

Analyzing Public Spending and Income Links in CIVETS

Yunus Savaş¹

Received/ Başvuru: 28.04.2025

Accepted/ Kabul: 31.07.2025

Published/ Yayın: 11.10.2025

Abstract

A substantial body of research has emerged within the economic discourse surrounding the intricacies of public expenditure and its relationship with national income. Researchers have dedicated significant effort to investigating the nature of this interdependence. This study endeavors to make a meaningful contribution to the extant body of research by assessing the validity of two prominent perspectives—those of Wagner and Keynes—within the context of the CIVETS countries (Colombia, Indonesia, Vietnam, Egypt, Turkey, and South Africa) for the time period of 1995-2023, for both absolute and relative versions. The Westerlund cointegration test and Dumitrescu-Hurlin panel causality test with a bootstrap approach were utilized to examine the dynamic interactions between public spending and national income. The findings indicate that, in its absolute form, Wagner's Law is supported; however, no significant relationship is observed in the case of the Keynesian perspective. The findings indicate that the influence operates from national income to public expenditure, rather than the reverse, in the case of CIVETS countries. This finding contributes to the ongoing discussion regarding the directionality of causality between public spending and national income, emphasizing the relevance of Wagner's Law in the context of emerging market economies.

Keywords: public spending, national income, wagner law, panel causality

¹ Ass. Prof., Bitlis Eren University, Türkiye, yunusavas@outlook.com, Orcid: 0000-0002-9642-4734



CIVETS Ülkelerinde Kamu Harcamaları ve Gelir İlişkilerinin Analizi

Öz

Ekonomik söylem içerisinde kamu harcamalarının incelikleri ve milli gelirle olan ilişkisi üzerine önemli bir araştırma grubu ortaya çıkmıştır. Araştırmacılar bu karşılıklı bağımlılığın doğasını araştırmak için önemli çaba sarf etmişlerdir. Bu çalışma, 1995-2023 dönemi için CIVETS ülkeleri (Kolombiya, Endonezya, Vietnam, Mısır, Türkiye ve Güney Afrika) bağlamında Wagner ve Keynes'in iki önemli perspektifinin geçerliliğini hem mutlak hem de göreceli versiyonlar için değerlendirerek mevcut araştırma bütününe anlamlı bir katkıda bulunmaya çalışmaktadır. Kamu harcamaları ve milli gelir arasındaki dinamik etkileşimleri incelemek için Westerlund eşbütünleşme testi ve bootstrap yaklaşımıyla Dumitrescu-Hurlin panel nedensellik testi kullanılmıştır. Bulgular, mutlak haliyle Wagner Yasası'nın desteklendiğini, ancak Keynesyen perspektif söz konusu olduğunda anlamlı bir ilişki gözlenmediğini göstermektedir. Bulgular, CIVETS ülkeleri söz konusu olduğunda, etkinin milli gelirden kamu harcamalarına doğru değil, tersine işlediğini göstermektedir. Bu bulgu, kamu harcamaları ile milli gelir arasındaki nedenselliğin yönüne ilişkin süregelen tartışmaya katkıda bulunmakta ve Wagner Yasası'nın yükselen piyasa ekonomileri bağlamındaki önemini vurgulamaktadır.

Anahtar Kelimeler: kamu harcamaları, milli gelir, wagner yasası, panel nedensellik



1. INTRODUCTION

The intricate relationship between public expenditures and national income continues to be the focus of significant scholarly debate. This relationship has profound implications for economic theory and policymaking. The fundamental question that lies at the core of this discourse is the extent to which government intervention influences economic growth. Theoretical perspectives on this issue are deeply polarized. They range from laissez-faire economic doctrines that emphasize minimal state involvement to more interventionist views. Proponents of classical and neoclassical economic theories posit that market forces, when left largely unregulated, operate with optimal efficiency. In contrast, interventionist perspectives contend that the state must play a fundamental role in correcting market failures, mitigating economic downturns, and facilitating structural economic transformation.

