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TÁC ĐỘNG CỦA THUẾ GIÁ TRỊ GIA TĂNG ĐẾN BẤT BÌNH ĐẲNG THU NHẬP Ở CÁC NƯỚC ASEAN TRONG GIAI ĐOẠN 2000 ĐẾN 2022

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Tóm tắt

Trong bối cảnh đa dạng của khu vực ASEAN, với các hệ thống thuế khác nhau và sự chênh lệch thu nhập rõ ràng, nghiên cứu tiên phong này đi sâu vào mối quan hệ giữa thuế giá trị gia tăng (VAT) và bất bình đẳng thu nhập. Sử dụng dữ liệu từ 10 quốc gia ASEAN trong khoảng thời gian 23 năm từ năm 2000 đến năm 2022, các nhà nghiên cứu đã áp dụng phương pháp hồi quy tuyến tính OLS, kiểm tra độ tin cậy của mô hình một cách nghiêm ngặt thông qua các kiểm tra chẩn đoán như hệ số VIF, Breusch-Pagan và Wooldridge. Đáng chú ý, nghiên cứu đã sử dụng mô hình hồi quy phân vị để khảo sát tác động khác biệt của VAT và các yếu tố khác trên các quốc gia ASEAN với mức độ bất bình đẳng thu nhập khác nhau, được phân loại thành ba nhóm dựa trên phần trăm bất bình đẳng thứ 25, 50 và 75. Kết quả cho thấy VAT làm trầm trọng thêm bất bình đẳng ở các quốc gia có mức độ bất bình đẳng ban đầu thấp hơn, nhưng có thể giảm thiểu bất bình đẳng ở các quốc gia có mức độ bất bình đẳng ban đầu cao, do tính chất lùi tiến của VAT, tác động không cân đối đến người thu nhập thấp. Mạng lưới an toàn xã hội mạnh mẽ của một quốc gia cũng được phát hiện là ảnh hưởng đến tác động của VAT đối với bất bình đẳng. Nghiên cứu khuyến nghị các quốc gia ASEAN nên ưu tiên các biện pháp thuế thay thế, như thuế thu nhập, để đạt được mục tiêu bình

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đẳng thu nhập, đồng thời thận trọng tiếp cận việc tăng thu nhập từ VAT và khám phá các lựa chọn thuế trực tiếp, đặc biệt là ở các quốc gia có bất bình đẳng thu nhập cao.

Từ khóa: bất bình đẳng thu nhập, các quốc gia ASEAN, thuế giá trị gia tăng (VAT)

IMPACT OF VALUE ADDED TAX ON INCOME INEQUALITY: EMPIRICAL STUDY IN ASEAN COUNTRIES PERIOD 2000 TO 2022

Abstract

Across the diverse economic landscape of the ASEAN region, marked by varying taxation systems and stark income disparities, this pioneering study delves into the relationship between value-added tax (VAT) and income inequality. Utilizing data from 10 ASEAN countries spanning 23 years from 2000 to 2022, the researchers employed the Ordinary Least Squares (OLS) linear regression method, rigorously testing the model's reliability through diagnostic examinations such as the Variance Inflation Factor (VIF), Breusch-Pagan, and Wooldridge tests. Remarkably, the study used a quantile regression model to examine the differential impacts of VAT and other factors across ASEAN countries with varying income inequality levels, categorized into three groups based on the 25th, 50th, and 75th inequality percentiles. The findings suggest VAT exacerbates inequality in countries with lower initial inequality, but can potentially mitigate it in those with high initial inequality, attributed to VAT's regressive nature, which disproportionately impacts low-income earners. The strength of a country's social safety net was also found to influence VAT's impact on inequality. The study recommends that ASEAN countries should prioritize alternative tax measures, like income-based taxes, to achieve income equality goals, while cautiously approaching VAT revenue increases and exploring direct tax options, particularly in countries with high income inequality.

Keywords: ASEAN countries, income inequality, value-added-tax (VAT)

1. Introduction

In addition to essential responsibilities like promoting equity, fair income distribution, fiscal responsibility, accountability, provision of national goods and services, and economic growth and development, governments are also tasked with providing basic services to the populace. Social services largely depend on the total revenue a government generates, particularly in the least developed countries (Ibadin and Oladipupo, 2015). Governments fulfill these responsibilities - such as income and wealth distribution, promoting growth and development, and providing national goods and services - primarily through tax collection. In other words, taxation is the main mechanism for generating income for nations worldwide.

Governments use taxes for two purposes: raising revenue and controlling the macroeconomic environment. Tax policy actively targets market inefficiencies, particularly wealth inequality, rather than merely providing funding for public goods like infrastructure and education. Well-designed tax systems can reduce the wealth gap between the rich and the poor by redistributing wealth (Atkinson, 2005; OECD, 2012). This highlights the critical role taxes play in achieving both

fiscal and social objectives (Anyaduba and Otulugbu, 2019), fostering not only social equality but also long-term economic growth (Sameti and Rafie, 2010; Ostry, Berg, and Tsangarides, 2014).

