.00	1.00	0.00	0.30	0.46
Agbucred (1= if granted agri-business credit, given that applied)	0.22	0.42	0.22	0.42	0.28	0.45	0.17	0.38	1.00	0.00
Ecoact	1.63	0.94	1.75	0.96	1.93	0.98	1.54	0.91	1.84	0.91
PM	0.89	0.31	0.94	0.24	0.93	0.25	0.94	0.24	0.98	0.15
PMexpend ($x10^{-6}$)	0.70	5.06	1.10	10.00	0.79	2.41	1.71	15.90	0.55	0.93
Head	0.07	0.25	0.51	0.50	0.51	0.50	0.50	0.50	0.56	0.50
Femalehead	0.14	0.35	0.11	0.31	0.07	0.25	0.18	0.38	0.06	0.25
Married	0.83	0.37	0.86	0.35	0.86	0.35	0.83	0.37	0.85	0.36
Muslim	0.92	0.28	0.88	0.32	0.90	0.30	0.84	0.36	0.86	0.35
Yos	5.04	3.72	6.17	3.65	6.38	3.96	5.83	3.27	6.66	3.70
Agehhd	46.77	14.57	44.60	13.29	46.40	12.36	42.83	14.23	45.18	11.63
Sqagehhd	2400	1444	2165	1274	2305	1194	2036	1370	2175	1132
Hhsize	3.61	1.66	3.91	1.57	3.98	1.45	3.81	1.70	4.02	1.49
Sqhhsize	15.83	14.99	17.74	14.32	17.93	12.66	17.41	16.10	18.37	13.04
Rural	0.87	0.34	0.80	0.40	0.79	0.41	0.80	0.40	0.87	0.34
Farmbus	0.81	0.39	0.79	0.41	0.80	0.40	0.74	0.44	0.95	0.23
Nonfarmbus	0.24	0.43	0.35	0.48	0.42	0.49	0.27	0.44	0.24	0.43
Expend ($x10^{-6}$)	1.01	10.60	1.18	10.00	0.93	2.56	1.74	15.90	0.55	0.93
House	0.90	0.30	0.90	0.30	0.91	0.29	0.88	0.33	0.93	0.25
Vehi	0.61	0.49	0.71	0.46	0.79	0.41	0.63	0.48	0.74	0.44
Land	0.63	0.48	0.66	0.47	0.71	0.46	0.56	0.50	0.77	0.42
Jewl	0.47	0.50	0.56	0.50	0.59	0.49	0.54	0.50	0.61	0.49
Farmland	0.59	0.49	0.61	0.49	0.63	0.49	0.52	0.50	0.71	0.46
Hitsevshocks04_06	0.02	0.14	0.03	0.18	0.02	0.15	0.04	0.20	0.01	0.10

Chapter 5

Impact Evaluation of Food-based and Health Care Social Safety Nets on Household Consumption Expenditure

5.1 Introduction

The two largest poverty reduction programmes in Indonesia are food-based and health care social safety nets (Giannozzi & Khan, 2011; Jha et al., 2013). The food-based social safety net, known as the *Raskin* programme, provides rice at a subsidized price to poor households. The health care social safety programme offers health insurance targeted at the poor households. This scheme has undergone various name changes over time. For example, Health Cards 1994, Health Safety Net 1997-1998, *Askeskin* 2005-2007, *Jamkesmas* 2008-2013, which in 2014 became integrated with the National Health Insurance, or *JKN* (World Bank, 2012b; Suryahadi et al., 2010; Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-a).

Social safety net programmes assist poor households in meeting their basic needs and reducing the negative effects on households' wellbeing and consumption (Gupta et al., 1999). The *Raskin* programme provides subsidized rice that aims to reduce the financial burden on poor households, provides sufficient food calories (carbohydrates) and prevents reduced consumption of proteins (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-a). Health insurance targeted at the poor households aims to provide access to health services for those who cannot afford it (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-b). The programme promotes healthy households, keeps students in school and adults in employment and thereby increases the productivity of the population (World Bank, 2012b).

As consumption expenditure is also a welfare indicator (World Bank, 2005), it is essential to evaluates the impact of food-based and health care social safety nets on household consumption expenditure. This chapter examines the impacts of those programmes on households' food and non-food consumption by using a propensity score matching (PSM) method. Food consumption includes rice, vegetables, meat, dairy products, tofu and tempeh consumption, while the non-food consumption covers household items, as well as school and medical consumption.

The chapter starts with a brief literature review related to impact evaluation of government safety net programmes on household consumption and an outline of food-based and health care safety net programmes in Indonesia. This is followed by a description of the empirical data used in this study based on the household survey data for Western Provinces in Indonesia. The next two sections provide details of the methodology used for estimation, and the empirical results. The final section of the chapter provides a conclusion with some policy implications.

5.2 Brief Literature Review of Impact Evaluation

Social safety nets can affect household consumption behaviour (Rogers & Coates, 2002; Bitrán & Giedion, 2003). They aim to give short-term support and assistance to the poor in managing risk and reducing vulnerability, particularly when shocks occur in an economy and affect wellbeing and consumption levels (Gupta et al., 1999). In order to evaluate the programmes' impact on consumption expenditure, several studies have used a number of methods for the country case studies. Sumarto et al. (2005) used linear regression to measure the impact of Indonesian households' participation in the social safety net programmes on the households' welfare and poverty. The result shows that participation significantly increases consumption level of the households.

A study by Leininger et al. (2010) in the United States examined the effect of children's health insurance (SCHIP) on consumption levels and the well-being of the poor household. They employed two methods to assess this impact, those are, the simple difference-in-difference and the multivariate instrumental variable models. Their results show that the programme significantly reduces health care spending and increased total consumption of the households. Those households who were part of the programme reallocated their consumption from medical care to transportation cost and retirement savings. This implies that the programme can raise well-being of the households as their total consumption increases.

In the case of China, Ying and Du (2012) analysed the effect of China's medical insurance on household durable goods consumption by employing a panel binary choice model. The results show that the households that receive medical insurance have significantly higher consumption of durable goods such as washing machines, televisions, electric fans, electric cookers, cameras, telephones, and refrigerators.

Wagstaff and Pradhan (2005) conducted a similar impact evaluation study of Vietnam's health insurance (VHI) on health outcomes, health care utilization and nonmedical household consumption. The PSM with difference-in-difference method was used to measure the impact. The result shows that the VHI increases health care utilization (i.e., hospital inpatient and outpatient services) by children and adults. The study also finds that the programme reduces annual out-of-pocket expenditure on health and increases nonmedical household consumption including food, education, and durable goods.

In the country case study of Bangladesh, Ahmed et al. (2009) also employed the PSM to measure the effect of some food and cash transfer programmes on food consumption, food calorie intake and other livelihood indicators.[53] According to the results, the households' participation in those programmes significantly raised their calorie intake and total per capita consumption. Participation also increased the value of asset consumption on livestock and poultry.

Gilligan, Hoddinott and Taffesse (2009) analysed the effect of productive safety net programmes (PSNP) and other food security programmes (OFSP) on food security, consumption levels, agricultural productivity and asset accumulation in Ethiopia. Using the PSM method to measure the impact, they found that participation in the PSNP and OFSP resulted in a positive impact on food calorie intake, as well as food security. Participation also increased the use of improved agricultural technologies, access to credit for productive purposes and the chance of operating their own non-farm business.

In Indonesia, Sparrow et al. (2010) analysed the impact of health insurance targeted at the poor on health care utilization and health consumption. They noted that poor households with health issues have relatively high burden on medical costs. Thus, they need to be supported by government health insurance scheme *Askeskin*. They employed a PSM with difference-in-difference model and found that *Askeskin* increased the use of outpatient health care. In addition, they noted that the programme slightly increased the out-of-pocket health payments in the urban areas of Indonesia, as the high cost of hospital care was not fully covered by the insurance.

[53] The programmes evaluated in the study include the income-generation for vulnerable group development (IGVGD), food security for vulnerable group development (FSVGD), food for asset-creation (FFA) and the rural maintenance programme (RMP).

5.3 Food-Based and Health Care Social Safety Net Programmes, Indonesia

There are four clusters of government programmes to alleviate poverty in Indonesia (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-g). The first refers to family-based social assistance which aims to fulfil poor households' basic needs, including food, health and education. Food based and health care social safety nets (subsidized rice and health care fee waivers) are included in this cluster (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-a, n.d.-b). The second cluster consists of empowerment programmes to help poor communities escaping from poverty by improving their skills and capacity. The third cluster offers financial assistance, access to product marketing and entrepreneurship skills enhancement, to improve small and micro enterprises. The last cluster involves affordable housing and transportation programmes.

Food-based Social Safety Net

The food-based social safety net, known as the Special Market Operation (*OPK*), started in 1998. It was part of an emergency relief package during the Asian Financial Crisis. Since 2002, it has been called *Raskin,* with added instruments in the quota of rice per household, improved distribution channels and better targeting of the beneficiaries (SMERU, 2008). The National Logistics Board (*BULOG*) is responsible for distribution to agreed levels in each district. Local government helps to deliver the rice to the households considered eligible by the district government. Since 2006, a database for the eligible households has been used in the distribution mechanism of the *Raskin* programme. The programme allows the households to buy up to 15 kilograms of rice per month at the price of Rp. 1,600 per kilogram. This represents a subsidy of approximately 75% of the market price (World Bank, 2012b; Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-a).

Health Care Social Safety Net

The health care social safety net was introduced in 1994, known as the Health Card programme (*Kartu Sehat*). This changed to the Health Safety Net (*JPS-BK*) programme in 1997-1998 during the Asian Financial Crisis. In 2005, the programme focused on the family-based special form of health insurance aimed only for poor households (*Askeskin*). This was reformed again in 2008 to individual-based insurance called the Health Guarantee for The Poor (*Jamkesmas*) (Suryahadi et al., 2010). In 2014, all health insurance programmes were integrated into one single social health insurance scheme called the National Health Insurance (*JKN*). The programme covers the medical expenses for poor households

subsidized by the government, and paying members, including civil servants, pensioners, veterans, employees of state-owned and private companies, military and police personnel (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-b).

The initial programme, Health Card, gave free curative health care at the community health centres (*Puskesmas*) and third-class inpatient room at the district hospitals. The health safety, *JPS-BK* programme, provided free curative health with additional health services including outpatient, inpatient and mother-and-child care (World Bank, 2012b). In this scheme, the health care providers were directly funded by the government to cover all health services provided to the patients. Under the *JPS-BK* scheme, the dual function of the "payer" and "provider" services by the government caused inefficiencies. This led to a reform to an insurance-based programme, *Askeskin*. Under the *Askeskin*, PT. Askes was mandated by the government to manage the programme as the "payer" services (Meyke, 2008). The scheme further changed to the *Jamkesmas* programme, controlled by the government, which again, acts as both "payer" and "provider" of health care services (Ministry of Health Republic of Indonesia, 2008). In 2014, the *Jamkesmas* was integrated to *JKN* programme. The JKN is managed by the Social Security Implementer Agency, a government-owned insurance company. Under this scheme, people pay monthly for health protection and the government pays the insurance fee for the poor (Secretariat of the National Team for The Acceleration of Poverty Reduction, n.d.-b).

