IPN Journal of Research and Practice in Public Sector Accounting and Management
Vol. 15, No. 1, 2025, pp. 117 - 130

Threshold Analysis of Governmental Developmental Expenditures and Relevant Impacts on the Association of Southeast Asian Nations (ASEAN)

Nurhaiza Nordin, Nurnaddia Nordin*, Nik Syuhailah Nik Hussin, Zuraimi Abdul Aziz, Dzulkifli Mukhtar

Faculty of Entrepreneurship & Business, Global Entrepreneurship Research and Innovation Centre, Universiti Malaysia Kelantan, City Campus, Kota Bharu, Kelantan, Malaysia

**Corresponding Author: naddia.n@umk.edu.my*

https://doi.org/10.58458/ipnj.v15.01.06.0115

Received: 28 October 2024 *Reviewed: 7 March 2025* *Accepted: 17 April 2025* *Published: 26 June 2025*

Abstract

Purpose: Sustainable economic growth serves as the top priority for global governments, especially in rapidly developing regions. The allocation of governmental developmental expenditures plays an essential role in economic strategies by directing financial resources towards infrastructure, education, health, and technology initiatives, which potentially leads to productivity improvements and private sector investments despite the actual impact yet to be determined.

Objective: The current study seeks to analyse how governmental developmental expenditures contribute to economic growth through non-linear associations among the Association of Southeast Asian Nations (ASEAN) countries.

Methodology: Panel threshold regression was conducted to appraise the study hypothesis, which could flexibly measure how governmental developmental expenditures influenced economic growth through observations from 10 ASEAN nations between 2000 and 2022.

Variables: The independent variable was governmental developmental expenditures while Gross Domestic Product (GDP) per capita was the dependent variable, with inflation, foreign direct investments, and gross national expenditures serving as control variables.

This article is part of a research on Unravelling Growth Patterns: Government Development Expenditure, ASEAN Economic Performance, and Policy Implications for Malaysia supported by the Accountant General's Department of Malaysia through *Geran Penyelidikan Perakaunan dan Kewangan Sektor Awam Tahun 2024* (JANM.100-12/2/1 (13)).

Results: The critical threshold value was identified as 1.2696, which suggested slower economic growth when governmental spending remained below the threshold while surpassing the threshold would lead to limited additional benefits. Hence, a balanced approach to public spending is essential, wherein governmental spending effectiveness relies on the allocated budget, economic structure, governance framework, and institutional capacity.

Policy Recommendations: The ASEAN governments should develop and implement a targeted developmental budget strategy to exceed the stipulated threshold in preventing risks from underspending. While expanding governmental budgets is critical, the priority is also enhancing efficiency within essential sectors, including infrastructure, education, and technology.

Conclusion: The present study analysed the most optimal method to allocate governmental budgets for development. The findings demonstrated that spending above the stipulated threshold did not significantly contribute to economic growth among ASEAN nations. Simultaneously, underspending would constrain the economy, which posited that sufficient budgets and effective leadership were pivotal factors.

Originality/ Value: The current study demonstrated to the policymakers that sufficient governmental budgets are imperative for national development and economic growth among ASEAN countries.

Keywords: Governmental developmental expenditures, economic growth, ASEAN nations, panel threshold regression

1.0 Introduction

Sustainable global economic growth is one of the top priorities for governments across nations, particularly in fast-developing regions, including the ASEAN. The ASEAN comprises 10 heterogeneous economies, which encompasses Indonesia, Malaysia, Thailand, and Vietnam, with significant economic transformations in the past few decades driven by active governmental policies and the rapid expansion of globalised value chains (Ngigi et al., 2023). Investments from the public sector have also resulted in considerable productivity growth and encouraged participation from the private sector, which has generated a ripple effect on economic generation. While supporters perceive governmental developmental expenditures as vital for long-term economic growth, the actual impact remains ambiguous (Pesaran et al., 2001), particularly among heterogeneous regions, such as the ASEAN. Simultaneously, numerous theoretical frameworks have been developed to delineate the association between governmental spending and economic growth. Keynesian economic theory posits that an increase in government spending can elevate aggregate demand and employment, especially during economic downturns. Wagner's Law postulates that the demand for the expansion of public expenditures or governmental spending will be higher as the economy progresses. Nonetheless, existing empirical evidence remains inconclusive as certain scholars have discovered a positive relationship while others have revealed negative or mixed impacts (Santanu & Wardani, 2023, Saroj et al., 2023). The Gross Domestic Expenditure (GDE) is the most relevant aspect to developing countries