In ASEAN, income inequality remains a significant issue. The Gini coefficient indicates that, despite various efforts, the region remains unequal, with South and East Asia as the most unequal sub-regions (UNESCAP, 2019). While some countries, such as Malaysia, the Philippines, and Thailand, have seen decreases in inequality, Indonesia is expected to experience a notable increase. Although wealth inequality appears constant, it remains highly uneven, with over 140 million people currently living in poverty due to this widening disparity (The Asian Post, 2018), prompting governments to prioritize income redistribution through tax reforms.

This paper, therefore, aims to explore the complex relationship between the implementation of VAT and its impact on income inequality in ASEAN countries from 2000 to 2022. The ASEAN region, comprising ten diverse member states - Brunei, Myanmar, Cambodia, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand, and Vietnam—offers a rich landscape of economic structures, policy frameworks, and socio-economic dynamics. Understanding how VAT policies have influenced income distribution in this context is crucial for developing effective and equitable fiscal strategies.

To address this issue and guide the study, the following research questions have been formulated:

1. To what extent does Value-Added Tax influence income inequality in ASEAN countries?

2. What other factors may affect the income gap in ASEAN countries?

3. What recommendations can be proposed to reduce income inequality in the ASEAN region?

The paper is organized as follows: Section 2 reviews the literature on income inequality and VAT's impact on ASEAN. Section 3 outlines the theoretical framework, while Section 4 details the methodology. Sections 5 and 6 present the results, discussion, and policy implications. Finally, Section 7 provides a summary and conclusion.

2. Literature review

Many empirical studies have examined the impact of VAT on income distribution. Hayrullahoglu and Tuzun *(2020)* investigated the effect of taxes on income distribution in Turkey and other selected OECD countries between 2002 and 2019. Using the Panel ARDL model, they found that an increase in the share of tax revenues in GDP decreases the Gini index by 0.17. Similarly, research by Karabulut *(2020)* on the Turkish economy showed that indirect taxes, such as VAT and special consumption tax, negatively affected income distribution during the period from 1990 - 2017. In Vietnam, a study by Cuong *(2019)* demonstrated that VAT increases overall inequality in the countries examined. Moreover, the results showed that the impact of VAT on income inequality varies between countries with high-income inequality and those with low-income inequality.

Additionally, numerous studies have demonstrated the correlation between income inequality and other factors. Firstly, Deyshappriya *(2017)* employed dynamic panel data analysis from 1990 - 2013 across 33 Asian countries and found that further increases in GDP redistribute income from the top 20% to middle-income and poor groups, recommending higher and sustained long-term economic growth. Authors like Persson and Tabellini *(1991)* and Alesina and Rodrik *(1994*) discovered a negative correlation between economic growth and income inequality. Conversely, Li and Zou *(1998)* observed that increased inequality is associated with accelerated economic growth.

Secondly, research by Yuldashev et al. *(2023*) in Asia from 1990 to 2020 confirmed that Foreign Direct Investment (FDI) negatively affects inequality, with its impact being more effective in the presence of human capital. However, a study by Le et al. *(2021)* found that in Vietnam, the effects of FDI on income inequality differ depending on the level of education and institutions in host provinces. Moreover, Chen *(2016)* indicated that FDI has had a dual impact on urban-rural income inequality. On one hand, it has helped diminish this gap by generating employment, fostering knowledge transfer, and stimulating economic expansion. On the other hand, FDI has also exacerbated urban-rural income inequality through its involvement in international trade.

Thirdly, income inequality is further influenced by trade openness, as shown in prior research. For example, Dorn, Fuest, and Potrafke *(2021)* studied 139 countries from 1970 - 2014 and found that the effect of trade openness on income inequality varies across countries. Trade openness tends to disproportionately benefit the relative income shares of the very poor, but not necessarily all poor, in emerging and developing economies. In most advanced economies, trade openness increased income inequality, an effect driven by outliers. Similarly, Mahesh (2016) found a positive and significant relationship between trade openness and income inequality in developing countries. Meschi and Vivarelli *(2007)* also demonstrated a weak correlation between total trade flows and income inequality. However, analyzing trade flows by origin and destination revealed that trade with high-income countries exacerbates income inequality in developing countries, through both imports and exports. This supports the idea that technological disparities between trading partners play a significant role in shaping the distributive impacts of trade liberalization, particularly for middle-income countries.

Fourthly, government expenditures often disproportionately benefit the wealthy more than the poor, increasing the income gap *(Berg et al., 2018).* This suggests that government spending frequently requires higher taxes or expanded borrowing, placing a heavier financial burden on low-income groups *(Kraay and Dollar, 2001)*. The findings indicate a moderately inverse correlation between government expenditure and income inequality, particularly in social welfare and similar spending areas. Furthermore, Anderson et al. *(2016)* argued that this correlation is most pronounced when using metrics like the Gini coefficient or the top income share to measure inequality. The magnitude and direction of this correlation are influenced by factors such as control variables and estimation methods. Additionally, there is evidence of publication bias, suggesting that negative estimates of this relationship are underreported in the literature.

