IS LIVING STANDARD IN URBAN AREAS BETTER THAN RURAL AREAS? EVIDENCE FROM EDUCATIONAL FACTOR IN INDONESIA

CHAI WAI SHAN
CHAN JING CI
CHIAR SIOU YING
LAI SHU ZHEN
TAN YEAN SHIN

BACHELOR OF ECONOMICS (HONS)
FINANCIAL ECONOMICS

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE
DEPARTMENT OF ECONOMICS

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BY

CHAI WAI SHAN
CHAN JING CI
CHIAR SIOU YING
LAI SHU ZHEN
TAN YEAN SHIN

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DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

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Name of Student:	Student ID:	Signature:
1. Chai Wai Shan	13ABB02349	_____
2. Chan Jing Ci	14ABB04384	_____
3. Chiar Siou Ying	13ABB05046	_____
4. Lai Shu Zhen	13ABB04139	_____
5. Tan Yean Shin	13ABB07630	_____

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LIST OF ABBREVIATIONS

CIA	Conditional Independence Assumption
ICT	Information Communication Technology
IFLS	Indonesia Family Life Survey
IFLS2	Indonesia Family Life Survey 2
IFLS3	Indonesia Family Life Survey 3
IFLS5	Indonesia Family Life Survey 5
OECD	Organisation for Economic Co-operation and Development
UNCEN	Universitas Cenderawasih (Cendrawasih University Jayapura)
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
MD	Master Degree
OVB	Omit Variables Bias
PHD	Doctors of Philosophy
RP	Rupiah

ABSTRACT

This report aims to study how education level affects living standard in Indonesia urban and rural areas. We use welfare as a "proxy" measure of living standard in this study. The effects of education on wages, household assets, household conditions, and spending are studied in this report. We use potential outcome framework to measure the causal effect of education on welfare. Also, we learn about the average causal effect by comparing two groups of individuals with similar characteristics. In order to avoid omitted variables bias, we controlled the regression by including gender, marital status, age and ethnicity dummies. In line with literature reviews, the findings show that education improves the living standard in both urban and rural areas. But, the effects of education appear to be greater in urban areas in term of wages and spending. However, the effects of education on household assets are found to be greater in rural areas as compared to in urban areas. For instance, better educated rural residents are more likely to own a land for non-business use as most of them are engaging in agricultural sectors. Moreover, the effects of education on household conditions appear to be greater in rural areas as compared to urban areas. For example, better educated rural residents are more possible to have electricity at home. In urban areas, most of the households have electricity at home regardless their education level due to the subsidies on utility they received. Thus, education does not influence much on whether they have electricity at home. However, according to some researchers, education not always influences welfare directly. Instead, education is able to influence households' welfare through other ways.

CHAPTER 1: INTRODUCTION

1.0 Introduction

This chapter begins with introduction of Indonesian education background. Further, it discusses about reform policies that implemented by Indonesian government to improve education. In addition, this chapter also consists of the outcomes of reform policies. Also, this chapter includes problem statement, research objectives and significance of study.

1.1 Education in Indonesia

1.1.1 Background

In 1950, the compulsory education in Indonesia was 6-year period. In Indonesia, every student is required to have compulsory education. In year 1994, the compulsory education prolonged, included six years of primary education plus three years of junior secondary education, a total of 9-year period (Yeom, Acedo, & Utomo, 2002). This compulsory education expansion aims to the children from 7 years old to 15 years old. They can choose to attend one to three years pre-school education and proceed to compulsory education which is primary school and junior secondary school, then followed by senior secondary school. Senior secondary schools include general stream and technical or vocational stream. Besides, Indonesia citizens have alternative for Islamic education, which offers both primary and secondary education. Furthermore, Indonesia has five types of higher educations: universities, academies, colleges, polytechnics, and institutes. For higher education level, they need to pass an

entrance examination. However, these still depend on the college admission requirement (EP-Nuffic, 2015).

1.1.2 Reforms

To increase the coverage of education of its population, according to Larocque (2015), the government announced a set of reform strategies for boosting the education system performance over the past 15 years in 2015. Decentralization was one of the tools for domestic governments to take responsibility for the conveyance of basic education, 9-year compulsory education, the teacher's law, the introduction of school operating support, and channel of a statutory requirement to allocate 20% of the Indonesia's national budget to education in 2009. In 1990, the education reform was focused on offering higher quality education opportunities through basic education expansion and decentralizes the education administrative decentralization. Education decentralization is the process of transferring decision making power from central Ministries of Education to intermediate governments, local governments, communities, and schools. It can improve the citizens' access to basic services like education. The reforms were on the national stage primarily dedicated on increasing educational values, more flexibility accommodation and responsibility for improvement of students' classroom level learning.

Indonesian government has implemented a series of reform policy to enhance the education growth in Indonesia. Firstly, National Education Law was renewed by two reforms: School Science Curriculum Reform (1994 & 2000) and Basic Technology Education Pilot Project which focused on curriculum changes. Besides, Teacher Development (1996-2001), Central Indonesia Junior Secondary Education Project (1996-2002), Sumatra Junior Secondary Education Project (1996-2002) and Sulawesi Tenggara Junior Secondary Education Project (2002) have been introduced and still exist now. The major purposes of all the projects were in growing access to junior secondary education and improving the quality of both junior and senior

secondary education. Further, the government tried to offer better quality of the basic education chances in junior secondary education. Also, the government concerned with increasing the effectiveness of pre-service and in-service teacher education and enhancing the education system management at every stages (Yeom, Acedo, & Utomo, 2002).

1.1.3 Outcomes

The outcome of the educational reforms seems favorable. First, there was a rising trends in average years of schooling in Indonesia. The numbers of senior secondary schools, students and teachers have been increasing since 2000. From year 1980 to year 2013, the average years of schooling rose from 3.1 to 7.5 years, whereas expected years of schooling increased from 8.7 to 12.7 years. Other than that, Indonesia net enrolment rate of primary school in year 2008 to 2012 achieved 98% for male and 100% for female, and net enrolment rate of secondary school in year 2008 to 2012 were 74.5% for male and 74.4% for female respectively (Unicef, n.d.).

Second, the literacy rate in Indonesia shows an increasing trend. In 1990, the adult (15 years and above) literacy rate was 81.5% and increased to 92.6% in 2010. For youth (15 years to 24 years) literacy rate, it increased from 96.25% in 1990 to 99.5% in 2010. The illiterate population of adult decreased from 21,557 in 1990 to 12,709 in 2010. For youth, the illiterate population reduced from 1450 in 1990 to 228 in 2010 (UNESCO, 2012).

1.2 Problem Statement

Although the government has put many efforts in reforming and restructuring the educational system in Indonesia, there was still a gap between urban and rural areas when it comes to education: the population in urban areas have more years of schooling and higher literacy rate than those in rural areas. In 2011, children who attended pre-primary education were 38.6% in urban areas while the children in rural areas who attended pre-primary education were 28.4%. Besides, there was 24% among the urban population have accomplished senior high school while there was less than 10% among populations in rural areas have accomplished senior high school. For university level, there was only 1% among the population in rural areas has accomplished education in university while there was 5% among urban population has accomplished education in university (OECD, 2013). Besides, the illiteracy rate among 15 years old and above in urban areas is also lower as compared to rural areas. The illiteracy rate in urban areas such as Jakarta was only 0.9% while in rural areas such as Papua was having a rate of 31.7%. For net enrolment rate at primary school level, it ranges from 94.7% in urban areas such as Bali to 83.1% in rural areas such as West Papua. There was a larger gap of enrolment rate for lower secondary school between urban and rural areas. In Jakarta, the rate was 94.7% while the rate in Papua was only 31.6%. In urban areas, more than 50% of the primary and junior secondary school teachers have accomplished four years degree in university while there was only 20% of teachers in rural areas have accomplished four years degree (OECD, 2015).

There are reasons which contributed to the education gap between urban and rural areas in Indonesia. First of all, according to Mollet (2007), the primary, secondary and high schools were insufficient in the remote and rural areas. Besides, there was an issue of insufficient number of teachers in highland areas. Thus, there were many residents in such areas who had not attended and accomplished even primary schools. Second, most of the teachers were not willing to teach in remote and urban areas. The reasons which contribute to this problem were lack of facilities and

social services such as satisfactory housing and health care, transportation problem, lack of incentives, and uneven payments of salary to teachers in the areas.

In addition, the different education level achieved may also lead to different household expenditure. Akita, Lukman and Yamada (1999) find, in Indonesia, rising of formal education level would cause a significant decline on the overall inequalities in Indonesia. The higher the educational achievement, the mean monthly household expenditure would be higher also. The average expenditure for people with university education was higher than for people with no formal education. This was due the lower education benefits for poor students in rural areas as compared to better-off students in urban areas. According to the research, households in urban areas tend to have higher expenditure as more households in urban areas were having higher education. Besides, Hayashi, Kataoka, and Akita (2014) find the overall inequalities per capita expenditure in the Indonesia increases between 2008 and 2010. This shows the difference in mean expenditure per capita between rural and urban areas into a number of components, including educational attainment. The educational differences appear to have triggered a crucial aspect in expenditure inequality between urban and rural households. The disparity in educational endowments has accounted for approximately 36 percent of the urban-rural expenditure gap between 2008 and 2010. The mean expenditure per capita rises as the level of education of household increased. In conclusion, the well-developed educational system in developing areas has caused a larger inequality gap between urban and rural areas since it results in higher opportunity cost and lower education benefit for poor students. As a result, many of the poor students in rural areas choose to drop out from school and bearing lesser education expenditure as compared to better-off students in urban areas.

Besides, there are also several types of inequalities of welfare between urban and rural areas in Indonesia. During decentralization period in 2001, the level of poverty was at 18.4 percent and the urban-rural poverty gap was the widest which was at 15 percentage point. The poverty gap was due to the concentration of industrial development in urban areas which in turn provides more job opportunities

to urban than in rural areas (Miranti, Vidyattama, Hansnata, Cassells, & Duncan, 2013). The strong economic growth did not share equally and therefore it contributed to an increasing inequality in Indonesia. Since 2000, the income and consumption inequality in Indonesia have been increasing. Income inequality indicates that the income for the rich group is growing faster than the poor and middle groups. The wide wage gap between skilled workers and unskilled workers has increased the inequality. This is because the return to education are increasing, indicates that high skilled worker tend to earn more than those with a basic education. For example, workers with tertiary education are able to earn twice than those with primary education or less. This wage gap can directly affect the consumption inequality. If the head in household is better educated, then he or she can have a higher consumption. This leads to an increasing consumption gap. Children in rural areas also suffered from inequality of opportunity. Compared with urban children, rural children experience less education, health and transportation services. This may due to the financial ability and education of their parents (Aji, 2015).

Consequently, inequality is unfair and harmful when people do not have equal opportunities. For instance, unfair opportunities such as the place where someone are born, education and wealth of parents and accession to public facilities may influence his or her life. These reasons may prevent them from getting into a good job and achieving the potential outcome. One should be aware that high inequality may slow down the economic growth. Economic in Indonesia can be slowed down when poorer groups are unable to invest for the development of their children, unable to find productive jobs and come out from poverty and easily move into consumer class. In addition, the inequality that is caused by lacking of good employment opportunities will hurt the economic growth. Majority of the poor groups cannot find jobs while non-poor groups with higher education cannot find productive jobs. The employment opportunities provided since 2001 mostly are in low productivity sectors. As a result, it fails to maximize the potential labor productivity today. Furthermore, high inequality leads to high social costs and conflict. There would be social tensions and conflict when the difference between income and wealth is big. Therefore, conflicts

will damage the image of the country and affect the investment, which in turn lower down the economic growth of Indonesia (World Bank, 2015).

Further, many researchers studied about education effects on welfare in terms of income (Byrlee, 1974; Li & Luo, 2010; Wu, 2012; Su & Heshmati, 2013), consumption (Wodon, 2000; Valeria & Valentin, 2011; Peng, 2015), expenditures (Le & Booth, 2014; Amini & Nivorozhkin, 2015), household assets (Tsai, Chu & Chung, 2000; Fisher & Weber, 2004; Singh, 2011), and also household conditions (Singh, 2011; Liu, 2015). However, there are no studies which including all these variables altogether to measure welfare. In our research, income, spending, household asset and household conditions are included as measures of welfare. Besides, there is very few researchers study about the education effects on welfare in Indonesia (Chongvilaivan & Kim, 2015; Wicaksono, Amir & Nugroho, 2017). Thus, it induces us to examine the education effects on welfare in Indonesia.

In conclusion, the access to education can be one of the reasons for the welfare gap between the rural and urban areas. This issue induces our interest, perhaps also practitioners' and policy makers' interest, to understand to what extent education relates to welfare of the individuals in Indonesia. Hence, the findings of the research are very important in order to help the government to develop a better education performance and also help to improve the welfare of the country's population.

1.3 Research Objectives

The purpose of this research is to study the relationship between education and welfare of households in rural and urban areas in Indonesia.

1.3.1 General Objectives

Education is one of the most effective tools to boost up the individual welfare. Hence, we would like to find out the impact of education on welfare of individuals in urban and rural areas.

1.3.2 Specific Objectives

In this report, specifically, we aim to:

1. Study the effects of completing senior high school on the household income.

2. Study the effects of completing senior high school on the household assets.

3. Study the effects of completing senior high school on the household spending.

4. Study the effects of completing senior high school on the household conditions.

5. Compare the welfare between urban and rural areas by education status.

1.4 Research Questions

Based on the above objectives, the followings are the research questions for our study:

1. Is there any effect of education on income, household assets, spending, and household conditions?

2. Is there any significant differences in the effect of education on welfare between urban and rural areas?

1.5 Significance of study

This research aims to study the relationship between education and welfare of individuals in urban and rural areas. This study may deliver a better understanding and serve as a guideline for the government to recognize the relationship between education and welfare. Besides, it also might help the policymakers to develop a better policy in order to improve the welfare for the households in both urban and rural areas. Further, there are studies that discuss about the education system and how it might affect the economic growth (Mollet, 2007). However, there is no study that investigates the welfare fully, in terms of income, household assets, spending and also household conditions. Thus, by conducting this study, our research outcomes may help to fill up the literature gap in examining the education effects on welfare. Besides, we also compare the welfare among urban and rural areas and how does education relates to it. This research functions as a caution light for policymakers and practitioners, on the relationship between education and welfare, which may explain the gap between urban and rural areas.

1.6 Chapter Layout

This report contains five chapters. Chapter 1 discusses research overview that includes the background of study, problem statement and objectives. Chapter 2 describes the literature review on selective variables. Chapter 3 shows the empirical strategies, data and variables, as well as descriptive statistics. Further, data analysis will be explained in chapter 4. In the end, the limitations, recommendations and conclusion of the study will be discussed in chapter 5.

1.7 Conclusion

In this research, we aim to study on the effects of education on the welfare in urban and rural areas. This chapter is to briefly discuss on the education background in Indonesia, problem statement, research objectives and significance of study. With the brief introduction, we are able to understand more about our research objectives, and a clearer path is provided to conduct the study.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This chapter discusses the literature review on our selected variables that contribute to inequality in welfare between urban and rural areas. We focus on education as the main factor that contributes to the urban-rural welfare gap. Also, we look at other factors that related to urban and rural welfare. Welfare refers to the happiness, good fortune, health, and prosperity of an individual or group. The literatures on the research are focus on eight different type of welfare, and finally we use household wages, household assets, spending, and household conditions as our variables.

2.1 Education as a Key Factor for the Urban-Rural Inequality

2.1.1 Educational and Occupational Aspiration of Students

Rural-urban education inequality may lead to different educational and occupational aspiration of students. Educational and occupational aspirations relate to how much importance people give to formal education and how they try to pursue it. People live in different areas that receive different education level tend to influence their choice on later education. For example, they might seek for further education like a diploma, or a four-year college degree or other post-secondary training, or perhaps a Ph.D. or M.D. degree. For instance, McCracken and Barcinas (1991) find students who live in rural areas are likely to go to technical institution, whereas

students who live in urban areas are more likely to go to normal college to get higher level of education. Also, students in rural wish to find an occupation that with lower income expectation, and therefore, they do not seek for high-income jobs as compared to urban students. Dorjdagva, Batbaatar, Dorjsuren, and Kauhanen (2015) did a research on urban and rural areas education show that education for individual likely to affect the future occupation. Cobb, McIntire and Pratt (1989) find younger generations in rural areas think their jobs more important than their academics, which is different with younger generations in urban areas. Rural students tend to work under lower position and less skilled job. In rural areas, people who obtain lower education level do not wish to have post-secondary educational opportunities. Besides, Doyle, Kleinfeld and Reyes (2009) concluded the superiority of the high school education experience in fact could help the students to prepare for post-secondary education and reduce the uncertainty which prevent them from taking further steps to accomplish their educational aspirations. As stated by Bajema, Miller and Williams (2002), rural students desire to continue their education after high school. However, the types of institutions they hope to attend are technical or business schools, community colleges, and four-year colleges and universities; while students from urban areas have high frequency of intentions to study in the areas of business, health, and education.

