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Article

The relationship between government expenditure and economic growth in ASEAN-5 countries

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Abstract: This study investigates the influence of government expenditure on the economic growth of the ASEAN-5 countries from 2000 to 2021. The study employs the Pooled Mean Group (PMG) ARDL model and robust least squares method. The importance of the current study lies in its analysis of the short and long-run impact of government expenditure on economic growth in ASEAN-5. The empirical findings demonstrate a positive relationship between government expenditure and economic growth in the long run. These results align with the Keynesian perspective, asserting that government expenditure stimulates economic growth. The study also confirms one-way causality from government expenditure to economic growth, supporting the Keynesian hypothesis. These insights hold significance for policymakers in the ASEAN-5, highlighting the necessity for policies promoting the effective allocation of productive government expenditure. Moreover, it is important to enhance systems that promote economic growth and efficiently allocated economic resources toward productive expenditures while also maintaining effective governance over such expenditures.

Keywords: government expenditure; economic growth; labor force; gross capital formation; PMG ARDL model; ASEAN-5

1. Introduction

The allocation of government funds exhibits significant disparities among nations and has undergone substantial transformations on a global scale throughout history (Chen et al., 2022). The nexus between government spending and economic growth has been extensively examined in both theoretical and empirical studies within the field of economic growth. The existing body of literature has initiated discourse among scholars regarding the impact on a country's economic growth, whether it's positive or negative (Barro, 1990; Lahirushan and Gunasekara, 2015). Concerning the relationship between government expenditure and economic growth, certain studies have identified a positive correlation (Alshammary et al., 2022; Erdogan et al., 2023; Oanh et al., 2022; Poku et al., 2022; Raifu et al., 2023; Tung et al., 2023), while others have revealed a negative correlation (Barro, 1990; Hasnul, 2015; Nuru et al., 2022; Onifade et al., 2020). Additionally, some studies have reported mixed findings and an insignificant linkage between government spending and economic growth (Arawatari et al., 2023; Buthelezi, 2023; Chen et al., 2022; Selvanathan et al., 2021). This underlined the urgency to examine the effect of government expenditure on economic growth, particularly the ASEAN-5.

Regarding the nexus between government spending and economic growth, two primary theoretical propositions have been scrutinized through empirical analysis: the Keynesian hypothesis and Wagner's law. Wagner's law (1883) reveals the existence of a positive linkage between economic growth and government expenditure,

specifically in the areas of transfer, infrastructure, social services, and various other economic services (Palamalai, 2014). On the other hand, the Keynesian hypothesis posits that government spending is an exogenous policy instrument capable of exerting influence on short-term economic activities. Keynes (1936) specifically proposed that government expenditure plays a crucial role as the primary catalyst for economic growth when considering fiscal policy. Therefore, one could argue that fiscal policy is highly effective in combating economic stagnation (Fazzari, 1994). The Keynesian economic theory reveals that increasing government expenditure, while holding other components of expenditure such as consumption and investments constant, will lead to an expansion in output.

Moreover, it is worth noting that within Keynesian models of economic activity, there exists a multiplier effect, suggesting that the increase in output is proportional to the initial change in expenditure that triggered it (Blinder, 2008). Additionally, the efficacy of Keynesian-style fiscal policy has been widely acknowledged in the context of economic downturns, exemplified by events such as the Great Depression of the 1930s and the Great Recession of 2007–2008. The government employed a range of measures, including increased government expenditure, tax rebates, and different stimulus packages, as part of its strategy to tackle a recessionary gap (Feldstein, 2009). Therefore, government spending, utilized as a fiscal policy instrument to allocate resources to specific priority sectors, might play a crucial role in influencing economic growth. This occurrence can be ascribed to the assertions made by Ram (1986), who argues that government intervention can result in two main outcomes: (1) a rise in productive investment and (2) the resolution of contradictory interests among the private sector and society, finally stimulating economic development.

It has been observed that countries worldwide have undergone significant changes in the allocation of government expenditure due to diverse challenges arising from the dynamic global and local economic landscape. Additionally, certain countries are currently recovering from the negative socioeconomic consequences of the COVID-19 pandemic, which has presented diverse challenges and had adverse effects on global economic standards. We contend that a thorough investigation is currently pertinent regarding the nexus between sectoral-level government spending and economic growth.

The selection of the ASEAN-5 countries for analysis was motivated by several reasons. Firstly, the ASEAN-5 countries are highlighted due to their significant GDP and relatively advanced level of economic development within the ASEAN group. Secondly, the ASEAN region has witnessed substantial economic growth, with a total GDP estimated at $3.2 trillion in 2019. According to the ASEAN Development Outlook (ADO, 2021), it is the world's fifth-largest economy, and projections indicate it will become the fourth-largest economy by 2030. Similarly, various ASEAN-5 countries undertook reforms in the institutional and financial sector and achieved economic growth by the gradual elimination of trade barriers, resulting in enhanced trade partnerships.

However, despite this progress, challenges and uncertainties persist. These include disparities in income and human capital among member countries, as well as inequality in economic growth (Chia, 2014). Although government expenditure in Asia experienced rapid growth, increasing from 50% of total spending in 1980 to 67%

in 2002 (Fan et al., 2008), a critical examination of **Figure 1** reveals a close correlation between government expenditure and the economic growth of the region. The two variables, in general, lean in the same direction over time. While the ASEAN region has made significant economic strides, persistent challenges, such as disparities among member nations and the interconnected association between government spending and economic development, as depicted in **Figure 1**, require attention.

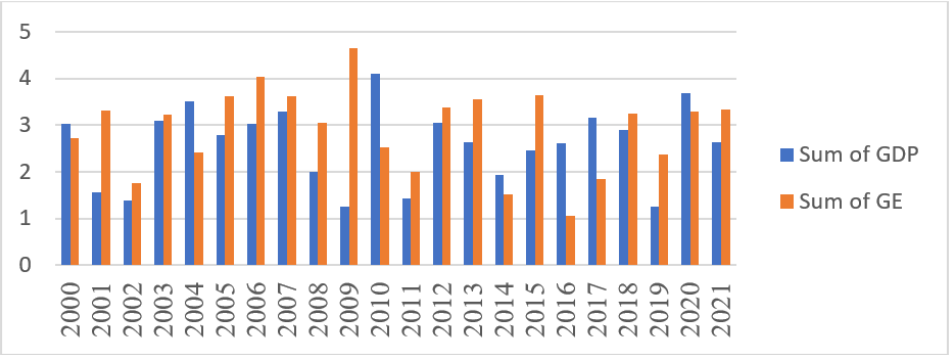

Figure 1. Government expenditure and economic growth of ASEAN-5 from 2000–2021.

