

Financial Inclusion and the Role of Financial Literacy in the Philippines

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Abstract

Financial inclusion is increasingly seen as a key enabler of various development objectives. While not explicitly one of the UN Sustainable Development Goals (SDGs), financial inclusion is recognized as an important enabler for them. The Philippine central bank—the Bangko Sentral ng Pilipinas (BSP)—has even identified financial inclusion as a “national development agenda” that requires a conscious effort by various sectors to accelerate and enable its societal benefits. This paper studies the relationship between financial literacy and financial inclusion in the Philippines using data gathered from the 2019 Financial Inclusion Survey (FIS). We apply ownership of financial account and use of financial services as indicators of financial inclusion. Based on the results, financial literacy is a positive driver of financial inclusion. We calculated that a one-standard-deviation increase in financial literacy scores increased the likelihood of holding at least one account by 3.7 to 4.2 percentage points. On the other hand, a one-point increase in financial literacy scores improved the likelihood of availing of a financial service by 4.9 to 6.0 percentage points. The other drivers of owning at least one formal account and availing of financial services are age, gender, employment status, awareness of BSP’s programs, income above 40,000 PHP, and being the main household financial decision-maker. This paper aims to promote BSP’s agenda to bridge the financial inclusion gap and raise financial literacy levels in the country. With this study, the authors second BSP’s advocacy that financial inclusion is one of the instruments to attain sustainable and equitable development in the Philippines.

Keywords: financial inclusion, financial literacy, Philippines, probit regression

1. Introduction

1.1 Background of the Study

Financial inclusion as a major goal and policy tool has been given greater importance in recent years. The World Bank (2022) underscores financial inclusion as a key enabler for reducing extreme poverty and boosting shared prosperity. The United Nations Capital Development Fund (UNCDF) has likewise recognized financial inclusion’s role in facilitating the 2030 Sustainable Development Goals (SDGs). The Philippine central bank, Bangko Sentral ng Pilipinas (BSP, 2022), upholds financial inclusion as a tool to lay the ground for sustainable and equitable national development. For the central bank, a “well-informed public literate in basic economic and financial concepts could make informed decisions leading to better saving, asset-building, use of credit, and, ultimately, economic and financial well-being” (BSP, 2022). Moreover, the BSP desires four key outcomes: reduced disparities in financial inclusion, improved financial health and resilience, more financially capable and empowered consumers, and increased access to finance for micro, small, and medium enterprises (BSP, 2022). The BSP’s efforts, demonstrated through various programs and research activities, show financial inclusion’s significance to their overall mandate.

1.2 Definitions and Dimensions of Financial Inclusion

Grohmann and Menkhoff (2020) measure financial inclusion in three levels. The first level is account ownership at a formal financial institution. The second measurement is the active use of a financial account, and the final is the “rational” use of financial services. Most institutions like the BSP, the World Bank, and the United Nations adopt these measures as their definitions of financial inclusion. According to the World Bank, financial inclusion

implies that “individuals and businesses have access to useful and affordable products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way.” The United Nations defines financial inclusion as “universal access, at a reasonable cost, to a wide range of financial services, provided by a variety of sound and sustainable institutions.” The BSP interprets it as “a state wherein there is effective access to a wide range of financial services for all, especially the vulnerable sectors.” The BSP’s 2019 Financial Inclusion Survey (FIS) employs “account ownership at a formal financial institution” as a basic indicator of financial inclusion similar to Grohman and Menkhoff’s first level definition. In fact, the World Bank considers opening a transaction account as a gateway toward broader financial inclusion. Summarizing these definitions, financial inclusion captures access, usage, and affordability, which are interconnected to the Global Partnership for Financial Inclusion’s (GPFI) dimensions of financial inclusion.

The GPFI identifies three dimensions of financial inclusion: access to financial services, usage of financial services, and the quality of the products and the services delivery. It considers “arithmetic scores to questions on basic financial concepts, such as inflation, interest rate, compound interest, money illusion, risk diversification and main purpose of insurance, and source of emergency funding” as indicators of financial knowledge and financial behavior (GPFI, n.d.). These two categories fall under the quality dimension and specifically target the aspects of financial literacy and capability. The Organization for Economic Co-operation and Development International Network on Financial Education (OECD/INFE, 2011) defines financial literacy as “a combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being.” Subbarao (2010) claims that “while financial inclusion acts from supply side providing the financial products and services that people demand, financial literacy stimulates the demand side – making people aware of what they can demand.” Based on these, one could observe that financial inclusion encapsulates financial literacy, and that they complement each other (Agnier & Desello, 2022).

1.3 Problem Statements

A review of a wealth of existing financial literacy literature determined that “financial literacy is a backbone of financial inclusion” (Khan, Siddiqui, & Imtiaz, 2022). With these, the authors have recognized that there is existing international and local literature that covers both the demand and the supply side of financial inclusion and financial literacy research. International studies, including cross-country evidences, have captured the relationship between them (Yoshino & Morgan, 2016; Yoshino, Morgan, & Trinh, 2017; Morgan & Trinh, 2017; Grohmann, Klühs, & Menkhoff, 2018). However, Philippine-based studies on financial inclusion and financial literacy have either been few, done separately, or focused on a specific geographical location or group (Llanto, 2015; Operaña, 2016; Llanto & Rosellon, 2017; Alinsunurin & Alinsunurin, 2015; Castro, Salamat, & Tabor, 2020; Monsura, 2020; Debuque-Gonzales & Corpus, 2021; Park & Mercado, Jr., 2021; Bangco, Dimatulac, Sanchez, & Cabauatan, 2022). Employing Grohmann and Menkhoff’s financial inclusion definitions; namely, basic account ownership and the rational use of financial services, this paper attempts to provide an empirical study on financial inclusion and financial literacy using data gathered from the 2019 Financial Inclusion Survey (FIS) conducted in the Philippines. Hence, the researchers seek to answer: *What is the effect of financial literacy on account ownership in the Philippines? What are the factors that drive the ownership of a financial account and the use of financial services in the Philippines?*

