Beyond the Binary: Investigating the Differential Effects of Microcredit on Poor and Near-Poor Households

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Abstract

This study employs difference-in-differences methodology to examine the impact of formal microcredit on income levels of poor and near-poor households in Vietnam using panel data from 2016-2018. Findings reveal microcredit participation leads to a 0.021% increase in average income over time, with loan size, purpose, and household characteristics significantly influencing outcomes. The research contributes a nuanced analysis of microcredit's differential effects across income groups, incorporating credit use as a key variable. Results have implications for designing targeted interventions maximizing microcredit's poverty alleviation potential. Policymakers should promote productive credit use and support services tailored to borrowers' needs.

Keywords: *microcredit; poor households; near-poor households; Vietnam.*

JEL classification: I32; I38; O12; O16

Introduction

Microfinance has long been heralded as a potent instrument for poverty alleviation and economic development in emerging economies (Yunus, 1999; Robinson, 2001). The theoretical underpinnings suggest that providing financial services to the underprivileged can lead to enhanced entrepreneurial activities, increased household income, and improved resilience against economic shocks (Banerjee & Duflo, 2013). Despite considerable research on microfinance outcomes, there remains a lacuna in understanding the granular effects on distinct income groups, particularly in the Vietnamese context—a rapidly developing economy with a significant proportion of its population hovering near the poverty line (World Bank, 2020).

Vietnam, with its dynamic transition from a centrally-planned to a market-oriented economy, presents a unique case study to examine the influence of microfinance on the economic status of low-income households (Tran, 2018). While poverty rates have declined significantly, the incidence of near-poor—households whose income levels are marginally above the poverty threshold—remains relatively understudied (Nguyen & Wodon, 2014; Dang & Lanjouw, 2017). The near-poor are often at risk of slipping back into poverty, and their financial needs and responses to microfinance may differ from those of the poorer strata (Khandker, 2005; Banerjee et al., 2018).

This research fills the theoretical and empirical gap by dissecting the income effects of microfinance across these two closely aligned yet distinct groups. In doing so, it responds to calls for more nuanced poverty analyses that go beyond binary classifications of 'poor' and 'non-poor' (Sumner, 2016; Alkire et al., 2021), and it contributes to the body of knowledge on microfinance with a focus on its role in not just alleviating poverty but also preventing the descent into poverty. Furthermore, it addresses the practical need for evidence-based policy interventions that can tailor microfinance products to the specific needs of different household income groups, thereby enhancing the efficacy of poverty reduction efforts (Morduch & Haley, 2001; Duvendack & Mader, 2020).

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The novelty of this study lies in its nuanced approach to investigating the impact of microcredit on the income levels of poor and near-poor households in Vietnam. By employing the Difference-in-Differences (DiD) methodology and utilizing rich panel data from the Vietnam Household Living Standards Survey (VHLSS) in 2016 and 2018, the research provides robust empirical evidence on the differential effects of microcredit across these two distinct yet vulnerable groups. Moreover, the study extends the existing literature by incorporating the purpose of credit use as a key variable, shedding light on how the allocation of borrowed funds between agricultural and non-agricultural activities influences the income-generating potential of microcredit.

This study offers a theoretical contribution by enriching our understanding of microfinance's differential impacts within a nuanced income framework, and it holds practical significance by guiding targeted microfinance strategies to optimize development outcomes in Vietnam and other similar economies. The findings have far-reaching implications for policymakers, microfinance institutions, and development practitioners seeking to design and implement effective poverty alleviation interventions that cater to the diverse needs of low-income populations.

Literature Review

Microcredit, a subset of microfinance, involves the provision of small loans to low-income individuals who lack access to traditional banking services (Microworld, 2018; Ledgerwood, 2013; Chowdhury, 2000). These loans are typically used to support entrepreneurial, productive, and income-generating activities, as well as to enhance the value of assets (Banerjee et al., 2015). Microcredit has been widely recognized as a catalyst for promoting self-sufficiency, increasing product value, and fostering sustainable livelihoods among the poor, ultimately leading to improved living standards (Mohanan, 2005; Shaw, 2004; Puhazhendi & Badatya, 2002; Afrin et al., 2010; Brown, 2010).

The impact of microcredit on poverty alleviation and income generation has been widely explored in various contexts. In Bangladesh, a pioneering country in microfinance, Pomi (2021) investigated the role of microcredit in empowering women borrowers in the Chattogram district. The study found that microcredit provided by BRAC and ASA significantly reduced the vulnerability of poor women by generating income, improving living standards, and enabling psychological, economic, and social empowerment. Women borrowers acquired decision-making power in household activities, contributed to their living standards, gained control over assets, and experienced increased freedom of voice and mobility.

However, the effectiveness of microfinance in poverty alleviation has been questioned in some studies. Chikwira et al. (2022) examined the role of microfinancing in poverty alleviation in developing economies using a Vector Error Correction Model on quarterly time-series data. Contrary to expectations, the study found that microfinancing increased poverty in the long run, while SMEs and agricultural development reduced poverty levels. The findings suggest that improper microfinancing can escalate poverty levels, highlighting the importance of efficient use of microfinance loans and the need for a holistic approach to poverty alleviation.