Fifthly, unemployment has been shown to correlate positively with income inequality, as evidenced by Sheng *(2012)* in an empirical study of the U.S. from 1941 - 2010. Using microdata from the Luxembourg Income Study, Martinez, Ayala, and Ruiz-Huerta *(2001)* uncovered the relatively minor influence of unemployment on income distribution in most countries examined. Nonetheless, unemployed individuals face a heightened risk of poverty compared to others. Saunders *(2002)* provided compelling evidence that unemployment heightens poverty risk and contributes to inequality, leading to adverse social consequences for individuals, families, and communities. Findings by Zandi et al. *(2022)* also indicated a significant positive association between corruption, inflation, unemployment, and the Gini index, suggesting that these factors are central contributors to heightened income inequality in developing Asian countries.

Lastly, political stability has been found to reduce income inequality. Studies by Khan, Weili, and Khan *(2022)* showed that in Belt and Road Initiative (BRI) countries, political stability significantly reduces income inequality. Similarly, Trung *(2022)* found that political instability negatively affects the effectiveness of fiscal redistribution, as evidenced by the gap between market and net income inequality. This redistributive effect is particularly pronounced in non-democratic regimes, highly diverse societies, and low-income economies. Memon et al. *(2020)* emphasized a positive correlation between political instability and inequality, which is significant in developing economies but absent in developed nations. Additionally, developing countries implementing an inflation-targeting framework appear shielded from the adverse effects of inflation volatility on income inequality. Inflation-targeting policies may support equity and efficiency outcomes concurrently. These findings remain robust across various control variables, alternative volatility and inequality metrics, sub-sample analyses, and dynamic panel specifications.

In summary, while many studies have explored the factors influencing income inequality, there remains a lack of empirical evidence on the impact of VAT on income inequality in ASEAN countries. Moreover, the role of income regulation in reducing inequality remains controversial. Therefore, this study was conducted to provide empirical evidence on the impact of VAT on income inequality in ASEAN countries. The authors believe that the results will offer valuable information for policymakers in shaping future VAT policies.

3. Theoretical framework

3.1. Theoretical framework on income inequality

Income inequality is defined as a measure that highlights the gap between different individuals' or households' disposable income in a particular year *(OECD, 2023)*. According to a report by the OECD in 2012, measures of income inequality can be categorized into two groups: the Gini index, which serves as a single numerical summary statistic, and income distribution at different points, often referred to as shares of income or percentile ratios.

The Gini coefficient ranges from 0 (perfect equality) to 1 (perfect inequality), with higher values indicating greater inequality. The Gini index, as per Index Mundi, measures the degree to

which income distribution deviates from perfect equality within an economy, calculated as the area between the Lorenz curve and the line of perfect equality.

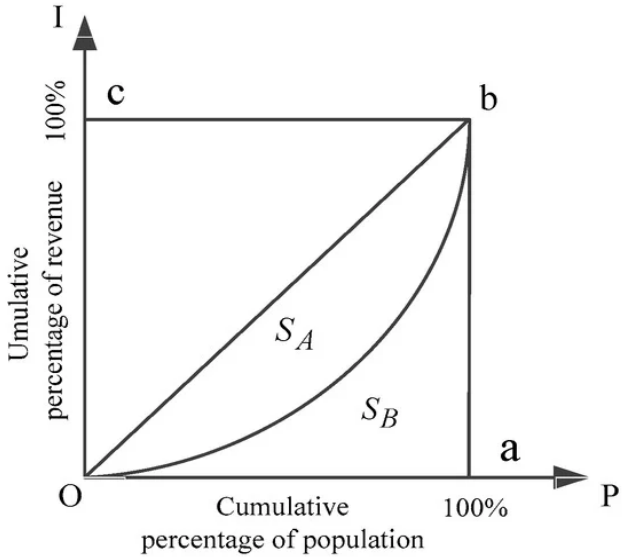

Figure 1. The Gini coefficient as illustrated by the Lorenz curve

Source: Max Lorenz, 1905

The Lorenz curve depicts income inequality by showing the cumulative share of income held by the cumulative share of the population. A perfectly equal distribution would be a straight line at a 45-degree angle. The actual distribution, however, deviates from this line, with a larger bulge away from the line indicating greater inequality, which is calculated based on the formula below:

$$G = 1 - \sum_{i=1}^{n} (F_i - F_{i-1})(Y_i + Y_{i+1})$$

In which:

F_i: Cumulative population ratio up to the ith person;

Y_i: Cumulative income ratio up to the ith person.

Bourguignon, cited by Omotola and Kabir *(2015)*, categorized Gini index values: as 0.55 and above indicating high inequality, 0.45-0.55 as middle-high, 0.35-0.45 as middle, and below 0.35 as low inequality. Various factors have been attributed to unequal distribution, including changes in technology favoring skilled labor, globalization, liberalization of markets, increased labor-force participation by low-skilled workers, and tax policies favoring high-income individuals, as noted by Appergis *(2015)*.

