

HOW DO SOCIO-DEMOGRAPHIC CHARACTERISTICS INFLUENCE THE PROBABILITY OF FINANCIAL INCLUSION? EVIDENCE FROM A TRANSITIONAL ECONOMY

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Abstract

Financial inclusion can be understood as the provision of financial services in a convenient and appropriate way to meet the needs of society, help vulnerable groups have opportunities, and promote sustainable economic growth. This study uses a probit regression model with 200 observations collected from November 1st to December 31st, 2019, to examine how socio-demographic characteristics influence the probability of financial inclusion in Vietnam. The results show that human capital, education, and living in urban areas increase personal financial inclusion, while age has an inverse relationship with financial inclusion. Based on the analysis results, we recommend some solutions to promote financial inclusion, especially by applying financial technology and supplying more services to Vietnamese people.

Keywords: Financial inclusion; Financial technology; Human capital; Place; Probit regression.

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1. INTRODUCTION

Recently, financial inclusion has been the subject of much attention from the international community, countries in transition, and developing countries due to its importance in economic development. Financial inclusion has improved in many countries around the world, and many remarkable results have been achieved (Camara et al., 2014; Demirgüç-Kunt & Klapper, 2013; Fungáčová & Weill, 2015; Tran et al., 2020). Foreign investment in financial institutions can positively influence the financial inclusion of households and businesses and their access to credit (Léon & Zins, 2020). Greater financial literacy can significantly increase financial inclusion, with benefits across income levels and subgroups within economies (Grohmann et al., 2018). Zins and Weill (2016) found that being male, wealthier, more educated, and older can increase financial inclusion in Africa, based on a dataset of 37 African economies and a probit regression model.

Previous studies suggest that numerous factors affect financial inclusion. Camara et al. (2014) found that people living in rural areas have difficulty accessing financial services offered by financial intermediaries. Income is the main factor affecting access to financial inclusion (Demirgüç-Kunt & Klapper, 2013; Fungáčová & Weill, 2015; Zins & Weill 2016). According to Fungáčová and Weill (2015), education and gender also affect financial inclusion in the case of China. Similarly, a person with more education is more likely to favor using financial services (Kaur & Kapuria, 2020; Zins and Weill, 2016).

According to statistics from World Bank (2014), about 75% of the Vietnamese population has not accessed financial and banking services and only about 50% of small and medium enterprises have accessed bank loans. The barriers that limit financial inclusion include cumbersome procedures and the need for collateral for loans (Dao et al., 2020). Therefore, determining what factors affect financial inclusion in an emerging economy is a major question in the economic development of Vietnam. Furthermore, not many empirical studies have been conducted on how human capital and individuals' place of residence affect the probability of financial inclusion. This study examines the factors affecting financial inclusion in Vietnam, particularly such major factors as human capital and residence. In this context, it is necessary to evaluate the accessibility of financial services for communities in the emerging economy of Vietnam. Some solutions for increasing financial inclusion at the community and provincial level are then proposed to contribute to the sustainable socioeconomic development of Vietnam.

We selected the province of Binh Duong, Vietnam, for this study. Binh Duong is a small industrial province in southern Vietnam, just north of Ho Chi Minh City, with a high economic growth rate, a population of approximately 2 million people, and an average population density of about 741 residents/km². According to State Bank of Vietnam, the province has about 67 commercial bank branches, 10 people's credit funds, investment funds, mutual funds with 173 transaction offices, and 770 ATMs to meet the financial transaction needs of people in the province. Gross regional domestic product (GRDP) in 2018 is estimated to increase by 9.01% compared to 2017, and GRDP per capita is 130.8 million VND. The economic structure of the province is distributed among

industry (63.87%), services (23.94%), agriculture (3.08%), and product tax minus product subsidy (9.11%).