1.4 Significance of the Study

By contributing to the flourishing literature on financial inclusion and financial literacy, this paper aims to examine the relationship between them and identify the determinants of account ownership and usage of financial services of Filipinos using a nationally representative survey. Through this study, the authors want to support the goals laid out by the Philippine government in the FIS in its commitment to pin down gaps, craft evidence-based financial inclusion policies, and measure financial inclusion in terms of access (i.e., accessibility of financial service providers) and usage (i.e., uptake of financial products and services). More importantly, this paper is timely as it attempts to confirm the positive link between account ownership and use of financial services to financial literacy, the results of which may help develop effective approaches to bridge the financial inclusion gap and raise financial literacy levels in the Philippines.

2. Literature Review

2.1 Financial Literacy and Positive Behavioral Outcomes

A growing number of research points toward the relationship between financial education programs and positive financial behavior such as those found in the works of Bernheim and Garrett (1996, 2003), Muller (2003), Bernheim, Garrett, and Maki (2011), and Bruhn, de Souza Leão, Legovini, Marchetti, and Zia (2016). From a

policy-making standpoint, this link implies that a financial education program may be designed with specific content to potentially alleviate long-term personal finance issues such as the availability of finances during retirement. The OECD (2015) associates a higher level of financial knowledge and skills with “increased long-term savings and improved investment behavior”. However, Lusardi (2019) suggests that financial literacy all around the world are generally low. This issue is exacerbated in developing countries where financial literacy is even lower, and financial inclusion remains a problem (Cicchello, Kazemikhasragh, Monferra, & Giron, 2021).

In the same vein, Beverly, Hilgert, and Hogarth (2003) investigated the connection between financial knowledge and household financial management. They found out that higher financial knowledge can be linked to higher index scores on cash-flow management, credit management, savings, and investment. This implies that more financially literate people tend to exhibit positive financial behavior. This relationship is confirmed by Lusardi and Mitchell (2009). They conclude that financially literate adults are more likely to plan for their retirement. The same authors in a later study point out that financially savvy individuals are also more likely “to succeed in their [retirement] planning” (Lusardi & Mitchell, 2011). Furthermore, financially literate people are found to rely more on formal avenues for gaining financial knowledge such as attending seminars, using retirement calculators, and consulting financial experts over relying on family or friends for advice.

2.2 Financial Literacy and Financial Inclusion

Financial literacy has also been linked to higher degrees of financial inclusion. Khan, Siddiqui, and Imtiaz (2022), in a meta-analysis of existing financial literacy literature, concluded that “financial literacy is a backbone of financial inclusion”. The basic indicator of financial inclusion is ‘account ownership at a formal financial institution’ (BSP, 2020; Grohmann & Menkhoff, 2020).

Based on Morgan and Trinh’s (2017) findings, financial literacy is a positive driver of financial inclusion in Cambodia and Vietnam. Their estimation results reveal that a one-standard-deviation increase in the financial literacy score is associated with a rise in the financial inclusion score of 41.5 percentage points in Cambodia and 34.4 percentage points in Vietnam. This holds true in Kenya and Tanzania. Fanta and Kingston (2021) reports that financial literacy is a strong factor of financial inclusion in these countries. Vaid, Singh, and Sethi (2020) cite some authors favoring financial literacy’s role in enhancing financial inclusion. For instance, as a major demand side factor, it facilitates finer financial decisions, and a more advanced level of financial inclusion (Rastogi & Ragabiruntha, 2018; Rai, Due, & Yadav, 2019). They also mention that it has a decisive role in identifying individuals who are financially included or excluded (Kabakova & Plaksenkov, 2018); and finally, Rastogi and Ragabiruntha, (2018), Rai et al. (2019) and Shankar (2013) acknowledge that financial literacy aids in achieving financial inclusion through financial attitude, financial behavior, and financial knowledge. Other authors, such as Grohmann and Menkhoff (2020) and Hasan, Le, and Hoque (2021), also assert financial literacy’s influence in financial services’ demand and accessibility. On the other hand, Fischer (2011) claims that even though individuals have experience and practical knowledge about finance through utilization, they still lack basic financial literacy.

2.3 Financial Literacy and Availing of Financial Products and Services

Early research by van Rooj, Lusardi, and Alessie (2011) have demonstrated the role of financial literacy in the participation of Dutch households in the stock market. Follow-up research conducted in various parts of the world such as in Japan (Kadoya, Khan, & Rabbani, 2017), Pakistan (Munir, Yue, Ijaz, Hussain & Zaidi, 2020), South Africa (Nyakurukwa & Seetharam, 2022), and in various countries across Europe (Arts, 2018) have likewise confirmed the same relationship. Yet this positive correlation is not limited to stock market investments. Wang, Zhang, Guariglia, and Fan (2021) have demonstrated the correlation between higher financial literacy and greater demand for life insurance in China, regardless of the current scarcity of literature in this area. In another study, awareness of insurance products was enhanced with higher financial literacy among university students (Dalkilic & Kirkbesoglu, 2009). There has also been work done exploring the relationship between financial literacy and ownership of investment trusts (Yamori & Ueyama, 2020) and mutual funds (Müller & Weber, 2008). Based on these studies, there is a clear positive link between having more knowledge in financial matters and obtaining various financial services.

