RESEARCH ARTICLE

Socioeconomic Characteristics of Households, Government Programs on Human Capital, and Natural Shocks as Determinants of Philippine Household Income Mobility

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Abstract: The purpose of this study is to introduce income mobility analysis to examine households' welfare through time. Income mobility in the Philippines has been characterized by offsetting forces of upward and downward mobility. In this kind of scenario, policy targeting for households' welfare can be done by examining the drivers of income mobility. Pseudo-longitudinal panel data generated from the Family Income and Expenditures Survey (FIES), through the household matching method, were used to identify the households included in the study. The needed information on the levels of living and differences in income and expenditure of Filipino families were provided by FIES. In addition, the Becker, Kominers, Murphy, and Spenkuch (BKMS) framework was utilized to determine the factors that affect income mobility. Ordinary least squares (OLS) and multinomial logit regressions were used to explain and examine absolute and relative income mobility, respectively. The findings showed that households' income mobility was influenced by geographical location, household heads' marital status, educational attainment, and occupation. In addition, government investments in human capital development such as education, health, and social services were significant factors of income mobility. On the other hand, because of the country's preparedness and planning before the onset of a natural disaster and immediate solutions in the aftermath of a disaster, natural shocks were found to be an insignificant factor of income mobility.

Keywords: economic status, human capital, income mobility, natural shocks, socioeconomic characteristics

The Philippines is among the fastest-growing economies in Southeast Asia, with upgrades in sovereign investment ratings confirming improvements in the country's macroeconomic fundamentals. The government has defined its development objectives as driving rapid but inclusive economic growth, accelerating employment on a massive scale, and reducing poverty. However, poverty in the country remains a challenge when economic growth does not translate into poverty reduction. Poverty is a deprivation of minimum essential assets and opportunities to which every human being is entitled (Schelzig, 2005).

In 2012, 19.7% or one out of every five Filipino families was poor. A family of five needs to have an estimated amount of PhP5,513 monthly income to buy minimum basic food needs. Although the poverty incidence of 2012 is lower than that in 2009 and 2006 (20.5% and 21.0%, respectively), the differences are not statistically significant (Philippine Statistics Authority [PSA], 2012). The country's poor performance on poverty reduction was among those to be addressed by the 2011–2016 Philippine Development Plan (PDP) of the National Economic Development Authority (NEDA). The plan was meant to enable the government to work systematically to give the Filipino people a better chance of finally finding their way out of poverty, inequality, and the poor state of human development. Towards the end of this program, the Philippines experienced a significant decline in poverty incidence of 16.5% in 2015 compared to an estimated 19.7% in 2012. However, on average, an additional monthly income of PhP2,230 was still needed by an underprivileged family with five members to move out of poverty because incomes of poor families were short by 24.6% of the poverty threshold (PSA, 2016).

The PDP 2017–2022 was launched to continue the purpose of PDP 2011–2016 on poverty reduction. This plan adopted a 25-year long-term vision to end poverty in the country by 2040. The *Ambisyon Natin* 2040 (Our Ambition 2040) represents the collective vision that by 2040, the Philippines will be a prosperous, predominantly middle-class society where no one is poor. By 2022, the overall poverty rate and poverty incidence in rural areas are targeted to decline to 14% and 30%, respectively.

Poverty reduction has become the ultimate goal of many institutions that consider pro-poor growth, growth inclusiveness, and other pro-poor policies very important in their operations (Son, 2007). However, there is also a need to address the issues on income mobility because income is a measure of individual economic status/poverty status. Many studies often neglect income mobility, and consequently, their analysis of income inequality is incomplete and misleading. Hungerford (2008) explained that income inequality does not address the issue of whether or not the poor are getting poorer, whereas income mobility does. Static measures of inequality, however, are insufficient to portray the well-being of individuals in a society and must be complemented by the dynamics of mobility. The welfare of individuals in two societies with similar levels of income inequality but different patterns of income mobility would be expected to differ. Individuals with higher mobility would enjoy greater incentives to exert effort and climb up the income distribution ladder than individuals with lower mobility. Economic policies to reduce the growth of income inequality may work through their effects on income mobility. Hence, examination of mobility is an alternative approach to the conventional poverty and inequality analyses. Compared to static indicators of poverty and inequality, measures of mobility provide more detailed information about the dynamic evolution of a country's well-being (Martinez et al., 2013).

Income mobility in the Philippines has been characterized by offsetting forces of upward and downward mobility. Although some households experienced upward mobility due to high economic growth, a large number of households were pushed into poverty because of many man-made and natural crises and the lack of inclusive growth. This means that the income gains experienced by a significant number of Filipinos during this period of economic growth have been neutralized by the income reductions experienced by others (Martinez et al., 2014). Policy targeting for this kind of results can be done by examining the profile of these households using various indicators and examine the main drivers of their income mobility. Thus, this paper aims to identify and analyze the factors of income mobility of Filipino households. The results of this study contribute to the preparation and formulation of suitable policies for the poor as well as for the households who experience downward and upward income movement.