In recent years, promoting financial inclusion has become one of the most important policies in developing countries. Demirgüç-Kunt and Klapper (2013) found that the banking system in China has made a great contribution to financial inclusion. The place of residence can also affect financial inclusion, as shown by Camara et al. (2014). Chen and Jin (2017) found that promoting financial inclusion can expand the access to formal credit associated with socioeconomic characteristics of household heads, such as employment and education, and of households, such as human capital. In the case of Vietnam, the average poverty rate of the whole country decreased by about 1.43% per year from 2015 to 2019, reaching the target assigned by the National Assembly. The percentage of poor households in extremely disadvantaged districts decreased by 27.85%, equivalent to an average reduction of 5.65% per year. Although the poverty rate has decreased rapidly in many districts and ethnic minority areas, many places have a poverty rate above 50%. According to Nguyen, Phan, and Nguyen (2020), Vietnam is known as a country with a young population and a high rate of internet access and mobile phone usage. However, there are still consumer segments that have not yet accessed banking services. In particular, the quality of human resources in mountainous and remote areas is still low, and people do not have access to modern financial services. Therefore, informal finance, which operates outside the scope of legal regulation as “black credit,” has become popular. Nguyen, Nguyen, and Nguyen (2020) argued that more investment in human capital can impact financial inclusion. Oyinlola and Adedeji (2019) found that the financial market acts as a catalyst in human capital and inclusion growth, and greater human capital can positively impact inclusion growth in the development of financial markets. However, empirical studies investigating the impact of socio-demographic characteristics on the probability of financial inclusion, with a significant contribution on human capital in an Asian lower-middle-income economy, have been largely ignored in the literature. Binh Duong is an industrial province in southern Vietnam and is quite successful in terms of economic growth and financial inclusion. Therefore, more and more people have attained financial inclusion, which is important to further ensure long-term economic growth. Therefore, it was necessary to carry out this research.

This study contributes to knowledge in many ways. It examines how socio-demographic characteristics influence the probability of attaining financial inclusion to provide additional evidence in support of policy recommendations for Vietnam and other developing economies worldwide. The findings of this research indicate that human capital and urban residence increase the level of personal financial inclusion. Age is found to have an inverse relationship and educational level to have a positive relationship with financial inclusion in Vietnam.

The remainder of this paper is organized as follows. Section 2 reviews the literature on financial inclusion and states our hypothesis. In Section 3, we discuss the research methodology and describe research variables and data collection. In Section 4, we show our main results, which are discussed in Section 5. Section 6 provides some recommendations and concludes.

2. LITERATURE REVIEW AND HYPOTHESIS

There are different definitions of financial inclusion. According to Beck et al. (2007), financial inclusion is the use of financial products and services by individuals and businesses in the economy. According to the Financial Action Task Force (FATF, 2013), financial inclusion provides safe, convenient, and affordable financial services to disadvantaged and vulnerable groups, including low-income rural residents who have not been served by or are excluded from the formal financial sector. Financial inclusion also provides more extensive financial services to individuals who currently use only basic financial products (FATF, 2013). The World Bank (2014) defines financial inclusion as meaning that individuals and businesses can access useful financial service products at affordable prices that meet their needs, including money transfers, payments, savings, credit, and insurance delivered responsibly and sustainably.

Financial inclusion plays an important role in a country's economic and social development (Camara et al., 2014; Demirgüç-Kunt & Klapper, 2013). According to an evaluation by the United Nations, financial inclusion is considered one of the important solutions for countries in achieving sustainable development by 2030. Financial inclusion helps entities in society, especially the disadvantaged and vulnerable groups, have the opportunity to raise their financial awareness, gain access to capital, save, and profit from their assets, thereby improving livelihoods and reducing poverty sustainably. Financial inclusion helps people to better understand the meaning and importance of financial products and services and enhances their ability to use them. When people understand the benefits of opening a payment account or a savings account at a bank, they will improve their ability to manage cash flow, increase the profitability of their assets, and they will also form a habit of saving (Brune et al., 2011). Financial inclusion is important for society since it helps reduce poverty, reduces income inequality, improves investment efficiency, and promotes economic growth. In addition, Brune et al. (2011) have shown that savings have helped households increase agricultural productivity and incomes and improve living standards. Furthermore, increasing financial inclusion will give people the opportunity to invest in education and health care.

