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ORIGINAL ARTICLE

The private sector and multidimensional poverty reduction in Vietnam: A cross-province panel data analysis

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Abstract

This study examines the role of private sector development (PSD) in multidimensional poverty alleviation in Vietnam, using provincial panel data for the 2010–2019 period. PSD is measured as the proportion of the workforce in (i) all private firms, (ii) domestic private firms, and (iii) multinational firms, respectively. We use a two-step general method of moment estimator to account for unobservable heterogeneity, simultaneity, and the relationship between current provincial characteristics and past provincial poverty. We find that each percentage point increase in private sector employment contributes to a reduction of 0.30% and 0.31% in multidimensional poverty and monetary poverty, respectively. Notably, further analysis confirms that a similar effect is also found for both domestic private and multinational enterprises. In addition, our study finds that economic growth and educational attainment emerge as major factors mitigating multidimensional and unidimensional poverty, while income inequality increases both poverty measures.

KEYWORDS

economic growth, macro regression, multidimensional poverty, poverty reduction, private sector development

INTRODUCTION

Considered a country that has achieved great success in combating poverty, Vietnam has seen its monetary poverty rate decrease from 15.50% (2005) to 5.80% (2016). Beginning in 2016, multidimensional poverty has been calculated according to Decision 59/2015/QD-TTG and includes income criteria, access to social services, and the supply of basic needs. Multidimensional poverty also has decreased from 9.20% (2016) to 5.70% (2019) and is especially low in urban areas (only 1.20% in 2019) (General Statistical Office [GSO], 2020a). In addition, satisfaction of the six basic human needs—health, education, housing, clean water and sanitation, and information—has

Abbreviations: 2SLS, two-stage least squares; DPEs, domestic private enterprises; FDI, foreign direct investment; GMM, general method of moment; GRDP, low- gross regional domestic product; GSO, General Statistical Office of Vietnam; IFC, International Finance Corporation; IV, Instrumental variables; MNEs, multinational enterprises; MOLISA, Ministry of Labor, Invalids and Social Affairs; MPI, Ministry of Planning and Investment; OECD, Organization for Economic and Co-operation Development; OLS, ordinary least squares; PAPI, provincial governance and public administration performance index; PCI, Provincial Competitive Index; PSD, private sector development; ROA, return on assets; SMEs, small and medium-sized enterprises; SOEs, state-owned enterprises; UNCTAD, United Nations Conference on Trade and Development; USAID, US Agency for International Development; VCCI, Vietnam Chamber of Commerce and Industry; VHLSS, Vietnam Household Living Standard Survey; WB, World Bank; WTO, World Trade Organization.

improved steadily. In 2019, the percentage of the population with access to hygienic water, electricity, and literacy was about 96%, 99%, and over 98%, respectively. Almost seven tenths of the population are able to make use of internet services. The average Vietnamese life expectancy is now 75.40 and the average number of years of schooling has increased from 7.45 (2012) to 9.00 (2019) (World Bank [WB], 2020).

In addition to the government's poverty reduction programs and policies, such as human capital enhancement, work skills training, micro-financial support, and community health improvement, it is important to determine and implement economic processes that contribute to poverty alleviation. The resulting mechanism stimulates the economy while assisting in the allocation of resources to the needy (the "economic pie" is bigger and more evenly distributed). One approach is private sector development (PSD) in countries in transition. It is well established that PSD not only increases employment opportunities and improves people's living standards (Hipsher, 2013; International Finance Corporation (IFC), 2013) but it also improves the welfare of the poor in other ways, such as diversifying goods and services at a lower cost, improving the quality of public goods and services (through increased tax revenue), and so on (Deaton, 2013; Jenkins, 2005; Organization for Economic and Co-operation Development [OECD], 2007a; Raworth et al., 2008).

Vietnam was one of the first countries in the Asia Pacific area to adopt the multidimensional poverty (MDP) approach to poverty eradication in all its forms. The country's official MDP metrics include not only income but also non-monetary factors, such as housing, access to water and sanitation, education and health facilities, and social and health insurance (Ministry of Labor, Invalids and Social Affairs [MOLISA], 2018) (see more in Appendix 1). While a few recent studies have examined the role of the private sector in monetary poverty reduction (e.g., income or consumption poverty) in Vietnam (e.g., Giang et al., 2016; Jaax, 2020), no similar research has been conducted on multidimensional poverty thus far. Gaining insight into the role of the private sector in multidimensional poverty reduction is crucial for both academics and policy makers. This research aims to fill this knowledge gap in the literature. Specifically, the main focus of the study is to investigate the effect of PSD on changes in multidimensional poverty across Vietnam's provinces from 2010 to 2019. Following Jaax (2020), PSD is defined as the proportion of the workforce in (i) all private firms, (ii) domestic private firms, and (iii) multinational firms, respectively.

Our study has two contributions. *First*, it provides fresh evidence of the role of the private sector in reducing multidimensional poverty in a transitional country. Vietnam is an interesting case study because it switched from a planned economy to a market economy, with two noteworthy features: (i) the existence of large state-owned corporations (such as Vinashin) that inhibit PSD; and (ii) the country's rapid growth in all areas, especially the private sector, favorable to monetary and multidimensional poverty reduction. *Secondly*, using provincial panel data for 2010–2019, combined with a two-step general method of moment (GMM) estimator, the approach allows us to account for unobservable heterogeneity, simultaneity, and the relationship between current provincial characteristics and past provincial poverty (Blundell & Bond, 1998; Wintoki et al., 2012).

We find that each percentage point increase in private sector employment contributes to a reduction of 0.30% and 0.31% in multidimensional poverty and monetary poverty, respectively. Notably, further analysis confirms that a similar effect is found for both the domestic private and foreign direct investment (FDI) sectors. In addition, our study finds that economic growth, population size, and educational attainment emerge as major factors lowering multidimensional and monetary poverty, while inequality increases both poverty measures. Vietnam's domestic private sector employs over 70% of the labor force and has a faster growth rate than the public sector (Ministry of Planning and Investment [MPI], 2020). The multinational sector, which employs over 19.70% has much superior ROA (return on assets) and velocity metrics (when compared to state-owned enterprises) (MPI, 2020). Combined, these findings suggest that policies encouraging PSD not only contribute to growth but also promote the progress of poverty alleviation in Vietnam.

The remaining part of the paper is structured as follows. The next section gives the country's context and literature, followed by an account of the data and econometric methods in Section 3. Section 4 reports empirical results and discussion, while Section 5 concludes with some policy implications.

COUNTRY CONTEXT AND RELATED LITERATURE

The nexus between the private sector and poverty alleviation

Sustainable poverty alleviation frequently has two conditions: optimal economic wealth and equitable distribution (De Silva & Sumarto, 2014; Shorrocks & Van der Hoeven, 2004). Without question, PSD boosts the economy, particularly in transitional countries, but its allocation is contentious (Buiter, 2004; Fields & Pfeffermann, 2003). According to the Organization for Economic and Co-operation Development [OECD] (2007b), the private

sector is a critical component in alleviating poverty and strengthening economic foundations.

The private sector assists the poor in a multitude of ways. First, it is the biggest job creator in most countries (Berrios & Pilgrim, 2013; IFC, 2013). It typically includes most small and medium-sized companies (SMEs), which play a key role in job generation, accounting for two-thirds of all formal jobs in developing nations and up to 80% in low-income countries (Berrios & Pilgrim, 2013). Secondly, the fair creative competition provided by private firms benefits the economy (and the poor) by reducing prices, increasing quality, and diversifying market products, all of which raise living standards (Deaton, 2013). Thirdly, the development of multinational businesses has spillover benefits for workers in the host country through training programs for unskilled workers and the promotion of job opportunities (OECD, 2007b). Furthermore, the growth of the private sector makes critical goods and services (such as clean water, the internet, and food systems) more affordable for the poor (OECD, 2007b).