Parihar et al. (2024) explored the pivotal role of microfinance institutions (MFIs) in alleviating poverty and fostering economic development. Using a mixed-methods approach, the study assessed the impact of microfinance on various socioeconomic indicators and found that MFIs significantly contributed to poverty reduction and economic empowerment in many communities. However, the success of MFIs was influenced by factors such as institutional efficiency, interest rates, and the regulatory environment. The study advocated for a supportive policy framework and innovative financial products tailored to the needs of the poor, emphasizing the importance of integrating financial inclusion with broader socioeconomic development strategies.

Numerous other studies have explored the impact of microcredit on poverty alleviation and income generation. Khandker (2005) found that microcredit not only reduces poverty but also has spillover effects on the local economy, particularly benefiting female borrowers in Bangladesh. Similarly, Islam (2016) concluded that microcredit participation leads to significant increases in household income and

consumption levels. Shucai et al. (2017) evaluated the effects of microcredit in China through a randomized control trial, highlighting the considerable impact on improving incomes and reducing poverty. The study identified extended repayment periods and lower interest rates as key factors contributing to the success of microcredit programs.

However, the impact of microcredit is not always straightforward. Navajas et al. (2000) provided evidence from Bolivia indicating that microcredit may not always reach the poorest of the poor, limiting its impact on poverty reduction. Rukiye (2012) challenged the assumption that microcredit is primarily sought for income generation purposes, revealing that borrowers often utilize funds to meet diverse capital needs not directly tied to income-generating activities. These findings underscore the multifaceted nature of microcredit and suggest that its benefits extend beyond income augmentation. Moreover, some studies have raised concerns about the potential negative consequences of microcredit. Bateman and Chang (2012) argued that the commercialization of microfinance has led to a shift away from its original purpose of poverty alleviation, resulting in the exploitation of vulnerable borrowers. They contended that microcredit can undermine local economies by diverting resources away from more productive investments and creating a cycle of indebtedness. Guérin et al. (2018) examined the social and cultural dimensions of microcredit in South India, highlighting how the pressure to repay loans can lead to increased stress, social tensions, and even violence within communities.

In the Vietnamese context, various studies have explored the effects of microcredit, yielding mixed conclusions. Dinh & Dong (2015) employed a difference-in-differences (DiD) methodology and regression techniques to establish a causal link between access to formal credit and improved household welfare in rural Vietnam. The study highlighted the role of household characteristics, external shocks, and geographic location in shaping income and expenditure patterns. Nguyen (2018) investigated the impact of microcredit on the income of poor households in the Southeast region, providing further evidence of its potential benefits.

Contrasting viewpoints exist within the Vietnamese literature. Quach (2005) argued that the impact of microcredit on income is indistinct and lacks specificity, contending that income changes are contingent upon a multitude of household characteristics, with no definitive evidence to ascertain the influence of credit on income variations. Phan (2012) concluded that while microcredit may increase household income and expenditure, its impact remains elusive and marginal. The study identified a discernible positive effect on household expenditure but failed to detect a significant impact on income. Recent studies have further contributed to the discourse on microcredit's impact on income and poverty reduction in Vietnam. Luan (2019) examined the role of microcredit in promoting entrepreneurship and employment among low-income households, finding that access to microcredit significantly increased the likelihood of starting a business and generating self-employment. However, the study also noted that the effects were more pronounced for better-off households, suggesting potential limitations in reaching the poorest segments of the population. Nguyen et al. (2021) investigated the impact of microcredit on the economic empowerment of women in rural Vietnam, highlighting its positive influence on women's decision-making power within households and their engagement in income-generating activities. The study emphasized the need for gender-sensitive microcredit policies and support services to maximize the benefits for women borrowers.

The present study addresses the gaps in the existing literature by providing a more nuanced analysis of the impact of microcredit on the income levels of poor and near-poor households in Vietnam. By employing the DiD approach and utilizing rich panel data from the Vietnam Household Living Standards Survey (VHLSS), the research offers a robust empirical assessment of the differential effects of microcredit across these distinct income groups. Moreover, the incorporation of the purpose of credit use as a key variable extends the current understanding of how the allocation of borrowed funds influences the income-generating potential of microcredit. This study contributes to the ongoing discourse on the effectiveness of microcredit as a poverty alleviation tool, providing valuable insights for policymakers and practitioners in Vietnam and beyond. The findings have important implications for the design and implementation of microcredit programs, emphasizing the need for targeted interventions that cater to the specific needs of different income groups and promote the productive use of borrowed funds. By shedding light on the complex relationship between microcredit and household income, this study aims to inform evidence-based

policies and practices that can enhance the impact of microcredit on poverty reduction and economic empowerment in developing economies.

METHODOLOGY

Research model development

Drawing from theoretical underpinnings and a comprehensive literature review, this study advances a conceptual framework to examine the effects of formal microcredit on the incomes of poverty-stricken and near-poor households, as depicted in Figure 1.

This model posits that the income levels of these households are significantly influenced by their capacity to gain access to formal microcredit facilities. However, the model also acknowledges that household income is not solely determined by access to credit but is also influenced by a range of intrinsic household characteristics. Therefore, to more accurately discern the impact of formal microcredit on household income, the proposed research model incorporates additional variables into the analysis. These include the age, gender, and ethnicity of the household head, the educational attainment of the household head, the total number of individuals in the household, the household dependency ratio (the proportion of non-working members to working members), and the geographical location of the household's residence.