5.4 Model Specification, Data and Methodology

This section presents the models to examine the effects of food-based and health care safety nets on household consumption in the Western Provinces of Indonesia. The characteristics of a household such as the age and educational level of the household head, the size of a household and the participation of a household in other government programmes, serve as the control variables. The participants in the safety net programmes are the targeted poor households. The models, methodological approach, data and the related econometric issues are discussed in detail in the following sections.

5.4.1 Model Specification

This part presents the models to measure the impact of food-based and health care social safety net programmes on household consumption levels. As access to social safety nets is not randomized, this study uses the propensity score matching (PSM) method (Gilligan et al., 2009). The PSM involves a probit regression model to predict the probability of each

household participating in the food-based and health care social safety nets (Caliendo & Kopeinig, 2008; Khandker, Koolwal & Samad 2010). Using the results of the probit model, a propensity score for each household is calculated. This propensity score reflects the probability of each household participating in the programmes. The estimated propensity score is then used in the next step to determine the match between the households who are covered by the programmes and the households who are not covered (Gilligan et al., 2009).

The probit model is applied to all households in the western provinces and the analysis is further disaggregated to estimate the effects on the agricultural households. The model takes the following basic form:

$$P(y = 1|x) = G(\alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \cdots + \beta_i x_i = G(\alpha + \beta_i X_i) \quad (5.1)$$

Where, $P(y = 1|x)$ is the dependent variable i.e. probability of a household of participating in food-based or health care social safety nets. The outcome probability is a function of independent variables (X_i), which consists of socio-economic characteristics of the household that significantly affect the household probability to be targeted as a beneficiary of the programmes. The model specifies that the function of $G(.)$ in equation (5.1) is the standard normal cumulative distribution function (Cameron & Trivedi, 2010).

After estimating the propensity score (using PSM), the average treatment effect of the social safety net programmes is calculated. The average treatment effect shows the mean difference of the outcome, which is the consumption expenditure (i.e, spending on food and non-foods commodities) of the beneficiaries and the non-beneficiaries. The PSM compares the consumption level of each beneficiary and non-beneficiary that has a similar propensity score and "…the average difference in outcomes across the two groups is compared to get the programme treatment effect" (Khandker et al., 2010, p. 54).

It should be noted that the average treatment effect calculation in the PSM should be different in the case of experimental and non-experimental situation. In the experimental situation, there are two groups of samples known as the 'treated' and the 'control'. The treated group consists of individuals who are accepted in an experimental programme and are treated by the programme. The control group consists of individuals "…who applied and were accepted into the programme but were randomized out before the programme began" (Heckman & Hotz, 1989, p. 862). Due to the fact that social safety nets are non-experimental cases, they will consist of individuals who participate and some who do not participate in the programmes. Thus, there will be no special stage to form the proper control

group as in the experimental case. In the non-experimental cases, direct comparison of the programmes' impacts between participant and non-participant groups can cause selection bias (Heckman & Hotz, 1989).

PSM is a method that solves the problem of selection bias in estimating the average treatment effect on the treated (ATT) (see Wang, Yip, Zhang & Hsiao, 2009). The ATT method measures the average treatment effect of food-based and health care social safety nets by focusing on "…the effects on those for whom the programme is actually intended." (Caliendo & Kopeinig, 2008, p.34). Thus, this study uses PSM to estimate ATT and analyses the impact of social safety nets on household consumption expenditure. The ATT is estimated using following equation:

$$\tau_{ATT} = E(\tau|D = 1) = E[Y(1)|D = 1] - E[Y(0)|D = 1] \quad (5.2)$$

Equation (5.2) shows that "the expected value of ATT is defined as the difference between expected outcome values with and without treatment for those who actually participated in treatment" (Caliendo & Kopeinig, 2008, p.34).

5.4.2 Data and Methodology

The empirical analysis is based on the household data from Indonesia Family Life Survey (IFLS) conducted in 2007-2008, which is the most recent available household data. The analysis is divided into the food-based program *Raskin* and the health care social programme *Askeskin* (available to poor households in 2007-08*)*, applied to total and agricultural households in the Western Provinces of Indonesia.

There are several steps in doing the PSM method.[54] The first step is to determine the different characteristics between the beneficiaries and non-beneficiaries of the *Raskin* and *Askeskin* programme. As such, this step chooses the variables for the second step, which is the probit model to measure the probability of participating in the programme. This first step is very important to avoid over-specification and inefficiency based on standard errors and bias estimation in the PSM method (Caliendo & Kopeinig, 2008). Thus, the characteristics that significantly differ between those two groups should be included in the next step. According to Caliendo & Kopeinig (2008), a t-test on each characteristic is applied to see

[54] In running the PSM method, this research uses cross-section analysis households' weight that has been provided in IFLS data 2007-2008, so that the estimates that are weighted reflect all households living in IFLS provinces in Indonesia. The IFLS sample is based on a sample of households living in 13 provinces in Java, Sumatra, Bali, West Nusa Tenggara, Kalimantan and Sulawesi (Strauss et al., 2009). Those are mostly Western Provinces of Indonesia.

which characteristics are significantly different. As the beneficiaries of the *Raskin* and *Askeskin* programmes are targeted, there must be some characteristics that differentiate them from the non-beneficiaries. The significantly different characteristic then can reflect the characteristics that influence a household to be a participant in the *Raskin* and *Askeskin* programmes.

The household's characteristics used in this study include the number of household members, education levels and gender of household head, expenditure per capita per month, asset ownership and their participation in any poverty reduction programmes. For the *Askeskin* programme, health issues are included as additional characteristics (see also Sparrow et al., 2010). The other characteristics define a household's socio-economic status and determine its eligibility to take part in the programmes. Based on Statistics Indonesia, the characteristics of poor household include 16 indicators, as follows (Ministry of National Development Planning Republic of Indonesia, 2010):

1. Lives in a house with area less than 8 meter square per person.
2. There is no flooring or flooring material such as cheap wood or bamboo is used.
3. Wall material is cheap bamboo, wood, un-plastered brick or bush.
4. Does not have toilet facilities or uses public toilets.
5. Does not have electricity.
6. Water source is from a well, unprotected spring, river or rainwater.
7. Uses firewood, charcoal or kerosene as a cooking fuel.
8. Can only buy one new piece of clothing per year.
9. Eats only one or two meals per day.
10. Consumes meat, milk or chicken only once per week.
11. Cannot meet health costs of the community health centre (*Puskesmas*).
12. Head of household who works as a farmer with less than 0.5 Ha of farmland, a landless farmer, fisherman, construction worker, plantation worker or has other employment with a salary of less than Rp. 600,000 per year.[55]
13. Household head's highest education is elementary school or none.
14. Does not have savings or liquid assets, such as a motorcycle, gold, livestock, boat, or other assets, with a total value more than Rp. 500,000.[56]
15. Type of the widest roof is shingle, tile, zinc, low quality asbestos, low quality roof, fibre or thatch.
16. Is often in debt to meet daily needs.

The second step in the PSM method is to calculate propensity score of each household for the beneficiaries and non-beneficiaries. Calculating the propensity score involves probit model estimation. In the case of the *Raskin* programme, the dependent variable for the probit model takes the value "1" if a household participated in *Raskin* and bought rice from it during the last 12 months, and "0" if otherwise. For the *Askeskin* programme, the dependent

[55] According to World Bank (2014), Rp. 9,141 was equal to USD 1 in 2007. Thus Rp. 600,000 was equal to USD 65.64.
[56] The value of Rp. 500,000 was equal to USD 54.70 in 2007.

variable takes the value "1" if a household has an *Askeskin* card, and "0" if not. The independent variables used are those chosen from step one which are significantly different. The definition of the estimated variables is presented in Appendix Table A.5.1. The propensity score predicts probability of a household to participate in the *Raskin* or *Askeskin* programme through the probit model (Caliendo & Kopeinig, 2008).

The third step is matching the propensity score. In this step, the estimated propensity score is used to define the 'match' of the beneficiaries to non-beneficiary comparison group. The beneficiary and non-beneficiary with similar value of propensity score will be matched (Gilligan et al., 2009). For matching the propensity score, several matching algorithms can be used. This study employs the Nearest Neighbour (NN) matching, as it is a most frequently used and straightforward matching algorithm (Caliendo & Kopeinig, 2008; Khandker et al., 2010). Three different model specifications for NN matching are used: i) matching with replacement where non-beneficiaries can be used as a match for different beneficiaries; ii) matching without replacement, where one non-beneficiary is used as a match only for one beneficiary; and iii) radius matching, or Caliper, where matching between beneficiary and non-beneficiary is limited to the propensity score within a certain range (Khandker et al., 2010). They also suggest the number of replacements is usually five within the radius (propensity score range) of 0.001.

After the beneficiaries and non-beneficiaries have been matched, PSM then compares consumption expenditure of the matched beneficiary household. The consumption mean difference of the matched household is the ATT of the *Raskin* and *Askeskin* programmes. In this study, the consumption is disaggregated into seven types of per capita per month expenditure. The first four consist of food consumption, including rice, meat and dairy, vegetables and tofu/tempeh consumption. The other three are medical, educational and household items spending. The expenditure for education includes school fees and other costs such as uniform, transportation and school supplies. The household items spending include laundry detergent, anti-mosquito and cleaning supplies.

The fourth step is assessing the matching quality. There are several assessment methods that can be applied such as a balancing test, a mean standardized bias comparison, a likelihood ratio (LR χ^2) test and pseudo-R^2 value (see D'agostino, 1998; Caliendo & Kopeinig, 2008). This study uses balancing test before and after matching of the model. The final model, before matching, should have significantly different characteristics between the beneficiaries and non-beneficiaries. After matching, the model should successfully control for the

differences, meaning that, there are no significantly different characteristics between the beneficiaries and non-beneficiaries. Based on the mean-standardized bias comparison, the good model should reduce the mean-standardized bias the most (D'agostino, 1998; Kassie, Shiferaw & Muricho, 2011).

Additionally, the LR χ^2 test and the pseudo-R^2 value comparison can also be used to assess the model. The LR χ^2 test is used for joint significance on all regressors in the probit model. "The test should not be rejected before, and should be rejected after matching" (Caliendo & Kopeinig, 2008, p. 49). The rejection of the LR χ^2 test after matching implies that statistically the variables tested through balancing test are not different between the beneficiaries and non-beneficiaries group. The pseudo-R^2 reflects how well the independent variables explain the probability of households to participate in the *Raskin* and *Askeskin* programmes. After matching, there should be no significantly different characteristics between the beneficiaries and non-beneficiaries of those programmes. Thus, the value of pseudo-R^2 should be fairly low in the balancing test after matching (Caliendo & Kopeinig, 2008; Kassie et al., 2011).

5.5 Empirical Results

The empirical results report the impact of food-based (*Raskin*) and health care (*Askeskin*) social safety nets on household consumption expenditure. The results are presented in two parts. The first set of results indicates the impact of *Raskin* programme for all households in the Western Provinces and specific for households in the agricultural sector. The second set of results indicates the impact of *Askeskin* programme for all Western Provinces households, and those in the agricultural sector.

5.5.1 Impact of the *Raskin* Programme, Food-based Social Safety Net

The first step in this analysis is selecting the characteristics of households that significantly influence their participation in the *Raskin* programme. Appendix Table A.5.2 presents the results of the t-tests for each characteristic in the case of all households in Western Provinces and the agricultural households. The estimated results show significant differences between the beneficiaries and non-beneficiaries of the *Raskin* programme.