On the micro level, on the one hand, the role of the private sector in poverty reduction via job generation is obvious (Villanger & Berge, 2015). Moving from unemployment to employment may result in an income that lifts a person out of poverty. On the macro level, the benefits of such employment are apparent in the mere fact that a large proportion of the workforce in more developed countries with less poverty is engaged in salaried employment, mostly in private enterprises (Villanger & Berge, 2015). In several countries in Asia (Hipsher, 2013), sub-Saharan Africa (Yahie, 2000), and some developed countries (Altenburg, 2000), a great deal of empirical evidence consistently confirms the positive role of the private sector in job generation and poverty alleviation.

On the other hand, some argue that PSD may not necessarily help reduce poverty in developing countries because the number of private enterprises in these economies is tiny, such enterprises are extremely small, produce few jobs, and pay poor salaries in comparison to self-employment or employment in other industries (Aspen Network of Development Entrepreneurs [ANDE], 2012). Furthermore, the expansion of private firms does not always mean the creation of jobs or a decline in poverty. Fierce competition among big corporations, particularly international corporations, can generate problems, even insolvency, for local small and medium-sized businesses (SMEs), as well as unemployment and poverty for the local population (Gardiner, 2002). Economic shocks from the global economy mediated through companies can have a negative influence on households (Easterly & Kraay, 2000; Winters et al., 2004). As a result, the effect of private sector expansion on incomes and poverty alleviation remains uncertain.

Some argue that the dominance of the private sector would increase unequal distribution, especially in the long run (Chao et al., 2016), and this in turn has been a major barrier to poverty alleviation under capitalism (Piketty, 2018). Some demand that the government intervene in the market to balance resource allocation and promote poverty reduction (Lakey, 2016). In Vietnam, however, two points should be noted. First, Vietnam is a transitional country with intensive government interventions, which suggests that the government aims for a balance between state power and market forces (Acemoglu & Robinson, 2019). And second, as Nguyen and Pham (2018) point out in regard to Vietnam's success in poverty reduction, about 44% of this achievement derives from redistribution.

Jaax (2020) recently discussed the relationship between PSD and poverty reduction in Vietnam, maintaining that it is based on three mechanisms: increasing jobs, improving economic efficiency by accelerating the equitization enterprises, and fair creative competition in the State capitalism (Vietnam). He argues that (i) a decline in state-owned enterprises (SOEs) without private enterprise backup will not contribute to poverty mitigation, and (ii) that the expansion of domestic private and multinational enterprises will contribute to improving the well-being of the poor (Baccini et al., 2019; Becheikh et al., 2006; Jenkins, 2005; McCaig, 2011; McCaig & Pavcnik, 2013; OECD, 2007a; Phan & Coxhead, 2013).

Private sector development in Vietnam

At the 6th Party Congress in 1986, the Doi Moi reform policy was formally introduced in Vietnam, a country that had adopted a planned economy for many years. The private sector was legally recognized as part of the establishment of a socialist-oriented multisector market economy under the Doi Moi program. The most immediate consequence of this official acknowledgment was the rapid expansion of household businesses. Specifically, there were 333,300 registered household enterprises throughout the country in 1989 before the Sole Proprietorship Law and the Company Law were formally enacted in 1990 (Schaumburg-Müller, 2005). In 1991, following the introduction of the former, the first private enterprises were founded. However, setting up a private firm at that time was both cumbersome and prohibitively expensive. By 1999, only 14,500 private companies were founded in the nine years following the implementation of the new regulations (Bihn, 2018).

The adoption of the Enterprise Law in 2000 fueled a surge in the number and scale of private enterprises. It loosened market entrance restrictions and conditions. The Enterprise Law and Investment Law were amended

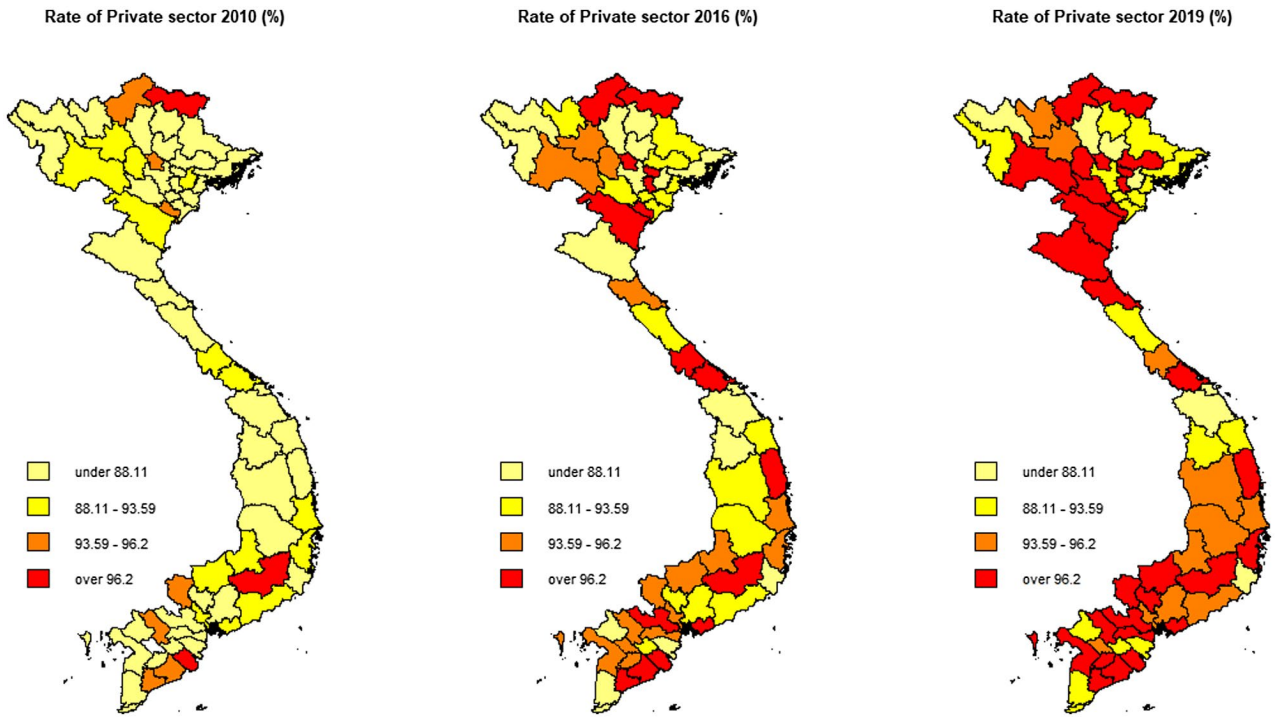

FIGURE 1 Map of Vietnam's private sector development from 2010 to 2019. *Source:* Author's calculation

in 2004, establishing a common legal framework for private, state-owned, and international enterprises, and were further modified in 2014. In particular, as specified in Resolution No. 5 of the Party's XII Congress in 2017, the private sector was officially recognized as the driving force and a crucial pillar of the national economy, and private large-scale businesses were especially encouraged. Since then, the number of companies has grown at an astonishing rate. More than one million private enterprises had been registered by the end of 2017, which increased the number of enterprises to 10 per 1000 people (Bihn, 2018).

