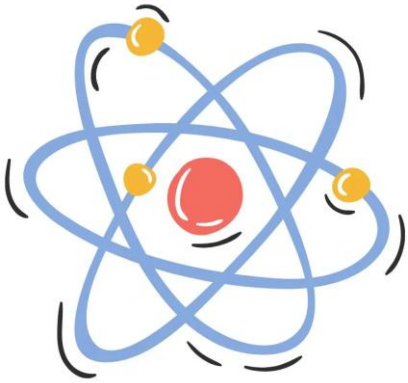

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INFORMATION TECHNOLOGY, TAX COMPETITION, BENEFIT-COST OF TAX INCENTIVES, LOCAL GOVERNMENT AUTONOMY AND FIRM PERFORMANCE IN VIETNAM

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Abstract: *This study investigates the influence of institutional factors, including local fiscal autonomy, provincial tax competition, provincial competitiveness, ICT adoption, and digital transformation on the business performance of enterprises across Vietnam's provinces and regions from 2017 to 2021. The research employs cross-sectional regression to estimate provincial tax competitiveness, a benefit–cost analysis framework for assessing tax incentives, and the dynamic GMM method for panel data estimation. The findings reveal that tax competition exerts a negative impact on firm performance, indicating that preferential tax policies in economically disadvantaged areas do not necessarily stimulate investment or enhance operational efficiency. Conversely, the benefit–cost ratio of tax incentives shows a significant positive effect on performance, highlighting that incentives are effective only when their benefits outweigh associated costs. Furthermore, the composite fiscal autonomy index (Automany2) exhibits a negative relationship with firm efficiency, suggesting limitations in the current revenue allocation mechanism. These results offer important policy implications for reforming tax incentives, moderating tax competition, and restructuring fiscal autonomy frameworks to foster business performance in Vietnam's provinces and cities.*

Keywords: *Institutional factors, benefit-cost of tax incentives, Tax competition, Firm performance, Vietnam*

JEL codes: *C23, E63, H25*

1. INTRODUCTION

Contemporary theories of economic development emphasize that, beyond capital, labor, science, and technology, the institutional environment plays a decisive role in shaping a competitive business climate, attracting investment, and fostering the growth of the private sector. Strong institutions enhance competitiveness in the global market, facilitate mobility and specialization, ensure the efficient allocation of resources, and ultimately improve the productivity of market participants (World Economic Forum, 2018).

Empirical studies in Vietnam have shown that institutional quality measured through indices such as PAPI and PCI reduces transaction costs, mitigates uncertainty in economic activities, and influences the economy's incentive structure. This, in turn, exerts a substantial effect on economic growth (Nguyen Van Phuc, 2013; Chu Thi Mai Phuong, 2019; Huynh Thi Dieu Linh, 2022). While Vietnam's political system operates under a

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unified centralized framework, it also incorporates regional and local adaptability through differentiated investment and tax policies, thereby creating inter-provincial competition to attract investment. From the investor's perspective, location decisions are influenced by the trade-off between potential benefits and costs in each locality. Existing research has examined the impact of various institutional dimensions such as tax competition on business performance (Hayashi & Boadway, 2001; Yongzheng Liu, 2014), fiscal autonomy policies (Jay K. Rosengard et al., 2006; Enid Slack, 2017), and institutional quality (Malesky, 2004; Chu Thi Mai Phuong, 2017) in many countries. However, in Vietnam, the combined effects of tax competition, local fiscal autonomy, and technological infrastructure on firm level financial performance remain underexplored. Furthermore, Vietnam's provinces and cities differ markedly across socio-economic regions, each with unique geographic and strategic development characteristics. These disparities influence both institutional arrangements and economic outcomes. Building on prior literature, this study addresses existing gaps by developing new variables, constructing an integrated econometric model, and synthesizing empirical results. The ultimate goal is to generate policy-relevant insights for both businesses and local government officials, aimed at enhancing enterprise performance across provinces.