Two seminal theoretical frameworks encapsulate these divergent perspectives: Wagner's Law and Keynesian economics. Wagner's (1958) theoretical postulate posited that as an economy develops and national income rises, public expenditure will grow proportionally, a phenomenon that will be propelled by the mounting demand for public goods and services. Wagner's Law is regarded as an archetypal and widely acknowledged model for elucidating public expenditure (Magazzino, 2012). This theoretical proposition, subsequently recognized as Wagner's Law, posits that economic progress requires augmented state involvement in economic affairs. Contrasting with this, Keynes (1936) fundamentally contested the idea that public expenditure constitutes no more than a passive response to economic growth. Keynes's (1936) seminal work countered this prevailing thought by contending that government expenditure is, in fact, a primary catalyst of economic activity, particularly in periods of economic downturns when demand from the private sector is inadequate to sustain growth, which were adopted by policymakers in the wake of the Great Depression. The United States, as the epicenter of the crisis and a global economic leader, was among the first nations to adopt Keynesian-inspired policies. In doing so, it demonstrated the transformative potential of government-led economic recovery efforts.

Despite the extensive empirical research conducted in the field, the academic community has yet to reach a definitive consensus regarding the primacy of either Wagner's or Keynesian perspectives. In recent decades, numerous empirical studies have been performed in an effort to assess the validity of these competing theories. Sophisticated econometric methodologies have been applied across diverse geographical and temporal contexts; however, the findings remain inconclusive, largely due to variations in fiscal policy frameworks, institutional quality, and economic structures across different nations (Peacock and Wiseman, 1961). In some economic systems, observed patterns of expenditure growth are consistent with the theoretical propositions posited by the economic principle advanced by Wagner. Conversely, alternative economic systems demonstrate expenditure growth dynamics that are more analogous to the economic principles articulated by the economist John Maynard Keynes.



The hypothesis proposed by Wagner (1958) is intricately tied to the overarching principles of comparative advantage and structural economic transformation, highlighting the complementarities between industrialization and the increasing demand for government-provided economic services, including infrastructure investments, transportation networks, communication systems, healthcare, and waste management (Peacock and Scott, 2000). Subsequent to its initial formulation, Wagner's Law has undergone multiple refinements and reinterpretations, giving rise to a plethora of theoretical models. Among the most widely recognized contributions are those of Peacock and Wiseman (1961), Pryor (1968), Goffman (1968), Musgrave (1969), Gupta (1967), and Mann (1980), each of whom offers a nuanced perspective on the expenditure-growth relationship. These theoretical adaptations can be broadly categorized into two principal classifications: absolute and relative versions.

Absolute versions of this concept—illustrated by works from Peacock and Wiseman (1961), Pryor (1968), Goffman (1968), and Gupta (1967)—center on the monetary magnitude of government expenditure. These works hypothesize that as national income escalates, public spending will invariably rise, irrespective of its proportion relative to GDP. Conversely, the relative versions, exemplified by works such as Musgrave's 1969 study and Mann's 1980 analysis, explore government expenditure as a percentage of the nation's Gross Domestic Product (GDP). They contend that, while absolute expenditure may rise, its relative proportion within the broader economic framework may fluctuate based on policy decisions and structural changes within the economy. This classification, initially proposed by Demirbas (1999) and subsequently refined by Verma and Arora (2010), underscores the intricacies inherent in formulating a unifying interpretation of Wagner's Law. The utilization of varied methodological approaches in testing Wagner's hypothesis further accentuates the inherent heterogeneity in fiscal dynamics across diverse economic systems.

In light the aforementioned theoretical underpinnings, this study aspires to investigate the applicability of both Wagnerian and Keynesian economic theories within the context of CIVETS economies over the period 1995–2023. The rationale for this investigation stems from the recognition that these emerging markets possess a wide array of economic structures, policy orientations, and institutional characteristics. The aim of this research endeavor is to attain an understanding of the subject matter whether public expenditure in these nations exhibits a greater degree of alignment with Wagner's hypothesis of passive government expansion in response to economic growth or with the Keynesian proposition of active government intervention as a driver of economic expansion.

2. LITERATURE REVIEW

The nexus that exists amongst government expenditure and economic growth is a multifaceted subject that has been thoroughly investigated through empirical research. The results of this research have shown significant variation across different geographical contexts, methodological approaches, and frameworks. Early studies primarily examined the broad



macroeconomic implications of public spending on growth. More recent research, however, has shifted towards sectoral disaggregation and causality analysis, providing deeper insights into the nuanced dynamics of fiscal policy effectiveness. Empirical research conducted in this area has yielded inconclusive results. The extant studies have produced equivocal findings regarding the relationship among variables, with some studies indicating a positive correlation and others indicating a negative one, depending on the particular variables considered (i.e., the nature of public spending, the economic context, the methodological approaches, etc.).