As already mentioned above, previous researchers have also used other measures of inequality such as the share in income of a particular quintile *(Dominics et al., 2008)*. Many researchers have used the income share of different quintiles, such as the top 10%, and the top 1%, which are held

by the richest 10% and 1%, respectively. Additionally, alternative measures have been utilized by some researchers, such as the income share of the bottom 50% or the bottom 20%, which capture the proportion of income held by the least affluent 50% and 20% of the population, separately. Besides, many other measurements are used, including the ratio of the incomes coming from different groups, for example, the ratio of top income share and the bottom of the income distribution, or indicators belonging to the family of generalized entropy measures.

Moreover, VAT is of interest because of its impact on income distribution *(Tait, 1991)*. VAT is charged at the point of consumption, so it is assumed that it has a greater impact on low-income groups because they pay a higher tax rate than high-income earners (the regressive nature of indirect taxes). Based on this argument, progressive taxes such as personal income taxes are better than regressive taxes in reducing income inequality. Several previous empirical studies have found convincing evidence to support this assertion *(Leahy et al., 2011; Martinez-Vazquez et al., 2012)*. The results of these studies suggest that increasing the rate of VAT revenue collection is a cause of income inequality.

3.2. Theoretical framework on value-added tax

A value-added tax is a tax applied to the final selling price of goods and services at each stage of production and distribution. Essentially, it is a consumption tax that only falls on the added value created at each step in the supply chain. The government sets a specific VAT rate, which businesses then collect from their customers and ultimately remit to the government. In simpler terms, VAT is a multi-stage consumption tax ultimately borne by the end consumer.

When broken down, as a consumption tax, Ochei *(2010)* opined that VAT is an indirect tax system where the consumer actually bears the cost of the tax. Bird *(2005)* on his part confirmed the multi-stage nature of VAT when he asserted that VAT is a multi-stage tax imposed on the value added to goods and services as they go through various stages of production and distribution as well as services rendered. Obviously from the shades of opinions highlighted above, it is clear that the final incidence or burden of VAT is borne by the final consumer of goods and services in ASEAN countries. It is a tax that most consumers pay without knowing, yet it helps the government generate substantial revenue for economic growth.

Given that more than half a century has elapsed since the introduction of the first VAT, it seems appropriate to contemplate adjustments to the current VAT systems. In the aftermath of one of the most severe banking recessions in recent decades, governments face the imperative of reducing public debt to sustainable levels as we emerge from this crisis. Revenue streams from tax rates, corporate income tax, and social security payments are expected to remain relatively subdued in the coming generations, with a prolonged recovery period anticipated. Many businesses impacted by the recession are likely to incur losses, resulting in minimal or no corporate income tax payments. Consequently, household incomes are unlikely to see significant growth, with numerous families having already experienced or facing potential losses. When evaluating existing VAT schemes, it is essential to consider the proliferation of diverse VAT rates implemented across

various regions. The use of multiple VAT rates can diminish the effectiveness of the VAT system, leading to increased complexity and higher organizational and compliance costs.

Since VAT is a subset of the entire tax system in Asia, it becomes imperative to look at the basic theories surrounding taxation. The theories highlighted in this work include the following:

a) Faculty theories, which propose that taxation should align with an individual's ability to pay, with Bhartia *(2009)* suggesting that citizens should be taxed based on their capacity to contribute relative to others. The goal is to enhance the equitable distribution of tax burdens within a nation. However, pushing tax rates too high can lead to diminishing returns, making it counterproductive to generate additional revenue.

b) Ibu Khaldun's taxation theory delineates two aspects, including the arithmetic and economic effects. The arithmetic effect posits that changes in VAT rates directly impact VAT revenue - lower rates decrease revenue while higher rates increase it. On the other hand, the economic effect emphasizes how lower VAT rates stimulate economic activities like work, output, and employment, incentivizing participation. Conversely, high VAT rates can dampen economic activity, overshadowing any positive arithmetic effects and ultimately reducing VAT revenue.

4. Methodology

4.1. Research methodology

The research employed a panel dataset constructed from 10 ASEAN countries covering 23 years from 2000 to 2022. The initial analysis utilized ordinary least squares (OLS) regression to assess the relationship between the independent and dependent variables. Subsequently, the model underwent diagnostic tests to identify potential issues such as multicollinearity by using the variance inflation factor (VIF), heteroskedasticity by using the Breusch-Pagan test, and autocorrelation by using the Wooldridge test. If any of these problems were detected, robust standard errors HAC were implemented to rectify the issues of heteroskedasticity and autocorrelation.

To delve deeper into the differential impacts of VAT and other independent variables across countries with varying income disparities, a quantile regression model is utilized. Ten Asian nations are categorized into three groups based on their income inequality levels at the 25th, 50th, and 75th percentiles, representing low, medium, and high-income inequality, respectively. The overall findings will be compared to those of the quantile regression model to evaluate model consistency, and robustness checking, then derive further insights.

4.2. Research model

Based on the literature review and theoretical framework, this study develops the following model to examine the impact of VAT on income inequality.

$$Inc\_ine = \beta_0 + \beta_1 VAT + \beta_2 lnGDP + \beta_3 FDI + \beta_4 TO + \beta_5 Govexp + \beta_6 Unem + \beta_7 Pol\_sta + \varepsilon_{it}$$

In which:

β_0: the intercept of the regression model.