Many previous studies have used quantitative models to evaluate people's financial inclusion to provide a better overall picture of global financial inclusion. A study by Camara et al. (2014) determined financial inclusion based on survey data from Peru; the results showed that people living in rural areas and women have difficulty accessing financial services of financial intermediaries. Demirgüç-Kunt and Klapper (2013) used three dependent variables (bank account ownership, bank savings, and bank credit) to analyze the use of financial services in several countries. The results showed that income was the main factor affecting financial inclusion. Fungáčová and Weill (2015) used a quantitative model for a binary dependent variable to identify factors affecting the financial inclusion of individual consumers in China. Their results showed that income, education, and gender all affect the use of personal financial services. Each study was conducted with a different scope, and the research results were not similar. Therefore, it is necessary to add different perspectives on this topic.

Zins and Weill (2016) studied 37 African economies using the World Bank global index and performed probit estimations. Zins and Weill (2016) found greater financial inclusion for males, persons with higher incomes, persons with more education, and older persons in particular. In addition to technological use, mobile banking can also drive financial inclusion, and African governments should design policies to enhance financial inclusion in their economies. Social trust can be a major driver contributing to the development of financial inclusion, as shown by Xu (2020) using the Global Findex dataset and the World Values Survey. Xu (2020) also found trust to supplement weak formal institutions and low levels of education. In addition, Kaur and Kapuria (2020) found that finance is an important source of economic development and social inclusion. Using multinomial logistic regression, factors that can influence households through institutional finance are education levels, cost-based household resources, and the size of land holdings.

Human capital has long been a driver of value that improves the quality of the workforce. Human capital is an intangible asset representing the economic value of a worker's experience and skills. Human capital includes knowledge, skills, and health (The World Bank, 2020). Balogh (2013) indicated that human capital can be measured by either monetary or non-monetary methods. Non-monetary methods include knowledge, skills, and healthcare, whereas monetary methods include income and cost-based approaches. The cost-based approach measures the costs of producing human capital by a combination of education and schooling costs. The income-based approach measures human capital as the present value of a person's future income stream. Therefore, human capital can be proxied by a person's income (Balogh, 2013; Le et al., 2003). As shown by Le et al. (2003), the measurement of human capital remains controversial; an educational stock-based approach should be used, not just income and cost.

Human capital is considered one of the most important factors that affect economic growth and financial development. According to Fungáčová and Weill (2015), who used an income-based approach as a proxy for human capital, greater human capital has significantly improved access to financial services in China. In the case of Africa, Zins and Weill (2016) found that a person with higher human capital is more likely to favor the use of financial services. However, Zins and Weill (2016) also considered that African countries are mostly the least developed economies, and Africa has been lagging behind other continents in economic performance and financial development. A majority of Africans are trapped in the informal economy and avoid digital financial services or face many barriers to financial inclusion as access, cost, and complexity are extremely high (Raji, 2020). Conversely, Asia is the fastest-growing economic region, accounting for 34% of global GDP in 2020 and predicted to account for 52% of global GDP by 2050. Asia would be the dominant economic position in the world with developed and emerging economies such as Thailand, Malaysia, Indonesia, Vietnam, Bangladesh, India, China, South Korea, Japan, Singapore, and the UAE (Asian Development Bank, 2020).

Financial inclusion can enhance the economic potential of rural areas, and particularly the rural poor, by increasing income and business opportunities. According

to the International Labour Office (2019), people living in rural areas do not have many opportunities to access financial services in the financial market. As with urban areas, people living in rural areas need to access financial services for multiple purposes, such as production, protection, investment in education, shelter, and healthcare. The International Labour Office (2019) found that formal financial institutions have frequently failed to offer financial services to rural areas. Thus, a person living in an urban area has a greater opportunity to access the formal commercial market than a person living in a rural area. Therefore, increasing access to financial services can be an effective tool for reducing poverty, enhancing income, and lowering income inequality in rural areas (Kaur & Kapuria, 2020). In this case, FATF (2013) explained that in the rural areas, especially in mountainous areas and ethnic minority areas, rates of new poverty and relapses into poverty are still high because progress in poverty reduction is often not sustainable. Therefore, financial inclusion can be considered a good channel providing affordable financial services to low-income people. According to Kaur and Kapuria (2020), transaction costs in remote rural areas are higher than in urban areas because of low population density and inconvenient infrastructure connections. Accordingly, informal providers with weak managerial capacity can only offer limited financial services to rural people (FATF, 2013; Kaur & Kapuria, 2020). The following hypothesis is suggested.