2.1.2 Education and Income Gap

Choice of education is very important as it may affect the welfare between urban and rural areas. Some literature reviews of education suggest that income gap is related to education. A number of researchers find that education led to a large income gap between urban and rural areas. Several papers study the income gap in China, and find that the dissimilarities educations increase the income gap between urban and rural areas. In China, most of the educational subsidies and investments go to urban residents and also education developments are focus on urban areas. Education can promote the urban productivity rather than rural productivity and

eventually leads to a brain drain in rural areas. In relation, rural people with lower educational levels always have a lower income. As a result, it causes the income gap between urban and rural areas to rise. (Su & Heshmati, 2013; Li & Luo, 2010; Wu, 2012; Zhang, Chen & Zhang, 2012). Other than that, another two finding based on Indonesia done by Chongvilaivan and Kim (2015), and Wicaksono, Amir and Nugroho (2017) conclude that education is positively related to per capita income. Level of education is able to possess an individual's knowledge and hence level of income paid. Further, different education level contributes to income gap between urban and rural areas as education has an impact on economic opportunities and wages. Based on Byerlee (1974), in Africa, school syllabus focused on urban occupation and emphasized on higher educational needed jobs in modern sector. This led to different educational level between urban and rural areas. Thus, income gap became larger since people from urban areas tend to get higher income jobs than those from rural areas.

Despite the larger income gap, some studies conclude that the income gap do not differ vastly between rural and urban areas. For example, Das and Pathak (2012) argue, in India, higher living costs in urban areas should reduce the income gap, despite the average education is lower in rural areas. Low literacy rate in India contributes to the low development of socio-economics in rural areas as education represents an investment that donates to individual and social development. Moreover, Knight and Sabot (1983) find, in Kenya and Tanzania for example, the expansion of education cause an increase in the supply of skilled labor. At first, the composition effect of the increase in education likely to broaden the gap of the inequality between urban and rural areas. However, the consequent compression effect outweighs it, and thus reduces the inequality gap.

2.1.3 Education and Disparity of Health Status

Other than income gap, a number of researchers argue, education may correlate with health status. Zurayk, Tawil and Gangarosa (1982) find women with lower education level who live in rural areas have lower living standard in terms of family formation patterns, immunization, and baby care as compared to urban area. It is necessary for all mothers, especially those in rural areas, to have health education programs. The gap between the rural and urban women can be the result of low education level of mothers and also the lack of health services and facilities. Besides, Fotso (2006) find, in sub-Saharan Africa (SSA), maternal education may affect the child health and nutrition level. As urban and rural area have education disparity, rural females mostly are not educated, and they tend to have less knowledge on uses of clean water, electricity, and lower income. Therefore, it is found that education level indirectly affecs the health of their children. Smith, Ruel and Ndiaye (2005) also find the evidence that lack of maternal education would lead to malnutrition of a child. Women who live in urban areas tend to have formal education relative to those in rural areas. They can achieve higher levels of education and get more information on children feeding, which have positive influence on child nutritional status.

Apart from that, Dorjdagva et al. (2015) argue that educational level is negatively connected with self-reported physical limitation. In general, urban population is likely to have better education, and there is a significant larger education-related inequality in chronic disease between rural areas and urban areas. They find out that in Mongolia, 37 percent of people who live in urban areas are reported having tertiary education, but only 16 percent have the same level in rural areas. People are educated greatly report rarer chronic diseases and limitations. Nevertheless, the influence in the rural population is higher. People living in rural and urban areas have different view in terms of health knowledge, attitude and practice.

In addition, Binh (2012) finds a negative relationship between educational level and abortion rate, the abortion rate for rural areas is slightly higher than urban areas, and this is because of the variation in education level. Women with higher education level tend to have higher awareness of contraceptive methods and also better sex education. Therefore, the abortion rates for urban areas always remain lower. Moreover, according to Das and Pathak (2012), health status and development of society are positively related. Employment, educational attainment, income level, accessibility to health care and service, and level of awareness are the indicators that affect health status. In rural India, most of the residents are lower socio-economic and health problems like anaemia, underweight, and hunger continue to happen. As a result, this may cause a serious issue.

2.1.4 Education and Consumption

Some literature of education suggests that consumption pattern is related to education. Peng (2015) finds, in China, spending for basic education in urban areas is higher than rural areas. The basic education inequalities between urban and rural areas contributed to the differences in consumption structure of urban and rural households. With the low education, individuals in rural areas choose to spend more on necessity consumption, such as food; however, the individuals in urban areas choose to spend more on development-oriented consumption, such as transportation and communication services. Besides, the improvement of basic education also brings impact to the taste of individuals in rural areas. The residents tend to consider about the clothing style, brands, and design before purchasing them. Lastly, with higher education qualification obtained by the individuals, they are able to spend more on higher level consumption instead of production consumption. Wodon (2000) suggests the education has significant effect towards consumptions for household head and its spouse. In the urban areas, households which have higher education level, such as completed secondary school studies, are expected to have double per capita consumption compare with similar households which have lower qualification in

studies or illiterate. However, in rural areas, the education level of households has lesser effect on their expected per capita consumption but it is still considered as an important factor. The difference of consumption for households head and its spouse in rural areas is approximately 60%. Also, Valeria and Valentin (2011) find different education level between urban and rural areas contributes to a difference in income level. For instance, the low educational level in rural areas can result in low income level for residents. This has led to difference in the consumption level of educational and cultural services. Hence, it has negative effect on the development of rural areas. This situation has caused the gap between urban and rural areas become larger.

2.1.5 Education and Expenditures

There are some studies conclude that higher education lead to higher expenditures. Le and Booth (2014) find, in Vietnam, the mean of real per capita expenditure of the urban households is the twice of rural households. Vietnam has experienced a stretching of the gap between urban and rural areas though the progressive high economic growth. Education plays as the key determinant contributing the high urban-rural gap. The most educated working age person significantly and positively related to household per capita expenditure in both areas. The urban households which have more years of education tend to have higher living standard and thus higher expenditure than those rural households with less years of education. Furthermore, Amini and Nivorozhkin (2015) conclude, in Rusia, education and spending of people are positively related. Urban areas tend to have better school resources for people to have better individual education achievement and this leads to higher motivation for students to study. However, rural students are less available to higher education and thus they have lesser aspiration to seek for higher education. In general, people with aspiration to seek for higher education tend to spend more on both private and public educational institution.

2.1.6 Education and Employment

Apart from that, some researchers argue that the level of education relates to employment. Daniela-Emanuela, and Cirnu (2014) find, in Romania for example, individuals in urban areas who obtain high education qualification were able to gain better position in labor market. However, individuals in rural area with practical education have the best chance to get unemployed. Therefore, the reasons that generate the gap between urban and rural areas in terms of unemployment spells are the poor and low quality of education. Wu (2006) and Liu (2005) find, in China for example, hukou system is able to influence the education attainment and which in turn, affect the employment. People who possess urban resident status before age 15 are able to receive more years of education compared to those who possess urban resident status after age 15. This is because the latter receive lesser formal education in rural areas. Due to the lower education attainment of rural residents, this group of people possesses low skills and human capital, which makes them harder to compete in the urban labor market after they possess the urban resident status. Consequently, people who obtain urban resident status late are less likely to receive job in state sector and to enjoy the employer-provided healthcare benefits. However, they are more likely to be self-employed and unemployed. While in urban areas, individuals who receive more education are less likely to be self-employed. Das and Pathak (2012) used literacy rate to explain education status in India, the result for year 2011 show that, male and female literacy rate in urban are 89.7% and 79.9% respectively. Whereas male and female literacy rate in rural are only 78.6% and 58.8% respectively. Literacy is one of the important indicators for employment opportunities, if an individual has higher literacy rate, his or her productivity is higher and thus higher chance to get a job. Faggio and Silva (2014) studied the urban-rural self-employment and entrepreneur innovation in Britain. They found a significant positive correlation between self-employment and creation of firm in urban areas. However for rural area, self-employment did not correlate with the creation of firm. As a result, self-employment and entrepreneur innovation only exist in urban areas.

2.1.7 Education and Household Assets

In addition, some studies support that there is a relationship between education and household assets. Based on Fisher and Weber (2004), people who live in metropolitan area (urban area) tend to have more household asset, while people who live in nonmetropolitan area (rural area) are likely to have poor household asset. The researchers consider education as one of the household characteristics. Those who did not complete high school have higher risk to be asset poor as compared with those who have higher education level. The study of Tsai, Chu and Chung (2000) show a positive relationship between parents' education level and savings for metropolitan areas in Taiwan. Parents are able to explain the benefit of savings to their children as their have better knowledge on financial system. Besides, Odongo and Lea (1977) find the education level for both rural and urban areas are likely to indicate the nature and location of household ownership in Uganda. For instance, the residents in rural (or urban) areas own a land in rural (or urban) areas for their agricultural (or business) purpose. According to Singh (2011), people who live in urban areas with higher education level tend to have higher probability to buy car than people that live in rural, as well as urban female and students who go to their workplace and college institution independently tend to buy scooters. However, motorcycle ownership will be popular in rural area as fuel efficiency and rough road. This result shows that education may not affect the welfare for both areas.

2.1.8 Education and Household Conditions

Besides, some researchers say that education level also may affect the household conditions. According to Liu (2015), most of the Beijing rural migrants are having low education level and low skills, hence lower wages paid. As a result, they are only able to rent a house and with bad facilities. Besides, Singh (2011) and Hu, Li and Wei (1989) find, there is a positive relationship between education level and purchases of consumer durables such as refrigerators, washing machine, and record players. More educated people tend to save his or her time on housework. Urban residents tend to buy record player as a study aid to learn English. Also, Hu, Li and Wei (1989) discuss on the camera and black-white television consumption was not related to educational level; instead it depends on the age of household.

2.2 Determinants of Urban-Rural Inequality (Various Factors)

Other than education, there are other factors that contribute to welfare gap between urban and rural areas. First, among others, people in urban areas are better off because of urbanization. Studies in China find that, urban-rural income gap is expanded with the higher urbanization level especially in Anhui, Sichuan and Fujian because of lower rural income and the urban policies implemented. Rural development is also left behind due to the accelerating urbanization in China (Su, Liu, Chang & Jiang 2015; Sicular, Ximing, Gustafsson & Shi 2007; Wang, Liu, Li & Li, 2016). Also, urbanization has led to central government in China to focus more on cities and at the same time the needs of rural areas is being neglected (Yu, Wu, Shen, Zhang, Shen & Shan, 2015).

Second, some researchers also find that economic reform in the country result in high welfare in urban population. As the evidence, urban households have higher income distribution, real per capital expenditure and incentives compared to rural households during economic reform period (Zhang & Kanbur, 2005 in China; Nguyen, Albrecht, Vroman & Westbrook, 2007; Fesselmeyer & Le, 2010 in Vietnam).

Third, urban population is also better off as they benefit from the government policy. In China, urban-biased policy led to higher welfare, education opportunity and government spending and development in urban areas (Yang, 1999; Zhang et al., 2012). The barriers to rural-urban labor mobility benefited urban population and resulted in a larger urban-rural income gap (Lu, 2002; Wang, Piesse & Weaver, 2013). In United States, for example, the minimum wage law has larger impact on urban areas but no significant impact on rural areas. (Wu, Perloff & Golan, 2006). Apart from that, in Georgia, urban people were able to enjoy advanced health care system compared to those who live in rural area (Liff, Chow & Greenberg, 1991). It leads to larger welfare gap between urban and rural areas.

Fourth, heavy industry oriented development strategy is also one of the factors that contribute to urban-rural inequality. The government transforms capital that originally used to invest in agriculture sector to heavy industry sector. Hence, heavy industries' employment in urban areas will increase, and contrast, rural employment in agriculture sector will decrease. According to Wang et al. (2013) and Yang and Zhou (1999), in China, urban households receive higher labor income and welfare provision and this lead to high urban-rural difference. However, Lin and Chen (2011) find that the heavy industry oriented development strategy actually makes people in both urban and rural areas worse off because it leads to a reduction in urban employment and an increase in agriculture employment with a low average wage level in rural areas.

On the other hand, some studies concluded people in rural areas are better off. For instance, as a result of legal reform, rural residents can have a better access to urban health care system, education and even buy a house in urban area (Le & Booth, 2014 in Vietnam). According to Shedenowa and Beimisheva (2013), during the economy transformation and modernization in Kazakhstan, rural people tend to have higher proportion of social transfer in terms of income than urban people.

As a conclusion, most of the studies find that education plays an important role to affect the welfare of individual and households between urban and rural areas. People with higher educational level tend to have higher income, higher expenditure and consumption, more household assets, and better household condition. Therefore, we develop our research question on whether education has impact on the welfare of an individual in both areas. We consider wages, household assets, household spending, and household conditions as our variables.

CHAPTER 3: METHODOLOGY

3.0 Overview

In this chapter, methodology deals with the relationship between the welfare and the education of urban and rural areas in Indonesia. At first we discuss about the theoretical framework that apply in the study. Next, we discuss on the potential outcome framework, average causal effect and regression control strategy that we employ in this research. Then, we state out our general model in precise. Hereafter, we discuss on the data sources with description of each variable and the summary statistics in our analysis.

3.1 Theoretical Framework

Manifold researches explicitly connect the investment in human capital development to education. The Theory of Human Capital and Mincer Theory are the major theories that commonly used on explaining how the education matters for earnings. Theory of Human Capital is said to be one of the classic works in economics that it was first established by the Nobel Laureate Gary Becker in 1964. Becker pointed out that education is an investment. Mincer theory is said to be the traditional view as it was first established by and named after Jacob Mincer (father of modern labor economics) in 1974. The Mincer Theory models the earnings as a function of human capital in statistical estimation. The variables for instance schooling and work experience are intermittently used measures of human capital. Mincer and Becker accompanied to evolve the empirical groundwork of human capital theory, ergo reform the labor economics field.

Based on **Theory of Human Capital**, investment in an individual's education is similar to the business investments in equipment. Becker's research was integral in

contend for the augmentation of human capital. He estimated the money rate of return to education in United States. According to Becker (1962), the rate of return on education is supposed to be higher than elsewhere. Schools perhaps served as unique organization that offers enormous and diverse expertise to train the students. Education is able to expand the knowledge of an individual. This apt to increase the career opportunities and thus surge the real income. A non-educated individual will earn less due to reason of being cannot work as much or as regularly. Becker includes the net earnings which is the difference between potential earnings and total costs (sum of direct and indirect school costs). Additionally, he distinguished the general and specific education and whereby their impact on the job-lock and promotions.

Based on **Mincer theory**, theory of investment in human capital used to examine the income distribution. Education is perceived as an investment in the human skills accumulation that can alter the earning rates. Schooling is not the only type of investment in human capital, yet it is a momentous self-investment in the initial step of life rhythm. Mincer spotlighted the analysis of the causal effect of education on earnings, which is the return to schooling. According to Angrist and Pischke (2015), schooling is an investment in human capital, with a monetary reward analogous to that of a financial investment. Working with U.S. consensus data, Mincer quantified the return to schooling using regression estimates. He related the income distribution in America to the different extent of education and on-the-job training among workers. Consequently, he observed that the average earnings rise for each additional year of education. Mincer theory proposed that there is a positive relationship between the education and earnings.

Both of the theories are supported by the other researchers, simultaneously. According to Pereira and Martins (2004), in 1995, the return to education in Portugal is around 9.7% and that it elevated by about 1% over ten years. There has been a massive hike in the average education of workers in the labor market. When there is a substantial rise in the demand for the skills, the earning power of these workers upsurge concurrently. Wannakrairoj (2013) claimed that there was a significant

relationship between education and wage. The wages rise with further years of education. According to Angrist and Keueger (1991), through mandatory school laws, students who are impelled to attend school longer are able to obtain more wages for the sake of their extra schooling. Johnson and Chow (1997) stated that the rate of return to schooling for female was significantly higher than the male in the urban areas.

