ANALYSIS OF THE IMPACT OF STATE BUDGET REVENUE ON GROSS REGIONAL DOMESTIC PRODUCT IN THE CONTEXT OF DIGITAL TRANSFORMATION IN VIETNAM

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Abstract: ***This study investigates the impact of state budget revenue on Gross Regional Domestic Product (GRDP) within the context of digital transformation in Vietnam. Using panel data from five major cities over the period 2015-2021, the research applies the Pooled Ordinary Least Squares (POLS) model to estimate the relationship between fiscal capacity and regional economic growth. The empirical findings demonstrate that state budget revenue exerts a significantly positive effect on GRDP, thereby confirming its crucial role in promoting regional economic performance. Furthermore, variables representing the digital environment and digital transformation are also found to contribute positively to local economic growth, highlighting the importance of technological modernization in enhancing fiscal efficiency and growth dynamics. These results imply that state budget revenue, when efficiently mobilized and allocated in alignment with digital transformation strategies, can serve as a pivotal instrument to foster sustainable regional development. Policy recommendations are proposed accordingly.***

• Keywords: *state budget revenue, gross regional domestic product, digital transformation, Vietnam.*

Date of receipt: 08th Nov., 2025
Date of receipt revision: 10th Dec., 2025
Date of delivery revision: 02th Dec., 2025
Date of approval: 20th Jan., 2026

DOI: https://doi.org/10.71374/jfar.v26.i1.03

1. Introduction

State budget revenue constitutes a fundamental component of public finance and plays a decisive role in shaping the economic development trajectory of nations and regions. In essence, state budget revenue refers to the total financial resources collected by government authorities through taxation, fees, charges, and other lawful contributions, which are then allocated to fund public expenditures. It not only ensures the functioning of the state apparatus but also provides the fiscal foundation for public investment in infrastructure, education, healthcare, and other socio-economic activities. Within the Vietnamese context, state budget revenue is particularly critical for regional development, as it supports both short-term stabilization measures and long-term strategies to foster inclusive growth.

Parallel to this, Gross Regional Domestic Product (GRDP) is widely recognized as a key indicator reflecting the overall economic performance of a locality. It measures the total value of goods and services produced within a specific region over a defined period, thereby capturing the scale and efficiency of economic activities at the subnational level. Unlike national GDP, GRDP emphasizes local productivity, competitiveness, and structural transformation, which are increasingly relevant for policy formulation in decentralized economies such as Vietnam. Understanding the determinants of GRDP growth, particularly the role of fiscal capacity, is therefore essential for both scholars and policymakers.

The mechanism through which state budget revenue influences GRDP is multifaceted. On the one hand, higher fiscal revenue expands the government's ability to finance productive public expenditures, including investments in infrastructure, technological innovation, and social welfare, which directly enhance regional productivity. On the other hand, budget revenue can indirectly stimulate private sector activities by improving institutional quality, reducing transaction costs, and creating a favorable business environment. However, the effectiveness of these mechanisms depends largely on how revenues are mobilized and allocated. Excessive reliance on distortionary taxes or inefficient spending patterns may, conversely, impede growth. Hence, empirical research is required to disentangle the net effect of state budget revenue on regional economic performance.

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In recent years, the wave of digital transformation has introduced new dynamics into this relationship. Digital transformation, understood as the adoption of digital technologies and digital governance in economic and administrative processes, has significantly altered the way state revenues are mobilized and managed. E-government platforms, digital tax administration, and data-driven public finance management enhance transparency, efficiency, and accountability, thereby increasing the effectiveness of budgetary policies. Moreover, digital transformation improves the productivity of regional economies by fostering innovation, facilitating connectivity, and expanding access to new markets. Consequently, the interplay between fiscal revenue and digital transformation is emerging as a crucial determinant of local economic growth in Vietnam.

