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DOES MICROFINANCING, FINANCIAL INCLUSION, AND EDUCATIONAL LOANS ALLEVIATE POVERTY AND INEQUALITY: EVIDENCE FROM VIETNAM

Trung Kien TRAN*

School of Public Finance, College of Economics, Law and Government, University of Economics Ho Chi Minh City, 59C Nguyen Dinh Chieu Street, District 3, Ward Vo Thi Sau, Ho Chi Minh City, Vietnam

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Abstract. Poverty reduction is considered as the top priority of governments and international institutions. At the same time income inequality is a far-reaching concern especially in emerging nations. US former president even labelled income inequality and poverty are the challenges of our times. Theoretically there are different views on the impact of microfinancing and financial inclusion on income inequality and poverty, hence, it is interesting to evaluate these estimations in Vietnamese context from 1986 to 2020. The researchers have applied the Bayesian Auto-regressive Distributed Lags (BARDL) model and exposed that microfinancing, financial inclusion, educational loans increase income equality and reduces poverty. Based on the evidences, the paper implies that government institutions must focus on microfinancing and financial inclusion aspects to facilitate poor and boost prosperity which ultimately brings income equality.

Keywords: microfinancing, financial inclusion, educational loans, alleviation of poverty and inequality, industrialization, Vietnam.

JEL Codes: D25, G32, H25, H75, P36, D63, I14.

Introduction

Previously, financial inclusion viewed as a single sector; "financial services types or financial access." However, with the passage of time, the concept has evolved and now viewed as "the state of easy and voluntary access to basic financial services (saving accounts, types of deposit, credit and money advice) at a suitable fee to all society." According to reports, 70% of world population does not have access to basic financial services. As per World Bank statement, "financial inclusion is a key enabler to reducing poverty and boosting prosperity." Resultantly, there are exceptions that financial inclusion may reduce alleviate poverty and increases income equality. However, in certain cases, when nations become wealthy, there is no guarantee that it reduces the gap between rich and poor. This questions the effectiveness

*Corresponding author. E-mail: *kientt@ueh.edu.vn*

of financial inclusion towards income equality and poverty reduction (Erlando et al., 2020; Tran et al., 2022).

Studies also proved the importance of micro-financing in driving low-income group out of poverty and then promise better income. As an emerging economy, Vietnam comes in the category of main receiver of this sort of capital via international programs related to poverty and hunger. The country has accomplished various goals in social and economic development in more than thirty years of its economic reform. The growth in economy helped country to subdue the rate of poor population Microfinancing is viewed as the greater contribution to have this great achievement. Unfortunately, income inequality appears to be increasing with the increase in growth and sharp poverty reduction in particular case of Vietnam. Gini coefficient which is the common tool to measure income inequality jumped from 0.34 to 0.42 during 1993–2018 (Miled et al., 2022; Phan et al., 2023). Although literature is abundant which offers empirical evidences regarding these constructs in Vietnamese context, however, contradicting statements and different theoretical views still maintains the curiosity to evaluate the association with fresh data set (Marin-Gracia et al., 2022; Pimhidzai & Niu, 2021; Qin et al., 2021).

It is argued that Vietnam still has a problem with poverty reduction. In the country which is the 13th most populated nation with a population of 95 million, there are 9.8% of the population estimated roughly 9 million people live in poverty. This amount is more than the population of many nations, including Laos, Israel, and Libya (Nguyen & Pham, 2018; Tabeikyna et al., 2021). The main characteristics of poverty are below par skills levels and education, less supported infrastructure, large household size as well as isolated life in rural and mountainous locations. This implies that minorities residing near such locations experience poverty and inequality. Even while ethnic minorities make up just around 15% of the population overall, they account for about 6.6 million of the 9 million impoverished individuals (Vu & Nguyen, 2021). The poverty rate among some ethnic minorities is even as high as 70 to 80 percent. Although rural mountainous areas in Vietnam are often associated with the impoverished, there is a big disparity between majority and minority residents in the same location. Kinh and Hoa people have a poverty rate of 10.4% in high mountain areas, compared to an ethnic minority's number that is almost six times higher, demonstrating that the high poverty rate of ethnic minorities is not just related to where they live but also to how they vary from the majority. The major reasons for poverty and inequality in Vietnam are illiteracy, low education, financial inclusions, opportunities cost, and inflation (Al Mamun et al., 2021). The poverty reduction rating in Vietnam can be seen Figure 1.

Besides these two issues, there is another interesting debate about educational loans and its link with poverty and income inequality. Specifically talking about Vietnam, the country's economic growth ever since 90s has been injected by young labour force who supposed to have a strong literacy and numeracy skills. It is said that during 1990–2018 almost 900,000 additional workers joined hands and during the same tenure, the percentage of net enrolment rose from 70. However, labour supply growth got slowed down during 1990–2010 from 2.2% to 1.3%. This entails that the country might get old before it becomes rich. Thereby, skill development is considered to be even more critical for such situation as it enhances productive and helps country to ditch the middle-income trap (Hussain et al., 2022; Tran et al., 2023; Narloch & Bangalore, 2018).