2. LITERATURE REVIEW

Developing economies increasingly rely on investment incentives to stimulate capital inflows. By 2015, more than half of 107 developing countries had adopted tax exemptions or preferential corporate tax rates across multiple sectors at the national level. However, such incentives often impose a substantial fiscal burden on economies with limited revenue capacity, while empirical evidence suggests their effectiveness in attracting investment remains limited (IMF, OECD, UN, & World Bank, 2015a). The role of tax incentives in shaping corporate investment decisions varies across contexts. According to IMF, OECD, UN, and World Bank (2015b), three primary methods are commonly used to estimate the costs of tax incentives: (1) the revenue foregone method, (2) the revenue gain method, and (3) the outlay equivalence method. Correspondingly, the benefits of tax incentives are typically measured using: (1) return-on-investment (ROI) analysis, (2) sectoral regression analysis, and (3) investor motivation surveys. The choice of method depends on national conditions and regional characteristics. In Vietnam, no prior research has systematically applied these tools to compare the benefit–cost structures of tax incentives across provinces and cities. This gap leaves policymakers without robust empirical evidence to evaluate whether such incentives yield net positive outcomes.

Existing studies on local fiscal autonomy primarily focus on its impact on socio-economic outcomes, such as infrastructure development, economic growth, and income stabilization

https://doi.org/10.71058/jodac.v9i9003

(Krisztina Beer-Tóth, 2009; Enid Slack, 2017). More recent research extends this to business performance. For example, Henry (2019) finds that greater local government spending autonomy boosts small and medium-sized enterprise (SME) profitability by enhancing household purchasing power, which, in turn, increases sales and profits. Similarly, De Sousa et al. (2020) show that fiscal autonomy improves healthcare system efficiency in Brazil. Despite these findings, limited evidence exists on whether local fiscal autonomy facilitates an institutional environment conducive to business efficiency. Theoretically, excessive reliance on local revenue sources could create disparities in public goods provision, particularly in regions with weaker economic bases.

Tax competition arises when differences in tax rates between jurisdictions influence the mobility of capital, labor, and population (Mintz & Tulkens, 1986; Wildasin, 1989). If equilibrium tax rates are set too low, public goods provision may become inefficient. Empirical studies in Canada (Hayashi & Boadway, 2001) and the United States (Wu & Hendrick, 2009) reveal asymmetric responses among jurisdictions, with tax rates tending to converge upward rather than downward (OECD, 2011). In China, Liu (2014) documents significant interprovincial tax interactions, confirming the existence of competitive dynamics in fiscal policy. In Vietnam, heterogeneous economic conditions across provinces lead to varying tax incentive packages, potentially fueling tax competition. While some research suggests that tax policy is not the sole determinant of investment attractiveness, its influence remains considerable particularly in interaction with other institutional factors.

Empirical evidence supports the premise that higher institutional quality enhances firm performance (Hallward-Driemeier et al., 2006; Ward et al., 2010). Johan (2015), studying 42 developing countries, confirms that robust economic institutions foster productivity and growth. In Vietnam, institutional quality often proxied by the Provincial Competitiveness Index (PCI)—has been linked to improvements in enterprise productivity and efficiency (Nguyen Van Thang et al., 2013; Chu Thi Mai Phuong, 2017). Parallel research has examined the role of information and communication technology (ICT) in enhancing both public- and private-sector efficiency (Daveri, 2000; Niebel, 2014; Karlsson & Liljevern, 2017). In Vietnam, studies by Dang Thi Viet Duc (2019) and Nguyen Anh Phong et al. (2021) find that ICT development positively affects business performance, though these analyses have yet to integrate ICT with broader institutional quality indicators in a unified framework.

3. DATA, MODEL, AND METHODOLOGY

Research data: The data for the author's research includes reports on ICT index rankings, indexes and PCI indexes of provinces. Data on production, business and finance of enterprises in 63 provinces and cities were collected from 2015 to 2021. Specifically as follows: First, regarding

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production, business and financial data of enterprises in 63 provinces and cities, the author uses two sources: Statistical reports and white books of Vietnamese enterprises in the years; Second, regarding the ICT index of provinces and cities, the author uses this index from the "Report on assessment and ranking of readiness for development and application of IT in Vietnam Vietnam ICT Index over the years of the Ministry of Information and Communications and the Vietnam Association of Information Technology. The PCI index is published annually on key channels; Third, on the division of 7 economic regions: According to Article 3 of Resolution No. 81/2023/QH15 of the National Assembly on "National Master Plan for the period 2021-2030, vision to 2050", Vietnam is effectively divided into 6 key economic regions. However, in the article, the author divides the North Central and Central Coast regions into 7 regions, that is, the North Central and Central Coast regions are divided into 2 regions (North Central and South Central), including the following regions: (1) Northern Midlands and Mountains (MNPB); (2) Red River Delta (RBD); (3) North Central Region (BTB); (4) South Central Coast (NTB); (5) Central Highlands (TN); (6) Southeast Region (DNB); (7) Mekong River Delta (DBSCL).