3.2 Potential outcome framework

To measure the causal effect of education, there are two possible outcomes on welfare of an individual: (i) if the individual completed high school $\boldsymbol{D_i = 1}$, the welfare status is assumed to be $\boldsymbol{Y_{1i}}$; (ii) If the individual did not complete high school $\boldsymbol{D_i = 0}$, the welfare status is assumed to be $\boldsymbol{Y_{0i}}$. Individual education is described by a binary random variable, $\boldsymbol{D_i = \{0, 1\}}$. The outcome of interest, a measure of welfare, is denoted by $\boldsymbol{Y_i}$. Thus, by comparing the two possible outcomes, the effect of education can be observed using equation (1).

$$\boldsymbol{Y_i = \alpha_1 + \alpha_2 D_i}$$

$$\boldsymbol{Y_i = Y_{0i} + (Y_{1i} - Y_{0i}) D_i} \qquad (1)$$

From the equation above: $\boldsymbol{\alpha_2}$ and $(\boldsymbol{Y_{1i} - Y_{0i}})$ show the difference in the individual welfare, which measure the causal effect of education. Treatment effect refers to the causal effect of the binary variable, $\boldsymbol{D_i = \{0, 1\}}$ on the outcome variable, $\boldsymbol{Y_i}$. However, we can't measure $(\boldsymbol{Y_{1i} - Y_{0i}})$ since we never observe both $\boldsymbol{Y_{1i}}$ and $\boldsymbol{Y_{0i}}$ for the same individual at the same time. If the individual is educated$(\boldsymbol{D_i = 1})$, the welfare is $\boldsymbol{Y_{1i}}$ and $\boldsymbol{Y_{0i}}$for the individual is unobservable. In conclude, we never see both potential outcomes for any one person. Simultaneously, we must learn about the effects of education status by comparing the average welfare of those who were and were not educated (average causal effect) (Angrist & Pischke, 2009).

3.3 Average Causal Effect

We measure the average causal effect which compares two groups of individuals who have similar characteristics. For example, we compare individuals in group A who completed high school with individuals in group B who did not complete high school. The average of all such group specific is the first shot at estimating the causal effect, as equation (2) shows.

$$\boldsymbol{E(Y_i|D_i = 1) - E(Y_i|D_i = 0) = E(Y_{1i}|D_i = 1) - E(Y_{0i}|D_i = 0)} \qquad (2)$$

where $\boldsymbol{E(Y_{1i}\,|\,D_i = 1)}$ is the average welfare status of those who completed high school, while $\boldsymbol{E(Y_{0i}|D_i = 0)}$ captures the average welfare status of those who did not complete high school. The average causal effect is the difference between the $\boldsymbol{E(Y_{1i}\,|\,D_i = 1)}$ and $\boldsymbol{E(Y_{0i}|D_i = 0)}$.

A simple comparison of the welfare by education status may produce a biased estimate of education. We suspect we will not be able to learn about the causal effect of education status simply by comparing the average levels of welfare status because of selection bias. Regardless the education status, people can have better welfare because of other factors. For example, gender may affect the welfare of individual itself (Wood, Rhodes & Whelan, 1989). Therefore, we include selection bias in equation (2), and the equation is rewritten as equation (3).

$$\boldsymbol{E(Y_i|D_i = 1) - E(Y_i|D_i = 0) = E(Y_{1i}|D_i = 1) - E(Y_{0i}|D_i = 0)} \\ + \\ \boldsymbol{E(Y_{0i}|D_i = 1) - E(Y_{0i}|D_i = 0)} \qquad (3)$$

The selection bias, $\boldsymbol{E(Y_{0i}|D_i = 1) - E(Y_{0i}|D_i = 0)}$ is the difference in average $\boldsymbol{Y_{0i}}$, in the absence of education, between those who completed and those who did not complete high school. We suspect that potential outcomes for those who were educated are better than for those who did not; there is positive selection bias which it will overestimate the true treatment effects between the binary variable, $\boldsymbol{D_i}$

and the outcome variable, $\boldsymbol{Y_i}$. A regression that does not control for the other factors may suffer from omitted variables bias (OVB). After adding $\boldsymbol{E(Y_{0i}|D_i = 0)}$ and $\boldsymbol{E(Y_{0i}|D_i = 1)}$, equation (2) which is the model without controls will have a different regression coefficient with equation (3) which is model with control. This shows that individual who completed high school, $\boldsymbol{E(Y_{0i}|D_i = 1)}$ may have welfare that same with individual that did not completed high school, $\boldsymbol{E(Y_{0i}|D_i = 0)}$ due to other factors.

OVB is a mathematical result that explains the difference between regression coefficients in any short- versus long- scenarios, irrespective of the causal interpretation of the regression parameters. The **short** scenario controls for the fact that only education affects welfare. The **short** scenario is shown in equation (2) not with control on selection bias. Meanwhile, the **long** scenario controls for the fact that education and other control variables taken into account. The long scenario is shown in equation (3) with the control on selection bias. If these control variables are not included, there is omitted variable bias.

Including a set of control variables in the equation is one of the strategies to eliminate the omitted variable bias. The control variables are variables that correlate with welfare and education. Further, we estimate the relationship between omitted variables and education and the relationship between omitted variable and living standard. An array of the control variables or covariates should be hold fixed to obtain an accurate causal inference. According to Angrist and Pischke (2009), the conditional independence assumption (CIA) provides the justification for the causal interpretation for the causal analysis of regression estimates, so called selection on observables. It is a core assumption that the covariates to be held fixed and are assumed to be known and observed. From equation (3), those who completed high school seem likely to earn more at all compared to those who did not complete high school. Nevertheless, selection bias always to be positive and the simple comparison, $\boldsymbol{E(Y_i|D_i = 1) - E(Y_i|D_i = 0)}$ would amplify the welfare of those who completed

high school. Thus, the CIA contends that conditional on observed characteristics (a vector of control variables), $\boldsymbol{X_i}$, the selection bias tends to disappear. That is:

$$\{\boldsymbol{Y_{0i}}, \boldsymbol{Y_{1i}}\} \text{ independent of } \boldsymbol{D_i}, \text{ conditional of } \boldsymbol{X_i} : \{\boldsymbol{Y_{0i}}, \boldsymbol{Y_{1i}}\} \perp\!\!\!\perp (\boldsymbol{D_i}|\boldsymbol{X_i})$$

In words: If we are looking at individuals with the same characteristics $\boldsymbol{X}$, then $\{\boldsymbol{Y_{0i}}, \boldsymbol{Y_{1i}}\}$ and $\boldsymbol{D_i}$ are independent.

It follows, given the CIA, conditional-on- $\boldsymbol{X_i}$ comparisons of average welfare across education levels have a causal interpretation. It is shown in the following equation:

$$\boldsymbol{E}(\boldsymbol{Y_i}|\boldsymbol{X_i}, \boldsymbol{D_i} = \boldsymbol{1}) - \boldsymbol{E}(\boldsymbol{Y_i}|\boldsymbol{X_i}, \boldsymbol{D_i} = \boldsymbol{0}) = \boldsymbol{E}(\boldsymbol{Y_{1i}} - \boldsymbol{Y_{0i}}|\boldsymbol{X_i}) \qquad (4)$$

For obvious reasons, this quantity is interpretable as the average conditional treatment effect. This leads to the CIA, a core assumption that provides the (sometimes implicit) justification for the causal interpretation of regression estimates. From equation (4), the observed characteristics or covariates, $\boldsymbol{X_i}$ insert to make a valid regression estimates where $\boldsymbol{E}(\boldsymbol{Y_{1i}} - \boldsymbol{Y_{0i}}|\boldsymbol{X_i})$ implies that average welfare is conditional on the other observed characteristics besides of the binary variable. Given the CIA, education level is independent of potential welfare, $\{\boldsymbol{Y_{0i}}, \boldsymbol{Y_{1i}}\}$ conditional on $\boldsymbol{X_i}$ **(**observed characteristics), hence the selection bias, $\boldsymbol{E}(\boldsymbol{Y_{0i}}|\boldsymbol{D_i} = \boldsymbol{1}) - \boldsymbol{E}(\boldsymbol{Y_{0i}}|\boldsymbol{D_i} = \boldsymbol{0})$ in equation (3) vanishes.

3.4 Regression Control Strategy

We use the following regression equation to estimate the effects of education on individuals' welfare:

$$\boldsymbol{Y_i = \alpha_1 + \alpha_2 D_i + \alpha_3 X_i + \mu_i} \qquad (5)$$

where $\boldsymbol{Y_i}$ is the welfare status; $\boldsymbol{D_i}$ is an education dummy, an indicator whether the individual completed high school; $\boldsymbol{X_i}$ is a vector of individual characteristics; and μ_i is the error term.

We introduce individual characteristics to ensure the likelihood of an individual's education is as random as possible. For instance, in most of the time, we assumed that those who are older always attain the higher education level compared with the younger. Males always have higher education than female due to many socialization reasons. Apart from that, different ethnical groups might have different culture and opportunities causing their different education attainment. Therefore, to make sure that the likelihood of an individual's education is as random as possible, we control for the gender, marital status, age and ethnicity.

We can never be sure whether a given set of control variables is enough to eliminate the selection bias, thus it is important to ask how sensitive regression results are to changes in the list of controls. It is to the extent that the regression estimates of causal effects grow when the dummy variable, $\boldsymbol{D_i}$ is insensitive to the added or dropped of particular variable as long as a few core controls are always included in the model. In this case, we use the control variables that are correlated with the education and welfare in order to remove the selection bias problem.

3.5 Data Description

The data we use in this report are from the fifth wave of the Indonesia Family Life Survey (IFLS) collected in Indonesia in year 2014 and 2015. It is a socioeconomic and health survey which helps the researchers and policymakers to understand more about the Indonesian population's livings, health and education facilities used. There are five waves in the survey: the first wave is started in year 1993-1994, the second wave (IFLS2) is conducted in year 1997-1998, follow by IFLS3 in year 2000 and the fourth wave is collected in year 2007-2008. The sample size is 45,071 and 30,522 in urban and rural areas, respectively.

We use Book 1, 2 and 3A in IFLS 5 for the variables studied. Book 1 provides information of household expenditure and knowledge of health facilities. The survey is answered by spouse of head household or those who have better knowledge on the household affairs. For instance, Book 1 includes the information such as quantity and purchase price of food and non-food items. Other than that, it also gives details about the public and private healthcare services. Next, Book 2 is about the Household Economy. This segment is more about the household characteristics and household business such as farm and non-farm businesses. Besides, non-business assets and non-labor income are also included in this book. Furthermore, Book 3A is related to the individual adult in Indonesia. In Book 3A, the survey is done on the household members who are 15 years old and older about their educational, marital status, work, and long run migration histories (Strauss, Witoelar & Sikoki, 2016).

There are three types of variable used in our regression, including dependent variable, independent variable and also control variables. All the data used for these variables are adapted from the IFLS 5. We use four measures for household welfare, the dependent variable: income, household assets, spending and household conditions. All variables are in logarithm, except household conditions that are dummy variables. Moreover, we used two measures for education, the independent variable: completing senior high school and completing bachelor degree. Both variables are dummy variables. Apart from that, a set of control variables are used to eliminate the selection

bias problem in our regression model. The control variables are gender, marital status, age and ethnicity.

3.5.1 Dependent Variable

3.5.1.1 Income

We use wage income as one of the measures of welfare. There are four measures: hourly income, weekly income, monthly income and annually income. These data are mostly adapted from the IFLS 5 (Book 2) while the labor and non-labor income are asked in that particular section. Besides, the unit of measurement is in Rupiah, million Rupiah and billion Rupiah for the wage income. The functional form of the variable is lnwage in our regression.

3.5.1.2 Household Assets

Household assets are another dependent variable we use to measure welfare. We use the types of assets owned by households for non-business use. The assets include house and land that occupied by households, other buildings, lands not for business use, poultry, livestock or fishpond and hard stem plant. Besides, we also obtain information whether the households own vehicles (such as bicycles, motorbikes, cars and boats), household appliances (such as television, radio, tape recorder, fridge, VCD player, hand phone, sewing machine and washing machine), savings, receivables, jewelry, household furniture and utensils and other assets. The unit of measurement is in million Rupiah and the functional form of the variable is lnhr02 in our regression.

3.5.1.3 Household Spending

Household spending are one of the measures of welfare. We measure household spending in three ways: food items, non-food items and spending on schooling. From the survey, questions were asked according to type of food items spent during the past week, non-food items spent during the past month and year, and spending on schooling in the last year. The questions asked to learn the total expenditures to purchase the above items. The types of food items included were staple foods, vegetables, dried foods, meat and fish, milks and eggs, spices, beverages and other drinks. The types of non-food items were utilities, household items, domestic services, transportation, medical costs, taxes and other expenditures. The spending on schooling were the total expenditures that the household spent on their children's tuition, school committee contribution, registration, exams and other contribution. Besides, the survey also asked questions to learn other expenditure needed for their children's schooling needs such as uniforms, transportation and pocket money. The variable is measured in million Rupiah and the functional form is lnfood, lnnonfood and lnfee_sch in our regression.

3.5.1.4 Household Condition

We also use household conditions, which are dummy variables, to measure welfare. The variables include a number of basic amenities: whether a household has electricity; whether a household has pipe water; whether a household owns toilet; whether a household has proper drainage ditch; whether a household disposes garbage in trash can; whether a household store food in the fridge; whether a household has electricity or gas stove; whether a household has a TV. The indicators are dummy variables, which equal one if a household condition present, and zero otherwise. The functional form of the variable is electricity, pipe, toilet, drain, trash, fridge, stove and tv.

3.5.2 Independent Variable

3.5.2.1 Education

We use two measures for education: completing senior high school and completing bachelor degree. The indicators take the value one if an individual completing a grade, and zero otherwise. The information and data regarding the education level of an individual are taken from IFLS 5 (Book 3A).

3.5.3 Control Variable

There are four control variables included in the regression test, which are gender, marital status, age and ethnicity. Gender refers to either an individual is a male or female. It shows dummy one for male, and zero otherwise. Marital status indicates whether the individual is married or not. It shows dummy one if an individual is married, and zero otherwise. Ethnicity is a set of dummies for many races in Indonesia. All control variables are dummy variables except for the age which takes a range of different age among individuals.