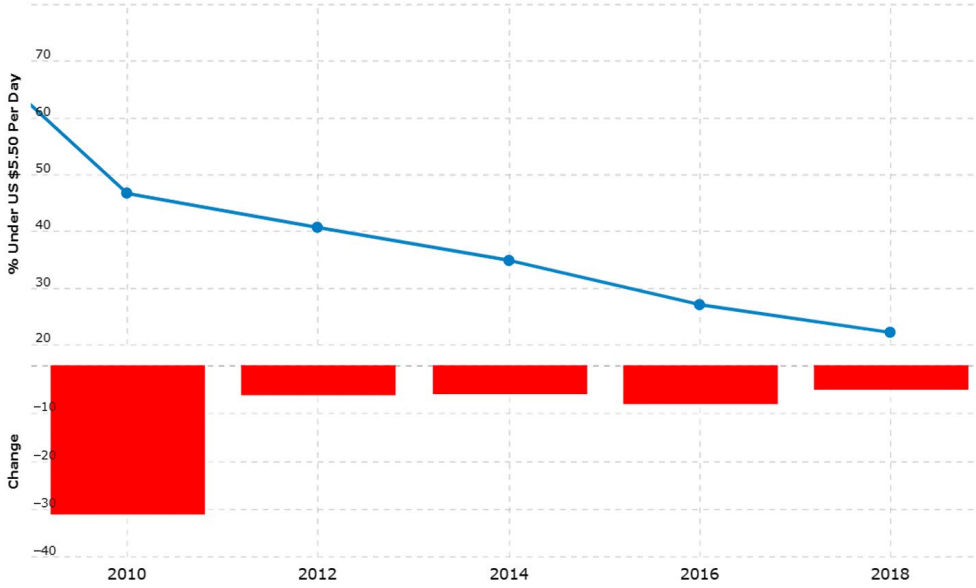

Figure 1. Poverty reduction in Vietnam

Vietnam's higher education system is unable to meet the demand of skilled labour. In contrast to upper-middle income countries, Vietnam's gross tertiary is low. Also, here occupational skill shortage is also viewed as a major obstacle for businesses. This means domestic degree is not sufficient to equip graduates with the skills that are required at organizations. In 2015, higher education got only 5% of government spendings which is 0.255 of GDP. Also, public loan schemes barely exists and even if they exist, they are poorly designed. It is reported that less than 3% students got government loans in 2018. Also, the government of Vietnam does not give guarantee about commercial student loans, hence students belonging to disadvantaged backgrounds, do not have easier access to commercial credits (Duong & Nghiem, 2022; Tran, 2023).

There is a strong association witnessed between poverty and educational attainment. There are 55 percent of the poor households in 1998 had guardians who had only finished their elementary education (Janovská et al., 2021; Pham & Riedel, 2019). In 2010, this number climbed by up to 75%. This number was reduced back down to 57 percent in 2016 with great efforts to eradicate poverty and inequality and hence enhance education for everybody, but there has been no progress for 20 years ago. Another factor to be addressed here is the poor's financial demands for investment in order to continue the discussion on how the poor, especially minority groups, might plant perennials and earn better revenues from their land (Cera et al., 2022; Pilinkienė et al., 2021; Son & Yoon, 2020). With this debate, the question arises that are factors such microfinancing, financial inclusion and educational loans helpful in alleviating poverty in the context of Vietnam?

This way, the study in contrast to prior literature offers several contributions. Firstly, in terms of empirical evidences, literature has not entirely agreed on the positive outcome of financial inclusion, hence, contradicting evidences encourage scholars to offer new insights

in Vietnamese setting. Secondly, the study by adding microfinance and educational loans as a predictor also offers unique insights as the captured snapshot of current situation of a country makes the study sample more interesting and might offer interesting evidences as there are studies which highlighted the shortcomings of microfinancing in emerging economies. Lastly, it will highlight the importance of poverty and inequality alleviation with the view to the betterment of the society in the form of a high standard of living in a country like Vietnam.

The study structure is bifurcated into different chapters. Introductory part which is the first section of the study talks about the overall study introduction inclusive of the gap and contribution. The evidence about outlined constructs in connection with preceding literature is elaborated in the next section. The third chapter is about methodology, i.e., the collection of data and data techniques. After that, the validity of the data will be analyzed. Next, the discussion part is about the collected evidences and being contrasted with prior evidences. Lastly, the study is concluded with some implications and recommendations.

1. Literature review

Nobody can argue against the fact that poverty and inequality exist everywhere around the globe. It comes in a variety of forms and aspects across the world. In the current situation, poverty and inequality act as fertile ground for conflicts among people (Badulescu et al., 2021; Shafi et al., 2022). One of the prime factors which cause poverty and inequality is financing at the micro level. In this lieu, Tasos et al. (2020), worked on poverty and inequality alleviation and microfinance from Pakistan's perspective. The results of the study revealed that Microfinance plays a crucial role in eradicating poverty and inequality, as seen by the drop in poverty and inequality rates from 42.67% contrasted with households to 29.33% in program households. Finally, a bad correlation has displayed between microfinance availability and household poverty and inequality level. A declined rate in poverty from 42.67%–29.33% has been witnessed due to provision of microfinance institutions. Similarly, Chikwira et al. (2022) explored whether the institutions which provide micro-financing affect poverty and inequality alleviation. The results of the study revealed a strong long-term correlation between the factors poverty and inequality, micro-financing, SMEs, and agricultural expansion. In contrast to predictions, microfinance was proven to prolong poverty and inequality. Long-term poverty levels have been proven to be decreased through SMEs and agricultural development. The establishment of small and medium businesses less the burden of poverty and inequality but in short run. Moreover poverty & Inequality triggers the expansion of microfinance loans all over the nation. Moreover, Khan et al. (2021) checked whether microfinance helps to alleviate poverty and inequality in Pakistan. Obtained results revealed that many business entrepreneurs use personal resources as their initial funding source. The findings indicate that microfinance and small and medium-sized businesses have a beneficial association. Microfinance and poverty and inequality reduction have also been proven to have a substantial relationship. However, no links between microfinance and employment rates, as well as outreach to the weak and marginalized, have been discovered. Therefore, on the basis of argument, we formulate that:

H1: Microfinance and Poverty and inequality reduction are related to each other.