Quantitative methods and research models

- **OLS cross-data method**: OLS regression method using cross-data calculates the regression of equation (1) for each year to determine the residual value representing the tax competitiveness factor in localities. At the same time, the variable of FDI capital invested in localities is added to the research model. According to recent studies, the role of tax competition in attracting FDI capital flows to a country or region is shown. Low income tax rates will lead to high net foreign direct investment inflows, and there is a causal link between these two trends that has implications for the debate on taxation and tax competition for FDI attraction (Reint et al, 2001; John H. Mutti, 2004; Azémar, C, and Dharmapala, 2019; Nguyen Thi Kim Chi, 2021). Therefore, the research model on tax competition is used as follows:

$$\pi_{it} = \alpha\pi_{it-1} + \delta\sum_{i\#j} w_{ij}\pi_{jt} + \gamma Pop_{it-1} + \theta indust_{it-1} + \beta X_{it-1} + \boldsymbol{\vartheta FDI_{it-1}} + n_i + tt_t + \varepsilon_{it} \quad (1)$$

Where:

π_{it}: is the average effective tax rate (AETR) of province i in year t, calculated by dividing the total revenue from taxes and fees by the GRDP of province i in year t

https://doi.org/10.71058/jodac.v9i9003

$\sum_{i\#j} w_{ij}\pi_{jt}$: is the average value of the average effective tax rate of provinces other than province i in year t, calculated according to the following predetermined weights:

$$w_{ij} = \begin{cases} \dfrac{s_{ij}d_{ij}}{\sum_{j=1}^{N} s_{ij}d_{ij}} \text{ với i\#j} \\ 0 \text{ với i} = \text{j} \end{cases}$$

Where s_{ij} is the inverse of the absolute value of the difference in GRDP per capita between province i and j ($s_{ij} = \frac{1}{|Percapita_{it} - Percapita_{jt}|}$); d_{ij} is the inverse of the distance between province i and j ($d_{ij} = \frac{1}{|d_{it} - d_{jt}|}$);

Pop_{it-1} is the population size of province i in year (t -1); it measures the effect of the size of province i

$indust_{it-1}$ is a measure of the level of industrialization of a province i in year (t-1) according to Zhang et al (2004), it is measured by the ratio of the value of non-agricultural GDP to the value of agricultural GDP of province i in year (t – 1)

Xi_{t-1} are the control variables in the model, which include the main determinants of tax rates based on theories and empirical studies, including: (1) GDP per capita, (2) openness (measured by the value of goods and services consumption of province i, (3) local government consumption, (4) urban population ratio.

FDI_{it-1} is the additional investment capital of province i in year (t-1)

The residual value of regression model (1) represents the tax competitiveness of the provinces. The residual value >0 shows that the province has better tax competitiveness than the province with the residual value <0.

-Method of analyzing benefits and costs from preferential income tax policies in provinces: The author uses the tool of analyzing the benefits and costs of corporate income tax incentives in provinces and cities to examine the impact of this index on the financial performance of enterprises. In this study, the author estimates the cost by the revenue increase method (calculated based on the pre-tax profit value of the enterprise, from which the income tax collected if applying the common tax rate for each year is calculated, compared with the actual tax collected from the

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statistical report, this difference is the additional revenue value obtained if there is no tax rate incentive or tax exemption or reduction incentive, it is considered as the cost from the tax incentive policy). The author estimates the benefits using return on investment (ROI) analysis, which is calculated based on the difference in the value of the return on investment if the ROI is obtained from the incentive compared to the ROI if the implementation is based on the general tax rate. The author chooses this method because it has advantages such as being easy to calculate and suitable for calculating benefits-costs at the local level (Forstater, 2017), in addition to being consistent with the available statistical reporting data of Vietnam. Next, the author calculates the benefit/cost ratios (B/C-Cost-benefit ratios) representing an important input to inform policy reforms for tax incentives at the local level. After calculating the value, the author converts it to a binary variable by converting if any province has B/C>1 is assigned a value of 1, otherwise assigned a value of zero.