2.4 Financial Literacy and Inclusion in the Philippines

In the Philippines, enhancing financial literacy remains a challenge. The World Bank (2015) concludes that Filipinos, on a national level, lack knowledge of basic financial concepts. Later surveys conducted by the BSP reach the same conclusion (BSP, 2019; BSP, 2022). On the other hand, some research has been conducted on the impact of financial literacy on the financial behavior of Filipinos. Financial literacy, demonstrated through the

practice of financial record-keeping, has been linked to lower impulse buying behavior among public school teachers (Jabar & Delayco, 2021). Eloriaga, Roxas, and Cabauatan (2022) conclude that financial literacy has a positive influence on financial well-being and development among young professionals in Metro Manila. Sarsale (2021) even asserts that financial literacy has a positive correlation with entrepreneurial characteristics. With regard to determinants of financial literacy, age (Sanglay, Apat, Sumague, & Tec 2021), educational attainment (Sucuahi, 2013; Bangco et al., 2022; Guliman, 2015), marital status (Bangco et al., 2022), and gender (Sanglay, et al., 2021) are demographic factors found to have a significant positive correlation.

There is existing Philippine literature about financial inclusion covering both demand and supply side research using data from Annual Poverty Indicators Survey, the National Baseline Survey, and the Global Findex Data (Llanto, 2015; Llanto & Rosellon, 2017; Alinsunurin & Alinsunurin, 2015; Debuque-Gonzales & Corpus, 2021). For instance, Llanto (2015) uses access to credit as proxy for financial inclusion and households' decision to access financial services. In another study written two years later, Llanto and Rosellon (2017) examine financial inclusion from the perspective of transaction with formal financial institutions, ownership of savings account, access to credit, and access to insurance. Alinsunurin and Alinsunurin (2015) explore the supply and demand factors of financial inclusion in the Philippines. They observe that the providers of financial services, and the products and services available (i.e., the supply side) and the individuals who are financially included or excluded (i.e., the demand side) are indicators used to obtain a full representation of financial inclusion. To supplement Llanto and Rosellon (2017), Debuque-Gonzales and Corpus (2021) include estimating the determinants of barriers to financial inclusion. Based on these studies; however, we have deduced that literature focusing on the Philippines that link financial inclusion and financial literacy through nationally representative surveys have been very scarce.

3. Methodology

3.1 Data

This study uses data from the BSP's Financial Inclusion Survey (FIS) 2019. The FIS is a biennial survey that interviews 1,200 respondents mainly to obtain data regarding financial inclusion for both users and non-users of financial products and services. Part of the gathered information includes a three-item financial literacy quiz that covers the following topics: inflation, simple interest rate, and compound interest rate. Other research that have performed a three-item quiz such as Lusardi and Mitchell (2011) includes knowledge of the risk-return mechanism in select financial investments as a question item. While Gignac and Ooi (2022) point out the weaknesses in measuring financial literacy with only three to five question items, the FIS 2019 is the first iteration of the BSP's survey that attempts to measure this metric on a national scale. It should be noted that in future iterations, more questions are planned to be added by the central bank, which includes investment-related and risk diversification items.

3.2 Econometric Model

To address the first objective of modeling the impact of financial literacy on financial account ownership in the Philippines, we utilized a linear probability model and subsequently, a probit model to verify the results similar to the approach taken by Yoshino et al. (2017), Thomas and Spataro (2018), and Sekita (2020). Ownership of one (1) or more of the following financial accounts was used as a proxy for financial inclusion: bank account, microfinance, e-money, cooperative, or non-stock savings and loan association. This follows the same definition that the BSP used in its Financial Inclusion Survey, as well as Grohmann and Menkhoff's (2020). The equation that attempts to model this relationship is expressed as follows:

$$FA_i = \beta_0 + \beta_1 FL_i + \beta_2 X_i + u_i \quad (1)$$

The dependent variable FA is a binary variable that signifies whether the respondent possesses a financial account or not. We also modeled each type of formal account separately such that FA_i takes on the following values: (i) FA_1 for bank accounts, (ii) FA_2 for microfinance, (iii) FA_3 for e-money, (iv) FA_4 for cooperatives, (v) FA_5 for non-stock savings and loan association, and (vi) FA_6 for owning at least one of the above formal accounts.

The second objective, similar to the first one, aims to find out the determinants of financial inclusion expanded to include the use of financial services, which includes formal credit, investment, and insurance services. Again, this definition follows what the BSP has in their Financial Inclusion Survey. The equation that models this relationship is as follows:

$$FS_i = \beta_0 + \beta_1 FL_i + \beta_2 X_i + u_i \quad (2)$$

The dependent variable FS is a binary variable that signifies whether the respondent is subscribed to a financial

service or not. At the same time, to examine whether individual differences exist in the overall model, we also constructed individual models for each type of financial service. The variable FS_i takes on the following values: (i) FS_1 for formal credit, (ii) FS_2 for investment, (iii) FS_3 for insurance, and (iv) FS_4 for owning at least one of the above financial services, including ownership of at least one formal account as specified in Equation 1. In both equations, X_i represents a vector of variables that include demographic and social characteristics such as age, gender, employment, educational attainment, monthly income, area of residence, awareness of BSP's financial education programs, recipient of international remittance, and role in household financial decision-making. With the exception of age, the independent variables are dummy variables that take on either a value of 0 or 1. The independent variable FL indicates the financial literacy score of each respondent with values that range from 0 to 3.

All the models are presented with robust standard errors as opposed to their "classical" counterpart. Robust standard errors are useful for providing valid statistical inference for correctly-specified models with large sample sizes, and whose errors are not independently and identically distributed (Cottrell & Lucchetti, 2023). A comparison of classical and robust standard errors is included in the Appendix for reference.

4. Results and Discussion

The linear probability and probit estimations show insights on the correlation between financial inclusion and financial literacy. Table 1 shows the factors influencing the decision to own at least one account. Based on the results, financial literacy is significantly and positively correlated with owning at least one type of account. A one-standard-deviation increase in financial literacy scores increases the likelihood of holding at least one account by 3.7 to 4.2 percentage points. Moreover, the relationships between the demographic variables, such as age and being unemployed have showed the expected signs. Age is positively correlated, while being unemployed is negative. A negative sign in the variable 'age squared' indicates that as individuals reach a certain advanced age, their chances of owning at least one account decreases. Being female is found to positively correlate with owning at least one account.