3.6 Summary Statistics

Table 3.1: Summary Statistics

Variables	Unit	Urban	Rural	Full Sample
Dependent				
A. Income				
Hourly Wage	Rp	29347	15092	21956
	Rp million	(0.48)	(0.13)	(0.35)
Weekly Wage	Rp million	0.82	0.42	0.61
		(19.70)	(7.45)	(14.68)
Monthly Wage	Rp million	72.95	1.32	42.68
	Rp billion	(8.41)	(0.003)	(6.39)
Yearly Wage	Rp billion	0.10	0.11	0.11
		(8.46)	(9.83)	(9.07)
B. Household Assets				
House and land occupied by the household	Rp million	162.78	92.74	132.03
		(288.73)	(169.10)	(246.01)
Other building	Rp million	35.07	11.65	24.79
		(160.81)	(91.37)	(135.30)
Land not for business use	Rp million	19.06	13.47	16.60
		(109.22)	(90.61)	(101.50)
Poultry	Rp million	8.27	4.25	6.50
		(198.82)	(48.34)	(152.32)
Livestock/fishpond	Rp million	12.31	30.47	20.28
		(204.99)	(150.90)	(183.43)
Hard stem plant	Rp million	13.40	38.69	24.50
		(225.12)	(475.01)	(357.26)
Vehicles	Rp million	333.82	230.47	288.45
		(909.25)	(759.98)	(848.47)
Household appliance	Rp million	78.07	53.20	67.15
		(142.39)	(153.94)	(148.08)
Savings	Rp million	5.56	2.94	4.41
		(37.03)	(24.24)	(32.07)
Receivable	Rp million	22.45	18.40	20.67
		(280.09)	(217.63)	(254.55)
Jewelry	Rp million	4.77	3.30	4.13
		(18.55)	(16.12)	(17.54)
Household furniture and utensils	Rp million	76.00	62.00	69.85
		(202.84)	(188.54)	(196.80)
Other assets	Rp million	2.05	13.49	7.07
		(34.91)	(525.37)	(349.12)

Table 3.1: Summary Statistics (continued)

Variables	Unit	Urban	Rural	Full Sample
C. Household Spending				
Food (Previous week)	Rp million	0.45	0.35	0.41
		(0.36)	(0.29)	(0.33)
Nonfood (Previous month)	Rp million	1.79	1.10	1.51
		(3.69)	(2.82)	(3.38)
Nonfood (Previous year)	Rp million	10.66	7.59	9.40
		(33.58)	(25.01)	(30.41)
Schooling	Rp million	5.75	3.71	49.11
		(9.49)	(6.72)	(85.26)
D. Household Condition				
Have electricity at home		1.00	0.98	0.99
		(0.05)	(0.13)	(0.09)
Have pipe water for drinking		0.20	0.15	0.18
		(0.40)	(0.35)	(0.38)
Have own toilet		0.88	0.78	0.84
		(0.33)	(0.42)	(0.37)
Have proper drainage ditch		0.67	0.41	0.56
		(0.47)	(0.49)	(0.50)
Dispose garbage in trash can		0.56	0.07	0.36
		(0.50)	(0.26)	(0.48)
Store food in the fridge		0.51	0.34	0.44
		(0.50)	(0.47)	(0.50)
Have an electricity/ gas stove		0.84	0.56	0.72
		(0.37)	(0.50)	(0.45)
Have a TV		0.95	0.86	0.91
		(0.22)	(0.35)	(0.28)
E. Control Variables				
Gender		0.50	0.50	0.49
		(0.50)	(0.50)	(0.50)
Marital Status		0.22	0.16	0.20
		(0.42)	(0.37)	(0.40)
Age		32.98	33.19	33.07
		(21.76)	(22.58)	(22.10)
Javanese		0.44	0.43	0.43
		(0.50)	(0.50)	(0.50)
Observations		45071	30522	75593

Notes: The numbers in parentheses are robust standard deviations. The number of observations in urban and rural areas is 45071 and 30522, respectively. The amount of income refers to the income that all household members received in the previous 12 months. The values of household assets are those purchased in the previous 12 months. The household spending includes money spent for food item in the past week, nonfood item in past month and year and schooling in last year. Next, household conditions refer to the various types of facilities households own.

Table 3.1 shows the summary statistics. Panel A shows that individuals in urban areas have higher average income than those who live in rural areas. For example, the hourly wages, weekly wages, and monthly wages in urban areas are Rp 14255, Rp 0.40 million and Rp 71.63 billion higher, respectively. The annual wages, on the other hand, are slightly higher for individuals in rural areas. For instance, the annual wages in rural areas are Rp 0.01 billion higher.

Besides, panel B shows that household in urban areas own more average assets than those who live in rural areas. For example, the other building, land not for business use, poultry, household appliance, saving, receivable, jewelry, household furniture and utensil for urban households are Rp 23.42, 5.59, 4.02, 24.87, 2.62, 4.05, 1.47 and 14.00 million higher, respectively. There is a large difference for house and land occupied and the vehicles owned between urban and rural households. For instance, the house and land occupied and vehicles are Rp 70.04 and 103.35 million higher for households in urban areas. However, rural households own more average assets such as livestock, hard stem plant and other assets.

Panel C presents that individuals in urban areas spend more than those who live in rural areas. For instance, the spending for previous week food, previous month nonfood, previous year nonfood and schooling are Rp 0.10, 0.69, 3.07 and 2.04 million higher, respectively.

Moreover, panel D shows that urban households have a better household condition than rural households. For instance, the estimates of pipe water for drinking, toilet, proper drainage ditch, dispose garbage in trash can, store food in fridge, gas stove and TV for urban households are 0.05, 0.10, 0.26, 0.49, 0.17, 0.28 and 0.09 higher, respectively. However, both urban and rural households have similar access to the electricity at home.

Panel E shows that individuals in urban and rural areas share similar characteristics in terms of gender and ethnicity. For example, 50% are male in urban and rural areas. Besides, 44% are Javanese in both areas. However, it is observed that

more individuals in urban areas are married compared to the rural areas. For instance, 22% and 16% of individuals are married in urban and rural areas respectively. It maybe the reasons of people in the urban areas have high earning power and tend to be more married. Whilst, the divorce rate and remarried rate is high that the urban areas' people might married many times. Into the bargain, the age is different among the individual in urban and rural areas. There are more young people in the urban areas compared to the rural areas. A better infrastructure, job opportunities and lifestyle in the urban areas have attracted the migration of young people from the rural areas to the urban areas.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

This chapter presents the results of methodology as discussed in Chapter 3. We use regression control strategy to estimate the effect of education on an individual's welfare. First, we test the effects of completing senior high school study on the welfare. Besides, we also use another measures of education, completing bachelor degree to estimate its effects on the welfare. We interpret the coefficients of the results and also analyze the statistical significance of results at significance levels of 1%, 5% and 10% respectively. The results in Section 4.1 show the effects of completing senior high school on the welfare; section 4.2 presents the results of the effect of completing bachelor degree on welfare.

4.1 Completing Senior High School as the Measure of Education

We study the effects of completing senior high school on four measures of welfare: wages, household assets, household spending and household conditions.

4.1.1 Effects of Completing Senior High School on Wages

Table 4.1.1 presents the effects of completing senior high school on wages. Column (1) is basic specification without any control variables; column (2) controls for gender; column (3) includes marital status as an additional control; column (4) takes age into account; column (5) controls also ethnicity.

Table 4.1.1: The Effects of Completing Senior High School on Wages

Dependent variables		(1)	(2)	(3)	(4)	(5)
A. Urban						
Hourly Wage	(1)	9.35***	4.96***	4.84***	2.47***	0.79***
		(0.03)	(0.12)	(0.12)	(0.08)	(0.05)
Weekly Wage	(2)	12.64***	6.51***	6.35***	3.10***	0.75***
		(0.03)	(0.16)	(0.16)	(0.10)	(0.05)
Monthly Wage	(3)	14.40***	8.62***	8.29***	3.34***	0.70***
		(0.01)	(0.08)	(0.08)	(0.05)	(0.02)
Yearly Wage	(4)	16.67***	9.98***	9.64***	4.02***	0.94***
		(0.02)	(0.09)	(0.09)	(0.06)	(0.03)
B. Rural						
Hourly Wage	(5)	8.99***	3.12***	3.08***	1.80***	0.53***
		(0.05)	(0.15)	(0.15)	(0.09)	(0.06)
Weekly Wage	(6)	12.24***	4.16***	4.10***	2.26***	0.48***
		(0.05)	(0.20)	(0.20)	(0.11)	(0.05)
Monthly Wage	(7)	14.06***	6.51***	6.27***	3.06***	0.53***
		(0.02)	(0.13)	(0.13)	(0.07)	(0.03)
Yearly Wage	(8)	16.26***	7.51***	7.28***	3.72***	0.73***
		(0.03)	(0.15)	(0.15)	(0.08)	(0.04)
C. Full Sample						
Hourly Wage	(9)	9.23***	4.11***	4.01***	2.17***	0.73***
		(0.03)	(0.09)	(0.09)	(0.06)	(0.04)
Weekly Wage	(10)	12.5***	5.4***	5.27***	2.70***	0.71***
		(0.03)	(0.12)	(0.12)	(0.07)	(0.04)
Monthly Wage	(11)	14.31***	7.84***	7.54***	3.22***	0.69***
		(0.01)	(0.07)	(0.07)	(0.04)	(0.02)
Yearly Wage	(12)	16.57***	9.05***	8.74***	3.91***	0.94***
		(0.01)	(0.07)	(0.08)	(0.05)	(0.02)
Control Variables						
Gender			✓	✓	✓	✓
Marital Status				✓	✓	✓
Age					✓	✓
Ethnicity						✓

Notes: Column (1) is the regression without any control variables; column (2) controls for gender; column (3) includes marital status as additional control; column (4) age; and column (5) ethnicity dummies. In Panel A, the numbers of observation in row (1) are between 2,450 and 2,430; row (2) 2,580 and 2,460; row (3) 12,300 and 11,210; row (4) 12,630 and 11,510. In Panel B, the numbers of observation in row (5) are between 2,540 and 2,460; row (6) 2,580 and 2,500; row (7) 7,290 and 6,880; row (8) 7,880 and 7,440. In Panel C, the numbers of observation in row (9) are between 5,080 and 4,900; row (10) 5,160 and 4,950; row (11) 19,600 and 18,090; row (12) 20,500 and 18,950. The numbers in parentheses are robust standard errors. The asterisks ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Panel A shows the effects of completing senior high school on wages in urban areas. The estimates in column (1) show, without any control variable, completing senior high school increases wages in urban areas: the hourly wage, weekly wage, monthly wage, and yearly wage are 9.35, 12.64, 14.40, and 16.67 times higher, respectively. The estimates are statistically significant. In column (2), when gender is used as the control variable, the effects of education on wages become smaller but remain statistically significant. In column (3), with marital status as an additional control, the estimates do not change much. As age is added into the regression, the estimates in column (4) become smaller, but remain statistically significant at 1% level. In column (5), the estimates show a large drop after controlling for ethnicity. The estimates show that completing senior high school increases the hourly wage, weekly wage, monthly wage, and yearly wage in urban areas by 0.79, 0.75, 0.70, and 0.94 times higher, respectively. The estimates remain statistically significant.

Panel B shows the difference in wages by education status in rural areas. Without controlling any variable, the estimates in column (1) show wages in rural areas increase with completing senior high school: hourly wage, weekly wage, monthly wage, and yearly wage are 8.99, 12.24, 14.06, and 16.26 times higher, respectively. The estimates are statistically significant. With gender as the control variable in column (2), the estimates show a positive association between education and wages, but the effects appear to be smaller. In column (3), the estimates change slightly after marital status is added into the regression. After controlling for age in column (4), the magnitude of estimates continues to reduce. After ethnicity dummies are included as the additional controls, in column (5), the estimates show that the hourly wage, weekly wage, monthly wage, and yearly wage in rural areas are 0.53, 0.48, 0.53, and 0.73 times higher, respectively after completing senior high school. The estimates remain statistically significant.

Panel C shows the effects of completing senior high school on wages considering a full sample. Column (1) shows estimates without any control variable in the regression. The estimates show that completing senior high school leads the hourly, weekly, monthly, and yearly wage to increase by 9.23, 12.50, 14.31, and 16.57 times higher, respectively. The estimates are statistically significant. After controlling for gender in column (2), the effects of education on wages appear to be smaller but remain statistically significant at 1% level. In column (3), the estimates vary only for a small amount after controlling for marital status. In column (4), the estimates show a positive association between education and wages, but the effect has become smaller after age is added into regression. In column (5), with ethnicity as an additional set of control, the statistically significant estimates show that the hourly wage, weekly wage, monthly wage, and yearly wage after completing senior high school are 0.73, 0.71, 0.69, and 0.94 times higher, respectively.

The results show, in summary, completing senior high school has a larger effect on wages in urban areas as compared to rural areas. This is because the estimates for the wages in urban areas are higher than the estimates in rural areas in overall. For example, before control variable is added into the regression, completing senior high school increases the annual wages in urban areas and rural areas for 16.67 and 16.26 times, respectively. After including gender, marital status, age and ethnicity as the control variables, the annual wages in urban and rural areas increase for 0.94 and 0.73 times, respectively after completing senior high school. The estimates are statistically significant in both areas. Therefore, the results show that education has greater effects on wages in urban areas than rural areas after control variables are added. Besides, the results may due to the different allowance standard for the job in urban areas and rural areas. This is because the allowance for the jobs in urban areas might be higher due to the high living cost and skills requirement as compared to rural areas.

4.1.2 Effects of Completing Senior High School on Household Assets

Table 4.1.2: The Effects of Completing Senior High School on Household Assets

Dependent variables (in logarithm)		(1)	(2)	(3)	(4)	(5)
A. Urban						
House and land occupied by the household	(1)	12.75***	11.56***	11.56***	2.16***	1.08***
		(0.18)	(0.19)	(0.19)	(0.22)	(0.24)
Other building	(2)	3.49***	3.36***	3.36***	1.81***	1.84***
		(0.14)	(0.15)	(0.15)	(0.17)	(0.19)
Land not for business use	(3)	3.01***	2.80***	2.80***	1.40***	1.27***
		(0.13)	(0.14)	(0.14)	(0.16)	(0.18)
Poultry	(4)	3.76***	3.44***	3.44***	0.34*	-0.45**
		(0.13)	(0.14)	(0.14)	(0.18)	(0.19)
Livestocks/ fishpond	(5)	1.56***	1.40***	1.40***	0.51***	0.27**
		(0.09)	(0.10)	(0.10)	(0.12)	(0.14)
Hard stem plant	(6)	2.28***	2.12***	2.12***	0.68***	0.59***
		(0.11)	(0.11)	(0.11)	(0.14)	(0.16)
Vehicles	(7)	17.62***	16.29***	16.29***	6.17***	2.54***
		(0.10)	(0.12)	(0.12)	(0.19)	(0.18)
Household appliance	(8)	17.48***	16.02***	16.02***	4.79***	2.13***
		(0.06)	(0.08)	(0.08)	(0.13)	(0.13)
Saving	(9)	7.04***	6.88***	6.88***	4.22***	3.87***
		(0.15)	(0.16)	(0.16)	(0.19)	(0.20)
Receivable	(10)	2.78***	2.61***	2.61***	1.49***	1.23***
		(0.13)	(0.13)	(0.13)	(0.15)	(0.17)
Jewelry	(11)	10.16***	9.80***	9.80***	4.91***	3.60***
		(0.14)	(0.15)	(0.15)	(0.19)	(0.21)
Household furniture and utensils	(12)	17.16***	15.77***	15.77***	4.55***	1.92***
		(0.07)	(0.09)	(0.09)	(0.14)	(0.13)
Other assets	(13)	0.75***	0.69***	0.69***	0.34***	0.35***
		(0.07)	(0.07)	(0.07)	(0.08)	(0.09)
B. Rural						
House and land occupied by the household	(14)	14.50***	13.06***	13.06***	2.76***	0.47*
		(0.23)	(0.25)	(0.25)	(0.26)	(0.26)

Table 4.1.2: The Effects of Completing Senior High School on Household Assets (continued)

Dependent variables (in logarithm)		(1)	(2)	(3)	(4)	(5)
Other building	(15)	2.29***	2.21***	2.21***	1.24***	1.19***
		(0.19)	(0.19)	(0.19)	(0.20)	(0.22)
Land not for business use	(16)	3.29***	3.05***	3.05***	1.58***	1.34***
		(0.21)	(0.22)	(0.22)	(0.23)	(0.26)
Poultry	(17)	6.40***	5.77***	5.77***	1.69***	0.48*
		(0.23)	(0.24)	(0.24)	(0.27)	(0.28)
Livestocks/ fishpond	(18)	3.13***	2.79***	2.79***	0.69***	0.22
		(0.21)	(0.21)	(0.21)	(0.24)	(0.26)
Hard stem plant	(19)	4.40***	4.02***	4.02***	1.51***	1.27***
		(0.23)	(0.23)	(0.23)	(0.25)	(0.27)
Vehicles	(20)	16.76***	15.45***	15.45***	6.10***	2.71***
		(0.19)	(0.22)	(0.22)	(0.26)	(0.25)
Household appliance	(21)	17.29***	15.81***	15.81***	5.08***	2.77***
		(0.09)	(0.13)	(0.13)	(0.17)	(0.17)
Saving	(22)	5.29***	5.17***	5.17***	3.15***	3.01***
		(0.23)	(0.23)	(0.23)	(0.24)	(0.26)
Receivable	(23)	3.14***	3.00***	3.00***	1.97***	1.84***
		(0.21)	(0.21)	(0.21)	(0.22)	(0.24)
Jewelry	(24)	9.79***	9.35***	9.35***	5.05***	4.33***
		(0.22)	(0.23)	(0.23)	(0.26)	(0.27)
Household furniture and utensils	(25)	17.24***	15.75***	15.75***	4.82***	2.53***
		(0.09)	(0.13)	(0.13)	(0.16)	(0.17)
Other assets	(26)	0.67***	0.62***	0.62***	0.34***	0.36***
		(0.10)	(0.10)	(0.10)	(0.11)	(0.12)
C. Full Sample						
House and land occupied by the household	(27)	13.25***	11.88***	11.88***	1.84***	0.17
		(0.14)	(0.15)	(0.15)	(0.17)	(0.18)
Other building	(28)	3.15***	3.03***	3.03***	1.77***	1.82***
		(0.12)	(0.12)	(0.12)	(0.13)	(0.14)
Land not for business use	(29)	3.09***	2.86***	2.86***	1.39***	1.19***
		(0.11)	(0.12)	(0.12)	(0.13)	(0.14)
Poultry	(30)	4.51***	4.04***	4.04***	0.35**	-0.66***
		(0.12)	(0.12)	(0.12)	(0.15)	(0.16)
Livestocks/ fishpond	(31)	2.01***	1.76***	1.76***	0.22*	-0.20
		(0.09)	(0.09)	(0.09)	(0.12)	(0.13)