with immature or insufficient infrastructure and human capital. Aschauer (1989) elucidated that public investment in infrastructures can reduce transactional costs while increasing accessibility to markets and creating a favourable environment for the growth of the private sector. Investments in both educational and healthcare sectors can also contribute to higher labour productivity, which is critical to long-term economic sustainability (Fan et al., 2000). Nonetheless, the success of GDE depends on budget allocation efficiency, governance quality, and suitability to wider economic policies. Effective governmental funding disbursement can attract more foreign direct investment (FDI), generate more employment opportunities, and improve economic efficiency, whereas excessive spending, mismanagement, or corruption can undermine the aforementioned benefits and result in unsustainable public debts (Afonso et al., 2008). The ASEAN serves as a unique context for accessing the impacts of governmental developmental expenditures on economic growth in different developmental phases and institutional capacities. The Malaysian approach to infrastructure development through different projects, such as the East Coast Rail Link (ECRL), demonstrates how governmental investments directed toward specific objectives could assist in improving connectivity and regional cohesion. Hence, infrastructure development remains the most visible outcome of general developmental expenditures, especially investments in roads, railways, ports, and energy systems that can lower business costs and enhance trade (Rahman, 2023). Infrastructure development enables ASEAN countries to emerge as attractive investment locations to foreign investors who prefer to invest in regions with high-quality infrastructure (Aschauer, 1989). Nevertheless, budget constraints and unexpected economic shocks can impose significant challenges to maintaining the investments.

Human capital development is essential to promoting economic growth, with quality education and healthcare catalysing the transformation to a skilled and productive workforce to foster higher innovation and participation in high-value industries. Past researchers demonstrated that improved public health outcomes, including reduced illness-induced absenteeism, substantially enhanced national productivity and GDP growth (Barro, 1991). Public investment in research and development (R&D) could also profoundly lead to higher technological advancements, product innovation, and economic diversification, which are integral to sustaining economic growth in the contemporary competitive global economy (Romer, 1990). Furthermore, GDE plays a pivotal role in poverty alleviation and income distribution through pertinent programmes, such as social welfare schemes, housing initiatives, and food security measures, to facilitate inclusive growth by increasing living standards and participation in the economy among the lower-income population categories. Reducing poverty and inequality can ensure social stability, which is critical to long-term economic growth (Khan & Senhadji, 2000). Nevertheless, several prerequisites should be achieved to guarantee the effectiveness of GDE in promoting economic growth, including efficient and transparent fund allocation on infrastructural and social projects to prevent potential corruption. High project quality should also be maintained as ineffectively implemented infrastructure or social programmes would not generate the intended results. Concurrently, public spending is required to be consistent with fiscal sustainability to prevent high debt levels that can obstruct private investment and destabilise macroeconomic conditions when borrowing for developmental projects (Easterly & Rebelo, 1993). Moreover, policymakers are required to comprehend the GDE impact on ASEAN economic growth and identify factors capable of maximising GDE benefits towards fostering fair regional development. The current study also aims to determine the factors contributing to the non-linear relationship between GDE and economic growth among ASEAN member countries, with GDE aiding in enhancing economic prosperity. A threshold estimation

analysis was conducted from 2000 to 2022 to contribute insights into promoting governmental investment efficiency via sustainable economic growth. The findings would also offer policy recommendations on the most optimal method to allocate public resources across ASEAN economies. Section 2 reviews the existing literature relevant to GDE and associated economic implications. Section 3 delineates the methodology adopted in the current study, including data sources and analytical techniques. Section 4 discusses empirical findings and major insights generated through the analysis. Section 5 concludes the study by summarising key findings with policy implications and future directions.