In terms of educational attainment and monthly income, factors such as elementary schooling and a monthly income below 5,000 PHP or a monthly income between 5,000 PHP and 10, 000 PHP are significant, but negatively correlated with account ownership. Those individuals who attended only elementary school, and possess the incomes mentioned above are less likely to avail of at least one account. On the other hand, individuals with more than 40,000 PHP in monthly income have a higher probability of owning one account. In terms of residence, those who are from the Visayas region are more likely to own one. North and Central Luzon, and the Mindanao region show positive but insignificant correlations.

Those who are considered as a main financial decision-maker in the household avail of at least one account. Conversely, the models reveal a mixed result for the 'co-decision-maker' variable. Lastly, the respondents' awareness of BSP's financial programs has a positive and significant effect on account ownership.

Table 1. Financial literacy and ownership of at least one (1) financial account

	(1) OLS	(2) Probit
Financial Literacy	0.037** (0.014)	0.042** (0.017)
Age	0.010** (0.005)	0.013** (0.006)
Age (squared)	-0.0001* (0.000)	-0.0001* (0.0001)
Being female	0.171*** 0.029	0.194*** (0.034)
Being unemployed	-0.173*** 0.0323	-0.190*** (0.036)
Awareness of BSP Programs	0.133*** (0.023)	0.144*** (0.031)
Recipient of international remittance	0.0432 (0.037)	0.043 (0.038)

Education		
Attended elementary school	-0.103*	-0.121**
	(0.056)	(0.059)
Attended high school	-0.066	-0.076
	0.055	(0.057)
Attended vocational/technical college	0.049	0.045
	(0.085)	(0.086)
Attended college/graduate school	0.089	0.091
	(0.063)	(0.066)
Monthly Income		
< Php 5,000	-0.192***	-0.212***
	(0.055)	(0.070)
>=Php 5,000 and < Php 10,000	-0.123***	-0.137***
	0.037	(0.046)
>=Php 10,000 and <Php 20,000	0.001	0.010
	(0.034)	(0.038)
>=Php 20,000 and <Php 30,000	0.039	0.051
	(0.052)	(0.054)
>=Php 30,000 and <Php 40,000	0.044	0.048
	(0.064)	(0.067)
>=Php 40,000	0.248***	0.282***
	(0.0787)	(0.084)
Area of Residence		
Metro Manila area	-0.018	-0.028
	(0.044)	(0.052)
North and Central Luzon	0.012	0.007
	(0.039)	(0.045)
Visayas	0.129***	0.133***
	0.040	(0.045)
Mindanao	0.053	0.056
	(0.039)	(0.044)
Household Financial Decision-maker role		
Main decision-maker	0.134**	0.207**
	(0.056)	(0.081)
Co-decision-maker	0.060	0.131*
	(0.048)	(0.075)
Minor decision-maker	0.004	0.055
	(0.045)	(0.080)
Adj. R-sq/McFadden R-sq		
	0.180	0.171
N	1,200	1,200

Note. Full estimation results are in the Appendix.

* p < 0.05, ** p < 0.01, *** p < 0.001.

Table 2 reports the effect of financial literacy on the likelihood of holding individual financial accounts. Because ‘non-stock’ and ‘other accounts’ have insignificant results as dependent variables, the authors decided to exclude them from this discussion.

Table 2. Financial literacy and ownership of a specific financial account

	(1) Bank	(2) E-money	(3) Coop	(4) Micro
Financial Literacy	0.021** (0.010)	0.007 (0.007)	-0.0001 (0.0004)	0.005 (0.009)
Age	-0.0001 (0.004)	0.003 (0.003)	0.000 (0.0002)	0.014*** (0.003)
Age (squared)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)
Being female	0.011 (0.022)	-0.003 (0.015)	0.003*** (0.001)	0.140*** (0.017)
Being unemployed	-0.082*** (0.023)	0.014 (0.017)	-0.005*** (0.001)	-0.094*** (0.017)
Awareness of BSP Programs	0.070*** (0.020)	0.033** (0.014)	0.001 (0.001)	0.010 (0.015)
Recipient of international remittance	0.076*** (0.023)	0.011 (0.016)	-0.001 (0.001)	-0.009 (0.020)
Education				
Attended elementary school	-0.042 (0.045)	0.051 (0.038)	-0.002 (0.002)	-0.076*** (0.025)
Attended high school	0.037 (0.042)	0.022 (0.037)	0.001 (0.002)	-0.065*** (0.024)
Attended vocational/technical college	0.144** (0.056)	0.056 (0.045)	0.001 (0.003)	-0.054 (0.038)
Attended college/graduate school	0.192*** (0.047)	0.020 (0.040)	0.004* (0.002)	-0.156 (0.036)
Monthly Income				
< Php 5,000	-0.197** (0.070)	-0.054 (0.041)	undefined	0.004 (0.030)
>=Php 5,000 and < Php 10,000	-0.053* (0.032)	-0.056** (0.023)	0.001 (0.001)	-0.025 (0.022)
>=Php 10,000 and <Php 20,000	-0.007 (0.025)	-0.013 (0.017)	0.001 (0.001)	0.016 (0.018)
>=Php 20,000 and <Php 30,000	0.023 (0.032)	0.018 (0.021)	0.0003 (0.002)	-0.010 (0.028)
>=Php 30,000 and <Php 40,000	0.051 (0.039)	-0.015 (0.034)	0.0002 (0.002)	-0.007 (0.043)
>=Php 40,000	0.108** (0.049)	0.046 (0.033)	0.002 (0.002)	0.040 (0.044)
Area of Residence				
Metro Manila area	0.058* (0.032)	0.000 (0.022)	0.001 (0.002)	-0.092*** (0.031)
North and Central Luzon	0.063** (0.032)	0.019 (0.018)	0.004* (0.002)	-0.054** (0.023)
Visayas	0.135*** (0.031)	-0.008 (0.020)	0.006*** (0.002)	0.032 (0.020)
Mindanao	0.091*** (0.031)	-0.054** (0.021)	0.007*** (0.002)	0.010 (0.020)
Household Financial Decision-maker role				
Main decision-maker	0.199*** (0.063)	0.041 (0.033)	0.026*** (0.006)	0.001 (0.043)
Co-decision-maker	0.168*** (0.060)	0.032 (0.030)	0.024*** (0.006)	-0.018 (0.041)
Minor decision-maker	0.079 (0.063)	0.010 (0.032)	0.023*** (0.002)	-0.006 (0.048)
Adj. R-sq/McFadden R-sq	0.243	0.068	0.236	0.217
N	1,200	1,200	1,200	1,200