The private sector in Vietnam was enlarged with the participation of foreign enterprises when the first Law on International Investment was passed in 1987. Notably, international trade activity increased when the country joined the World Trade Organization (WTO) in 2007. At the same time, the net inflow of FDI nearly quadrupled, from $2.4 billion in 2006 to $9.58 billion in 2008 (WB, 2020). Some of Vietnam's policy changes between 2010 and 2019 have boosted business opportunities and lowered transaction costs.[1] In 2020, Vietnam was listed as one of the top 20 nations in the world in attracting the most FDI inflows (United Nations Conference on Trade and Development [UNCTAD], 2021). For over three decades, the private sector has been a key contributor to economic growth. The size of the economy's GDP has tripled, transforming the nation from one of the poorest in the world into a lower-middle income country by 2010 (WB, 2013). In 2016, the domestic private sector accounted for 38.60% of GDP (formally registered enterprises account for 8.20%, while household businesses account for 30.43%), and FDI accounted for 18.95% of GDP (Bihn, 2018; GSO, 2018).

Measures of the private sector in Vietnam

As defined by Jaax (2020), PSD in this study is represented by the index π, which is the ratio of the total labor of domestic private enterprises (DPE) and multinational enterprises (MNE) over the total labor of enterprises.

$$\pi = \frac{\text{DPE labor} + \text{MNE labor}}{\text{enterprise labor}}$$

The changes in π in the 2010–2019 period are given in Figure 1, which shows that the percentage of workers in the private sector has consistently increased over this period (from 84% to 94%), although the figure varies greatly across provinces.

Two essential measures for evaluating the efficiency of the use of enterprise resources are return on assets (ROA)

[1]For example, the Land Law of 2013 reduced the risks involved in land acquisition for FDI firms, and informal payment costs have nearly halved from 2010 to 2019 (Vietnam Chamber of Commerce and Industry [VCCI]& US. Agency for International Development [USAID], 2019).

and firm velocity. As a result, while DPEs have a low return on assets, their velocity from 2010 to 2018 was high (0.7–1) when compared with the state sector (0.3–0.4) (MPI, 2020). The multinational enterprises/foreign sector outperformed the state sector in profitability and velocity per dollar, demonstrating the private sector's competitiveness and efficiency in resource management (Table 1).

Poverty status

Unidimensional poverty, applying income or consumption measures, has been used for nearly 30 years in Vietnam, while the category of multidimensional poverty was only formally adopted in 2016, according to Decision No. 59/2015/QD-TTG. This measure is based on two main criteria: (i) household income and (ii) the supply of basic human needs in society (including ten indicators), such as health, education, housing, water, sanitation, and information. Over the last three decades, Vietnam has made remarkable progress in poverty eradication, with the poverty rate (measured in consumption expenditure) falling from 57% in the early 1990s to only 9.80% in 2016 (MOLISA, 2018) and 6.80% in 2018 (GSO, 2018). The multidimensional poverty rate also declined, from 18.10% in 2012 to 10.90% in 2016 (MOLISA, 2018) and 5.30% in 2019 (GSO, 2020a). Moreover, low- gross regional domestic product (GRDP) provinces seem to be reducing multidimensional poverty rates more rapidly, reflecting Vietnam's progress in steadily raising the living standards of poor households (Figure 2).

TABLE 1 Return on assets (ROA) and velocity of Vietnam's *enterprises*

	2011–2015	2017	2018
Velocity			
Average	0.70	0.70	0.60
SOEs (state owned enterprises)	0.50	0.30	0.40
DPEs (domestic private enterprises)	0.70	0.70	0.70
MNEs (multinational enterprises)	1.10	1.00	1.00
ROA			
On average	2.60	2.90	2.40
SOEs	3.00	2.20	2.00
DPEs	1.20	1.80	1.60
MNEs	5.80	7.00	5.80

Source: Ministry of Planning and Investment [MPI], 2020.

While securing impressive achievements in poverty alleviation regardless of the measure in use, Vietnam still faces numerous challenges in raising the living standards of the population, especially in non-monetary areas, and for ethnic minorities. The ethnic minority population's income was equal to 68% that of the Kinh in 2004, but by 2016 it had dropped to 52%, a fall of 16% (MOLISA, 2018). A recent report by Tran et al. (2022) revealed that ethnic minorities suffer from significantly greater levels of deprivation in a variety of areas, including adult education, home size and quality, access to sanitary latrines and clean water, communication services, and access to information networks. Between

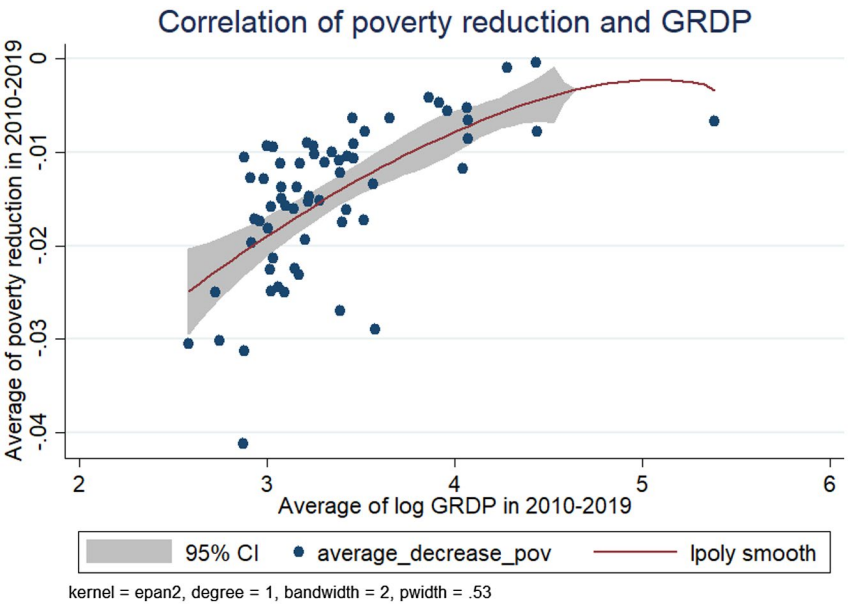

FIGURE 2 Correlation between multidimensional poverty rate and GDP scale in Vietnam's provinces and cities from 2010 to 2019.
Source: Author's calculation

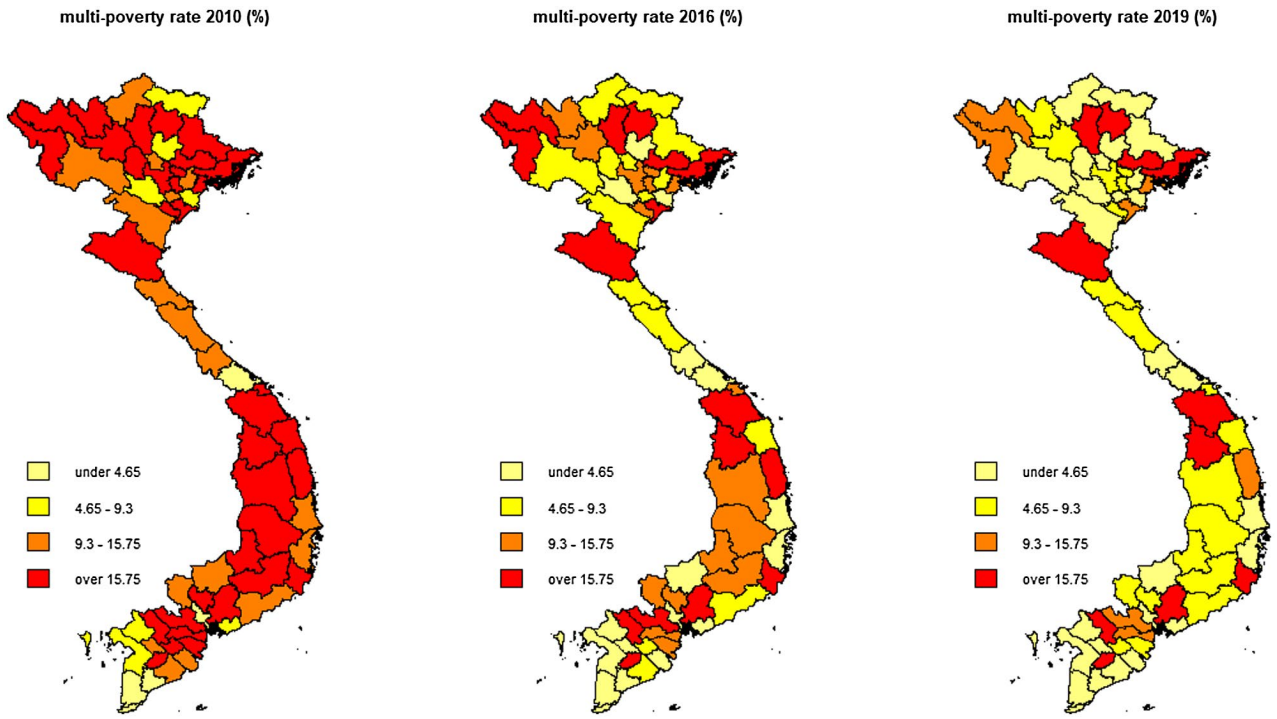

FIGURE 3 Vietnam's multidimensional poverty rate from 2010 to 2019. *Source:* Authors' calculation.