By integrating these multifaceted factors, the model aims to provide a more nuanced understanding of how formal microcredit intersects with various socio-economic and demographic elements to influence the economic outcomes of poor and near-poor households. This holistic approach is essential in capturing the complexity of the relationship between microcredit and household income, ensuring that the analysis yields robust and informative conclusions.
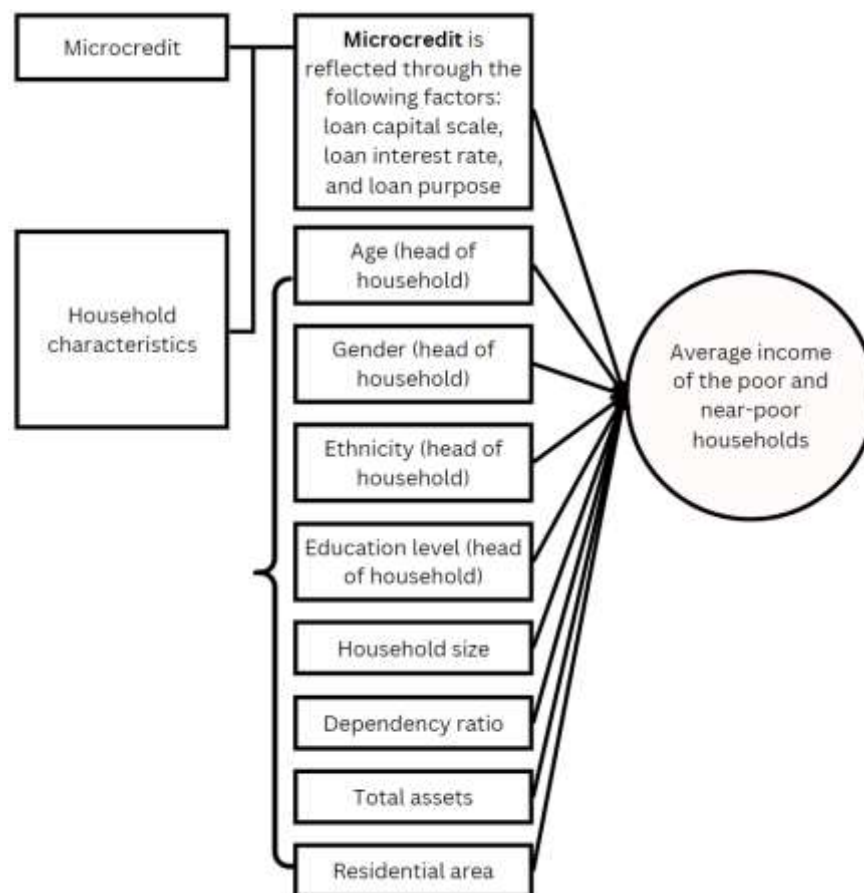

FIGURE 1: Proposed research model

In the articulated model, average household income is conceptualized as a function of multiple variables, where access to microcredit is merely one among several influential factors. The model incorporates a set of control variables that represent household characteristics, which are critical in understanding the nuances of income variation. These control variables include the age, gender, ethnicity, and education level of the household head; the size of the household; the dependency ratio, which reflects the proportion of dependent members to economically active ones; the total assets owned by the household; and the geographical area in which the household resides.

Given that the dependent variable—average income—is subject to considerable fluctuation in response to changes in these control variables, such variability can lead to heteroscedasticity, a condition where the variance of the error terms differs across observations. To mitigate this issue and stabilize the variance across the data set, the study employs a logarithmic transformation of the income variable. The use of the logarithmic scale can help to normalize the distribution of income and reduce the influence of extreme values or outliers.

Consequently, the study proposes to estimate the following econometric models using Ordinary Least Squares (OLS) to quantitatively evaluate the impact of formal microcredit on average household income. The application of these models aims to yield insights into the degree to which formal microcredit contributes to income levels, controlling for the aforementioned household characteristics. This approach ensures a more sophisticated analysis that accounts for the heterogeneity of the sample and the multifaceted nature of the income determination process.

Model 1 (M1): Estimating the difference in per capita income between poor and near-poor households participating and not participating in formal microcredit.

$$\begin{aligned} Ln(average\_income) \\ = \beta_0 + \beta_1 \times participation + \beta_2 \times age + \beta_3 \times gender + \beta_4 \times ethnicity + \beta_5 \\ \times education\_level + \beta_6 \times household\_size + \beta_7 \times dependency + \beta_8 \\ \times \ln(total\_asset) + \beta_9 \times area + \varepsilon \end{aligned}$$

The coefficient of interest in our econometric analysis is represented by β_1. If β_1 is statistically significant and differs from zero, we can deduce that there is a measurable distinction in income between poor and near-poor households that have received formal microcredit and those that have not.

However, Model 1, as initially constructed, fails to account for potential pre-existing income differences between households prior to their engagement with formal microcredit programs. This omission precludes the model from effectively isolating the impact of microcredit on household income. To address this limitation and accurately measure the effect of formal microcredit on average income, the study will employ the Difference-in-Differences (DID) methodology. The DID approach allows for a comparison of income changes over time between credit recipients and non-recipients, thereby controlling for income variations that exist independent of microcredit participation.

