

Does the private sector increase inequality? Evidence from a transitional country

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ARTICLE INFO

Article history:

Received 9 May 2022

Revised 7 June 2022

Accepted 8 June 2022

Available online 14 June 2022

JEL code:

D63

I38

P36

Keywords:

private sector

inequality

transitional country

Vietnam

ABSTRACT

This study examines the relationship between private sector development (PSD) and inequality in Vietnam's 63 provinces over the 2010–2020 period. PSD is measured by the ratio of (i) domestic private enterprises (DPE) and multinational enterprises (MNE) to the labor force (π), (ii) private sector employees/enterprises per 100 inhabitants, and (iii) private sector employees per one billion VND in private investment. We apply a two-step general method of moment (GMM) estimator to account for unobservable factors, heterogeneity, simultaneity, and potential dynamic endogeneity. We find that a 1% increase in π contributes to a 0.263% reduction in income inequality (i.e., the Gini coefficient and Theil T index). In particular, the mechanism is partly explained by reduced poverty and higher income resulting from the expansion of the economic “pie,” such as an increase in employment, especially for unskilled and skilled manual female workers, and the improvement of public services and essential goods. However, PSD in Vietnam entails unevenly distributed economic opportunity in the mountainous areas, which may exacerbate inequality, and is seen in a lack of commitment to female workers. Therefore, welfare and social programs for the vulnerable still need to be improved in the years ahead.

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1. Introduction

In a context of socio-economic fluctuation, economic inequality reduces economic growth, influences sustainable development goals, and increases social instability, especially among the disadvantaged. One solution for addressing inequality is through the provision of increased welfare (e.g., subsidies for the poor and income redistribution programs), which has many limitations and has received much criticism (Milton & Rose, 1980; Wilson, 2012). Specifically, the welfare approach often fails to meet the various needs of the disadvantaged and restricts economic activity by generating spurious market signals. Although imperfect in attaining welfare goals and harmonizing the distribution of economic opportunity, market mechanisms are still regarded as the best among all “evil” choices (Milton & Rose, 1980). Miletzki and Broten (2017) claim that economic freedom enhances social welfare or at least reduces income inequality through an expanded economic pie and “corporate social responsibility” (CSR). However, this result depends on whether its mechanisms improve primary education, the political power of citizens, and health care,

makes for longer and better lives, and reduces relative inequality. Wilson (2012) argues that it is necessary to find and strengthen economic approaches that improve both efficiency and equitable resource allocation in the long run—namely, a “third way,” harnessing the ability of social enterprises to achieve social purposes.

The private sector is a major job creator, a source of radical and incremental innovation, of diverse, cheap products, and a major contributor to the national budget. Consequently, it has great potential for addressing socio-economic and environmental issues in both short- and long-term development (Buhmann, Jonsson, & Fisker, 2019; Rashed & Shah, 2021). Accordingly, the large number of jobs created by the private sector contribute significantly to people's income and improve their mental health, given that the unemployed are among those most dissatisfied with their lives (Deaton, 2008, 2013). Private sector development (PSD) also leads to advances in health, increasing political equality, the quality of public goods and services (e.g., parks, roads, and the internet), and a wide variety of consumer products of high quality at lower prices (Deaton, 2013; Milton & Rose, 1980; Sen, 2014).

Moreover, the development of social enterprises creates an institutional framework that greatly increases opportunities and reduces inequality in financial services, especially for the disadvantaged (Van den Berg & Cuong, 2011; Wilson, 2012). In transitional countries like Vietnam, trade facilitation resulting from the rapid growth in the private business sector has contributed

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to reducing inequality by generating more jobs for low-skilled workers and reducing transaction costs (Le, Hoang, & Tran, 2022; Nguyen Viet, 2015). Furthermore, PSD stimulates the development of other channels for reducing inequality, e.g., rural-to-urban migration, remittances, the improvement of essential services such as electricity, sanitation, and clean water, and improving environment-friendly efficiency (Bocken, Short, Rana, & Evans, 2014; Rashed & Shah, 2021; Tran, 2016).

In the early stages of private sector development, however, a wide diversity of economic opportunities may exacerbate income and welfare inequalities, especially during times of crisis. Shamir (2004) reports that capitalists and capitalist entities often fail to keep their social responsibility commitments in the face of threats, challenges, or crises. Given the goal all companies have to maximize profit, the disadvantages for them of concerns with maternity and families steeped in Confucian culture make women less attractive than men to fill vacancies, an assessment that is reflected in women's wages (Fischer & Qaim, 2012). Furthermore, the growing influence of foreign corporations has resulted in shock transmission into the price channel (Winters, McCulloch, & McKay, 2004), with changes that can be significant and harmful for the poor. In transitional countries, PSD is often not strong enough, leading to the unequal distribution of employment opportunities for citizens, especially for ethnic minorities. De Silva and Sumarto (2014) found that in the decade from 2002–2012 in Indonesia, the poor derived less benefit from expanding the economic pie than the better-off. In Vietnam, (i) business development focuses on the industry service sector and lacks sustainable linkages with agriculture (Barker & Üngör, 2019) and (ii) non-agricultural income sources have an exceptionally unequal distribution in the north-west of the country (Gini coefficient is 0.9) (Nguyen, Doan, & Tran, 2020; Tran, 2016). Consequently, private sector development will increase inequality between ethnic minorities living in mountainous areas and urban dwellers.

This study makes two contributions. **First**, drawing on provincial panel data for Vietnam for 2010–2018, our investigation provides fresh evidence of the influence of private sector development on inequality in a transitional country and makes some noteworthy points: (i) The rapid change in socio-economic variables and the relative independence of local government policy—known as an “independent laboratory” (Schmitz, Tuan, Hang, & McCulloch, 2015)—establish a causal relationship between PSD and (income) inequality. (ii) Vietnam is a transitional country characterized by government control over many aspects (through the legal system, direct economic interventions, and state-owned enterprises [SOEs]). Therefore, evidence of the role of the private sector in improving general welfare will help determine policy towards a balance between market and state power (Acemoglu & Robinson, 2019). **Second**, using a two-step general method of moment (GMM) estimator, the study considers invariant, unobservable, simultaneous, and potentially endogenous issues (Blundell & Bond, 1998; Wintoki, Linck, & Netter, 2012).

Results show that a 1% increase in PSD—reflected in the ratio of private enterprise employment to the labor force (π)—contributes to a 0.263% decrease in the Gini coefficient. With coefficients in the range of 0.142% and 0.348%, respectively, the effect on both domestic private and multinational sectors confirms this relationship. PSD is also manifested by such indicators as private sector employees/enterprises per 100 inhabitants and 1 billion VND of private investment in the economy. The mechanism through which PSD reduces inequality can be expressed as follows: (i) Poverty and equality are closely related and PSD reduces (multidimensional) poverty; (ii) PSD improves average income (a larger share of the economic pie), creating and allocating economic opportunity more efficiently on average and in the long run.

The rest of the study is constructed as follows. Section 2 summarizes the literature review and research context, followed by a description of the econometric model design and required database in Section 3. Section 4 presents the results and discussion, while Section 5 concludes with some policy implications.

2. Literature review

2.1. The linkage between PSD and inequality

The private sector inequality nexus in former communist countries can be discussed in light of market transitional theory. The theory predicts that income inequality tends to increase as a result of privatization and growth in the private sector in most countries transitioning from a centrally planned to a market economy (Haskel & Szymanski, 1993). Specifically, market transition theory maintains that when economic policy becomes more market-oriented, workers in the state and public sectors receive less protection and less income, but workers in the private sector will benefit from the new system. Wages in the public sector used to be higher, but as businesses are privatized and expenses lowered, wages are likely to fall (Haskel & Szymanski 1993), as Haskel and Szymanski expected, and the gap in earnings between public and private sectors will start to even out. This theory is supported by Bandelj and Mahutga (2010) longitudinal study of ten Central and East European countries, confirming that rising inequality (Gini) was caused mainly by the expansion in GDP of both the private and foreign sectors during the first decade after 1989. Bakkeli (2017) finds similar evidence that provinces with larger private sectors (measured by the proportion of workers employed in that sector) tend to be characterized by higher levels of inequality (Gini).