The issue of higher government expenditure without corresponding economic growth has been a major challenge for many emerging nations, including the ASEAN-5 (Samudram et al., 2009). While most government expenditure is following favorable trends, there is a decline in the efficiency in the deployment of public sector resources. This has resulted in a shortage in the delivery of economically beneficial public goods and services. The presence of these stylized facts concerning government spending and economic growth gives rise to significant concerns due to the uncertain and varied impact of government expenditures on economic growth across the ASEAN-5 region. Against this background, this study aims to address these issues and contribute to the existing literature by filling this gap. Consequently, if government spending does influence GDP growth, then it could be a significant macroeconomic variable that demonstrates how the growth rates of the ASEAN-5 nations vary. The Keynesian argument that increased spending stimulates the economy remains a major reason why many economists oppose cutting spending in the near to medium term (Miron, 2010). However, there are economists who argue that increased government spending slows down the economy (Mehrara and Keshtgar, 2016).

The main objective of the current study is twofold: to examine the heterogeneous impact of government expenditure on economic growth across the ASEAN-5 region and to assess the soundness and durability of the Wagner and Keynesian hypotheses. This will be achieved by utilizing a range of econometric methodologies and more updated data spanning from 2000 to 2021.

This study aims to contribute to the existing literature in several ways. Firstly, it can aid fiscal policymakers in the ASEAN-5 region in determining whether their expansionary fiscal policies foster sustained economic growth. Addressing this issue may also help mitigate the impact of internal imbalances on economic growth. Consequently, future economic growth hinges on the dynamic impact that government expenditures have on growth. Secondly, unlike previous studies discussing the impact

of government expenditure on economic growth in the ASEAN-5 region (Abdullah and Rusdarti, 2017; Haznul, 2015; Maneejuk and Yamaka, 2021; Yun and Yusoff, 2018), the current study is novel as it explicitly focuses on the dynamic impact of government expenditure on economic growth in both the short run and long run across the ASEAN-5 region. Earlier studies concentrated on the government size threshold (Maneejuk and Yamaka, 2021), the causal relationship between government spending and economic growth (Yun and Yusoff, 2018), and the concentration of single-country studies (Haznul, 2015). Additionally, this study improves upon earlier research by employing a sample of 5 ASEAN countries and a robust dataset to draw strong and reliable conclusions. Finally, although a greater number of empirical studies discuss the validity of Wagner's Law and the Keynesian hypothesis with inconclusive findings (Bazan et al., 2022; Obeng, 2022; Rani and Kumar, 2022; Selvanath et al., 2021), only a few studies focus on the ASEAN-5, and most of them concentrate on a single country (Chandran et al., 2011; Inchauspe et al.,2022; Rambe et al., 2021). Therefore, the current study contributes to the existing body of literature by empirically examining the validation of Wagner's Law and the Keynesian hypothesis in the context of ASEAN-5 countries.

The current study is organized as follows: Section 2 reviews the literature regarding the impact of government expenditure on economic growth. Section 3 highlights the methodology and defines data sources. Section 4 focuses on the discussion of the empirical findings, while the last section presents conclusions and policy implications.

2. Literature review

2.1. Theoretical literature review

Several theories have explored the relationship between government expenditure and economic growth, giving rise to three distinct lines of reasoning. For instance, the Classical school of thought in the 1970s argued that the effects of government expenditure on long-term growth would be detrimental (Palley, 2013). The idea was that an increase in government expenditure, financed by a budget deficit, would discourage private investment, thereby hindering long-term economic growth. Various studies, including Gemmell et al. (2016), have demonstrated that government spending, especially when supported by distortionary taxation or deficit financing, tends to have a negative influence on real GDP. The study conducted by Kweka and Morrissey (2000) illustrates a correlation between productive spending and a decline in GDP per capita growth, particularly in emerging nations. This correlation can be attributed to the misallocation of capital expenditure.

In contrast to the neoclassical school's perspective, both Keynesian and endogenous growth viewpoints, particularly Barro's endogenous growth model (1990), underscore the pivotal role of fiscal policy in shaping economic performance. Keynesian theory contends that implementing expansionary fiscal policies, such as increasing government expenditure, can effectively stimulate real GDP by leveraging the multiplier effect (Keynes, 1936). On the other hand, the endogenous growth model posits that government spending has the potential to stimulate private investment, thereby fostering long-term economic growth (Barro, 1990). Gemmell et al. (2016)

further elaborate on the endogenous growth model, suggesting the possibility of categorizing government expenditure as either 'productive' or 'unproductive.' 'Productive' expenditures enhance the private sector's productivity, while 'unproductive' ones primarily impact citizens' welfare. This model challenges the neoclassical perspective by asserting that fiscal policy can influence both the output trajectory and long-term growth rates. For instance, an increase in public investment not only raises the private return on capital but also promotes private investment spending, leading to sustained production growth over the long term. The endogenous growth model transforms the neoclassical notion of transient fiscal policy effects into enduring growth impacts over an extended period (Muinelo-Gallo and Roca-Sagales, 2011). This perspective suggests that fiscal policy might have lasting effects on economic development by influencing the dynamics of private investment and overall productivity.

Nevertheless, several studies have focused on examining the mechanisms by which different types of government spending can influence the economy (Barro, 1990; Colombier, 2011; Landau, 1983; Mo, 2007; Poku et al., 2022). Despite these investigations, the impact of government expenditure on economic growth remains inconclusive. For instance, Mo (2007) reveals that the government has an impact on the growth rate through three divergent channels: factor productivity, investment, and aggregate demand. Therefore, despite these uncertainties, there are solid theories that indicate government expenditure can have a favorable impact on economic growth (Barro, 1990; Keynes, 1936).

2.2. Empirical literature review

Various studies have explored the impact of government expenditure on economic growth in both developed and emerging nations (Raifu et al., 2023; Erdogan et al., 2023; Nuru et al., 2022; Onifade et al., 2020; Tung et al., 2023). The results of these research efforts have produced diverse outcomes, indicating the presence of both positive and negative correlations between these two variables. Most studies suggest a positive linkage between government expenditure and economic growth. Recently, scholars have shifted their focus toward investigating the magnitude of the influence of government spending on the capacity to sustain economic development, rather than primarily seeking to establish the causal direction of the linkage between expenditures and growth. Empirical studies have documented varied conclusions regarding the nexus of government expenditure and economic growth, examining this association at both aggregate and disaggregated levels. Previous economic studies, including those by Guseh (1997) and Barro (1990), have provided evidence supporting the notion that government spending has a negative influence on economic growth. On the opposite end of the spectrum, scholars such as Ghali (1999) and Lin (1994) have indicated that government spending has a positive and significant impact on economic growth. Nevertheless, Kormendi and McGuire (1985) presented findings that deviated significantly from previous empirical research, suggesting a diminished correlation between government expenditure and economic growth.