2.0 Literature Review

Financial developmental spending of the government, such as infrastructure, education, healthcare, and overall national development, provides momentum to economic development. The existing debate is related to how GDE can act as a determined engine for economic growth as relevant operations depend on factors, such as governance, policy effectiveness, and allocation strategies. The current study would offer an overview of the existing literature on GDE and economic growth and assess gaps or challenges in the employed methodologies, on top of alternative insights. Specifically, past studies highlighted that GDE significantly impacted economic performance both positively and negatively, including in India with increases in domestic consumption and investments that led to higher GDP growth (Kumar, 2024). Similarly, prior scholars in Nigeria discovered that both capital and recurrent expenditures profoundly contributed to creating a platform assisting in attaining long-term growth despite the associated short-term fiscal pressures (Jibir et al., 2023). Nonetheless, most studies conducted time-series analyses on country-specific dynamics, which neglected regional trends and broader implications for economic integration, particularly in ASEAN economies.

High-quality institutions can foster effective GDE. For instance, robust financial institutions in Sub-Saharan Africa have maximised the returns from governmental expenditures by ensuring efficient resource allocation, whereas substandard governance has led to governmental fund misallocations and inefficiencies (Musah et al., 2024). Robust institutions in developed countries can also reduce corruption while promoting efficient public spending (Sidek & Asutay, 2021). Meanwhile, numerous researchers did not extensively scrutinise the specific institutional mechanisms in terms of regulatory efficiency or fiscal transparency to garner deeper insights into the underlying factors of GDE success or failure. The ASEAN economies also remain underrepresented in the current topic despite the differences in governance regimes and economic settings. In addition, debates remain on the optimal GDE level and composition. Certain academicians propounded that excessive public spending may lead to inefficiencies, inhibit private-sector participation, and create fiscal imbalances (Ansari et al., 2021) while other scholars contended that targeted investments should be aligned with the economic priorities of a specific country. Previous academicians in Malaysia also delineated that ineffectively executed interventions by the government would lead to diminishing returns despite the ability of FDI to drive economic growth (Ramlan & Latip, 2023). Additionally, other researchers from the ASEAN-5 countries (Indonesia, Malaysia, Phillipines, Singapore and Thailand) uncovered that high levels of inefficient government spending impeded instead of facilitating economic progress (Rajabi & Muhammad, 2013). Collectively, the results underscored the absence of distinctive insights in differentiating between capital and recurrent expenditures, particularly among ASEAN nations.

A majority of prior scholars utilised conventional econometric techniques, such as ordinary least squares (OLS) and autoregressive distributed lag (ARDL) models, to appraise the impacts of fiscal policies. The limitations of both aforementioned techniques include the assumption of a linear association between governmental spending and economic growth, and fiscal policy analysis might not adequately capture the complexities of the association. More advanced methodologies, including panel vector autoregression (PVAR) and machine learning models, have also not yet been fully utilised in scrutinising the current topic. Accordingly, the present study sought to fill the gap by applying a panel ARDL model, which allowed for a more dynamic analysis of both short- and long-term GDE impacts while determining variations across ASEAN countries. Meanwhile, Babalola (2015) highlighted those productive governmental expenditures substantially influenced long-term economic growth, especially in education and capital formation. Strategic public investment and trade liberalisation could also strengthen economic resilience in South Asia (Symoom, 2018). While existing studies have discussed investments in infrastructure and human capital, only limited studies have delineated how fiscal discipline and policy consistency impact such investments and how such policies are shaped by fiscal constraints in ASEAN countries. Therefore, a gap exists in comprehending the distinctive challenges of the ASEAN region. Ambiguous findings also exist on the governance issue and the balance between capital and recurrent spending and the most optimal methodology for analysing the relationship, although certain academicians analysed the GDE role in economic development. The panel ARDL model focusing on the ASEAN economies in this study could offer alternative empirical evidence to be leveraged by policymakers to develop long-term and sustainable economic growth.