2016 and 2018 in rural Vietnam, for instance, ethnic minority households experienced deprivation in adult education (26.80%), housing quality (12.10%), housing area (18.10%), clean water (22.30%), hygienic latrines (46.50%), communication services (11.60%) and the means for accessing information (8.50%). However, the corresponding figures were only 10.90%, 5.80%, 6.10%, 1.40%, 11.90%, 3.30% and 1.20% for the Kinh/Hoa (majority) population (Tran et al., 2022).

Moreover, the multidimensional poverty rate varies greatly across provinces, with the highest figures for those in the Northwest, Central Highlands, and Mekong River Delta regions (GSO, 2020a; Tran et al., 2022). Furthermore, the probability of falling into poverty in Vietnam has become worse due to the impact of environmental and economic shocks, and the consequences of Covid-19 (Bui et al., 2014; Ho et al., 2021; Sumner et al., 2020; Tran et al., 2020).

Using provincial level data, Figures 3 and 4 illustrate simply the correlation between PSD and multidimensional poverty. Figure 3 shows the change in multidimensional poverty in Vietnam from 2010 to 2019, while Figure 4 shows its trajectory after removing the effect of PSD. Figure 4 is generated by overlapping Figures 2 and 3, using the formula:

$$\sigma = \frac{\mu_1 - \min_1}{\max_1 - \min_1} - \frac{\mu_2 - \min_2}{\max_2 - \min_2}$$

where, μ_1 and μ_2 indicate the multidimensional poverty rate[2] and private enterprise rate (π). The slower rate of progress seen in Figure 4 (compared to Figure 3) demonstrates intuitively the correlation between PSD and multidimensional poverty reduction in Vietnam at the provincial level.

In a nutshell, this paper discusses poverty alleviation in Vietnam: (i) through PSD (Jaax, 2020), emphasizing the necessity of the equitization process (Le et al., 2014); (ii) through economic growth (Ashley, 2008; Nguyen & Pham, 2018) and income equality (Adams, 2004), and (iii) through education and other related factors (Arouri et al., 2017; Do et al., 2021). To the best of our knowledge, our study is notable as the first to examine the role of PSD in multidimensional poverty alleviation across Vietnamese provinces.

METHODOLOGY AND DATA

Data

Our study utilizes provincial data collected for 63 provinces from various sources from 2010–2019. First, the data on poverty and natural and socio-economic characteristics are taken from the Provincial Statistical Yearbook

[2]Multidimensional poverty in 2010—data are estimated, based on the rate of monetary poverty reduction.

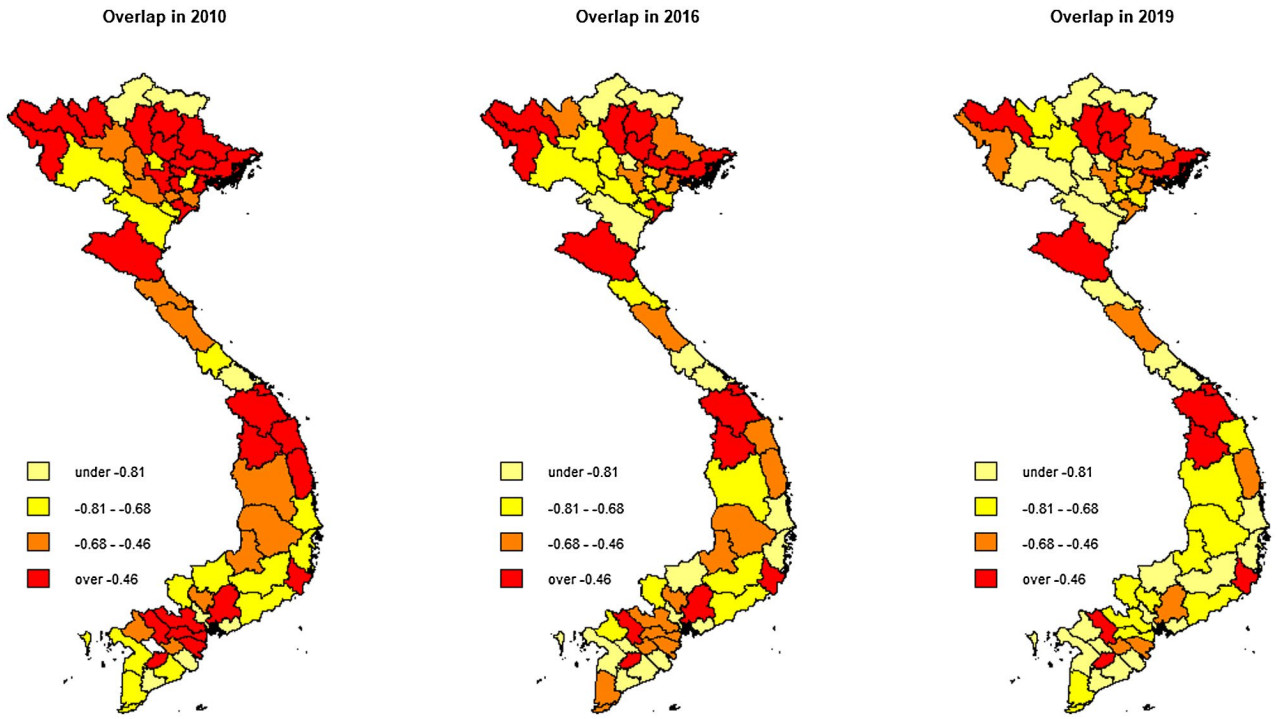

FIGURE 4 The overlap between Figures 2 and 3. *Source:* Author's calculation

(GSO, 2020b). Second, we use data from the provincial governance and public administration performance index (PAPI) (see in Appendix 2), which measures the quality of provincial public governance. Finally, we calculate the income inequality index (measured by the Gini coefficient) for each province using the Vietnam Household Living Standard Surveys (VHLSS) in 2010, 2012, 2014, 2016, and 2018. These datasets are then merged to generate a balanced provincial dataset. The definition and measurement of included variables and their descriptive statistics are given in Tables 2 and 3, respectively.

Econometric models

Examining the link between PSD and poverty reduction can be done using both micro and macro regressions. The term 'micro' refers to an analysis in which the unit of analysis is an individual or household, while 'macro' is used where the unit of analysis is a subgroup, such as a district, province, region, or country (Alkire et al., 2015). Research by Schmitz et al. (2015), cited by Jaax (2020), asserts that Vietnam's provinces have adopted markedly independent policies and function as "laboratories" or "local citadels". According to this argument, PSD and poverty reduction in these provinces are also relatively independent. Accordingly, our study uses a macro regression approach to investigate not only how the private sector influences poverty levels or change across provinces over time but also applies several other macro variables, such as average income, income inequality, land, urbanization, literacy, institutional quality, and so on.

$$Y_{it} = \beta_0 + \beta_1 . \pi_{it} + \sum_{k=1}^{K} \beta_k Z_{ikt} + \delta_i + \lambda t + u_{it} \qquad (1)$$

where, Y_{it} is the monetary poverty and multidimensional poverty rate, in province i in year t. π_{it} represents the variable of interest, which is measured by the percentage of the workforce employed by domestic private firms, multinational firms and firms of both types. Z_{ikt} is a vector of control variables selected in accordance with previous studies, as shown in Table 2. δ_i denotes invariant unobservable variables, and u_{it} is the error term.