In recent decades, there has been a growing emphasis on the effect of fiscal policy, specifically government expenditures, on economic growth. Nonetheless, prior studies

have yielded conflicting results regarding the impact of government spending on economic growth. For instance, several studies have revealed that government expenditures play a significant role in stimulating economic development (Alshammary et al., 2022; Ahuja et al., 2020; Raifu et al., 2023; Erdogan et al., 2023; Faisol et al., 2020; Poku et al., 2022; Tung et al., 2023; Wu et al., 2010). On the contrary, other studies have provided evidence supporting the notion that government expenditure has a detrimental impact on economic growth (Barro, 1990; Buthelezi, 2023; Hasnul, 2015; Javed et al., 2024; Nguyen et al., 2022; Nuru et al., 2022; Onifade et al., 2020). Additional studies have reported inconclusive and insignificant results (Chen et al., 2022; Selvanathan et al., 2021).

We conducted a review of prior studies in the ASEAN-5 region to explore the dynamic and heterogeneous effects of government spending on economic growth. Despite numerous empirical studies analyzing developed nations, very few specifically address the nexus between government spending and economic development in the ASEAN-5 region (Abdullah et al., 2008; Abdullah and Rusdarti, 2017; Rajabi et al., 2013). For example, Maneejuk and Yamaka (2021) stated that increased expenditure on tertiary education positively correlates with higher economic development in the ASEAN-5. Yun and Yusoff (2018), utilizing data from 1980 to 2012, identified a long-run linkage between health and education expenditures and economic growth. Their study confirmed that public expenditure on education and health significantly contributes to economic growth in the long term. Similarly, Abdullah and Rusdarti (2017) revealed the positive influence of government expenditure on the economic output of ASEAN-5 countries. However, Hasnul (2015), using the Ordinary Least Squares (OLS) technique, reported empirical findings indicating a negative influence of government spending on the economic growth of Malaysia. The study further revealed that various disaggregated expenditure components lowered economic growth, with education, health, and security spending failing to have a considerable role in the economy's growth.

Despite the existence of a variety of empirical studies, the mainstream of these has focused on analyzing the impacts of disaggregated government spending or productive expenditures on the level of real GDP and economic growth. A concentrated analysis of aggregate government expenditure may yield a complete comprehension of the trajectory and efficacy of government spending on income (Abdullah et al., 2019; Abdullah and Rusdarti, 2017; Hasnul, 2015; Maneejuk and Yamaka, 2021; Yun and Yusoff, 2018). Similarly, most studies have largely neglected the possible influence of methods of financing government expenditure on economic growth. Ignoring budget restrictions and the omitted variable bias in estimates can lead to erroneous results, providing misleading economic policy information (Blanchard and Perotti, 2002). Although a greater number of growth models focus on the long-term economic effect of government spending, they often overlook short-term implications and policy considerations. Taking these factors into account, the present study postulates the impact of government expenditure on GDP in the case of the ASEAN-5 countries within an endogenous growth framework. There have been limited studies into this relationship in the ASEAN-5 region (Abdullah et al., 2008; Abdullah and Rusdarti, 2017; Rajabi et al., 2013).

3. Empirical method

This study employs an adjusted version of Ram's (1986) approach to investigate the dynamic and diverse influence of government spending on economic growth. The model used in this study possesses a more robust theoretical framework regarding the effect of government spending on economic growth. The Ram model assumes the economy consists of two broad sectors: the government sector (G) and the non-government sector (C). If output in every sector relies on the inputs of labor (L) and capital (K), and if, in addition, the output ("size") of the government sector exercises an "externality" effect on output in the other sector (C), the Cobb-Douglas production function for the two sectors can be written as follows:

$$C = C\left(L_{cg,}K_{c,}G\right) \quad (1)$$

$$G = G\left(L_{g,}K_{g}\right) \quad (2)$$

Whereby subscripts signify sectoral inputs. If the total inputs are given,

$$L_c + L_g = \quad (3)$$

$$K_c + K_g = K \quad (4)$$

The total output (Y) is just the sum of the outputs in the two sectors, and thus,

$$C + G = Y \quad (5)$$

For a more comprehensive understanding, readers can consult Rams' original work from (1986). Rams formulated his growth equations by employing two distinct production functions. The first function pertains to the governmental aspect, while the subsequent function relates to the non-governmental aspect. The present study adopts the approach of Alshammary et al. (2022), utilizing the following regression equation:

$$d\left(\frac{Y}{Y}\right) = \beta_0 + \beta_1 + \left(\frac{dK}{Y}\right) + \beta_2\left(\frac{dL}{L}\right) + \beta_3\left(\frac{dG}{G}\right) + \varepsilon \quad (6)$$

Equation is frequently utilized to postulate the effect of the government spending on economic growth; the term $d\left(\frac{y}{y}\right)$ signifies the dependent variable, indicating the logarithm form of per capita GDP in nation i during time t serving as a metric for economic growth. $\left(\frac{dK}{y}\right)$ represents country i level of the physical capital during period t and act as proxy for the gross capital formation. $\left(\frac{dL}{L}\right)$ represent the available labor force in nation i during period t. $\left(\frac{dG}{G}\right)$ stands for government expenditure in country i during period t. While $\beta_{i,t}$ signifies unfamiliar parameter that might be assessed, while ε signifies the error term. To test the robustness of the results, we also consider other explanatory variables such as Initial income (II, i, t), and institutional quality, including regulatory quality (RQi, t). The inclusion of initial income is meaningful as most of the ASEAN-5 countries experienced a greater economic development. Meanwhile, institutional quality plays a significant role in promoting accountability and transparency, positively contributing to economic development.

Data and variable descriptions

The current study concentrates on the ASEAN-5 countries from 2000 to 2021 to estimate Equation (1). The data related to government spending, gross capital formation, labor force, initial income, and GDP are obtained from the World Development Indicators in the World Bank databases. Institutional quality variables

were sourced from the World Governance Indicator databases. In fact, **Table 1** explains in detail the variables utilized in this study.

Table 1. Variable Descriptions.