3.0 Methodology

The current study assessed the non-linear correlation between GDE and economic growth among ASEAN countries through Hansen's (1999) panel threshold regression method, which assisted in identifying non-linear GDE trends and threshold levels that altered the impact on economic growth when crossed. The model determined the number and position of threshold points endogenously and enabled a more flexible identification of undetected thresholds even in rapidly fluctuating conditions. The findings could provide a refined understanding of how varying GDE levels could either stimulate or hinder economic growth. Furthermore, Hansen's (1999) panel threshold regression offers more advantages compared to other forms of non-linear estimation by serving as a classical linear regression model for the endogenous calculation of threshold points. Classical regression models generally assume a constant influence of GDE on economic growth, which allows more detailed observations regarding non-linear relationships and different GDE impacts on governmental spending levels. Moreover, panel threshold regression is more flexible and data-oriented compared to other techniques, such as polynomial regression or interaction terms, which can minimise the probability of establishing arbitrary thresholds. Panel threshold regression was suitable for the current study due to significant differences in fiscal capacities and structural variables among ASEAN countries, in which a single linear model could not comprehensively capture the intricacies of expenditure-growth dynamics. Thus, panel threshold regression ensures optimal identification of crucial spending levels, which can aid policymakers in optimising public investment plans. The structure of the panel threshold regression model is as follows:

$$Y_{it} = \begin{cases} \beta_1 X_{it} + \varepsilon_{it}; \ GDE \leq \gamma \\ \beta_2 X_{it} + \varepsilon_{it}; \ GDE > \gamma \end{cases} \quad (1)$$

The GDP growth is denoted by Y_it while X_it refers to the vector of factors impacting the output, including governmental expenditures, exports, consumption spending, and FDI. The GDE functions as a threshold variable and could be employed to divide the sample into two different groups if GDE exceeds or below certain acceptable thresholds. The threshold also enables grasping how variables influence GDP expansion when GDE degrees vary. Accordingly, the threshold estimation method was utilised based on Chan (1993) and Hansen (2000), wherein the concentration sum of squared errors over all observations was minimised to determine the threshold without relying on prior knowledge. A data-driven estimation approach was also utilised to search the threshold value endogenously to decide whether to reject a null hypothesis or not. A rejection suggests that a threshold impact is embedded within the GDE and economic growth relationship. Nevertheless, the threshold estimate under the null hypothesis will not be distinctive and typical test statistics cannot be employed. Hansen (1996) proposed a bootstrapping solution based on the p-value of the threshold estimate to fit the model with both assumptions under the null hypothesis (linearity) and alternative assumptions (threshold at γ) based on the actual likelihood ratio test statistic computed via the following formulae:

$$F_1 = \frac{S_0 - S_1(GDE^*)}{\hat{\sigma}^2} \quad (2)$$

$$\hat{\sigma}^2 = \frac{1}{n(t-1)} S_1(GDE^*) \quad (3)$$

Where $\hat{\sigma}^2 = \frac{1}{n(t-1)} S_1(GDE^*)$ represents the residual variance. Subsequently, a bootstrap procedure was applied to generate alternative samples based on the residuals of the estimated threshold model. The model was re-estimated under both null and alternative hypotheses for each bootstrapped sample, and the likelihood ratio test statistic was computed. The p-value was derived from the proportion of bootstrapped test statistics that surpassed the actual value. A confidence interval for the threshold estimate γ was established when a threshold effect was detected to determine the ranges of the threshold effect. Hansen (2000) derived the appropriate distribution function and critical values, namely c(α), for the likelihood ratio statistic to formulate a confidence interval based on the GDE values for the likelihood ratio statistic below c(α). The next step was to estimate the model parameters for the two regimes, namely β_1 for GDE below the threshold and β_2 for GDE above the threshold, after the threshold γ was identified. The technique allowed the researcher to capture the varying GDE impacts on economic development across different expenditure schemes to provide a more nuanced understanding of the linkage between governmental spending and growth dynamics among ASEAN countries.

4.0 Results and Discussion

Table 1 demonstrates the descriptive statistics, which is a summary of the indicators highlighting differences in economic performance and GDE across ASEAN nations. The average GDP per capita was 3.5990, with moderate variation (standard deviation: 0.5656) ranging from 2.7164 to 4.8284, which reflected economic diversity. Gross national expenditure averaged 1.9649 with minimal variation (standard deviation: 0.0851), which indicated stable spending patterns. Meanwhile, inflation rates demonstrated significant fluctuations, with values ranging from - 1.2605 to 5.0246 and a high standard deviation of 4.9612. Exports were indicated as a percentage of GDP average at 1.9135 with variability (standard deviation: 0.7176), which reflected differences in trade dependence. Final consumption expenditure remained relatively stable at a mean of 1.8339 (standard deviation: 0.1382). Conversely, FDI inflows substantially varied ranging from - 1.7529 to 32.6912 with a high standard deviation (6.3788), which posited profound differences in foreign investment levels. The GDE reached a maximum of 4.4736, with variability (standard deviation: 1.3680) reflecting differing fiscal priorities among ASEAN nations.