$\beta_1 - \beta_7$: the variables' regression coefficients.

Inc_ine (Dependent variable): Income inequality measured by the share of national income captured by the top 10% of earners.

VAT: Proportion of total tax revenue collected through value-added tax (VAT). VAT has a positive effect on income inequality as stated in Hollar and Cubero *(2010)*.

lnGDP: Natural logarithm of the gross domestic product, representing the total value of a country's economic output in a given year (adjusted for exponential growth). GDP would have a negative impact on income inequality according to the research by Alesina and Rodrik *(1994)*.

FDI: Net foreign direct investment inflows, indicating the amount of foreign capital invested in a country's businesses. According to Haug, Nguyen and Owen *(2022)*, FDI inflows have a negative impact on income inequality.

TO: Trade openness, measured by the sum of exports and imports as a percentage of GDP. Trade openness would have a positive effect on income inequality as researched by Ram Mohan *(2009)*.

Govexp: Government expenditure on final consumption, capturing government spending on goods and services. A 2001 study by Kraay and Dollar found government expenditure could have a negative impact on income inequality.

Unem: Unemployment rate, expressed as the percentage of the unemployed labor force. A study by Spiezia (2000) linked the unemployment rate to potential reductions in income inequality.

Pol_sta: Political stability score (0-100), with higher scores indicating a lower risk of political instability or violence, ranked by Worldwide Governance Indicators. Research suggests political stability, as explored by Alesina and Perotti in 1996, may contribute to a more equitable society, indicating the reduction of inequality.

ε_{it}: The error term for country i in year t. This accounts for any omitted variables or factors that influence the dependent variable but are not explicitly included in the model.

This study assessed the influence of each independent variable on the dependent variable (Inc_ine) by evaluating the significance of their corresponding coefficients (β) in the model.

4.3. Data and data source

The authors utilized secondary data obtained from reputable sources such as the World Inequality Database, World Bank, and Trading Economics. Missing data were addressed using

country reports. The analysis focused on one dependent variable: income inequality. Seven independent variables were included in the model: VAT, the natural logarithm of GDP, FDI inflows, trade openness, general government expenditure, unemployment rate, and political stability. A table summarizing the variables is presented below.

Table 1. List of variables and sources

Variables	Meaning	Unit	Expected sign	Source
Inc_ine	Income inequality (top 10% income share)	%		World Inequality Database
VAT	Value-added tax revenue	% of tax revenue	+	OECD Statistics, the country's report
lnGDP	Natural logarithm of gross domestic product	USD	-	WDI
FDI	Foreign direct investment net inflows	% of GDP	-	WDI
TO	Trade openness	% of GDP	+	WDI, Trading Economics
Govexp	General government expenditure	% of GDP	-	WDI, Trading Economics
Unem	Unemployment rate	% of population	-	WDI, the country's report
Pol_sta	Political stability	Ranking	-	WDI

Source: The authors' compilation

5. Empirical result

5.1. Descriptive statistics of data

The study utilized data from 10 countries spanning 23 years, resulting in a standard sample size of 230 observations per variable. While not all variable data was available for publication, the

extent of missing data remained within acceptable limits. A detailed statistical description of the variables employed in the model is presented in the following table.

Table 2. Descriptive statistics results

Variable	Obs	Mean	Std. Dev.	Min	Max
Inc_ine	230	0.4573	0.0532	0.3289	0.5658
VAT	230	23.7578	12.7523	0	50.4213
lnGDP	230	24.6646	2.0282	19.7207	27.9080
FDI	230	0.04901	0.0679	-0.3296	0.3269
TO	230	124.4259	88.5970	0.1747	437.3267
Govexp	230	18.6758	23.3181	3.4603	147.735
Unem	230	3.2111	2.5927	0.14	21.8
Pol_sta	230	55.1746	28.6034	6.0302	100

Source: Authors' calculation

Following the descriptive analysis of the variables, a correlation matrix is constructed to assess the relationships between the independent variables in the regression model. The correlation coefficient ranges from -1 (indicating a perfect negative correlation) to +1 (indicating a perfect positive correlation), with a value of 0 representing no linear relationship.

Table 3. Variables correlation matrix

	Inc_ine	VAT	lnGDP	FDI	TO	Govexp	Unem	Pol_sta
Inc_ine	1.0000							
VAT	0.6443*	1.0000						
lnGDP	0.1070*	0.3978*	1.0000					
FDI	-0.0475*	0.1623*	0.1816*	1.0000				

	Inc_ine	VAT	lnGDP	FDI	TO	Govexp	Unem	Pol_sta
TO	-0.1370*	-0.0054*	0.1643*	0.7107	1.0000			
Govexp	-0.2320*	-0.5220	-0.6103*	-0.1982*	-0.0355*	1.0000		
Unem	-0.4820*	-0.4352*	0.0119	-0.0954*	0.0696*	0.1269*	1.0000	
Pol_sta	-0.4923*	-0.4302	-0.1588*	0.4224*	0.6343*	0.0234*	0.2135*	1.0000

Source: Authors' calculation

5.2. Estimated result

Based on the regression model built above, the authors conducted a regression analysis, whose results are shown in Table 4 below.