Financial inclusion (FI) is one of the factors out of many which play a crucial role in poverty and inequality and inequality reduction all over the world. Literature proposed that FI is important for poverty and inequality alleviation (Méndez-Picazo et al., 2021; Shahzad et al., 2022). In this context, Erlando et al. (2020) worked on the triangle between FI, EG and poverty and inequality reduction in 12 Indonesian provinces from 2010 to 2016. Findings exposed that in Eastern Indonesia, there is a strong correlation between FI, ED, poverty and inequality, and income distribution. The amount of FI is positively impacted by socioeconomic progress, whereas poverty and inequality are negatively impacted. Income disparity is pervasive in Eastern Indonesia as a result of financial inclusion's favorable impact on inequality. Similarly, Lal (2018), explored whether FI results in a reduction of poverty and inequality alleviation. The study was conducted in India on 540 banks. Obtained evidences revealed that financial inclusion through cooperative banks significantly and directly contributes to poverty and inequality reduction. The study further emphasizes how FI made improvement in lives of poor and facilitated them to get rid of the shackles of poverty and inequality by providing them with access to essential financial services. Moreover, Yahaya and Ahmad (2018), also explored the connection between FI and poverty and inequality reduction in Malaysian context. Findings exposed that that financial inclusion through the Islamic zakat system positively affects poverty and inequality alleviation in Islamic countries like Malaysia. Accordingly, Ogbeide and Igbinigie (2019), worked on the association between FI and poverty and inequality reduction in Nigerian context. The data set of 13 years from 2002 to 2015 was collected. Findings displayed that FI significantly affects per capita income, lowers the rate of poverty, and raises living standards. Moreover, the number of commercial bank branches per 100,000 individuals share favorable connection with per capita income, hence, raises the standard of living, and lessens poverty. Commercial bank depositors /1000 adults had a detrimental impact on eradicating poverty but were not statistically significant during the reference period. The number of commercial bank borrowers per 1000 individuals increases per capita income and, thus, reduces poverty and inequality but is not significant statistically. Additionally, it is also revealed that number of ATMs have improved FI, revenue production, and poverty reduction without being statistically significant.

H2: Financial inclusion and Poverty and inequality reduction are related to each other.

In every aspect of life, education is the key. The major difference between developed and developing countries is their education system. In developed countries due to a better economy, the students have more chances to avail of better education even by getting a loan. On the other hand, the developing countries students usually lack their educational carrier due to weak financial positions (Britton et al., 2019). Moreover, education also plays a vital role in poverty and inequality alleviation. Like the chances of a job or business for an educated individual are far bright than that illiterate. Thus, there is an association between educational loans and poverty and inequality alleviation (Ullah et al., 2020). In this context, Datzberger (2018) explored the association between educational loans vide micro-financing and poverty alleviation in Uganda. Showcased findings revealed that having access to educational loans vide micro-financing has a beneficial effect on lowering poverty and inequality. Further,

MFIs might play a substantial role in reducing poverty and inequality in Uganda through the interaction of "loan amounts, family employment, gross income, and education". Therefore, MFIs should offer non-financial support to the poor, who would otherwise continue to live in poverty and inequality, by integrating them into the nation's financial system. Non-financial support might include fostering business and management abilities. Similarly, Lal (2018) explored whether the educational loan being part of financial inclusion has any effect on poverty and inequality alleviation. The study was conducted in India on 540 banks and their data from July to December 2015 was gathered. Results displayed that educational loan through cooperative banks significantly and directly contributes to poverty and inequality reduction. The results also revealed how educational loan enhanced the quality of poor life, thus facilitating them to run from the shackles of poverty and inequality by providing them with access to essential educational institutions.

H3: Educational loans and Poverty and inequality reduction are related to each other.

The prime factor in any country which influenced poverty and inequality alleviation is the country's economy. The positive or negative trends of the economy decide the country's future regarding poverty and inequality. Erlando et al. (2020), explored EG and poverty and inequality alleviation and their connection to each other in the economy of Indonesia. Findings exposed a long-term connection between Indonesia's FD, economic expansion, and elimination of poverty and inequality. Additionally, research demonstrated bidirectional causation between economic growth and poverty and inequality reduction as well as a unidirectional causality connecting the financial sector to the latter. Therefore, measures that support the financial sector's expansion will significantly boost economic development, open up job possibilities, and ultimately hasten the end of poverty and inequality. Accordingly, Dauda (2017) checked whether the economic growth in the country has any effect on poverty and inequality alleviation in Nigeria's. Obtained results showcased that Programs to curtail poverty and inequality in Nigeria must be encouraged all over the country by making emphasis on perceived needs and occupational level of people. It is to be noted that supervised capacity building is necessary during the implementation of such programs. By doing so, several issues can be addressed such as unemployment. Similarly, Kouadio and Gakpa (2022) also evaluated the connection of institutional quality with poverty and inequality alleviation, and economic growth in West Africa. The results of the study revealed that According to the study, institutions and economic development have long- and short-term beneficial effects on per-household spending. This suggested that as poverty and inequality decreased, per household spending grew along with institutions and economic progress. Additionally, in the near term, the interaction between institutions and economic growth had a negative impact on per household consumption, indicating that this interaction had a favorable impact on poverty and inequality. This demonstrated that, in the near term, institutions and economic growth had complementary roles in alleviating poverty and inequality.