Table 1: Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
GDPC	3.5990	0.5656	2.7164	4.8284
GE	1.9649	0.0851	1.6840	2.2741
INF	4.6548	4.9612	-1.2605	5.0246
EX	1.9135	0.7176	1.0188	4.2833
C	1.8339	0.1382	1.4983	2.4827
FDI	5.4714	6.3788	-1.7529	32.6912
GDE	1.3680	0.4584	0.7939	4.4736

Notes: The GDPC is a dependent variable measured based on GDP per capita (constant 2015 US$); GE = Gross national expenditure (% of GDP); INF = Inflation, consumer prices (annual %); EX = Exports of goods and services (% of GDP); C = Final consumption expenditure (% of GDP); FDI = Foreign direct investment, net inflows (% of GDP); GDE = Government development expenditure (% of GDP).

The model was estimated with one, two, and three thresholds to identify the number of thresholds. All three bootstrap tests comprised the same number of replications (300). Table 2 summarises the threshold estimates for several models, in which the single-threshold test demonstrated a threshold estimate of 1.2696 significant at a 5% level with a bootstrap p-value of 0.0133. Contrarily, the double and triple-threshold models yielded non-significant bootstrap p-values. Hence, the results postulated that the model consisted of one threshold. The findings of the threshold regression analysis also revealed that the relationship between GDE and economic growth among ASEAN countries was non-linear, which propounded two distinct regimes depending on the threshold level of GDE estimated at 1.2696% of GDP. Thus, the GDE impact on economic growth varied depending on whether spending exceeded or below the threshold. Figure 1 depicts the concentrated likelihood ratio function of the threshold estimate, namely LR(γ), with 95% confidence intervals based on a single threshold value. The findings demonstrated the estimated thresholds at 1.2696.

Table 2: Threshold Estimate Results across Different Threshold Models

Model	Threshold	F-Statistic	Bootstrap p-value	Critical Value at 10%	Critical Value at 5%	Critical Value at 1%
Single Threshold	1.2696	61.04	0.0133	39.3670	45.0866	61.2791
Double Threshold	1.2696 1.3144	12.29	0.3467	18.8668	21.9911	30.0761
Triple Threshold	1.1672 1.2696 1.3144	9.14	0.9733	40.5787	45.2300	54.8081

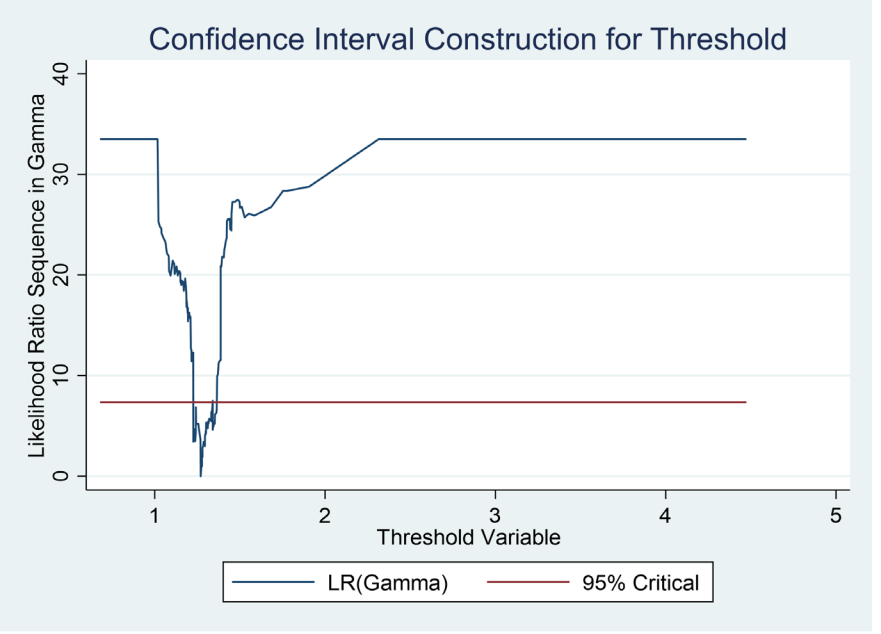

Figure 1: Plots of the Concentrated Likelihood Ratio with the Single Threshold
(Note: 95% Confidence Intervals)