-GMM method: In this study, the author chooses the lag variable of ROA as the explanatory variable affecting business performance (ROA). In addition to ensuring the reasonableness when applying DGMM, there are also many studies using the lag variable in the model such as (Nathan J. Kelly and Luke Keele, 2004; Nguyen Trong Nghia, 2022; Tran Thi Tuan Anh et al, 2023). In addition, in the study, the author uses the scale variable as an instrument variable to handle the endogeneity problem. Because in terms of theory, the theory of economies of scale (Smith, 1977) also argues that the size of a business is generally an important issue because the scale affects the cost of production, thereby affecting the business results of the business. Economies of scale can arise due to both internal and external factors. Internal economies of scale are based on managerial decisions, while external economies are related to external factors such as the business environment, competition, or institutional factors. In addition, the size of a firm is an important factor that directly influences its operations and determines its performance (Jim Lee, 2009; İlhan Dalc et al, 2019; Mahmood et al, 2019). The test results also show that the size variable is a good instrumental variable in the model.

Regression model (2) (3) quantifies institutional factors affecting business performance, the specific model applied is as follows:

$$\mathbf{ROA_{it}} = \mathbf{b_o} + \mathbf{b_1 ROA_{it-1}} + \mathbf{b_2}\,\boldsymbol{\pi_{it}} + \mathbf{b_3 (B/C)_{it}} + \mathbf{b_4 Automany1_{it}} + \mathbf{b_5 ICT_{it}} + \mathbf{b_6 PCI_{it}} + \mathbf{b_7 Salegrowth_{it}} + \mathbf{b_8 Debt_{it}} + \mathbf{b_9 LP_{it}} + \mathbf{b_{10}} \sum_{j=1}^{6} Zone_{jt} + \mathbf{e_{it}} \quad \mathbf{(2)}$$

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In addition, to check the stability of the model, the author replaces the Automany2 variable according to the following equation (3):

$$\mathbf{ROA_{it} = b_0 + b_1ROA_{it-1} + b_2\pi_{it} + b_3(B/C)_{it} + b_4Automany2_{it} + b_5ICT_{it} + b_6PCI_{it} + b_7Salegrowth_{it} + b_8Debt_{it} + b_9LP_{it} + b_{10}\sum_{j=1}^{6} Zone_{jt} + e_{it}} \quad (3)$$

Table 1: Summary of variables and calculation methods in the numerical model (2) and (3)

Interpretation	Variable	Measure variables	References	Expected sign
Dependent variable				
Performance measurement variables				
+ Return on total assets	ROA_{it}	Profit after tax/end of period i assets in year t	Nguyen Trong Nghia (2022), Thi Van Khanh Vo (2022), Tran Thi Tuan Anh et al (2023)	
Independent variables				
+ Lag of return on total assets	ROA_{it-1}	Profit after tax/end of period i in year (t-1)	Arellano và Bond (1991), Nathan J. Kelly và Luke Keele (2004), Dong Jun Lim and Moon Su Kim (2022)	+
+ Tax competition	π_{it}	Residuals from regression results of numerical model (1)	Hayashi và Boadway (2001), Wu và Hendrick, (2009), Yongzheng Liu (2014)	+
+ Benefits/costs from income tax incentives	B/C_{it}	Benefit from tax incentives/Cost from tax incentives of province i in year t (binary variable)	WorldBank (2016); Forstater (2017)	+
+ Financial and budget autonomy according to law	$Automany1_{it}$	Calculated by the retained budget ratio of province i in year t according to current regulations	Krisztina Beer-Tóth (2009), Enid Slack, (2017), Vuong Duc Hoang Quan and	+