Grier and Tullock's (1989) study constitutes a comprehensive empirical investigation. They employed pooled cross-sectional and time-series data from 113 countries to explore how variations in public sector spending patterns influence economic performance. Their findings revealed an inverse association in three of the four subsamples analyzed, including those comprising OECD member states. These findings imply that excessive government consumption exerts a dampening effect on economic performance. These findings initiated a line of research that examined the potential distortions caused by expansive government consumption, particularly in economies with significant public sector involvement. Building on this research, Barro (1991) extended the analysis to 98 countries from 1960 to 1985, further reinforcing concerns about inefficient government consumption. The findings indicated a negative relationship, suggesting that a rise in the government's consumption share of GDP is concomitant with a decline in economic growth rates, while public investment had an insignificant effect. These results contributed substantially to a mounting body of research that began to question the efficacy of public spending. This prompted scholars to explore whether specific categories of expenditure exert differentiated effects on growth trajectories.

Due to the inherent limitations of aggregate government spending analyses, subsequent research has underscored the significance of sectoral disaggregation in assessing the growth effects of public expenditure. Bose et al. (2007) conducted an examination of the impact of different expenditure categories across thirty developing nations during the 1970s and 1980s. The results revealed that while capital expenditure was positively and significantly linked to economic growth, current expenditure had no measurable effect. It is noteworthy that investments in education emerged as a pivotal catalyst for economic expansion, underscoring the pivotal function of human capital development in promoting long-term growth.

In a similar vein, Lamartina and Zaghini (2011) identified a structural positive correlation for OECD countries, whereby higher per capita GDP consistently aligned with greater public expenditure. The researchers' conclusions align with the established principles of Wagner's Law, which posits that as economies develop, the demand for public goods and services naturally increases, leading to an expansion in government expenditure.

Researchers have increasingly sought to ascertain the causal direction of the expenditure-growth nexus beyond correlation-based analyses. Odhiambo (2015) investigated the dynamic interactions for the case of South Africa, uncovering a bidirectional causality in the short run but a unidirectional causality in the long run, where economic growth predominantly influenced



government expenditure. This finding underscores the importance of a long-term perspective in fiscal policy, emphasizing the necessity of aligning public spending with sustainable economic expansion rather than short-term fluctuations.

A similar pattern was identified in Asian economies, as evidenced by Lahirushan and Gunasekara's (2015) analysis of data from 1970 to 2013. Their study confirmed a two-way causality, suggesting that government expenditure can stimulate economic growth, and economic expansion can influence public spending patterns. This observation emphasizes the feedback effects inherent in fiscal policy.

Furthermore, Lupu et al. (2018) examined the period between 1995 and 2015, focusing on Central and Eastern European countries, and discovered that expenditures on education and healthcare had a positive contribution to economic growth, while spending on other sectors exhibited negative effects.

In a country-specific context, Iniguez-Montiel's (2010) analysis of Mexico's fiscal policy from 1950 to 1999 identified unidirectional causality from GDP to government expenditure. This finding suggests that economic growth has historically driven increases in public spending rather than the reverse. This aligns with Wagner's hypothesis that government spending is an endogenous response to economic development.

In addition to the aforementioned observations, further variations in fiscal policy effectiveness were identified in the Malaysian context. Tan's (2003) findings indicated that the country's government expenditure patterns did not align with the principles of Wagner's Law, instead adhering to Keynesian principles, suggesting a greater responsiveness of the Malaysian fiscal policy to short-term economic fluctuations rather than to long-term structural trends. This observation serves to reinforce the notion that Keynesian demand-side interventions have played a more significant role in shaping the nation's fiscal policy. In a similar vein but focusing on a different nation, Onifade et al. (2020) examined Nigeria's economic record from 1981 to 2017. They found that government expenditures aimed at supporting ongoing activities (i.e., recurrent government expenditures) had a significantly negative impact on economic growth, while expenditures aimed at providing long-term benefits to the economy (i.e., public capital expenditures) exhibited no significant positive effect.