Hypothesis: Socio-demographic characteristics significantly impact the probability of attaining financial inclusion.

3. RESEARCH METHODS

3.1. Data

The study uses primary data from a survey of residents in Binh Duong Province on the status of their financial inclusion. The target sample size was determined from the formula of Hoelter (1983), which indicates that the minimum sample size must be 200 observations. According to Tabachnick and Fidell (2007), the minimum sample size for multivariate regression models can be calculated using the formula: $n = 8 \cdot m + 50$, where n is the sample size, and m is the number of independent variables in the regression model. In the case of 5 independent variables, the minimum sample size, based on Tabachnick and Fidell (2007), should be 90 observations.

We distributed 300 questionnaires from November 1 to December 31, 2019. Stratified random sampling under the probability sampling method was carried out to ensure representativeness and accuracy as well as low cost. The population was divided by rural areas, town, and city administrative units to ensure a representative sample. To determine the number of samples allocated to each administrative unit, the study used the ratio of the population in each administrative unit to the total population of the province. Sample characteristics are given in Table 1. The survey concentrated on five densely populated areas in Binh Duong, namely, the cities of Thu Dau Mot, Di An, and Thuan An, and the towns of Ben Cat and Tan Uyen with 43, 53, 67, 40, and 49 participants, respectively.

Table 1. Survey by administrative units

Administrative units	Total population in 2019 (people)	Population percentage	Survey participants
Thu Dau Mot city	325,551	14%	43
Di An city	403,760	18%	53
Thuan An city	508,433	22%	67
Ben Cat town	306,438	13%	40
Tan Uyen town	374,986	16%	49
Bac Tan Uyen district	66,656	3%	9
Bau Bang district	93,798	4%	12
Dau Tieng district	113,830	5%	15
Phu Giao district	90,825	4%	12
Total	2,284,277	100%	300

Source: Analyzed by authors and General Statistics Organization (2020).

3.2. Research model

Following studies by Fungáčová and Weill (2015), Tran et al. (2020), and León and Zins (2020), the estimated regression can be expressed as the following equation:

$$Y = f(X_1, X_2, X_3, \dots X_n). \quad (1)$$

The transformation of the above equation is specifically given as follows:

$$Y_i = \beta_0 + \beta_1 \cdot \text{GEN}_i + \beta_2 \cdot \text{AGE}_i + \beta_3 \cdot \text{EDU}_i + \beta_4 \cdot \text{HMC}_i + \beta_5 \cdot \text{PLACE}_i + \varepsilon_i \quad (2)$$

where

Y_i ($I = 1, \dots, n$): the dependent variable which is collected from survey takers i , assigned values of 0 and 1. In the detail, Y is 0 when the individual participating in the survey has not yet used financial services (deposit accounts, payments, loans, and insurance at formal financial institutions). Y is given the value 1 when the individual participating in the survey has previously used financial services at a formal financial institution.

HMC: an independent variable measuring human capital and proxied by the income of the survey participants, as suggested in the studies of Balogh (2013) and Fungáčová and Weill (2015). The participants are divided into four income groups: low, average, high average, and high. The results of previous studies show that income increases the use of financial services by individuals in the economy. The higher the income, the greater the person's ability to access financial services (Fungáčová & Weill, 2015).

PLACE: an independent variable reflecting the residence of the survey participants, with a value of 1 if they live in urban areas and 0 if they live in rural or

remote areas. People in rural and remote areas often face certain disadvantages in service infrastructure, including financial services. They may often have lower literacy levels than people in urban areas, so they have limited access to financial information. Therefore, the research hypothesis is that people living in urban areas are more likely to access financial services than those in rural and remote areas, as shown by the International Labour Office (2019) and Kaur and Kapuria (2020).