Against this backdrop, analyzing the impact of state budget revenue on GRDP in the context of digital transformation becomes highly significant. Such an inquiry not only provides empirical evidence on the effectiveness of fiscal policy at the regional level but also highlights the enabling role of digital transformation in strengthening the growth-enhancing effects of budget revenues. The findings bear important implications for policymakers, particularly in designing strategies that optimize the mobilization and allocation of fiscal resources while simultaneously accelerating digital adoption. By integrating fiscal efficiency with digital transformation, Vietnam can build a more resilient and sustainable growth model for its local economies.

The presentation unfolds through a well-structured progression. Following the introductory remarks, an integrative review of existing literature is undertaken, setting the foundation for the inquiry. Subsequently, the processes of dataset compilation and methodological design are outlined with clarity and rigor. The next part presents and interprets the empirical findings, linking them directly to the research objectives. Finally, the paper concludes by advancing policy recommendations aimed at fostering Vietnam's economic growth in the coming years.

2. Literature review

The topic of the relationship of state budget revenue and local economic growth has attracted the attention of many researchers. Sunarsih (2015) aimed to determine the effect of Sectoral Gross Regional Domestic Product on the local revenue district/city in Central Java province in 2011-2012. One indicator of success in the implementation of macro development was economic growth. The rate of economic growth into one of the essential purposes of local government and central government. Regional development was expected to have a positive impact on the growth of the national economy. Regional economic growth could be reflected in changes in the Gross Regional Domestic Product in the region. This study used multiple regression to test the hypothesis. The results showed that only the tertiary sector was positive and significant effect on the local revenue. While the primary sector and the secondary sector had no effect on local revenue due to the primary sector and the secondary sector more in contact with the base of the central government revenue and/or provincial governments.

A discussion on the relationship among some macro economics including budget and gross regional domestic products is executed by Husein & Cahyadi (2021). This study aimed to analyze the influence of Gross Regional Domestic Product, BI rate, and unemployment on inflation in Aceh Province. The data used were secondary data sourced from the Central Bureau of Statistics of the Republic of Indonesia in 2000-2015. The data analysis method used was the Error Correction Model. The results of the study indicated that: independent variables were positive and significant on inflation, but only the GRDP variable is not significant.

Usmansyah & Sungkowati (2022) confirmed that Gross Domestic Product (GDP) was influenced by investment, public consumption, and economic growth. Tax revenue was influenced by taxpayer compliance and tax administration system, and economic growth. In order to know how far GDP and Tax Revenue affect Tax Ratio, an analysis was carried out based on available data and using multiple linear regression and test of multicollinearity to conclude the relationship between GDP and State Revenue to Tax Ratio. The more State Revenue increased, the more tax ratio increased. Its consequence was to increase state revenues, especially tax revenues, taxation policies must be formulated that refer to taxpayer compliance, the taxation system, including tax intensification and extensification measures, economic growth to increase GDP and ultimately increase tax ratio.

Recently, Kurniawan & Anggraini (2024) aimed to analyze Regional Original Revenue, Gross

Regional Domestic Product, Revenue Sharing Funds, and Population on regional expenditure in the regencies/cities of Bengkulu Province. The analysis method used was panel data regression analysis, which combined time series data and cross-section data. The data used in this study were secondary data obtained from the Ministry of Finance and the Bengkulu Provincial Statistics Agency during the 2011-2023 period, as well as other supporting sources. The variables collected include Regional Original Revenue, Gross Regional Domestic Product, Revenue Sharing Fund, and Population. Based on the panel data regression results, the best model obtained was the fixed effect model. The research showed that Regional Original revenue, gross regional domestic product, and population had a significant influence on local expenditure in Bengkulu Province. However, Revenue Sharing Fund did not show a significant influence on regional expenditure. Overall, Regional Original revenue, gross regional domestic product, revenue sharing funds, and population together had a significant effect on regional expenditure in districts/municipalities in Bengkulu Province.