Based on the results, the household heads and their spouses in Western Indonesia, who are the beneficiaries, mostly have primary level of education (*primary* and *sprimary*) compared to the non-beneficiary households. The beneficiaries are more likely to work in the

agricultural sector (*agri* and *sagri*), have a larger household size (*hhsize*), have a higher number of household members aged 65 or more (*hh65*) and are located in the rural areas (*rural*). The beneficiaries also have lower levels of expenditure per capita per month (*expend*), asset ownership and certain housing conditions. Those are the ones with smaller house size with lower levels of water source, toilet type, fuel for cooking, types of floor, wall and roof. The households mostly have farming land, no savings and have a total value lower than USD 50 in vehicle, jewellery and livestock.

In the agricultural households, the household heads and their spouses have primary education level, larger household size, lower expenditure level and poorer housing conditions compared to the non-beneficiaries. They tend to have lower levels of water source, toilet, fuel for cooking and roof type, as well as have no farming land, no saving, no vehicle and jewellery with a total value higher than USD 50.

The *Raskin* participants, which are the poor households, become entitled to other poverty reduction programmes, such as the unconditional cash transfer programme (*BLT*) and the health care social safety net, *Askeskin* (*SSNhc*). Likewise, the households receiving support from *BLT* and *Askeskin* are also most likely to be the beneficiaries of the *Raskin* programme. Those significantly different characteristics are included in the probit model which is presented in Appendix Table A.5.3.

Before discussing the impact of *Raskin* results, it is necessary to highlight the results of matching quality assessment. Table 5.1 presents the results for before and after matching balancing test for the households in the Western Provinces. The results show that some household characteristics are still statistically different between the beneficiaries and non-beneficiaries even after three types of matching: single nearest neighbour matching without replacement (Model 1); single nearest neighbour matching within radius 0.001 (Model 2); and the nearest neighbour matching with replacement within radius 0.001 (Model 3).

Table 5.1

Results for Balancing Test Before and After Matching, Raskin Programme, Western Indonesia

Variable	Before Matching		Model 1[1]		Model 2[2]		Model 3[3]	
	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat
Agehhd	5.076	18.73***	-0.140	-0.49	-0.024	-0.08	-0.318	-1.10
Sqagehhd	437.10	16.98***	-1.40	-0.05	12.20	0.43	-21.000	-0.73
Male	-0.014	-1.82*	0.006	0.74	0.004	0.48	0.007	0.89

(continued)

Table 5.1 (continued)

Variable	Before Matching		Model 1[1]		Model 2[2]		Model 3[3]	
	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat
spouse	0.064	7.73***	-0.003	-0.34	-0.005	-0.62	-0.003	-0.37
childhd	-0.016	-7.68***	-0.002	-1.29	-0.002	-1.44	0.000	0.39
agri	0.196	25.20***	0.001	0.14	-0.005	-0.51	-0.017	-1.78*
sagri	0.116	18.80***	0.002	0.21	-0.002	-0.26	0.002	0.23
selfemp	0.155	18.03***	-0.013	-1.41	-0.021	-2.18**	-0.022	-2.25**
sselfemp	0.025	4.16***	-0.021	-3.14***	-0.019	-2.71***	-0.017	-2.42**
primary	0.259	30.73***	-0.039	-4.13***	-0.039	-4.10***	-0.030	-3.10***
secondary	-0.178	-20.60***	0.036	4.16***	0.034	3.92***	0.030	3.44***
tertiary	-0.157	-28.77***	0.005	1.94*	0.005	1.94*	0.007	2.50**
sprimary	0.183	23.08***	-0.007	-0.76	-0.016	-1.75*	-0.015	-1.57
ssecondary	-0.108	-13.64***	0.012	1.57	0.010	1.27	0.015	1.86*
stertiary	-0.082	-20.02***	0.002	1.04	0.002	1.04	0.003	1.51
hhsize	0.489	15.81***	-0.102	-3.10***	-0.106	-3.19***	-0.092	-2.75***
sqhhsize	3.366	12.31***	-0.799	-2.60***	-0.787	-2.54***	-0.654	-2.12**
hh014	-0.139	-13.10***	-0.017	-1.91*	-0.015	-1.71*	-0.005	-0.59
hh1564	-0.077	-16.65***	0.009	1.78*	0.006	1.13	0.012	2.48**
hh65	0.036	9.68***	0.008	1.87*	0.011	2.42***	0.002	0.36
rural	0.279	32.52***	-0.032	-3.48***	-0.035	-3.75***	-0.034	-3.61***
expend	-2900000	-4.72***	-100000	-0.30	0	-0.29	0.000	-0.06
toilet	0.242	29.45***	-0.006	-0.65	-0.007	-0.75	-0.015	-1.56
waterdrink	0.075	13.91***	0.013	1.94*	0.012	1.83	0.003	0.43
water	0.108	17.91***	0.002	0.24	0.003	0.37	-0.009	-1.15
fuelcook	0.245	36.23***	-0.007	-1.71*	-0.007	-1.67*	-0.009	-2.06**
electric	-0.033	-9.79***	0.006	1.36	0.007	1.58	0.004	0.85
floor	0.072	10.15***	-0.038	-4.56***	-0.038	-4.48***	-0.031	-3.69***
wall	0.092	11.69***	-0.036	-3.99***	-0.035	-3.83***	-0.029	-3.20***
roof	0.143	18.54***	0.018	2.44***	0.018	2.43**	0.020	2.59***
housesize	-23.333	-4.04***	2.310	0.84	2.417	0.86	-1.887	-0.48
house	0.231	29.19***	-0.010	-1.37	-0.009	-1.20	-0.013	-1.81*
farmland	0.107	13.32***	0.004	0.48	0.002	0.26	-0.009	-0.96
nosaving	0.197	25.73***	-0.012	-1.84*	-0.013	-1.91	-0.011	-1.54
vehicle	0.239	27.67***	0.011	1.27	0.009	1.01	0.012	1.32
jewel	0.227	27.61***	-0.011	-1.41	-0.009	-1.16	-0.010	-1.33
livestock	-0.019	-5.34***	0.002	0.38	0.002	0.55	0.002	0.54
SSNhc	0.198	31.00***	0.024	2.92***	0.022	2.61***	0.024	2.85***
BLT	0.335	50.96***	0.019	2.01**	0.020	2.13**	0.028	3.06***
Pseudo-R^2	0.316		0.011		0.01		0.008	
LRχ^2	5481.62***		161.96***		150.13***		119.62***	
Mean Bias	33.2		3.1		3.2		3.2	
Bias Reduction			90.66%		90.36%		90.36%	

Note. *, **, *** The effect is significant at 10%, 5% and 1% level. [1]Model with single nearest neighbour matching, [2]Model with single nearest neighbour matching within radius 0.001, [3]Model with nearest neighbour matching and replacement (n=5) within radius 0.001, [4]Mean value difference between the beneficiaries and non-beneficiaries.

After matching, the significant LRχ^2 test (Table 5.1) shows that the joint significance of the variables cannot be rejected and statistically the variables remain different between the beneficiaries and non-beneficiaries. However, the estimated mean absolute standardized values are successfully reduced by approximately 90% in the three models. This shows that the models are quite useful and reduced the bias in estimating the impact of the *Raskin* programme (see D'agostino, 1998). After matching, the three models also present lower pseudo-R^2 values. The use of radius and replacement reduces the bias further (Grilli & Rampachini, 2011), thus Model 3 is chosen to indicate the impact of the *Raskin* programme in the Western Provinces of Indonesia. The estimated value for bias reduction indicate a reduction to 90.36% and the lowest pseudo-R^2 value after matching, with only 18 significantly different variables out of the total of 39.[57]

In the case of agricultural households, the results of balancing test before and after matching are presented in Table 5.2, which still reveal some statistical different characteristics between the beneficiaries and non-beneficiaries in all three models. The insignificant LRχ^2 test after matching in the third model shows that the variables are statistically not different between the beneficiaries and non-beneficiaries. The third model also provides reduction bias until 89.14% and the lowest pseudo-R^2 value after matching. Thus, the third model is chosen as the best model.

Table 5.2

Results for Balancing Test Before and After Matching, Raskin Programme, Agricultural Households

Variable	Before Matching		Model 1[1]		Model 2[2]		Model 3[3]	
	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat
Agehhd	2.446	4.74***	0.372	0.80	0.145	0.29	-0.024	-0.05
Sqagehhd	239	4.71***	22	0.48	5	0.10	-5.900	-0.12
Male	-0.031	-2.55**	-0.005	-0.47	0.003	0.24	0.009	0.77
Primary	0.081	4.76***	-0.064	-4.39***	-0.062	-3.90***	-0.045	-2.85***
Secondary	-0.123	-8.12***	0.043	3.61***	0.047	3.54***	0.038	2.80***
Tertiary	-0.027	-6.35***	0.002	1.29	0.003	1.29	0.003	1.71*
Sprimary	0.047	2.69***	0.000	0.03	-0.007	-0.43	-0.010	-0.59
Ssecondary	-0.089	-6.54***	-0.008	-0.75	-0.001	-0.09	0.008	0.66
Stertiary	-0.022	-5.72***	0.000	0.26	0.000	0.00	0.001	0.42
Hhsize	0.219	3.80***	-0.007	-0.14	0.056	1.00	0.017	0.31

(continued)

[57] The value of mean-standardized bias before and after matching, the likelihood ratio (LR χ^2) test and the pseudo-R^2 value are compared to choose the model, among three models of matching, that is used in estimating the impact of *Raskin* programme.

Table 5.2 (continued)

Variable	Before Matching		Model 1[1]		Model 2[2]		Model 3[3]	
	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat
sqhhsize	1.685	3.25***	-0.290	-0.61	0.190	0.37	-0.063	-0.12
hh1564	-0.041	-4.65***	0.008	0.99	0.001	0.17	0.004	0.47
hh65	0.024	3.08***	-0.009	-1.27	-0.010	-1.30	-0.005	-0.69
rural	0.072	5.41***	0.027	2.35*	0.028	2.21*	0.018	1.47
expend	-1180000	-3.29***	90000	1.30	110000	1.34	110000	1.25
toilet	0.115	6.69***	-0.010	-0.66	-0.008	-0.47	-0.004	-0.26
waterdrink	0.054	3.79***	-0.010	-0.75	0.000	0.00	-0.011	-0.78
water	0.071	4.58***	-0.004	-0.27	0.007	0.48	-0.004	-0.30
fuelcook	0.078	10.49***	0.004	0.94	0.004	0.86	0.002	0.43
floor	-0.030	-1.76*	-0.008	-0.51	-0.003	-0.21	0.003	0.21
wall	-0.046	-2.65***	-0.017	-1.14	-0.010	-0.63	0.007	0.42
roof	0.249	16.58***	-0.021	-1.84*	-0.026	-2.01*	-0.020	-1.57
house	0.083	7.35***	0.002	0.27	0.003	0.34	-0.001	-0.09
farmland	-0.029	-1.69*	-0.017	-1.16	-0.009	-0.54	-0.019	-1.20
nosaving	0.089	7.57***	0.009	1.01	0.007	0.69	0.005	0.51
vehicle	0.168	10.57***	0.024	1.82*	0.019	1.26	0.014	0.96
jewel	0.156	10.90***	0.011	0.94	0.013	1.03	0.004	0.29
SSNhc	0.169	12.14***	-0.001	-0.07	0.004	0.28	0.020	1.48
BLT	0.305	19.93***	0.011	0.71	0.008	0.48	0.015	0.96
Pseudo-R^2	0.208		0.011		0.011		0.006	
LRχ^2	960.44***		67.29***		53.86***		32.67	
Mean Bias	22.1		2.9		2.6		2.4	
Bias Reduction			86.88%		88.24%		89.14%	

Note. *, **, *** The effect is significant at 10%, 5% and 1% level. [1]Model with single nearest neighbour matching, [2]Model with single nearest neighbour matching within radius 0.001, [3]Model with nearest neighbour matching and replacement (n=5) within radius 0.001, [4]Mean value difference between the beneficiaries and non-beneficiaries.