Variables	Description	Units	Sources	Variable Explanation	Empirical works used these variables
GDP	GDP per capita	GDP per capita (Current US$).	WDI	GDP is a good measurement for the productivity of the nation	Raifu et al, (2023) and Poku et al., (2022).
GE	Government expenditure	General government expenditure (Annual %).	WDI	Effective government expenditure is correlated higher growth	Buthelezi, (2023) and Poku et al., (2022).
II	Initial income	GDP per capita (Constant 2015 US$).	WDI	Higher initial income is correlated with a greater an economic growth	Mankiw et al., (1992) and Brueckner et al., (2018).
GCF	Gross capital formation	Gross capital formation as (% of GDP)	WDI	Greater capital formation is associated with higher economic growth	Buthelezi, (2023) and Poku et al., (2022).
LPF	Labor force	Labor force participation rate, total (% of total population ages 15–64)	WDI	Availability of highly skilled labor contributes a greater economic output	Haque et al., (2019).
RQ	Regulatory quality	Percentile Rank	WGI	Higher regulatory quality leads a greater economic growth	Misi et al. (2023) and Singh et al. (2022).

Note: WDI represents World Development Indictors. While WGI signifies World Governance Indicators.

3.2. Econometric methodology

3.2.1. ARDL approach

The current study utilizes the Pooled Mean Group (PMG) ARDL modeling approach, initially established by Pesaran and Shin (1999) and later developed by Pesaran et al. (2001), to examine the dynamic association between government expenditure and economic growth. The PMG estimator falls under the category of dynamic panel models. These models assume several observations, denoted as T, are equivalent or greater than the number of individuals, denoted as N. The PGM estimate imposes a restriction when it comes to the long-run coefficients, requiring them to be equal to those of the error-correction model. However, it allows for the possibility that the long-run coefficients may deviate from the error variances. Additionally, the short-term and long-run slope coefficients are assumed to be heterogeneous and homogeneous, respectively, when this estimator is built (Pesaran et al., 1999). In addition, the PMG ARDL has several advantages when compared to other econometric techniques. Firstly, the ARDL model is appealing for cointegration analysis in small samples because it eliminates finite sample bias. Secondly, it also permits co-integration analysis in situations where the underlying regressors are integrated at either zero or one order or even when they are fractionally integrated (Belloumi, 2014). Thirdly, ARDL provides consistent estimates and reliable t-ratios using a single reduced form equation rather than a system of equations, as is done in traditional Johansen cointegration. Fourth, ARDL models don't require all the lags to be the same. The ARDL model is robustly motivated by the research of Alshammary et al. (2022) and Selvanathan et al. (2021). The model can be expressed in the

following manner: The foundation of a Pooled-Mean Group approach lies in the estimate of the ARDL approach: (mi, ni, pi, si, vi).

$$\begin{aligned}\Delta GDP_{it} = \alpha_i + \sum_{j=1}^{m-1} \beta_{ij} \Delta GE_{1,t-j} + \sum_{l=0}^{n-1} \varphi_{i1} \Delta GCF_{i,t-l} + \sum_{r=0}^{p-1} \gamma_{ir} \Delta LPF_{i,t-r} \\ + \sum_{u=0}^{s-1} \theta_{iu} \Delta II_{i,t-u} + \sum_{w=0}^{v-1} \delta_{iw} \Delta RQ_{i,t-w} + \sigma_1 GDP_{i,t-1} \\ + \sigma_2 GE_{i,t-1} + \sigma_3 GCF_{i,t-1} + \sigma_4 LPF_{i,t-1} + \sigma_5 II_{i,t-1} + \sigma_6 RQ_{i,t-1} \\ + \varepsilon_{1,it}\end{aligned} \quad (7)$$

The dependent variable is represented by GDPit, where αi is a coefficient that describes the country in question, and β_{ij}, φ_{il}, γ_{ir}, θ_{iu}, and δ_{iw} are the coefficients of the short-run dynamics associated with each country. The term ε_{it} represents the model's error term. Nonetheless, it is expected that the long-run coefficients will be consistent across all nations. Thus, we can emphasize the existence of a long-term relationship between the independent variable and other explanatory factors if β_{1j} is negative and significant.

3.2.2. A panel unit root test

Before analyzing the causality of the model, it is essential to explore its steady qualities. This study utilizes a variety of panel unit root tests to provide reliable and unbiased estimates. The current work employs two out of four first-generation panel unit root tests, namely Levin et al. (2002) and Im et al. (2003). It is crucial to acknowledge that both LLC and Breitung assume the presence of identical unit root processes throughout all cross-sections. The ADF-Fisher, IPS, and PP-Fisher 2 models all posit the presence of independent unit root processes inside each cross-section. Since all the panel unit root tests are widely recognized in the literature, we will refrain from providing detailed explanations about them in this context (for a comprehensive analysis of these tests, refer to Hurlin, 2010).

3.2.3. Panel cointegration test

After confirming the presence of a panel unit root, the question arises as to whether there is a long-term equilibrium relationship between the variables under analysis, namely between two or more variables. Because every variable had an integration order of one, we conducted a panel cointegration analysis employing Kao, (1999). The residual-based test for panel data was proposed by Kao, (1999). Kao's test is simply a variant of the Engle and Granger, (1987) test that has been adapted to a panel format. Hence, Kao cointegration analysis can have the following equation:

$$y_{i,t} = \alpha_i + \beta X_{i,t} + u_{i,t} \quad (8)$$

Whereby *i*=1, *N* and *t*=1, T. Based to Kao, (1999) the variables in the model for instance, y and x must be integrated process of order one, *I* (1) for the whole *i* and measure the cointegration by employing Dicky-fuller, (1979) or augmented version of Dicky-fuller. Kao's (1999) test places significant emphasis on the homogenous long-term cointegration relationship among variables, with the null hypothesis indicating the absence of cointegration. In a similar vein, the current study employs the Fisher (1932) test, later extended by Maddala and Wu (1999) to panel data models. This test combines the *p*-values from the univariate trace test and maximum eigenvalue test

proposed by Johansen (1988). The combined test is utilized to evaluate both the null hypothesis of no cointegration and the null hypothesis of at most one cointegration in panel data models. The Fisher (1932) test holds the advantage of compatibility with the Engel-Granger two-step technique. Moreover, these tests provide reliable insights into the long-term relationship between variables.