Another recent notable study, Putra & Ahmad (2024) aimed to know the Locally Generated Revenue (PAD), Balancing Fund (DP), Local Government Expenditures (BD) and Regional Financing (PD) of Regional Economic Growth (PDRB). The data used in this study was annual data published by website Directorate General of Fiscal Balance and Central Bureau of Statistics for five period from 2011 until 2015. The analytical method used is Multiple Linear Regression. The results showed that the Locally Generated Revenue (PAD), Local Government Expenditures (BD) and Regional Financing (PD) had no effect significant on Regional Economic Growth (PDRB). While Balancing Fund (DP) had negatively significant effect on Regional Economic Growth (PDRB).

The review of prior scholarship has unequivocally demonstrated that examining the impact of state budget revenue on local economic growth is both theoretically justified and empirically relevant. It was further observed that most existing studies have relied on conventional determinants, thereby leaving substantial empirical gaps. To address this limitation, the present research strategically incorporates distinct independent variables - namely foreign direct investment and indicators of digital transformation - ensuring both novelty and analytical rigor in exploring regional growth dynamics within Vietnam.

3. Methodology and research data

This study uses annual time series data of five big cities Vietnam, including Can Tho, Da Nang, Hai Phong, Hanoi, Ho Chi Minh city from 2015 to 2021, including Gross regional domestic product as local economic growth, State budet revenue as fiscal capacity, Foreign direct investment, Turnover of postal service and telecommunication service, Number of internet subscribers as proxy of digital transformation.

The collected data is panel data, so the panel data analysis methods performed here are the choice between POLS, REM, FEM models. Panel data analysis is a statistical method, widely used in social sciences, epidemiology and econometrics to analyze two-dimensional panel data (usually cross-sectional and longitudinal). Data are usually collected over time and on the same individuals and then a regression is run on these two dimensions. Multivariate analysis is an econometric method in which data are collected across more than two dimensions (usually, time, individuals and some third dimension).

Table 1 below reports the description of the variables used in the study.

Table 1. Variables and Measurement

Variables name	Symbols	Variables measurement
Loal economic growth	GRDP	Gross regional domestic product (at current prices, bill. Dongs)
State budet revenue	SBR	State budet revenue (Bill. Dongs)
Foreign direct investment	FDI	Foreign direct investment (implementation capital (Mill. USD)
Digital Transformation	PS_TS	Turnover of postal service and telecommunication service (Bill. dongs)
	INTER	Number of internet subscribers (Thous. subs.)

Source: Authors' summary.

The empirical model is specified as:

$$\mathrm{GRDP_{it}} = \beta_0 + \beta_1 SBR_{it} + \beta_2 FDI_{it} + \beta_3 PS_{TS_{it}} + \beta_4 INTER_{it} + \mathrm{a_i} + \mu_t + \mathrm{u_{it}}$$

where β_i are the regression coefficients, a_i is a fixed effect in error, μ_t is error over time and u_{it} is the residuals over time and cities.

4. Empirical results

Table 2 below presents the descriptive statistics on mean of all variables used in this study.

Table 2. Descriptive on mean of variables

City	GRDP	SBR	FDI	PS_TS	Inter
Can Tho	79400.77	22183.83	24.41429	3703.286	729.8571
Da Nang	95434.86	37991.29	179.1143	2144.286	1026.643
Hai Phong	215206.6	82281.46	418.725	3474.333	1358.714

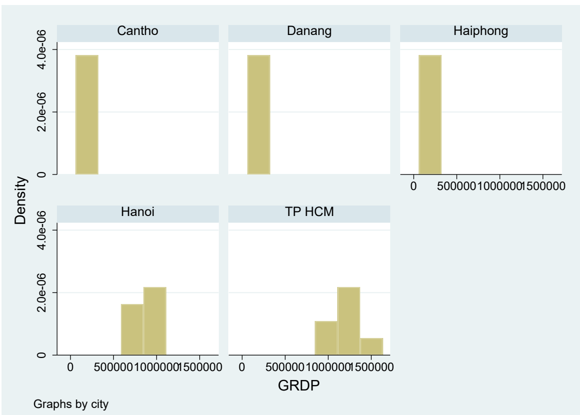
City	GRDP	SBR	FDI	PS_TS	Inter
Hanoi	865662.9	241286.1	1247.286	35849.86	8104.143
HCM city	1186411	353840.3	5960.3	.	10463.43
Total	488423.3	147516.6	1673.522	11582.52	4336.557