Model 2 (M2): Estimating how loan size, interest rate, and loan purpose impact the per capita income of poor and near-poor households.

$$\begin{aligned} Ln(average\_income) \\ = \beta_0 + \beta_1 \times \ln(loan_{size}) + \beta_2 \times interest\_rate + \beta_3 \times loan\_purpose + \beta_4 \times age \\ + \beta_5 \times gender + \beta_6 \times ethnicity + \beta_7 \times education\_level + \beta_8 \times household\_size \\ + \beta_9 \times dependency + \beta_{10} \times \ln(total\_asset) + \beta_{11} \times area + \varepsilon \end{aligned}$$

Table 1 below describes the specification of variables adopted for the research model.

TABLE 1: Specifications of Variables

Denotation	Description	Sources of reference
DEPENDENT VARIABLE		
average_income	Per capita income of a poor/ near-poor household	
INDEPENDENT VARIABLE OF MICROCREDIT		
participation	The participation of the household to the microcredit program	Ngo (2011); Phan (2010); Khandker (2005); Montgomery (2006).
loan_size	The amount of a microcredit loan	Afrin et al. (2010); Ibrahim and Bauer (2013).
interest_rate	The interest rate on a microcredit loan	Brown, 2010
loan_purpose	The household's purpose of obtaining a loan (agricultural loan, non-agricultural loan, and loan for other purposes)	Brown (2010); Alhassa and Akudugu (2012)
CONTROL VARIABLE		
age	Age of the household head	Mai (2016); Mpuga (2010); Swain & Floro (2012)
gender	Gender of the household head, =1 if the household head is male, =0 if the household head is female	Van Rooyen et al. (2012)
ethnicity	Ethnicity of the household head, =1 if it is Kinh, =0 if it is another ethnicity	Montalvo & Reynal-Querol (2021), World Bank (2004)
education_level	Education level of the household head	Tran, T. T. T., & Hoang, H. L. (2014); Mpuga (2010);
Dependency	Ratio of dependents to the household in total. According to the regulations of the Ministry of Labour, War Invalids and Social Affairs, dependents are people who are not of working age and have little income	Van Rooyen et al. (2012); Arun et al. (2006)
household_size	The total number of people in the household	Verner (2005); Ngo (2011)
total_assets	Total assets of the household	Mai (2016); Khandker (2005); Montgomery (2006)
area	The household's living area, =1 if it is an urban area, =0 if it is a rural area	Dinh & Dong (2015); Mai (2016)

Source: Created by authors

Research Method

The Difference-in-Differences (DID) methodology has emerged as a preeminent tool in contemporary research for assessing the ramifications of economic policies, technological advancements, and innovative business strategies. This study employs the DID approach, drawing inspiration from the seminal work of Nguyen et al. (2017) on evaluating subsidy schemes in Vietnam, to elucidate the impact of microcredit on the income levels of impoverished and marginally poor households. The DID method facilitates the comparison of outcome changes over time between a treatment group and a control group, effectively isolating the intervention's effect while controlling for pre-existing inter-group disparities. The application of the DID approach necessitates access to panel data, which encompasses both temporal and spatial dimensions across a multitude of observations. The methodology's nomenclature stems from its dual comparative framework, assessing differences across both time periods and distinct groups (treatment and control). This "double difference" empowers researchers to infer causal relationships by accounting for time-invariant unobserved variables and the idiosyncratic attributes of different entities, thereby crystallizing the policy or intervention's true impact (Wooldridge, 2016) (Figure 2).
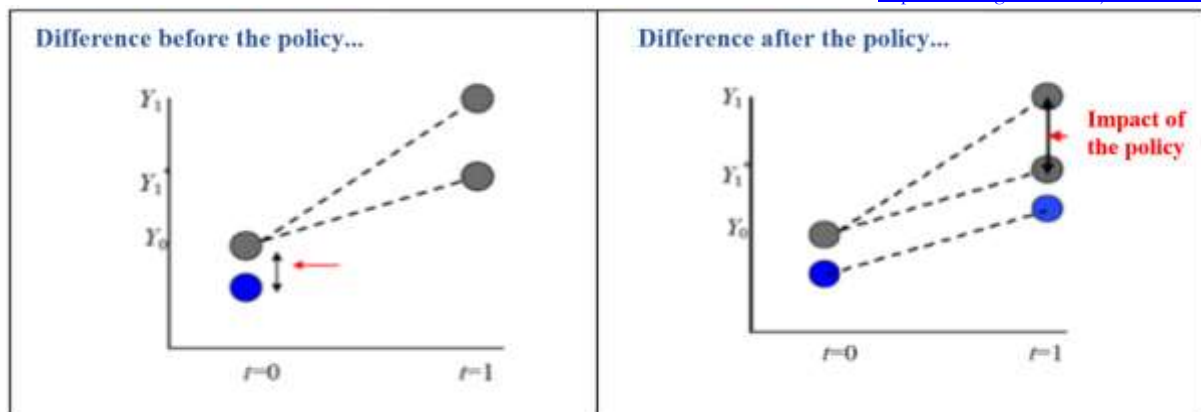
FIGURE 2: Illustration of the Difference between Two Groups after the Policy

The DID estimation method bifurcates the units of analysis into two cohorts: a treatment group subject to the policy and a comparison group unaffected by the intervention (Angrist & Pischke, 2009). In the context of this study, the treatment group comprises 274 poor and near-poor households who were recorded to have participated in formal microcredit programs in both the VHLSS 2016 and 2018. Conversely, the comparison group encompasses 394 poor and near-poor households who participated in formal microcredit programs in 2016 but did not in 2018. These households are drawn from a larger sample of 9399 households surveyed in the VHLSS 2016, of which 4180 households were re-interviewed in the VHLSS 2018. The 668 poor and near-poor households selected for this study are a subset of these 4180 households, ensuring that the analysis captures the impact of sustained participation in microcredit programs over the two-year period.