Methods

Income mobility can be measured and analyzed using longitudinal panel data, which allows examination of how the incomes of these individuals change through time. Because these data were not available in most developing countries, including the Philippines, pseudo-longitudinal panel data was created based on the Family Income and Expenditure Survey (FIES) of 2006, 2009, and 2012, covering three survey years, through the household matching method.

In the absence of genuine longitudinal panel data, a pseudo-longitudinal panel method is an alternative approach when independent repeated cross-sectional

data (which usually consists of comparing the differences among the subjects) are available. Both true panel data and pseudo panel data should be based on responses to similar questions collected in a similar manner. True panel data also needs to be repeatedly collected from the same individuals across time to ensure comparability (Russell & Fraas, 2005). Given that FIES is a cross-sectional data that provide information on the levels of living and differences in income of Filipino households (income and expenditure data) and the method of household matching tracked the same households that were interviewed from initial year to final year, the generated pseudo-longitudinal panel data can be used as an alternative longitudinal panel data for income mobility analysis.

The data were filtered using the unique identification number (ID code), household head's gender, location (refers to urban or rural), and household head's age (year of birth) to track the households that were interviewed from 2006 to 2012. A household was assumed to be present in the three consecutive year surveys when the household head's age increased by three years for every survey after 2006. When this assumption was not met, the household was not included in the sample. There were 33,975 households included in the sample, almost 85% of the total sample from the genuine data after household matching.

Household Income Movement and Income Classifications

Household income was deflated using the Consumer Price Index (CPI) with the base year 2000 to derive the household's real income. Real household expenditures of 2006 denote the household's real income for the initial year, and the real household expenditures of 2012 served as the real household income for the final year. The household expenditures were ranked using income class to observe mobility and identify the change in their economic status.

In this study, income mobility can be defined as the change of income cluster of the household—upward or downward movement of the income cluster. This positional change concept of mobility (Jantti & Jenkins, 2013) was used to determine the possible outcomes of the income movement: (a) *stayers* when the household's income belongs to the same income cluster from the initial year to the final year, (b) *sliders* when its income cluster has a downward movement—from higher-income cluster to a lower income cluster, and (c) *climbers* when the household has an upward movement of income cluster, from lower to higher income class, were used as dependent variables. The extent of the change, however, was not included in the discussion.

The income distribution of households was divided into seven groups (clusters) with three broad income classes—low income, middle income, and upper income (Albert et al., 2015). Households with five members whose monthly family income is PhP15,780 below are called low-income households, which includes income clusters such as poor and lower-income (but not poor). The middle-income households with the same number of members have a monthly family income between PhP15,780 to PhP118,350, whereas the upper-income households have a monthly family income of at least PhP118,350. The middle-income group considers three income clusters such as lower middle income (between PhP15,780 to PhP31,560), middle income (between PhP31,560 to PhP78,900), and upper middle income (between PhP78,900 to PhP118,350). The upper income (but not rich; between PhP118,350 to PhP157,800) and rich income clusters belong to the upper-income class.

Factors of Income Mobility

FIES provides the socioeconomic indicators of income mobility such as household head's gender, location class, marital status, household head's educational attainment, occupation, household type, spouse employment, toilet facilities, electrical facilities, water facilities, number of employed household members, and number of dependents (household members under 15 years old and 65 years old and above).

The government programs on human capital as determinants of income mobility were examined through (a) health as represented by the number of barangay public health stations and public hospitals, (b) education as the number of public schools (primary and secondary), and (c) social services that include government spending on social services and social welfare. In addition, natural shocks, also known as the natural disasters from the International Disaster Database of the Centre for Research on the Epidemiology of Disasters (CRED), were utilized as an additional factor.

Empirical Framework and Econometric Models

To examine income mobility differences between different household income groups and to estimate the probability that income mobility corresponds to the selected indicators, the ordinary least squares (OLS) regression and multinomial logit regression were used, respectively. The selection of indicators was based on Becker, Kominers, Murphy, and Spenkuch (BKMS) framework. This framework is useful in understanding the links among family environments and circumstances, child development, and mobility. Through the concept of complementarity, households with high income tend to invest more in their children's human capital even under perfect capital markets. On the other hand, households with low income tend to invest sub-optimally in their children's human capital, leading to a high degree of persistence. A high degree of transmissibility translates to high persistence, which leads to lower mobility (Bayudan-Dacuycuy & Dacuycuy, 2018).