The development of private enterprise can also exacerbate inequality in a country. With the company goal of profit maximization, corporate social responsibility (CSR) must cope with many limitations in avoiding financial exclusion and preserving vulnerable consumer welfare (Wilson, 2012), especially in times of threat, challenge, and crisis (Shamir, 2004). Whether the process of expanding the economic pie enables the disadvantaged to change their status of inequality in society depends in relative terms on the effect of that expansion on basic education, poverty reduction, personal income, political power, health care, and longer and better lives (Miletzki & Broten, 2017). With the expansion of the private sector and rapid economic growth in Indonesia in the decade from 2002 to 2012, De Silva and Sumarto (2014) find that the poor received little benefit compared to those better off. Furthermore, in the face of shocks, such as the Covid-19 pandemic (Dang & Nguyen, 2021) and natural disasters (Arouri, Nguyen, & Youssef, 2015; Bui, Dungey, Nguyen, & Pham, 2014), women and the vulnerable suffer the most and, at the same time, the shock effect on prices of the arrival of multinational enterprises has caused significant harm to the poor (Winters et al., 2004).

However, convincing arguments favor the development of the private sector for reducing poverty and solving socio-economic problems, such as inequality, arguments which are widely advocated by the neoclassical school and Austrian economists (Deaton, 2013; Hayek, 1980; Milton & Rose, 1980; Sen, 2014). Deaton (2008, 2013) asserts that private sector development not only creates economic opportunities (e.g., jobs) but also significantly improves people's health in a time when various forms of inequality are reflected in contemporary health advances. This process leads to an improvement in (i) health services, (ii) the quantity and quality of public goods (through tax on businesses), (iii) political power for the disadvantaged, and (iv) diversification of consumer products and services of higher quality and at

lower prices (Deaton, 2013; Hayek, 1980; Milton & Rose, 1980; Sen, 2014).

Moreover, Wilson (2012) argues that the development of the private sector, especially social enterprises, will effectively and optimally establish a social framework to assist in attaining financial inclusion. This is an essential target for optimizing the national welfare system (Fineman, 2010). Digital transformation has aggravated complex financial issues (Claessens, 2006). Accordingly, governmental regulations and finance programs and subsidies often meet only a small segment of the financial needs of vulnerable people. Meanwhile, social enterprises have proved themselves able to respond to the diversity of needs (Van den Berg & Cuong, 2011; Wilson, 2012). Notably, the increase of private services has stimulated a reduction in inequality through other channels, e.g., through rural-to-urban migration and remittances, and has improved basic services such as electricity, sanitary conditions, and clean water, all of this coupled with an improvement in environmentally friendly energy efficiency (Bocken et al., 2014; Rashed & Shah, 2021; Tran, 2016).

In the context of economic globalization, Locke, Amengual, and Mangla (2009); Thorlakson, de Zegher, and Lambin (2018) believe that under the pressure of fair, long-term competition, businesses tend to pursue an approach oriented towards cultivating long-term business relationships, by improving work benefits, the transparency of information, and enhancing employee engagement, which in turn contribute to improving employee welfare. For domestic private enterprises, the shift from small-farm or informal private enterprises to formal ones brings with it greater assurance in labor contracts, insurance, and salary regimes for employees (Malesky & Taussig, 2009; Rado, 1973). At the same time, multinational enterprises foster international free trade, promote employment for low-skilled workers, reduce transaction costs in the economy, then reduce inequality in transitional countries (Le et al., 2022; Nguyen Viet, 2015).

In Vietnam, a number of studies have examined the contribution of the private sector to the reduction of poverty and inequality. For instance, Van den Berg and Cuong (2011) point out that compared to public cash transfers, private cash transfers contribute significantly to reducing inequality. Recent studies confirm that the expansion of the private sector (measured by the number of workers in both private and foreign firms) has the effect of diminishing income poverty (Jaax, 2020) and multidimensional poverty (Van Le, Tran, & Doan, 2022) across provinces. The development of the private sector also indirectly affects inequality in Vietnam through many other facets, such as improving the education system, health care, and other aspects of living standards. Trinh Thanh et al. (2022) show that the evolution of private higher education institutions has taken care of almost 20% of students. Its total factor productivity (TFP) is 30% higher than that of the public sector. The number of non-state health workers accounts for nearly 17% of the total national health workforce, significantly improving the health care system and lessening pressure on the public sector. Furthermore, a better organized and regulated private sector could help to improve access to healthcare care for 68% of rural citizens (Nguyen & Wilson, 2017). The private sector also contributed 38.2% of the total tax revenue, followed by FDI companies (33.94%) and SOEs (27.9%), and the incremental capital-output ratio (ICOR) of the private sector was also lower than the public one (General Statistical Office [GSO], 2022).

However, to the best of our knowledge, no study has analyzed the connection between PSD and inequality in Vietnam. It should be noted that Vietnam is going through the process of reform from central planning to a free market system, so that understanding how the private sector addresses socio-economic issues will contribute to determining how to balance state vs. market power (Acemoglu & Robinson, 2019). The importance of the topic

and the gap in the literature motivated us to conduct the current study.

2.2. Vietnamese context

2.2.1. Private sector development

Following the study of Van Le et al. (2022) and Jaax (2020), PSD is reflected in the ratio of the total labor of domestic private enterprises (DPE) and multinational enterprises (MNE) to the labor force, yielding the π index.

$$\pi = \frac{\text{DPE labor} + \text{MNE labor}}{\text{labors of enterprises}} \quad (1)$$

An increase in π may come from: (i) a decline in public sector employment without any backup from private sector employment, (ii) growth in the private sector in both domestic and multinational enterprises. In particular, when workers lose their jobs in the public sector without finding replacement positions in private enterprises, the result may increase inequality by reducing economic growth and increasing poverty (Jaax, 2020). However, there is no evidence in Vietnam to verify this trend thus far. Accordingly, PSD in Vietnam often creates pressure to accelerate the equitization of state-owned enterprise (SOEs), a process which is inherently slow (Le, Cabalu, & Salimb, 2014). If the increase in π comes from increasing the number of private-sector firms, inequality is expected to decline.

Evaluating PSD through the π index may face certain difficulties related to its number compared to population density or capital size. Firm size also significantly affects inequality and poverty reduction in the economy. In particular, large-scale enterprises, which employ high-quality, skilled labor, may increase inequality. Furthermore, the π index does not reflect changes in the structure of the private sector. Barker and Üngör (2019) warn that the private sector is slanted towards industry and is unsustainable for the agricultural sector. Given these arguments, our study is concerned with other variables representing PSD: (i) Private sector employees/enterprises per 100 inhabitants and (ii) Private sector employees per one billion VND of private investment in the economy. It should be noted *first* that the proportion of large-scale enterprises in Vietnam did not fluctuate throughout the research period, with a ratio of about 2–3% of total enterprises (Ministry of Planning and Investment [MPI], 2020). *Second*, the developmental imbalance seen in the agricultural and industrial sectors is partly the result of policies that favor industry and the rapid attraction of foreign direct investment (FDI). Thus, agricultural (high-tech) projects are less attractive than their counterparts in the services and industry sector. In the long run, this type of incentive will significantly change business owner behavior (Hayek, 1980).

2.2.2. Inequality in Vietnam

Income inequality can be decomposed into (i) inequality between provinces/cities (between groups) and (ii) inequality between individuals/households in a province/city (within a group). Accordingly, we calculate inequality in Vietnam according to the Theil T index and its components using the following formula:

$$\text{Theil T} = T_e + \sum_{h=1}^k Y_h T_h \quad (2)$$

where $T_e = \sum_{h=1}^k Y_h \log\left(\frac{Y_h}{\pi_h}\right)$ is the Theil T between groups and $T_h = \sum_{i=1}^{n_h} \frac{y_{hi}}{Y_h} \log n_h \frac{y_{hi}}{Y_h}$ is the Theil T within groups. n_h is the n^0 of people in the h -th group and $\pi_h = \frac{n_h}{N}$ (N is the number of observations in the sample). Y_{hi} is total income share of the i -th individual

Table 1
Theil T index and its components in Vietnam, 2010-2018

Year	Theil's Index	Theil between	Theil within	Shared within	Different within
2010	0.404	0.075	0.329	0.026	0.303
2012	0.310	0.048	0.262	-0.049	0.312
2014	0.310	0.035	0.275	0.078	0.197
2016	0.287	0.036	0.250	0.093	0.157
2018	0.256	0.037	0.219	0.112	0.107

Source: Authors' calculation from the Vietnam Household Living Standard Surveys (VHLSS).