Table 3 portrays the threshold regression analysis results. Particularly, GDE was discovered to be below the first threshold and negatively impact economic growth, as indicated by the coefficient of - 0.1077 with a highly significant p-value below 0.001. The findings posited that lower GDE levels were unproductive or potentially detrimental due to suboptimal resource allocation, mismanagement, or inadequate competence to properly implement developmental programmes. As such, limited GDE would lead to low economic returns, which emphasised the importance of both the quantity and quality of governmental spending. Bayraktar (2019) also explicated that public investment was less effective among low-income countries owing to the threshold effect, in which investment was required to reach a certain level before significantly and positively impacting economic growth. In addition, the second threshold was revealed to demonstrate a statistically insignificant impact on economic growth when the GDE was 1.2696 or larger. The impact on the economy also profoundly diminished when governmental spending surpassed a certain level, with a substantially low coefficient of - 0.0042 and a p-value of

0.779. The results corresponded to the concept of diminishing returns, which propounded that additional government spending would not produce further economic benefits (Romer, 1990) and might engender inefficient and counterproductive outcomes, which highlighted the importance of careful fiscal management (Nguyen, 2022). Resource misallocation would also restrict private investments and create dependence on governmental support, which further aggravated the situation. Mimoun and Raies (2022) elucidated that ineffective governance and limited political freedom significantly reduced the effectiveness of social spending among developing countries due to the lack of effective mechanisms to ensure effective fund allocation and usage for poverty reduction. In addition, the findings were consistent with past research on the impacts of governmental spending depending on the overall economic circumstance and partially on the implementation approach (Hansen 1999; Shafuda & De 2020). The policymakers of ASEAN countries should consider relevant factors when implementing developmental programmes.

Table 3: Regression Estimate Results via a Single Threshold Model

Variable	Coefficient	Standard Deviation	T-Statistic	p-value
Governmental Expenditure	0.0358	0.1554	0.2300	0.8180
Inflation	- 0.0059	0.0012	- 4.5000	0.0000
Export	0.3711	0.0605	6.1300	0.0000
Consumption Expenditure	0.0688	0.0779	0.8800	0.3790
Foreign Direct Investment	0.0056	0.0020	2.7300	0.0070
Threshold Estimate		1.2696		
Below	- 0.1077	0.0225	- 4.7700	0.0000
Upper	- 0.0042	0.0152	- 0.2800	0.7790
R-squared		0.4769		
F-test		21.2300		
p-value		0.0000		
Bootstrap p-value		0.0133		
Number of Bootstrap Replications		300		

The findings underscored the significance of considering GDE, existing economic structures, governance models, and institutional capabilities. According to Sidek and Asutay (2021), institutional quality plays a crucial role in determining the impact of governmental expenditures on economic growth. Environments with robust institutions can assist in consumption and developmental expenditures in promoting economic growth through decreased corruption and political risks. Targeted fiscal policies are also imperative without implementing a universal spending approach. Governments should concentrate public resources in the most crucial areas while reinforcing national objectives by focusing on citizenship benefits to produce higher impacts. Governments should also refrain from solely developing initiatives without coherence, which can dissipate scarce governmental funds towards unsustainable development. The sensitivity tests were employed in the current study to evaluate the reliability of previous findings, especially how measurement errors and data quality would impact the reliability of Coronavirus

Disease 2019 (COVID-19) analysis outcomes. The tests were essential to ensuring that policy decisions were grounded in robust and accurate data (Yoon & Kim, 2022). Accordingly, the years 2020, 2021, and 2022 were excluded from the analysis. Table 4 illustrates the threshold estimation analysis, and the results indicate that the single-threshold test contains a threshold estimate of 1.2381 at a 5% significance level, with the single-threshold model significant by attaining a bootstrap p-value of 0.0024. The GDE below the threshold value or in the first regime was also negative (- 0.0921) and significant at a 1% significance level, whereas the GDE value above the threshold was insignificant at all significance levels. The results were aligned with the previous estimation and suggested that the findings were robust without being influenced by simultaneity bias.