The results of impact evaluation of the *Raskin* programme on household consumption expenditure, that is, rice, meat and dairy products, vegetables and fruits, tofu and tempeh, household items, medical and school consumption are presented in Table 5.3. The effects of the programme for each category are presented in the three models of matching. The estimated results are for the households in the Western Provinces and the agricultural households.

In general, the three models of matching estimates show similar results. According to the assessment of matching quality, the third model has been chosen as the model estimation. Model 3 results suggest that *Raskin* programme significantly increases rice consumption per capita per month of the beneficiaries in Western Indonesia by Rp. 6,732 and raises tofu and tempeh consumption per capita per month by Rp. 2,048. This suggests that subsidized price of rice through *Raskin* programme encourages the beneficiary households to increase their

consumption of rice and other food which is tofu and tempeh. Tofu and tempeh are one of the main sources of protein and are relatively cheaper than meat and dairy products. Even though the estimated meat and dairy products category is not significant, the *Raskin* programme suggests a decline in the meat and dairy products consumption per capita per month by Rp. 3,714. The weak positive effects of the programmes also appear in household items and education consumption per capita per month by *Raskin* beneficiaries which increase by Rp. 25,065 and Rp. 8,670, respectively. These findings imply that the beneficiaries may reallocate their expenditure to consume more of the household items and education.

Table 5.3

Impact on Household Consumption Expenditure, Raskin programme

Part A: Western Indonesia						
Outcome	Model 1[1]		Model 2[2]		Model 3[3]	
	Effect	T-stat	Effect	T-stat	Effect	T-stat
Rice	9051.80	4.32***	8904.69	4.42***	6731.56	3.25***
Meat and Dairy Products	-1466.23	-0.34	-1268.52	-0.30	-3714.27	-0.82
Vegetables and Fruits	-555.15	-0.17	-485.93	-0.15	-510.30	-0.20
Tofu and Tempeh	1994.30	2.15**	2105.87	2.25**	2047.55	1.99**
Household Items	28303.46	1.45	29093.15	1.45	25064.77	0.78
Medical	-1438.48	-0.23	-1332.34	-0.22	776.09	0.14
School	7099.63	0.34	8001.86	0.39	8670.18	0.52
Part B: Agricultural Households						
Outcome	Model 1[1]		Model 2[2]		Model 3[3]	
	Effect	T-stat	Effect	T-stat	Effect	T-stat
Rice	8523.83	2.24**	9564.12	2.81**	9763.75	3.35***
Meat and Dairy Products	-6791.36	-1.94**	-7860.27	-2.65**	-7124.28	-2.64***
Vegetables and Fruits	275.08	0.17	-304.50	-0.21	-403.70	-0.30
Tofu and Tempeh	670.79	1.00	350.87	0.58	237.43	0.44
Household Items	15251.61	0.98	17982.99	0.98	18033.72	0.98
Medical	2468.03	0.79	3140.97	0.95	1911.74	0.43
School	-4274.90	-0.14	-9242.84	-0.35	-4503.49	-0.23

Note. The effect is in Rupiah (According to World Bank (2014), Rp. 9,141 was equal to USD 1 in 2007). *, **, *** The effect is significant at 10%, 5% and 1% level. [1]Model with single nearest neighbour matching, [2]Model with single nearest neighbour matching within radius 0.001, [3]Model with nearest neighbour matching and replacement (n=5) within radius 0.001.

In the case of agricultural households, based on model 3, the *Raskin* programme significantly increases rice consumption per capita per month by Rp. 9,764. The increase in rice consumption by *Raskin* beneficiaries in the agricultural sector is compensated by a reduction in meat and dairy products consumption per capita per month by Rp. 7,124. Although it is not significant, the programme also suggests an increase in household items consumption per capita per month by Rp. 18,034. This implies that the *Raskin* programme causes indirect

additional income and leads to a reallocation of household spending. The beneficiary households tend to shift their spending to rice and household items and reduce their expenditure on meat and dairy products.

5.5.2 Impact of *Askeskin* Programme, Health Care Social Safety Net

This section discusses the impact of the *Askeskin* programme on household consumption expenditure for the households in the Western Provinces and the agricultural households. The beneficiaries are poor households who receive assistance from the *Askeskin* programme and live in the Western Provinces of Indonesia. The first step is to select the characteristics that are significantly different between the beneficiaries and non-beneficiaries of the *Askeskin* programme. Selecting these variables to be included in the probit model reduces the bias and increases the efficiency in estimating the propensity score. The estimated results of the t-tests for households in the Western Provinces and the agricultural households are shown in Appendix Table A.5.4. Results of probit model are presented in Appendix Table A.5.5.

According to estimated t-values (Table A.5.4), *Askeskin* beneficiaries' household heads and their spouses in Western Indonesia, mostly have primary educational level *(primary* and *sprimary)* compared to the non-beneficiaries. The beneficiaries have larger households size (*hhsize*) with higher number of people aged 65 or older (*hh65*). They are mostly located in rural area and more likely to work in the agricultural sector (*agri* and *sagri*) with farming land. The beneficiary households have lower levels of consumption expenditure (*expend)*, water source, toilet type, cooking fuel, types of floor and wall. The households also have smaller house size and no vehicle and jewellery with a value higher than USD 50. They are more likely to have chronic diseases, including hypertension, asthma, cancer and arthritis.

In the case of agricultural households, the beneficiary household heads mostly have primary education level compare to the non-beneficiary households. The beneficiaries have larger household size, lower levels of asset value, fuel for cooking and types of toilet, floor, wall and roof type with no farming land, and no vehicle or jewellery that has a value more than USD 50. Mostly, the households also have chronic health conditions including diabetes and heart disease. The households who benefit from the *Askeskin* programme are eligible and likely to be participants in other poverty reduction programmes such as *Raskin* (*SSNfb)*, *BLT*

and Health Fund.[58] Those characteristics determine Indonesian households in Western Indonesia and in the agricultural ones to receive *Askeskin* programme.

The matching model assessment is discussed first to evaluate the models. Table 5.4 presents the results of balancing test before and after matching for the households in Western Indonesia. These are the same three matching models as in the previous section: the single nearest neighbour matching without replacement (Model 1), the single nearest neighbour matching within radius 0.001 (Model 2) and the nearest neighbour matching with replacement within radius 0.001 (Model 3).

Table 5.4

Results for Balancing Test Before and After Matching, Askeskin Programme, Western Indonesia

Variable	Before Matching		Model 1[1]		Model 2[2]		Model 3[3]	
	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat
Agehhd	4.314	11.74***	-0.902	-1.88*	-0.943	-1.94*	0.001	0.00
Sqagehhd	382.4	10.97***	-86.5	-1.80*	-88.9	-1.83*	-3.600	-0.07
Male	-0.019	-1.93**	0.001	0.07	0.003	0.26	0.001	0.11
Spouse	0.019	1.67*	0.003	0.20	0.003	0.20	-0.003	-0.19
Childhd	-0.008	-3.04***	0.002	1.09	0.002	1.09	-0.002	-0.63
Agri	0.096	8.96***	-0.021	-1.39	-0.018	-1.18	-0.014	-0.91
Sagri	0.057	6.83***	0.002	0.20	0.003	0.28	-0.002	-0.19
Selfemp	0.081	6.95***	-0.019	-1.25	-0.016	-1.01	0.004	0.27
Primary	0.161	13.78***	-0.008	-0.50	-0.007	-0.44	-0.014	-0.88
Secondary	-0.122	-10.42***	0.004	0.31	0.004	0.27	0.004	0.29
Tertiary	-0.095	-12.59***	0.000	-0.09	0.000	-0.09	0.003	0.60
Sprimary	0.115	10.59***	-0.006	-0.42	-0.009	-0.58	-0.004	-0.27
Ssecondary	-0.097	-9.10***	0.008	0.64	0.007	0.56	-0.002	-0.20
Stertiary	-0.043	-7.67***	0.002	0.55	0.002	0.55	0.003	0.62
Hhsize	0.360	8.61***	0.000	0.00	-0.002	-0.04	0.027	0.48
Sqhhsize	2.801	7.59***	-0.049	-0.09	-0.061	-0.12	0.174	0.32
hh014	-0.076	-5.29***	-0.028	-1.70*	-0.028	-1.65*	-0.028	-1.65
hh1564	-0.053	-8.38***	-0.006	-0.68	-0.007	-0.78	-0.002	-0.21
hh65	0.031	6.16***	-0.008	-1.05	-0.007	-0.91	-0.003	-0.35
Rural	0.095	7.97***	-0.009	-0.59	-0.007	-0.47	-0.013	-0.84
Expend	- 1,700,000	-2.17**	280,000	1.03	270,000	1.03	200,000	0.51
Toilet	0.207	18.37***	0.015	0.93	0.017	1.07	0.010	0.65

(continued)

[58] The beneficiaries are also part of the Health Fund (*Dana Sehat*) which is the older programme designed to maintain public health promoted by the Ministry of Health Republic of Indonesia. The health fund programme is a voluntary-based, self-financing programme, which provides health insurance to the people. Members of this programme pay relatively low premiums using cash, handicrafts or crops. Its participants are mostly farmers, fishermen and students, and because the premiums are low the health services offered are limited (World Bank, 2004).