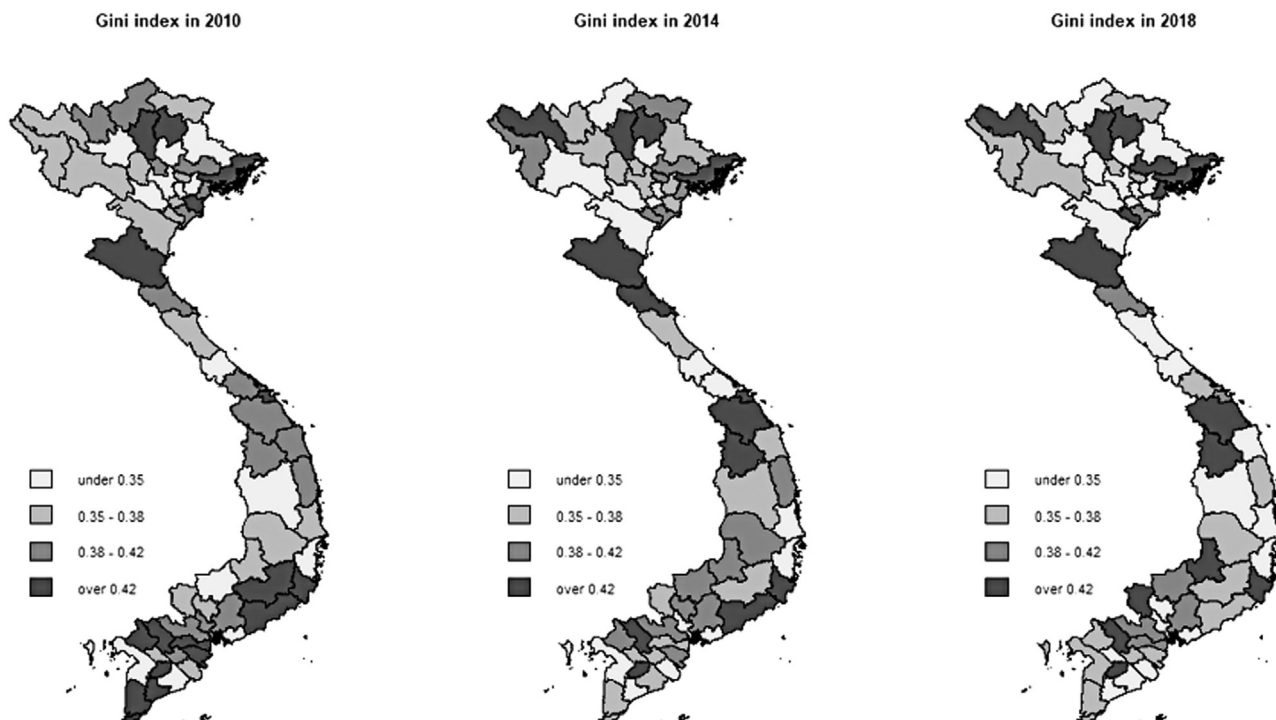


Figure 1. Changes in the Gini coefficient in Vietnam, 2010-2018. Source: Authors' calculation from the Vietnam Household Living Standard Surveys (VHLSS).

of the h -th group and $Y_n = \sum_{i=1}^{n_h} y_{h_i}$. Accordingly, the results presented in **Table 1** show that the contribution to reducing inequality in Vietnam after 2014 is predominantly from the within inequality component. Also, the decline in inequality before 2014 made a significant contribution to dealing with the income gap between provinces/cities.

Vietnam's Gini coefficient remained relatively stable at 0.42/0.43 points throughout the 2010-2019 period before falling to 0.37 in 2020, but underwent change throughout the study period, as shown in **Figure 1**. In general, income inequality in Vietnam has not changed significantly (see the color-coded changes in **Figure 1**), except for some provinces and cities in the Mekong Delta.

The income gap between the fifth quintiles (the 20% wealthiest people) and the first quintiles (the 20% poorest people) continually declined from 4.29 times (2010) to 3.30 times (2020) (General Statistical Office [GSO], 2022). Relative inequality also decreased due to improvements in services for basic human needs. Accordingly, the percentage of the population with access to sanitation, clean water, electricity, and literacy was 96.3%, 99%, and over 98%, respectively. Almost seven-tenths of the population had access to internet services. The average Vietnamese life expectancy rose to its current 75.4 years, and the average number of years of schooling increased from 7.45 (2012) to 9.0 (2019) (World Bank [WB], 2020). From 2010 to 2020, inequality in Vietnam was greater in households headed by women than by men, and in rural as opposed to urban areas (see **Figure 2**). Benjamin, Brandt, and Mc-

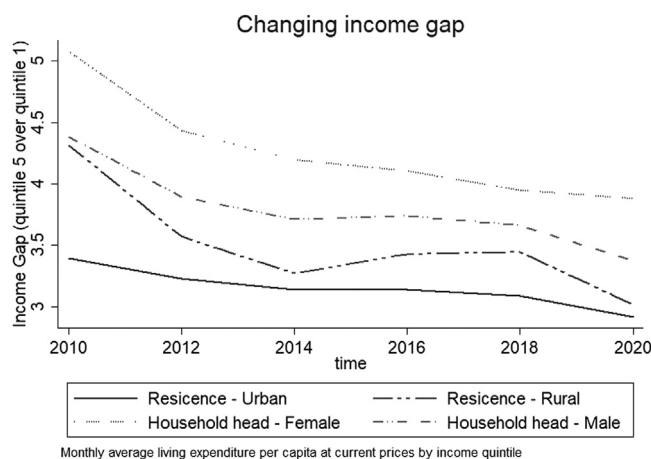


Figure 2. Income gap between fifth and first quintiles in Vietnam, 2010-2020. Source: Authors' calculation from the Vietnam Household Living Standard Surveys (VHLSS).

Caig (2017) explain that the decline in inequality in Vietnam between 2002 and 2014 resulted from a significant reduction in the inequality-increasing effect of wage-labor markets, agricultural opportunities, and remittances. Moreover, the decline in inequality is also the result of the initial success of the process combating (mul-

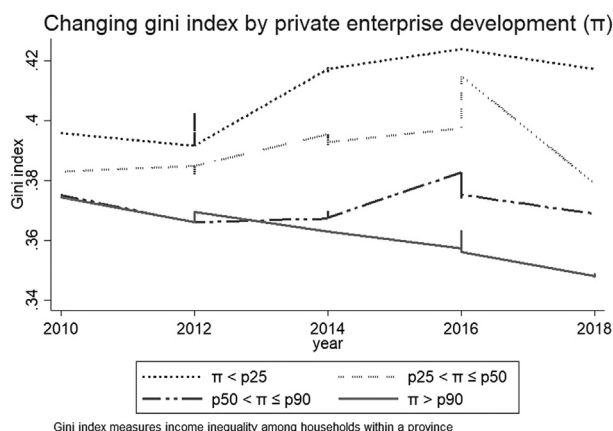
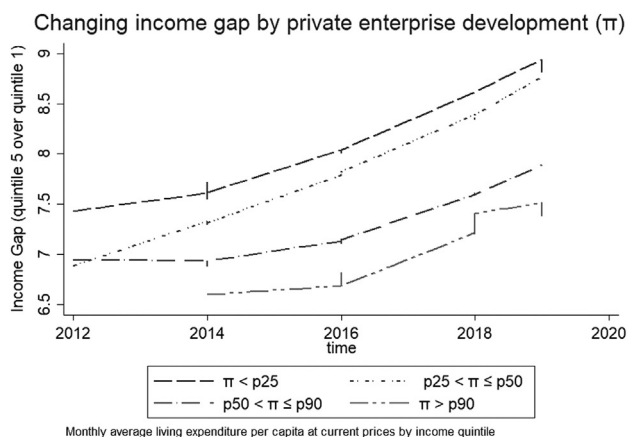


Figure 3. Income gap between 5th quintile and 1st quintile by private sector development. Source: Authors' calculation from the Vietnam Household Living Standard Surveys (VHLSS).

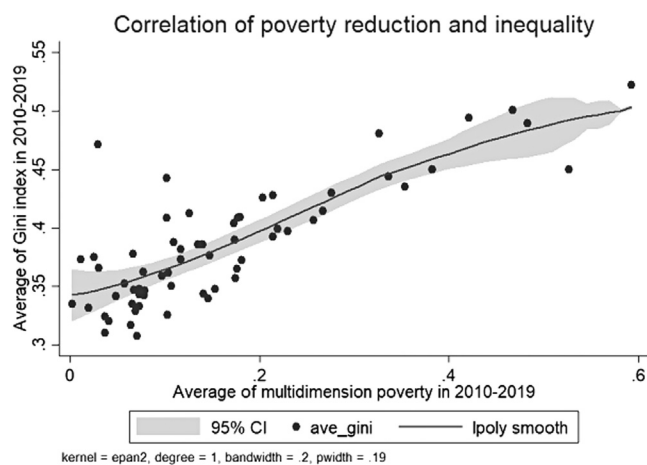


Figure 4. Gini coefficient by private sector development

tidimensional) poverty (see Appendix 1), in which the growth of private enterprise is a critical driving factor (Van Le et al., 2022).