Note. * p < 0.05, ** p < 0.01, *** p < 0.001

The estimation results show that financial literacy is positively associated with the likelihood of owning a bank account only. A one-standard-deviation increase in financial literacy increases the likelihood of holding a bank account by 2.1 percentage points. Age and age squared are positively and significantly correlated with microfinance. This means that as individuals get older, their chances of owning microfinance increases. Females are more likely to own accounts with cooperatives and microfinance. Being unemployed shows the expected and significant negative correlations with owning bank, cooperative and microfinance accounts. Factors such as being a recipient of international remittance and awareness of the BSP's financial programs have positive and significant effects on bank account ownership. On the other hand, awareness of the BSP program has a positive and significant correlation with e-money account only.

In terms of education, individuals who attended only elementary and high school are less likely to avail of a microfinance account. On the other hand, individuals who attended vocational and technical college, or college and graduate school are more likely to own a bank account. Within income groups, individuals with a monthly income below 5,000 PHP or a monthly income between 5,000 to 10, 000 PHP are less likely to own bank and e-money accounts. Bank account ownership appears positive and significant across all Philippine regions. This also holds true for availing of an account with cooperatives, except for those based in Metro Manila. Furthermore, residents from Metro Manila and North and Central Luzon are less likely to avail of an account with microfinance, while individuals from Mindanao are less likely to own an e-money account. Finally, those who are considered as main decision-makers and co-decision-makers avail of bank and cooperative accounts, while those who are minor decision-makers tend to avail of cooperative accounts only.

The second objective attempts to examine the same relationship when the definition of financial inclusion is expanded to include financial services beyond formal account ownership used for basic financial transactions. Table 3 presents our estimates on the factors that influence the decision to avail of at least one of four financial services. All estimations show a positive and highly significant correlation between financial literacy and availing of a financial service. A one-standard-deviation increase in financial literacy score improves the likelihood of availing of a financial service by 4.9 to 6.0 percentage points.

Table 3. Financial literacy and availing of at least one (1) financial service

	(1) OLS	(2) Probit
Financial Literacy	0.049*** (0.015)	0.060*** (0.019)
Age	0.022*** (0.005)	0.026*** (0.006)
Age (squared)	-0.0002*** (0.000)	0.000*** (0.000)
Being female	0.090*** (0.029)	0.120*** (0.037)
Being unemployed	-0.134*** (0.032)	-0.166*** (0.040)
Awareness of BSP Programs	0.110*** (0.029)	0.137*** (0.036)
Recipient of international remittance	0.069* (0.036)	0.084*** (0.045)
Education		
Attended elementary school	-0.076 (0.057)	-0.092 (0.065)
Attended high school	0.018 (0.055)	0.021 (0.063)
Attended vocational/technical college	0.138* (0.075)	0.177* (0.095)
Attended college/graduate school	0.180*** (0.061)	0.244*** (0.076)
Monthly Income		
< Php 5,000	-0.030 (0.064)	-0.036 (0.073)
>=Php 5,000 and < Php 10,000	-0.107*** (0.041)	-0.121** (0.049)

>=Php 10,000 and <Php 20,000	0.024 (0.034)	0.023 (0.042)
>=Php 20,000 and <Php 30,000	0.025 (0.050)	0.022 (0.062)
>=Php 30,000 and <Php 40,000	-0.019 (0.064)	-0.012 (0.085)
>=Php 40,000	0.142** (0.066)	0.196* (0.102)
Area of Residence		
Metro Manila area	-0.045 (0.047)	-0.044 (0.059)
North and Central Luzon	-0.136*** (0.040)	-0.162*** (0.048)
Visayas	-0.041 (0.040)	-0.055 (0.049)
Mindanao	-0.015 (0.040)	-0.013 (0.049)
Household Financial Decision-maker role		
Main decision-maker	0.241*** (0.062)	0.339*** (0.082)
Co-decision-maker	0.211*** (0.057)	0.305*** (0.076)
Minor decision-maker	0.128** (0.057)	0.211*** (0.079)
Adj. R-sq/McFadden R-sq	0.21	0.19
N	1,200	1,200

Note. Full estimation results are found in the Appendix.

* p < 0.05, ** p < 0.01, *** p < 0.001.

In terms of the rest of the variables, the estimated models yielded relationships that are more or less aligned with our expectations. Older respondents are more likely to avail of a financial service by 2.2 to 2.6 percentage points. However, this positive correlation with age reverses at a certain point, as the quadratic version of the variable would suggest. Women are also more likely to obtain any of these services. Lack of employment, and presumably a stable source of income, greatly hinders having any financial service by 13 to 17 percentage points. In terms of respondents' awareness of the BSP's financial programs, this was found to have a highly significant positive effect. As the Philippines is known for having a considerable portion of its overseas workers remit money to support their families, we found it has a positive correlation with receiving remittance and obtaining a financial service.