3.2.4. The panel Granger causality test

The fundamental concept underpinning Granger causality which proposed by Granger (1969) is as follows: A variable *Y* demonstrates Granger causality if predicting variable *X* is enhanced by including the past values of both *X* and *Y*, rather than solely relying on the historical data of X. The foundational causal model can be formulated as follows:

$$y_{i,t} = \alpha_i + \sum_{k=1}^{K} \gamma_{ik}\, y_{i,t-k} + \sum_{k=1}^{K} \beta_{ik}\, x_{i,t-k} + \varepsilon_{i,t} \; with \; i = 1, \dots, N \; and \; T = 1, \dots, T \quad (9)$$

The variables $x_{i,t}$ and $y_{i,t}$represent the measurements of two stationary variables for an individual *i* during period *t*. The coefficients are permitted to vary among individuals (as indicated by the subscripts *i* connected to the coefficients), but they are intended to remain constant throughout time. All individuals are assumed to have the same lag order K, and the panel must be balanced composition. Therefore, the current study will employ the Dumitrescu and Hurlin (2012) panel Granger causality test to confirm the validity of the Wagnerian law, the Keynesian hypothesis, or the existence of both in ASEAN-5 countries, following the early works of Olaoye et al. (2020) and Sedrakyan et al. (2019).

3.2.5. Robust least square

Robust Least Squares (RLS) are a regression analysis technique designed to address inherent constraints in conventional regression methodologies. While ordinary least squares and similar techniques exhibit desirable characteristics under certain assumptions, they may produce misleading outcomes when these assumptions are violated, highlighting a lack of robustness. Robust regression methods aim to mitigate the impact of violations in the assumptions made by the data-generating process on the regression analysis estimates (Costa et al., 2020). Robust least squares offer several advantages over other regression techniques. Firstly, it demonstrates lower sensitivity to outliers compared to regular least squares. Secondly, it can produce more reliable outcomes, particularly when dealing with outliers. Thirdly, it allows for the removal of significant errors or extreme values within the dataset, thereby enhancing accuracy and reliability of the obtained results. The current study aligns with earlier research that utilized the robust least squares method, including the studies by Shi et al. (2023) and Costa et al. (2020). Consequently, RLS can have the following equation:

$$minmize \sum_{i=1}^{n} p(^{r_i}) \quad (10)$$

Whereby r_i signifies the residuals (the variation among observed and estimated values), and $p(r_i)$ is the robust lost function. The Huber loss function, often used in RLS, is characterized by a threshold, δ, determining the transition from quadratic to

linear behavior. Optimization involves identifying model parameters that minimize the total robust losses, usually through iterative techniques like iteratively reweighted least squares (IRLS). Robust regression methods, including RLS, are crucial for handling real-world data with outliers, providing a more dependable fit compared to conventional linear regression. Therefore, the current study will use RLS as a robustness check method.

4. Empirical results

Table 2 presents the results of the descriptive statistics for the primary variables in our model. This analysis provides insights into the attributes of the variables by examining their mean, median, minimum, and maximum values. Additionally, it assesses the distribution pattern of the data using Kurtosis and Skewness statistics. **Table 2** demonstrates that both the mean and median fall within the range of the maximum and minimum values, suggesting that the data are very accurate. Likewise, the standard deviation, which measures the extent of deviations from the mean, indicates that the series is stable. The skewness values, approaching zero, suggest normality for the variables. Kurtosis statistics were used to determine whether the distributions have tails lighter or heavier than a normal distribution. The empirical findings reveal that most of the series exhibit platykurtic behavior, with values below the critical threshold of 3. In summary, these statistical analyses instill confidence in the reliability of the data and support the robustness of the estimated results.

Table 2. Descriptive statistics outcome.

Variables	Mean	Median	Minimum	Maximum	Std. Dev	Skewness	Kurtosis
GDP	3.7644	3.6285	2.8686	4.8905	0.5236	0.5773	2.5171
GE	1.0405	1.0359	0.8150	1.2615	0.0957	0.2158	2.5172
GCF	1.3886	1.3910	1.1955	1.5462	0.0794	–0.0354	2.8399
LPF	1.8404	1.8394	1.7552	1.8982	0.0353	–0.0168	1.9115
RQ	1.7052	1.7598	0.0001	2.000	0.3995	–3.5254	1.4417
II	3.8284	3.7064	3.2628	4.8272	0.4779	0.8842	2.5132

Table 3 presents the results of the correlation analysis conducted to examine the presence of linear relationships among the variables. The findings reveal significant associations between all the variables, with the majority exhibiting a positive correlation. For instance, economic growth, proxied by GDP, is found to have a positive and significant correlation with total government expenditure (GE), gross capital formation (GCF), labor force (LPF), regulatory quality (RQ), and initial income (II). Therefore, this indicates that GDP has a significant positive correlation with GE, GCF, LPF, RQ, and II, thereby suggesting that greater government spending should contribute to the economic growth of ASEAN-5 countries. Furthermore, the VIF results confirm the earlier findings, with most values falling below the threshold of 10 percent (Farrar and Glauber, 1967). This supports the robustness of the correlation analysis and adds confidence to the reliability of the observed associations.

Table 3. Correlation and VIF results.

Variables	GDP	GE	GCF	LPF	RQ	II	VIF
GDP	1.0000						
GE	0.1427	1.0000					1.66
GCF	0.2316	–0.1135	1.0000				1.29
LPF	0.4360	0.2803	0.3853	1.0000			2.00
RQ	0.4321	0.1156	0.0782	0.1279	1.0000		2.61
II	0.9763	0.0751	0.1665	0.4433	0.3604	1.0000	3.46
Mean VIF							2.20

Nevertheless, the appropriate selection of lag length is a crucial aspect in the estimating process, as the inclusion of additional lags can significantly impact the accuracy of the findings. However, an excessive number of lags can lead to a reduction in the available degrees of freedom and may give rise to issues such as multicollinearity, serial correlation of the error terms, and specification errors (Asongu, 2014). The selection of an ideal lag, which accurately characterizes the nature of the data and effectively specifies the model, is mostly an empirical matter. The specification of the lag length for the PMG study is contingent upon the current body of literature concerning the nexus between government expenditure and economic growth, as specified by the Schwarz Bayesian Criterion (SBC) and Akaike Information Criterion (AIC) (Arpaia and Turrini, 2008). However, the AIC and other tests such as the FPE, signifying the Final Prediction Error, are most accurate in calculating the ideal lag length for small samples, as stated by Liew (2004). When samples are larger than this, a Hannan-Quinn Criterion (HQC) is a better fit. In summary, the AIC is used to specify the maximum lags for every variable in the study, with a maximum lag of one. A panel analysis used in this study requires an examination of cross-sectional dependencies among ASEAN member states. This study attempts to use two separate tests to address the issue of cross-section dependence. The cross-section independence of the panel time series is first estimated using the Breusch and Pagan (1980) test. Second, the Pesaran (2006) test is utilized, typically implemented in panel research. **Table 4** exhibits the outcome of the tests performed using these correlations. The results indicate no cross-sectional dependence (correlation) in residuals across the entire ASEAN-5 countries.