Schmitz et al. (2015) maintain that the relative independence of local growth policies has led to a significant disparity in socio-economic development. In conjunction with the “Hoku” policy in Vietnam, which offers more favorable terms to permanent than to temporary residents, this factor partly restricts the freedom to move labor resources between provinces and cities (Malesky & London, 2014). These arguments imply that controlling for fixed effects at the sub-national level is particularly important in studying inequality in Vietnam. The correlation between PSD and inequality in Vietnam is vividly illustrated in Figures 3 and 4. Provinces with a higher number of private enterprises show significantly lower inequality, reflected by the Gini coefficient and the income gap between the fifth quintile and the first quintile.

3. Methodology and data

3.1. Data

Our study utilizes four sources of provincial data collected for 63 provinces and cities from 2010 to 2018. First, the Gini coefficient represents the income inequality index calculated from the Vietnam Household Living Standard Surveys (VHLSS) in 2010, 2012, 2014, 2016, and 2018 (Adams Jr, 2004). Second, the data on socio-economic characteristics are taken from the Provincial Statistical

Yearbook 2010–2020 (General Statistical Office [GSO], 2022). Third, we use data from the provincial governance and public administration performance index (PAPI), which measures the quality of provincial public governance (more detail in Appendix 2). Fourth, the data source describing the quality of provincial public governance in Vietnam is found in the provincial competitive index (PCI) (more detail in Appendix 3). These datasets are then merged to generate a strongly balanced provincial dataset. The definition and measurement of included variables and their descriptive statistics are given in Tables 2 and 3, respectively (the correlation table of these variables is given in Appendix 4).

3.2. Econometrics model

In Vietnam, based on our research in 63 Vietnamese provinces and cities (i) in 7 economic regions (j) from 2010 to 2019 (t), we can establish a causal nexus between private sector development and inequality discussed in terms of its impact on poverty reduction and per capita income growth (Adams Jr, 2004; Benjamin et al., 2017; Nguyen & Pham, 2018; Van Le et al., 2022). Mathematically, we have $inequality = f(private\ sector\ development, poverty, GDP\ per\ capita)$. Therefore, the econometric model is applied according to the following formula:

$$Y_{ijt} = \beta X_{ijt} + \sum_{k=1}^K \delta_k Z_{ijt} + \lambda t + \theta_i + \theta_j + \varepsilon_{ijt} \quad (3)$$

where Y represents the inequality index (i.e., the Gini coefficient); X represents private sector development as π , the ratio of private enterprises over 100 inhabitants/one billion VND in investment; described in detail in Table 2, Z is the control factor, such as poverty, literacy, and GDP per capita and is selected on the basis of previous studies; λ , θ_i , θ_j indicate time-trends and provincial and regional fixed-effects; ε represents the error term.

Focusing our study on the sub-national level has several advantages: (i) The independence of decision-making policy in certain localities—referred to as independent laboratories—and the freedom to relax the assumption of independent and identically distributed random variables (Schmitz et al., 2015); (ii) Eliminating inequality among localities through controlling for regional fixed effects. Furthermore, this panel also allows controlling for other critical factors (see Table 2) and examining appropriate instrumental variables (e.g., regional private sector development and provincial institutional quality).

Table 2
Variables, expectations, and their sources

Variables	Definition and measurement	Expected sign	Source
<i>Dependent variables</i>			
Gini coefficient and Theil T index	Measuring income inequality among households within a province and inequality between provinces/cities(Adams Jr, 2004).		Authors' calculation using the VHLSS data
<i>Independent variables</i>			
<i>Variable of interest</i>			
π , private enterprise rate	The ratio of employees in the private sector to the labor force (Jaxx, 2020; Van Le et al., 2022).	-	General Statistics Office
Private sector employees per 100 inhabitants	Reveals the size of private sector development by population.	-	General Statistics Office
Private sector employees per 1 billion VND in private investment	Reveals the scale of development of the private enterprise sector by (private) investment.	-	General Statistics Office
<i>Control variables</i>			
Multidimensional poverty rate	Poverty and inequality are closely related (Nguyen & Pham, 2018).	+	General Statistics Office
GDP per capita	Improvement in living standards can lead to an increase in inequality because of differences in individual capabilities (Nguyen & Pham, 2018).	+	General Statistics Office
Literacy	Education improves people's employment opportunities.	-	General Statistics Office
FDI inflows	FDI inflows create spillover effects in the economy with the domestic private sector and job creation (Ni, Spatareanu, Manole, Otsuki, & Yamada, 2017).	-/+	General Statistics Office
Forestry land	Forest land area can help reduce poverty for mountain residents (Tran, 2016; Viet Cuong, 2011).	-	General Statistics Office
Urbanization rate	Urbanization can create more local job opportunities, thereby reducing inequality (Nguyen & Pham, 2018).	-	General Statistics Office
PAPI index	Good public governance reduces inequality via lowering poverty (Nguyen, Giang, Tran, & Do, 2021).	-	PAPI Vietnam
Rainfall	Controlling environmental factors in tropical climates (Vietnam);	-/+	General Statistics Office
Temperature	adaptation to variations in climate change (Kjellstrom et al., 2016).	+	General Statistics Office
Government spending for development	Vietnam makes an inefficient but fair budget allocation from the central to the local level, thus producing inequality among regions (Thanh, IHart, & Canh, 2020).	-/+	General Statistics Office
Government expenditure on social relief		-/+	General Statistics Office
Number of medical facilities in log	Inequality in health leads to income inequality (Deaton, 2008, 2013).	-	General Statistics Office
Time-trend (t)	Unobserved factors that affect reduction in inequality and that change over time.	-	Dummy variable
δ_i	Controlling for invariant unobservable factors at the sub-national level.	-/+	Fixed-effects model

Source: Authors

3.3. Endogeneity

Coefficients in Equation (3) estimated by ordinary least squares (OLS) and fixed effects estimators may be biased and inconsistent due to simultaneity issues (Wintoki et al., 2012). Specifically, high inequality can affect the development of the private sector. When the outcome may be determined by the degree of inequality, simultaneity is inevitable. Furthermore, given the potential dynamic endogeneity issue—that current PSD is determined by inequality in the past—the fixed-effects estimator will yield bias and inconsistent results. To deal with these issues, we apply two-stage least squares (2SLS)/XT-IV and two-step generalized method of moments (GMM) estimators. The two instrumental variables used to ensure the consistency of the result are (i) the provincial competitive index (PCI) (Van Le et al., 2022) and (ii) average regional PSD by year (Fisman & Svensson, 2007). Meanwhile, given a strong balanced panel and the potential dynamic endogeneity issue, the GMM estimator is dominant over the 2SLS estimator discussed in Roodman (2009); Wintoki et al. (2012).

The PSD of province i in economic region j in period t (X_{ijt}) is affected by: (i) Regional private sector development (X_{jt}), which is assumed to be an exogenous event for a province or city (an exogenous factor of Model (3)), in which development depends mainly on the socio-economic situation of the country, an assumption that implies that $cov(X_{jt}, \varepsilon Z) = 0$; (ii) The Provincial Competitive Index (PCI). Malesky and Taussig (2009); Viet, M.Walle, and Herwartz (2020) (cited by Van Le et al. (2022)) confirm the relevant assumption for PCI and PSD. Van Le et al. (2022) also argue that the exclusion condition (i.e., the PCI interacts with improvement in the quality of public service over time ownership to the model's

error term) can be guaranteed by controlling for the PAPI index, representing citizen perception of the quality of public governance. In other words, the study assumes that $Cov(u, PCI | PAPI, X, Z) = 0$. Furthermore, one-year lagged instruments are chosen, emphasizing the dynamic interaction of past factors. This hypothesis is verified through the AR (1) and AR (2) tests presented in the study; (iii) Other confounding factors $cov(\eta_{ijt}, \varepsilon) \neq 0$.

$$X_{ijt} = X_{jt} + PCI_{ijt} + \eta_{ijt} \tag{4}$$

Thus, the first stage regression in Equation (3) follows the formula.

$$X_{ijt} = f(X_{jt}, PCI_{ijt}, X_{ijt-1}, Z_{Kijt}) \tag{5}$$

4. Results

The results in Table 4 show the causal effect between PSD (index π) and the Gini coefficient, reflecting the level of inequality in Vietnam's provinces and cities from 2010–2018. Accordingly, columns (1) and (3) of Table 4 report coefficients estimated through OLS and fixed-effects estimators. These results may be biased and inconsistent if Equation (3) has simultaneous issues, where inequality influences PSD, given control variables, fixed effects, and time-trend. Table 4, columns (4) and (5), reports the results of IV and GMM estimations, in which the two instrumental variables used are (i) regional private sector development (X_{jt}) and (ii) PCI coupled with one-year lagged instruments. The suitability of the instrumental variable was verified through AR (1) and AR (2) serial correlation tests, the Hansen test of overidentification, and the diff-in-Hansen exogeneity tests. Given a strongly