Moreover, Akbulut and Başoğlu (2023) analyzed Turkey's public expenditure patterns from 2006:1 to 2021:4, testing the validity of both Wagner's Law and the Keynesian hypothesis. Their findings suggest that while both theoretical frameworks are valid to a certain extent, their applicability depends on the nature of the expenditure in question. Specifically, their research indicates that only expenditures related to education and investment exhibit a Keynesian effect in the short term. This lends further support to the idea that deliberate government interventions can significantly influence economic performance.



By distinguishing between the absolute and relative versions of Wagner's Law and jointly testing the Keynesian hypothesis, this study addresses a gap in the literature by empirically comparing these competing theories in the context of CIVETS countries — a comparative approach that remains largely underexplored. The extant empirical literature on government expenditure and economic growth presents a set of findings that are, at times, contradictory. While a proportion of these studies lend support to the notion of Wagner's Law, under the premise that government spending is an inherent consequence of economic expansion, others align more closely with the economic principles espoused by Keynes, contending that strategic interventions by the state in the fiscal sphere can serve as a catalyst for economic growth.

3. RESEARCH METHOD

3.1. Data

This research examines the bidirectional relationship between government spending and economic growth in CIVETS countries over the years 1960–2023, assessing both the influence of fiscal activity on growth and the reciprocal impact of growth on government expenditure. To achieve this, an empirical analysis is conducted using various adaptations of Wagner's Law, which postulates a long-term relationship between public expenditure and economic growth. In order to comprehensively assess this relationship, the study also incorporates Keynesian perspectives by altering both dependent and independent variables across different model specifications. Data in this analysis is obtained from the World Bank's Development Indicators resource.

Table 1. Variations of Wagner's Law

Version	Regression Equation
Absolute Versions	
Peacock-Wiseman (1961)	$GE = f(GDP)$
Gupta (1967)	$GE/P = f(GDP/P)$
Goffman (1968)	$GE = f(GDP/P)$
Pryor (1968)	$GCE = f(GDP)$
Relative Versions	
Musgrave (1969)	$GE/GDP = f(GDP/P)$
Mann (1980)	$GE/GDP = f(GDP)$

Source: Adopted from the work of Demirbas (1999) and Verma and Arora (2010)

Due to constraints in data availability, the period from 1960 to 2023 was selected for analysis, as it encompasses the maximum range for which consistent data are available across the sample. The investigation is further motivated by the acknowledgment that these emerging markets demonstrate a heterogeneity in economic structures, policy frameworks, and institutional attributes, rendering them a compelling context for elucidating the interplay between public expenditure and economic growth. The various formulations of Wagner's Law utilized in this study are summarized in Table 1, where GE signifies government expenditure, GCE represents government consumption expenditure, GDP denotes gross domestic product, and P refers to



population. Real GDP is expressed in constant 2015 U.S. dollars to maintain comparability over time. Additionally, population data are incorporated as a key variable in the analysis. Due to the unavailability of comprehensive data on total government expenditure for the selected countries and period, government consumption expenditure is used as a proxy. As a result, all tested versions of Wagner's Law listed in Table 1 are applied, except for the Peacock and Wiseman (1961) version. The exclusion of this specific version is justified by the observation made by Ghazy et al. (2021), who indicated that the Peacock and Wiseman model closely resembles Pryor's version, differing only in the choice of expenditure measure—government expenditure rather than government consumption expenditure. Since this study adopts government consumption expenditure as a proxy, it effectively yields results that align with those obtained under the Peacock and Wiseman framework, thus ensuring consistency.

Table 2. Descriptive statistics

Variables	Obs	Mean	Std. dev.	Min	Max
GC	174	24.42842	.6690765	22.76899	25.85709
GDP	174	26.4955	.631798	24.9255	27.85851
GDPC	174	8.273648	.5781942	6.832628	9.596525
GCY	174	2.455283	.3410217	1.698401	3.098316
GCP	174	6.206575	.7729238	4.676121	7.5951

Moreover, the descriptive statistics have been illustrated in Table 2. The mean values for all variables suggest central tendencies for each variable. GC, GDP, and GCY show relatively narrow ranges, indicating moderate consistency, while GDPC and GCP exhibit more variability, suggesting more diversity in the data. The standard deviations indicate that GC and GDP are less dispersed, whereas GDPC and GCP show higher dispersion.