When the human capital produced in equation (1) where a child's level of human capital (H_c) depends on the amount of parental investment in children (y), government spending on education (G), abilities of the child (A), and other factors (F) become the household head who has the responsibility to finance the expenses of the household, his earning capacity depends on the same factors when his human capital is produced.

$$H_c = F(y, G, A_c) \tag{1}$$

With the same behavior of consumption and investments, the household's income equation within a generation is

$$Y_t = f(G, A, F) \tag{2}$$

where G represents government spending on human capital, A is the ability of the child, and F refers to other factors. The expected signs of the factors were determined in the first-order condition of equation (2) by assuming Y_t in a quadratic form,

$$Y_t = \alpha + \beta G + \gamma G^2 + \delta AG + \zeta A + \eta A^2 + F \tag{3}$$

In linear terms, government spending on human capital G and the child's ability A are positive, that is β and $\zeta > 0$. If equation (3) is continuous and differentiable, the derivative of Y_t with respect to G is

$$\frac{\partial Y_t}{\partial G} = \beta + 2\gamma G + \delta A \tag{4}$$

whereas the derivative of Y_t with respect to A is

$$\frac{\partial Y_t}{\partial A} = \zeta + 2\eta A + \delta G \tag{5}$$

To maximize Y_t in terms of G, then $\frac{\partial_{Y_t}}{\partial G} = 0$ and $\frac{\partial^2 Y_t}{\partial G^2} < 0$. Taking the second derivative,

$$\frac{\partial^2 Y_t}{\partial G^2} = 2\gamma \tag{6}$$

thus $\gamma < 0$. In the same manner, in terms of A, maximizing Y_t requires $\frac{\partial Y_t}{\partial A}$ and $\frac{\partial^2 Y_t}{\partial A^2} < 0$. The second derivative

$$\frac{\partial^2 Y_t}{\partial A^2} = 2\eta \tag{7}$$

requires $\eta < 0$. The negative signs for γ and η are explained by diminishing returns, as the mental capacity of the household head has an upper limit even if government spending is increased and the ability of the head is also increased. Given that the sign of the quadratic term is negative to maximize Y_t; thus, $\delta < 0$.

Equation (2) was estimated using econometric models to show that household's income, Y_t, is a function of different factors such as socioeconomic characteristics of households, government investments in human capital, and natural shocks.

Thus, the OLS econometric model for income mobility is presented as

$$\Delta Y_t = \beta_0 + \sum_{i=1}^{n} \beta_i X_{ik}^{2006} + \sum_{i=1}^{n} \alpha_i \Delta Z_{ik} + \sum_{i=1}^{n} \gamma G N_{il} + \varepsilon_i \tag{8}$$

where ΔY_t represents the movement of income, upward or downward for income mobility analysis, household head's characteristics is X^{2006} such as, i, island group, location class, household type, toilet, electricity, water, marital status, educational attainment, occupation and spouse employment for k households; ΔZ denotes the socioeconomic characteristics that change over time (these indicators were observed from 2006 to 2012)

such as, *i*, number of household's employed members, and number of dependents for *k* households, and GN_{il} represents government programs on human capital investments and natural shocks, where *i* represents health, education, social welfare, and natural shocks for every, *l*, region.

Furthermore, multinomial logit regression was considered to estimate the probability that income mobility corresponds to the indicators; factors of relative income mobility were estimated as well. In a multinomial logit regression, the slope coefficient of the variables gives the change in the log of the odds associated with the unit change in the variables, ceteris paribus. Income mobility is the log of the odd ratio, which is a linear function of the regressors (Gujarati, 2000). The model is specified as follows:

$$\log\left(\frac{pMobility_j}{pMobility_o}\right) = \beta_0 + \sum_{i=1}^{n} \beta_i X_{ik}^{2006} + \sum_{i=1}^{n} \alpha_i \Delta Z_{ik} + \sum_{i=1}^{n} \gamma GN_{il} + \varepsilon_i \quad (8)$$

where $pMobility_j$ denotes the probability of income movement j = 1 (downward) sliders and 2 (upward) climbers while 0 is the base considered as the stayers. The household's real expenditures were classified according to income clusters; any movement from one income cluster to another is considered as income mobility. The second term X_{ik}^{2006} refers to the characteristics of a household in 2006 where i = 1 to 10 for k household. Then ΔZ_{ik} denotes the indicators which change over for k household. These indicators were tracked from 2006 to 2012. Lastly, GN_{il} represents government programs and natural shocks for i = 1 to 5 for l regions.

Results

Income mobility analysis was explained in absolute and relative terms. Income mobility is considered absolute when the movement of the socioeconomic status of an individual can be derived by looking at their income, consumption, education, and other appropriate data indicators of their lifetime socioeconomic status, taken in isolation. On the other hand, relative income mobility refers to the relative change in an individual's income with respect to the change of income of others in their generation.