Table 3
Descriptive variables

	unit	2012		2014		2016		2018	
		mean	SD	mean	SD	mean	SD	mean	SD
Gini coefficient	[0,1]	0.376	0.050	0.390	0.060	0.396	0.080	0.373	0.060
Theil T index	[0,1]	0.262	0.100	0.301	0.150	0.368	0.500	0.274	0.100
Variable of interest									
Private enterprise rate (π)	[0,1]	0.873	0.100	0.887	0.100	0.910	0.080	0.925	0.070
Domestic private enterprise (DPE)	[0,1]	0.707	0.170	0.694	0.190	0.690	0.190	0.692	0.200
Multidimensional enterprise (MNE)	[0,1]	0.166	0.180	0.193	0.210	0.220	0.210	0.233	0.220
Private sector employees per 100 inhabitants	person	8.129	8.240	9.421	9.920	9.807	8.580	10.285	8.850
Private sector employees per 1 billion VND in private investment	person	.	.	11.657	12.510	9.189	8.200	7.538	6.290
Instruments									
PCI index		57.018	4.150	58.073	3.240	58.887	2.930	63.315	2.360
Average of the private enterprise rate by region and year	[0,1]	0.873	0.040	0.887	0.050	0.910	0.030	0.925	0.030
Control variables									
Multidimensional poverty rate	[0,1]	0.198	0.150	0.162	0.140	0.129	0.120	0.098	0.100
GRDP per capita	Dong (million)	28.396	27.620	32.339	29.330	37.877	30.850	43.009	31.170
Urbanization rate	[0,1]	0.266	0.170	0.277	0.170	0.287	0.180	0.291	0.180
Log of forest land	Hectares (thousand)	5.049	1.359	5.051	1.357	5.063	1.341	5.064	1.333
Rainfall	mm	1,767.36	407.53	1,720.36	472.54	1,978.23	569.07	1,893.56	476.22
Temperature		25.227	2.190	25.149	2.000	25.503	2.060	25.411	2.030
Government spending for development	Dong (million)	2,810.22	3,722.13	3,006.32	4,411.53	3,574.06	4,428.61	4,920.37	4,921.50
Government expenditure on social relief	Dong (million)	344.10	285.93	422.32	470.68	576.87	553.75	645.03	596.23
Literacy	[0,1]	0.928	0.070	0.926	0.070	0.932	0.070	0.929	0.070
Number of medical facilities in log	1 unit	196.937	118.500	202.937	117.720	202.746	116.620	202.755	115.960
PAPI index		36.446	1.880	36.162	2.230	35.988	1.650	36.251	1.230
FDI implemented	US dollars (million)	146.565	299.460	211.879	479.160	236.540	435.680	255.144	521.940
Mechanism explanation variables									
Unskilled & skilled manual workers	People	645,325	392,347	621,513	409,457	623,916	366,020	584,610	350,153
Unskilled & skilled manual female workers	People	305,490	194,852	290,734	201,843	289,196	176,829	270,098	169,002
Observation		63		63		63		63	

Source: Authors' calculation using the data from the GSO, PAPI and VHLSS. Note: Nominal values have been converted to the 2010 base year. The PAPI index has been formulated since 2011, and the proportion of investment capital in the economy by type of ownership (i.e., private and public investment) has been calculated since 2014. The entry "." indicates no available data.

balanced panel and the potential dynamic endogeneity issue, the GMM estimator is dominant over the 2SLS estimator discussed in Roodman (2009); Wintoki et al. (2012).

The results in Table 4 show clear evidence of PSD damping income inequality in some localities in Vietnam. Specifically, Table 4, column (5), applying the GMM estimator yields a consistent coefficient (-0.26), with a 95% confidence interval of (-0.44; -0.09). In other words, each percentage point increase in PSD would reduce the Gini coefficient by an average of about 0.26%, holding all other variables in Model (3) constant. These results are consistent with previous studies affirming the role of job creation in improving the efficiency of income distribution among formally employed workers (Deaton, 2013; Hayek, 1980; Milton & Rose, 1980; Sen, 2014). We consider its mechanism through the channel of GDP per capita. Table 4, columns (2) and (6), describes the nexus of PSD and income inequality without controlling for GDP per capita. Coupled with the findings of Van Le et al. (2022) about alleviating the poverty that results from PSD, the significantly higher absolute value of coefficients in column (2) compared to column (1), and column (6) compared to column (5), confirms the argument of previous scholars about the complex interaction among the factors of inequality, poverty, and economic growth (Adams Jr, 2004; Benjamin et al., 2017; Nguyen & Pham, 2018; Van Le et al., 2022). This study also finds that domestic private and multinational sec-

tor growth reduce income inequality (see Table 5). Accordingly, a 1% increase in the number of domestic private enterprises (π_1) and enterprises in the multinational sector (π_2) leads to an average reduction of about 0.240% and 0.348%, respectively, in the Gini coefficient, keeping all other factors constant. The study similarly estimates the formula in Tables 4 and 5 with the Theil T index; its coefficients confirm our expectations (Appendix 5).

As discussed in Section 2.2, the use of π to evaluate PSD may not reflect the level of this development in relation to population density and capital size. In other words, the π index cannot reflect the number of workers or enterprises in the private sector when the population is larger and the market more competitive (e.g., by entering into free trade agreements and increasing FDI flows). Moreover, firm size partly influences the reduction of inequality in Vietnam. Consequently, Table 6 uses other variables to represent PSD, including the number of private employees or enterprises per 100 inhabitants and per one billion VND in private investment. It should also be noted by the Ministry of Planning and Investment (2020) that during 2010–2020, the proportion of large-scale enterprises did not change significantly, fluctuating from 2–3%. The results once again confirm the role of PSD in inequality in Vietnam, especially in expansion in the multinational sector.

Following the approach by Le et al. (2022), we also check the robustness by testing several hypotheses: (i) Does the increasing

Table 4
Regression model results with OLS, FEM, 2SLS, and GMM

VARIABLES	(1) OLS	(2) OLS	(3) FEM	(4) XT-IV	(5) GMM	(6) GMM
Private sector rate (π)	-0.080** (0.039)	-0.114** (0.052)	-0.060 (0.117)	-0.568* (0.317)	-0.263*** (0.090)	-0.273** (0.108)
Multidimensional poverty	0.285*** (0.069)	0.257*** (0.062)	-0.289** (0.121)	-0.363*** (0.128)	0.492*** (0.148)	0.247* (0.124)
Log of GDP per capita	0.038* (0.023)		-0.050 (0.042)	-0.066 (0.044)	0.057* (0.033)	
Urbanization rate	-0.049 (0.032)	-0.004 (0.017)	0.058 (0.139)	0.191 (0.155)	-0.191* (0.104)	-0.106 (0.100)
Log of rainfall	-0.008 (0.014)	-0.006 (0.014)	-0.014 (0.017)	-0.002 (0.017)	-0.084** (0.034)	-0.102** (0.047)
Log of temperature	-0.132* (0.079)	-0.141* (0.075)	-0.102 (0.158)	-0.032 (0.161)	0.243** (0.119)	0.166 (0.182)
Government spending for development	-0.000 (0.005)	0.002 (0.006)	0.002 (0.005)	-0.002 (0.005)	0.010 (0.016)	0.009 (0.014)
Government expenditure on social relief	-0.004 (0.005)	-0.002 (0.005)	0.003 (0.009)	0.010 (0.010)	-0.001 (0.014)	0.002 (0.033)
Literacy	-0.048 (0.113)	-0.034 (0.111)	-0.167 (0.277)	-0.013 (0.288)	0.028 (0.222)	-0.248 (0.270)
Number of medical facilities in log	0.000 (0.008)	-0.001 (0.009)	0.004 (0.018)	0.006 (0.019)	-0.024 (0.037)	-0.021 (0.037)
Log of PAPI index	0.006 (0.054)	0.011 (0.054)	-0.066 (0.069)	-0.083 (0.072)	0.134 (0.146)	0.119 (0.237)
Log of forest land	-0.005 (0.003)	-0.008* (0.004)				
Regional dummy	YES	YES				
Year dummy	YES	YES	YES	YES	YES	YES
Constant	0.849*** (0.298)	0.972*** (0.294)	1.391** (0.641)		-0.203 (0.797)	
Observations	252	252	252	252	252	252
R-squared	0.549	0.519	0.128	-0.033		
Number of panels			63	63	63	63
Sanderson-Windmeijer (SW) under-identification tests (p-value)				0.000		
Sanderson-Windmeijer (SW) weak identification (F-value)				15.460 ¹		
AR (1) test (p-value)					0.090	0.087
AR (2) test (p-value)					0.900	0.545
Hansen test of over-identification (p-value)					0.758	0.431
Diff-in-Hansen tests of exogeneity					0.478	0.112

Note: Robust standard errors in parentheses.