In terms of education, having a college education registers a likelihood of availing of financial services by 18 to 24 percentage points. Monthly incomes reveal a similar pattern, with higher-income individuals more likely to avail of one of these services. Incidentally, having a monthly income level between 5,000 PHP and 10,000 PHP has a negative effect on availing of a financial service by 10 to 12 percentage points. Where the respondents live largely does not have a significant effect on our dependent variable, except for those living in the North and Central Luzon rural areas. Lastly, the extent of one's role as a financial decision-maker in the household has a positive effect on availing of financial services. Being the main decision-maker increases the likelihood by 24 to 34 percentage points, a co-decision-maker by 21 to 30 percentage points, and a minor decision-maker by 13 to 21 percentage points.

We also wanted to examine the relationship between financial literacy and the decision to avail of an individual financial service to see if certain aspects deviate from the overall model found in the previous table. Table 4 reports our findings on the effect of financial literacy and the likelihood of availing of individual financial services. All the estimates in this table are based on probit models with their corresponding marginal effects shown.

Table 4. Financial literacy and availing of a specific financial service

	(1) Financial Account	(2) Formal Credit	(3) Investment	(4) Insurance
Financial Literacy	0.042** (0.017)	0.006 (0.006)	0.037** (0.015)	0.019 (0.015)
Age	0.013** (0.006)	0.012*** (0.003)	0.016*** (0.006)	0.016*** (0.005)
Age (squared)	-0.0001* (0.000)	-0.0001*** (0.000)	-0.000** (0.000)	-0.000*** (0.000)
Being female	0.194*** (0.034)	0.076*** (0.013)	-0.094*** (0.031)	0.146*** (0.029)
Being unemployed	-0.190*** (0.036)	-0.078*** (0.014)	-0.119*** (0.034)	-0.176*** (0.031)
Awareness of BSP Programs	0.144*** (0.031)	-0.004 (0.012)	0.082*** (0.030)	0.044 (0.028)
Recipient of international remittance	0.043 (0.038)	0.023* (0.014)	0.022 (0.035)	0.090*** (0.033)
Education				
Attended elementary school	-0.121** (0.059)	-0.074*** (0.021)	0.110 (0.072)	-0.135*** (0.051)
Attended high school	-0.076 (0.057)	-0.004** (0.020)	0.211*** (0.070)	-0.055 (0.049)
Attended vocational/technical college	0.045 (0.086)	-0.053* (0.032)	0.321*** (0.089)	0.047 (0.072)
Attended college/graduate school	0.091 (0.066)	-0.034 (0.024)	0.354*** (0.076)	0.072 (0.057)
Monthly Income				
< Php 5,000	-0.212*** (0.070)	-0.012 (0.026)	-0.010 (0.067)	0.101* (0.055)
>=Php 5,000 and < Php 10,000	-0.137*** (0.046)	-0.006 (0.012)	-0.117*** (0.045)	0.002 (0.040)
>=Php 10,000 and <Php 20,000	0.010 (0.038)	0.033** (0.015)	0.027 (0.035)	0.069** (0.034)
>=Php 20,000 and <Php 30,000	0.051 (0.054)	0.033* (0.020)	-0.012 (0.047)	0.076 (0.047)
>=Php 30,000 and <Php 40,000	0.048 (0.067)	0.032 (0.027)	0.043 (0.062)	0.011 (0.072)
>=Php 40,000	0.282*** (0.084)	0.064** (0.030)	0.143* (0.078)	0.186** (0.078)
Area of Residence				
Metro Manila area	-0.028 (0.052)	-0.012 (0.020)	0.031 (0.044)	-0.059 (0.047)
North and Central Luzon	0.007 (0.045)	-0.006 (0.017)	-0.217*** (0.042)	-0.066 (0.040)
Visayas	0.133*** (0.045)	0.046*** (0.016)	-0.150*** (0.041)	0.078** (0.039)
Mindanao	0.056 (0.044)	0.015 (0.017)	-0.105*** (0.040)	0.135*** (0.039)
Household Financial Decision-maker role				
Main decision-maker	0.207** (0.081)	0.635 (undefined)	0.239*** (0.084)	0.215*** (0.081)
Co-decision-maker	0.131* (0.075)	0.622*** (0.185)	0.264*** (0.080)	0.185** (0.077)
Minor decision-maker	0.055 (0.080)	0.609*** (0.105)	0.183** (0.080)	0.180** (0.084)
McFadden R-sq	0.17	0.18	0.20	0.15
N	1,200	1,200	1,200	1,200

Note. Based on the FIS, 'investments' include ownership of at least one of the following: time deposit, UITF/mutual funds, stocks, bonds, government securities, SSS (Social Security System), GSIS (Government Social Security System), PAG-IBIG (Home Development Mutual Fund), PERA (Personal Equity and Retirement Account), and others.

* p < 0.05, ** p < 0.01, *** p < 0.001.

The estimation results show that financial literacy is positively associated with the likelihood of availing of a financial account, a formal credit, an investment, or insurance. These relationships, however, vary in their statistical significance. The positive impact of financial literacy is seen to be statistically significant at 5% level only with respondents who avail of a financial account, or avail of an investment. A one-standard-deviation increase in financial literacy scores raised the likelihood of having either of these services by 3.7 to 4.2 percentage points. Age has a consistent positive correlation with all specifications, implying that the older a respondent is, the more likely he or she is to avail of these financial services. Being a woman, on the other hand, shows a positive impact on availing of a financial account, formal credit, and insurance; but a negative association with having investments. All of the specifications in this aspect are statistically significant at 1%.

Consistent with the overall financial services model, being unemployed has a negative association with individual financial services, with the likelihood diminished by -8 to -17 percentage points. On the other hand, awareness of the central bank's financial programs shows a statistically significant impact on availing of a financial account, and on having investments only. The corresponding figures are at 14 and 8.2 percentage points, respectively. Investigating the actual content of BSP's programs would be interesting for further research. We also found a positive correlation between respondents receiving international remittance and owning any of the individual financial services.