GEN: an independent variable reflecting the gender of the survey participants. In this research, the hypothesis is that men access financial services more than women. With Vietnamese social characteristics of Eastern culture, gender prejudice often occurs. The empirical research results of Fungáčová and Weill (2015) showed that women's financial inclusion in China was more restricted than men's.

AGE: a variable reflecting the age of the survey participants. Many previous studies have shown that the elderly tend to access financial services more than young people due to the accumulation of knowledge, assets, and information (Camara et al., 2014). However, young people often update technology quickly and show interest in new and risky things. Elderly people often have psychological concerns about risks, prefer to preserve assets, and find it difficult to change habits (Camara et al., 2014; Tran et al., 2020). In this study, an inverse relationship is expected between the AGE variable and access to financial services, meaning that older people are less likely to access financial services.

EDU: a variable reflecting the education level of individuals participating in the survey. The EDU variable is measured in four levels: (1) intermediate and lower, (2) college, (3) graduate, and (4) postgraduate. Dummy variables are used to measure education levels. College, graduate, and postgraduate variables are included in the model, and "intermediate and lower" is treated as a benchmark level in analyzing and explaining the results. Based on previous research results, such as Tran et al. (2020), and the population characteristics, positive signs are expected for variables that reflect the education level. In other words, the research hypothesis is that the higher the education level of an individual, the greater their likelihood of financial inclusion.

β_i : regression coefficients

ε_i : error terms

Table 2 gives previous studies and describes the variables used in this study.

Table 2. Detailed description of variables in the regression model

Variable	Meaning	Data collected	Sign	Previous studies
Y	Individuals using financial services at formal financial institutions	1 if an individual uses financial services and 0 if the individual does not	None	Beck et al. (2007), Camara et al. (2014), Desalegn and Yemataw (2017), Tran et al. (2020)

Source: Analyzed by authors.

Table 2. Detailed description of variables in the regression model (cont.)

Variable	Meaning	Data collected	Sign	Previous studies
Y	Individuals using financial services at formal financial institutions	1 if an individual uses financial services and 0 if the individual does not	None	Beck et al. (2007), Camara et al. (2014), Desalegn and Yemataw (2017), Tran et al. (2020)
HMC	Human capital (Average monthly income)	There are four levels of income: + Low income (0 to 10 million VND); + Average income (10 to 15 million VND); + High average income (15 to 20 million VND) + High income (20 million VND and above)	+	Balogh (2013), Demirgüç-Kunt and Klapper (2013), Fungáčová and Weill (2015)
PLACE	Residence	0 for urban areas and 1 for rural areas	+	Allen et al. (2016), Desalegn and Yemataw (2017), Kaur and Kapuria (2020)
GEN	Gender	1 for males and 0 for females	+	Camara et al. (2014), Tran et al. (2020)
AGE	Age	Age is determined based on year of birth	-	Camara et al. (2014), Tran et al. (2020)
EDU	Academic level	There are four levels of EDU: (1) intermediate and lower, (2) college, (3) graduate and (4) postgraduate	+	Camara et al. (2014), Fungáčová and Weill (2015)

Source: Analyzed by authors.

4. RESEARCH RESULTS

4.1. Descriptive statistics for research data

Table 3. Data descriptive statistics

Criteria	Sub-groups	Frequency	Percentage (%)
GEN	Male	98	49%
	Female	102	51%
AGE	Under the age of 23	23	12%
	From 23 to 34 years old	85	43%
	From 35 to 44 years old	55	28%
	From 45 to 54 years old	29	15%
	Over 55 years old	8	4%

Source: Analyzed by authors.

Table 3. Data descriptive statistics (cont.)

Criteria	Sub-groups	Frequency	Percentage (%)
EDU	Intermediate and lower	54	27%
	College	39	20%
	Graduate	102	51%
	Postgraduate	5	3%
HMC	Less than 10 million VND	165	83%
	From 10 to under 15 million VND	20	10%
	From 15 to under 20 million VND	9	5%
	Over 20 million VND	6	3%
PLACE	City	138	69%
	Rural or remote area	62	31%
Access to financial services at a formal financial institution	Uses at least 1 service	148	74%
	Uses no financial services	52	26%

Source: Analyzed by authors.