*** p<0.01,

** p<0.05,

* p<0.1. GMM method using (a) 1-year lagged independent variables and (b), the regional and yearly average of the private enterprise rate as instruments. Year dummies are considered to be exogenous. XT_IV: IV with fixed effects. The observations are 252 (63 provinces/cities in 2012, 2014, 2016, 2018). The Gini coefficient 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 has been calculated since 2011.

¹ Stock-Yogo weak ID F test critical values for single endogenous regressor is 11.59 at 15% maximal IV size.

labor rate in the state sector (placebo1) dampen inequality? (ii) Does the prospect of domestic economic development contribute to a reduction in inequality? (iii) Does eliminating domestic private sector growth still reduce the Gini coefficient? The second hypothesis implies that factors that reduce inequality originate only from domestic economic opportunity (both private and public) but not from π . We replace π with the variable placebo1 in column (1) of Table 7. Placebo2 represents the ratio of employment in domestic public and private enterprises (Table 7, column [2]), and placebo3 represents the ratio of employment in public and multinational enterprises (Table 7, column [3]). In addition, Table 7, column (4), considers the problem of reverse causality by replacing π_t with π_{t+1} (or placebo4). In this case, if any coefficient of the placebo* variable in Table 7 is negative and statistically significant, this will weaken the theory of the impact of PSD on the reduction of income inequality. The coefficients in Table 7 are consistent with expectations. Households often have multiple income earners and a possible channel by which private sector expansion might mitigate poverty and inequality would be to provide secondary earners, especially women with more low-income jobs. This in turn can complement or stabilize household income that would otherwise

be reliant on a single primary earner. This mechanism is verified through regression results in Appendix 6, which confirm that the PSD really increased the number of unskilled and skilled manual jobs, notably for female workers.

5. Conclusion and policy implications

Inequality is undoubtedly a fundamental issue. Does the private sector increase inequality? On the one hand, the private sector is a job creator, a source of radical, incremental innovation, of diverse and cheap products, a mainstay of the national budget, and consequently addresses socio-economic and environmental issues (Buhmann et al., 2019; Rashed & Shah, 2021). On the other hand, private sector development (PSD) can exacerbate national inequality by diversifying economic opportunity, erode corporate social responsibility and existing mechanisms for protecting the vulnerable from shocks to the economy (De Silva & Sumarto, 2014; Miletzki & Broten, 2017; Shamir, 2004; Winters et al., 2004). This study provides fresh evidence for the role of PSD in reducing inequality in the transitional country of Vietnam.

Table 5
Regression results of the impact of DPE and MNE on inequality

VARIABLES	(1) GMM	(2) GMM	(3) GMM
DPEs ($\pi 1$)	-0.206** (0.087)		-0.240** (0.111)
MNEs ($\pi 2$)		-0.142*** (0.049)	-0.348*** (0.129)
Multidimensional poverty	0.212 (0.378)	0.441*** (0.106)	0.372** (0.149)
Log of GDP per capita	-0.047 (0.083)	0.089** (0.037)	0.094* (0.052)
Urbanization rate	0.171 (0.142)	-0.254** (0.126)	-0.279 (0.183)
Log of rainfall	-0.061 (0.076)	-0.060 (0.043)	-0.092** (0.045)
Log of temperature	-0.067 (0.230)	0.243*** (0.075)	0.268* (0.135)
Government spending for development	-0.013 (0.020)	0.015 (0.015)	0.008 (0.013)
Government spending on social relief	0.043 (0.050)	-0.024 (0.021)	-0.012 (0.019)
Literacy	-0.133 (0.516)	0.156 (0.205)	-0.087 (0.319)
Number of medical facilities in log	0.017 (0.089)	-0.006 (0.026)	0.003 (0.038)
Log of PAPI index	0.147 (0.273)	0.010 (0.127)	0.001 (0.159)
FDI implemented in log	-0.021** (0.010)		
Year dummy	YES	YES	YES
Constant	0.726 (1.748)	-0.318 (0.554)	0.238 (0.697)
Observations	252	252	252
Number of panels	63	63	63
AR (1) test (p-value)	0.086	0.098	0.069
AR (2) test (p-value)	0.703	0.892	0.925
Hansen test of over-identification (p-value)	0.946	0.749	0.911
Diff-in-Hansen tests of exogeneity	0.946	0.341	0.406

Note: Robust standard errors in parentheses.

*** p<0.01,

** p<0.05,

* p<0.1. GMM method using (a) year lagged independent variables and (b) the regional and yearly average of the private enterprise rate as instruments. Year dummies are considered to be exogenous. XT_IV: IV with fixed effects. There are 252 observations (63 provinces/cities in 2012, 2014, 2016, 2018). The Gini coefficient is calculated from the Household Living Standards Survey (VHLSS database). This data set is collected every two years (2010, 2012, 2014, 2016, and 2018), and the PAPI has been calculated since 2011.

The study applies a GMM estimator, using provincial panel data for 2010–2019 to take into account an invariant-unobservable, simultaneous, and potentially endogenous issue, then yields a consistent result (Wintoki et al., 2012). Eliminating disparities in the economic development of provinces and cities in Vietnam by controlling for provincial and regional fixed effects, we show that a 1% increase in PSD, measured by the ratio of the total labor of private enterprises over the labor force, and termed the π index, will contribute to reducing inequality by 0.263% on average. Notably, this effect is also true for both the domestic private and multinational sectors. This nexus is confirmed by (i) examining the impact of PSD by population density and private investment, and (ii) asserting the role of PSD in a complex interaction between economic growth, inequality, and poverty reduction. The results are similar to research findings by previous scholars (Adams Jr, 2004; Benjamin et al., 2017; Nguyen & Pham, 2018; Van Le et al., 2022). Accordingly, as a socialist-oriented market economy, Vietnam needs to leave room for the contribution of the private sector to improving social welfare instead of relying solely on government welfare programs.

However, rather than being overly persuaded by optimistic neo-classical and Austrian views (Deaton, 2013; Hayek, 1980; Milton & Rose, 1980; Sen, 2014), we see a trend towards increasing inequality in the northern mountainous region of Vietnam (Nguyen et al., 2020; Tran, 2016). Inequality in employment opportunities and

wages between women and men are much in evidence (Dang & Nguyen, 2021), and the evolution of PSD in Vietnam favors industry and is unsustainable for agriculture (Barker & Üngör, 2019). This is a limitation of the study. Moreover, market mechanisms “are part of the way human beings in society live and interact with each other (unless stopped by regulation or fiat). The contribution of the market mechanism to economic growth is, of course, important, but this comes only after the direct significance of the freedom to interchange - words, goods, gifts - has been acknowledged” (Miletzki & Broten, 2017, p. 6). Thus, improving the effectiveness of government intervention in income distribution remains a crucial task, in which supporting social enterprises—the “third way” pointed out by Miletzki & Broten (2017)—is a wise and advantageous strategy.

Conflict of Interest Statement

The author agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare absence of conflicting interests with the funders.