Econometrically, our regression model, as given in Equation (1), is likely to suffer from two sources of econometric endogeneity (Wintoki et al., 2012). *First*, simultaneity, whereby provinces with high poverty rates may attract fewer private enterprises, leading to sluggish economic growth and exacerbating poverty. Also, some provincial authorities may promote the development of the private sector in any period with a view towards obtaining a particular level of poverty reduction in that period. While outcomes may be determined by the development of the private sector, the reverse will also be true—the private sector will be affected by poverty levels. In this case, the private sector and poverty levels

TABLE 2 Variables, expectations, and their sources

Variables	Definition and measurement	Expected sign	Source
Dependent variables			
Monetary poverty rate	Decision 59/2015/QD-TTg		General Statistics Office
Multidimensional poverty rate[a]	Decision 09/2011/QĐ-TTg		General Statistics Office
Independent variables			
Variable of interest			
π, private enterprise rate	Estimation according to Jaax (2020)	–	General Statistics Office
Control variables			
GDP per capita	In general, growth in GRDP/GRDP per capita promotes monetary/multidimensional poverty alleviation (Adams, 2004; Nguyen & Pham, 2018)	–	General Statistics Office
Gini	Measuring income inequality among households within a province. Income inequality limits poverty reduction (Adams, 2004)	+	Authors' calculation using the VHLSS data
Literacy	Literacy rate (Jaax, 2020)	–	General Statistics Office
FDI inflows	FDI inflows can promote the wealth of workers and be seen as an anti-poverty strategy in Vietnam (McLaren & Yoo, 2017)	∓	General Statistics Office
Agricultural and forestry land	Measured by the total land area for agroforestry. An increase in agroforestry land contributes to the alleviation of poverty (Nguyen & Pham, 2018)	–	General Statistics Office
Urbanization rate	The ratio of people living in rural and urban areas (Jaax, 2020)	∓	General Statistics Office
PAPI	Measuring the quality of state governance from the citizen's perspective (research proposed). Better provincial governance reduces poverty (Nguyen, Giang, et al., 2021)	–	PAPI Vietnam
Rainfall	Weather control—Nguyen (2021) argues that extreme rainfall will increase the migration of the poor in Vietnam, especially those working in agricultural areas vulnerable to climate change	∓	General Statistics Office
Population	The study aims to assess which provinces (small or large) benefit more from private sector development	∓	General Statistics Office
Time-trend (t)	Unobserved factors that affect poverty alleviation and that change over time	–	Dummy variable
δ_i	Controlling for unobservable invariant factors, e.g., distance to major centers (Hanoi, HCM), seaport location, distance to latitude 17 and variables suggested by Jaax (2020), such as the density of bombing experienced by a province, migration rate before the study period, etc	∓	Calculation from fixed-effect model

[a]Multidimensional poverty is measured by five basic social services: health care, education, housing, clean water and sanitation, and information accessibility; and by ten indicators for measuring level of deprivation: (1) Adult education; (2) Child school attendance; (3) Accessibility to health care services; (4) Health insurance; (5) Housing quality; (6) Housing area per capita; (7) Drinking water supply; (8) Type of toilet/latrine; (9) Use of telecommunication services; (10) Means for information access (GSO, 2018, p. 531).

Source: Authors.

TABLE 3 Descriptive data

		2010		2016		2019	
	Unit	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Multidimensional poverty rate	[0, 1]	0.219	0.160	0.129	0.120	0.085	0.090
Monetary poverty rate	[0, 1]	0.167	0.110	0.079	0.060	–	–
Private sector rate	[0, 1]	0.839	0.110	0.910	0.080	0.937	0.070
Domestic private enterprise rate	[0, 1]	0.696	0.170	0.690	0.190	0.692	0.210
Multidimensional enterprise rate	[0, 1]	0.143	0.160	0.220	0.210	0.245	0.220
GRDP per capita	Dong (million)	25.019	25.880	37.877	30.850	45.699	31.440
Literacy	[0, 1]	0.916	0.080	0.932	0.070	0.937	0.070
FDI implemented	USD (million)	203.444	494.230	236.540	435.680	247.601	438.930
Agricultural land	Hectares (thousand)	182.498	145.170	182.498	145.170	182.498	145.170
Urbanization rate	[0, 1]	0.254	0.160	0.287	0.180	0.297	0.180
PAPI index		–	–	35.988	1.650	36.600	1.230
Population	Thousand persons	1381.813	1179.330	1465.638	1354.860	1516.229	1444.240
PCI index		58.100	4.870	58.887	2.930	65.663	2.600
Region	Dummy variables	4.349	2.040	4.349	2.040	4.349	2.040
Rainfall	mm	1822.689	573.080	1978.230	569.070	1683.834	575.020

Note: Nominal values have been converted to the base year 2010. The PAPI index has been collected since 2011, and monetary poverty data have not been reported since 2017. The "–" indicates no available data.

Source: Authors.

are simultaneously determined, and both ordinary least squares (OLS) and fixed-effects estimates of Equation (1′) will be biased. *Second*, potential dynamic endogeneity may exist if current development of the private sector is positively (or negatively) related to past poverty levels. In this case, a fixed effect estimate of current poverty levels on the development of the private sector will be negatively (or positively) biased. As noted by Wintoki et al. (2012), even if there is no causal link from x to y, a fixed effect estimator could generate a spurious estimate of the effect of x on y.

To address the endogeneity problem, several instrumental variables (IV) can be applied following the approach outlined by Fisman and Svensson (2007) and Jaax (2020), which uses the speed of the average growth of the previous period's private rate, and the Provincial Competitive Index (PCI) (see more in Appendix 2). Malesky and Taussig (2009) state that the quality of provincial institutions, as measured by the PCI, can affect the capacity and motivation of enterprises to transform the informal sector into the formal private sector in Vietnam. Viet et al. (2020) present evidence that the PCI facilitates the efficiency of the business environment (financial markets). Consequently, the PCI is strongly correlated with formal private enterprise transformation in Vietnam. Furthermore, Gueorguiev and Malesky (2012) observe a nexus between PCI and FDI flows, raising the number of multinational enterprises (MNEs) in Vietnam. In other words, using the PCI as an instrumental variable ensures the assumption of instrument relevance.

Regarding the exclusion condition, the PCI can interact with the model's error term (u) (e.g., the improvement of the quality of public service over time). To alleviate this problem, our model controlled for the PAPI index, representing citizen perception of the quality of public governance, so that we assumed $Cov\,(u, PCI|PAPI, X, Z) = 0$. Rather than the traditional IV method, we then used the two-step system GMM estimator proposed by Blundell and Bond (1998), with two-year lagged instruments to obtain consistent estimates. The advantage of the two-step system GMM over two-stage least squares (2SLS) is argued convincingly by Roodman (2009). First, 2SLS requires a set of external instrumental variables, which is often impossible to obtain in practice because almost all independent variables are not strictly exogenous. Furthermore,

when instruments outweigh regressors and equations outnumber unknowns, the system generally cannot be solved (Roodman, 2009). However, GMM has the advantage that it can generate a set of "internal" instruments contained within the panel itself: past values of dependent and independent variables can be used as instruments for current independent variables (Roodman, 2009; Wintoki et al., 2012). Thus, this eliminates the requirement for external instruments (Wintoki et al., 2012). Second, GMM is more efficient than 2SLS (Roodman, 2009).