Table 4.1.2: The Effects of Completing Senior High School on Household Assets (continued)

Dependent variables (in logarithm)		(1)	(2)	(3)	(4)	(5)
Hard stem plant	(32)	2.88***	2.62***	2.62***	0.58***	0.33**
		(0.10)	(0.11)	(0.11)	(0.13)	(0.14)
Vehicles	(33)	17.38***	15.98***	15.98***	6.08***	2.79***
		(0.09)	(0.11)	(0.11)	(0.15)	(0.14)
Household appliance	(34)	17.43***	15.88***	15.88***	4.72***	2.31***
		(0.05)	(0.07)	(0.07)	(0.10)	(0.10)
Saving	(35)	6.54***	6.39***	6.39***	4.01***	3.77***
		(0.13)	(0.13)	(0.13)	(0.15)	(0.16)
Receivable	(36)	2.88***	2.72***	2.72***	1.65***	1.46***
		(0.11)	(0.11)	(0.11)	(0.12)	(0.13)
Jewelry	(37)	10.06***	9.64***	9.64***	4.97***	4.01***
		(0.12)	(0.12)	(0.12)	(0.15)	(0.16)
Household furniture and utensils	(38)	17.18***	15.67***	15.67***	4.40***	2.00***
		(0.05)	(0.07)	(0.07)	(0.10)	(0.10)
Other assets	(39)	0.73***	0.67***	0.67***	0.34***	0.35***
		(0.06)	(0.06)	(0.06)	(0.06)	(0.07)
Control Variables						
Gender			✓	✓	✓	✓
Marital status				✓	✓	✓
Age					✓	✓
Ethnicity dummies						✓

Notes: Column (1) is the regression without any control variables; column (2) controls for gender; column (3) includes marital status as additional control; column (4) age; and column (5) ethnicity dummies. In Panel A, the numbers of observation in rows (1) to (13) are between 5,085 and 5,276. In Panel B, the numbers of observation in rows (14) to (26) are between 3,890 and 3,970. In Panel C, the numbers of observation in rows (27) to (39) are between 8,975 and 9,246. The numbers in parentheses are robust standard errors. The asterisks ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 4.1.2 presents the effects of completing senior high school on household assets. Column (1) is basic specification without any control variables; column (2) controls for gender; column (3) includes marital status as an additional control; column (4) includes age as an additional control; column (5) includes ethnicity as an additional control.

Panel A shows the effects of completing senior high school on household assets in urban areas. The estimates in column (1) show, without any control variables, completing senior high school increases household assets in urban areas: house and land occupied by the household, other building, land not for business use, poultry, livestocks/fishpond, hard stem plant, and vehicles, are 12.75, 3.49, 3.01, 3.76, 1.56, 2.28, and 17.62 times higher, respectively. Also, household appliance, saving, receivable, jewelry, household furniture and utensils, and other assets are 17.48, 7.04, 2.78, 10.16, 17.16, and 0.75 times higher, respectively. The estimates are statistically significant. In column (2), gender is added as the control variable in the regression, it shows that there is a decline in the estimates, but still statistically significant at 1% significance level. In column (3), we find that after the marital status is added in as additional control variable, the estimates remain unchanged as like column (2), and statistically significant. In column (4), when age is included in the regression as additional control variable, most of the estimates have a dramatically drop, yet remain statistically significant. Lastly, in column (5), as ethnicity dummies are added in, the estimates show a continuous drop. All the estimates are statistically significant.

Panel B shows the effects of completing senior high school on household assets in rural areas. The estimates in column (1) show, without any control variables, completing senior high school increases household assets in rural areas: house and land occupied by the household, other building, land not for business use, poultry, livestocks/fishpond, hard stem plant, and vehicles are 14.50, 2.29, 3.29, 6.40, 3.13, 4.40, and 16.76 times higher, respectively. Besides, the estimates of household appliance, saving, receivable, jewelry, household furniture and utensils, and other assets are 17.29, 5.29, 3.14, 9.79, 17.24, and 0.67 times higher, respectively when an individual complete senior high school education. The estimates are statistically significant. In column (2), the results show that the estimates drop after gender is added as the control variable. However, the estimates are still statistically significant at 1% significance level. In column (3), the estimates remain unchanged and statistically significant after we include marital status as an additional control variable in the regression. In column (4), when age is added into the regression as additional

control variable, most of the estimates have a dramatically drop, yet remain statistically significant. Lastly, in column (5), as ethnicity dummies are added in, the estimates show a continuous drop. In overall, the estimates are statistically significant.

Panel C shows the effects of completing senior high school on household assets in full sample. The estimates in column (1) show that an individual who completes senior high school education has higher value of household assets. For instance, without any control variables in the regression, completing senior high school increases household assets in full sample: house and land occupied by the household, other building, land not for business use, poultry, livestocks/fishpond, hard stem plant, and vehicles are 13.25, 3.15, 3.09, 4.51, 2.01, 2.88, and 17.38 times higher, respectively. Moreover, household appliance, saving, receivable, jewelry, household furniture and utensils and other assets are 17.43, 6.54, 2.88, 10.06, 17.18, and 0.73 times higher, respectively. The estimates are statistically significant. In column (2), gender is added as the control variable, there is a drop in the estimates, but still remain statistically significant at 1% significance level. In column (3), we find that after the marital status is added in as additional control variable, the estimates remain unchanged as like column (2), and statistically significant. In column (4), age is included in the regression as additional control variable and most of the estimates decrease drastically. Yet, they still remain statistically significant. Lastly, in column (5), as ethnicity dummies are added into the regression, the results show a continuous drop in the estimates. All the estimates are statistically significant in overall.

Overall, the results show the evidence that completing senior high school increases the values of household assets, and the effects appear to be stronger in rural areas. Without control variable, most of the results in rural areas are close to and higher than the results in urban areas. Apart from that, we also observe that the results in rural areas are slightly higher than that in urban areas even after we include control variables in the regression. For instance, without or with control variables in the regression, the estimates for poultry and hard stem plant are both higher in rural areas

as compared to urban areas. This is because people in rural areas majority are involved in agricultural activities. As a result, they might own more poultry and hard stem plants. In overall, the results are statistically significant in both areas.

4.1.3 Effects of Completing Senior High School on Household Spending

Table 4.1.3 presents the effects of completing senior high school on household spending. Column (1) is basic specification without any control variables; column (2) controls for gender; column (3) includes marital status as an additional control; column (4) includes age as an additional control; column (5) includes ethnicity as an additional control.

Panel A shows the effects of completing senior high school on household spending in urban areas. The estimates in column (1) show, without any control variables, completing senior high school increases household spending in urban areas: previous week food, previous month non-food, previous year non-food and previous year schooling are 12.87, 14.01, 15.48, and 11.03 times higher, respectively. The estimates are statistically significant. In column (2), gender is added as the control variable, the results show a decline in the estimates, but still statistically significant at 1% significance level. In column (3), we find that after the marital status is added in as additional control variable, the estimates decrease slightly as compare with column (2), and remain statistically significant. In column (4), when age is included in the regression as additional control variable, most of the estimates have a dramatically drop, yet remain statistically significant. Lastly, in column (5), as ethnicity dummies are added in, the estimates show a continuous drop. All the estimates are statistically significant.

Table 4.1.3: The Effects of Completing Senior High School on Household Spending

Dependent variables		(1)	(2)	(3)	(4)	(5)
A. Urban						
Food (Previous week)	(1)	12.87***	8.65***	8.07***	2.85***	0.23***
		(0.01)	(0.05)	(0.05)	(0.04)	(0.01)
Non-food (Previous month)	(2)	14.01***	9.56***	8.93***	3.37***	0.57***
		(0.01)	(0.05)	(0.06)	(0.05)	(0.02)
Non-food (Previous year)	(3)	15.48***	10.55***	9.87***	3.72***	0.63***
		(0.01)	(0.06)	(0.06)	(0.05)	(0.02)
Schooling (Previous year)	(4)	11.03***	7.69***	7.09***	2.93***	0.37***
		(0.07)	(0.09)	(0.10)	(0.10)	(0.11)
B. Rural						
Food (Previous week)	(5)	12.71***	7.28***	6.84***	2.85***	0.21***
		(0.01)	(0.09)	(0.09)	(0.06)	(0.02)
Non-food (Previous month)	(6)	13.65***	7.97***	7.51***	3.34***	0.58***
		(0.02)	(0.10)	(0.10)	(0.07)	(0.02)
Non-food (Previous year)	(7)	15.38***	8.94***	8.42***	3.67***	0.58***
		(0.02)	(0.11)	(0.11)	(0.07)	(0.03)
Schooling (Previous year)	(8)	10.61***	6.10***	5.60***	2.36***	-0.04
		(0.12)	(0.15)	(0.15)	(0.14)	(0.15)
C. Full Sample						
Food (Previous week)	(9)	12.83***	8.12***	7.56***	2.75***	0.26***
		(0.01)	(0.05)	(0.05)	(0.03)	(0.01)
Non-food (Previous month)	(10)	13.92***	8.96***	8.37***	3.29***	0.65***
		(0.01)	(0.05)	(0.05)	(0.04)	(0.01)
Non-food (Previous year)	(11)	15.45***	9.91***	9.26***	3.56***	0.63***
		(0.01)	(0.05)	(0.06)	(0.04)	(0.02)
Schooling (Previous year)	(12)	10.92***	7.10***	6.50***	2.64***	0.29***
		(0.06)	(0.08)	(0.08)	(0.08)	(0.08)
Control Variables						
Gender			✓	✓	✓	✓
Marital Status				✓	✓	✓
Age					✓	✓
Ethnicity						✓

Notes: Column (1) is the regression without any control variables; column (2) controls for gender; column (3) includes marital status as additional control; column (4) age; and column (5) ethnicity dummies. In Panel A, the numbers of observation in rows (1), (2), (3) and (4) are between 19,580 and 17,600. In Panel B, the numbers of observation in rows (5), (6), (7) and (8) are between 12,780 and 11,900. In Panel C, the numbers of observation in rows (9), (10), (11) and (12) are between 32,360 and 29,500. The numbers in parentheses are robust standard errors. The asterisks ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Panel B shows the effects of completing senior high school on household spending in rural areas. The estimates in column (1) show, without any control variables, completing senior high school increases household spending in rural areas: previous week food, previous month non-food, previous year non-food, and previous year schooling are 12.71, 13.65, 15.38, and 10.61 times higher, respectively. The estimates are statistically significant. In column (2), gender is added as the control variable, it shows that there is a decline in the estimates, but still statistically significant at 1% significance level. When we include marital status as additional control variable in column (3), the estimates decrease slightly as compared with column (2). The estimates are statistically significant at 1% significance level. In column (4), when age is included in the regression as additional control variable, most of the estimates drop dramatically, yet remain statistically significant. Lastly, in column (5), as ethnicity dummies are added in, the estimates show a continuous drop. All the estimates are statistically significant, except for the spending on schooling in which its estimate changes from 2.36 in column (4) to -0.04 times higher in column (5).

Panel C shows the effects of completing senior high school on household spending in full sample. The estimates in column (1) show, without any control variables, completing senior high school increases household spending in full sample: previous week food, previous month non-food, previous year non-food and previous year schooling are 12.83, 13.92, 15.45, and 10.92 times higher, respectively. The estimates are statistically significant. In column (2), gender is added as the control variable, the results show that the estimates drop, but still remain statistically significant at 1% significance level. In column (3), we find that after marital status is added in as additional control variable, the estimates decrease slightly as compared with column (2), and remain statistically significant. In column (4), when we include age in the regression as additional control variable, most of the estimates have a dramatically drop, yet remain statistically significant. Lastly, in column (5), as ethnicity dummies are added in, the estimates show a continuous drop. All the estimates are statistically significant.

Overall, the results show the evidence that completing senior high school increases the values of household spending, and the effects appear to be stronger in urban areas. Without control variable, the estimates in urban areas are close to and higher than the results in rural areas. With control variables, most of the results for urban areas are slightly higher than that in rural areas. It is observed that the estimates for previous week food spending in urban areas and rural areas are the same after age is added into the regression as additional control variable. However, when we include ethnicity dummies as additional control variable, the estimates for previous food spending in urban areas turns to be slightly higher as compared to rural areas. Moreover, the estimates for previous month non-food spending in urban areas and rural areas do not differ much after controlling for gender, marital status, age and ethnicity. This implies that the effect of education on previous month non-food spending is the same in both areas. Despite this result, we still observe a larger effect of education on spending in urban areas. The reason behind is that other than previous month non-food spending, the estimates for previous week food, previous year non-food and schooling spending are higher in urban areas. In overall, the results are statistically significant in both areas, except for the previous year schooling spending with all the four control variables in rural areas.

4.1.4 Effects of Completing Senior High School on Household Conditions

Table 4.1.4: The Effects of Completing Senior High School on Household Conditions

Dependent variables		(1)	(2)	(3)	(4)	(5)
A. Urban						
Have electricity at home	(1)	1.00***	0.67***	0.62***	0.21***	0.00***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Have pipe water for drinking	(2)	0.19***	0.13***	0.12***	0.03***	0.00
		(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Have own toilet	(3)	0.94***	0.67***	0.63***	0.28***	0.12***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Have proper drainage ditch	(4)	0.72***	0.51***	0.48***	0.22***	0.09***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Dispose garbage in trash can	(5)	0.66***	0.52***	0.49***	0.29***	0.20***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Store food in the fridge	(6)	0.60***	0.48***	0.47***	0.28***	0.19***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Have an electricity/ gas stove	(7)	0.88***	0.62***	0.60***	0.26***	0.09***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Have a TV	(8)	0.96***	0.65***	0.62***	0.22***	0.03***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
B. Rural						
Have electricity at home	(9)	0.99***	0.56***	0.53***	0.21***	0.01***
		(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
Have pipe water for drinking	(10)	0.14***	0.08***	0.07***	0.02**	0.00
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Have own toilet	(11)	0.88***	0.56***	0.53***	0.28***	0.16***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Have proper drainage ditch	(12)	0.45***	0.28***	0.27***	0.13***	0.06***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Dispose garbage in trash can	(13)	0.13***	0.11***	0.10***	0.08***	0.06***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Store food in the fridge	(14)	0.48***	0.36***	0.35***	0.24***	0.20***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Have an electricity/ gas stove	(15)	0.69***	0.47***	0.45***	0.28***	0.18***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Have a TV	(16)	0.91***	0.54***	0.51***	0.23***	0.07***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
C. Full sample						
Have electricity at home	(17)	1.00***	0.63***	0.58***	0.20***	0.01***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Table 4.1.4: The Effects of Completing Senior High School on Household Conditions (continued)

Dependent variables		(1)	(2)	(3)	(4)	(5)
Have pipe water for drinking	(18)	0.18***	0.12***	0.11***	0.03***	0.02***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Have own toilet	(19)	0.92***	0.63***	0.60***	0.28***	0.15***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Have proper drainage ditch	(20)	0.65***	0.46***	0.43***	0.23***	0.13***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Dispose garbage in trash can	(21)	0.53***	0.43***	0.41***	0.29***	0..25***
		(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Store food in the fridge	(22)	0.57***	0.45***	0.44***	0.28***	0.22***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Have an electricity/ gas stove	(23)	0.83***	0.59***	0.56***	0.30***	0.16***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Have a TV	(24)	0.95***	0.61***	0.58***	0.23***	0.06***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Control Variables						
Gender			✓	✓	✓	✓
Marital status				✓	✓	✓
Age					✓	✓
Ethnicity dummies						✓

Notes: Column (1) is the regression without any control variables; column (2) controls for gender; column (3) includes marital status as additional control; column (4) age; and column (5) ethnicity dummies. In Panel A, the numbers of observation in rows (1) to (8) are between 29,520 and 31,380. In Panel B, the numbers of observation in rows (9) to (16) are between 11,890 and 12,780. In Panel C, the numbers of observation in rows (17) to (24) are between 17,630 and 19,640. The numbers in parentheses are robust standard errors. The asterisks ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 4.1.4 presents the effects of completing senior high school on household conditions. Column (1) is basic specification without any control variables; column (2) controls for gender; column (3) includes marital status as an additional control; column (4) includes age as an additional control; column (5) includes ethnicity as an additional control.