According to Hoelter (1983), the sample size limit in the linear structure is 200. The survey had 300 questionnaires. The result obtained 225 observations, and only 200 tables were valid (75 invalid questionnaires). Thus, the sample size meets the sample size requirements, ensuring the reliability of testing the model.

Table 3 shows no significant difference by gender in the number of individuals participating in the survey. Regarding age, 85 respondents are between 23 and 34 years old, equivalent to 43%. The age group from 35 to 44 years old follows, with 28%. The smallest age group is those above 55, who account for only 4% of the total sample. Five individuals with postgraduate education participated in the survey, accounting for 3%. Individuals with a college degree account for 20%, equivalent to 39 people. The 102 university graduates account for 51%. The intermediate group consists of 54 people, accounting for 27%.

In terms of human capital, the income level of the individuals participating in the survey is quite diverse, with groups of people with incomes below 10 million VND, 10 to 15 million VND, 15 to 20 million VND, and above 20 million VND. The majority of respondents receive an income below 10 million VND. The majority (69%) of the individuals surveyed live in urban areas. A total of 148 individuals (74%) have used at least one financial service (payment account, savings account, loan, and payment service) at a formal financial institution, and 52 (26%) have not.

4.2. Estimation results

Table 4 presents the estimation results and the marginal effects of the probit regression model, identifying the factors affecting the financial access of residents living in Vietnam.

Table 4. Estimated results and marginal effects

Independent variable	Regression coefficient	Marginal impact coefficient (dy/dx)	P-value of coefficient dy/dx
Constant	-0.5592		
GEN	-0.2251	-0.0379	0.400
AGE	-0.0392	-0.0066	0.004
EDU1	1.1847	0.1996	0.012
EDU2	1.7263	0.2910	0.000
EDU3	1.0274	0.1731	0.048
HMC1	0.7891	0.1330	0.066
HMC2	1.1450	0.1930	0.004
HMC3	1.5180	0.1932	0.002
PLACE	1.1405	0.1922	0.000

Number of observations: 200
Pseudo R² = 0.2910
LR $\chi^2(9) = 50.21$
Prob > $\chi^2 = 0.000$
Log likelihood = -61.154

Note: The education (EDU) and human capital (HMC) variables are EDU1 (college), EDU2 (university graduate), EDU3 (postgraduate), HMC1 (average income), HMC2 (high average income), and HMC3 (high income).

Source: Regression results from Stata software.

The likelihood ratio (LR) test proves the suitability of the model; the results show that the factors in the model can be used to explain the use of financial services by individuals. With the assumption that the other factors remain unchanged, the influence of each factor on the financial inclusion of Vietnamese people can be explained. According to Table 4, the results show that the estimated model is suitable and significant in the study, with the determination coefficient $R^2 = 0.29$, meaning that the independent variables in the model explain 29.10% of the change in the dependent variable. The LR χ^2 index with 9 degrees of freedom is 50.21, and p-value = 0.0000 indicates that the explanatory variables included in the model are significant factors of personal financial inclusion.

Table 5. Test of multicollinearity

Variables	VIF	1/VIF
Y	1.39	0.7198
GEN	1.09	0.9172
AGE	1.24	0.8043
EDU1	3.79	0.2639
EDU2	5.28	0.1895
EDU3	3.18	0.3149
HMC1	3.08	0.3249
HMC2	3.60	0.2775
HMC3	3.21	0.3114
PLACE	1.19	0.8375
Mean VIF	2.71	

Source: Analyzed by authors.

A diagnostic test for multicollinearity was performed, based on the vector inflation factor (VIF) There is no collinearity in the model because the VIF of each independent variable is less than 10 (Table 5).