Acknowledgements

The authors declare that there is no conflict of interest in this research

Table 6
The impact of PSD on inequality given different proxies

VARIABLES	(1) OLS	(2) GMM	(3) GMM	(4) OLS	(5) GMM
Private sector employees per 100 inhabitants	-0.001*** (0.000)	-0.003** (0.001)			
Domestic private enterprise (DPE) employees per 100 inhabitants			-0.002** (0.001)		
Multinational private enterprise (MNE) employees per 100 inhabitants			-0.006*** (0.002)		
Private sector employees per 1 billion VND in private investment in the economy				-0.001*** (0.000)	-0.001*** (0.000)
Multidimensional poverty	0.365*** (0.068)	0.415*** (0.112)	0.400*** (0.127)	0.489*** (0.083)	0.691*** (0.168)
Log of GDP per capita	0.036 (0.023)	0.045 (0.027)	0.064** (0.028)	0.036 (0.028)	0.060 (0.042)
Urbanization rate	-0.018 (0.025)	-0.060 (0.088)	-0.076 (0.101)	-0.051 (0.035)	-0.130 (0.108)
Log of rainfall	-0.006 (0.012)	-0.061* (0.032)	-0.069* (0.038)	-0.009 (0.015)	-0.037 (0.028)
Log of temperature	0.043 (0.052)	0.179* (0.092)	0.180 (0.130)	0.076 (0.072)	0.192 (0.169)
Government spending for development	-0.000 (0.005)	0.014 (0.017)	0.021 (0.015)	-0.002 (0.005)	0.011 (0.013)
Government expenditure on social relief	-0.005 (0.005)	-0.016 (0.015)	-0.018 (0.018)	-0.000 (0.006)	0.008 (0.020)
Literacy	0.006 (0.089)	0.032 (0.244)	-0.002 (0.232)	0.004 (0.107)	0.195 (0.249)
Number of medical facilities in log	0.002 (0.007)	-0.005 (0.026)	-0.011 (0.028)	-0.007 (0.010)	-0.043 (0.034)
Log of PAPI index	0.016 (0.053)	0.071 (0.148)	0.056 (0.177)	0.024 (0.059)	0.209 (0.178)
Year dummy	YES	YES	YES	YES	YES
Constant	0.072 (0.295)	-0.182 (0.609)	-0.090 (0.767)	-0.009 (0.353)	-1.053 (0.977)
Observations	252	252	252	186	186
R-squared	0.502			0.562	
Number of panels		63	63		62
AR (1) test (p-value)		0.097	0.079		0.209
AR (2) test (p-value)		0.925	0.945		.
Hansen test of over-identification (p-value)		0.562	0.444		0.309
Diff-in-Hansen tests of exogeneity		0.205	0.295		0.309

Note: Standard errors in parentheses.

*** p<0.01,

** p<0.05,

* p<0.1. The Gini coefficient 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 calculated since 2011. The proportion of investment capital in the economy by type of ownership (i.e., private and public investment) has been computed since 2014. Thus, the observations in columns (5), and (6) cover three years (2014, 2016 and 2018), with private sector employees per 1 billion VND in private investment in the economy as the independent variable.

Table 7
Robustness check

VARIABLES	(1) GMM1	(2) GMM2	(3) GMM3	(4) GMM4
State sector rate (placebo1)	0.235*** (0.077)			
State and multinational sector rate (placebo2)		0.071 (0.104)		
Domestic sector rate (placebo3)			0.142*** (0.052)	
Private sector rate _{t+1} (π_{t+1}) (placebo4)				-0.089 (0.170)
Multidimensional poverty	0.500*** (0.157)	0.434* (0.236)	0.441*** (0.144)	0.828*** (0.307)
Log of GDP per capita	0.050 (0.031)	-0.002 (0.069)	0.086** (0.041)	0.118 (0.088)
Urbanization rate	-0.154 (0.095)	0.046 (0.199)	-0.232* (0.135)	-0.197 (0.183)
Log of rainfall	-0.097** (0.039)	-0.043 (0.040)	-0.066 (0.045)	-0.067 (0.091)
Log of temperature	0.242** (0.113)	0.379 (0.227)	0.218** (0.099)	0.512 (0.388)
Government spending for development	0.014 (0.012)	-0.014 (0.020)	0.009 (0.015)	-0.002 (0.019)
Government expenditure on social relief	-0.007 (0.014)	-0.013 (0.037)	-0.017 (0.021)	-0.003 (0.046)
Literacy	0.021 (0.261)	0.133 (0.408)	0.151 (0.298)	0.418 (0.402)
Number of medical facilities in log	-0.026 (0.027)	0.111 (0.089)	-0.005 (0.041)	0.016 (0.077)
Log of PAPI index	0.180 (0.137)	-0.379** (0.164)	0.012 (0.141)	0.327 (0.318)
Year dummy	YES	YES	YES	YES
Constant	-0.499 (0.772)	0.253 (1.265)	-0.340 (0.592)	-2.753 (2.369)
Observations	252	252	252	252
Number of panels	63	63	63	63
AR (1) test (p-value)	0.069	0.095	0.095	0.092
AR (2) test (p-value)	0.801	0.580	0.892	0.340
Hansen test of over-identification (p-value)	0.766	0.866	0.537	0.409
Diff-in-Hansen tests of exogeneity	0.499	0.996	0.164	0.567

Note: Robust standard errors in parentheses.

*** p<0.01,

** p<0.05,

* p<0.1. GMM method using year lagged independent variables as instruments; year dummies are considered to be exogenous. XT_IV: IV with fixed effects. There are 252 observations (63 provinces/cities in 2012, 2014, 2016, 2018). The Gini coefficient is calculated from the Household Living Standards Survey (VHLSS database), carried out every two years (2010, 2012, 2014, 2016, and 2018). The PAPI has been computed since 2011.

Appendix 1. Correlation of poverty reduction and the Gini coefficient

	gini	rate_pri	pri_pe~a	pri_pe~v	mul_pov	grdp_pc	urban_~e	lrain	ltemp
rate_pri	-0.254	1.000							
pri_per_inha	-0.381	0.235	1.000						
pri_per_inv	-0.065	0.217	0.529	1.000					
mul_pov	0.709	-0.340	-0.428	0.027	1.000				
grdp_pc	-0.022	-0.025	0.459	-0.029	-0.358	1.000			
urban_rate	-0.210	-0.202	0.483	-0.009	-0.318	0.568	1.000		
lrain	-0.071	-0.086	0.193	0.014	-0.085	0.007	0.152	1.000	
ltemp	-0.366	0.345	0.188	0.029	-0.591	0.205	0.267	0.038	1.000
lgor_s1	-0.270	-0.002	0.414	0.044	-0.329	0.355	0.321	0.064	-0.031
lgor_s2	-0.416	0.222	0.354	-0.007	-0.551	0.268	0.234	0.124	0.238
literacy	-0.605	0.255	0.355	0.060	-0.809	0.214	0.156	-0.006	0.390
lmed	-0.066	-0.057	0.053	-0.019	0.027	-0.098	-0.152	-0.027	-0.370
lpapi	-0.123	0.100	0.026	0.040	-0.177	0.071	-0.056	0.005	0.002

Appendix 2. The Viet Nam Provincial Governance and Public Administration Performance Index (PAPI)

The Viet Nam Provincial Governance and Public Administration Performance Index (PAPI)

Established in Vietnam in 2009, the PAPI index is a collaboration between the Center for Community Support Development Studies (CECODES) under the Viet Nam Union of Science and Technology Associations (VUSTA) and the United Nations Development Program (UNDP). However, the official data have only been published and updated since 2011 (<https://papi.org.vn>). It is the most significant Vietnam’s social survey that considers the government performance in some respects such as implementation, monitoring, formulation, and public services.

The philosophy of the PAPI index is to consider citizens as “users” and public authorities as service providers. Thus, it reflects the quality of local public administrations and governance.

By the end of 2020, the experiences of 146,233 residents were surveyed with the PAPI index. The index included six dimensions, i.e., vertical accountability, participation, transparency, public administrative procedures, and delivery of public services until 2017. Since 2018, the PAPI index has added two additional dimensions, i.e., environmental governance and e-governance, to consider Vietnam’s digital transformation goals.

Appendix 3. The Provincial Competitiveness Index (PCI)

The Provincial Competitiveness Index (PCI)

In order to create a business-enabling environment and enhance local government governance in Vietnam, the U.S. Agency for International Development (USAID) and the Viet Nam Chamber of Commerce and Industry (VCCI) originates the provincial competitiveness index (PCI).

The index evaluates the degree to which the business environment and the government’s administrative reform efforts favor the development of Vietnam’s private sector.

It reflects the enterprise community’s voice about the business environment at localities. In which the index contains ten sub-indices, i.e., the entry costs (i); land access and security (ii); transparency and access to information (iii); time costs and regulatory compliance (iv); informal charges (v); policy transparency (vi); proactivity of provincial leadership (vii); business support services (viii); labor and training (ix); and legal institutions (x). The study additionally controls for the PAPI index with the expectation that covariance ($\pi, u \mid PAPI, X, Z$) = 0.