Table 5.4 (continued)

Variable	Before Matching		Model 1[1]		Model 2[2]		Model 3[3]	
	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat
waterdrink	0.031	4.24***	0.007	0.66	0.010	0.99	0.006	0.60
water	0.061	7.46***	0.014	1.14	0.016	1.31	0.010	0.79
fuelcook	0.149	15.73***	-0.003	-0.37	-0.005	-0.62	-0.005	-0.60
electric	-0.031	-6.83***	-0.011	-1.46	-0.010	-1.41	-0.002	-0.27
floor	0.107	11.21***	-0.011	-0.79	-0.011	-0.76	-0.023	-1.58
wall	0.147	13.85***	-0.008	-0.51	-0.007	-0.45	-0.009	-0.60
housesize	-16.163	-2.08**	4.919	0.95	5.051	0.96	3.458	0.53
house	0.123	11.21***	-0.011	-0.88	-0.010	-0.80	0.005	0.40
farmland	0.023	2.11**	-0.016	-1.11	-0.015	-1.02	-0.005	-0.34
nosaving	0.123	11.66***	-0.001	-0.13	-0.001	-0.13	-0.004	-0.31
vehicle	0.201	17.03***	0.000	0.00	0.000	0.00	-0.002	-0.16
jewel	0.151	13.30***	0.000	0.00	0.002	0.19	-0.010	-0.79
SSNfb	0.357	31.00***	0.010	0.74	0.010	0.74	0.009	0.61
BLT	0.367	40.11***	0.000	-0.03	0.000	-0.03	0.002	0.10
healthfund	0.033	5.01***	0.007	0.75	0.005	0.52	0.000	0.00
hypertension	0.024	3.87***	-0.001	-0.06	-0.001	-0.07	0.001	0.07
asthma	0.005	2.00**	-0.001	-0.29	0.000	0.02	0.001	0.39
Cancer	0.002	2.25**	-0.001	-0.42	0.001	0.42	-0.001	-0.49
Arthritis	0.022	4.50***	-0.007	-1.01	-0.005	-0.70	0.001	0.17
Pseudo-R^2	0.157		0.005		0.005		0.003	
LRχ^2	1770.27***		29.07		28.95		15.02	
Mean Bias	22.7		2		2		1.4	
Bias Reduction			91.12%		91.12%		93.83%	

Note. *, **, *** The effect is significant at 10%, 5% and 1% level. [1]Model with single nearest neighbour matching, [2]Model with single nearest neighbour matching within radius 0.001, [3]Model with nearest neighbour matching and replacement (n=5) within radius 0.001, [4]Mean value difference between the beneficiaries and non-beneficiaries.

Table 5.4 shows that there are a number of significant differences between beneficiary and non-beneficiary characteristics in Model 1 and Model 2. However in Model 3, the bias has been reduced significantly, which is shown by characteristic differences being insignificant between the beneficiaries and non-beneficiaries. Therefore, it can be concluded that Model 3 is the best model. In addition, after matching, the LRχ^2 test of model 3 concludes that statistically the characteristics of the beneficiaries and non-beneficiaries are not different. Model 3 also shows a reduction bias of 93.83%, with the lowest pseudo-R^2 value.

The results of balancing test using before and after matching comparison in the case of agricultural households are shown in Table 5.5. All the different characteristics between the beneficiaries and non-beneficiaries of *Askeskin* programme have been controlled after matching, so statistically there are no significantly different variables in these three models of matching. The insignificant LRχ^2 test after matching, in Table 5.5, shows that the joint

significance test has been rejected. In this case, selecting the best model is based on bias reduction and low values of pseudo-R^2 after matching. Model 3 provides the lowest value of pseudo-R^2 after matching, and a reduction in mean standardized bias up to 88.27%. Thus, model 3 is chosen as the model estimation.

Table 5.5

Results for Balancing Test Before and After Matching, Askeskin Programme, Agricultural Households

Variable	Before Matching		Model 1[1]		Model 2[2]		Model 3[3]	
	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat	Diff[4]	T-stat
Agehhd	1.800	2.92***	1.081	1.43	0.972	1.26	0.415	0.54
Sqagehhd	155.100	2.55**	101.800	1.35	92.700	1.20	40.200	0.52
Primary	0.058	2.85***	-0.011	-0.44	-0.017	-0.66	-0.020	-0.77
Secondary	-0.085	-4.66***	-0.022	-1.04	-0.014	-0.66	-0.002	-0.10
Tertiary	-0.010	-2.04**	0.000	0.00	0.000	0.00	-0.001	-0.26
Ssecondary	-0.063	-3.86***	-0.034	-1.79**	-0.032	-1.66*	-0.014	-0.71
Stertiary	-0.008	-1.84*	0.005	2.00**	0.006	2.00**	-0.001	-0.22
Hhsize	0.157	2.28**	-0.073	-0.81	-0.092	-1.01	-0.080	-0.88
Sqhhsize	1.322	2.14**	-0.643	-0.77	-0.804	-0.94	-0.760	-0.89
hh1564	-0.031	-2.88***	-0.006	-0.47	-0.006	-0.44	0.002	0.17
Toilet	0.095	4.59***	-0.001	-0.05	-0.001	-0.05	0.001	0.03
Fuelcook	0.035	3.91***	-0.003	-0.37	0.000	0.00	0.003	0.33
Electric	-0.036	-3.02***	0.000	0.00	0.006	0.33	-0.001	-0.08
Floor	0.074	3.70***	-0.023	-0.90	-0.021	-0.81	-0.015	-0.58
Wall	0.084	4.03***	0.007	0.26	0.014	0.53	0.000	0.02
Roof	0.034	1.82*	0.027	1.19	0.031	1.33	0.014	0.60
House	0.027	1.99**	-0.005	-0.36	-0.007	-0.45	0.004	0.27
Farmland	-0.067	-3.29***	0.007	0.26	0.001	0.05	0.018	0.66
Vehicle	0.149	7.79***	0.001	0.07	0.000	0.00	0.009	0.41
Jewel	0.095	5.51***	0.007	0.36	0.008	0.44	0.000	0.00
SSNfb	0.241	12.14***	0.008	0.39	0.008	0.39	0.009	0.43
BLT	0.325	17.54***	-0.007	-0.26	-0.007	-0.27	-0.001	-0.02
Healthfund	0.037	3.62***	0.010	0.64	0.011	0.81	0.004	0.25
Diabetes	-0.006	-2.50**	0.000	0.00	0.000	0.00	0.000	-0.11
Heart	-0.007	-1.83*	-0.008	-1.82*	-0.008	-1.82*	-0.006	-1.41
Pseudo-R2	0.107		0.009		0.01		0.003	
LR chi2	381.74***		18.46		18.84		6.51	
Mean Bias	17.9		3.4		3.5		2.1	
Bias Reduction			81.01%		80.45%		88.27%	

Note. *, **, *** The effect is significant at 10%, 5% and 1% level. [1]Model with single nearest neighbour matching, [2]Model with single nearest neighbour matching within radius 0.001, [3]Model with nearest neighbour matching and replacement (n=5) within radius 0.001, [4]Mean value difference between the beneficiaries and non-beneficiaries.

The effects of *Askeskin* programme on consumption expenditure of households in the Western Provinces of Indonesia and agricultural households are shown in Table 5.6. In general, the three matching models show similar results, although there are few results that show different signs among those matching models. Since in model 3 the bias has been reduced the most, the *Askeskin'*s impact analysis is based on model 3 results.

Table 5.6

Impact on Household Consumption Expenditure, Askeskin programme

Part A: Western Indonesia						
Outcome	Model 1[1]		Model 2[2]		Model 3[3]	
	Effect	T-stat	Effect	T-stat	Effect	T-stat
Rice	868.03	0.39	938.48	0.42	2605.26	1.48
Meat and Dairy Products	3927.95	0.45	3920.41	0.44	4397.61	0.51
Vegetables and Fruits	-2337.1	-1.6	-2542.06	-1.75**	-788.99	-0.69
Tofu and Tempeh	1946.68	0.9	1925.92	0.88	2006.59	0.93
Household Items	35907.64	0.69	36547.55	0.69	41263.9	0.81
Medical	-80.44	-0.01	-79.18	-0.01	-3294.38	-0.5
School	5871.82	0.25	5893.9	0.25	3773.11	0.2
Part B: Agricultural Households						
Outcome	Model 1[1]		Model 2[2]		Model 3[3]	
	Effect	T-stat	Effect	T-stat	Effect	T-stat
Rice	2332.64	0.85	2815.34	1.05	532.18	0.22
Meat and Dairy Products	-1704.63	-0.6	-1236.26	-0.43	-175.16	-0.07
Vegetables and Fruits	-1010	-0.65	-1105.27	-0.7	322.42	0.28
Tofu and Tempeh	-702.31	-1.03	-693.46	-1	-242.68	-0.47
Household Items	76.61	0.26	133.31	0.44	139.48	0.52
Medical	182.73	0.11	218.23	0.13	-5299.42	-0.93
School	737.52	0.11	564.91	0.08	-2725.61	-0.23

Note. The effect is in Rupiah (According to World Bank (2014), Rp. 9,141 was equal to USD 1 in 2007).
*, **, *** The effect is significant at 10%, 5% and 1% level. [1]Model with single nearest neighbour matching, [2]Model with single nearest neighbour matching within radius 0.001, [3]Model with nearest neighbour matching and replacement (n=5) within radius 0.001.

According to the results (Table 5.6), there is not enough evidence to conclude that the *Askeskin* programme has an impact on the consumption expenditure per capita per month of the beneficiaries in Western Indonesia and the agricultural sector. However, in the case of households in Western Indonesia, there is a weak positive impact from the programme on rice, while tofu/tempeh, household items and meat and dairy products consumption per capita per month are also positive. The results show an increase on rice, tofu/tempeh, household items and meat and dairy products consumption per capita per month by Rp. 2,605, Rp. 2,007, Rp. 41,264 and Rp. 4,398, respectively. The results also suggest that the *Askeskin* programme may reduce medical expenditures of the beneficiaries in Western

Indonesia by Rp. 3,294 and vegetables and fruits consumption expenditure by Rp. 789, even though the results are not statistically significant (Table 5.6).

In the case of agricultural households, although there are no significant impacts, the *Askeskin* programme indicates contribution to the decrease of medical expenses and the increase of household items consumption per capita per month of its beneficiaries. The *Askeskin* programme may reduce their consumption expenditure on medical care by Rp. 5,299 and increase their household items consumption expenditure by Rp. 139. The *Askeskin* programme provides fee waiver for health services of the poor households, as one major goal of the programme is to assist the poor households in accessing health services and improving their health condition. The results indicate that *Askeskin* can help the beneficiaries to reduce their medical spending, which usually can be costly if they are not covered by the programme, and allow them to reallocate their financial resources on non-medical items.

5.6 Conclusion

Consumption expenditure is one of the key indicators of welfare. This part of the study evaluates the impact of food-based (*Raskin*) and health care (*Askeskin*) social safety nets on household consumption expenditure. Households which are beneficiaries of the *Raskin* and *Askeskin* programmes have lower educational level, larger household size, are located in rural areas and work in the agricultural sector. Furthermore, they have a low economic status, spend less on consumption per capita per month, have low assets ownership and live in poor housing conditions. Moreover, they are beneficiaries of other poverty reduction programmes such as unconditional cash transfers from the government. Especially for the *Askeskin* programme whose beneficiaries are most likely to become sick due to existing chronic health symptoms.

The results suggest that the *Raskin* programme significantly affects beneficiaries' consumption expenditure. The cheaper price of rice significantly contributes to higher households spending on rice and tofu/tempeh. Therefore, programme purposes to meet the poor households' basic need and prevent decreasing protein consumption have been met. The results then imply that tofu/tempeh is an important commodity to meet the poor households' basic needs for protein. Thus it is important for the government to keep the stable price of tofu and tempeh.

In the case of agricultural households, the results are slightly different. The agricultural households use surplus cash generated from the subsidised rice programme to buy more rice,

but they spend less on meat and dairy products. This outcome may be due to the relatively high price of meat and dairy products.