Panel A shows the effects of completing senior high school on household conditions in urban areas. Without any control variables, the estimates in column (1) show that an individual who completed senior high school enjoys better household conditions. For example, education increases the household conditions in urban areas: having electricity at home, having pipe water for drinking, having own toilet, having proper drainage ditch, able to dispose garbage in trash can, able to store food in the fridge, having an electricity or gas stove, and having a television are 100, 19, 94, 72, 66, 60, 88, and 96 percentage points higher, respectively. The results are statistically significant at 1% significance level. By controlling for gender in column (2), the overall results decrease but still indicate a statistically significant positive association between education and household conditions. In column (3), we include marital status as additional control variable and there is only a slightly decrease in the estimates. The estimates are statistically significant. This shows that the effect of marital status on the results is small. After that, in column (4) when we control for age, the estimates drop drastically and still remain statistically significant. Lastly, the estimates continue to drop after the ethnicity dummies are added in as additional control variable in column (5). The estimates of electricity and pipe water become 0 percentage point higher, which indicates an equal chance for the ethnics to enjoy the facilities.

Panel B shows the effects of completing senior high school on household conditions in rural areas. The estimates in column (1) show, without any control variables, completing senior high school increases household conditions in rural areas: having electricity at home, having pipe water for drinking, having own toilet, having proper drainage ditch, able to dispose garbage in trash can, able to store food in the fridge, having an electricity or gas stove, and having a television are 99, 14, 88, 45, 13, 48, 69, and 91 percentage points higher, respectively. The estimates are statistically significant. By adding gender as the first control variable in column (2), the estimates become smaller and remain statistically significant. For instance, the estimate of electricity at home changes from 0.99 to 0.56 percentage point higher. In column (3), when marital status is added in as additional control variable, the

estimates drop a little and remain statistically significant. Next, the estimates decrease when we add in age into the regression as additional control variable in column (4). The estimates are statistically significant. In column (5), ethnicity dummies are added in, the estimates continue to drop. In overall, the results are statistically significant at 1% except for the pipe water for drinking.

Panel C column shows the effects of completing senior high school on household conditions in full sample. Without any control variables, the estimates in column (1) show that an individual who completed senior high school enjoys better household conditions. For example, education increases the household conditions in full sample: having electricity at home, having pipe water for drinking, having own toilet, having proper drainage ditch, able to dispose garbage in trash can, able to store food in the fridge, having an electricity or gas stove, and having a television are 100, 18, 92, 65, 53, 57, 83, and 95 percentage points higher, respectively. The estimates are statistically significant. In column (2), gender is added as the control variable, the results show that estimates drop but still remain statistically at 1% significance level. When we include marital status as additional control variable in column (3), the estimates decrease slightly and remain statistically significant. In column (4), we add in age to control the regression, the estimates decrease by half as compared with the previous estimates in column (3). In column (5), we include ethnicity dummies as additional control variable and the estimates continue to drop. The results are statistically significant at 1% significance level.

Overall, the results show the evidence that completing senior high school increases the household conditions, and the effects appear to be stronger in rural areas. Without control variable, the results in urban areas are higher than the results in rural areas. However, after we add in control variables into the regression, the results in rural areas turn to be higher as compared with urban areas. The results are statistically significant for both areas in overall. For instance, it is observed that people who completed senior high school in rural areas have higher chances to own a TV as compared with those in urban areas. This is because people in rural areas have less

entertainment and therefore they will watch TV programs during their leisure time. As a result, most of the households in rural areas own a TV regardless of whether they are rich or poor. Apart from that, we observe that people who live in rural areas have higher chances to have a gas stove in home. This might due to the reason that urban people are busy for their job and tend to work for long hours. Consequently, they might feel tired and lack of time to cook in home.

4.2 Completing Bachelor Degree as the Measure of Education

This section shows the effects of completing bachelor degree, the alternative measure of education, on the welfare of households: wages, household assets, household spending and household conditions.

4.2.1 Effects of Completing Bachelor Degree on Wages

Table 4.2.1: The Effects of Completing Bachelor Degree on Wages

Dependent variables (in logarithm)		(1)	(2)	(3)	(4)	(5)
A. Urban						
Hourly wage	(1)	9.83***	4.92***	4.65***	2.18***	1.03***
		(0.06)	(0.22)	(0.22)	(0.12)	(0.07)
Weekly wage	(2)	13.04***	6.23***	5.85***	2.53***	0.95***
		(0.06)	(0.30)	(0.29)	(0.15)	(0.07)
Monthly wage	(3)	14.80***	7.62***	7.28***	2.29***	0.86***
		(0.03)	(0.17)	(0.17)	(0.09)	(0.03)
Yearly wage	(4)	17.22***	8.93***	8.55***	2.85***	1.16***
		(0.03)	(0.20)	(0.19)	(0.10)	(0.04)
B. Rural						
Hourly wage	(5)	9.37***	4.35***	4.29***	2.22***	0.91***
		(0.10)	(0.31)	(0.31)	(0.15)	(0.10)
Weekly wage	(6)	12.48***	5.54***	5.46***	2.56***	0.74***
		(0.10)	(0.42)	(0.42)	(0.19)	(0.10)
Monthly wage	(7)	14.28***	7.46***	7.20***	2.61***	0.70***
		(0.05)	(0.30)	(0.30)	(0.14)	(0.06)
Yearly wage	(8)	16.64***	8.90***	8.61***	3.41***	1.05***
		(0.07)	(0.34)	(0.34)	(0.16)	(0.07)
C. Full Sample						
Hourly wage	(9)	9.68***	4.73***	4.54***	2.26***	1.06***
		(0.05)	(0.18)	(0.18)	(0.09)	(0.06)

Table 4.2.1: The Effects of Completing Bachelor Degree on Wages (continued)

Dependent variables (in logarithm)		(1)	(2)	(3)	(4)	(5)
Weekly wage	(10)	12.86***	5.99***	5.73***	2.61***	0.97***
		(0.05)	(0.24)	(0.24)	(0.12)	(0.06)
Monthly wage	(11)	14.67***	7.57***	7.24***	2.43***	0.87***
		(0.03)	(0.15)	(0.15)	(0.07)	(0.03)
Yearly wage	(12)	17.08***	8.92***	8.54***	3.09***	1.20***
		(0.03)	(0.17)	(0.17)	(0.08)	(0.03)
Control Variables						
Gender			✓	✓	✓	✓
Marital status				✓	✓	✓
Age					✓	✓
Ethnicity dummies						✓

Notes: Column (1) is the regression without any control variables; column (2) controls for gender; column (3) includes marital status as additional control; column (4) age; and column (5) ethnicity dummies. In Panel A, the numbers of observation in row (1) are between 2,400 and 2,600; row (2) 2,400 and 2,600; row (3) 11,000 and 12,500; row (4) 11,000 and 13,000. In Panel B, the numbers of observations in row (5) are between 2,400 and 2,600; row (6) 2,400 and 2,600; row (7) 6,500 and 7,500; row (8) 7,400 and 7,900. In Panel C, the numbers of observations in row (9) are between 4,800 and 5,100; row (10) 4,900 and 5,200; row (11) 18,000 and 20,000; row (12) 18,000 and 21,000. The numbers in parentheses are robust standard errors. The asterisks ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 4.2.1 shows the effects of completing bachelor degree on wages. Column (1) is basic specification without any control variables; column (2) controls for gender; column (3) includes marital status as an additional control; column (4) takes age into account; column (5) controls also ethnicity.

Panel A shows the effects of completing bachelor degree on wages in urban areas. Without any control variables, the estimates in column (1) show completing bachelor degree increases the wages in urban areas: hourly wage, weekly wage, monthly wage, and yearly wage are 9.83, 13.04, 14.80, and 17.22 times higher, respectively. The estimates are statistically significant at 1% level. In column (2), with gender added into regression as control variable, the estimates still show a statistically positive association between wages and education. However, the effects

seem to be smaller. After controlling for marital status, the estimates in column (3) only change for a small amount. The estimates are statistically significant at 1% significance level. In column (4), when age is included in the regression as additional control variable, the estimates become smaller but remain statistically significant. With ethnicity included into the regression, estimates in column (5) continue to drop. For instance, the hourly wage, weekly wage, monthly wage, and yearly wage in urban areas are 1.03, 0.95, 0.86, and 1.16 times higher, respectively after completing bachelor degree. The estimates remain statistically significant at 1% significance level.

Panel B shows the effects of completing bachelor degree on wages in rural areas. Column (1) shows the estimates for hourly, weekly, monthly, and yearly wages without any control variables in the regression. The statistically significant estimates show that when an individual in rural areas completes bachelor degree education, his or her hourly, weekly, monthly, and yearly wages are 9.37, 12.48, 14.28, and 16.64 times higher, respectively. In column (2), the estimates become smaller but remain statistically significant after controlling for gender. Also, the estimates in column (3) do not change much after controlling for marital status. In column (4), the effects between education and wages appear to be smaller as marital status is included into the regression as additional control variable. After controlling for ethnicity, the estimates in column (5) show, completing bachelor degree increases the hourly wage, weekly wage, monthly wage, and yearly in rural areas for 0.91, 0.74, 0.70, and 1.05 times higher, respectively. The estimates remain statistically significant at 1% level.

Panel C shows the effects of completing bachelor degree on wages in full sample. In column (1), the estimates show, without any control variables, completing bachelor degree increases wages: the hourly wage, weekly wage, monthly wage, and yearly wage are 9.68, 12.86, 14.67, and 17.08 times higher, respectively. After controlling for gender, the estimates in column (2) drop but remain statistically significant at 1% level. After controlling for marital status in column (3), the estimates show not much different. After age is added into the regression as

additional control variable in column (4), the effects between wages and education become smaller but remain statistically significant. The statistically significant estimates in column (5) show, the hourly wage, weekly wage, monthly wage, and yearly wage after completing bachelor degree are 1.06, 0.97, 0.87, and 1.20 times higher, respectively after ethnicity dummies are included to control the regression.

In short, the results show the evidence that completing bachelor degree increases wages, and the effects appear to be greater in urban areas. Before control variable is added into the regression, completing bachelor degree increases the annual wages in urban areas and rural areas for 17.22 and 16.64 times higher, respectively. After including gender, marital status, age and ethnicity as control variables in the regression, the annual wages in urban and rural areas increase for 1.16 times and 1.05 times higher, respectively after completing bachelor degree. The results show a greater effect of education on wages in urban areas. However, the differences of wages between urban and rural areas become smaller after control variables are added into regression. The estimates are statistically significant in both areas. Moreover, the jobs in urban areas are more competitive and require high qualification of studies and knowledge. Thus, the employer may provide high salary to their employees with high qualification of studies such as bachelor degree holders. This leads to a difference in wages between a bachelor degree holder in urban and rural areas.

4.2.2 Effects of Completing Bachelor Degree on Household Assets

Table 4.2.2: The Effects of Completing Bachelor Degree on Household Assets

Dependent variables (in logarithm)		(1)	(2)	(3)	(4)	(5)
A. Urban						
House and land occupied by the household	(1)	15.42***	13.56***	13.56***	3.92***	3.28***
		(0.35)	(0.38)	(0.38)	(0.36)	(0.36)
Other building	(2)	5.00***	4.67***	4.67***	2.64***	2.53***
		(0.37)	(0.37)	(0.37)	(0.39)	(0.39)
Land not for business use	(3)	4.72***	4.36***	4.36***	2.78***	2.58***
		(0.35)	(0.36)	(0.36)	(0.38)	(0.38)
Poultry	(4)	3.59***	3.05***	3.05***	-0.13	-0.59*
		(0.29)	(0.30)	(0.30)	(0.31)	(0.31)
Livestocks/ fishpond	(5)	1.65***	1.41***	1.41***	0.41*	0.27
		(0.22)	(0.22)	(0.22)	(0.24)	(0.24)
Hard stem plant	(6)	3.24***	2.95***	2.95***	1.50***	1.34***
		(0.29)	(0.29)	(0.29)	(0.31)	(0.31)
Vehicles	(7)	18.92***	16.57***	16.57***	4.89***	2.9***
		(0.19)	(0.29)	(0.29)	(0.28)	(0.23)
Household appliance	(8)	17.94***	15.49***	15.49***	3.04***	1.83***
		(0.14)	(0.28)	(0.28)	(0.25)	(0.22)
Saving	(9)	9.94***	9.35***	9.35***	5.62***	5.30***
		(0.34)	(0.35)	(0.35)	(0.37)	(0.37)
Receivable	(10)	3.72***	3.39***	3.39***	2.08***	1.92***
		(0.32)	(0.33)	(0.33)	(0.34)	(0.34)
Jewelry	(11)	11.93***	10.93***	10.93***	4.82***	4.03***
		(0.30)	(0.32)	(0.32)	(0.34)	(0.34)
Household furniture and Utensils	(12)	17.61***	15.23***	15.23***	2.86***	1.64***
		(0.17)	(0.29)	(0.29)	(0.26)	(0.24)
Other assets	(13)	0.89***	0.85***	0.85***	0.51***	0.53***
		(0.28)	(0.27)	(0.27)	(0.29)	(0.30)
B. Rural						
Household and land occupied by the household	(14)	15.13***	14.16***	14.16***	2.18***	0.75
		(0.53)	(0.62)	(0.62)	(0.56)	(0.52)
Other building	(15)	3.84***	3.76***	3.76***	2.64***	2.50***
		(0.53)	(0.53)	(0.53)	(0.55)	(0.56)

Table 4.2.2: The Effects of Completing Bachelor Degree on Household Assets (continued)

Dependent variables (in logarithm)		(1)	(2)	(3)	(4)	(5)
Land not for business use	(16)	4.81***	4.63***	4.63***	2.90***	2.71***
		(0.57)	(0.58)	(0.58)	(0.59)	(0.60)
Poultry	(17)	6.06***	5.62***	5.62***	0.88	0.10
		(0.54)	(0.56)	(0.56)	(0.58)	(0.58)
Livestocks/ fishpond	(18)	3.15***	2.92***	2.92***	0.46	0.36
		(0.48)	(0.48)	(0.48)	(0.50)	(0.51)
Hard stem plant	(19)	4.78***	4.51***	4.51***	1.50***	1.08*
		(0.53)	(0.54)	(0.54)	(0.56)	(0.57)
Vehicles	(20)	17.85***	16.89***	16.89***	5.42***	3.16***
		(0.38)	(0.46)	(0.46)	(0.46)	(0.42)
Household appliance	(21)	17.74***	16.69***	16.69***	3.87***	2.61***
		(0.18)	(0.35)	(0.35)	(0.33)	(0.31)
Saving	(22)	7.19***	7.05***	7.05***	4.49***	4.39***
		(0.57)	(0.57)	(0.57)	(0.57)	(0.58)
Receivable	(23)	4.16***	4.04***	4.04***	2.70***	2.51***
		(0.54)	(0.54)	(0.54)	(0.55)	(0.57)
Jewelry	(24)	11.73***	11.34***	11.34***	6.02***	5.08***
		(0.48)	(0.50)	(0.50)	(0.50)	(0.53)
Household furniture and Utensils	(25)	17.33***	16.27***	16.27***	3.26***	1.97***
		(0.25)	(0.40)	(0.40)	(0.36)	(0.36)
Other assets	(26)	0.89***	0.85***	0.85***	0.51*	0.53*
		(0.28)	(0.27)	(0.27)	(0.29)	(0.30)
C. Full Sample						
House and land occupied by the household	(27)	15.34***	13.63***	13.63***	3.05***	2.12***
		(0.29)	(0.33)	(0.33)	(0.30)	(0.29)
Other building	(28)	4.69***	4.45***	4.45***	2.8***	2.73***
		(0.31)	(0.31)	(0.31)	(0.32)	(0.32)
Land not for business use	(29)	4.74***	4.42***	4.42***	2.78***	2.59***
		(0.30)	(0.30)	(0.30)	(0.32)	(0.32)
Poultry	(30)	4.26***	3.66***	3.66***	-0.20	-0.78***
		(0.26)	(0.27)	(0.27)	(0.28)	(0.28)
Livestocks/ fishpond	(31)	2.06***	1.77***	1.77***	0.14	-0.07
		(0.21)	(0.21)	(0.21)	(0.22)	(0.22)
Hard stem plant	(32)	3.66***	3.32***	3.32***	1.20***	0.95***
		(0.26)	(0.26)	(0.26)	(0.27)	(0.28)