Absolute Income Mobility

Households located in Mindanao are significantly different from the households located in the Visayas and have a negative effect on absolute income mobility. Households residing in Luzon, however, are not different from households residing in the Visayas. These locations have a greater chance of realizing absolute income mobility compared to Mindanao, which is far from the country's capital city where more opportunities and employment are present. In addition, households in rural areas are significantly different from the household in urban areas and have a negative effect on absolute income mobility.

Household heads with married and widowed (divorced/separated) civil status are significantly different from a household head who is single. This means that a household head with single civil status is more likely to realize absolute income mobility because they are more flexible in searching for greater opportunities to earn higher incomes than household heads with spouses and children. Without any hesitation, a household head with single civil status accepts any opportunity to earn more, whereas a married household head needs to consider their family. In addition, a married household head with a spouse and children has a greater cost of living and financial responsibilities than a household head who is single. Hence, this type of marital status is less likely to experience absolute income mobility.

The basic education of the household head is a significant factor of absolute income mobility. Households heads who have elementary and secondary education positively influenced absolute income mobility. Moreover, household heads who are employed in a low-skilled type of job positively affect absolute income mobility. On the other hand, household heads with a professional job, considered as a high-skilled occupation, do not significantly affect absolute income mobility because of the increasing job opportunities requiring less education and little skills.

A household with a single family has a significant positive effect on absolute income mobility because a single family has a lesser cost of living compared to households composed of more than one family. A single-family type has a greater likelihood of having more income due to lesser spending. However, spouse employment has no significant effect on absolute income mobility.

Although investment in potable water sources and sanitized toilet facilities may result in additional costs making present income to decrease, future benefits take place. Particularly, a household having a water source as its own faucet has a significant negative effect on absolute income mobility because ownership of water source has an additional cost upon application and approval of line for potable water supply. However, a household will experience convenience and sanitation in the future. When there is an improved and more accessible water source, households spend less time and effort physically collecting it, which makes them productive in other ways. This can also result in greater personal safety by reducing the need to make long or risky journeys to collect water.

Similarly, households having water-sealed and closed pit toilet facilities have a significant negative effect on absolute income mobility. Although these facilities have costs, especially in maintaining cleanliness, sanitation, and convenience, these are still among the priorities of the households to avoid diseases and sickness that can hinder an individual from working and earning.

The number of dependent household members and number of employed household members significantly decrease the probability of realizing absolute income mobility. A household with a large number of dependents has the least income among other households. Income declines in larger households; more dependents generally mean less income. Though the number of employed household members is a significant factor, it is inversely related to absolute income mobility. This implies that having a job does not guarantee an increase in income because the job's quality matters.

A household's income pattern can be changed through various government interventions. Public schools and government spending on social services and welfare are two out of four government programs that are investments in human capital and have a significant effect on absolute income mobility. Barangay public health stations and public hospitals, which are investments in health, are not significant factors of absolute income mobility.

As reflected in the number of public schools, education has a significant effect on absolute income mobility. The availability and accessibility of infrastructure play an important role in school outcomes. Nevertheless, the number of schools is negatively related to absolute income mobility. In addition, government spending on social welfare and services is a significant factor of absolute income mobility. Although it impacts absolute income mobility in the short-run period, the negative sign of the coefficient shows that the effect of the government's programs on social welfare can be felt after the full implementation of the programs.

All types of natural disasters have a negative effect on household welfare, household income, and expenditure, as shown by a negative sign of the coefficient. However, the results showed that natural disaster is an insignificant factor of absolute income mobility.

Relative Income Mobility

The multinomial logit regression results in Table 2 show that sliders located in Mindanao are more likely to experience income mobility relative to households in Luzon. On the other hand, the climbers in Mindanao are less likely to experience income mobility relative to those located in Luzon. A household, whether a slider or a climber, who lives in the Visayas has no significant difference from those households who live in Luzon. In addition, sliders residing in urban areas are less likely to experience income mobility than the sliders in rural areas. Climbers, however, are more likely to experience income mobility when they reside in urban areas relative to rural areas. This implies that sliders residing in Mindanao and in rural areas are more likely to experience income mobility, maybe because their economic status is suitable in these locations. If residing in the same location, climbers are less likely to experience income mobility because their capacity to have greater opportunities to earn from employment and business is more adaptable in Luzon and urban areas.