The education variable is divided into four levels, with dummy variables representing intermediate and lower, college, graduate, and postgraduate education. College, graduate, and postgraduate variables are included in the model. Variables reflecting educational attainment are positive, indicating a positive relationship between education and personal access to financial services. In particular, the variables EDU1 (college) and EDU3 (postgraduate) are statistically significant at 5%, and EDU2 (graduate) is statistically significant at 1%. The marginal impact coefficient shows that when other factors are unchanged, the education level of individuals at the college level will increase the individual's likelihood of financial inclusion by 19.96% compared to individuals with the other qualifications. An individual with a graduate degree will increase his/her likelihood of accessing financial services by 29.09%. Similarly, for individuals with higher education, if the other factors are constant, the overall likelihood of financial inclusion will increase to 17.31%.

Income is also a factor affecting the financial inclusion of individuals living in Vietnam. Based on previous studies, income is divided into four dummy variables corresponding to low, average, high-average, and high income levels. The regression coefficients of average income, high-average income, and high income are positive and statistically significant.

Specifically, the average income variable has a marginal impact coefficient of 0.1330 with a significance level of 10%, meaning that when other factors are constant, the average income earner has a higher likelihood of financial inclusion than other groups by 13.30%. For the group with high-average income, the coefficient of marginal impact

is 19.30% – higher than the group with average income at the significance level of 1%. The high-income group has the largest coefficient of marginal impact, 19.32%, with a significance level of 1%.

The place of residence, represented by the PLACE variable, has a positive relationship with the individual’s financial inclusion status. Positive regression coefficients at the 1% significance level indicate that people living in urban areas have higher access to finance. The marginal impact factor of 0.1922 means that when other factors are constant, people living in urban areas have higher access to financial services than rural and remote areas by 19.22%.

The GEN variable is included in the model to evaluate the role of gender differences in the financial inclusion of people in Vietnam. After regression, the β_1 coefficient has a negative sign, indicating that women are more likely to access financial services at formal financial institutions than men. According to the marginal impact coefficient (dy/dx), when other factors are not changed, if the respondent is male, use of financial services decreases by 3.79% compared to women. The AGE variable has a positive influence on the financial inclusion of people in Binh Duong Province at the 1% significance level, showing that an individual’s age and the likelihood of financial inclusion are inversely related. Based on the marginal impact coefficient, increasing age by one year will reduce an individual’s likelihood of financial inclusion by 0.66% when other factors are constant.

Model selection (specification testing) and/or the selection of appropriate regressors are without a doubt important tasks in empirical research, and failing to do so might result in incorrect results. As a consequence, the specification of the dependent variable is evaluated, and the results are displayed in table 6. The hat variable is statistically significant at 1%. This demonstrates that the identification model is a reasonable model, despite the fact that _hatsq is not statistically significant.

Table 6. Test of the specification of the dependent variable

Y	Coef.	Std. Err.	z	P > z
_hat	1.127622	.3142998	3.59	0.000
_hatsq	.0847549	.1714509	-0.49	0.621
_cons	.0052181	.196502	0.03	0.979

Source: Regression results from Stata software.

5. DISCUSSION

It is evident that the estimated coefficient of educational level is positive, indicating a positive relationship between educational level and personal access to financial services. This result is consistent with the theory and studies of Tran et al. (2020) and Allen et al. (2016). Individuals with higher educational levels have more information about financial products and services, are receptive to new things, and are less afraid to access financial products and services, so their overall financial ability is higher.

Therefore, raising the educational level is an important factor in promoting comprehensive financial access in Vietnam. In fact, when people's awareness level increases, they have a certain understanding of financial inclusion. When individuals are able to study at a higher level, they have more access to financial services and this increases the financial inclusion of this group.

Human capital is proxied by income; it is also a factor affecting the overall financial ability of individuals. The results indicate that the regression coefficients of human capital are positive, showing that a person with a higher income has a higher likelihood of financial inclusion. This result is consistent with our research hypothesis and with domestic and foreign empirical studies, such as Tran et al. (2020) and Fungáčová and Weill (2015). The reason for this is that low-income people often do not have enough money, or enough knowledge to understand and use financial services. People with higher incomes will often be interested in using their idle cash to make a profit, as well as being able to access formal loans to serve their daily needs and business. In the case of Binh Duong, increasing citizens' incomes in the province is more likely to improve financial inclusion. In fact, Binh Duong has greatly improved its economic performance in recent years; therefore, per capita GDP is increasingly improving.