There is not enough evidence to conclude that the *Askeskin* programme affects the consumption expenditure of its beneficiaries. However, for households in Western Indonesia, a weak effect was found in the case of the consumption of rice, tofu and tempeh, household items and meat and dairy products, which appeared to increase. The *Askeskin* programme also may reduce the beneficiaries' expenditure of medical care and vegetables and fruit. The programme provides waivers for health care fees for poor households, which should reduce spending on medical care and allow that to be reallocated to other needs. In the case of agricultural households, the *Askeskin* programme may reduce its beneficiaries' expenditure of medical care and increase their consumption expenditure on household items. Although there is a lack of clear evidence, the results suggest that the programme may be achieving its target to reduce poor households' health expenditure. However, its broader welfare goals are not being met. Therefore, the programme may need some adjustments to better implement the programme and more accurately target households in need to generate a broader significant increase of welfare.

Appendix 5.1

Appendix Table A.5.1 presents the description of variables used in this study.

Table A.5.1

Variable Definition

Variable	Description
agehhd/sqagehhd	Age of the household head (years)/ Squared age of household head
male/spouse	1 = HH head is male, 0=otherwise/ 1 = HH head has spouse, 0=otherwise
Childhd	1 = HH head is childe (under 18), 0=otherwise
agri/sagri	1 = HH head works in agricultural sector, 0=otherwise/ 1 = HH head's spouse works in agricultural sector, 0=otherwise
selfemp/sselfemp	1 = HH head and HH head's spouse work as self-employed worker, 0=otherwise
primary	1 = HH head's highest education level is primary, 0=otherwise
secondary	1 = HH head's highest education level is secondary, 0=otherwise
Tertiary	1 = HH head's highest education level is tertiary, 0=otherwise
sprimary	1 = Spouse's highest education level is primary, 0=otherwise
ssecondary	1 = Spouse's highest education level is secondary, 0=otherwise
stertiary	1 = Spouse's highest education level is tertiary, 0=otherwise
hhsize/sqhhsize	Number of household members/ Squared number of household size
hh014	Share of household member aged 0-14 years old
hh1564	Share of household member aged 15-64 years old
hh65	Share of household member aged > 65 years old
Rural	Location of household (1=rural, 0=urban)
Expend	Expenditure per capita per month (Rupiah)
Toilet	1=Household has lower type of toilet, 0=otherwise
waterdrink	1=Household has lower type of water drink source, 0=otherwise
Water	1=Household has lower type of non-drinking water source (such as for bathing and laundry), 0=otherwise
fuelcook	1=Household has lower type of fuel for cooking, 0=otherwise
Electric	1= Household has electricity access, 0=otherwise
Floor	1=Household has lower type of floor, 0=otherwise
Wall	1=Household has lower type of wall, 0=otherwise
Roof	1=Household has lower type of roof, 0=otherwise
housesize	The size of house (m2)
House	1= Household has house as household asset, 0=otherwise
farmland	1= Household has farming land, 0=otherwise
nosaving	1=Household does not have savings up to a minimum value of USD 50 , 0=otherwise
Vehicle	1=Household does not have vehicle up to a minimum value of USD 50 , 0=otherwise
Jewel	1=Household does not have jewellery up to a minimum value of USD 50 , 0=otherwise
livestock	1=Household does not have livestock up to a minimum value of USD 50 , 0=otherwise
SSNfb	1=household bought rice from *Raskin* during past year, 0=otherwise
SSNhc	1=household has *Askeskin* card, 0=otherwise
BLT	1=household has *BLT* card (unconditional cash transfer), 0=otherwise
healthfund	1=household join health fund programme, 0=otherwise
TBC	1=household experience per capita chronic health (TBC), 0=otherwise
hypertension	1=household experience per capita chronic health (Hypertension), 0=otherwise

(continued)

Table A.5.1 (continued)

Variable	Description
diabetes	1=household experience per capita chronic health (Diabetes), 0=otherwise
Asthma	1=household experience per capita chronic health (Asthma), 0=otherwise
Heart	1=household experience per capita chronic health (Heart attack/Heart disease) 0=otherwise
Stroke	1=household experience per capita chronic health (Stroke), 0=otherwise
Liver	1=household experience per capita chronic health (Liver disease), 0=otherwise
Cancer	1=household experience per capita chronic health (Cancer/Malignant Tumor), 0=otherwise
arthritis	1=household experience per capita chronic health (Arthritis or Rheumatism), 0=otherwise
uricacid	1=household experience per capita chronic health (Uric Acid or Gout), 0=otherwise

Appendix 5.2

Appendix Table A.5.2 presents the result of t-test to choose the significantly different characteristic between the beneficiaries and non-beneficiaries in the case of *Raskin* programme. The results are for households in Western Indonesia and agricultural households.

Table A.5.2

Variables Selection between Beneficiaries and Non-Beneficiaries of Raskin Programme

Variable	Part 1: Western Indonesia			Part 2: Agricultural Households		
	Mean Value		t-stat	Mean Value		t-stat
	Beneficiaries	Non-Beneficiaries		Beneficiaries	Non-Beneficiaries	
Agehhd	45.410	40.334	-18.731***	47.041	44.595	-4.741***
Sqagehhd	2292.13	1855.03	-16.976***	2437.13	2198.09	-4.708***
Male	0.767	0.781	1.823*	0.849	0.879	2.546**
Spouse	0.718	0.653	-7.735***	0.787	0.789	0.106
Childhd	0.005	0.020	7.683***	0.002	0.003	0.670
Agri	0.384	0.188	-25.205***	-	-	-
Sagri	0.207	0.091	-18.803***	-	-	-
Selfemp	0.468	0.313	-18.031***	0.711	0.727	1.000
Sselfemp	0.142	0.117	-4.163***	0.134	0.125	-0.720
Primary	0.537	0.278	-30.727***	0.624	0.542	-4.761***
Secondary	0.303	0.481	20.599***	0.210	0.333	8.116***
Tertiary	0.023	0.180	28.773***	0.005	0.031	6.349***
Sprimary	0.392	0.208	-23.077***	0.479	0.432	-2.687***
Ssecondary	0.214	0.323	13.645***	0.157	0.246	6.542***
Stertiary	0.011	0.093	20.018***	0.004	0.025	5.716***
Hhsize	3.664	3.175	-15.807***	3.719	3.500	-3.805***
Sqhhsize	16.419	13.053	-12.305***	16.591	14.906	-3.255***
hh014	0.358	0.497	13.099***	0.353	0.380	1.509
hh1564	0.637	0.714	16.647***	0.643	0.684	4.646***
hh65	0.089	0.053	-9.677***	0.094	0.069	-3.082***
Rural	0.616	0.337	-32.521***	0.848	0.776	-5.407***
Expend	1038795	3885507	4.716***	624561	1754515	3.292***
Toilet	0.481	0.238	29.445***	0.596	0.480	-6.693***
Waterdrink	0.146	0.071	-13.914***	0.234	0.180	-3.790***
Water	0.195	0.087	-17.914***	0.296	0.225	-4.581***
Fuelcook	0.942	0.697	-36.231***	0.980	0.902	-10.487***
Electric	0.943	0.977	9.792***	0.902	0.915	1.357
Floor	0.238	0.166	-10.148***	0.355	0.384	1.757*
Wall	0.321	0.229	-11.685***	0.442	0.488	2.648***
Roof	0.824	0.680	-18.537***	0.821	0.572	-16.584***
Housesize	72.459	95.792	4.036***	73.585	74.116	0.085
House	0.834	0.604	-29.192***	0.912	0.829	-7.349***
Farmland	0.345	0.238	-13.322***	0.595	0.624	1.692**
Nosaving	0.850	0.653	-25.727***	0.902	0.813	-7.568***
Vehicle	0.695	0.456	-27.671***	0.753	0.584	-10.572***
Jewel	0.788	0.561	-27.614***	0.836	0.679	-10.900***
Livestock	0.946	0.966	5.340***	0.907	0.918	1.092
SSNhc	0.274	0.076	-30.999***	0.276	0.106	-12.140***
BLT	0.392	0.057	-50.956***	0.430	0.124	-19.932***
Healthfund	0.080	0.087	1.554	0.068	0.061	-0.844
Total Sample	5,555	7,111		1,335	2,134	

Note. *, **, *** The effect is significant at 10%, 5% and 1% level.

Appendix 5.3

Appendix Table A.5.3 presents the result of probit model in the case of *Raskin* programme's impact on total households' consumption expenditure. The dependent variable takes value 1 if a household, in Western Indonesia or agricultural sector, bought rice from *Raskin* during past year and 0 if otherwise.

Table A.5.3

Result of Probit Model, Raskin Programme

Independent Variable	Part 1: Western Indonesia				Part 2: Agricultural Households			
	Coef.	SE	z	P>z	Coef.	SE	z	P>z
Constant	-2.386	0.199	-12.00	0.000***	-1.658	0.348	-4.77	0.000***
agehhd	0.005	0.006	0.81	0.417	-0.012	0.011	-1.08	0.278
sqagehhd	0.000	0.000	-1.13	0.260	0.000	0.000	1.26	0.209
male	-0.298	0.043	-6.96	0.000***	-0.180	0.081	-2.21	0.027**
spouse	0.296	0.069	4.30	0.000***	-	-	-	-
childhd	-0.388	0.138	-2.81	0.005***	-	-	-	-
agri	0.025	0.037	0.68	0.496	-	-	-	-
sagri	-0.042	0.044	-0.94	0.346	-	-	-	-
selfemp	0.014	0.030	0.46	0.647	-	-	-	-
sselfemp	0.078	0.041	1.90	0.057*	-	-	-	-
primary	0.025	0.050	0.51	0.609	-0.001	0.077	-0.02	0.986
secondary	-0.220	0.055	-3.98	0.000***	-0.208	0.095	-2.19	0.028**
tertiary	-0.658	0.080	-8.28	0.000***	-0.929	0.268	-3.46	0.001***
sprimary	-0.066	0.060	-1.09	0.276	-0.014	0.062	-0.22	0.824
ssecondary	-0.182	0.067	-2.73	0.006***	-0.065	0.083	-0.79	0.432
stertiary	-0.602	0.105	-5.74	0.000***	-0.606	0.258	-2.35	0.019**
hhsize	0.201	0.033	6.04	0.000***	0.225	0.060	3.77	0.000***
sqhhsize	-0.015	0.003	-4.62	0.000***	-0.017	0.006	-2.99	0.003***
hh014	-0.064	0.027	-2.38	0.018**	-	-	-	-
hh1564	-0.263	0.084	-3.12	0.002***	-0.017	0.155	-0.11	0.912
hh65	-0.066	0.132	-0.50	0.618	-0.076	0.231	-0.33	0.742
rural	0.302	0.032	9.37	0.000***	0.137	0.074	1.85	0.065*
expend	0.000	0.000	-2.26	0.024**	0.000	0.000	-2.02	0.043**
toilet	0.122	0.031	3.91	0.000***	-0.011	0.052	-0.21	0.834
waterdrink	0.184	0.061	3.00	0.003***	0.289	0.089	3.27	0.001***
water	-0.002	0.056	-0.03	0.977	-0.016	0.082	-0.19	0.849
fuelcook	0.639	0.043	15.01	0.000***	0.666	0.121	5.51	0.000***
electric	0.234	0.072	3.27	0.001***	-	-	-	-
floor	-0.188	0.044	-4.28	0.000***	-0.186	0.064	-2.89	0.004***
wall	-0.085	0.041	-2.09	0.036**	-0.130	0.063	-2.04	0.041***
roof	0.552	0.036	15.42	0.000***	0.717	0.058	12.29	0.000***
housesize	0.000	0.000	-1.94	0.052*	-	-	-	-
house	0.458	0.035	13.13	0.000***	0.226	0.080	2.84	0.005***
farmland	-0.064	0.034	-1.85	0.064*	-0.089	0.052	-1.71	0.087*
nosaving	0.104	0.034	3.05	0.002***	0.087	0.073	1.19	0.234
vehicle	0.240	0.030	7.98	0.000***	0.212	0.055	3.89	0.000***
jewel	0.198	0.031	6.31	0.000***	0.140	0.060	2.34	0.019**
livestock	-0.049	0.062	-0.79	0.429	-	-	-	-
SSNhc	0.448	0.039	11.59	0.000***	0.451	0.065	6.92	0.000***
BLT	0.877	0.037	23.98	0.000***	0.733	0.058	12.67	0.000***

Note. *, **, *** The effect is significant at 10%, 5% and 1% level.