https://doi.org/10.71058/jodac.v9i9003

			Nguyen Anh Phong (2020)	
+ Financial autonomy of own budget	$Automany2_{it}$	Calculated by the proportion of revenue from each local tax item using the weighting method (Binary variable)	Krisztina Beer-Tóth (2009), Enid Slack, (2017), Mariola Kapidani (2018), Vuong Duc Hoang Quan and Nguyen Anh Phong (2020)	+
+ ICT index	ICT_{it}	Composite ICT index of province i in year t	Heshmati and Wang (2006), Niebel (2014), Karlsson và Liljevern (2017)	+
+PCI index	PCI_{it}	Calculate the natural logarithm of the provincial competitiveness index in province i in year t	Tran Thi Bich et al. (2009), Nguyen Van Thang et al. (2013), Chu Thi Mai Phuong (2017)	+
Control variables				
+ Total revenue growth	$Salegrowth_{it}$	(Year t revenue minus year t-1 revenue)/Year t-1 revenue	Uly Wulandari et al. (2021); Nugroho & Halik, (2021); Tri Kurniawati (2023); Pham Quoc Hai et al. (2023)	+
+ Leverage	$Debt_{it}$	Total Debt/ Total Assets	Berger & Bonaccorsi di Patti, (2006); Demiraj et al. (2023); Richard Arhinful et al. (2023)	-
+ Labor productivity	LP_{it}	Net revenue of province i in year t / Number of employees of province i in year t	Yazdanfar (2013); Prakash et al., (2017); Nguyen Anh Phong et al. (2019); Christian Krekel et al. (2019)	+
+ Economic zone	$Zone_{jt}$	Divided into 7 economic regions, in which the author chooses the North Central region (BTB) as the standard region.	Manzhi Liu et al. (2019), Yu Qi et al. (2022)	+

Source: Compiled from the author

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Automany2: Calculated by separate collection autonomy index, this index is calculated as follows:

B1. Use the revenue as the weight of each type of tax and fee (we have w1, w2,....wn)

B2. Calculate the budget allocation ratio of each type of tax and fee (we have f1, f2,....fn)

B3. Calculate the average ratio

Automany2=RLGA=w_1*f1+w_2*f_2+...+w_n*f_n

According to the provisions of Clause 3, Article 13 of Decree 163/2016/ND-CP, the revenues are divided according to the percentage (%) between the central budget and the local budget as follows: + The central budget enjoys 100% but the revenue is generated in the provinces, including: revenue from import and export (import and export tax, VAT on imported goods, special consumption tax on imported goods, environmental tax on imported goods); taxes and fees from resources, oil and gas exploration and exploitation; Revenues are divided proportionally between the central and local budgets: VAT, corporate income tax, personal income tax, special consumption tax and aviation environment tax. This division ratio is approved by the National Assembly and is adjusted and changed over time, usually every 5 years. Local financial autonomy includes both revenue autonomy and expenditure autonomy. According to the Law on State Budget of Vietnam, most expenditures are planned and regulated according to the legal framework. In addition, according to authors such as Rodriguez-Pose and Kroijer (2009) and Mariola Kapidani (2018), revenue autonomy plays the most important role in local financial autonomy. Therefore, the author only chooses to calculate the revenue autonomy in this study. After calculating based on the weight and the division ratio, the author classifies the Automany2 variable into a binary categorical variable. The author calculates the annual average value, any province with a value greater than the average value will be assigned a value of 1, the provinces with a value less than the annual average value will be assigned a value of zero.

4. RESULTS AND DISCUSSION

Table 2. Average ROA value over the years of 7 economic regions

ROA by economic region	2016	2017	2018	2019	2020	2021	Average
Northern Mountains	1.65	2.09	1.69	1.71	1.44	1.57	1.69
Northern Delta	1.20	4.23	3.63	3.36	2.75	2.82	3.00
North Central	0.20	0.25	-0.17	-0.55	-0.90	1.38	0.04
South Central	3.54	3.19	2.28	2.08	0.88	2.23	2.37
Central Highlands	1.80	2.04	0.58	0.38	1.32	1.64	1.29
Southeast	4.12	4.20	3.57	3.43	3.72	2.78	3.64
Mekong Delta	4.88	4.23	3.49	2.55	2.67	2.21	3.34

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Source: Author's calculation

Table 2 reports the average ROA of enterprises across Vietnam's seven economic regions during 2016–2021. The data reveal a notable decline in ROA in 2020–2021, largely attributable to the COVID-19 pandemic. Over the six-year period, the North Central region recorded the lowest average ROA (0.04%), followed by the Central Highlands (1.29%) and Northern Midlands and Mountains (1.69%). In contrast, the Southeast exhibited the highest average ROA (3.64%), followed by the Mekong River Delta (3.34%) and Red River Delta (3.00%). Given its consistently poor performance, the North Central region is selected as the reference category in subsequent regression analyses.