In addition, the GMM estimator is superior to the OLS and fixed effect estimators in accounting for time-invariant unobservable heterogeneity across provinces, and for simultaneity and dynamic endogeneity (Blundell & Bond, 1998; Wintoki et al., 2012). Furthermore, in our study, two-year lagged instruments are chosen, emphasizing the delay in the dynamic interaction of past factors. This hypothesis is verified through the AR (1) and AR (2) tests presented in the study. Given this background, PSD observations in Equation (1) are determined by the fitted values from the first-stage regression of the equation as follows:

$$\pi_{it} = f\left(PCI_{it}, \pi_{it-2}, PAPI_{it}, Z_{ikt}\right) \quad (1')$$

EMPIRICAL RESULTS AND DISCUSSION

Factors affecting multidimensional and monetary poverty

As already defined, PSD is represented by the percentage of private-sector employees in total employment (π). The effects of PSD and other explanatory variables on multidimensional and monetary poverty are given in Tables 4 and 5, respectively. Column 1 of Table 4 applies an OLS estimator to gauge the impact of PSD on multidimensional poverty reduction, with coefficients as expected in Table 2. However, the OLS estimates may be biased due to the lack of control for time-invariant unobservable variables (e.g., joining free-trade agreements, or ethnicity, historical and social factors), so fixed effects estimates are reported in column 2. Both OLS and fixed-effects models obtain the most efficient, consistent, and unbiased estimates if the explanatory variables are not endogenous (Wintoki et al., 2012).

However, PSD is likely to be an endogenous explanatory variable. When the explanatory variables are endogenous, the IV estimation can yield consistent results. Column 3 of Table 4 describes the results of the IV estimation with PCI as the instrumental variable. One of the problems with traditional IV estimation is that finding a set of external instrumental variables seems impossible since almost no independent variables are considered exogenous. Therefore, column 4 of Table 4 presents the GMM results using a two-year lagged instrument, allowing for consistent coefficients and solving the problem of the IV method. Some specification tests are also reported to ensure the appropriateness of instrumental variables, such as the serial correlation test of the AR (2), the Hansen test of overidentification, and the Diff-in-Hansen tests of exogeneity.

The results from all model specifications in Table 4 show clear evidence that provinces where the private sector is preponderant have lower levels of multidimensional poverty. Specifically, the result from the GMM estimator indicates that a one percentage point increase in PSD would reduce the multidimensional poverty rate by 0.30%, holding all other variables in the model constant. Thus, our study provides strong evidence of the positive role of PSD in multidimensional poverty alleviation in Vietnam. The increase in the number of workers in the private sector is the result of equitization—moving labor from public to private enterprises—and the creation of more new jobs by the expansion of private enterprises through improving the business environment (Baccini et al., 2019; Jaax, 2020). In Vietnam, the equitization process has been sluggish, characterized as "keeping big and leaving small", meaning that only small-scale state-owned enterprises will be equitized. According to the Ministry of Finance, this level of progress is only about 30% of the target plan in the 2016–2020 period (Communist Party of Vietnam, 2021). The same effect from PSD was also found on monetary poverty, as can be seen in Table 5. Combined, the findings here confirm the positive contribution of the private sector to improving the welfare of the poor, both in monetary and non-monetary aspects.

The results of the various models in Tables 4 and 5 also reveal the role of economic growth and education in reducing both monetary and multidimensional poverty. For instance, the GMM estimates in Tables 4 and 5 show that a 1% increase in GDP per capita would reduce the multidimensional and monetary poverty rates by 0.08 and 0.11 percentage points, respectively. The findings here suggest that economic growth appears to do more to relieve monetary than multidimensional poverty. Our research findings are in partial accord with those of previous studies which confirm the positive role of economic growth in monetary poverty reduction (Adams, 2004; Datt & Ravallion, 1992; Kraay, 2006; Nguyen & Pham, 2018).

We also find that literacy has a positive effect on reducing both monetary and multidimensional poverty. The results in Tables 4 and 5 reveal that literacy has the effect of reducing both poverty measures, with a larger effect on multidimensional than on monetary poverty. The same result is found in several developing countries (Pervez Zamurrad & Kamal, 2011), as well as in provinces in rural China (Liu et al., 2021). Notably, in Vietnam's case, our finding suggests that increasing GDP per capita has

TABLE 4 The impact of private sector development on multidimensional poverty

	(1)	(2)	(3)	(4)
Variables	**OLS**	**FE**	**XT_IV**	**GMM**
Private sector rate (π)	−0.203***	−0.089*	−0.490**	−0.304**
	(0.041)	(0.046)	(0.215)	(0.134)
Log of GDP per capita	−0.048***	−0.055***	−0.183***	−0.081*
	(0.008)	(0.017)	(0.025)	(0.043)
Literacy	−1.136***	−0.144	−0.156	−1.077***
	(0.084)	(0.119)	(0.152)	(0.280)
Log of population	−0.032***			−0.080**
	(0.007)			(0.037)
Log of FDI implemented	−0.004***	0.001	−0.000	0.005
	(0.002)	(0.001)	(0.001)	(0.006)
Log of agricultural land	−0.000			−0.002
	(0.005)			(0.036)
Urbanization rate	−0.059***	0.116**	0.477***	−0.118
	(0.021)	(0.057)	(0.054)	(0.163)
Log of PAPI index	0.116**	−0.032	−0.013	0.000
	(0.056)	(0.034)	(0.038)	(0.194)
Log of rainfall	0.002	−0.000	0.002	−0.015
	(0.011)	(0.007)	(0.008)	(0.050)
Year dummy	Yes	Yes	Yes	Yes
Constant	1.427***	0.697***		2.379***
	(0.224)	(0.172)		(0.863)
Observations	566	566	566	566
R^2	0.804	0.758	0.664	
Number of panels		63	63	63
Sanderson-Windmeijer (SW) under-identification tests (p-value)			0.000	
Sanderson-Windmeijer (SW) weak identification (F-value)			29.172[a]	
AR (1) test (p-value)				0.559
AR (2) test (p-value)				0.004
Hansen test of over-identification (p-value)				1.000
Diff-in-Hansen tests of exogeneity				1.000

Note: Robust standard errors in parentheses. GMM method using 2-year lagged independent variables as instruments; year dummies are considered to be exogenous. XT_IV: IV with fixed effects. The observations are 566, not 630 (63 provinces/cities from 2010 to 2019), because the PAPI index has only been computed since 2011.

[a]Stock-Yogo weak ID F test critical values for single endogenous regressor: 10% maximal IV size is 16.38.

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

a stronger impact on combating monetary poverty, while raising literacy rates is better for multidimensional poverty reduction. Examining the distribution of these effects allows us to determine which large or small provinces benefit more from poverty reduction (Nguyen, Giang, et al., 2021; Nguyen, Tran, et al., 2021). Specifically, we find that the population size of a province results in a reduction of multidimensional poverty, which can be explained through an agglomeration effect in creating new jobs and increasing household incomes (Giang et al., 2016).