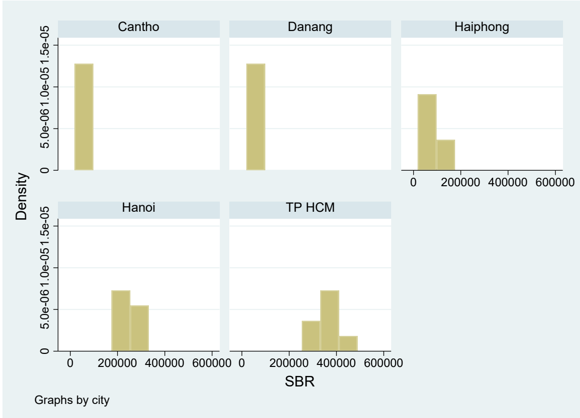
Source: Summarized by the author

The descriptive statistics reveal marked disparities among Vietnam's five major cities in terms of economic scale, fiscal capacity, foreign investment, and digital infrastructure. Gross Regional Domestic Product (GRDP, at current prices, billion VND) varies substantially, ranging from 79,400.77 in Can Tho to 1,186,411 in Ho Chi Minh City, reflecting wide gaps in regional economic output. State Budget Revenue (billion VND) follows a similar pattern, with the lowest value recorded in Can Tho (22,183.83) and the highest in Ho Chi Minh City (353,840.3), indicating strong differences in fiscal capacity. Foreign Direct Investment (implementation capital, million USD) is most pronounced in Ho Chi Minh City at 5,960.3, whereas Can Tho receives only 24.41, underscoring the uneven distribution of international capital. Turnover of postal service and telecommunication service (billion VND) peaks in Hanoi with 35,849.86, compared to 2,144.29 in Da Nang. Likewise, the number of internet subscribers (thousand subscriptions) reaches 10,463.43 in Ho Chi Minh City, significantly higher than Can Tho's 729.86. Overall, the data demonstrate pronounced inter-city disparities, highlighting the dual role of fiscal revenue and digital infrastructure in shaping local economic development.

The visualization of GRDP and SBR for all five cites during the period 2015-2021 serves as an essential analytical tool to provide both descriptive insights and preliminary interpretations of economic dynamics as in Figure 1.

Figure 1. Bar graph of GRDP and SBR of five cities during the period of 2015-2021





Source: Executed by the author

First, we estimate the random effect model and perform a test to choose the POLS or FE/RE model. The results of the Breusch and Pagan Lagrangian multiplier test for random effects give a probability value greater than 5%, so the POLS model is suitable for the collected data. The estimated POLS result is shown in the Table 3.

Table 3. POLS estimation result

GRDP	Coefficient	Standard error	Z	P > |z|	95% confident interval	
SBR	2.32	.37	6.20	0.000	1.58	3.05
FDI	25.98	37.01	0.70	0.483	-46.56	98.53
PS_TS	2.75	.98	2.78	0.005	.81	4.68
INTER	22.89	6.84	3.35	0.001	9.48	36.30
CONSTANT	-17018.33	12641.52	-1.35	0.178	-41795.25	7758.59

Source: Summarized by the author

Table 3 indicates that, the empirical results of the relationship are presented as follows:

$$\mathrm{GRDP}_{it} = -17018.43 + 2.32 * SBR_{it} + 25.98 * FDI_{it} + 2.75 * PS_{TS_{it}} + 22.89 * \mathrm{INTER}_{it} + \mathrm{u}_{it}$$

The results show a positive impact of local state budget revenue on local economic growth, as shown by the positive regression coefficient of SBR and statistical significance at the 1% level. Although there is no evidence of the impact of local FDI on local economic growth, in return, digital transformation is positively impacting local economic growth, as shown by the regression coefficients of the two variables PS_TS and INTER, which are both positive and statistically significant at the 1% level.