3.2. Methodology

This paper utilizes a variety of econometric techniques to conduct analyses. The analyses employ multiple tests and procedures to account for potential issues, such as cross-sectional dependence, stationarity, cointegration, and causality. This comprehensive approach aims to provide a deeper understanding of the relationships among the variables under investigation.

3.2.1. Cross-Sectional Dependence

The initial step in the analysis entails the examination of cross-sectional dependence. Cross-sectional dependence, defined as the correlation between observations in a dataset across different cross-sectional units, necessitates consideration due to its potential impact on the reliability of other econometric tests. To assess this dependency, a series of tests are employed, including the Breusch-Pagan LM Test (Breusch and Pagan, 1980), the Pesaran Scaled LM Test (Pesaran, 2021), the Bias-Corrected Scaled LM Test (Baltagi et al., 2012), and the Pesaran CD Test (Pesaran, 2021).



3.2.2. Unit Root Tests

Stationarity constitutes a pivotal assumption within the domain of time series analysis, exerting a substantial impact on the determination of suitable econometric methodologies. Consequently, this critical assumption is instrumental in ensuring the credibility of the outcomes obtained. The present study undertakes an empirical investigation by leveraging a suite of unit root tests that are categorized into two distinct generations. The initial set encompasses first-generation unit root tests, operating under the premise of cross-sectional independence. These assessments are meticulously implemented in order to ascertain the presence of stationarity or the existence of a unit root within the individual time series. The following second-generation unit root tests are used for this purpose: The Levin, Lin, and Chu (LLC) Test ([Levin, et al., 2002](#)), the Im, Pesaran, and Shin (IPS) Test ([Im et al., 2003](#)), the Augmented Dickey-Fuller (ADF) Test ([Dickey and Fuller, 1979](#)), and the Phillips-Perron (PP) Test ([Phillips and Perron, 1988](#)). Given the assumption of no cross-sectional dependence made by first-generation tests, the potential issues resulting from cross-sectional dependence are addressed by the second-generation unit root tests. For this purpose, the Pesaran CIPS Test is employed as it was proposed by Pesaran ([2007](#)).

3.2.3. Cointegration Analysis

After establishing stationarity, the next step is to assess the existence of cointegration among the variables. The relationship can be revealed via cointegration tests, and the Westerlund Cointegration Test developed by Westerlund ([2007](#)) is selected because it is flexible in its handling of variables that may exhibit different levels of stationarity. The Westerlund cointegration test can be implemented under circumstances in which the variables are integrated at varying orders and can also be used when all variables are stationary at the same level. To ensure the robustness of the results, it is conducted with 1,000 bootstrap replications. Bootstrapping is a resampling technique that helps to generate more reliable statistical inferences by repeatedly sampling from the data to estimate the distribution of the test statistic.

3.2.4. Panel Causality Testing

Following the establishment of cointegration relationships, the subsequent step entails the exploration of the direction of causality among the variables. To investigate the direction of Granger causality across the panel data, the Dumitrescu-Hurlin panel causality test ([Dumitrescu and Hurlin, 2012](#)) is employed, utilizing bootstrap resampling consistent with the approach adopted in the cointegration tests. The bootstrap procedure enhances the robustness of the causality results by providing more accurate critical values and p-values.

4. EMPIRICAL RESULTS

In this section, the econometric methodology outlined in the methodology section is employed to conduct empirical analysis. The initial step in this process entails examining the existence of



cross-sectional dependence among the variables. As demonstrated in Table 3, the outcomes of multiple cross-sectional dependence tests indicate that all series manifest significant cross-sectional dependence. Nevertheless, a noteworthy exception emerges in the case of the Pesaran CD test for GCY, which does not indicate cross-sectional dependence. Conversely, the application of alternative tests consistently substantiates the existence of cross-sectional dependence for this variable.