When we look at the impact of the respondents' level of education, we can generally see a trend where more educated individuals are likely to avail of a financial service. A negative correlation is largely observed among those who have reached elementary school at most. Having a college degree, on the other hand, appears to have a strong positive effect only on owning investments. One's income level generally follows this same trend, where a higher income increases the likelihood of availing of a financial service. The effect is most pronounced when the income level reaches the highest range, with the likelihood of possessing one of the services increasing by 6.4 to 28 percentage points.

As expected, the opposite case is true when we look at the lower income levels. Those whose incomes are below 10,000 PHP a month have a negative likelihood of availing of a financial account or an investment by -12 to -21 percentage points. With regard to the respondents' area of residence, there is largely no set pattern that consistently indicates a strong correlation with owning any of the individual financial services. However, residents from the Visayas region, appear to be more likely to own a financial account, formal credit, or insurance. Availing of investments, on the other hand, appears to have a negative correlation which is the same as the rest of the regions except for the highly-urban Metro Manila area.

Lastly, the degree of a respondent's financial decision-making responsibility in the household largely corresponds to the likelihood of availing of specific financial services. This follows a similar trend in the overall specification discussed in Table 3. Those who are considered to be the main decision-makers are more likely to have financial accounts, investments, and insurance by 20 to 24 percentage points. This is in contrast to being a minor decision-maker whose impact is at 5 to 18 percentage points. However, the correlation between an individual being the main household financial decision-maker and owning a credit account appears inconclusive.

5. Conclusion and Recommendations

In this study, we aimed to investigate the relationship between financial literacy and financial inclusion in the Philippines, using a large-scale dataset. Financial literacy was measured using a three-item quiz devised by the Philippine central bank (BSP) that covers key topics such as inflation and interest rates. The definitions of financial inclusion that we used follows both the basic definition of owning a formal financial account, and an expanded one that involves availing of certain financial services. Using OLS and probit models, we found out that financial literacy has a positive and significant effect on financial inclusion in the Philippines. Consistent across the general models, we also uncovered various demographic and behavioral determinants of owning or availing of financial accounts and services.

For the first objective, this paper has revealed that financial literacy has a positive and significant effect on account ownership. A one-standard-deviation increase in financial literacy increased the likelihood of holding at least one account by 3.7 to 4.2 percentage points. The other drivers of owning at least one formal account are age, being female, awareness of the BSP programs, income above 40,000 PHP, Visayas as residence, and being the main financial decision-maker. Also, our model highlighted that financial literacy is positively associated with the likelihood of owning a bank account. A one-standard-deviation increase in financial literacy increased the likelihood of holding a bank account by 2.1 percentage points. Individuals who know the BSP programs, receive international remittances, are educated beyond the high-school level, and have income above 40,000 PHP are most likely to own a bank account. In addition, bank account ownership appeared positive and significant across

all Philippine regions. This strong positive correlation in opening a bank account held true for both main and co-decision-makers. With our results, the study supports the findings of Morgan and Trinh (2017) and Fanta and Kingston (2021) that financial literacy is a positive driver of financial inclusion.

Our second objective focused on financial literacy's effect on availing of financial services. The results largely echoed what we found out from the first objective. A one-point increase in financial literacy scores improved the likelihood of availing of a financial service by 4.9 to 6.0 percentage points. Age, gender, employment status, awareness of BSP's programs, and the respondent's role in household finances greatly contributed as well. When we looked into each kind of financial service, financial literacy scores had a significant impact only on owning investments and any formal financial account. This relationship is found to be insignificant when we consider ownership of formal credit or insurance. Nevertheless, our findings generally validate and reinforce what other studies have concluded: improving the knowledge and understanding of financial concepts and tools lead to greater participation in the formal financial industry (van Rooj et al., 2011; Kadoya et al., 2017; Yamori & Ueyama, 2020).

Further studies can concentrate on analyzing the impact of additional financial literacy items covered in the succeeding financial inclusion survey. It is also worth investigating for future researchers the rationale for the determinants; namely, being female, household decision-maker, and aware of the BSP programs for showing positive significance and larger coefficients to financial inclusion as compared with other demographic and behavioral variables used in this paper. Researchers can also study the link between financial literacy and financial technology, and explore other drivers and factors that could provide a better understanding of how to narrow the financial inclusion gap in the Philippines.