The mechanism through which local state budget revenue promotes regional economic growth operates through several interrelated channels. First, higher fiscal revenue enhances the government's capacity to finance essential public goods and services, such as infrastructure, education, healthcare, and transportation. These investments reduce transaction costs, improve productivity, and create a more favorable business environment, thereby stimulating private sector development. Second, state budget revenue enables the implementation of redistributive policies and social safety nets, which can stabilize consumption and reduce inequality, indirectly fostering sustainable economic growth. Third, predictable and sufficient fiscal resources strengthen local governments' ability to engage in long-term planning and strategic investment, which are critical for regional competitiveness.

In parallel, digital transformation exerts a complementary and reinforcing effect on local economic development. The expansion of digital infrastructure, including internet penetration and telecommunications services, enhances connectivity, reduces information asymmetries, and lowers barriers to market participation. Digital governance mechanisms, such as e-tax systems and online public services, improve transparency, efficiency, and accountability in revenue mobilization and allocation, thus increasing the effectiveness of fiscal policy. Moreover, the digital economy fosters innovation, supports new business models, and widens market access for local enterprises. Consequently, the synergy between strong fiscal capacity and digital transformation not only accelerates regional economic growth but also strengthens the foundations for long-term sustainable development.

5. Conclusion

The model reveals that state budget revenue has a significant positive influence on local economic growth during the research period of 2015-2021. Building upon the empirical findings, it becomes imperative to propose targeted policy measures that can maintain the fiscal capacity for promoting local economic growth in big cities in Vietnam.

A fundamental solution to sustaining local state budget revenue involves strengthening fiscal autonomy and diversifying revenue sources. Local governments should expand their capacity to mobilize tax and non-tax revenues through more efficient tax administration, rationalized fee structures, and innovative financing mechanisms such as public-private partnerships. By reducing excessive dependence on central transfers, fiscal decentralization enhances accountability and allocative efficiency, thereby reinforcing the growth-enhancing effect of local revenue. Within the digital transformation context, e-tax platforms and digital auditing tools significantly improve transparency, compliance, and collection efficiency, ultimately ensuring that fiscal capacity continues to fuel robust regional economic performance.

Sustaining the growth-inducing impact of state budget revenue requires not only effective mobilization but also judicious allocation. Prioritizing expenditure on high-impact sectors such as infrastructure, education, healthcare, and digital connectivity creates substantial spillover effects on local productivity and competitiveness. Strategic investment in digital infrastructure, including broadband expansion and smart public services, amplifies the multiplier effect of fiscal resources by lowering transaction costs and stimulating private innovation. Moreover, digital monitoring systems and performance-based budgeting increase efficiency in public spending, ensuring that every unit of revenue mobilized yields maximum developmental outcomes. Such optimized allocation reinforces the virtuous cycle between fiscal capacity and regional growth.

A third solution lies in institutional innovation and the integration of digital governance into fiscal management. The adoption of big data analytics, blockchain-based public finance tracking, and AI-powered forecasting tools enhances the precision, accountability, and responsiveness of local revenue systems. By embedding digital technologies into tax collection, budget planning, and expenditure monitoring, local governments can minimize leakages, strengthen compliance, and foster taxpayer trust. This institutional modernization not only consolidates fiscal sustainability but also aligns with Vietnam's broader digital transformation strategy, ensuring that fiscal revenues are effectively leveraged to drive structural upgrading, productivity gains, and sustainable economic growth at the local level.

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