Table 3. Cross-Section dependency tests

Variables	Breusch-Pagan LM	Pesaran scaled LM	Bias-corrected scaled LM	Pesaran CD
GC	416.265***	73.260***	73.153***	20.400***
GDP	417.031***	73.400***	73.293***	20.418***
GDPC	372.213***	65.217***	65.110***	19.236***
GCY	103.693***	16.193***	16.085***	1.140
GCP	382.852***	67.160***	67.053***	19.539***

The subsequent stage in the econometric analysis entails the evaluation of the stationarity properties of the variables. To this end, initial application of first-generation unit root tests is undertaken. These tests facilitate the determination of whether the time series variables contain a unit root or not. At the level form, the findings suggest that none of the series are stationary at the 5% significance level under both the constant-only and the constant-and-trend specifications. This observation indicates the presence of a unit root, thereby suggesting the non-stationary status of the series when expressed in their original form. Subsequent to implementing the first-differences operator on the variables, it is observed that each series becomes stationary. This transformation signifies that the variables are I(1) integrated, implying that stationarity is only achieved following the differentiation process once.

Table 4. Unit root tests

At Level		GC	GDP	GDPC	GCY	GCP
Levin et al. (2002)	Constant	-0.724	-1.151	0.303	0.354	-0.266
	Constant and trend	1.643	-1.117	-1.528*	-0.267	0.758
Im et al. (2003)	Constant	2.602	2.860	0.998	0.546	2.552
	Constant and trend	0.274	-0.544	-1.074	0.747	0.145
ADF	Constant	1.881	3.588	0.994	7.658	2.162
	Constant and trend	9.030	16.610	19.960*	6.523	9.652
PP	Constant	4.419	11.133	0.546	10.216	4.257
	Constant and trend	12.470	6.552	8.754	7.509	11.095

At First difference		GC	GDP	GDPC	GCY	GCP
Levin et al. (2002)	Constant	-4.338***	-5.078***	-5.092***	-5.288***	-4.099***
	Constant and trend	-2.765***	-4.208***	-4.327***	-4.008***	-2.599***
Im et al. (2003)	Constant	-5.322***	-5.357***	-5.199***	-6.031***	-5.253***
	Constant and trend	-3.714***	-4.554***	-4.419***	-4.866***	-3.718***
ADF	Constant	51.864***	51.149***	49.843***	57.962***	50.855***
	Constant and trend	36.380***	41.734***	40.865***	44.249***	35.918***
PP	Constant	74.493***	72.108***	70.476***	95.644***	72.034***
	Constant and trend	53.454***	60.091***	59.653***	91.479***	51.185***



Second-generation unit root tests are utilized to identify and address potential dependencies that arise when studying cross-sectional dependence in a panel dataset. In the context of second-generation unit root tests, CIPS test is employed to assess the stability of the variables in the dataset. The findings from this test indicate that both GC and GDPC exhibit stationarity under the constant-only specification. However, upon expanding the model to include the constant-and-trend specification, the resultant stationarity is observed only in GDPC.

Table 5. Unit root test

	Level		First Difference	
	Constant	Constant and trend	Constant	Constant and trend
GC	-3.046***	-2.560	-3.649***	-3.687***
GDP	-2.326*	-2.741*	-4.752***	-3.532***
GDPC	-2.357**	-3.167***	-4.385***	-3.603***
GCY	-2.310*	-2.465	-4.319***	-4.625***
GCP	-2.966***	-2.619	-3.671***	-3.909***

Pursuant to calculating the first differences of the variables, the findings indicate that no series exhibits a unit root, thereby confirming their stationarity. The results from both the first-generation and second-generation unit root tests consistently demonstrate that no variables are I(2).

This study explores the cointegration relationship across different permutations of Wagner's Law, alongside the consideration of reverse causality, within the context of the Keynesian hypothesis. The analysis commences with the Pryor (1968) approach, where the results suggest that Wagner's Law holds, yet no evidence of cointegration is observed for the Keynesian hypothesis. The results from the Goffman (1968) approach yield a parallel pattern, validating Wagner's Law while refuting the cointegration of the Keynesian framework; the outcomes for the Gupta (1967) approach align with these results, providing further substantiation for Wagner's Law. The aforementioned approaches, classified as absolute versions of Wagner's Law, as outlined in Table 1, thereby reinforcing the applicability of Wagner's hypothesis in the context of the analyzed countries.