The marital status of the household head is a significant factor in income mobility for both sliders and climbers. Married as civil status has a significant positive effect on sliders' income mobility. They are more likely to experience upward mobility of income relative to being single. Accordingly, marital status as widowed/separated/divorced is a significant factor of income mobility for sliders. On the other hand, climbers who are married and divorced are less likely to experience income mobility relative to being single. The conditions and obligations of having a family, especially dependents, are always considered

Table 1

Ordinary Least Squares Regression Results of Absolute Income Mobility

Variable	Income Mobility
Socioeconomic Characteristics	
Island Group (base = Visayas)	
Luzon	0.0089481
Mindanao	-0.0824353***
Location (base = Urban)	
Rural	-0.1240666***
Marital Status of the Household Head (base = Single)	
Married	-0.1214018***
Widowed/ Divorced / Separated	-0.0911852***
Educational Attainment of the Household Head (base = College Undergraduate/Graduate)	
Elementary Undergraduate/ Elementary Graduate	0.2133608***
High School Undergraduate/Graduates	0.1227499***
Post Baccalaureate	-0.0869806
Occupation of the Household Head (base = Technicians and Associate Professionals/ Clerks)	
Officials of the Government, Executives, Managers, and Professionals	0.0215686
Service Workers and Shop and Market Sales Workers	0.0896652***
Farmers, Forestry Workers and Fishermen	0.1209761***
Traders and Related Workers	0.1247959***
Plant and Machine Operators and Assemblers	0.050278*
Laborers and Unskilled Workers	0.1826369***
Special Occupation	0.0963794
No Occupation	0.0070802
Spouse Employment (base = Employed)	
Unemployed	-0.0061446
Household Type (base = Extended Family)	
Single Family	0.0696459***
With unrelated members	-0.0992327
Type of Toilet Facility (base = Open pit/others/none)	
Water Sealed	-0.1025864***
Closed pit	-0.045189**
Water Source (base = Shared, faucet)	
Own use, faucet	-0.1108239***
Own use, piped well	-0.0316647*
Shared use, piped well/dug well	0.03169**
Spring, river, stream/rain/peddler/others	0.0202816
Electricity (base = With)	
Without	0.1405991***
Employed Household Members	-0.0614612***
Dependent Household Members	-0.0194221***
Government Programs	
Barangay Public Health Stations	0.0000225
Public Hospitals	0.0006009
Public Schools	-0.0000274***
Social Services and Welfare	-4.25E-06**
Natural Shocks	-0.0000741

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2

Multinomial Logit Regression Results of Relative Income Mobility

Variables	Income Mobility	
	Sliders	Climbers
Socioeconomic Characteristics		
Island Group (base = Luzon)		
Visayas	0.1263708*	-0.015764
Mindanao	0.2743388***	-0.2564102***
Location (base = Rural)		
Urban	-0.314275***	0.3440069***
Marital Status (base = Single)		
Married	0.3534781***	-0.3337301***
Widowed/ Divorced / Separated	0.3037662***	-0.2456637***
Spouse Employment (base = Unemployed)		
Employed	0.0341431	0.0280804
Educational Attainment (base = Elementary Undergraduate/Graduate)		
High School Undergraduate/Graduate	0.1342822***	-0.2378528***
College Undergraduate/Graduate	0.7143476***	-0.6162747***
Post Baccalaureate	1.164593***	-1.601924***
Occupation (base = No Occupation)		
Officials of the Government, Executives, Managers, Professionals	0.0675537	0.0077858
Technicians and Associate Professionals/Clerks	-0.216229***	-0.0392383
Service Workers and Shop and Market Sales Workers	-0.525406***	0.2181868***
Farmers, Forestry Workers and Fishermen	-0.501716***	0.3110884***
Traders and Related Workers	-0.520934***	0.3090946***
Plant and Machine Operators and Assemblers	-0.604238***	0.1165383**
Laborers and Unskilled Workers	-0.804985***	0.45051***
Special Occupations	-2.719579***	0.2262666
Household Type (base = Single Family)		
Extended Family	0.3667745***	-0.1990241***
With unrelated members	0.2738004	-0.7395838**
Toilet (base = Open pit/others/none)		
Water Sealed	0.5408535***	-0.2297949***
Closed pit	0.2339026***	-0.0940567*
Water Source (base = Spring/others)		
Own use, faucet	0.3108439***	-0.3622056***
Shared, faucet	-0.1454261*	-0.0567715
Own use, piped well	0.2785029***	-0.1128997**
Shared use, piped well/dug well	-0.230912***	0.0259996
Electricity (base = without)		
With Electricity	0.6573427***	-0.3160995***
Employed Household Members	0.1969185***	-0.1778291***
Dependent Household Members	0.0026301	-0.0539728***
Government Programs		
Barangay Public Health Stations	0.000027	0.0000684
Public Hospitals	-0.0032113	0.0016441
Public Schools	0.0001262***	-0.0000802***
Social Services and Social Welfare	-0.000042***	-9.38E-06*
Natural Shocks	-0.0011664	-0.0001328

Notes: * p < 0.1, ** p < 0.05, *** p < 0.01

by climbers, making them immobile in searching and accepting greater opportunities, especially abroad.