Table 4.2.2: The Effects of Completing Bachelor Degree on Household Assets (continued)

Dependent variables (in logarithm)		(1)	(2)	(3)	(4)	(5)
Vehicles	(33)	18.63***	16.67***	16.67***	5.16***	3.26***
		(0.17)	(0.24)	(0.24)	(0.24)	(0.20)
Household appliance	(34)	17.89***	15.81***	15.81***	3.28***	2.10***
		(0.12)	(0.23)	(0.23)	(0.20)	(0.18)
Saving	(35)	9.19***	8.77***	8.77***	5.53***	5.33***
		(0.30)	(0.30)	(0.30)	(0.31)	(0.31)
Receivable	(36)	3.84***	3.58***	3.58***	2.28***	2.13***
		(0.27)	(0.28)	(0.28)	(0.29)	(0.29)
Jewelry	(37)	11.87***	11.05***	11.05***	5.29***	4.63***
		(0.25)	(0.27)	(0.27)	(0.28)	(0.28)
Household furniture and Utensils	(38)	17.53***	15.49***	15.49***	2.91***	1.70***
		(0.14)	(0.24)	(0.24)	(0.21)	(0.20)
Other assets	(39)	1.08***	1.00***	1.00***	0.61***	0.60***
		(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
Control Variables						
Gender			✓	✓	✓	✓
Marital status				✓	✓	✓
Age					✓	✓
Ethnicity dummies						✓

Notes: Column (1) is the regression without any control variables; column (2) controls for gender; column (3) includes marital status as additional control; column (4) age; and column (5) ethnicity dummies. In Panel A, the numbers of observation in rows (1) to (13) are between 5,276 and 5,085. In Panel B, the numbers of observation in rows (14) to (26) are between 3,970 and 3,890. In Panel C, the numbers of observation in rows (27) to (39) are between 8,975and 9,246. The numbers in parentheses are robust standard errors. The asterisks ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 4.2.2 presents the effects of completing bachelor degree on household assets. Column (1) is basic specification without any control variables; column (2) controls for gender; column (3) includes marital status as an additional control; column (4) includes age as an additional control; column (5) includes ethnicity as an additional control.

Panel A shows the effects of completing bachelor degree on household assets in urban areas. The estimates in column (1) show, without any control variables, completing bachelor degree increases household assets in urban areas: house and land occupied by the household, other building, land not for business use, poultry, livestocks/fishpond, hard stem plant, and vehicles are 15.42, 5.00, 4.72, 3.59, 1.65, 3.24, and 18.92 times higher, respectively. Moreover, household appliance, saving, receivable, jewelry, household furniture and utensils, and other assets are 17.94, 9.94, 3.72, 11.93, 17.61, and 0.89 times higher, respectively. The estimates are statistically significant. After controlling for gender in column (2), there is a small decline in the estimates, but remain statistically significant at 1% significance level. When we include marital status as additional control variable, in column (3), we find that the statistically significant estimates remain unchanged as like column (2). In column (4), when age is added into the regression as additional control variable, most of the estimates decrease sharply. The estimates are statistically significant, except for the poultry. Lastly, in column 5, when ethnicity dummies are included as additional control variable, the estimates still show a positive association between education and household assets in overall, but the effects appear to be smaller. The estimates are statistically significant except for the livestocks/ fishpond.

Panel B shows the effects of completing bachelor degree on household assets in rural areas. The estimates in column (1) show, without any control variables, completing bachelor degree increases household assets in rural areas: house and land occupied by the household, other building, land not for business use, poultry, livestocks/fishpond, hard stem plant, and vehicles are 15.13, 3.84, 4.81, 6.06, 3.15, 4.78, and 17.85 times higher, respectively. Besides, the estimates for household appliance, saving, receivable, jewelry, household furniture and utensils, and other assets are 17.74, 7.19, 4.16, 11.73, 17.33 and 0.89 times higher, respectively when an individual completes bachelor degree education. The estimates are statistically significant. When we control for gender in column (2), the results show that there is a small drop in the estimates. The estimates remain statistically significant at 1% significance level. In column (3), marital status is added into the regression as

additional control, it is observed that the statistically significant estimates remain unchanged as the estimates in column (2). After that, when age is included as additional control in column (4), the estimates drop dramatically but remain statistically significant, except for the poultry and livestocks/fishpond. Lastly, in column (5), with ethnicity dummies as additional control variable, the estimates continue to drop and the effects between education and household assets appears to be smaller. In overall, the estimates are statistically significant.

Panel C shows the effects of completing bachelor degree on household assets in full sample. The estimates in column (1) shows, without any control variables, completing bachelor degree increases household assets in full sample: house and land occupied by the household, other building, land not for business use, poultry, livestocks/fishpond, hard stem plant, and vehicles are 5.34, 4.69, 4.74, 4.26, 2.06, 3.66, 18.63 times higher, respectively. Also, when an individual completes bachelor degree education, his or her household appliance, saving, receivable, jewelry, household furniture and utensils, and other assets are 17.89, 9.19, 3.84, 11.87, 17.53 and 1.08 time higher, respectively. The estimates are statistically significant. After controlling for gender in column (2), there is a small decline in the estimates, but remain statistically significant at 1% significance level. Next, when marital status is included as additional control variable in column (3), we find that the estimates remain unchanged as like column (2) and remain statistically significant. In column (4), when we add age into the regression as additional control variable, most of the estimates decrease sharply. In overall, the estimates are statistically significant. Lastly, in column (5), ethnicity dummies are included as additional control and the estimates continue to drop. The estimates are statistically significant except for the livestocks/ fishpond.

Overall, the results show the evidence that completing bachelor degree increases the values of household assets and the effects appear to be stronger in rural areas. In urban areas, before control variable is added into the regression, completing bachelor degree increases the values of vehicles for 18.92 higher times higher. After

including gender, marital status, age and ethnicity as control variables, completing bachelor degree in urban areas increases the values of vehicles for 2.9 times higher. Moreover, in rural areas, before control variable is added into the regression, completing bachelor degree increases the values of vehicles for 17.85 times higher. After including gender, marital status, age and ethnicity as control variables, completing bachelor degree in rural areas increases the values of household assets for 3.16 times higher. The results show that before including the control variables, the effect of education is larger in urban areas; however, after control variables is added into the regression, the effect of education is larger in rural areas. The estimates are statistically significant in both areas. People in rural areas gain more knowledge when they are more educated. For instance, they will own more gold jewelry due to its high money value. Also, they are able to study the market performance and do some estimations of value for their assets.

4.2.3 Effects of Completing Bachelor Degree on Household Spending

Table 4.2.3: The Effects of Completing Bachelor Degree on Household Spending

Dependent variables		(1)	(2)	(3)	(4)	(5)
A. Urban						
Food (Previous week)	(1)	13.09***	7.06***	6.68***	1.80***	0.38***
		(0.02)	(0.14)	(0.14)	(0.08)	(0.02)
Non-food (Previous month)	(2)	14.50***	8.05***	7.65***	2.40***	0.87***
		(0.02)	(0.15)	(0.15)	(0.09)	(0.03)
Non-food (Previous year)	(3)	16.09***	8.96***	8.52***	2.72***	1.03***
		(0.03)	(0.17)	(0.16)	(0.10)	(0.03)
Schooling (Previous year)	(4)	11.41***	6.45***	6.09***	2.06***	0.74***
		(0.17)	(0.21)	(0.21)	(0.19)	(0.19)
B. Rural						
Food (Previous week)	(5)	12.88***	7.15***	6.79***	2.14***	0.32***
		(0.04)	(0.25)	(0.24)	(0.13)	(0.04)
Non-food (Previous month)	(6)	14.10***	8.07***	7.70***	2.81***	0.91***
		(0.05)	(0.27)	(0.25)	(0.14)	(0.05)
Non-food (Previous year)	(7)	15.87***	9.04***	8.62***	3.07***	0.96***
		(0.05)	(0.30)	(0.28)	(0.15)	(0.06)
Schooling (Previous year)	(8)	11.14***	6.38***	5.99***	2.29***	0.68**
		(0.29)	(0.36)	(0.35)	(0.30)	(0.31)
C. Full Sample						
Food (Previous week)	(9)	13.05***	7.07***	6.68***	1.89***	0.40***
		(0.02)	(0.12)	(0.12)	(0.07)	(0.02)
Non-food (Previous month)	(10)	14.41***	8.06***	7.64***	2.53***	0.97***
		(0.02)	(0.13)	(0.13)	(0.07)	(0.02)
Non-food (Previous year)	(11)	16.03***	8.96***	8.50***	2.79***	1.04***
		(0.03)	(0.15)	(0.14)	(0.08)	(0.03)
Schooling (Previous year)	(12)	11.34***	6.42***	6.02***	2.11***	0.77***
		(0.15)	(0.18)	(0.18)	(0.16)	(0.16)
Control Variables						
Gender			✓	✓	✓	✓
Marital Status				✓	✓	✓
Age					✓	✓
Ethnicity						✓

Notes: Column (1) is the regression without any control variables; column (2) controls for gender; column (3) includes marital status as additional control; column (4) age; and column (5) ethnicity dummies. In Panel A, the numbers of observation in row (1), (2), (3), and (4) are between 19,580 and 17,600. In Panel B, the numbers of observation in row (5), (6), (7), and (8) are between 12,780 and 12,000. In Panel C, the numbers of observation in row (9), (10), (11), and (12) are between 32,360 and 29,500. The numbers in parentheses are robust standard errors. The asterisks ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 4.2.3 presents the effects of completing bachelor degree on household spending. Column (1) is basic specification without any control variables; column (2) controls for gender; column (3) includes marital status as an additional control; column (4) includes age as additional control; column (5) controls also ethnicity.

Panel A shows the effects of completing bachelor degree on household spending in urban areas. The estimates in column (1) show, without any control variables, completing bachelor degree increases household spending in urban areas: previous week food, previous month non-food, previous year non-food and previous year schooling are 13.09, 14.50, 16.09, and 11.41 times higher, respectively. The estimates are statistically significant. Column (2) shows that the estimates drop drastically but still remain statistically significant at 1% significance level after gender is added in as control variable. In column (3), with marital status as an additional control variable, the estimates do not change much and remain statistically significant. Next, after controlling for age, the estimates in column (4) become smaller but remain statistically significant. Lastly, after ethnicity dummies are included as additional control variable, estimates in column (5) still indicates that education is positively related to spending in urban area but the effect appears to be smaller. The spending for previous week food, previous month non-food, previous year non-food and previous year schooling in urban areas are 0.38, 0.87, 1.03, and 0.74 times higher, respectively. The estimates remain statistically significant at 1% significance level.

Panel B shows the effects of completing bachelor degree on household spending in rural areas. Column (1) shows the estimates without controlling any variables in the regression. The estimates show a statistically significant positive relationship between education and spending in rural area. For example, the household spending in rural areas: previous week food, previous month non-food, previous year non-food and previous year schooling are 12.88, 14.10, 15.87, and 11.14 times higher, respectively. After controlling for gender in column (2), the estimates show a large drop but remain statistically significant. In column (3), the

estimates change slightly and are statistically significant at 1% significance level after marital status is added into the regression as additional control variable. With age as the additional control variable in column (4), the magnitude of estimates continues to fall but remain statistically significant. In column (5), with ethnicity as an additional control, the estimates show the evidence of positive association between education and spending. The estimate for previous year schooling in rural area becomes 5% statistically significant while the others spending are 1% statistically significant.

Panel C presents the effects of completing bachelor degree on household spending considering full sample. The estimates in column (1) show, without any control variables, completing bachelor degree increases household spending in full sample: previous week food, previous month non-food, previous year non-food and previous year schooling are 13.05, 14.41, 16.03, and 11.34 times higher, respectively. The estimates are statistically significant. In column (2), after gender is included as control variable in the regression, the estimates become smaller but remain statistically significant at 1% significance level. With marital status as the additional control variable in column (3), the estimates reduce and remain statistically significant. In column (4), when age is added in as additional control, the estimates continue to drop but still remain statistically significant. After ethnicity dummies are included as additional control in column (5), the estimates are statistically significant although the magnitude of estimates continue to reduce.

The results show, in summary, completing bachelor degree has a larger effect on household spending in urban areas than in rural areas. For instance, in urban areas, completing bachelor degree increases the last year nonfood spending for 16.09 times higher when no control variable is added into the regression. After including gender, marital status, age and ethnicity as control variables, the last year non-food spending for those who have completed bachelor degree in urban areas increases for 1.03 times higher. On the other hand, in rural areas, before control variable is added into the regression, completing bachelor degree increases last year non-food spending for 15.87 times higher. The last year non-food spending for those who have completed

bachelor degree in rural areas increases for 0.96 times higher after including all the four control variables. Therefore, the results show that even after including control variables, the effect of education is still larger in urban areas. Also, the estimates are statistically significant in both areas. The spending for urban people who complete bachelor degree is higher as compared with rural people. For instance, the last year schooling expenses in urban areas is higher as compared with rural areas. This is because people in urban areas think that education status is very important for their children to seek for a better job in the future. Therefore, they are willing spend more in schooling.

4.2.4 Effects of Completing Bachelor Degree on Household Conditions

Table 4.2.4: The Effects of Completing Bachelor Degree on Household Conditions

Dependent variables		(1)	(2)	(3)	(4)	(5)
A. Urban						
Have electricity at home	(1)	1.00***	0.52***	0.49***	0.11***	0.00***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
Have pipe water for drinking	(2)	0.19***	0.10***	0.09***	0.01	-0.01
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Have own toilet	(3)	0.98***	0.57***	0.54***	0.20***	0.11***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
Have proper drainage ditch	(4)	0.73***	0.42***	0.40***	0.15***	0.08***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Dispose garbage in trash can	(5)	0.75***	0.49***	0.48***	0.27***	0.21***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Store food in the fridge	(6)	0.73***	0.51***	0.50***	0.30***	0.25***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Have an electricity/ gas stove	(7)	0.91***	0.53***	0.51***	0.18***	0.10***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Have a TV	(8)	0.97***	0.53***	0.50***	0.13***	0.03***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
B. Rural						
Have electricity at home	(9)	0.99***	0.54***	0.51***	0.14***	0.00
		(0.00)	(0.02)	(0.02)	(0.01)	(0.00)
Have pipe water for drinking	(10)	0.19***	0.12***	0.12***	0.06***	0.05***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Have own toilet	(11)	0.93***	0.57***	0.55***	0.25***	0.17***
		(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Have proper drainage ditch	(12)	0.42***	0.23***	0.22***	0.05**	0.02
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Dispose garbage in trash can	(13)	0.16***	0.13***	0.13***	0.09***	0.07***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Store food in the fridge	(14)	0.58***	0.43***	0.42***	0.28***	0.22***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Have an electricity/ gas stove	(15)	0.74***	0.48***	0.47***	0.26***	0.22***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Have a TV	(16)	0.92***	0.53***	0.50***	0.17***	0.07***
		(0.01)	(0.02)	(0.02)	(0.01)	(0.01)

Table 4.2.4: The Effects of Completing Bachelor Degree on Household Conditions (continued)

Dependent variables		(1)	(2)	(3)	(4)	(5)
C. Full sample						
Have electricity at home	(17)	1.00***	0.53***	0.49***	0.12***	0.00***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
Have pipe water for drinking	(18)	0.19***	0.11***	0.10***	0.03***	0.02**
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Have own toilet	(19)	0.97***	0.58***	0.55***	0.22***	0.14***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
Have proper drainage ditch	(20)	0.66***	0.39***	0.37***	0.16***	0.11***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Dispose garbage in trash can	(21)	0.61***	0.44***	0.43***	0.29***	0.26***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Store food in the fridge	(22)	0.69***	0.50***	0.49***	0.32***	0.27***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Have an electricity/ gas stove	(23)	0.87***	0.54***	0.52***	0.24***	0.17***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Have a TV	(24)	0.96***	0.53***	0.50***	0.15***	0.05***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
Control Variables						
Gender			✓	✓	✓	✓
Marital Status				✓	✓	✓
Age					✓	✓
Ethnicity						✓

Notes: Column (1) is the regression without any control variables; column (2) controls for gender; column (3) includes marital status as additional control; column (4) age; and column (5) ethnicity dummies. In Panel A, the numbers of observation from rows (1) to (8) are between 29,520 and 31,380. In Panel B, the numbers of observation from rows (9) to (16) are between 11,890 and 12,780. In Panel C, the numbers of observation from rows (17) to (24) are between 17,630 and 19,640. The numbers in parentheses are robust standard errors. The asterisks ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 4.2.4 presents the effects of completing bachelor degree on household conditions. Column (1) is basic specification without any control variables; column (2) controls for gender; column (3) includes marital status as an additional control; column (4) includes age as an additional control; column (5) includes ethnicity as control variables.