Table 4. Cross sectional dependency test in ASEAN-5.

Test	Statistic	d.f.	Probability
Breusch-Pagan LM	5.7274	10	0.7578
Pesaran CD	1.0188		0.1708

Note: Null hypothesis signifies no cross-section dependence in residuals.

In addition, it is important to perform a panel unit root test before employing cointegration methodologies. Prior to delving into the primary findings of this study, it is imperative to ascertain the congruence of all variables in terms of their order. Therefore, the panel unit root methodology proposed by Im, Pesaran, and Shin (2003)

and LLC are employed. The findings provide strong evidence that all variables exhibit non-stationarity but become stationary when differenced once, as demonstrated in **Table 5**. Hence, a greater number of variables that are examined are integrated of order one, denoted as *I* (1). Contrarily, the outcome of Kao and Fishers panel cointegration tests provides empirical evidence that supports the existence of a long-run linkage between the variables in **Table 6**.

Table 5. Panel unit root results.

Items	**LLC**		**IPS**	
variables	**At levels**	**At first difference**	**At levels**	**At first difference**
GDP	3.0978	–1.4595*	2.0756	–3.6865***
GE	1.2458	–3.5438***	1.9349	–5.4399***
GCF	3.5986	–1.7129**	0.6666	–4.3269***
LPF	1.6356	0.4654*	1.3104	–1.3098*
II	–2.7248***	–0.1326***	–1.1710***	–1.3908***
RQ	–2.1738**	–8.8013***	–1.607**	–8.0771***

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. The Schwarz Information Criteria (SIC) are used to determine the optimal lag lengths for unit root tests.

Table 6. Panel cointegration tests.

Kao Residual Cointegration Test		
Item	***t*-Statistic**	**Probability**
ADP	–4.3050	0.0000***
Residual variance	8160	
Hac variance	9862	
Johansen Fisher Cointegration Test		
Hypothesized No. of CE(S)	**Fisher Stat*(from trace test)**	**Fisher Stat* (from max-eigen test)**
None	249.7***	136.1***
At most 1	210.3***	133.8***
At most 2	115.1***	51.96***
At most 3	74.67***	40.17***
At most 4	47.39***	31.38***
At most 5	40.54***	40.54***

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

After confirming stationarity and establishing a long run cointegration relationship, our current study employs a Pooled Mean Group (PMG) ARDL model, with empirical results presented in **Tables 7** and **8** represents the outcome of long run and short run respectively. The PMG ARDL estimate proves to be more informative than other panel estimates, allowing for an investigation into the dynamically varied impact of government spending on economic growth in the ASEAN-5 region. This superiority arises because most other panel approaches suffer from lower degrees of freedom due to time constraints (Demetriades and Law, 2006).

Table 7. Estimated long run results: dependent variable GDP.

Variable	Coefficient	Std. Error	*t*-Statistics	Probability
GE	11.5511	46.6609	2.4978	0.0150**
GCF	62.4718	16.8242	3.7132	0.0004***
LPF	16.8529	43.1603	0.3904	0.6975
RQ	–19.3718	26.6855	–7.1338	0.0000***
II	1.3652	0.1185	1.5131	0.0000***

Note: GDP signifies gross domestic product, GE, represent government expenditure as % of GDP, GCF signifies of gross capital formation as % of GDP, LPF represents labor force as % of total population ages 15 to 64, RQ signifies regulatory quality in percentile rank, II represent initial income as GDP per capita of constant 2015 US$. AIC signifies Akaike Information Criterion. While ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 8. Estimated short run results.

Variable	Coefficient	Std. Error	*t*-Statistics	Probability
D(GE)	–26.9323	19.8676	–1.3439	0.1836
D(GCF)	86.2804	42.8700	2.0126	0.0483**
D(LPF)	10.0944	58.2610	1.7523	0.0844*
D(RQ)	–53.3532	80.3817	–0.6637	0.5092
D(II)	0.8711	0.2985	2.9175	0.0048***
ECTt-1	–0.1875	0.0996	–1.8818	0.0643*
C	10.8880	46.8941	2.2248	0.0296**

Notes: GE, represent government expenditure as % of GDP, GCF signifies of gross capital formation as % of GDP, LPF represents labor force as % of total population ages 15 to 64, RQ signifies regulatory quality in percentile rank, II represent initial income as GDP per capita of constant 2015 US$. ECT_{t-1} represent error correction term. While ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

To analyze the impact of variables used in this on economic growth, we examine the long run influence of gross capital formation, labor force, initial income, regulatory quality, and government expenditure. Empirical results from the long run in **Table 7** reveal that government expenditure has a positive and statistically significant impact on economic growth in the long run. These findings indicate that a unit increase in government spending results in a 11.6 unit increase in economic growth in the long run for ASEAN-5 countries. These results align with earlier studies, including those by Raifu et al. (2023), Tung et al. (2023), Erdogan et al. (2023), Poku et al. (2022), Alshammary et al. (2022), Chen et al. (2022), and Oanh et al. (2022). This finding is consistent with the principles of Keynesian macroeconomics, which propose that various types of government expenditures have the potential to stimulate favorable economic growth. Hence, it may be argued that government expenditures can stimulate economic growth through a significant crowding-in impact, resulting in an expansion in private sector output and employment rates. This perspective aligns with the results of Abdullah et al. (2019) and Abdullah and Rusdarti (2017) in ASEAN-5 countries.

Conversely, the long-run results reveal that gross capital formation (GCF) exhibits a positive and statistically significant influence on the economic growth of ASEAN-5 countries. This implies that a one-unit increase in GCF will result in a 62.5 unit increase in economic growth. These findings align with prior studies highlighting

the positive linkage between GCF and economic output, including studies by Mengesha et al. (2023) and Pasara et al. (2020). From a theoretical perspective, the neoclassical synthesis posits that a substantial amount of capital development leads to enhanced productivity, thereby fostering economic growth (Nweke et al., 2017). However, this perspective relies on the assumption of an investment-saving equilibrium within a closed economic system. In contrast, developing countries consistently face challenges related to insufficient savings and, consequently, investments. Liberalization is considered an efficient means of addressing this issue. The current results align with early researchers who determined a positive linkage between GCF and economic growth in ASEAN-5 (Etokakpan et al., 2020, and Solarin et al., 2015).