Table 4. Original regression results

Inc_ine	Coefficient	Std. Err.	95% Conf. Interval	
VAT	0.0018***	0.0002	0.0013	0.0024
lnGDP	-0.0096***	0.0019	-0.0133	-0.0060
FDI	-0.1554***	0.0514	-0.2567	-0.0541
TO	0.0002***	0.0001	0.0001	0.0003
Govexp	-0.0040***	0.0002	-0.0012	-0.0002
Unem	-0.0007***	0.0010	-0.0060	-0.0020
Pol_sta	-0.0009***	0.0001	-0.0012	-0.0007
_cons	0.7075***	0.0508	0.6073	0.8076
Breusch Pagan test for heteroskedasticity		Prob > chi2	0.0107	
Wooldridge test for autocorrelation		Prob > F	0.0000	

Significance: *** p < 0.01, ** p < 0.05, * p < 0.1

Source: Authors' calculation

After obtaining the original regression results, the authors conducted a series of tests to check for defects in the model. First, to assess the presence of multicollinearity, the authors employed the VIF method. The VIF values are presented in the table below.

Table 5. Variance Inflation Factors result

Variable	VIF	1/VIF
TO	3.09	0.3233
Pol_sta	2.85	0.3506
VAT	2.42	0.4132
FDI	2.35	0.4262
Govexp	1.89	0.5295
lnGDP	1.81	0.5519
Unem	1.29	0.7749

Source: Authors' calculation

The table above shows that the VIF values for all independent variables are below 5, indicating that multicollinearity is not present in the model. However, the Breusch-Pagan and Wooldridge test yield p-values below 5%, suggesting that the model exhibits heteroskedasticity and autocorrelation. To address these issues, the authors re-estimate the OLS regression model using robust standard errors HAC, with the results presented in column (1) of Table 6 below.

Table 6. Regression results

Inc_ine	**(1)**	**(2)**	**(3)**	**(4)**
	OLS	**Q1 - 25**	**Q2 - 50**	**Q3 - 75**
VAT	0.0018***	0.0012**	0.0020***	0.0021***
	(0.0004)	(0.0005)	(0.0005)	(0.0006)

Inc_ine	**(1)** **OLS**	**(2)** **Q1 - 25**	**(3)** **Q2 - 50**	**(4)** **Q3 - 75**
lnGDP	-0.0096***	-0.0034	-0.0126***	-0.0118***
	(0.0020)	(0.0036)	(0.0037)	(0.0016)
FDI	-0.1554**	-0.2144	-0.1023	0.0406
	(0.0718)	(0.1322)	(0.1140)	(0.0934)
TO	0.0002***	0.0003***	0.0002***	0.0002***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Govexp	-0.0040***	-0.0003	-0.0009***	-0.0010***
	(0.0002)	(0.0003)	(0.0002)	(0.0002)
Unem	-0.0007*	-0.0068***	-0.0069**	-0.0032
	(0.0021)	(0.0024)	(0.0035)	(0.0036)
Pol_sta	-0.0009***	-0.0008***	-0.0010***	-0.0012***
	(0.0002)	(0.0003)	(0.0002)	(0.0003)
_cons	0.7075***	0.5409***	0.7958***	0.7874***
	(0.0546)	(0.0951)	(0.0892)	(0.0387)
Observations	211	211	211	211
R_squared	0.6128	0.4291	0.4113	0.4830
Significance: *** p < 0.01, ** p < 0.05, * p < 0.1				

Source: Authors' calculation

The OLS regression results shown in column (1) indicate that all independent variables have an impact on the dependent variable. In which, VAT and trade openness have a positive effect on income inequality, which aligns with previous research by Chan and Ramly *(2018)*; Anyaduba and Otulugbu *(2019)*; Mahesh *(2016)*. Meanwhile, the remaining independent variables, including GDP, FDI inflows, government expenditure, unemployment rate, and political stability, had a

negative impact on income inequality. This result is also consistent with previous studies such as Kraay and Dollar *(2001)*; Alimov and Malikov *(2023)*.

Furthermore, the results of quantile regression provide a more nuanced perspective when countries are divided according to their income inequality level. When the income inequality level is high, the impact of VAT on income inequality is also greater. Conversely, GDP will reduce income inequality more significantly in countries with a low-income inequality level. Moving along the increasing trend of income inequality, government expenditure, and political stability show a gradually increasing negative impact, leading to the strongest countervailing effect on income inequality in countries with a high level of income inequality. In addition, trade openness shows an equalizing effect across country groups, indicating that the impact of trade openness on income inequality is not dependent on the level of income inequality. Finally, the unemployment rate has a strong countervailing effect on income inequality in countries with low- and medium-income inequality, and no impact on income inequality in countries with a high level of income inequality.