Table 4: Sensitivity Analysis

Variable	Coefficient	Standard Deviation	T-Statistic	p-value
Governmental Expenditure	0.0451	0.1124	0.4012	0.4701
Inflation	- 0.0059	0.0041	- 1.4390	0.0021
Export	0.4581	0.1374	3.3340	0.0056
Consumption Expenditure	0.0814	0.0524	1.5534	0.0564
Foreign Direct Investment	0.0215	0.0201	1.0695	0.0010
Threshold Estimate		1.2381		
Below	- 0.0921	0.0420	- 2.1928	0.0001
Upper	- 0.0085	0.0356	- 0.2387	0.2098
R-squared		0.6587		
F-test		15.8017		
p-value		0.0000		
Bootstrap p-value		0.0024		
Number of Bootstrap Replications		300		

The intricate linkage between GDE and economic growth among ASEAN nations was delineated through the current findings, which discovered a critical threshold at 1.2696% of GDP. Governmental spending below the threshold would produce a detrimental impact on economic growth owing to ineffective resource allocation and substandard execution, which led to diminishing returns when governmental spending above the threshold would not result in further economic advantages. Thus, prudent fiscal planning is imperative and policymakers should stipulate the appropriate expenditure level and guarantee that allocated budgets are efficiently employed through robust governance and high-quality institutions. Governments should also strive to maintain developmental spending equivalent to or above the threshold to prevent the potential detrimental impacts of underfunding or overspending. Simultaneously, the efficiency of government spending should be elevated by allocating funds to high-impact industries, maintaining openness, and encouraging responsibilities in fund administration. Afonso et al. (2008) also elucidated the significance of financial accountability in governmental policy, efficient resource allocation, and robust governance to optimise the economic advantages of public spending. The current results challenged the general belief that higher

public spending would lead to enhanced economic development and highlighted the necessity of a focused and planned approach to governmental spending. The findings also significantly contributed to the existing knowledge corpus on fiscal policy by demonstrating that institutional strength, governance quality, and economic structure collectively impacted the effectiveness of governmental spending. Accordingly, ASEAN nations should concentrate on targeted interventions in facilitating more effective spending, performing investments in sectors with the highest returns, and ensuring that public expenditures could drive long-term and sustainable economic growth (Kamisan et al., 2024; Zulkifli et al., 2022).

5.0 Conclusion

The analysis of GDE across ASEAN countries demonstrated a complex relationship with economic growth and identified a crucial threshold of 1.2696. Spending below the threshold would lead to significant sluggish economic growth, whereas spending above the threshold could only offer a slight boost. The results underscored the importance of a balanced public spending approach and the effectiveness of government spending depended not only on the amount but also the quality. Policymakers are required to ensure that GDE remains at or exceeds the identified threshold annually to mitigate the harmful outcomes of underspending. Similarly, policymakers should maximise the benefits of public investments by prioritising key sectors for transformative impacts while strengthening transparency, accountability, and resource management. Hence, a more targeted approach is vital to guarantee that GDE surpasses the threshold among ASEAN countries to alleviate the risks associated with underspending. In addition, governmental budgets should primarily be allocated to infrastructure, education, and technology for higher returns and impacts, with efficient project management and high accountability aiding in optimising developmental spending. Developing performance-based budgeting and conducting regularly scheduled reviews of spending plans can also assist in selecting projects with the highest economic impact. Meanwhile, several study limitations exist as the results are specific to ASEAN nations and might not be generalisable to other regions with different economic and fiscal policies. Additionally, only data from a particular period were analysed, which might neglect the shifts in fiscal policy or external economic factors that could influence the association between governmental spending and economic growth. The threshold model also did not account for other factors, including political stability or institutional quality, which could determine the effectiveness of governmental spending. Future researchers can expand the current findings by exploring other interactions among different variables and the long-term dynamics between GDE and economic growth.

Acknowledgement

The authors would like to express appreciation and gratitude to the National Accounting Institute, Accountant General's Department of Malaysia for funding the current study.

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