Nonetheless, the initial income variable exhibits a positive and significant impact on long-term economic growth, wherein a one-unit increase in initial income leads to a 1.4 unit increase in economic growth. These current findings align with prior studies, as evidenced by research conducted by Barro et al. (1991). These results underscore the crucial role of initial income in the production process and the economic growth of the region. From a theoretical perspective, these findings align with the Keynesian hypothesis, which posits that enhancing initial income, particularly through government expenditure, can increase aggregate demand, leading to a higher production level and economic growth.

The institutional quality variable, such as regulatory quality, exhibits a negative and significant effect on the long-term economic growth of ASEAN-5 countries. This implies that a one-unit increase in the regulatory quality variable will lead to a 19.4 unit decrease in economic growth. The current findings align with prior empirical researchers who have established a negative relationship between regulatory quality and economic development, as demonstrated by Zhuo et al., (2021). However, these empirical findings contradict the outcomes of earlier studies that found a positive relationship between regulatory quality and economic development (Misi et al. 2023, Hussen, 2023 and Nawaz et al.,2014), and more specifically the ASEAN-5 countries as observed in the work of Sari et al. (2021) and Salman et al. (2019). This negative impact could be attributed to various reasons. Firstly, the utilization of Regulatory Impact Assessment (RIA) has the potential to enhance the quality of regulations by promoting openness, accountability, and evidence-based decision-making. Nevertheless, the implementation and institutionalization of RIA in ASEAN-5 countries face limitations due to several obstacles, including inadequate capacity, insufficient data and resources, interference from political entities, and limited engagement of stakeholders. Secondly, governance quality affects the formulation, execution, and enforcement of regulations, as well as the confidence and adherence of regulated organizations and the public. Consequently, these factors may contribute to the negative influence of regulatory quality on the region. The labor force displays a positive but insignificant influence on economic growth in the long run. This suggests that the labor force is not contributing to the economic growth of ASEAN-5 countries in the long term. These results are consistent with earlier studies such as Ahmed et al. (2016).

Contrarily, the Error Correction Model (ECM) term is included in the examination of short-run estimates within the context of the ARDL model. This

highlights the direct influence of the labor force, gross capital formation, regulatory quality, initial income, and government expenditure in the ASEAN-5 region. The ECM controls the pace of adjustment for the elements being examined, hence dictating the speed at which the variables revert to equilibrium in the short term.

The short-run results displayed in **Table 8** reveal that the Error Correction Term (ECT) is statistically significant at the 10% level and negative, aligning with the long-run equilibrium relationship among the variables from the cointegration test. Additionally, it demonstrates that the model exhibits signs of stability and resilience. This suggests that in the event of a short-term disruption, all variables in the model will eventually reach equilibrium in the long run. The findings indicate that the variables' rate of adjustment to equilibrium is 18 times in the presence of a shock.

The short-run estimation results display that both GCF and the labor force exhibit a positive and significant impact on economic growth at significant level of 5% and 10%, respectively. These findings underscore the importance of both GCF and the labor force in shaping a country's economic growth. These results align with earlier findings by Poku et al. (2022), suggesting that an increase in gross fixed capital creation has substantial spill-over effects on short-term economic growth. Similarly, the results regarding the labor force are consistent with the earlier work by Haque et al. (2019), highlighting the positive influence of the labor force on short-term economic growth.

From a theoretical perspective, these current findings align with neoclassical growth theory, which emphasizes the significance of labor and capital in the production process. Additionally, initial income demonstrates a positive impact on economic growth at the significant level of 1% in the short run. It is essential to note that the immediate effect of initial income on economic growth may vary depending on factors such as general economic conditions, the type of income injection, and the overall economic climate. However, it is worth mentioning that other explanatory variables exhibit an insignificant association with economic growth in the short run. These results imply that factors beyond GCF, labor force, and initial income may have limited impact on short-term economic growth.

However, other variables display an insignificant relationship with economic growth in the short run, and this could be justified as follows. Firstly, ASEAN-5 policymakers focus on formulating and implementing policies that favor long-term contributions to economic development and growth. Secondly, variables such as the labor force are macroeconomic, and in most cases, these types of variables yield positive results in the long term rather than the short term. Thirdly, most ASEAN-5 countries share common economic characteristics and highly interdependent policies, such as trade, tourism, immigration, and working opportunities, which might impact economic conditions in the long term.

Nevertheless, the present study employs a panel Granger causality test, as proposed by Dumitrescu-Hurlin in (2012). This test is specifically designed to investigate the heterogeneity of panel causality models. This test has various advantages including considering the interdependence of cross-sectional units, working with imbalanced panel data, and being applicable in situations where the time and section dimensions vary widely in magnitude relative to one another (Dumitrescu-Hurlin 2012). Similarly, a panel Granger causality allow us t to validate which theory

the ASEAN-5 countries adhere to when establishing the linkage between government expenditure and economic growth. **Table 9** presents the results of the panel Granger causality test, revealing unidirectional causality from government expenditure to economic growth. These findings support the hypothesis of Keynesian theory, which posits that government expenditure leads to higher economic growth. This aligns with previous studies supporting Keynesian theory, such as those by Alshammary, et al., (2022); Arestis et al., (2021); Poku et al., (2022); and Kirikkaleli et al., 2022. Furthermore, several fundamental elements of Keynesian economic theory provide the rationale for increased government expenditure to stimulate economic growth. Firstly, Keynesians seek to stimulate economic growth by raising demand for products and services through increased government spending, particularly on public programs. Secondly, based on Keynesian perspectives, an initial boost in government expenditure triggers a more significant general expansion in economic activity, leading to a positive cycle of growth. Thirdly, economic downturns can be mitigated using Keynesian policies, which advocate for increased government spending and other fiscal measures. Lastly, Government expenditure often focuses on public goods and services like infrastructure and education, which stimulate current demand and promote long-term productivity for sustainable economic growth. Therefore, the increase in government spending can be attributed to rising prosperity, rather than the reverse (Bird, 1971).

Table 9. The outcome of pairwise panel granger causality test.

Null Hypothesis	W-Stat	Zbar-Stat	Probability	Decision	Applicable Theory
GE does not Granger cause GDP	4.8977	2.1491	0.0316**	Reject the null hypothesis	Support Keynesian theory
GDP does not Granger cause GE	7.4716	4.2849	2.0000	Accept the null hypothesis	Validate neutrality hypothesis

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

The interpretation of Keynesian theory holds significance in understanding the long-term association between government expenditure and real per capita income. This suggests that for Keynesian theory to be applicable, government spending must not be determined by actual per capita income. While the impact of government spending on real per capita income remains a subject of consideration, it appears improbable that it would singularly determine per capita GDP over an extended period. However, a potential connection may exist through public investment.