Basic education is found to be a significant factor of sliders' income mobility because the returns to basic education remain significant. Household heads with tertiary education are more likely to realize income mobility compared to those with elementary education. All levels of education are significant factors of income mobility for climbers relative to elementary education. However, the negative sign reflected a temporary decrease in income mobility in the short run because college and post-graduate education are costly, including the foregone earnings due to studying. In the short-run period, returns of investment in a college education will not be experienced immediately because the expected real returns take time to be realized.

All job classifications of sliders except government officials and professionals are significant factors of income mobility and have a negative relationship to income mobility. Moreover, educational attainment is positively related to higher income levels. Individuals from higher-income households have the capability to gain higher education like tertiary and post-graduate, proving them to be more skilled and prepared to enter the labor market to earn more income compared to low-income households. However, climbers as professionals, technicians, and associate professionals are less likely to experience income mobility.

Sliders with an extended family are more likely to experience income mobility relative to the single-family household type. Although an extended family in one household means more family members, it is an opportunity for the sliders to gain more income because many family members will work to increase the household's income. Climbers, on the other hand, are less likely to experience income mobility because of additional costs of living due to the additional number of household members.

Investment in sanitation and water is part of human capital investment in health. A household with proper sanitation and a good water source is less prone to diseases that can decrease productivity and earning capacity. The results show that sanitation and water are crucial for both sliders and climbers. Toilet facilities such as water-sealed and closed-pit are significant indicators of income mobility for sliders, whereas climbers prioritize using water-sealed toilets. Although the negative sign of the coefficient refers to the fact that there is an additional cost for maintaining a toilet in terms of sanitation and infrastructure, households look forward to the benefits of having properly sanitized toilet facilities. Among the water sources, sliders with shared-faucet and shared-piped wells are less likely to experience income mobility because this source is not as safe and convenient as having an own-use faucet.

On the other hand, climbers with own-use faucets are more likely to realize income mobility because this source provides safe and clean water. Most toilet and water sources of the sliders were provided by the government. Having an own-use faucet and water-sealed toilet means higher cost to the climbers, but convenience and comfort are their priority, resulting in more productive and healthy household members.

Access to electricity is a significant factor in income mobility for both sliders and climbers. However, the negative sign of the coefficient for climbers shows that consumption of high-income households is greater than that of low-income households because of greater durable goods or assets ownership. Because of this, climbers are encouraged to shift to modern electricity sources like home solar adoption.

Employment opportunities generate income for households. The more household members who are employed, the more likelihood for them to have higher incomes. With the increasing number of employed household members, the more likelihood of income mobility for sliders. Although, employment of the household members and spouse employment are significant factors of income mobility for the climbers.

Moreover, the number of dependent household members is an insignificant factor in sliders' income mobility, but the positive coefficient appeared because of the additional workforce that these members can offer. In many poor households, children are seen as an additional source of income. On the other hand, additional dependents mean less likelihood to experience income mobility for the climbers.

Aside from the socioeconomic characteristics of households, government interventions in human capital and natural shocks are considered factors of income mobility. With regards to investment in health, barangay health centers and hospitals are insignificant factors of sliders' income mobility, whereas basic education is a significant factor for both sliders' and climbers' income mobility. A positive effect on income mobility will be experienced by the sliders as basic education provides a greater chance of experiencing income mobility. With free basic education, greater

opportunities to earn will be realized in the future. However, basic education has a negative effect on climbers' income mobility.

With government spending on social services and welfare, the likelihood of experiencing income mobility for sliders and climbers is possible. However, the negative sign of the coefficient shows that the government's social protection is to be felt in years to come.

Lastly, natural shocks represented by disasters are an insignificant factor and negatively affect the income mobility of both sliders and climbers.

Discussion

Socioeconomic characteristics of households and government investments in human capital significantly affect both absolute and relative income mobility. However, natural shocks were found to be an insignificant factor in income mobility.

Geographical Differences

Households' locations, such as those in rural areas and Mindanao, have a significant negative effect on absolute income mobility because of the lack of sustainable income opportunities in the rural areas where most of the poor can be found (ADB, 2009). Market options are very few in rural areas where jobs are concentrated in the minimum wage and part-time jobs with limited security and room for advancement (Villejo et al., 2014). However, living in urban areas negatively affects the income mobility of sliders but positively affects climbers' income mobility because urban households have more opportunities to improve their rankings in the country's income distribution (Azam, 2016) as long as they are capable and fit for urban living (urban living has a higher cost compared to rural living). In addition, stayers residing in Mindanao have a higher likelihood of income mobility but not for climbers. Climbers in Mindanao and rural areas are less likely to experience income mobility because their capacity to have greater opportunities to earn from employment and business is more adaptable in Luzon and urban areas. The urban population tends to be better than the rural population in terms of health, housing, education, and access to services and opportunities (Villejo et al., 2014). Mindanao is far from the capital city of the country, where opportunities for earning income are present. This conformed with the study of Aristei and Perugini (2015) that found that living in the capital city is positively associated with wage income.