The results in Table 6 show a breakdown of the private sector (π) into domestic enterprises (π_1) and multinational enterprises (π_2) to examine the contribution to poverty reduction by each segment of the private sector. The table shows that both sectors have a positive effect on reducing multidimensional and monetary poverty. Specifically,

TABLE 5 The impact of private sector development on monetary poverty

	(1)	(2)	(3)	(4)
Variables	**OLS**	**FE**	**XT_IV**	**GMM**
Private sector rate (π)	−0.121***	−0.006	−1.126**	−0.310**
	(0.026)	(0.051)	(0.519)	(0.125)
Log of GDP per capita	−0.038***	−0.064***	−0.118**	−0.106***
	(0.007)	(0.021)	(0.052)	(0.037)
Literacy	−0.717***	−0.139	0.123	−0.618***
	(0.055)	(0.104)	(0.234)	(0.205)
Log of population	−0.021***			−0.039
	(0.006)			(0.033)
Log of FDI implemented	−0.002*	0.002	−0.000	0.008
	(0.001)	(0.001)	(0.002)	(0.005)
Log of agricultural land	−0.006*			0.001
	(0.003)			(0.017)
Urbanization rate	−0.104***	0.144**	0.303**	−0.109
	(0.018)	(0.071)	(0.133)	(0.127)
Log of PAPI index	0.128***	0.015	0.036	0.154
	(0.046)	(0.032)	(0.048)	(0.143)
Log of rainfall	0.011	0.007	0.024*	−0.003
	(0.010)	(0.007)	(0.013)	(0.034)
Log of industry index[a]			0.021	
			(0.016)	
Year dummy	Yes	Yes	Yes	Yes
Constant	0.740***	0.368**		1.070*
	(0.187)	(0.162)		(0.536)
Observations	376	376	314	376
R^2	0.793	0.767	0.173	
Number of panels		63	63	63
Sanderson-Windmeijer (SW) under-identification tests (p-value)			0.017	
Sanderson-Windmeijer (SW) weak identification (F-value)			5.538[b]	
AR (1) test (p-value)				0.745
AR (2) test (p-value)				0.005
Hansen test of over-identification (p-value)				0.718
Diff-in-Hansen tests of exogeneity				0.198

Note: Robust standard errors in parentheses. GMM method using 2-year lagged independent variables as instruments; year dummies are considered to be exogenous. The PAPI and industry indexes have been collected since 2011 and 2012, respectively. Monetary poverty data have not been reported since 2017. Therefore, the observations in columns (1), (2), (3), and (4) are 376, 376, 314, and 376, respectively.

[a]GSO calculation.

[b]Stock-Yogo weak ID F test critical values for single endogenous regressor: 25% maximal IV size is 5.53.

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

each percentage point increase in the number of workers in private domestic firms lowers multidimensional and monetary poverty levels by about 0.27% and 0.29%, respectively. The corresponding effects for those in multinational firms are about −0.36% and −0.34%.

Robustness check

In general, high initial levels of income inequality restrict the power of growth to decrease poverty but increasing income inequality reduces poverty directly for a given level

of growth (Fosu, 2017). An increasing number of empirical studies show that income inequality has played a key role in the transition from growth to poverty reduction (Adams, 2004; Fosu, 2017). This suggests that income inequality should be included as an important control variable in our models. As a robustness check, in Table 7 we report the results of the GMM estimator with control for the Gini index. The results in Table 7 are almost the same as those in Tables 5 and 6 that do not control for income inequality, confirming that our results are robust even after considering income inequality. Once again, these results affirm the positive contribution of PSD to poverty eradication, regardless of any measures. The coefficient on the Gini variable in Table 7 is positive and statistically highly significant, suggesting that inequality increases both monetary and multidimensional poverty. This finding supports arguments that high income inequality may limit the effectiveness of growth in combating poverty.

We also consider several hypotheses to verify the robustness of our results: (i) Does the increasing labor rate in the state sector (placebo1) affect poverty reduction? (ii) Does the prospect of domestic economic development contribute to poverty reduction? This hypothesis implies that factors that reduce poverty originate only from domestic economic opportunity (both the private and public sectors) but not from π. We replace π with the variable placebo2, which is the ratio of employment in domestic public and private enterprises; (iii) Does eliminating domestic private sector growth still reduce the poverty rate? In other words, π is replaced by the variable placebo3 representing the ratio of employment in public and multinational enterprises. Thus, if any coefficient of the placebo variable is negative and statistically significant, it will weaken the theory of the impact of PSD on poverty reduction. The results are shown in Table 8 and are as expected: (i) An increased/decreased employment rate in SOEs could lead to an increase/decrease in the poverty rate in Vietnam, and (ii) the coefficients of placebo2 and placebo3 are not statistically significant. In general, the results consistently confirm the role of the private sector in poverty eradication in Vietnam.

CONCLUSION AND POLICY IMPLICATIONS

Summary of main findings

Vietnam has made successful initial steps toward reducing multidimensional poverty. The population's quality of life was enhanced through raising GDP per capita, wealth redistribution, and greater success in meeting basic human needs (e.g., clean water, the internet, housing, etc.). One of the key factors contributing to this progress is the private sector, including both domestic and multinational firms. Our study is the first to investigate the effect of PSD on poverty reduction, both monetary and multidimensional, over the 2010–2019 period. PSD is measured as a percentage of the workforce in the private sector in general and in domestic and multinational enterprises in particular. We utilized provincial secondary data sources from the General Statistical Office of Vietnam and employed a two-step GMM estimator to account for unobservable heterogeneity, simultaneity, and the relationship between current provincial characteristics and past provincial poverty. We find evidence that increasing numbers in the workforce in the private sector as well as in domestic and multinational firms all have the effect of reducing both monetary and multidimensional poverty. The results are robust even after accounting for unobservable heterogeneity, simultaneity, and various important control variables. Furthermore, our research reveals that economic growth and educational attainment are important determinants in reducing multidimensional and unidimensional poverty, whereas income inequality raises both measures of poverty.

Policy implications

When paired with the descriptive data in Table 1 on the velocity and return on investment of domestic and multinational companies versus state-owned enterprises, the findings in Table 6 suggest some policy implications. First, the domestic private sector, which employs over 70% of the labor force and has a faster growth rate than the public sector, will provide a critical basis for poverty reduction in the years ahead (MPI, 2020). This sector is especially crucial since over 97% of domestic private businesses are small and medium-sized and deal directly with the poor (MPI, 2020). Second, the multinational sector, which employs about 20% of the labor force (MPI, 2020), and has much superior ROA and velocity metrics (when compared to state-owned enterprises) will continue to play an important role in reducing poverty and laying a solid economic base for international trade. This suggests that policies for PSD not only contribute to growth but also promote progress in poverty alleviation in Vietnam.

Some of our findings, such as those related to growth, education, and inequality, are consistent with earlier research. Among other things, for example, economic progress and educational achievement might lower poverty levels considerably in both monetary and multidimensional terms. Poorly educated people today may be the consequence of restricted access to education in the past or poorly educated parents. The former, in

TABLE 6 The impact of the development of private domestic and multinational enterprises on poverty reduction

	(1)	(2)
Variables	**Multidimension poverty**	**Monetary poverty**
Domestic private sector rate (π_1)	−0.270**	−0.289**
	(0.114)	(0.131)
Multinational sector rate (π_2)	−0.358**	−0.306**
	(0.135)	(0.150)
Log of GDP per capita	−0.071*	−0.073*
	(0.039)	(0.037)
Literacy	−1.042***	−0.629***
	(0.382)	(0.236)
Log of population	−0.073**	−0.047
	(0.032)	(0.052)
Log of FDI implemented	0.004	0.003
	(0.006)	(0.004)
Log of agricultural land	−0.011	−0.008
	(0.027)	(0.016)
Urbanization rate	−0.107	−0.152
	(0.147)	(0.144)
Log of PAPI index	0.003	0.037
	(0.173)	(0.097)
Log of rainfall	−0.010	0.008
	(0.055)	(0.030)
Government support	0.009	0.011
	(0.012)	(0.011)
Year dummy	Yes	Yes
Constant	2.187***	1.357***
	(0.567)	(0.330)
Observations	566	376
Number of panels	63	63
AR (1) test (p-value)	0.380	0.133
AR (2) test (p-value)	0.008	0.008
Hansen test of over-identification (p-value)	1.000	1.000
Diff-in-Hansen tests of exogeneity	1.000	0.917

Note: Standard errors in parentheses. The PAPI index has been collected since 2011. Monetary poverty data have not been reported since 2017. Therefore, the observations in columns (1) and (2) are 566 (corresponding with 63 provinces/cities during 2011–2019), and 376 (corresponding with 63 provinces/cities during 2011–2016), respectively.