Table 6. Westerlund co-integration test

Wagner Version					Keynesian Version				
Statistic	Value	Z-value	P-value	Pryor (1968)					Robust P-value
				Robust P-value	Statistic	Value	Z-value	P-value	
Gt	-2.288	-3.089	0.001	0.001	Gt	-0.983	-0.015	0.494	0.360
Ga	-10.670	-3.699	0.000	0.000	Ga	-4.119	-0.170	0.432	0.154
Pt	-5.685	-3.800	0.000	0.002	Pt	-2.620	-1.173	0.120	0.180
Pa	-9.113	-6.841	0.000	0.000	Pa	-4.478	-2.920	0.002	0.041
Statistic	Value	Z-value	P-value	Goffman (1968)					Robust P-value
				Robust P-value	Statistic	Value	Z-value	P-value	
Gt	-2.396	-1.685	0.046	0.037	Gt	-1.553	0.612	0.730	0.553
Ga	-10.532	-1.525	0.064	0.011	Ga	-6.331	0.365	0.642	0.284
Pt	-7.002	-3.477	0.000	0.006	Pt	-3.344	0.203	0.580	0.550
Pa	-12.150	-4.370	0.000	0.003	Pa	-6.392	-1.193	0.117	0.134



Gupta (1967)									
Gt	-3.073	-3.531	0.000	0.000	Gt	-1.493	0.776	0.781	0.614
Ga	-14.808	-3.449	0.000	0.000	Ga	-6.446	0.313	0.623	0.263
Pt	-8.641	-5.125	0.000	0.001	Pt	-3.256	0.291	0.615	0.577
Pa	-14.941	-5.910	0.000	0.001	Pa	-6.171	-1.071	0.142	0.154
Musgrave (1969)									
Gt	-1.895	-2.163	0.015	0.012	Gt	-0.897	2.401	0.992	0.940
Ga	-3.986	-0.099	0.461	0.164	Ga	-1.347	2.608	0.995	0.992
Pt	-3.098	-1.583	0.057	0.097	Pt	-2.582	0.970	0.834	0.723
Pa	-2.598	-1.329	0.092	0.162	Pa	-1.769	1.358	0.913	0.872
Mann (1980)									
Gt	-1.874	-2.114	0.017	0.013	Gt	1.425	5.655	1.000	0.999
Ga	-3.325	0.257	0.601	0.296	Ga	0.520	2.328	0.990	0.976
Pt	-3.247	-1.711	0.044	0.078	Pt	2.967	3.613	1.000	0.957
Pa	-2.356	-1.125	0.130	0.192	Pa	0.299	1.122	0.869	0.776

In this study, we extend our research by incorporating relative versions of Wagner's Law in the analysis. This approach complements the absolute versions and provides a comprehensive assessment. The Musgrave (1969) and Mann (1980) approaches were employed, but neither yielded statistically significant findings. Despite the presence of some statistically significant test statistics from the Westerlund cointegration test for relative Wagner's Law, the overall findings do not support the hypotheses. The results indicate that the absolute versions of Wagner's Law are valid for the countries examined in this study. Conversely, there is no compelling evidence that validates the Keynesian hypothesis. Furthermore, the relative versions demonstrate that neither Wagner's nor Keynes's approaches are statistically significant.

Table 7. Dumitrescu-Hurlin panel causality

	W-bar	Z-bar	Z-bar tilde	Z-bar p-value	Z-bar tilde p-value
Pryor (1968)					
GDP to GC	9.6748	15.0252	12.8008	0.0060	0.0060
GC to GDP	1.4998	0.8656	0.6153	0.7940	0.8150
Goffman (1968)					
GDPC to GC	7.2652	10.8516	9.2090	0.0040	0.0040
GC to GDPC	2.7117	2.9648	2.4218	0.5160	0.5160
Gupta (1967)					
GDPC to GCP	10.3758	16.2394	13.8457	0.0010	0.0010
GCP to GDPC	1.6519	1.1292	0.8422	0.7220	0.7340
Musgrave (1969)					
GDPC to GCY	2.1738	2.0330	1.6200	0.5190	0.5190
GCY to GDPC	2.8370	3.1818	2.6086	0.0530	0.0530
Mann (1980)					
GDP to GCY	2.2543	2.1724	1.7399	0.5130	0.5130
GCY to GDP	1.9931	1.7201	1.3507	0.1360	0.1510