H4: Economic growth and Poverty and inequality reduction are related to each other.

The standard of living of any country people expresses the poverty and inequality in that country. The standard of living is based on financial factors like inflation. Thus, inflation has a direct association with poverty and inequality. In this context, Febriani et al. (2021), checked whether inflation along with another variable effect poverty and inequality in the time span

of 1992–2007. The results of the study revealed that Nigeria's economic growth has a negative influence on poverty and inequality whereas unemployment and inflation have a favorable impact. The report suggests using an adequate macroeconomic strategy, which is much needed in order to lessen poverty and inequality rate. The level of local production must be raised in order to boost economic growth through increased productivity. A job training center must be established, new economic hubs must be established, and a link must be made between education and the skills that employers value. Furthermore, as inflation primarily impacts real wages, which in turn affects poverty and inequality, there must be actual efforts made to limit inflation (Talha et al., 2021). In other words, inflation has an impact on people's ability to buy. Similarly, Ncube et al. (2014) also explored inflation and other variables associated with poverty and inequality in the Middle East and North Africa (MENA). The results of the study revealed that EG and poverty and inequality are negatively related to each other whereas inflation shares positive relation.

The world is exploring more aspects of alleviation of poverty and inequality. As the poverty and inequality in the country lead to many issues like crimes. Thus, countries around the globe are expressing their much interest in the alleviation of poverty and inequality with the view to bringing betterment in their people's standard of living. One of the factors which strongly influences poverty and inequality alleviation is industrialization. Literature also witnessed that industrialization strongly influences poverty and inequality alleviation in the world. In this context, Fosu (2015) checked whether there is any association between poverty and inequality, and industrialization. The results of the study revealed that industrialization has a positive association with poverty and inequality alleviation in the selected Sub-Saharan Africa countries. Moreover, Osakwe (2018) also explored the association between poverty and inequality, and IND in Nigeria. It is revealed that industrialization results in job creation which affect poverty and inequality alleviation in the country.

H5: Industrialization and Poverty and inequality reduction are related to each other.

2. Research methodology

The study explored microfinancing, financial inclusion, educational loans, inflation, and industrialization and their effectiveness on alleviating poverty and inequality in Vietnam. The researchers have followed the secondary sources for the secondary data collection, such as Vietnam's central bank and WDI from 1986 to 2020. The study equation is developed as under:

$$PIEA_t = \alpha_0 + \beta_1 MFN_t + \beta_2 FIN_t + \beta_3 EDL_t + \beta_4 EG_t + \beta_5 INF_t + \beta_6 IND_t + e_t, \quad (1)$$

where: *PIEA* – Poverty and Inequality Alleviation; *t* – Time Period; *MFN* – Microfinancing; *FIN* – Financial Inclusion; *EDL* – Educational Loan; *EG* – Economic Growth; *INF* – Inflation; *IND* – Industrialization.

The study has taken poverty and inequality alleviation as the DV and four predictors such as microfinancing, financial inclusion, educational loans and economic growth. Finally, inflation and industrialization were considered as control variables. These constructs, measurements, and sources are given in Table 1.

Table 1. Measurements of variables

S#	Variables	Measurement	Sources
01	Poverty and Inequality Alleviation	Multidimensional poverty headcount ratio (% of the total population)	WDI
02	Microfinancing	The ratio of a small loan to total loans.	Central Bank
03	Financial Inclusion	The logarithm of net financial flows (Current US Dollar)	WDI
04	Education Loans	The ratio of educational loans to total loans.	Central Bank
05	Economic Growth	GDP growth (annual percentage)	WDI
06	Inflation	Consumer price annual percentage	WDI
07	Industrialization	Industry value added (percentage of GDP)	WDI

Descriptives have been used to study the properties of data. The study also examines the correlation between the variables that also exposes the multicollinearity results. Furthermore, the study also checks the unit root of the variables that are necessary for the application of a suitable model by using ADF and Phillips-Perron (PP) technique. The expression is mentioned below:

$$d(Y_t) = \alpha_0 + \beta t + \Upsilon Y_{t-1} + d\left(Y_t\left(-1\right)\right) + \varepsilon_t. \tag{2}$$

In addition, co-integration among the variables was also explored by using (Westerlund & Edgerton, 2008) approach. The examination of co-integration is also essential for the application of the suitable model. The equations for (Westerlund & Edgerton, 2008) approach are given below:

$$LM_{\varphi}\left(i\right) = T\hat{\varphi}_i \ (\hat{r}_i / \hat{\sigma}_i); \tag{3}$$

$$\left(i\right) = \hat{\varphi}_i / SE\left(\hat{\varphi}_i\right). \tag{4}$$

Eqs (3) and (4) show $\hat{\varphi}_i$ that indicated the estimate against standard error. These equations also show $\hat{\varphi}_{i,}^2$ which indicates long-run measured variance, and also shows $\varphi_i(L) = 1 - \Sigma \varphi_{ij} L^j$ that indicates scalar polynomial with L lag length. Finally, these equations show ρ_i that indicates the factor loading parameters vector.