Appendix 4. Correlation table

	gini	rate_pri	pri_pe~a	pri_pe~v	mul_pov	grdp_pc	urban_~e	lrain	ltemp
rate_pri	-0.254	1.000							
	-0.381	0.235	1.000						
pri_per_inha									
pri_per_inv	-0.065	0.217	0.529	1.000					
mul_pov	0.709	-0.340	-0.428	0.027	1.000				
grdp_pc	-0.022	-0.025	0.459	-0.029	-0.358	1.000			
urban_rate	-0.210	-0.202	0.483	-0.009	-0.318	0.568	1.000		
lrain	-0.071	-0.086	0.193	0.014	-0.085	0.007	0.152	1.000	
ltemp	-0.366	0.345	0.188	0.029	-0.591	0.205	0.267	0.038	1.000
lgor_s1	-0.270	-0.002	0.414	0.044	-0.329	0.355	0.321	0.064	-0.031
lgor_s2	-0.416	0.222	0.354	-0.007	-0.551	0.268	0.234	0.124	0.238
literacy	-0.605	0.255	0.355	0.060	-0.809	0.214	0.156	-0.006	0.390
lmed	-0.066	-0.057	0.053	-0.019	0.027	-0.098	-0.152	-0.027	-0.370
lpapi	-0.123	0.100	0.026	0.040	-0.177	0.071	-0.056	0.005	0.002

Appendix 5. Robustness check with Theil T index

VARIABLES	(1) GMM-TheilT	(2) PDE-TheilT	(3) MNE-TheilT	(4) PSD-TheilT
Private sector rate (π)	-0.789** (0.390)			
DPEs (π 1)		-0.277** (0.137)		-0.623 (0.397)
MNEs (π 2)			-0.583** (0.246)	-1.100** (0.461)
Multidimensional poverty	2.569** (1.250)	0.661 (0.536)	2.265** (0.950)	2.529** (0.987)
Log of GDP per capita	0.568*** (0.198)	0.049 (0.101)	0.758*** (0.241)	0.789*** (0.253)
Urbanization rate	-1.106*** (0.323)	0.063 (0.183)	-1.335** (0.535)	-1.310** (0.552)
Log of rainfall	-0.294 (0.195)	-0.172** (0.079)	-0.161 (0.102)	-0.248 (0.262)
Log of temperature	1.549* (0.852)	0.257 (0.389)	1.403** (0.549)	1.499* (0.799)
Government spending for development	0.075 (0.052)	-0.007 (0.029)	0.037 (0.032)	0.059 (0.060)
Government expenditure on social relief	0.028 (0.073)	0.033 (0.039)	-0.018 (0.070)	0.002 (0.055)
Literacy	1.127 (1.860)	-0.044 (0.783)	1.704 (1.653)	1.709 (1.518)
Number of medical facilities in log	-0.194 (0.200)	-0.032 (0.096)	-0.133 (0.192)	-0.165 (0.225)
Log of PAPI index	-0.101 (0.699)	0.224 (0.405)	-0.013 (0.600)	-0.494 (0.660)
FDI implemented in log		-0.016 (0.017)		
Year dummy	YES	YES	YES	YES
Constant	-4.213 (5.494)	0.019 (2.707)	-6.399* (3.526)	-4.079 (3.800)
Observations	252	252	252	252
Number of panels	63	63	63	63
AR (2) test (p-value)	0.601	0.221	0.666	0.764
Hansen test of over-identification (p-value)	0.601	0.937	0.932	0.858
Diff-in-Hansen tests of exogeneity	0.601	0.840	0.764	0.292

Source: Authors. Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. GMM method using (a) 1-year lagged independent variables and (b), the regional and yearly average of the private enterprise rate as instruments. Year dummies are considered to be exogenous

VARIABLES	(1) GMM-TheilT	(2) PDE-TheilT	(3) MNE-TheilT	(4) PSD-TheilT
Private sector rate (π)	-0.789** (0.390)			
DPEs ($\pi 1$)		-0.277** (0.137)		-0.623 (0.397)
MNEs ($\pi 2$)			-0.583** (0.246)	-1.100** (0.461)
Multidimensional poverty	2.569** (1.250)	0.661 (0.536)	2.265** (0.950)	2.529** (0.987)
Log of GDP per capita	0.568*** (0.198)	0.049 (0.101)	0.758*** (0.241)	0.789*** (0.253)
Urbanization rate	-1.106*** (0.323)	0.063 (0.183)	-1.335** (0.535)	-1.310** (0.552)
Log of rainfall	-0.294 (0.195)	-0.172** (0.079)	-0.161 (0.102)	-0.248 (0.262)
Log of temperature	1.549* (0.852)	0.257 (0.389)	1.403** (0.549)	1.499* (0.799)
Government spending for development	0.075 (0.052)	-0.007 (0.029)	0.037 (0.032)	0.059 (0.060)
Government expenditure on social relief	0.028 (0.073)	0.033 (0.039)	-0.018 (0.070)	0.002 (0.055)
Literacy	1.127 (1.860)	-0.044 (0.783)	1.704 (1.653)	1.709 (1.518)
Number of medical facilities in log	-0.194 (0.200)	-0.032 (0.096)	-0.133 (0.192)	-0.165 (0.225)
Log of PAPI index	-0.101 (0.699)	0.224 (0.405)	-0.013 (0.600)	-0.494 (0.660)
FDI implemented in log		-0.016 (0.017)		
Year dummy	YES	YES	YES	YES
Constant	-4.213 (5.494)	0.019 (2.707)	-6.399* (3.526)	-4.079 (3.800)
Observations	252	252	252	252
Number of panels	63	63	63	63
AR (2) test (p-value)	0.601	0.221	0.666	0.764
Hansen test of over-identification (p-value)	0.601	0.937	0.932	0.858
Diff-in-Hansen tests of exogeneity	0.601	0.840	0.764	0.292

Source: Authors. Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. GMM method using (a) 1-year lagged independent variables and (b), the regional and yearly average of the private enterprise rate as instruments. Year dummies are considered to be exogenous.

Appendix 6. Impact of private sector development on unskilled and skilled manual workers in Vietnam, 2010-2018

VARIABLES	OLS All	GMM All	All	OLS Female	GMM Female	Female
	(1)	(2)	(3)	(4)	(5)	(6)
Private sector rate (π)	0.300* (0.168)	0.524* (0.304)		0.437** (0.190)	0.700** (0.302)	
DPEs ($\pi 1$)			0.898* (0.496)			0.753** (0.363)
MNEs ($\pi 2$)			0.723** (0.361)			0.902** (0.367)
Log of GDP	0.033 (0.066)	0.054 (0.140)	0.070 (0.165)	0.049 (0.069)	0.154 (0.170)	0.109 (0.159)
Log of population	0.607*** (0.174)	0.500 (0.326)	0.492* (0.293)	0.554*** (0.182)	0.391 (0.316)	0.453 (0.311)
Urbanization rate	-0.405*** (0.137)			-0.617*** (0.148)	-0.407 (0.419)	-0.265 (0.496)
Log of rainfall	-0.060 (0.046)	0.038 (0.053)	0.035 (0.089)	-0.016 (0.049)	0.089 (0.124)	0.125 (0.122)
Log of temperature	-0.534* (0.303)	-0.457 (0.693)	-0.570 (0.651)	-1.131*** (0.338)	-1.436** (0.580)	-1.397** (0.641)
Government spending for development	-0.033 (0.025)	-0.051 (0.069)	-0.017 (0.051)	-0.019 (0.028)	-0.012 (0.063)	
Government expenditure on social relief	0.068 (0.043)	0.030 (0.084)		0.083* (0.045)		
Literacy	-0.499 (0.330)	-0.181 (0.691)	-0.195 (0.787)	-0.326 (0.338)	0.444 (0.757)	
Number of medical facilities in log	0.251** (0.116)	0.388 (0.235)	0.373 (0.262)	0.280** (0.124)	0.344* (0.185)	0.368 (0.241)
Log of PAPI index	-0.049 (0.219)	-0.604 (0.485)	-0.417 (0.440)	0.072 (0.261)	-0.705 (0.620)	-0.288 (0.650)
Year Dummy	YES	YES	YES	YES	YES	YES
Log of FDI implicated					-0.018 (0.017)	-0.026 (0.024)
Constant	10.074*** (1.227)	10.720*** (2.823)	10.152*** (3.066)	10.245*** (1.387)	13.053*** (3.377)	10.973*** (2.904)
Observations	252	252	252	252	252	252
R-squared	0.860			0.848		
Number of panels		63	63		63	63
AR (1) test (p-value)		0.063	0.021		0.011	0.009
AR (2) test (p-value)		0.371	0.362		0.346	0.389
Hansen test of over-identification (p-value)		0.997	0.957		0.750	0.390
Diff-in-Hansen tests of exogeneity		0.316	0.370		1.000	0.976

Note: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. GMM method using (a) year lagged independent variables and (b) the regional and yearly average of the private enterprise rate as instruments. Year dummies are considered to be exogenous. Unskilled workers and skilled manual workers are defined according to Elementary Occupations (ISCO 9)(ILO, 2012).

Results in Appendix 6 confirm that (i) both the expansion of domestic private and multinational enterprises increases the number of unskilled and skilled manual jobs in Vietnam during 2010-2018.

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