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

turn, may provide inadequate education for their children in the future, resulting in poverty transmission between generations. Given the importance of education, as demonstrated by our research, government policies aimed at improving the access of the poor to education should be further promoted, particularly in remote and mountainous areas like the Northwest and the Central Highlands, where poverty is greater and education levels lower (MOLISA, 2018). Furthermore, given our study's findings on inequality and poverty, a valuable consequence for provincial government policy is that boosting economic equality can help reduce both monetary and multidimensional poverty.

Some argue the possibility of adverse effects of PSD on addressing poverty when capitalism is exercised to a large or extreme extent such as those observed in the liberal welfare nations (e.g., United States) (Brady, 2003; Krugman, 1994). This scenario is less likely to occur because Vietnam pursues a socialist-oriented market economy with a high level of government intervention, which

TABLE 7 Robustness check with Gini index

	Multidimension poverty			Monetary poverty		
Variables	**OLS**	**GMM**	**GMM**	**OLS**	**GMM**	**GMM**
Private sector rate (π)	−0.171***	−0.352***		−0.114***	−0.151**	
	(0.056)	(0.127)		(0.033)	(0.058)	
DPEs (π_1)			−0.332**			−0.471**
			(0.164)			(0.208)
MNEs (π_2)			−0.341**			−0.444**
			(0.164)			(0.202)
Log of GDP per capita	−0.056***	−0.109**	−0.096**	−0.042***	−0.122***	−0.185***
	(0.012)	(0.049)	(0.040)	(0.008)	(0.037)	(0.059)
Literacy	−0.984***	−1.211***	−1.091***	−0.598***	−0.681***	−0.688***
	(0.125)	(0.382)	(0.373)	(0.074)	(0.131)	(0.230)
Gini index	0.440***	0.271**	0.286**	0.221***	0.179	0.324**
	(0.117)	(0.135)	(0.131)	(0.060)	(0.137)	(0.146)
Log of population	−0.026**	−0.050	−0.061	−0.026***	−0.024	−0.017
	(0.010)	(0.039)	(0.044)	(0.008)	(0.031)	(0.040)
Log of FDI implemented	−0.001	0.002	0.003	−0.001	0.004	0.018**
	(0.002)	(0.006)	(0.008)	(0.002)	(0.004)	(0.009)
Log of agricultural land	−0.003	−0.025	−0.019	−0.010**	−0.018	−0.012
	(0.006)	(0.027)	(0.026)	(0.004)	(0.015)	(0.020)
Urbanization rate	−0.036	0.091	0.066	−0.119***	−0.003	0.103
	(0.029)	(0.212)	(0.139)	(0.023)	(0.126)	(0.180)
Log of PAPI index	0.075	0.003	0.094			
	(0.067)	(0.276)	(0.220)			
Log of rainfall	0.002		−0.023	0.012	0.020	0.005
	(0.016)		(0.070)	(0.010)	(0.035)	(0.055)
Government support			−0.033	0.011**	0.012	−0.009
			(0.021)	(0.005)	(0.015)	(0.029)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	1.200***	2.277***	2.171**	0.971***	1.246***	1.731***
	(0.278)	(0.743)	(0.940)	(0.125)	(0.327)	(0.490)
Observations	252	252	252	250	250	250
R^2	0.835			0.817		
Number of panels		63	63		63	63
AR (1) test (p-value)		0.834	0.333		0.678	0.369
AR (2) test (p-value)		0.009	0.310		0.990	0.583
Hansen test of over-identification (p-value)		0.221	0.393		0.166	0.255
Diff-in-Hansen tests of exogeneity		0.863	0.915		0.682	0.347

Note: Standard errors in parentheses. The Gini index is calculated from the Household Living Standards Survey (VHLSS database). This data set is collected every two years (2010, 2012, 2014, 2016, and 2018). The PAPI index has been collected since 2011, but monetary poverty data have not been reported since 2017. Therefore, the observations of columns (1), (2), and (3), including the PAPI index, cover four years—2012, 2014, 2016, and 2018. The observations in columns (4), (5), and (6), with monetary poverty as the dependent variable, cover four years—2010, 2012, 2014, and 2016.

***$p < 0.01$; **$p < 0.05$.

TABLE 8 Robustness check with placebo variable

	Multidimensional poverty			Monetary poverty		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
State sector rate (placebo1)	0.326**			0.304**		
	(0.142)			(0.118)		
Domestic sector rate (placebo2)		−0.056			−0.007	
		(0.090)			(0.067)	
State and multinational sector rate (placebo3)			0.075			0.044
			(0.100)			(0.063)
Log of GDP per capita	−0.084**	−0.099**	−0.086**	−0.103***	−0.105**	−0.098**
	(0.042)	(0.050)	(0.041)	(0.037)	(0.048)	(0.038)
Literacy	−1.025***	−1.237***	−1.209***	−0.652***	−0.765***	−0.753***
	(0.331)	(0.403)	(0.314)	(0.217)	(0.190)	(0.176)
Log of population	−0.081**	−0.069**	−0.081*	−0.031	−0.065	−0.068**
	(0.040)	(0.033)	(0.041)	(0.033)	(0.043)	(0.026)
Log of FDI implemented	0.004	−0.000	0.002	0.007	0.005	0.008
	(0.007)	(0.007)	(0.006)	(0.005)	(0.007)	(0.005)
Log of agricultural land	−0.002	−0.032	−0.033	0.002	−0.009	−0.008
	(0.030)	(0.029)	(0.021)	(0.018)	(0.013)	(0.015)
Urbanization rate	−0.111	0.069	−0.001	−0.097	−0.016	−0.054
	(0.116)	(0.173)	(0.216)	(0.099)	(0.114)	(0.118)
Log of PAPI index	−0.011	0.081	0.098	0.153	0.228	0.222
	(0.224)	(0.195)	(0.162)	(0.143)	(0.182)	(0.143)
Log of rainfall	−0.013	0.019	0.007	−0.005	0.028	0.032
	(0.049)	(0.054)	(0.045)	(0.036)	(0.042)	(0.039)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	2.061**	1.814**	1.804**	0.735	0.636	0.575
	(0.877)	(0.769)	(0.761)	(0.499)	(0.545)	(0.644)
Observations	566	566	566	376	376	376
Number of panels	63	63	63	63	63	63
AR (1) test (p-value)	0.475	0.228	0.198	0.631	0.789	0.584
AR (2) test (p-value)	0.005	0.020	0.001	0.004	0.004	0.008
Hansen test of over-identification (p-value)	1.000	1.000	1.000	0.723	0.775	0.857
Diff-in-Hansen tests of exogeneity	1.000	1.000	1.000	0.723	0.337	0.370

Note: Standard errors in parentheses.

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

suggests that the government attempts to maintain a balance between state power and market forces.

Limitations

We acknowledge that our study has certain limitations. As pointed out by Roodman (2009), the two-step system GMM estimator has some drawbacks. First, it makes an additional assumption that the changes of instruments are uncorrelated with the fixed effects (δ). In this case, the assumption implies that $E(\Delta PCI_{it,} \delta_i) = 0$ for all i and t. Second, since it easily produces fallacious estimates because of their complexity, it is necessary to have external exogenous variables to ensure the consistency of the coefficient in the model. Also, measures of the private sector as a percentage of the total labor force may not capture other aspects of its development. Future research should compute the number of private firms or private sector employees per 1000 inhabitants across provinces.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest in this research.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated.

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