The study checks the relationships between predictors and predictive variables using the ARDL model. It is appropriate when variables have no unit root at I(0) and I(1) (Ghazouani et al., 2020). In addition, it is also suitable when co-integration exists. Moreover, this approach controls the effects of auto-correlation and heteroscedasticity (Adebayo et al., 2021). The equation is stated as follows:

$$\begin{aligned}\Delta PIEA_t = {} & \alpha_0 + \sum \delta_1 \Delta PIEA_{t-1} + \sum \delta_2 \Delta MFN_{t-1} + \sum \delta_3 \Delta FIN_{t-1} + \sum \delta_4 \Delta EDL_{t-1} + \\ & \sum \delta_5 \Delta EG_{t-1} + \sum \delta_6 \Delta INF_{t-1} + \sum \delta_7 \Delta IND_{t-1} + \varphi_1 PIEA_{t-1} + \varphi_2 MFN_{t-1} + \\ & \varphi_3 FIN_{t-1} + \varphi_4 EDL_{t-1} + \varphi_5 EG_{t-1} + \varphi_6 INF_{t-1} + \varphi_7 IND_{t-1} + \varepsilon_t. \end{aligned} \tag{5}$$

The study also employed the Bayesian inference analysis that exposed the parameters of the estimations are random on the other hand, observed data are fixed. Hence, Bayesian in-

ference analysis has been operating on the basis of Bayes's rule that represents the previous distribution findings using posterior statistics related to the model parameters from observed data (Salakpi et al., 2021). Therefore, the Bayesian estimated model is given as under:

$$Y_t \sim N + \beta^T X_t,\ \delta^2 I. \tag{6}$$

Eq. (6) shows Y_t that represents poverty and inequality alleviation drawn from Gaussian distribution. In this equation X_t shows the matrix of predictors. Moreover, β^T shows the transposed weight matrix, in contrast, δ^2 shows the variance, and I represent the identity matrix.

The previous distributions represent the pre-existing details regarding parameters that are extracted from expert knowledge (Meirun et al., 2021). Therefore, the ordinary least square (OLS) model provides weak results. Consequently, it is highly suggested that the researchers should adopt the Bayesian GLM model with the assumption of normal distribution (Ngoc & Awan, 2022). The posterior distribution is estimated as under:

$$P(\beta / Y_t, X_t) = \frac{P\left(Y_t / \beta, X_t\right) * P\left(\beta / X_t\right)}{P\left(Y_t / X_t\right)}. \tag{7}$$

Eq. (7) shows $P\left(Y_t / \beta, X_t\right)$ that represents the likelihood of the data, it also shows $P\left(\beta / X_t\right)$ that represents prior probability data, and it also shows $P\left(Y_t / X_t\right)$ that represents the normalization constant. Moreover, the study has also used the adaptive random-walk Metropolis-Hasting's algorithm to avoid spurious convergence. It also verifies the effects of microfinancing, financial inclusion, inflation, educational loan, economic growth, and industrialization on poverty and inequality alleviation.

3. Research findings

The study used descriptives to study the variable properties thoroughly. Results from Table 2 implicate the PIEA average value was 3.43% followed by MFN 8.907%, FIN 8.823%, EDL 0.751%, EG 6.506%, inflation 5.947% and IND 6.947%.

In addition, the study also evaluated year-wise details of outlined constructs. The findings from Table 3 exposed that the highest PIEA was in 2020, while the largest MFN was in 1986, and the highest Fin was in 2020. The outcomes also unveiled that the largest EDL was recorded in 2020, the highest EG was in 1995, while the largest INF was in 2008, and the highest IND was in 2020.

Table 2. Descriptives

Variable	Obs	Mean	Std. Dev.	Min	Max
PIEA	35	3.438	0.232	3.019	3.822
MFN	35	8.907	1.994	5.194	12.14
FIN	35	8.823	0.425	8.177	9.911
EDL	35	0.751	0.255	0.345	1.174
EG	35	6.506	1.575	2.789	9.540
INF	35	5.947	4.508	–1.710	23.115
IND	35	6.947	0.597	5.897	7.935

Table 3. Descriptive statistics by years

	PIEA	MFN	FIN	EDL	EG	INF	IND
1986	3.019	12.140	8.177	0.345	2.789	5.651	5.897
1987	3.109	11.950	8.215	0.357	3.583	5.669	5.998
1988	3.116	11.760	8.253	0.369	5.135	5.686	6.287
1989	3.128	11.569	8.291	0.388	7.365	5.704	6.109
1990	3.138	11.379	8.329	0.398	5.101	5.721	6.083
1991	3.146	11.189	8.367	0.491	5.961	5.738	6.177
1992	3.198	10.999	8.405	0.478	8.646	5.756	6.388
1993	3.212	10.809	8.443	0.503	8.073	5.773	6.367
1994	3.235	10.619	8.481	0.528	8.839	5.791	6.425
1995	3.257	10.429	8.519	0.553	9.540	5.808	6.483
1996	3.280	10.238	8.557	0.577	9.340	5.675	6.541
1997	3.303	10.048	8.595	0.602	8.152	3.210	6.599
1998	3.325	9.858	8.633	0.627	5.764	7.266	6.657
1999	3.348	9.668	8.413	0.652	4.774	4.117	6.715
2000	3.370	9.478	8.635	0.677	6.787	–1.710	6.773
2001	3.393	9.288	8.817	0.702	6.193	–0.432	6.831
2002	3.415	9.097	8.850	0.727	6.321	3.831	6.889
2003	3.438	8.907	8.882	0.751	6.899	3.235	6.947
2004	3.461	8.717	8.914	0.776	7.536	7.755	7.006
2005	3.483	8.527	8.947	0.801	7.547	8.285	7.064
2006	3.506	8.337	9.091	0.826	6.978	7.418	7.122
2007	3.528	8.147	8.980	0.851	7.130	8.344	7.180
2008	3.551	8.497	9.016	0.876	5.662	23.115	7.238
2009	3.574	7.750	9.052	0.900	5.398	6.717	7.296
2010	3.596	6.699	9.088	0.925	6.423	9.207	7.354
2011	3.619	7.579	9.124	0.950	6.410	18.678	7.412
2012	3.641	7.971	9.591	0.975	5.500	9.095	7.470
2013	3.664	7.416	8.923	1.000	5.550	6.593	7.528
2014	3.686	6.864	9.448	1.025	6.420	4.085	7.586
2015	3.709	6.337	9.177	1.050	6.990	0.631	7.644
2016	3.732	5.616	9.106	1.074	6.690	2.668	7.703
2017	3.754	5.194	9.034	1.099	6.940	3.520	7.761
2018	3.777	5.726	8.963	1.124	7.200	3.540	7.819
2019	3.799	5.767	9.589	1.149	7.150	2.796	7.877
2020	3.822	7.187	9.911	1.174	2.940	3.221	7.935