Table 3. Descriptive statistics of variables

Variable	Obs	Medium	Standard deviation	Minimum	Max
ROA	378	2.31	2.95	-5.6	19.3
π	378	0.09	0.06	0	0.59
Benefit-Cost	378	0.42	0.49	0	1
Auto1	378	0.92	0.18	0.18	1
Auto2	378	0.39	0.48	0	1
ICT	378	0.42	0.14	0.08	0.94
PCI	378	63.17	3.52	52.98	75.09
Debt	378	0.61	0.08	0.38	1.1
LP	378	1.39	0.71	0.09	5
Salegrowth	378	0.17	0.21	-0.23	2.17

Source: Author's calculation

Table 3 describes the statistics of the variables in the research model, in which the total number of observations is 378 with balanced panel data (6 years x 63 provinces = 378 observations). The average ROA value of the entire sample is 2.31% with a standard deviation of 2.95%, in which the smallest value is -5.6% and the largest value is 19.3%. In general, the business performance calculated by the general ROA ratio of the business sector of 63 provinces and cities is effective (because the average value >0). The average value of the tax competitiveness variable of the provinces $\pi = 0.09$, the standard deviation is 0.06 with values from 0 to 0.59. In general, this value is >0, meaning that the provinces have different levels of tax competitiveness and are all tax competitive. The analysis results show that in the provinces and economic regions with many difficulties such as the provinces in the Northern mountainous region, the provinces in the North Central region and the provinces in the Central Highlands economic region, there are many

https://doi.org/10.71058/jodac.v9i9003

localities with difficult or especially difficult economic conditions, so they still enjoy many preferential policies to attract investment. Particularly in provinces with locations that are easy to attract investment, provinces/regions with developed economic conditions such as the Southeast economic region, or the Northern Delta economic region, although enterprises located in the area do not enjoy geographically attractive policies, there are still enterprises that enjoy other incentives (such as incentives for strategic industries, incentives for education, healthcare, etc.). The benefit-cost ratio from tax incentives (Benefit-Cost) after being converted to binary values (according to the classification >1 and <1) has an average value of 0.42, standard deviation of 0.49, meaning that less than 50% of provinces/cities have benefit value > cost from corporate income tax incentives. Budget autonomy value is calculated according to the average Automany1 value of 0.92, this value is the budget retention rate of 4 taxes/fees (VAT, CIT, PIT, SCT and aviation environment tax under import), most provinces with large budget revenue have high rate and vice versa.

The ICT and PCI indexes have average statistical values of 0.42 and 63.17, respectively. The ICT index ranges from 0-1, with an average value of 0.42, meaning that the development and application of IT in the provinces is below average. The PCI provincial competitiveness index is currently being improved by all provinces/cities, however, the average value is not high (although higher than the average). The average leverage value (debt/total assets) is 61%, where the debt value is the total debt value, including loans and commercial debts or capital appropriations. The Debt index has the largest value of 1.1>1, there are loss-making businesses with negative equity, leading to this situation. The labor productivity (LP) variable has an average value of 1.39>1, showing that the labor productivity of the enterprise sector is quite good, however, there are still provinces with low productivity <1 (shown by the smallest value of 0.09). The revenue growth variable has an average value of 17%, showing that the business situation of the provinces has good revenue growth, however, there are also years and provinces where enterprises have poor business conditions, with declining revenue (the smallest value is -23%).

Table 4. Quantitative results

Variable	Results with Automany 1 and Automany2		Results with Automany1		Results with Automany2	
	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Constant	-7.43	0.45	-6.01	0.55	-8.18	0.39

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ROA_{t-1}	0.60	0.00(*)	0.63	0.00(*)	0.56	0.00(*)
π	-5.13	0.06(***)	-5.02	0.07(***)	-4.60	0.04(**)
Benefit-Cost	0.89	0.00(*)	0.81	0.00(*)	0.98	0.00(*)
Auto1	-0.28	0.65	-0.59	0.34		
Auto2	-0.51	0.00(*)			-0.53	0.00(*)
ICT	0.44	0.52	0.54	0.43	0.43	0.52
lnPCI	1.75	0.48	1.31	0.61	1.92	0.43
Debt	-0.78	0.71	-0.14	0.94	-1.39	0.51
LP	0.59	0.02(**)	0.62	0.02(**)	0.64	0.01(**)
Salegrowth	3.00	0.00(*)	3.00	0.00(*)	3.06	0.00(*)
MNPB	0.54	0.18	0.50	0.21	0.63	0.12
DBBB	0.21	0.67	0.18	0.70	0.32	0.49
NTB	0.68	0.17	0.67	0.17	0.77	0.14
TN	0.28	0.46	0.12	0.79	0.32	0.41
DNB	0.15	0.81	0.06	0.92	0.35	0.54
DBSCL	0.33	0.56	0.21	0.71	0.48	0.41