The Dumitrescu-Hurlin panel causality approach with 1,000 bootstrapping iterations based on the Bayesian Information Criterion (BIC) was selected as the final econometric method to be employed in the present study. The results obtained through the use of this method served to



reinforce the findings obtained from the cointegration analysis, thereby further supporting Wagner's Law. Specifically, the causality tests demonstrate that government expenditure is a Granger-cause of economic growth, thereby validating Wagner's hypothesis for absolute versions of Wagner law. Conversely, there is an absence of empirical evidence supporting the Keynesian viewpoint. This is due to the fact that the results do not reveal a substantial causal relationship that would corroborate the Keynesian perspective.

5. DISCUSSION and CONCLUSION

This paper contributes to the ongoing discourse by testing two prominent economic theories: Wagner's hypothesis—which posits that economic growth is a driving factor of government expenditure—and the Keynesian perspective—which asserts that government expenditure is a stimulant of economic growth. To this end, the analysis encompasses a comprehensive review of theoretical frameworks and empirical studies. The research focuses on the CIVETS countries over the period from 1995 to 2023, providing an empirical foundation to assess these long-debated economic relationships. The study undertakes a rigorous examination of Wagner's laws across diverse forms—both absolute and relative—while concurrently exploring the reverse causality aspect within the framework of the Keynesian hypothesis.

The Westerlund cointegration test yielded a unidirectional relationship between the variables, thereby supporting the absolute version of Wagner's law. This finding stands in contrast to the Keynesian perspective concerning CIVETS countries from 1995 to 2023. The Dumitri-Hurlin panel causality test yielded consistent results, indicating statistical significance exclusively for the absolute variation of Wagner's law. Consequently, the findings of this study indicate the robustness and statistical significance of the variations of Wagner's law proposed by scholars such as Pryor (1968), Goffman (1968), and Gupta (1967) across various econometric models. These variations underscore the concept that economic growth invariably leads to an augmentation in government expenditure, driven by the proliferation of public needs and services. In contrast, the relative variations of Wagner's law, as proposed by Musgrave (1969) and Mann (1980), were not found to be statistically significant for either the Wagnerian or Keynesian versions.

The results of the present study demonstrate a congruence with the findings of Lamartina and Zaghini (2011) and Iniguez-Montiel (2010), suggesting the Wagnerian perspective as a more pertinent theoretical framework for economic analysis. In contrast to the Wagnerian perspective, empirical evidence from Tan (2003) indicates that the Keynesian perspective is not supported, while the arguments put forth by Akbulut and Başoğlu (2023) and Lahirushan and Gunasekara (2015) for the validity of both views are similarly not supported by examination in this paper.

The present study makes a contribution to the academic discourse on the intricate relationship between public spending and national income. By offering empirical evidence that supports the Wagnerian hypothesis over the Keynesian view, particularly in the context of emerging



economies, the study aimed to provide an addition to the existing body of knowledge in this field. It must be noted that the present study employs an econometric approach and does not analyze country-specific results; consequently, caution must be exercised when interpreting the findings. Therefore, it can be posited that the results of the study may be influenced by institutional characteristics and fiscal policy differences that are unique to each country. This suggests that any generalizations made should be done so with a sufficient degree of contextual awareness. The findings of the study hold significant implications for policymakers, suggesting that a strategy aimed at fostering economic growth could be instrumental in achieving a sustainable increase in government expenditure and the expansion of public services. In light of the observed incongruity between the evidence and the tenets of the Keynesian perspective, policymakers would be wise to exercise discernment before placing undue reliance on government spending as a panacea for economic stimulation. Instead, there is a compelling rationale for prioritizing policies that catalyze long-term economic growth in CIVETS countries, thereby ensuring that any augmentation in government expenditure is congruent with the overarching economic development paradigm in these countries.

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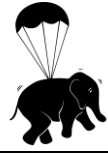
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Declaration of Contribution Rate: The entire study has been prepared only by the responsible author.

Declaration of Support and Appreciation: The research did not receive any support from any institution or organisation.

Declaration of Conflict: The author declares that there is no conflict of interest.

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