Appendix 5.4

Appendix Table A.5.4 presents the result of t-test to choose the significantly different characteristic between the beneficiaries and non-beneficiaries of *Askeskin* programme. The results are for households in Western Indonesia and for the agricultural households.

Table A.5.4

Variables Selection, Beneficiaries and Non-Beneficiaries, Askeskin Programme

Variable	Part 1: Western Indonesia			Part 2: Agricultural Households		
	Mean Value		t-stat	Mean Value		t-stat
	Beneficiaries	Non-Beneficiaries		Beneficiaries	Non-Beneficiaries	
Agehhd	46.172	41.858	-11.744***	47.521	45.721	-2.916***
Sqagehhd	2.366.852	1.984.518	-10.974***	2467.65	2312.48	-2.555**
Male	0.759	0.778	1.927*	0.847	0.864	1.220
Spouse	0.697	0.679	-1.666*	0.782	0.789	0.420
Childhd	0.006	0.015	3.043***	0.001	0.003	0.593
Agri	0.354	0.258	-8.963***	-	-	-
Sagri	0.190	0.132	-6.827***	-	-	-
Selfemp	0.449	0.368	-6.947***	0.711	0.719	0.402
Sselfemp	0.131	0.127	-0.437	0.119	0.133	1.004
Primary	0.526	0.365	-13.784***	0.638	0.580	-2.847***
Secondary	0.300	0.423	10.417***	0.190	0.275	4.655***
Tertiary	0.032	0.127	12.594***	0.007	0.017	2.038**
Sprimary	0.385	0.270	-10.594***	0.486	0.454	-1.547
Ssecondary	0.194	0.291	9.097***	0.141	0.204	3.856***
Stertiary	0.021	0.064	7.671***	0.005	0.014	1.843*
Hhsize	3.691	3.331	-8.606***	3.759	3.602	-2.281**
Sqhhsize	16.874	14.073	-7.587***	16.986	15.664	-2.138**
hh014	0.372	0.448	5.290***	0.358	0.365	0.313
hh1564	0.637	0.689	8.375***	0.635	0.665	2.880***
hh65	0.095	0.064	-6.159***	0.095	0.081	-1.479
Rural	0.540	0.444	-7.972***	0.810	0.823	0.857
Expend	1,159,383	2,924,174	2.173**	594,764	1,183,247	1.435
Toilet	0.518	0.311	-18.368***	0.626	0.531	-4.589***
waterdrink	0.130	0.099	-4.238***	0.200	0.217	0.968
Water	0.186	0.125	-7.461***	0.277	0.267	-0.532
Fuelcook	0.929	0.780	-15.728***	0.978	0.943	-3.912***
Electric	0.936	0.967	6.834***	0.878	0.915	3.017***
Floor	0.287	0.180	-11.210***	0.425	0.350	-3.702***
Wall	0.392	0.245	-13.851***	0.526	0.442	-4.032***
Roof	0.743	0.743	-0.009	0.752	0.718	-1.824*
housesize	72.026	88.189	2.079**	65.227	76.071	1.460
House	0.807	0.685	-11.212***	0.901	0.874	-1.993**
farmland	0.304	0.281	-2.111**	0.553	0.620	3.290***
nosaving	0.842	0.719	-11.663***	0.884	0.863	-1.449
Vehicle	0.729	0.528	-17.032***	0.805	0.656	-7.786***
Jewel	0.787	0.636	-13.300***	0.851	0.755	-5.505***
livestock	0.954	0.958	0.810	0.916	0.909	-0.588
SSNfb	0.738	0.380	-30.999***	0.805	0.564	-12.140***
BLT	0.511	0.144	-40.111***	0.568	0.244	-17.543***
healthfund	0.112	0.079	-5.010***	0.095	0.057	-3.625***
TBC	0.004	0.003	-1.519	0.002	0.002	0.009
hypertension	0.120	0.096	-3.869***	0.089	0.097	0.767
diabetes	0.013	0.016	0.989	0.001	0.008	2.504**
asthma	0.022	0.016	-2.002**	0.021	0.016	-1.077

(continued)

Table A.5.4 (continued)

Variables Selection, Beneficiaries and Non-Beneficiaries, Askeskin Programme

Variable	Part 1: Western Indonesia			Part 2: Agricultural Households		
	Mean Value		t-stat	Mean Value		t-stat
	Beneficiaries	Non-Beneficiaries		Beneficiaries	Non-Beneficiaries	
heart	0.014	0.012	-0.730	0.005	0.012	1.829*
stroke	0.006	0.005	-0.201	0.002	0.004	0.977
liver	0.003	0.003	0.711	0.001	0.002	0.563
cancer	0.005	0.002	-2.249**	0.002	0.002	-0.312
arthritis	0.076	0.054	-4.500***	0.074	0.069	-0.583
uricacid	0.040	0.036	-1.014	0.028	0.028	0.048
Total Sample	2,061	10,605		730	2,739	

Note. *, **, *** The effect is significant at 10%, 5% and 1% level.

Appendix 5.5

Appendix Table A.5.5 presents the result of probit model of *Askeskin* programme's impact in Western Indonesia and in the agricultural sector.

Table A.5.5

Result of Probit Model, Askeskin Program

Independent Variable	Part A: Western Indonesia				Part B: Agricultural Households			
	Coef.	SE	z	P>z	Coef.	SE	z	P>z
Constant	-2.466	0.208	-11.87	0.000***	-2.388	0.347	-6.88	0.000***
Agehhd	0.009	0.007	1.29	0.199	0.020	0.012	1.64	0.102
sqagehhd	0.000	0.000	-0.91	0.362	0.000	0.000	-1.33	0.185
Male	0.001	0.049	0.02	0.987	-	-	-	-
Spouse	-0.030	0.071	-0.42	0.673	-	-	-	-
Childhd	0.163	0.159	1.03	0.305	-	-	-	-
Agri	-0.031	0.040	-0.79	0.431	-	-	-	-
Sagri	-0.038	0.047	-0.82	0.415	-	-	-	-
Selfemp	-0.015	0.033	-0.45	0.654	-	-	-	-
Primary	0.050	0.051	0.98	0.328	0.132	0.074	1.79	0.074*
secondary	-0.004	0.060	-0.07	0.945	0.045	0.099	0.45	0.652
Tertiary	-0.225	0.097	-2.33	0.020**	0.070	0.300	0.23	0.815
sprimary	0.083	0.060	1.37	0.171	-	-	-	-
ssecondary	-0.003	0.070	-0.04	0.967	0.008	0.081	0.10	0.923
Stertiary	0.121	0.116	1.04	0.296	-0.015	0.314	-0.05	0.963
Hhsize	0.079	0.036	2.23	0.026	0.063	0.052	1.22	0.223
Sqhhsize	-0.004	0.003	-1.18	0.239	-0.003	0.006	-0.60	0.547
hh014	0.037	0.031	1.21	0.225	-	-	-	-
hh1564	-0.037	0.094	-0.39	0.695	-	-	-	-
hh65	0.045	0.141	0.32	0.748	-0.035	0.111	-0.31	0.753
Rural	-0.084	0.037	-2.28	0.022**	-	-	-	-
Expend	0.000	0.000	-0.94	0.348	-	-	-	-
Toilet	0.139	0.034	4.10	0.000***	0.030	0.055	0.55	0.583
waterdrink	-0.087	0.065	-1.33	0.184	-	-	-	-
Water	-0.029	0.058	-0.50	0.616	-	-	-	-
Fuelcook	0.230	0.056	4.13	0.000***	0.172	0.156	1.11	0.269
Electric	0.048	0.073	0.65	0.513	-0.025	0.090	-0.28	0.779
Floor	0.093	0.044	2.12	0.034**	0.102	0.064	1.61	0.108
Wall	0.120	0.041	2.96	0.003***	0.029	0.064	0.46	0.645
Roof	-	-	-	-	-0.078	0.064	-1.21	0.226
housesize	0.000	0.000	-0.42	0.676	-	-	-	-
House	0.068	0.041	1.66	0.097*	0.009	0.088	0.10	0.922
farmland	-0.067	0.038	-1.76	0.079*	-0.158	0.053	-2.98	0.003***
nosaving	0.042	0.041	1.03	0.305	-	-	-	-
Vehicle	0.172	0.036	4.85	0.000***	0.176	0.062	2.82	0.005***
Jewel	0.060	0.038	1.59	0.111	0.059	0.069	0.84	0.399
SSNfb	0.413	0.035	11.67	0.000***	0.396	0.062	6.41	0.000***
BLT	0.720	0.034	21.04	0.000***	0.640	0.055	11.74	0.000***

(continued)

Table A.5.5 (continued)

Independent Variable	Part A: Western Indonesia				Part B: Agricultural Households			
	Coef.	SE	z	P>z	Coef.	SE	z	P>z
healthfund	0.310	0.053	5.86	0.000***	0.355	0.096	3.69	0.000***
hypertension	0.044	0.058	0.76	0.444	-	-	-	-
diabetes	-	-	-	-	-1.704	0.851	-2.00	0.045**
asthma	-0.011	0.127	-0.08	0.934	-	-	-	-
heart	-	-	-	-	-0.372	0.322	-1.16	0.247
cancer	0.922	0.286	3.22	0.001***	-	-	-	-
arthritis	0.149	0.070	2.13	0.033**	-	-	-	-

Note. *, **, *** The effect is significant at 10%, 5% and 1% level.

Chapter 6
Conclusion and Policy Implications

6.1 Introduction

This study has empirically examined the determinants of poverty dynamics and access to credit of households based on their socio-economic characteristics. The study also estimates the impact of food-based and health care social safety nets on consumption expenditure of the beneficiaries. The estimations are applied to households in the Western Provinces of Indonesia and those involved in the agricultural sector. The household level data sets from the Indonesian Family Life Survey (IFLS) 2000-2007 are used to compare those impacts on poverty.

The findings and discussion in this study provide knowledge about poverty in Western Indonesia, both from theory and empirical perspectives. Theoretically, this study provides the definition and measurement of poverty and the factors that can influence poverty conditions at the household level. The findings indicate some policy recommendations to overcome poverty, especially in the case of agricultural households, by considering household level characteristics, access to credit and safety nets programmes for poverty reduction.