Source: Author's calculation (*); (**); (***) correspond to significance levels of 1%; 5% and 10%

The quantitative results in Table 4 show the influence of institutional factors on business performance of enterprises in different provinces/cities. The results are estimated using the DGMM method, according to which the author verifies and finds the size variable (Size measured by total assets of the enterprise) is the optimal instrument variable in the model. To check the robustness of the model, the author replaces it with two variables Automany1 and Automany2 with two different measurements. The results show that the model has good robustness when the variables do not change sign for the whole model when using both measures (Automany1 + Automany2), which proves that the method and the selected variables are appropriate, the instrumental variable is selected correctly by the GMM regression method. In addition, the author also chooses the option (vce (robust)) to help correct the error of heteroscedasticity in the model

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-The previous year's ROA lag variable has an impact on the current year, with a marginal effect of 0.6% and is statistically significant at the 1% level. That is, when other factors remain constant, a positive ROA value in the previous year will create an effect to increase operating efficiency for the following year at the level of 0.6%. This result is consistent with the expected sign and consistent with the studies of (Nathan J. Kelly and Luke Keele, 2004; Nguyen Trong Nghia, 2022; Dong Jun Lim and Moon Su Kim, 2022). Indeed, if a business is profitable, it will create motivation for the next year to continue to maintain a good business situation. On the contrary, if a business is experiencing poor results, it will be more difficult to recover and increase efficiency next year. In addition, the previous year's profitable business, ROA>0, also shows that the business's management capacity is better and therefore the following years will also be favorable for better management and business for the business.

-Tax competition in localities has a negative impact on business efficiency with an impact of -5.13% and a statistical significance level of 10%. This result is contrary to the expected sign and some previous research results such as (Hayashi and Boadway, 2001; Wu and Hendrick, 2009; Yongzheng Liu, 2014). This result shows that which province has high tax competition (ie focusing on preferential policies, tax exemptions and reductions), considering from equation (1) shows that the provinces have different effective tax rates because the province is in a difficult area, enjoying higher preferential policies. As mentioned, currently, high incentives are concentrated in difficult and especially difficult economic areas. This result contributes to reaffirming that preferential policies in difficult areas do not necessarily help businesses increase investment and increase operational efficiency. Meanwhile, other non-financial conditions such as open policies, favorable locations, good economic and technical infrastructure, and a good business environment will help businesses increase efficiency more.

- The Benefit-Cost variable has a positive impact on ROA at 0.89% and reaches a statistical significance level of 1%. This result is consistent with the expected sign and supports some previous research results such as (WorldBank, 2016; Forstater, 2017). This result shows that instead of paying attention to tax incentives or tax competition, local authorities and enterprises should pay more attention to the benefits and costs of incentives. If the benefits received from incentives are lower than the losses from incentives, it means that incentives are redundant or ineffective. This result shows that in provinces/cities where benefits > costs from incentives really help businesses increase operational efficiency and thus are worth incentives to attract investment, and businesses are interested in expanding investment.

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- The Automany2 variable (composite financial autonomy index) is negatively correlated with ROA performance, meaning that provinces with high levels of autonomy (value = 1) reduce business performance by -0.51% and have statistical significance at the 1% level. This result is contrary to the expected sign and contrary to previous research results (Krisztina Beer-Tóth, 2009; Enid Slack, 2017; Mariola Kapidani, 2018; Vuong Duc Hoang Quan and Nguyen Anh Phong, 2020). Indeed, provinces with high financial autonomy (value >1), according to the formula and calculation method, as well as according to legal regulations, currently also fall into provinces or regions with poor economic development conditions. In these provinces, 100% of the revenue from 4 types of taxes and fees (VAT, CIT, PIT, SCT and aviation environment belonging to NK) is retained, while the revenue distributed to the central budget is 100% from import and export tax, while provinces with difficult economic conditions do not generate or generate very little of this revenue. This leads to underdeveloped provinces having high Automany2 coefficients. Therefore, the current revenue allocation policy still has limitations when considering the aspect of helping the private sector or businesses operate effectively.