Moreover, the paper scrutinized the correlation among constructs that also exposes the multicollinearity results. The findings from Table 4 exposed that microfinancing, FIN, EDL, INF and IND have a positive and significant linkage with the alleviation of poverty and inequality in Vietnam.

Furthermore, the study also checks the unit root of the variables that are necessary for the application of a suitable model using ADF and PP. Table 5 indicated that the PIEA, EG, INF, and IND have no unit at level, but MFN, FIN, and EDL have no unit root at first difference.

In addition, co-integration among the variables has also checked via (Westerlund & Edgerton, 2008) approach. The outcomes exposed that p-values <5% and t-value >1.96. These statistics are indicated co-integration exists. Table 6 shows these statistics.

The findings exposed that microfinancing, financial inclusion, educational loans, inflation, and industrialization have a negative linkage with the poverty headcount ratio and a positive and significant linkage with the alleviation of poverty and inequality in Vietnam in the short-run. Table 7 shows these associations.

Table 8 exposed that microfinancing, financial inclusion, educational loans, inflation, and industrialization are negatively correlated with the poverty headcount ratio and positive with alleviation of poverty and inequality in Vietnam in the long-run.

Table 4. Matrix of correlations

Variables	PIEA	MFN	FIN	EDL	EG	INF	IND
PIEA	1.000						
MFN	–0.976	1.000					
FIN	–0.916	–0.842	1.000				
EDL	–0.998	–0.976	0.916	1.000			
EG	–0.015	–0.056	–0.087	–0.023	1.000		
INF	–0.040	0.011	0.080	0.040	–0.062	1.000	
IND	–0.998	–0.974	0.914	0.996	–0.009	0.039	1.000

Table 5. Unit root test

	ADF		PP	
Series	Level	First difference	Level	First difference
PIEA	–5.093***	–	–4.664***	–
MFN	–	–5.479***	–	5.093***
FIN	–	–4.003***	–	–4.554***
EDL	–	–4.102***	–	–3.775***
EG	–3.966***	–	4.902***	–
INF	–4.664***	–	–4.443***	–
IND	–3.999***	–	–5.543***	–

Table 6. Co-integration test results

Model	No Shift		Mean Shift		Regime Shift	
	t-value	p-value	t-value	p-value	t-value	p-value
LM_{τ}	–5.199	0.00	–4.282	0.00	–5.097	0.00
LM_{φ}	–5.287	0.00	–4.557	0.00	–5.224	0.00

The findings exposed that microfinancing, financial inclusion, educational loans, inflation, and industrialization are negatively connected with poverty headcount ratio but share positive linkage with poverty and inequality in Vietnam. Moreover, the acceptance rate of 0.380 is higher optimal acceptance rate of 0.234, and the Monte Carlo chain standard errors (MCSE) are close to the decimal one. Therefore, Bayesian inference is valid. Table 9 shows these statistics.

Table 7. Short-run coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MFN)	–0.675	0.104	–6.490	0.000
D(FIN)	–0.984	0.341	–2.886	0.022
D(EDL)	–3.663	2.119	–4.273	0.011
D(EG)	–2.763	0.872	–3.169	0.014
D(INF)	–2.836	0.752	–3.771	0.006
D(IND)	–1.277	0.126	–10.135	0.000
CointEq(–1)*	–1.883	0.627	–3.003	0.017
R-sq	0.646	Mean dependent var		–0.050
Adjusted R-sq	0.641	S.D. dependent var		2.254

Table 8. Long-run coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MFN	–2.775	0.928	–2.990	0.019
FIN	–1.984	0.672	–2.952	0.021
EDL	–3.265	1.029	–3.173	0.017
EG	–2.901	1.011	–2.869	0.027
INF	–3.466	0.453	–7.651	0.000
IND	–4.891	1.882	–2.598	0.024
C	0.865	0.302	2.864	0.026

Table 9. Bayesian analysis results

Variables	Mean	Std. Dev.	MCSE	Prob. of mean > 0	Interval
MFN	–3.774	0.674	0.054	0.991	–1.432, –0.502
FIN	–5.938	0.223	0.022	0.929	–2.902, –1.741
EDL	–4.883	0.664	0.023	1	–1.332, –0.112
EG	–3.892	0.810	0.012	1	–3.265, –0.661
INF	–2.763	0.773	0.053	0.911	–2.025, –0.711
IND	–3.892	0.378	0.022	1	–0.176, –0.002
Intercept	–52.112	6.282	0.312	1	–1.338, –0.092
e.ME Sigma2	0.671	0.342	0.004		1.549, 3.666
					Acceptance rate = 0.380