To establish a pre-policy benchmark, baseline data on the outcome variable Y (average income) for both groups is collected prior to the introduction of the new policy or program (Gertler et al., 2016). Upon the policy's conclusion or after a designated operational duration, the change in the outcome variable Y is reassessed for both groups. The DID method then juxtaposes the difference in Y's changes between the treatment and comparison groups. A significant differential change in the outcome Y attributable to the policy can be construed as the policy's impact (Khandker et al., 2009).

The robustness of the DID approach lies in its ability to mitigate potential biases arising from endogeneity issues, such as self-selection or omitted variable bias, which often plague observational studies (Imbens & Wooldridge, 2009). By exploiting the longitudinal nature of panel data and the quasi-experimental setting created by the policy intervention, the DID method can yield unbiased and consistent estimates of the policy's causal effect on the outcome of interest (Abadie, 2005). This methodological rigor has propelled the DID approach to the forefront of policy evaluation research, particularly in the realm of microfinance and poverty alleviation (Banerjee et al., 2015; Nguyen et al., 2017).

Research Data

This paper uses data from two Vietnamese household living standard surveys (VHLSS) in 2016 and 2018, conducted by the General Statistics Office of Vietnam (GSO), with basic information about incomes, expenditures, and demographics of the households. The VHLSS data in 2020 is not considered because part of it was imported from the 2019 Population and Housing Census, which utilized a different approach for data collection. Therefore, in order to ensure non-bias results, the research only uses VHLSS data in 2016 and 2018. The two groups of poor and near-poor households were selected in accordance with the assumptions of this method. Specifically, the treatment group includes the poor and near-poor households in the VHLSS 2016 and 2018, who were recorded to have participated in formal microcredit programs in both years (2016 and 2018). The comparison group includes the poor and near-poor households in the VHLSS 2016 and 2018, who merely participated in formal microcredit programs in 2016 but did not in 2018.

FINDINGS

Estimation results of Model 1 and Model 2

The results of Model 1's regression analysis, as presented in Table 2, reveal a statistically significant income disparity at the 1% level between poor and near-poor households that either do or do not partake in microcredit programs. The regression coefficient of -0.004 indicates that households engaged with microcredit programs have an average income that is 0.4% lower than their counterparts who do not participate in such programs.

In addition to the variable of microcredit participation, the model identifies several other variables that exert a positive influence on the average income of poor and near-poor households. Specifically, the results suggest that households headed by males experience higher average incomes compared to those headed by females. Similarly, households with a head from the Kinh ethnic majority are associated with higher average incomes than those from ethnic minority groups. The level of education also plays a significant role; household heads with education beyond high school tend to have higher average incomes than those with high school education or less. Furthermore, urban households are found to have higher average incomes than their rural counterparts, and there is a positive correlation between the magnitude of a household's total assets and its average income.

Conversely, some variables are identified as having a negative impact on the average income of poor and near-poor households. A larger household size is associated with a lower average income, suggesting that income per capita decreases as the number of household members increases. Additionally, a higher dependency ratio, which indicates a greater proportion of non-working members relative to working members within a household, is linked to a decrease in the average household income. These findings highlight the complex interplay of demographic, socio-economic, and geographic factors that contribute to the economic well-being of households within the context of microcredit program participation.

TABLE 2: Model 1's estimation results

Dependent Variable: ln(average_income)		Model 1	
		Regression Coefficient	**P Value**
participation		-0.004***	0.000
Age		0.000***	0.000
Gender		0.009***	0.000
Ethnicity		0.073***	0.000
area		0.188***	0.000
Education_level1			
Education_level2		0.044***	0.001
Education_level3		0.019***	0.001
Education_level4		0.043***	0.002
Household_size		-0.032***	0.000
Ln(Total_assets)		0.063***	0.000
Dependency		-0.003***	0.000

*Note: *, **, *** represent the significance level of 10%, 5%, and 1% respectively*

Based on Model 2's estimates (Table 3), it is shown that the regression coefficient for loan size in the model is positive, at 0.013, indicating a beneficial relationship between the size of the loan and the average income of households. Specifically, for each 1% increase in loan size, there is a corresponding 0.013% rise in average household income. This positive correlation supports the notion that larger loans enhance the ability of poor and near-poor households to engage in activities that generate employment and income. The empirical evidence that loan size is positively associated with increases in borrower income aligns with theoretical

models such as those proposed by Bateman (2010) and is substantiated by the empirical research of Alhassan & Akudugu (2012), and Banerjee & Duflo (2013), all of which report similar findings regarding the impact of loan size on economic outcomes.