The results indicate that people living in urban areas have greater access to financial services than those in rural areas. Urban areas often have a network of bank transaction points, and so the financial inclusion of people in urban areas is often higher than for people living in rural or remote areas. The results of this study are also in line with those of Beck and Brown (2011). As shown by Kaur and Kapuria (2020), transaction costs in both rural and remote areas are higher than in urban areas; therefore, a person living in an urban area has a greater opportunity to attain financial inclusion. Furthermore, Binh Duong's urbanization rate is among the highest in Vietnam and will continue to increase in the near future as will local opportunities for financial inclusion.

The estimation results show that GEN is not statistically significant or there is no significant relationship between gender and the financial inclusion status of individuals in Vietnam. This result is also consistent with the research of Tran et al. (2020). However, financial service organizations should consider attracting female customers because, in oriental culture, women often hold money to ensure their family's living (Tran, et al., 2020). The study also confirms gender equality in Binh Duong, in particular, and Vietnam in general. Financial inclusion also contributes to increased financial access opportunities for women and sustainable development.

Finally, the results of this analysis reveal that the AGE variable has a positive influence on the financial inclusion of people in Binh Duong Province. More specifically, older people are less likely to attain financial inclusion. This can be explained in that the more the "elderly mentality," the more often they are anxious and doubtful about using complex financial products and services. Young people now have easy access to technology and information, so access to financial services from formal credit institutions is increasing. The younger generations have had more opportunities to study at higher education levels, so they have access to financial services, resulting in financial inclusion.

This is also the customer segment that many banks focus on. Meanwhile, for older individuals who are often afraid of change and fear risks, access to modern financial services is often limited. This shows that formal credit institutions need to pay attention to young customers, and at the same time have appropriate solutions to attract older customers to access financial services.

6. CONCLUSION

The impact of human capital on financial inclusion, with a significant contribution to human capital in a lower-middle-income Asian economy, has often been investigated in recent years. We used an econometric model to investigate the factors affecting financial inclusion in the case of Binh Duong, Vietnam. The analysis results show that age, education level, human capital, and place of residence affect the use of formal financial services. In particular, young people, who are highly educated, have higher incomes, and live in urban areas tend to have higher rates of financial inclusion than other groups. There are many reasons for barriers to financial inclusion for individuals in Vietnam. In addition to causes related to demographic characteristics, causes of complicated product procedures, financial services, distance from transaction points, and low deposit interest rates/high banking service fees cause a large part of the population to not use formal financial services. Based on the analysis results, we offer the following recommendations.

Firstly, expanding financial infrastructure is one of the key measures to bring financial services to a wide range of customers. Attention needs to be paid to expanding the network in rural areas since this is the target group of customers who have not received proper attention. This is entirely consistent with the socioeconomic development of Vietnam when 100% of the communes have reached new rural areas.

Secondly, designing more financial products and services to suit the needs of the people, especially the disadvantaged groups in society, such as the poor, students, and farmers should be considered. In addition to increasing the number of transaction points, suppliers can exploit information technology to bring customers closer to financial services by creating an application to distribute financial services to customers. Personal banking in Vietnam with a friendly interface and refined information so customers can quickly access reliable information about financial services.

Thirdly, attention should be paid to the price of financial services, such as deposit rates, lending rates, fees for payment services, and insurance, to attract customers. By setting affordable prices for financial services, such as deposit rates, lending rates, fees for payment services, insurance, etc., providers can convince customers to access financial services more regularly. Finally, the government should focus on furthering people's understanding and awareness of financial services. This is an important factor in raising awareness of the need to use financial services. Promotional campaigns to educate consumers can be carried out through many communication channels, such as direct communication (credit officers, social organizations, loudspeakers, radio, and training institutions) or indirectly through social media sites.

Several extensions can be made to this study in the future. First, the study should be carried out in a larger area, possibly extending to many provinces in southeast or southern Vietnam. Second, the sample size should be increased to improve the research recommendations. Third, it is necessary to assess the impact of the COVID-19 pandemic on financial inclusion.

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