4. Discussions

Findings display a positive connection between microfinancing and poverty and inequality alleviation. Hussain et al. (2019), in this regard, shared similar findings by stating that the purpose of microfinancing is to enable people with lower income levels and lower financial positions to raise their financial resources for initiating their careers. This gives a chance to poor persons to move ahead and overcome poverty by fixing their feet in the business world. These results also agree with (Mushtaq & Bruneau, 2019), which analyzes the microfinancing contribution to poverty alleviation. The study posits that microfinancing allows small businesses to expand their activities, improve their performance, and thereby enable them to compete successfully in the market. This improves the profits alleviating poverty and inequality because the change in financial resources can be overcome. Subramaniam et al. (2021) also shared similar thoughts that microfinancing enables women, lower-income household businesses, and small trading or manufacturing firms to grow. This creates employment for many individuals without discrimination and opportunities to earn a livelihood. So, microfinancing reduces poverty and inequality in the country.

The study results showed that FIN and poverty and inequality alleviation are linked positively. Cepparulo et al. (2017) shared the similar evidences and stated that financial inclusion assures the availability of opportunities for individual persons and firms to have access to financial facilities like savings, credits, transfer of money, payments, and insurance. Access to these facilities enables individuals and firms to participate in some contracts, make easy transactions, expand business activities, and raise marketing. As a result of increasing financial strength, poverty can be overcome, and inequality based on the change in incomes can be reduced. These results also agree with Erlando et al. (2020), which shows that financial inclusion helps to promote the businesses which provide a source of employment to the public. The employment opportunities to people enable them to raise their incomes, meet their basic needs of food, clothes, and shelter, and facilitate their lives by improving their living standards. Hence, financial inclusion allays poverty and reduces inequality between poor and rich. Neaime and Gaysset (2018) also shared similar thoughts by highlighting that when financial services like savings, credits, transfer of money, payments, and insurance are made accessible to each and every one in society, they can overcome financial distress and climb the stairs to success. So, it is a key solution to poverty and inequality.

The study results showed that education loan has a positive link with poverty and inequality alleviation. Brown and James (2020) produced similar evidences and argued that in society, because of the distinction in income level and financial status, education facilities may not be equally available to adolescents. When the banks provide special education loans, the individual, whether they belong to a lower social class, can have the ability to attain education and prepare themselves for professional life. So, the education loan removes inequality and mitigates poverty. These results also agree with Kling et al. (2022). The education loan gives an opportunity to adolescents to gain education despite their lower financial position in society. By gaining an education, these adolescents can make economic progress and can meet the basic needs of life and facilitate their lives. In this way, education loan is an instrument to fight against poverty and inequality. In the similar context, Hassan et al. (2020) proclaimed

that the countries where financial firms provide loans to students to continue their education, the individuals, without any discrimination, complete their education and reduce poverty.

The study results showed that EG and poverty and inequality alleviation are linked positively. Abduvaliev and Bustillo (2020) shared the similar evidences and posited that when a country's economy is high it means different industries like construction, mining, manufacturing, and tourism are trying to expand their business. With the expansion in businesses, a greater number of workers are required so that they can carry the economic activities. The increasing employment level helps individuals to overcome financial problems. Thus, there is a reduction in poverty. In the similar lieu, Francis and Webster (2019) also highlighted that the increase in economic growth enhances the number of products and services. The increased supply results in reduced prices, and people from lower income classes can afford to meet basic needs. Hence, economic growth helps overcome poverty and inequality.

The study results showed that inflation has a positive link with poverty and inequality alleviation., hence, consistent with Michálek and Výbošťok (2019). During inflation, the government starts infrastructure development, energy generation, social development and economic programs. When there is work on these programs, it creates jobs for people having different professional abilities. The rise in employment level brings prosperity to their family, raising the incomes and ability to meet the needs of life. Therefore, inflation plays a significant role in poverty and inequality alleviation. These results also agree with Sehrawat and Giri (2018), which posits that inflation brings expansion in the economy. It raises the level of income production and processing of goods and services, which are linked to human needs. The easy availability of goods and services at low prices is helpful in meeting the needs and improving the living standard of people. Hence, inflation overcomes inequality in society and mitigates poverty. Prasetyo and Kistanti (2020) shared the similar evidences and stated that in the case of inflation, the social sectors also grow. They implement effective strategies in order to improve social prosperity and create peace in the community. The social development initiatives result in the mitigation of poverty and inequality.

The study results showed that industrialization has a positive link with poverty and inequality alleviation, hence confirm Charlier and Legendre (2021) study. This study highlights that when the government and economists work for the acceleration of industrialization, the people in remote areas no more need to rely on the traditional ways of earning. They can have better and more profitable sources to acquire livelihood. It will enable them to fulfil their needs in a better way and overcome their poverty. These results also agree with Khan et al. (2022), which explains that increasing industrialization reduces inequality among people of different regions. It assures the availability of modern facilities of life like transportation, electric appliance, household technologies, better residence, education, and financial services even in rural or remote areas. So, it assists in removing poverty. These results are in line with the past study of Riggirozzi (2020), which checks the impacts of industrialization on poverty and inequality alleviation. The study posits that the increasing industrialization enhances the professional awareness of people, even in remote areas and helps develop professional better skills. Consequently, when these people perform efficiently in their professional lives, they can have success, earn well, overcome financial issues, and reduce poverty. Thus, industrialization is useful for alleviating poverty and inequality.