The analysis indicates that the purpose for which a loan is taken has a significant impact on household income, with a positive coefficient of 0.027. This suggests that, ceteris paribus, when poor and near-poor households utilize loans for non-agricultural activities, their average income is 2.7% higher than those households that allocate loans for agricultural purposes. This differential may be attributable to the potentially higher returns on investment found in non-agricultural sectors compared to traditional agricultural ventures. Concurrently, the model reveals a negative correlation between the average interest rate and household income, as signified by a regression coefficient of -0.001. This infers that an increase in the interest rate by one percentage point, holding all else constant, results in a 0.1% reduction in the average income of households that are recipients of microcredit. This outcome is consistent with the broader literature, as studies by Brown (2010) have similarly identified that higher interest rates, by elevating the cost of borrowing, can have a detrimental effect on the net income of borrowers, particularly for those in poor and near-poor household categories.

The study's findings reveal significant correlations between the demographic characteristics of poor and near-poor households and their average income, particularly in relation to the use of microcredit.

The age of the household head emerges as a positive factor, with the regression coefficient of 0.001 indicating that for every additional year of the head of household's age, there is a 0.1% increase in average income. This relationship may be reflective of the greater experience, asset accumulation, and opportunity for investment and innovation in production and business methods that typically come with age. Such a trend corroborates the conclusions drawn by researchers like Mai (2016), who found that age can be linked to increased economic stability and income generation potential. This finding is consistent with the life-cycle hypothesis, which suggests that income tends to increase with age as individuals accumulate experience and assets (Modigliani, 1986). In the context of microcredit, older household heads may be better positioned to leverage credit for productive purposes, thereby enhancing their income-generating capacity.

Additionally, the gender of the household head is another influential characteristic. The regression coefficient of 0.018 for the gender variable suggests that households led by males have an average income that is 1.8% higher than those led by females, when controlling for other variables. This gender disparity in income is in line with the findings from various studies, including that by Phan (2010), which may reflect broader socio-economic gender inequalities, including differences in access to resources, employment opportunities, and wages. The present study contributes to the well-documented literature on gender disparities in income (Kabeer, 2005; World Bank, 2012), highlighting the persistence of these inequalities within the context of microcredit utilization among poor and near-poor households in Vietnam.

The study also demonstrates that the ethnicity of the household head is significantly correlated with average income. With a regression coefficient of 0.043, the analysis indicates that households headed by someone from the Kinh ethnic group, the majority group in Vietnam, have an average income that is 4.3% higher than households headed by someone from an ethnic minority. This can be attributed, according to a World Bank study from 2007, to the fact that ethnic minorities often live in mountainous or remote areas where infrastructure is less developed, educational conditions are poor, and there is a lack of access to modern technology for production and business. Additionally, ethnic minority households tend to have larger families and limited access to arable, fertile land, further challenging their income-generating capacity. These findings are consistent with previous studies that have highlighted the socio-economic challenges faced by ethnic minorities (Baulch et al., 2007), and the present study contributes to this body of literature by emphasizing the persistence of ethnic disparities in income, even among households participating in microcredit programs.

The educational attainment of the household head also impacts income, with those having an elementary or higher education level earning more than those with only high school education or below, which mirrors

the human capital theory's emphasis on the returns to education (Becker, 1964). This finding is consistent with previous studies that have demonstrated the positive relationship between education and income (Psacharopoulos & Patrinos, 2018), and it highlights the potential for microcredit to be more effective when targeted towards households with higher levels of human capital. Interestingly, the negative correlation between intermediate education and income warrants further exploration but may reflect labor market dynamics and the specific economic value of different educational qualifications in the Vietnamese context.

The regression analysis indicates a negative correlation between household size and average income, with a coefficient of -0.028. This implies that for each additional member in the household, the average income decreases by 2.8%. This finding is consistent with development economics theories, which suggest that larger households may dilute income per capita due to the need to distribute resources among more individuals. This is further corroborated by studies such as Mai (2016), which observed similar trends, indicating that a larger household size can result in a lower average income per household member. Furthermore, the dependency ratio, which reflects the proportion of non-working members (dependents) to working members within a household, is also found to have a negative relationship with average income, as evidenced by a regression coefficient of -0.037. This means that with each unit increase in the dependency ratio, the average household income decreases by 3.7%. These findings are consistent with the literature on household economics, which often highlights the financial strain of larger family sizes and higher dependency loads (Becker, 1981). In the context of microcredit, these results suggest that programs targeting larger households or those with higher dependency ratios may need to be tailored to address the unique challenges faced by these households in translating credit into increased income.

The regression analysis highlights a significant positive correlation between the living area of a household and its average income. With a regression coefficient of 0.235, the data suggests that, all else being equal, households located in urban areas have an average income that is 23.5% higher than those in rural areas. This substantial difference may be attributed to the greater availability of jobs, higher wages, and more diverse economic opportunities typically found in urban settings compared to rural ones. These findings are in line with previous research conducted by Mai (2016), which also reported higher average incomes for urban households, and they align with the urban advantage theory, positing that urban areas typically provide better access to markets, services, and employment opportunities (Glaeser, 2011). This finding underscores the importance of considering spatial factors when assessing the impact of microcredit on household income, as the effectiveness of such programs may vary depending on the geographic context.