To validate the robustness of these results, RLS is used to reaffirm the preliminary findings of the PMG ARDL model.). From **Table 10**, a coefficient is evident, positive, and significant at the 5% level. Government expenditure exhibits a positive and statistically significant influence on economic growth, indicating that a one percent increase in government expenditure results in a 13.5% higher economic growth. These results are consistent with the earlier outcomes of the PMG ARDL model. In relation to the other explanatory variables, all variables demonstrate a significant impact on the economic growth of the region, apart from regulatory quality. Lastly, the adjusted R2 value of 73.79% indicates the degree to which the data fits the regression model.

Table 10. The result from robust least squares.

Variable	Coefficient	Std. Error	*t*-Statistic	Probability
GE	13.5085	42.4308	3.2171	0.0013***
GCF	82.7849	20.5461	4.0292	0.0001***
LPF	–51.7098	11.9291	–4.3347	0.0000***
RQ	–13.4868	8.5020	–1.5862	0.1127
II	1.0927	0.0098	11.2797	0.0000***
C	13.4220	13.7461	1.0065	0.3142
Adjusted R^2	0.7379			

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

However, the current study also conducts various diagnostic tests to ensure the reliability of the outcomes, including normality tests, serial correlation, and tests for heteroskedasticity. As depicted in **Table 11**, most statistical figures validate the suitability of various estimation techniques by confirming the absence of heteroskedasticity and serial correlation and passing the normality test, thereby ensuring the reliability of our regressors.

Table 11. Diagnostic tests results.

Items	Coefficient & *P*-Value	Explanation
Heteroskedasticity	73.5988(0.1192)	No heteroskedasticity issue.
Normality test	313.1872(0.2182)	The model is normally distributed.
Wooldridge serial correlation test	116.5940(0.1127)	Absence of serial correlation issue.

5. Conclusion and policy implications

The current study investigates the dynamic and heterogeneous effects of government spending on economic growth in ASEAN-5 countries from 2000 to 2021, employing the PMG ARDL and robust least squares methods. Additionally, various econometric approaches, including unit root, cointegration, and Granger causality tests, are utilized. The outcomes of the study can be articulated as follows: Firstly, government expenditure demonstrates a significant impact on the economic growth of ASEAN nations. The study reveals that increasing government spending has a significant and favorable influence on economic growth, establishing a positive correlation in the ASEAN-5 countries. These results align with the common perspective emphasizing the crucial role of government spending in both economic and public advancement. Secondly, concerning the long-term impacts of other factors, the results show the positive influence of initial income and capital formation. This indicates that these variables might play a role in stimulating growth in the ASEAN-5 region. Similarly, these findings align with established economic theories such as Keynesian theory, emphasizing the significant influence of the government on economic growth. In general, the estimation findings unveil a significant and enduring linkage between government expenditures and economic growth in the ASEAN-5 region, highlighting the potential for future economic development contingent upon

the impact of government expenditure on growth. However, the regulatory quality variable exhibits a negative and significant influence on the economic development of the ASEAN-5. Thirdly, in terms of short-term relationships, government expenditure, GCF, labor force and initial income variables display a positive impact on the economic growth which underlines the significance of these variables on the growth of the region. Finally, other econometric techniques, such as panel unit root and panel cointegration tests, validate the non-stationarity as well as the existence of a long-run linkage between the variables. The results of the Granger causality test confirm the existence of unidirectional causality from government expenditure to economic growth, aligning with Keynesian hypothesis.

One of the most formidable challenges faced by a greater number of ASEAN-5 nations is promoting economic growth while simultaneously reducing the overall percentage of government expenditure. Acquiring a comprehensive comprehension of the impact of government expenditure on economic output in the ASEAN-5 region is crucial for formulating novel policies and strategies. The policy implications of the above findings hold an important role. Over time, a positive impact of government expenditure suggests that the crowding-in effect stimulates a heightened incentive to generate more productive capital, ultimately leading to a rise in the demand for innovative technologies. The ASEAN-5 region should prioritize the expeditious development of its fiscal balance through appropriate measures.

Additionally, to stimulate economic output in the ASEAN-5 nations, the findings imply that fiscal policy, which includes government expenditure and taxation, can be an effective instrument. Policymakers should be aware of the significant effect government spending may have on the economy and think carefully about how to use it during recessions (Abdullah et al., 2019). Quality expenditure allocation plays a significant role, allowing the ASEAN-5 countries to allocate their expenditure effectively and efficiently. This entails avoiding inefficient or susceptible-to-corruption practices and prioritizing projects and programs that yield concrete benefits for both the economy and society. Furthermore, ASEAN-5 countries require close coordination and collaboration of fiscal and monetary policies. To prevent inflationary pressures, central banks may need to modify monetary policy if the government increases spending to encourage growth. It is crucial that these two decision-making bodies work together and exchange information effectively (Yien, 2018). It is imperative for ASEAN-5 countries to allocate resources toward enhancing the capabilities of their institutions regarding the efficient strategizing, execution, and oversight of public expenditure initiatives. This includes guaranteeing accountability and transparency regarding the expenditure of public funds. Lastly, to promote economic growth, policymakers need to encourage productive government expenditures while minimizing non-productive ones. This can be achieved through the implementation of long-term profitable projects.

Nevertheless, the Granger causality test reveals a unidirectional relationship from government expenditure to economic growth. This indicates that government expenditure has a greater impact on the economy than the other way around. In other words, Keynesian theory is validated rather than the Wagner law in ASEAN-5 countries. The emergence of Keynesian economics in the 1930s was seen as a significant change in economic thought, focusing on the automatic adjustment of

market forces. Keynes believed that government intervention through fiscal policy is crucial for economic stability. Government spending can play a crucial role in stimulating the economy. The findings support the traditional Keynesian view of expanding fiscal policy. Public sector expenditure serves as a beneficial policy tool that can assist in stabilizing the economy throughout both favorable and unfavorable periods. Consequently, policymakers can utilize this information to determine the likely impacts and implications of heightened government spending on economic growth.

Regarding limitations, this study might not capture the specific nuances of each ASEAN member. The dynamic nature of government expenditure components also implies that the findings could be influenced by unforeseen factors. Therefore, future research should address these issues by focusing on individual ASEAN countries, measuring government expenditure at a disaggregate level, and employing advanced econometric techniques with a larger sample size. The journey of understanding ASEAN's effective government expenditure components is ongoing, with many areas still awaiting exploration.

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