5. Discussion

The regression results demonstrate a positive correlation between the implementation of the VAT and income inequality which is consistent with our expectations from the originally proposed model. It can be inferred that ASEAN countries are unable to achieve their objective of reducing income inequality through VAT. Specifically, when a country exhibits lower levels of income inequality, as indicated by the quantile regression results for the 25th and 50th percentiles, VAT has a consistent impact on income inequality in the same direction. This is also explained by previous studies. For example, Faridy et al. *(2016),* and Sapiei et al. *(2013)* agreed that countries with lower levels of inequality prioritize VAT policies over preferential measures aimed at redistributing income among different population groups, while countries with a higher level of income inequality, the impact of VAT on income inequality in that country will be greater.

The positive correlation between VAT and income inequality can be explained by the regressive nature of VAT can be attributed to the regressive nature of VAT. Regressive taxes impose a disproportionate burden on individuals with low incomes. Since VAT is a consumption tax levied on the final price of goods and services, low-income households have to allocate a significant portion of their income towards essential needs such as food and housing. Conversely, individuals with higher incomes have more discretionary income to spend on luxury goods and services, which may be exempt from VAT or subject to lower tax rates *(International Monetary Fund)*. This phenomenon exacerbates income disparity, creating a situation where individuals with lower incomes struggle to make ends meet while the wealthy are less affected by taxes.

Furthermore, the impact of VAT on income inequality is intensified by the strength of a country's social safety net. Countries with robust social programs, such as progressive income taxes and generous welfare benefits, can alleviate the regressive effect of VAT by redistributing income from the affluent to the less privileged. However, in nations with weaker social safety nets, the

entire burden of VAT falls disproportionately on low-income earners, further straining their limited resources. If reducing income inequality is a national objective, it is advisable to avoid implementing regressive taxes like VAT or to implement alternative measures to offset its impact. This could involve the application of progressive taxation in other areas of the system or strengthening social safety net programs to ensure a fairer distribution of the tax burden *(Hollar and Cubero, 2010)*. Consequently, the result agrees with some previous research that *VAT has a positive impact on Income Inequality*.

The findings unequivocally indicate that GDP exerts a detrimental impact on Income Inequality, which is consistent with our expectations from the originally proposed model and the percentile results further emphasize that GDP tends to reduce income disparities in countries with low levels of income inequality. However, one crucial factor to consider is the distribution of economic growth. As GDP increases, the benefits of such growth may be unevenly distributed among social groups *(Persson and Tabellini, 1991)*. In many cases, the affluent and businesses may capture a significant portion of the economic benefits, leading to an increase in income disparities. Besides, effective social policies like progressive taxation and investments in education and healthcare can mitigate the negative effects of uneven GDP growth on income inequality, while countries lacking such policies see wider gaps emerge despite strong economic performance. Additionally, the initial level of income inequality in a country can also influence the relationship between GDP and income inequality. In countries with high levels of initial income inequality, economic growth may lead to a greater widening of income gaps compared to countries with lower levels of initial income inequality. Hence, the result agrees with some previous research that *GDP has a negative impact on Income Inequality*.

The model's negative coefficient of FDI aligns with existing research illustrating its negative impact on Income Inequality, which is consistent with our expectations from the originally proposed model. The negative coefficient of FDI in the model aligns perfectly with a concerning trend highlighted in recent economic research, suggesting FDI may exacerbate income inequality despite its potential to boost economic growth *(Haug, Nguyen and Owen, 2022; Pan-Long, 1995)*. The influx of foreign capital can create a two-tiered system. Foreign companies, often equipped with advanced technologies, might displace low-skilled workers in the host nation. The skill set required might not match the existing workforce, further marginalizing those lacking the necessary qualifications *(Sarbajit Chaudhuri and Dibyendu Banerjee, 2010)*. Profits generated by these foreign entities might be repatriated back to their home countries, limiting reinvestment in the host nation and hindering broad-based growth. This confluence of factors can lead to a situation where the benefits of FDI accrue to a select few, while the majority of the population struggles to keep pace *(Christian Lessmann, 2013).* Therefore, the result agrees with some previous research that *FDI has a negative impact on Income Inequality*.

The study finds a positive association between trade openness and income inequality, aligning with our initial model. In developing countries, the expansion of international trade is likely to enhance income distribution as a result of the rising wages of unskilled laborers, accompanied by a

decrease in the wages of skilled laborers (Ram Mohan, 2009), some transition countries have experienced a particular fast change toward trade openness accompanied by large-scale market-oriented reforms and an economic transition process (Mohommad et al., 2022). This infers that the market-oriented reforms likewise promoted integration in the global market and increased income inequality. However, the results of the quantile regression indicate that trade openness exhibits an equal impact across country groups, showing that the impact of trade openness on income inequality is not dependent on the high or low level of income inequality. In other words, trade openness does not increase or decrease income inequality to a greater extent in countries with high-income inequality compared to others, which may be due to factors such as better infrastructure, such as a high-quality education and healthcare system, which help low-income workers improve their skills and productivity, or progressive taxation and social welfare programs. Therefore, the result agrees with some previous research that Trade Openness has a positive impact on Income Inequality.