Additionally, the study indicates a positive relationship between a household's total assets and its average income, as reflected by a regression coefficient of 0.054. This implies that for every 1% increase in the value of a household's total assets, there is a corresponding 0.054% increase in average income. The positive association between asset ownership and income is consistent with the Imperfect Market theory, which posits that more assets can enhance a household's ability to access formal sources of capital. When households secure loans, they can invest in productive activities that boost income. This relationship between asset holdings and income generation has been similarly observed in the work of Hulme and Mosley (1996), reinforcing the notion that assets can play a crucial role in improving the economic prospects of households. The present study contributes to the empirical validation of this relationship, which has been demonstrated in numerous studies (e.g., De Soto, 2000) by confirming the significance of assets in enhancing economic opportunities within the specific context of microcredit utilization among poor and near-poor households in Vietnam.

TABLE 3: Model 2's Estimation Results

	Model 2.

Dependent Variable: Log (average income)		Regression Coefficient	P Value
Ln(loan_size)		0.013***	0.000
Average_interest_rate		-0.001***	0.000
Loan_purpose1			
Loan_purpose2		0.027***	0.001
Loan_purpose3		0.009***	0.000
Age		0.001***	0.000
Gender		0.018***	0.001
Ethnicity		0.043***	0.000
area		0.235***	0.000
Education_level1			
Education_level2		0.093***	0.002
Education_level3		-0.005***	0.002
Education_level4		0.026***	0.003
Household_size		-0.028***	0.000
Ln(Total_assets)		0.054***	
Dependency		-0.037***	0.001

Note: *, **, *** represent the significance level of 10%, 5% and 1% respectively

The Impact of Formal Microcredit on Per Capita Income

The research employs the DID methodology to evaluate the effects of participation in formal microcredit programs on the average income of poor and near-poor households. According to the results presented in Table 4, the DID estimation provides evidence that participation in formal microcredit programs is associated with an increase in average income for these households. Specifically, the estimated DID effect shows that the average income for households participating in formal microcredit programs has increased by 0.021%. This figure is derived from the difference between the average income growth of the treatment group (those who participated in microcredit programs, which was 0.252%) and the average income growth of the comparison group (those who did not participate, which was 0.231%). The conclusion drawn from these findings is that formal microcredit programs have a positive impact on the income levels of poor and near-poor households. The 0.021% increase in average income attributable to microcredit participation signals that such financial services can be an effective tool for economic improvement among disadvantaged groups. This outcome aligns with the conclusions of several previous studies, including seminal work by Hulme and Mosley (1996), later research by Brown (2010), and more recent findings by Shucai et al. (2017), all of which support the idea that microcredit can play a significant role in enhancing the economic well-being of poor and near-poor populations.

TABLE 4: DID Estimation Results

Variable(s)	Coeff.	Std. Err.	t	P>|t|
age	0.002	0.000	65.225	0.000
gender	-0.041	0.001	-43.058	0.000
area	0.195	0.001	143.897	0.000
ethnicity	0.204	0.001	249.002	0.000
education_level2	0.344	0.004	83.968	0.000
education_level3	0.453	0.005	96.581	0.000
education_level4	0.659	0.006	116.169	0.000
household_size	-0.059	0.000	-244.301	0.000
dependency	-0.161	0.002	-100.381	0.000
ln(total_asset)	0.129	0.000	369.296	0.000
Outcome var.	lninc	S. Err.	t	P>|t|
Before				

Control	-459.910			
Treated	-459.680			
Diff (T-C)	0.231	0.000	531.56	0.000***
After				
Control	-503.419			
Treated	-503.166			
Diff (T-C)	0.252	0.001	388.19	0.000***
Diff-in-Diff	0.021	0.001	28.10	0.000***

Note: R-square: 0.53; Inference: *** p<0.01; ** p<0.05; * p<0.1. Number of observations in the DIFF-IN-DIFF: 668 (Before and After: Control: 394 and Treated: 274).

However, it is essential to reconcile the positive impact of microcredit on average income found in the DID estimation with the negative coefficient for microcredit participation in Model 1 (Table 2). The negative coefficient in Model 1 suggests that, on average, households participating in microcredit programs have lower incomes than those not participating. This finding may be due to self-selection bias, as poorer households are more likely to seek microcredit to improve their economic situation. Additionally, the negative coefficient may reflect the short-term impact of microcredit, as households may experience a temporary decrease in income due to the need to repay loans and invest in income-generating activities.

To better understand the impact of microcredit on household income, it is crucial to consider the purpose and actual use of credit. As shown in table 5, a significant proportion of loans are used for agricultural activities (14.30% for rice and other crop cultivation, 43.77% for livestock farming, and 6.39% for forestry), while a smaller share is allocated to non-agricultural activities (1.41%). This allocation pattern suggests that the income-generating potential of microcredit may be limited by the predominance of agricultural investments, which are often associated with lower returns and higher risks compared to non-agricultural ventures.

Table 5. Purpose and Actual Use of Credit of household

Purpose	Number of Loans	Proportion (%)	Usage	Proportion (%)
Rice and other crop cultivation	132	14.30	120	13.00
Livestock farming	404	43.77	333	36.08
Forestry	59	6.39	50	5.42
Fishery	4	0.43	4	0.43
Non-agricultural activities	13	1.41	14	1.52
Repaying other loans	23	2.49	65	7.04
House/land purchase/construction	186	20.15	198	21.45
Funerals	1	0.11	1	0.11
Education expenses	13	1.41	16	1.73
Medical expenses	28	3.03	38	4.12
Other	60	6.50	84	9.10
Total	923	100.00	923	100.00

Furthermore, the table reveals that a notable proportion of loans are used for purposes that do not directly generate income, such as house/land purchase/construction (20.15%), repaying other loans (2.49%), and medical expenses (3.03%). These findings underscore the multifaceted nature of microcredit and suggest that its impact on income may be moderated by the specific use of borrowed funds.