A number of econometric methods are applied to examine the hypotheses related to poverty, access to credit and the poverty reduction programmes. The empirical findings then provide useful policy implications to alleviate poverty at the household level that will be highlighted in this chapter. The structure of this chapter includes the following: (i) summary of findings of each chapter, (ii) policy recommendations based on the key findings, and (iii) areas for further research.

6.2 Summary of Chapter Findings

The focus of this study is to examine the households' socio-economic characteristics that influence poverty reduction and the households' access to credit. This study is also concerned with the impact evaluation of food-based and health care safety nets on households' consumption. Chapter 1 presents the discussion about background, aims and objectives of this study.

Chapter 2 explores the definition, measurement and cause of poverty with the discussion on the linkage of poverty reduction and access to credit as well as social safety net programmes. The literature review in this chapter notes that poverty shows deprivation in the multidimensional aspects such as lack of income, education, health, food and nutrition, shelter, power and human rights. In order to alleviate poverty, knowing the cause of poverty is important. The cause of poverty is divided into two levels, those are, country and household level. At the country level, high poverty incidence is related to low economic performance, lack of human resources, poor governance and inhospitable climate. At the household level, the characteristics of the household (e.g., location, assets ownership and access to credit) and household head (e.g., age, gender, educational levels and areas of employment) affect their risk of falling into poverty. Based on previous studies, chapter 2 also presents the theoretical and empirical findings about poverty reduction through access to credit and safety net programmes.

Chapter 3 examines the determinants of poverty dynamics at the household level in the Western Provinces of Indonesia. The two-stage estimation (probit and then multinomial logit model) are used as the method with households' socio-economic characteristics as the determinants variables. In this chapter, the poverty status transitions are identified into four categories, those are, chronic poor, transient poor (-), transient poor (+) and non-poor. The empirical results show that areas of employment play an important role in poverty condition of the households. Involvement in the service employment sector by a household head increases the household's probability to be in the non-poor group. Working in the agricultural sectors is insignificant in affecting the households' poverty status transition. However, there is an indication that the household headed by an agricultural worker, particularly in the case of Western Indonesia and urban households, tends to be chronically poor.

The educational level of the household head is found to be another important factor in reducing poverty. The household heads who have primary, secondary or tertiary level education successfully increase the households' probability to escape from chronic poverty. In the case of rural households, the household heads with secondary and tertiary level escalate the households' chance to be non-poor. Tertiary level is found to be the most important educational level for the agricultural households since these household heads with tertiary education increase the households' probability to escape from being chronic poor.

Financial assistance received by the households, which is indicated by credit access, affect the households' poverty status. It can increase the household's probability to escape from chronic poor condition. Other assistances from the government, which are food-based and health care safety net programmes, fail to affect households' poverty status transition to be non-poor, but these programmes are still vital and need to be provided. Moreover, the impact of the food-based and health care safety nets programmes on poverty reduction through consumption expenditure is analysed in Chapter 5.

Chapter 4 investigates the households' socio-economic characteristics that may affect the households' access to credit in Western Indonesia. The two-stage probit method is applied to examine the determinants of access to credit. The credit types, in this chapter, are divided into three types, those are, credit obtained from the formal and informal financial institutions and credit intended to fund business activities.

The empirical findings show that creditworthiness of households who apply for a loan is important. A household's probability to secure formal, informal and business credit increases if the household head is the one who asks for credit. This variable is also significant for the agricultural households. The area of employment is vital to help households in obtaining credit. A household that is headed by an agricultural worker has lower probability to get credit from the formal institutions. However, it increases the household's chance to obtain informal credit. It implies that a household which relies on the agricultural sector has limited access to formal credit. In the case of agricultural households, a female household head has lower creditworthiness and decreases the household's probability to secure formal and business credit. Available support from family members also increases a household's creditworthiness and helps to secure loan from the formal institution.

The educational level of the household head is found to be an important factor that affects the households' access to credit. In the case of Western Indonesia, as years of schooling of the household head increases, it helps them to get formal credit. In contrast, it reduces the household's probability to obtain informal credit. This implies that educated households have more access to formal institutions. However, the years of schooling does not significantly assist the household to get business credit. For the agricultural households, education has a weak impact in reducing the probability of the households to obtain informal credit and increase the probability to get agri-business credit. The results suggest that the educational level of the household head escalates the creditworthiness of agricultural

households. It shows that the more agricultural households are educated, the more they can prove to the lenders that they can run an agri-business.

In the case of Western Indonesia, assets ownership increases the households' probability to secure formal and business credit. In contrast, it decreases the probability of the households in obtaining credit from the informal sector. For the agricultural households, the assets ownership may increase the households' probability to secure formal loan. The assets ownership also reduces the households' probability to get informal credit. The results reflect that households with assets ownership tend to obtain credit from the formal sector. Assets represent a household's ability to repay the loan and can be used as collaterals. They play an essential role to increase the households' creditworthiness and help them to secure formal and business credit.

Chapter 5 evaluates the impact of food based (*Raskin*) and health care (*Askeskin*) social safety nets on Indonesian household consumption expenditure. The propensity score matching (PSM) is utilized to evaluate the effect of those programmes. The empirical results suggest that the *Raskin* programme significantly increases the beneficiaries' consumption expenditure on rice, tofu and tempeh. This implies that an increase in the consumption of rice leads to an increase in the side dish consumption, which are tofu and tempeh, as they are cheaper alternatives of protein sources. *Raskin* also significantly encourages the beneficiaries that rely on the agricultural sector to buy more rice and less meat and dairy products. This outcome is related to the higher price of meat and dairy products.

In the case of *Askeskin*, there is not enough evidence to conclude that the programme affects consumption expenditure of its beneficiaries. However, a weak positive effect was found in the case of households in Western Indonesia that increase its beneficiaries' consumption expenditure on rice, tofu and tempeh, household items and meat and dairy products. The programme also may decrease their spending on medical services and vegetables and fruits. In the case of agricultural households, there are weak impacts where the *Askeskin* programme tends to reduce its beneficiaries' health care expenditure and increase their household items consumption expenditure.

Overall, the empirical results obtained in this study provide the formulation of policies to support the poverty alleviation programmes in Indonesia. The policy recommendations are presented in detail in the next section.

6.3 Policy Recommendations

The empirical findings in this study highlight the main issues that can be used as input to formulate or improve poverty alleviation policies. This section provides policy recommendations, based on the key findings in this study, such as promoting agricultural sector, increasing access to credit, promotion of human capital, stabilizing foods price and improvement in targeting and integration.

Promoting Agricultural Sector

The results in the poverty dynamics and credit access model show that agricultural households tend to experience chronic poverty and have limited access to credit from the formal financial institutions. It implies that the situation makes people working in the agricultural sector find it difficult to improve their welfare.

Policy formulation from the Indonesian government should also support the development of the agricultural sector since the agricultural sector is vital in providing food and nutrients for people. The support can give benefits for the workers and promote the sector to be profitable. The policies to promote agricultural sectors and promote the pro-poor growth in this sector are also confirmed by the Overseas Development Institute (ODI) (2004) and Organisation for Economic Co-operation and Development (2006) which note that promoting the agricultural sector can be important to reduce poverty, particularly rural poverty. The ODI (2004) also notes the need for support from the government to develop the sector and increase the farmers' productivity. In association with that, the government should protect the land for agriculture and prevent the land conversion from agricultural sector to other sectors. The subsidy and investment are also necessary to support the agricultural development in Indonesia. Subsidy helps to provide affordable agricultural inputs, such as fertilizer and equipment, to the farmers. Investment in the agricultural sector then can increase the technology adoption and efficiency of the sector in producing agricultural products. Stabilization in price of agricultural outputs is also needed by the farmers to reduce their risk in doing agri-business.

Increasing Access to Credit

The empirical finding from the poverty dynamics model suggests that credit is useful to reduce the probability of households to fall into chronic poverty. Furthermore, the credit access model shows that the agricultural households have limited access to formal credit.

Therefore, the government should ensure the access to credit of the poor and agricultural households. The credit programmes should be easy to access by rural and poor people. The institutions that execute the programmes should reach all rural areas and be located in villages in Indonesia. Existing policies, such as the government's micro-credit programmes (*KUR)*, which provides collateral-free credit to support small business, should be continued. The government then can improve the programme and extend the program scope to the agricultural households as the target of the programme.

Promotion of Human Capital

The multidimensional framework shows, lack of education is one of the causes of poverty. Furthermore, the results from this study capture that education plays an important role in reducing poverty. Education and skills help people, especially the poor and women, to increase their standard of living. Education helps them to reach more opportunities, obtain better job, open access to credit, easily adopt new technologies and be more productive. In the long run, this can improve their health and welfare. Thus, the education development, both formal and informal, is needed to increase the capability and human capital in Indonesia.

In the case of agricultural households, education is necessary to prevent them from falling into poverty. Thus, poverty alleviation programmes can be conducted through education and skills development. For example, training to improve their skills in managing agri-business will be useful to help them adopting new technology, increasing efficiency and productivity, as well as developing the agricultural sector in the long run.

Stabilizing Food Prices

Stabilizing food prices is necessary to help the poor households in reducing their vulnerabilities and smooth their consumption pattern. The findings from impact evaluation of food-based and health care safety nets show that the programmes increase the beneficiaries' rice consumption. In the case of food-based safety nets, an increase in rice consumption is accompanied by increasing consumption of tofu and tempeh and decreasing consumption of meat and dairy products. Those outcomes can be related to the price of tofu and tempeh, which are relatively cheaper than meat and dairy products. This shows that tofu and tempeh are important commodities to meet the basic needs for protein of the poor households. In this case, the Indonesian government should ensure the price stabilization of

food, particularly tofu and tempeh. It can also prevent a decrease in the consumption of protein and nutritious food.

Improvement in Targeting, Integration and Monitoring

All policies constructed by the government will not be effective if they are not equipped by proper execution, such as strong targeting, integration and monitoring process. The poverty alleviation programmes must be well targeted for poor people. Thus, the government needs help from provincial and district governments to construct the profile of targeted people and households. This is needed to ensure that the programmes will always go to the right beneficiaries. Moreover, integration among central, provincial and district governments in terms of policy and implementation is important in the programme execution. The integration then allows the poverty reduction programmes to be delivered properly to the poor people. Monitoring by the central government during the execution is also important to minimise mistakes and mitigate obstacles which, in the future, can lead to improvements from the government in providing better poverty alleviation policies.

6.4 Areas of Further Research

This study has identified areas for further research. The current research uses household level data from Indonesian Family Life Survey 2000 and 2007. Those observation periods are the most updated available data from IFLS which provides detailed information about Indonesian households' behaviour. However, this data set only covers the Western part of Indonesia. Future poverty studies in the case of Indonesia should use more updated and informative household level data that represents all areas in Indonesia.

This current research provides a quantitative research by using secondary level data. To provide more comprehensive and detailed poverty studies, a qualitative approach and primary data collection can be considered for future research. By constructing a questionnaire for a qualitative approach and applying participatory research, the causes of poverty will be analysed in more detail based on the poor households' point of view. This approach can capture poverty in its multidimensional aspects, rather than focus only on the monetary cause of poverty. Moreover, this approach is also necessary when future work is about poverty in rural and agricultural areas, since the secondary data cannot always capture the situation of these areas in detail.

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