Panel A shows the effect of completing bachelor degree on household conditions in urban areas. In column (1), without including the control variable, the estimates show that an individual who completed bachelor degree enjoys better household conditions. For instance, education increases the household conditions in urban areas: having electricity at home, having pipe water for drinking, having own toilet, having proper drainage ditch, able to dispose garbage in trash can, able to store food in the fridge, having an electricity or gas stove, and having a television are 100, 19, 98, 73, 75, 73, 91, and 97 percentage points higher, respectively. By adding gender as the first control variable, the estimates in column (2) decrease and remain statistically significant. By controlling for marital status in column (3), the overall estimates drop around 2 percentage points. In column (4), the estimates decrease drastically when we include age as additional control variable. Lastly, the estimates continue to drop after the ethnicity dummies are added in as additional control variable in column (5). The results are statistically significant at 1% except for the pipe water for drinking.

Panel B shows the effects of completing bachelor degree on household conditions in rural areas. The estimates in column (1) show, without any control variables, completing bachelor degree increases household conditions in rural areas: having electricity at home, having pipe water for drinking, having own toilet, having proper drainage ditch, able to dispose garbage in trash can, able to store food in the fridge, having an electricity or gas stove, and having a television are 99, 19, 93, 42, 16, 58, 74, and 92 percentage points higher, respectively. By adding gender as the first control variable in column (2), the estimates become smaller and remain statistically significant. In column (3), when marital status is added in as additional control variable, it does not affect the estimates for having pipe water for drinking and able to dispose garbage in trash can; but have small effect on the other variables. In column 4, estimates drop a lot when we add in age to control the regression. Lastly, the estimates continue to drop when ethnicity dummies are added into the regression as additional control variable in column (5). In overall, the estimates are statistically significant.

Panel C shows the effects of completing bachelor degree on household conditions in full sample. Without any control variables, the estimates in column (1) show that an individual who completes bachelor degree enjoys better household conditions. For example, education increases the household conditions in full sample: having electricity at home, having pipe water for drinking, having own toilet, having proper drainage ditch, able to dispose garbage in trash can, able to store food in the fridge, having an electricity or gas stove, and having a television are 100, 19, 97, 66, 61, 69, 87, and 96 percentage points higher, respectively. The estimates are statistically significant. In column (2), the estimates become smaller but remain statistically significant when we control for gender. In column (3), when marital status is included in the regression as additional control variable, the estimates decrease slightly and remain statistically significant. After that, when we control also for age in column (4), the results show a large drop in the estimates. Lastly, in column (5), when we include ethnicity dummies as additional control in the regression, the estimates continue to drop and remain statistically significant.

Overall, the results show the evidence that completing bachelor degree increases the household conditions, and the effects appear to be stronger in rural areas. Without control variable, the results in urban areas are higher than the results in rural areas. However, with control variables in the regression, the results in rural areas turn to be higher as compared with urban areas. The results are significant for both areas. Also, it is observed that households in rural areas have higher chance to have own toilet, gas stove and TV.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

In this chapter, we will summarize the entire research that and discuss the findings from previous chapter. The topics in this chapter include general conclusion, limitations, recommendations and conclusion.

5.1 The General Conclusion

The main objective of this research paper is to study the relationship between education and welfare, including income, household assets, spending and also household condition of the Indonesian in rural and urban area. The data that we used are from the fifth wave of the Indonesia Family Life Survey (IFLS) collected in Indonesia 2014 and 2015. We study the relationship between education and welfare of Indonesian in rural and urban areas, we run the regression for both urban and rural areas to make comparison between both areas. Without any control variable, results show that there is significant correlation between education and welfare at 1% significance level. In order to make sure the model is free from omitted variable bias, we added in four control variables in our regression, including gender, age, marital status and also ethnicity. Results show that after the control variable added in, most of the results remain statistically significant. Besides, the results are robust, which may indicate the causal effect of education on household welfare. Also, it shows that there is a correlation between education and welfare of households in urban and rural area.

In our specific objective, we wish to study the effect of education on the household income. The results show positive and significant relationship between education and wages. In the key finding, we measure income in terms of wages. Overall, completing senior high school has a larger effect on wages in urban areas as compared to rural areas. The results show education has greater effect on wages in urban areas than rural areas after control variables are added. The results are consistent with the studies in Chapter 2. Since urban areas have better education development, educational subsidies, and education quality than rural areas, urban areas can get better pay compared with rural areas. (Su & Heshmati, 2013; Li & Luo, 2010 in China). According to Wu (2012), insufficient education investment in rural fundamental education causes the rural people receive less quality high school education. Consequently, rural people with lower educational level tend to receive a lower income. Also, according to Zhang et al. (2012), the people in urban areas earn a higher income because the secondary school enrolment in cities is advanced than that in rural area.

Moreover, one of our objectives is to study the effect of education on the household assets. The results in this study show positive and significant effects between these two variables. The results are in line with few studies. First, according to Tsai et al. (2000), there is a positive relationship between education level and savings for urban area in Indonesia. Second, according to Odongo and Lea (1977), the nature and location of household ownership depend on different education level, in which can explain why the rural have higher estimates on those components. They might have more ownership on land not for business use for their agricultural purpose. Third, rural areas have higher estimates on the vehicle components because most of them have own a motorcycle for their daily purpose. This finding is similar with the study of Singh (2011). However, the results are not consistent with the study of Fisher and Weber (2004) in which they argue that people who live in rural areas with lower educational level have poor household assets.

Besides, this report found a significant positive relationship between education and spending and the effect is higher in urban areas. After controlling for gender, marital status, age and ethnicity, the spending for those who have completed bachelor degree is higher in urban areas compared to rural areas. The study's finding is in line with the studies of Le and Booth (2014). The researchers found that the real per capita expenditure is doubled in urban areas. Higher education level indicates a higher living standard for urban households. Therefore, it leads to a higher expenditure in urban areas. Also, the result is in line with the study by Wodon (2000) where his research found that education is positively related to consumption. In urban areas, households with higher qualifications in studies have higher consumption level. The effect of education level on the consumption is weaker for the households in rural areas, yet it still plays an important role to the studies.

Apart from that, this report also found a larger effect of education level on the food spending in urban areas. Urban households that completed senior high school study spent more in food items compared to rural households. The results, however is not consistent with our existing literature review as discussed in Chapter 2. Peng (2015) found that with basic education's spending, rural households spent more on food consumption whereas urban households spent more on the development-oriented consumption. Apart from that, the non-food spending for those who have completed senior high school is slightly higher in rural areas than in urban areas. This result, however can support the study of Peng (2015). According to the researcher, improvement of education can improve the taste of an individual. Consequently, the individuals will increase their spending on non-food item such as clothing.

Furthermore, education brings a greater impact on the schooling expenses in urban areas. Those who have completed senior high school in urban areas have higher spending in schooling. This is consistent with the research of Amini and Nivorozhkin (2015). Urban people can obtain better school resources and therefore it leads to higher motivation of study. In this situation, they are willing to spend more on educational institution in order to improve their qualification of studies. In short, the

results meet our third and fifth research objectives. Education does matter for the household spending. This eventually may indicate a causal relationship as higher education leads to a higher spending. Since spending is a measure of the welfare, our results show the evidence that welfare is higher in urban areas than in rural areas.

According to our research objectives, we aimed to learn more about the effects of education on welfare in urban and rural areas. We use household condition as one of the measurements of welfare. The results of our tests show that education does have effects on household conditions. Also, the effects are larger in rural areas as compared to urban areas. With gender, age, marital status as control variables, the results show that households in rural areas have higher chance in having better household condition as compared to citizens in urban areas. Besides, the effects of education on having gas stove and TV at house appear to be larger in rural areas after ethnicity dummies are included into the regression. The result shown is inconsistent with the studies. Liu (2015) finds, rural migrant in Beijing with lower education and skills tend to stay in low rent house with bad housing facilities due to their low salary. On the other hand, according to Singh (2011) and Hu, Li and Wei (1989), the purchases of refrigerators and record players are positively affected by education. This research aligns with our results where education has effects on household condition in both areas. As households in urban areas have higher education than citizens in rural areas, there will be less consuming on housework.

5.2 Policy Implications

The empirical results in this report show some evidence that education matters for the welfare of households in both rural and urban areas. The findings imply that government actions to improve the average education to reduce the welfare gap between rural and urban areas. One of the actions could be improving the quality of education. In many developing countries, including Indonesia, quality of teacher is an issue in delivering quality education to students. In Indonesia, there is increasing

number of children in rural areas who enroll into school education. However, with the poor quality of education, their welfare such as income is still low. Quality of teachers plays an important role in improving the quality of education. For instance, a Grade 3 student in Java is able to read 26 words faster per minute than the same grade student in Maluku and Papua (World Bank, 2015). Traced to it, according to Osterhelm, Horn and Johnson (2006), an effective recruitment and retention strategy could be implemented to the teachers to rural areas. It is a complicated course to recruit and retain teachers for rural areas. Strict selection at entry and exit by using competency tests is needed in order to ensure more high quality teachers in poor areas. Besides, providing trainings and supports for school administrators can ensure all classes are scheduled well. Also, teachers should be engaged in teaching during their paid time. Furthermore, the government may set a policy where school must have a performance agreement with teachers in order to well-monitored their performances (OECD, 2015). Appraisal system also can be applied based on the performance of teachers. This in turn can motivate the teachers to improve their teaching method and materials. For instance, good performance teacher can receive rewards such as bonus or paid leave. Consequently, teachers will always improve themselves in terms of the knowledge and teaching skills. With the high competency teachers, students can get benefit of high quality education and able to perform well in their studies (World Bank, 2015).

Moreover, government can redesign the curriculum system to improve the average education of citizens. According to Mollet (2007), one significant factor that contributes to the education gap between urban and rural area is curriculum in the rural areas. Government tends to neglect the curriculum system in rural areas and hence the standard of the syllabus is not efficient and effective. Consequently, the students from rural area may find that it is hard for them to adapt to the curriculum that mainly designed for urban areas students. Hence, to make sure that the students from both rural and urban area can enjoy the same quality and standards of education system, government is encouraged to redesign the curriculum system that can apply for both areas to minimize the education gap between urban and rural area. For

example, a more practical education should be applied, such as include linking and matching in an orientation program. Most of the people stay in rural areas are involved in agriculture sector, therefore, due to unrelated curriculum, many students dropout from school and help their parents in farming and fishing work. Hence, the school activities or school should pay more concerned in this particular section. In order to perform a better curriculum system, the central government and the local government are suggested to work together in designing new form of educational system that fulfils the needs of both urban and rural areas.

Apart from that, funding of investment in education also plays an important role to improve the average education. Students who live in rural have no incentive or motivation to attend school as they need to help their parent in agriculture activities. Besides, the problem of lack of teachers leads to teacher migration from other cities. However, by increasing the funding of investment in education sector, these problems are believed to be improved. Investment fund can support the school building program in remote areas, increase or upgrade the school libraries and make available of reading cultivate and incentive to study, and provide training for people who are interested to be a teacher in the future. Furthermore, that investment fund can be use as scholarship to encourage higher level of education. In short, the governments are proposed to focus more in education investment in order to improve the whole education system. According to Osterhelm et al. (2006), it is recommended that the facilities and transportation could be upgraded and expanded from time to time to deliver a conducive and convenience working atmosphere. Further, sufficient school resources are important in improving the rate of school enrolment and quality of education. Thus, the government is recommended to invest more in school resources such as textbooks, information communication technology (ICT) and other resources that are vital for study (OECD, 2015). This investment may help more students from poorer background to enroll into school.

5.3 Limitations of the Study and Recommendation for Future Research

In our study, we use the regression control strategy to estimate our results. We include control variables in the approach to remove the omitted variable bias problem. The regression control strategy uses the control variables that are correlated with binary variable (education) and outcome variable (welfare). Nonetheless, the regression control strategy may not control fully the selection bias in our research. In the end, the estimated results from the regression control strategy may imply correlation and always statistically significant. Therefore, other strategy can be applied to study the causal effects. For instance, instrumental variable approach can be applied. It is an approach that requires the instruments that are correlated with the endogenous regressors (independent variables) but uncorrelated with the error term. After that, the two stage least squares procedure can be applied. For instance, wages and education are jointly dependent on ability which is not directly observable, but we can use available test scores to proxy for ability. According to Angrist, Imbens and Rubin (1996), instrumental variable approach makes the nature of identifying assumptions more transparent and it allows us to consider the sensitivity of results to deviation from these assumptions in a straightforward manner.

From our research studies, we can conclude that education does have significant effect on household welfare in term of wages, spending, household condition and household assets. However, education might have influence on these variables through different channels instead of directly affect them. Hence, we recommend the future researchers to do their research on these certain fields, such as how does education affect one's job skill and wages paid, financial decisions, job security and job satisfaction.

Occupation can be one of the channels that income differs by education. According to Matz, Stieb, and Brion (2015), citizens in urban areas tend to be employed as professional due to their higher occupational skill level while there were

still a small portion of rural citizens being classified as unskilled labor. As professional jobs are generally with more complex tasks may need employees with specific skills and hence offer higher wages. Thus, this leads to higher income level in urban areas as compared to in rural areas. Based on OECD Better Living Index (n.d.), better education and skills helps in searching for a better job. For instance, in Finland, majority of the adults have completed high school and thus they are able to get a better job and spend on housing expenditures such as electricity, water and others with their sufficient income. Since education is able to affect wages and household expenditures through a person's skills, future researchers are recommended to study on how education can improve skills and how a person's skills can affect wages paid.

Besides, future researchers are suggested to study on how education can affect financial decisions made by a household. Based on some findings, household assets of citizens can be expanded if they have a proper financial education. Gale, Harris, and Levine (2012) find, improvement in households' financial literacy enable them to make financial decisions more precisely and thus, higher capital stocks such as savings. Further, we recommend future researchers to examine the effects of education on employee's job security as it can affect their consumption level. From the research done by Benito (2006), individuals with lower education level experience a higher job insecurity as compared to individuals which are degree holders. Job insecurity highly correlated with unemployment risks and caused the households to temporarily reduce their food consumption. Due to income uncertainty, households that face unemployment risks might save more for pre-cautionary purpose.

Lastly, education can affect employees' job satisfaction in term of job security, opportunities and more (Gurbuz, 2007). For example, dissatisfaction of low-educated employees due to job insecurity might cause them to hardly focus on job and hence lower productivity. In contrast, employees with higher education level have more motivation at workplace for them to work effectively. Accordingly, this helps them to earn a higher wage. As a result, we suggest future researchers to study on the impacts of education on job satisfaction as it can affect household spending and income.

5.4 Conclusion

In conclusion, the objectives of this research which is study the relationship between education and welfare in both urban and rural areas have been achieved. The results show that there is a significant correlation between education and welfare in both urban and rural areas. The research indicates that education may correlate with the income, household assets, spending, and also household condition of urban and rural family differently. In order to enhance the welfare and narrow the inequality gap between urban and rural area, a better education performance needs to be implemented. In addition, the limitations of this research are identified. Therefore, the future researchers are encouraged to refer to the recommendations for future studies. This study can serve as an advice for the future researchers or governments to recognize relationship between education and welfare in both urban and rural areas.

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