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Appendix A

Financial literacy and ownership of at least one (1) financial account

	(1) OLS	(2) OLS (HC errors)	(3) Probit (Marginal Effects)	(4) Probit (Marginal Effects; HC errors)
Financial Literacy	0.037** (0.014)	0.037** (0.014)	0.042** (0.017)	0.042** (0.017)
Age	0.010** (0.005)	0.010** (0.005)	0.013** (0.006)	0.013** (0.006)
Age (squared)	-0.0001* (0.000)	-0.0001* (0.000)	-0.0001* (0.0001)	-0.0001* (0.0001)
Being female	0.171*** (0.029)	0.171*** (0.029)	0.194*** (0.033)	0.194*** (0.034)
Being unemployed	-0.173*** (0.031)	-0.173*** (0.0323)	-0.190*** (0.035)	-0.190*** (0.036)
Awareness of BSP Programs	0.133*** (0.029)	0.133*** (0.023)	0.144*** (0.032)	0.144*** (0.031)
Recipient of international remittance	0.043 (0.034)	0.0432 (0.037)	0.043 (0.038)	0.043 (0.038)
Education				
Attended elementary school	-0.103* (0.054)	-0.103* (0.056)	-0.121** (0.061)	-0.121** (0.059)
Attended high school	-0.066 (0.053)	-0.066 (0.055)	-0.076 (0.059)	-0.076 (0.057)
Attended vocational/technical college	0.049 (0.078)	0.049 (0.085)	0.045 (0.086)	0.045 (0.086)
Attended college/graduate school	0.089 (0.061)	0.089 (0.063)	0.091 (0.068)	0.091 (0.066)
Monthly Income				
< Php 5,000	-0.192*** (0.058)	-0.192*** (0.055)	-0.212*** (0.070)	-0.212*** (0.070)
>=Php 5,000 and < Php 10,000	-0.122*** (0.038)	-0.123*** (0.037)	-0.137*** (0.045)	-0.137*** (0.046)
>=Php 10,000 and <Php 20,000	0.001 (0.034)	0.001 (0.034)	0.010 (0.038)	0.010 (0.038)
>=Php 20,000 and <Php 30,000	0.039 (0.048)	0.039 (0.052)	0.051 (0.053)	0.051 (0.054)
>=Php 30,000 and <Php 40,000	0.044 (0.070)	0.044 (0.064)	0.048 (0.080)	0.048 (0.067)
>=Php 40,000	0.248*** (0.080)	0.248*** (0.0787)	0.282*** (0.092)	0.282*** (0.084)
Area of Residence				
Metro Manila area	-0.017 (0.045)	-0.018 (0.044)	-0.028 (0.052)	-0.028 (0.052)
North and Central Luzon	0.012 (0.038)	0.012 (0.039)	0.007 (0.044)	0.007 (0.045)
Visayas	0.129*** (0.039)	0.129*** (0.040)	0.133*** (0.045)	0.133*** (0.045)
Mindanao	0.053 (0.038)	0.053 (0.039)	0.056 (0.043)	0.056 (0.044)

Household Financial Decision-maker role				
Main decision-maker	0.134*** (0.060)	0.134** (0.056)	0.207*** (0.078)	0.207** (0.081)
Co-decision-maker	0.060 (0.055)	0.060 (0.048)	0.131* (0.073)	0.131* (0.075)
Minor decision-maker	0.005 (0.056)	0.004 (0.045)	0.055 (0.078)	0.055 (0.080)
Adj. R-sq/McFadden R-sq	0.180	0.180	0.171	0.171
N	1,200	1,200	1,200	1,200

Note. * p < 0.05, ** p < 0.01, *** p < 0.001.

Appendix B

Financial literacy and availing of at least one (1) financial service

	(1) OLS	(2) OLS (HC errors)	(3) Probit (Marginal Effects)	(4) Probit (Marginal Effects; HC errors)
Financial Literacy	0.049*** (0.015)	0.049*** (0.015)	0.060*** (0.018)	0.060*** (0.019)
Age	0.022*** (0.005)	0.022*** (0.005)	0.026*** (0.006)	0.026*** (0.006)
Age (squared)	-0.0002*** (0.000)	-0.0002*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Being female	0.090*** (0.030)	0.090*** (0.029)	0.120*** (0.037)	0.120*** (0.037)
Being unemployed	-0.134*** (0.032)	-0.134*** (0.032)	-0.166*** (0.040)	-0.166*** (0.040)
Awareness of BSP Programs	0.110*** (0.030)	0.110*** (0.029)	0.137*** (0.037)	0.137*** (0.036)
Recipient of international remittance	0.069* (0.036)	0.069* (0.036)	0.084*** (0.044)	0.084*** (0.045)
Education				
Attended elementary school	-0.076 (0.056)	-0.076 (0.057)	-0.092 (0.068)	-0.092 (0.065)
Attended high school	0.018 (0.055)	0.018 (0.055)	0.021 (0.066)	0.021 (0.063)
Attended vocational/technical college	0.138* (0.081)	0.138* (0.075)	0.177* (0.102)	0.177* (0.095)
Attended college/graduate school	0.180*** (0.063)	0.180*** (0.061)	0.244*** (0.078)	0.244*** (0.076)
Monthly Income				
< Php 5,000	-0.030 (0.061)	-0.030 (0.064)	-0.036 (0.072)	-0.036 (0.073)
>=Php 5,000 and < Php 10,000	-0.107*** (0.039)	-0.107*** (0.041)	-0.121** (0.048)	-0.121** (0.049)
>=Php 10,000 and <Php 20,000	0.024 (0.035)	0.024 (0.034)	0.023 (0.043)	0.023 (0.042)
>=Php 20,000 and <Php 30,000	0.025 (0.050)	0.025 (0.050)	0.022 (0.061)	0.022 (0.062)
>=Php 30,000 and <Php 40,000	-0.019 (0.073)	-0.019 (0.064)	-0.012 (0.094)	-0.012 (0.085)
>=Php 40,000	0.142* (0.083)	0.142** (0.066)	0.196* (0.115)	0.196* (0.102)
Area of Residence				
Metro Manila area	-0.045 (0.046)	-0.045 (0.047)	-0.044 (0.058)	-0.044 (0.059)
North and Central Luzon	-0.136*** (0.039)	-0.136*** (0.040)	-0.162*** (0.048)	-0.162*** (0.048)

Visayas	-0.041 (0.041)	-0.041 (0.040)	-0.055 (0.050)	-0.055 (0.049)
Mindanao	-0.015 (0.039)	-0.015 (0.040)	-0.013 (0.048)	-0.013 (0.049)
Household Financial Decision-maker role				
Main decision-maker	0.241*** (0.062)	0.241*** (0.062)	0.339*** (0.082)	0.339*** (0.082)
Co-decision-maker	0.211*** (0.057)	0.211*** (0.057)	0.305*** (0.076)	0.305*** (0.076)
Minor decision-maker	0.128** (0.057)	0.128** (0.057)	0.211*** (0.079)	0.211*** (0.079)
Adj. R-sq/McFadden R-sq	0.21	0.21	0.19	0.19
N	1,200	1,200	1,200	1,200

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

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