Marital Status

Single as civil status is a significant factor for absolute income mobility, whereas married and widowed/divorced/others are significant factors of sliders' income mobility. Because of flexibility in searching for greater opportunities, sliders accept any opportunity to earn more without qualms about being apart from their children and spouses; household heads with single as civil status are more likely to realize absolute income mobility. On the other hand, married and widowed/divorced/others have a significant positive effect on sliders' income mobility because marriage pays financial rewards. Married men (most of the household heads are male) have higher productivity than single men because of responsibilities and their commitment to their families: their working hours increase, are less likely to quit a job or be fired, and have greater value on material well-being. Their level of productivity is much higher than that of single men, and they are less likely to quit a job or be fired from one—because of marriage, they became more committed to work (Lerman, 2002). In addition, they may view marriage as economically advantageous. Specifically, combined incomes can provide a higher standard of living compared to two single individuals living separately. In contrast, being married and divorced can negatively affect climbers' income mobility because of two reasons. First, their obligations of having a family (dependents) make them immobile in searching for and accepting greater opportunities, especially abroad. Second, their income may decrease because of the dissolution of marriage (Kronstadt & Favreault, 2008).

Classifications of Occupation

Although occupations with high skills requirements like professionals and officials have a positive effect on absolute income mobility and climbers' income mobility, these occupations are insignificant factors of both absolute and relative income mobility. These jobs are considered stable earning jobs because they offer permanent status. However, there is a weak demand for these high-skilled occupations resulting in the household heads with higher education engaging in low-skilled jobs. Almost one-fourth of

total employment in the Philippines and considered as the largest occupational group are unskilled workers (laborers in a job that requires no skills) (Rutkowski et al., 2016). In addition, these jobs are not significant factors for sliders' income mobility. All jobs requiring low skills affect the income mobility of sliders significantly. Although these occupations are significant factors, they have a negative effect on the income mobility of the sliders because these job types offer low income (not permanent-wage employment but casual-wage jobs; (Rutkowski, 2015). Accordingly, the problem of job informality looms large, around three-quarters of all jobs. Among wage workers, 6 out of 10 are hired informally. Having informal jobs that are often temporary, casual, or part-time means a lack of employment contract and social insurance and a lack of protection against unfair dismissal (Rutkowski et al., 2016). All else being equal, their wages are significantly lower, resulting in a weaker chance of experiencing income mobility.

Number of Dependent Members

An increase in the number of dependent members means that the family size increases, and the probability of experiencing downward mobility increases. This is in accordance with the study of Joveres et al. (2013) that an additional household member will result in higher everyday expenditures. With a given fixed household income, they will face difficulty in sustaining their daily needs. This conformed with the analysis of Orbeta (2005) that dependents (young and old household members) can be seen as a burden, opposite to the working population who earn more than they consume. Lower savings and economic production are the results of a higher dependency ratio. On the other hand, the number of dependents has a positive effect on the income mobility of sliders but is insignificant. Some children are used as an additional source of income by low-income households— child labor (Aldaba et al., 2004; Quimbo et al., 2008).

Human Capital Investment in Education, Health, and Social Services

Education contributes substantially to income, and it can also contribute to economic mobility across generations (Haskins, 2016). This is reflected in the result that household heads with basic education can positively affect absolute income mobility, but post-baccalaureate education has a negative effect. In the Philippines, a significant majority of the labor force is comprised of workers with at least some elementary education. On the national level, employment rates among those with at least elementary education were higher than those with at least some college education (those with elementary education had a 31.2% unemployment rate, whereas those with a college education had a 32.9% unemployment rate in 2012 (PSA, 2014).

However, it can be noticed that the higher the educational level attainment (post-graduate), the lesser the likelihood of experiencing absolute income mobility due to unemployment because a high proportion of college-level and post-graduate level graduates may be waiting for better-paying jobs. This is the same case for climbers, where even basic education negatively affects income mobility. Because many of these household heads come from well-to-do families, they can afford to be choosy and wait for better job offers or plan to pursue higher education to improve their employability (Quimbo et al., 2008).

On the other hand, tertiary education can positively affect the income mobility of sliders. Lower-income individuals are encouraged to go to school for higher education because they believe it will improve their employability and income (Mocetti, 2007). An educated person has better cognitive faculties and access to relevant information. A college graduate can make informed investment or employment decisions affecting their wealth status (Quimbo et al., 2008). Education increases the likelihood of full-time employment and gives people access to good jobs with high incomes, whereas a low level of education deprives people of the ability to combat economic hardships (Villejo et al., 2014). Thus, all levels of education are significant factors of the income mobility of sliders.