There is a large literature about poverty and inequality alleviation, and some studies have not addressed the influences of microfinancing, financial inclusion, education loan, economic growth, industrialization, and inflation on poverty and inequality alleviation simultaneously. The current study removes this gap and makes a simultaneous analysis of the role of outlined predictors in poverty and inequality alleviation. The study is a distinctive one in literature, for it analyzes the relationship of these factors with poverty and inequality alleviation in Vietnam for the first time.

The current study has great significance to developing economies like Vietnam, where the citizen has to face issues like poor living standard and injustice in society. The current study addresses poverty and inequality as well as talks about the ways how people of a country can get rid of poverty and inequality. This study provides guidelines to policymakers and regulators on how to alleviate poverty and inequality. The study suggests that government and financial institutions must encourage microfinancing to support lower-income people so poverty and inequality can be alleviated. The study also guides the economists and management of financial institutions to promote financial inclusion in order to mitigate poverty and inequality. It also conveys that such financial policies must be designed as education loans are preferred to be granted to students for continuity in education so that poverty and inequality can be alleviated. Economists, along with government support, must struggle to improve EG in order to reduce poverty and remove inequality. These findings help policymakers in developing policies related to poverty and inequality alleviation using microfinancing, financial inclusion, and educational loans. The government must formulate policies to maintain inflationary if needed to reduce the poverty level and overcome inequality. Moreover, policymakers must struggle to spread industrialization to mitigate poverty and inequality.

Conclusions

The paper aimed to check the effectiveness of microfinancing, FIN, and an education loan in poverty and inequality alleviation. A quantitative survey was conducted in Vietnam to acquire information on micro-financing, financial inclusion, education loan, economic growth, industrialization, and inflation and poverty and inequality alleviation. The authors found that microfinancing, financial inclusion, education loan, economic growth, industrialization, and inflation have a positive link with poverty and inequality alleviation. The study revealed that through microfinancing, financial institutions provide financial resources to lower-income individuals both and women so that they can carry small businesses and can get rid of their financial problems. Hence, it can be useful in reducing poverty and inequality alleviation. The results showed that when in area financial institutions implement financial inclusion, individuals and small firms can expand their business and raise transactions. Thus, the increased earnings reduce poverty and inequality within the country. The results indicated that the education loans provide equal opportunity to adolescents living in a country to gain an education. By removing financial issues, creating the ability to earn money in future, and giving equal education chances, education loans reduce poverty and inequality. The results exposed that high economic growth enhances equal employment opportunities and promotes all areas equally. Hence, it helps reduce poverty and inequality. The study also concluded

that the increase in the industrialization level enhances employment, professional skills and abilities, giving a source of earnings without discrimination among people. It leads to poverty and inequality alleviation.

Policy implications

The results are quite significant for practitioners and policy makers. The findings indicate that with the rise of microfinance activities, countries could use it as an effective tool to minimize inequality among citizens. As microfinance emphasizes on poor and those people who are financially excluded, thus, it offers financial opportunities to these people to take initiatives to generate income-generating sources which eventually increases their household income. Most of the microfinance institutions facilitate with so-called step loans which are normally called small but growing loans. These loans are provided to poor-income people to unleash their productive potential. With time, the very same micro entrepreneurs might need large credits in order to grow their small businesses. If assume that all of the income level are equal, these micro entrepreneurs get higher credits and they are able to utilized auxiliary microfinance services that are helpful to provide nutrition to businesses. Such kind of investments also have the ability to generate higher revenue due to learning behavior and high productivity levels. Although few transmissions and their mechanism are purely "economic–productive private investment of the poor" when it comes to gauge an effect of microfinance on inequality and poverty. However, others are operated with the support of changes that occur in health and education which is more effective as it provides lustful impact on inequality and poverty alleviation over time.

Moreover, government of Vietnam should also focus on poor and residents of rural areas. The success of financial inclusion development, poverty reduction and income inequality rely on financial improvement of rural areas. There people are not banked because they find it not useful due to lack of education. Hence, making it convenient for people through teaching where it is taught that how basic services should be used. This helps in improving literacy rate and increases financial penetration which is the first step to support them.

We all agree on this fact that Poverty is one of the biggest issues of developing economies. In this regard, MFIs are viewed as a legitimate tool to fight against poverty. Institutions offer financial services to those who do not have access to banks. Findings articulate that microfinance is a bigger player to fight against poverty. Micro-finance services might offer help in a way that it ensures the amount that is received in the form of loan to the people who use it for intended purpose. If the loan is utilized well then living standard of people might improve. The earned total income might also get increase when consumer who receive loan from institution starts income generating units in the form of business. Micro-credit also helps as it provides financial access to low-income and less educated people. Even it is also useful for people who belong to informal sector. Microfinance institutions are helps in business expansion, acquiring better residential places, access to quality education etc. This indicates that people can have higher savings though higher amount of loans. The reason is that it might improve their living standards which reduces the bracket of poor-income people.

Limitations and future directions

The current study has several limitations. As the paper examined only microfinancing, financial inclusion, education loan, economic growth, industrialization, and inflation and their effectiveness on poverty and inequality alleviation. There are other significant predictors as well which holds equal importance. The study is limited because of the absence of these essential factors. Future authors are recommended to enhance the study scope by analyzing more factors which can be useful in poverty and inequality alleviation. Moreover, the evidence from a single economy within limited cannot be enough to provide results valid equally to all countries. For higher generalizability, authors must conduct a survey of multiple countries and acquire data. The future authors must collect data for an extended period to add to the validity of the result.

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Data availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The author declare that they have no competing interests.

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