In light of these insights, the positive impact of microcredit on average income found in the DID estimation should be interpreted as the overall, long-term effect of microcredit participation, which takes into account the potential for income growth over time as households invest in income-generating activities and build

their asset base. The negative coefficient in Model 1, on the other hand, reflects the short-term, average impact of microcredit, which may be influenced by factors such as self-selection bias and the specific allocation of borrowed funds.

To reconcile these findings and provide a coherent conclusion, it is essential to emphasize the potential of microcredit as a tool for long-term economic improvement while acknowledging the challenges and limitations associated with its short-term impact. Policymakers and microfinance institutions should focus on promoting the productive use of microcredit, particularly in non-agricultural activities, and providing support services to help households effectively manage their loans and invest in income-generating ventures. By addressing these issues, microcredit programs can maximize their potential to improve the economic well-being of poor and near-poor households in Vietnam.

Conclusions

The vulnerability of poor households to unforeseen shocks underscores the importance of developing strategies that not only stabilize their lives but also elevate their income levels. Such interventions are crucial in assisting these households in their efforts to emerge from poverty. Applying the DID methodology and drawing upon data from the Vietnam Household Living Standards Survey (VHLSS) from both 2016 and 2018, this study assesses the impact of formal microcredit on the average income of poor and near-poor households. The analysis reveals that over time, microcredit has facilitated a 0.021% increase in average income for these households. Thus, the evidence suggests that microcredit programs have played a role in income enhancement for economically vulnerable groups, aligning with findings from previous studies (Banerjee et al., 2015; Karlan and Zinman, 2010).

With this incremental positive outcome, we can infer that microcredit initiatives have contributed to income growth among poor and near-poor households. This finding is consistent with the broader body of research indicating that access to financial services can lead to improved economic outcomes for the poor (Morduch, 1999; Roodman and Morduch, 2009). As such, it is imperative to consider policies that facilitate the provision and expansion of formal microcredit services. By equipping the poor with the necessary financial means, such programs can enable them to capitalize on economic opportunities that may otherwise be inaccessible, thereby fostering income generation and providing a buffer against financial instability (Armendáriz and Morduch, 2010; Yunus, 2007). The research findings align with established economic theories and empirical evidence, which suggest that household demographics and socio-economic factors play a critical role in determining income levels. The study identifies significant correlations between average income and factors such as the gender, age, ethnicity, and education level of the household head; household size and dependency ratio; urban residency; and total assets. These findings are consistent with various theoretical frameworks, including the life-cycle hypothesis (Modigliani, 1986), human capital theory (Becker, 1964), and the theory of imperfect markets (Banerjee & Newman, 1993), as well as empirical studies that have demonstrated the impact of these factors on household income (Kabeer, 2005; De Soto, 2000; Baulch et al., 2007).

However, it is important to acknowledge the limitations of this study. First, the analysis relies on data from the VHLSS, which, despite its comprehensive nature, may not capture all relevant aspects of household income and microcredit participation. Second, the study focuses on the impact of microcredit on income levels, but it does not extensively explore other dimensions of household welfare, such as consumption patterns, asset accumulation, or subjective well-being. Third, while the DID approach allows for causal inference, it is based on the assumption of parallel trends between the treatment and control groups in the absence of the intervention. Although this assumption is tested using pre-intervention data, there may be unobserved factors that influence the validity of this assumption.

Future research could address these limitations by incorporating additional data sources, such as administrative records from microfinance institutions or qualitative interviews with borrowers, to provide a more comprehensive understanding of the impact of microcredit on household welfare. Moreover, future studies could explore the long-term effects of microcredit participation by extending the analysis to cover

a longer time period and examining the sustainability of income gains. Additionally, investigating the impact of microcredit on other dimensions of household welfare, such as education, health, and social capital, could provide a more holistic assessment of the effectiveness of microcredit programs in alleviating poverty.

In light of the study's findings and corroborating literature, it is advisable to implement policies that bolster formal microcredit facilities as a viable tool for poverty reduction. Continuation and enhancement of these services could play a significant role in the ongoing efforts to improve the livelihoods of poor and near-poor populations (Collins et al., 2009; Copestake et al., 2005). Furthermore, policymakers and microfinance institutions should focus on promoting the productive use of microcredit, particularly in non-agricultural activities, and providing support services to help households effectively manage their loans and invest in income-generating ventures. By addressing these issues, microcredit programs can maximize their potential to improve the economic well-being of poor and near-poor households in Vietnam.

This study contributes to the existing body of knowledge by providing a nuanced analysis of the impact of microcredit on the income levels of poor and near-poor households in Vietnam, utilizing the DID approach and rich panel data from the VHLSS. The incorporation of the purpose of credit use as a key variable extends the current understanding of how the allocation of borrowed funds influences the income-generating potential of microcredit. The findings have important implications for policymakers, microfinance institutions, and development practitioners seeking to design and implement effective poverty alleviation interventions that cater to the diverse needs of low-income populations in Vietnam and other developing economies.

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