- The labor productivity (LP) variable has a positive impact on operating efficiency with a marginal impact of 0.59% and a statistical significance level of 5%. This result is consistent with the expected sign and supports the results of previous studies (Yazdanfar, 2013; Prakash et al, 2017; Nguyen Anh Phong et al, 2019; Christian Krekel et al, 2019). Labor productivity plays an important role in business performance, therefore, businesses need to pay attention and find ways to improve and enhance labor productivity.

- The variable of sales growth has a positive impact on operating efficiency with a fairly high marginal impact of 3% and a statistical significance of 1%. This result is consistent with the expected sign and supports the results of previous studies by (Uly Wulandari et al, 2021; Nugroho & Halik, 2021); Tri Kurniawati, 2023; Pham Quoc Hai et al, 2023). Revenue and sales growth play a key role in improving cash flow, creating liquidity and increasing operating efficiency for businesses. Therefore, in provinces where the business sector has poor revenue growth, the government also needs to review the causes, especially institutional factors, to see what needs to be improved to help businesses develop well.

-In addition, other institutional variables such as ICT and PCI have a positive relationship with business performance but are not statistically significant. However, from a management perspective, the government also needs to consider improving this group of indicators to help businesses improve their performance.

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- The quantitative results find the difference in efficiency between provinces divided into 7 different economic regions, in which the author takes the North Central Coast economic region (BC) as the standard comparison region. The results show that the marginal effects are all positive, meaning that the business performance of enterprises in the remaining regions is higher than that of enterprises located in the North Central Coast economic region. This result is also quite consistent with the descriptive analysis in Table 1, showing that the average ROA value over the years of enterprises in the North Central Coast economic region is also lower than that of the remaining economic regions.

5. CONCLUSION AND RECOMMENDATIONS

This study examined the impact of institutional factors including provincial tax competition, benefit–cost efficiency of tax incentives, fiscal autonomy, ICT development, and business environment quality on firm performance across Vietnam's 63 provinces from 2015 to 2021. Using cross-sectional OLS, benefit–cost analysis, and dynamic GMM estimation, the results reveal four key findings: (1) Tax competition exerts a negative effect on ROA, indicating that preferential tax policies in economically disadvantaged areas do not necessarily translate into higher business efficiency. (2) Benefit–cost efficiency of tax incentives is positively associated with firm performance, emphasizing that incentives are effective only when benefits exceed fiscal costs. (3) Composite fiscal autonomy (Automany2) shows a negative relationship with ROA, reflecting limitations in the current revenue-sharing mechanism, which grants high retention rates to economically weaker provinces with limited revenue-generating capacity. (4) Labor productivity and sales growth emerge as the most influential positive drivers of profitability, while ICT and PCI show positive but statistically insignificant effects. These findings underscore the need for a more nuanced approach to institutional reforms, shifting the focus from blanket tax incentives toward comprehensive improvements in non-financial conditions that underpin sustainable business performance. Based on the empirical results, six main policy implications are proposed: (1) Rebalance the role of tax competition: Local governments should avoid excessive reliance on preferential tax policies in disadvantaged regions. Instead, emphasis should be placed on non-financial enablers such as open regulatory frameworks, infrastructure development, and transparent governance that indirectly improve both ICT and PCI indicators. (2) Prioritize benefit–cost evaluation of tax incentives: Policymakers should institutionalize benefit–cost analysis in the design and review of incentive schemes, discontinuing those with net negative impacts. Enterprises should strategically prioritize investment in provinces with B/C>1, where incentives demonstrably enhance operational efficiency. (3) Reform fiscal autonomy

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mechanisms: The negative effect of Automany2 highlights the need to revise the revenue-sharing system to ensure that financially strong provinces retain adequate fiscal resources for infrastructure and business environment improvements, while preventing inefficient allocation in economically weak but high-retention provinces. (4) Enhance labor productivity: Both local authorities and firms should invest in workforce quality through skills training, technology adoption, and human capital development. In the current context, competitiveness is no longer based on low labor costs but on productivity gains driven by technology and institutional quality. (5) Promote sustained sales growth: Enterprises should adopt market expansion and product diversification strategies to sustain revenue growth. In provinces experiencing stagnation, local governments must address institutional bottlenecks that hinder market access and competitiveness. (6) Targeted support for underperforming regions: The North Central, Central Highlands, and Northern Midlands consistently exhibit low firm performance. Tailored interventions—focusing on infrastructure, technological readiness, and managerial capacity—are required to address structural disadvantages.

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