The model's negative coefficient of Government expenditure aligns with existing research illustrating its negative impact on Income Inequality, while the results also affirm that government expenditure exhibits an increasing negative effect, leading to the strongest adverse impact on income inequality in countries with high levels of income disparity. This suggests that government expenditure often requires higher taxes or increased borrowing, imposing a greater burden on low-income groups *(Dollar and Kraay, 2001*). When the government increases taxes to finance expenditures, low-income groups often face more severe financial pressures. Taxes can be implemented at a fixed rate or based on income tax rates, and typically higher-income groups contribute more than lower-income groups. This means that low-income households and individuals will allocate a larger portion of their income to tax payments, reducing their disposable income and increasing income inequality. When the government increases borrowing to finance expenditures, it needs to pay interest and repay the debt in the future, leading to higher taxes or cuts in social programs in the future to cover this debt. In this case, low-income groups may bear a greater burden as they are less likely to withstand the negative impacts of reduced social programs or increased taxes in the future. Hence, the result agrees with some previous research that *Government expenditure has a negative impact on Income Inequality*.

Our research findings from regression analysis indicate that Unemployment exerts a negative influence on Income Inequality. This can infer that higher unemployment rates are associated with lower income inequality (Spiezia, 2000). In other words, during economic downturns where unemployment rises, the gap between the rich and the poor tends to shrink. During economic downturns with high unemployment, stagnant or declining wages across the board can compress the bottom end of the income distribution, temporarily reducing inequality as the rich become distanced from a shrinking pool of low-income earners (Norris et al., 2015). However, this impact is strongest in countries with low- and moderate-income inequality (Cysne, 2004). In these nations, unemployment disproportionately affects those with fewer resources, further straining their finances and hindering future earning potential through skill erosion (Autor, 2003). This suggests the negative effect of unemployment on inequality may be mitigated by existing wealth disparities, allowing the

affluent to weather economic storms and maintain their advantage. Therefore, the result agrees with some previous research that Unemployment has a negative impact on Income Inequality.

The study's findings align with prior research *(Alesina and Perotti, 1996)* demonstrating a negative effect of political instability on income inequality. This effect strengthens as income disparity worsens. Political instability breeds economic uncertainty, discourages investment, and weakens growth, disproportionately harming vulnerable groups. It erodes institutions safeguarding fair competition and protecting marginalized populations. Property rights weaken, contracts become unenforceable, and the rule of law deteriorates, allowing the wealthy to exploit the system, and widening the income gap. Businesses hesitate to invest, productivity suffers, and capital flees, further harming the poor who lack resources to weather such storms and are more likely to fall into poverty, deepening inequality *(Alimov and Malikov, 2023).* This negative impact is especially concerning in countries with high existing income inequality, where political instability acts as a catalyst, fueling social unrest and extremist ideologies, exacerbating the issue further *(Persson and Tabellini, 1994)*. Consequently, the research result agrees with some previous studies that *Political stability has a negative impact on Income inequality*.

6. Conclusion and implication

As already analyzed above, our study focuses on how VAT impacts income inequality, with data extracted from 11 ASEAN countries over a 23-year period from 2000 to 2022. We have found that there is a positive correlation between the implementation of VAT and income inequality, which suggests that the higher value of VAT is synonymous with a higher level of income inequality in ASEAN countries. Specifically, VAT tends to exacerbate income inequality in countries with lower levels of initial inequality but can mitigate it in countries with high initial inequality. This is attributed to VAT's regressive nature, disproportionately burdening low-income individuals. Moreover, the impact of VAT on income inequality is influenced by a country's social safety net strength.

The study also examines the impact of GDP, FDI, trade openness, government expenditure, unemployment, and political stability on income inequality. GDP tends to reduce income inequality, but its distribution affects the extent of this impact. FDI has a negative effect on income inequality due to its potential to widen the gap between the wealthy and the rest. Trade openness generally reduces income inequality, regardless of a country's initial level of inequality. Government expenditure negatively affects income inequality, especially in countries with high levels of initial inequality. Unemployment has a negative impact on income inequality, particularly in countries with low to moderate income disparities. Political stability negatively influences income inequality, especially in countries with higher levels of income disparity.

In terms of policy implications, the study suggests that ASEAN countries should prioritize fortifying income tax collection practices to expand the tax base and ensure a fairer distribution. For nations with particularly high-income inequality, VAT reforms that incorporate exemptions or

deductions for low-income earners are a potential option, but the administrative complexities associated with such measures require careful consideration. Ultimately, a tax system that directly regulates income through efficient direct taxation offers a more sustainable path toward achieving income equality goals across ASEAN countries, including Vietnam. This approach would not only generate revenue but also promote a more equitable distribution of the tax burden. By prioritizing a robust direct tax system, ASEAN nations can harness the power of taxation to not only generate revenue but also foster a more equitable economic landscape.

This study acknowledges the diverse economic structures and administrative capacities across ASEAN countries. This variation in how VAT is applied and enforced can make it difficult to directly compare its impact on income distribution across the region. Some countries might have robust VAT collection and redistribution mechanisms, while others may struggle with tax evasion or inefficient administration. This complexity limits the generalizability of the study's findings to the entire ASEAN region.

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