Education improves human capital; thus, the government invests in education by providing free basic education that gives opportunity to households, especially low-income households to have access to primary and secondary education needed for job opportunities in the future. If higher qualifications through education are accessible to only those from the most advantaged families, then people will tend to stay in the circumstances into which they were born, and income mobility across generations will be lower. If the education system is not equitable, then schooling will serve to entrench disadvantages in

society (Centre for Education Statistics and Evaluation, 2016). However, the negative sign of its coefficient (sliders' income mobility) reflects the challenges faced by the Department of Education, which includes school accessibility issues, children's lack of interest in going to school, and classroom congestion (David & Albert 2012; Centre for Opportunity and Equality, 2017).

Government investments in health facilities like barangay health stations and public hospitals to enhance human capital were found to be an insignificant factor of income mobility due to the challenges and concerns of healthcare services. One of the concerns is the association of health problems and low-income individuals, which has a large causal effect on children's outcomes. This suggests that child health is important not only for its own sake but because it affects children's future prospects more broadly, as well as the projections of their future children in terms of future earnings or employment probabilities. This result raised the provocative idea that the best way to protect children's health may be to start with pregnant or about-to-be pregnant mothers. This is one of the services offered by barangay health centers. However, the insignificant result occurred in absolute and relative (sliders and climbers) income mobility because there is no immediate outcome of this program (Currie, 2009), especially in the short-run period. In addition, the health sector in the country faced some challenges such as insufficient government investment, inappropriate incentives for health service providers, weak social protection, and high inequity (Department of Health [DOH] & World Health Organization [WHO], 2012).

Government spending on social services and welfare has a significant negative effect on absolute and relative income mobility. This is in contrast to the assumption that public spending should have a positive effect on the upward movement of income. Various anti-poverty programs in the country and interventions were participated in by the national and local governments. Most of the programs appeared to be effective in the short-run alone and needed the long-term for human capital development. However, accessibility and availability of the programs in all areas are important to expand their effects and are not limited to accessible areas (Balisacan et al., 2010). This agrees with Tutor (2014) that location matters in the participation in program expansion. Limited access of households to the programs in the short-run period did not increase the average total household income. The negative effect of public spending may have been due to the programs' requirement for accessibility in the long-term period to complete its impact.

The effectiveness of these programs is still a challenge. The social protection system in the Philippines is characterized by fragmented, uncoordinated, and poorly targeted programs. In 2009, over 60 social protection programs were in place and implemented by as many as 20 agencies, which resulted in poor coordination among the implementing agencies and duplication of program beneficiaries. The poor targeting of program beneficiaries led to high inclusion (unintended individuals or households are included as beneficiaries) and exclusion (intended individuals and households are excluded as beneficiaries) errors, limiting the overall impact of the programs funded by scarce public resources. It is thus critical to ensure effective implementation and careful monitoring and evaluation to achieve the expected goals (Usui, 2011).

Natural Shocks

The geographic location of the Philippines makes it susceptible to natural hazards such as earthquakes, volcanic eruptions, environmental degradation, tropical cyclones, and flooding (United Nations Office for Disaster Risk Reduction [UNDRR], 2019). This motivates the country to be always prepared (even at the barangay level) before calamity strikes and to be able to recover and to reconstruct in the aftermath through support for disaster management (Capuno et al., 2013). The negative effect of natural shocks may be realized in the long run (Rentschler, 2013). This is followed by the results that natural disasters are an insignificant factor of short-run absolute income mobility and relative income mobility.

Moreover, natural disasters may not affect households' income through immediate solutions. Bayudan-Dacuycuy and Lim (2013) confirmed that natural disasters could lead to unemployment that may be prolonged depending on the recovery and state of the economy. Unemployment decreases the level of household income after a disaster, but immediate solutions for shocks that originate from natural disasters through adequate provisions of infrastructure and social protection programs can help households that are affected by these shocks to restore their capacity to recover and meet their basic needs.

Conclusion

The location of the households, marital status, educational attainment, job classification of the household heads, number of dependents in the households, and government programs on human capital influenced absolute and relative income mobility in the Philippines in the short-run period. Although education, health, and social services had a minimal positive effect on income mobility, these factors are expected to have a significant effect in the long run because human capital development results in higher productivity and income. On the other hand, natural shocks did not influence income mobility in the short run because of the country's preparedness and resiliency. Thus, it is recommended for future studies to use a longer time frame of longitudinal panel data to examine the long-run effect of the factors on the income mobility of households. It is also important to have genuine longitudinal panel data to precisely estimate and analyze income mobility. Through longitudinal panel data, it is easier for the country to have a better understanding of the changes and development processes over time.

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Declaration of Ownership

This paper is my original work.

Conflict of Interest

None

Ethical Clearance

This study was approved by the institution and the funding agency.

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