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Wagner's law versus Keynesian hypothesis in Malaysia: an impressionistic view

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Abstract

This article refreshes the inter-relationships between government spending and economic growth in Malaysia. The contribution of this article provides a better understanding of the application of Keynesian and Wagnerian hypotheses in the following aspects – (1) literature review; (2) conceptual review on government expenditure-economic growth nexus; and (3) empirical results.

Keywords : Government expenditure; Economic growth

JEL Classification : H50

1. Introduction

One of the contributions concerning the empirical research is to provide a better understanding how the macroeconomics issues is being examined (or re-examined) by filling the gaps identified from previous studies with application of appropriate (or robust) econometrics techniques. This article discusses the fundamental issues of two well-examined hypotheses (i.e. Wagner's law and Keynesian hypothesis) that illustrate the inter-relationships between government expenditure and economic growth. This article contributes to a better understanding of the nature of Wagner's law and Keynesian hypothesis, and the empirical application in a small open economy – Malaysia. Three fundamental issues are covered in this article, namely (1) Literature review; (2) Conceptual review on government expenditure-economic growth nexus; and (3) empirical illustration. Firstly, this article collects and reviews a bulk of empirical studies of government expenditure and income nexus in Malaysia. This extension of literature review does help in understanding further the empirical puzzle of the Warger's law and the Keynesian hypothesis in Malaysia. Secondly, both co-integration tests and causality tests (short-run) are widely applied to identify the inter-relationships between these two macroeconomics variables without further theoretical justification. Therefore, this article derives theoretical justification or conceptual understanding of the appropriateness of co-integration tests and causality tests (short-run) from the AD-AS model - market for goods and services. Finally, empirical re-confirmation on the Warger's law and Keynesian hypothesis has been done in this article by applying the causality tests and their stability is tested by the Quandt-Andrews unknown breakpoint tests.

2. Literature review – Government expenditure and economic growth for Malaysia

Many research works have studied the topic of Wagner's law and Keynesian hypothesis either developed countries or developing countries. For a small open economy - Malaysia, several empirical studies are available from the literature. Among them are Sinha (1998), Tang (2001), Tan (2003), Dogan and Tang (2006), Furoka (2008), Samudram, et al. (2009), and Tang (2009). A brief summary of these studies are documented as below.

Sinha (1998) has found a long-run relationship between GDP and government expenditure in Malaysia for the sample period 1950-1992. The augmented Granger causality tests suggested no evidence of causality between these macroeconomics variables. Tang (2001) applied Johansen's multivariate co-integration tests and he found no cointegration between national income and government expenditure, while a short-run causality was observed from national income to government expenditure (in growth rates) - supporting the Wagner's law over the period 1960-1998. Lately, Dogan and Tang (2006) found a uni-directional causality from government expenditures to national income in the Philippines, while no empirical support of Wagner's law and/or Keynesian hypothesis for Indonesia, Malaysia, Singapore and Thailand. The study covers annual data between 1960 and 2002. However, Furoka (2008) found long-run relationship between economic development and government expenditure and the Wagner's law is supported by data in the short-run. Using recursive approach on causality tests, Tang (2008) found no

stable causality pattern between government expenditure and economic growth in which the Wagner's law is supported from 1985 to 2000, but the Keynesian view is only for prior 1980.

The second group of studies employs disaggregated government expenditures data. Tan (2003) found cointegration between real GDP and real government expenditure in Malaysia over the period 1991q1-2002q3. The error-correction based causality tests showed uni-directional causality from real GDP to government expenditure in the short-run - supporting Wagner's law. In recent, Samudram, et al. (2009) re-investigated these two macroeconomics hypotheses. The ARDL (Auto-Regressive Distributed Lag) approach to cointegration and the Gregory-Hansen's cointegration (Gregory and Hansen, 1996) with structural break showed a favorable empirical finding that both Keynesian and Wagnerian views are hold in Malaysia in the long-run. Applying bootstrap simulation approach, Tang (2009) confirmed that the government spending on education and defense are co-integrated with the national income, respectively, while it is not the case for government spending on health. A uni-directional causality pattern is identified from national income to the three major components of government spending, namely education, defense, and health. But, there is bi-directional causality between government spending on health and national income.

3. Conceptual view on the government expenditure-economic growth nexus – goods and services market (AD-AS framework)

It is worthwhile to refresh the essence proposition that depicts the linkages between government expenditure and economic growth with a simplified, but well accepted macroeconomics framework, AD-AS model (Aggregate Demand and Aggregate Supply model) for goods and services market. Conversely, the accepted thinking of Wagner (1890) (Wagner's law) tells that public spending as an endogenous factor, which is determined by the growth of national income. Basically, as per capita income increases, public sector's importance will grow (Bird, 1971, p.2). In contrast, the Keynesian view (Keynes, 1936) hypothesized that the public expenditure is an exogenous factor that can be used as a policy variable, and which can impact upon growth and development in the short-run. A conceptual picture of the Wagner's law and Keynesian hypothesis can be analytically depicted by AD-AS framework. Let to start with a national income identity:

$$Y = C + I + G + NX$$

where Y represents GDP (national income), C refers consumption, I represents investment, G is government expenditure, and NX is net exports (exports minus imports). Clearly, G is defined as a component of GDP that an increase in G will simultaneously cause higher Y depending on domination of the multiplier or the crowding out effects. The inter-relationships between Y and G can be depicted from AD-AS framework in which the shift of AD curve is affected by the expenditure components such as C, I, G, and NX.

$$AD \equiv Y = C + I + G + NX.$$

From the Keynesian point of view, an expansionary fiscal policy (increasing G, largely) does shift the AD curve to the right, that moves the existing market equilibrium to a new equilibrium in the short-run

resulting a higher level of output (Y , real GDP), and a higher of price level (P). Over time, the short-run AS curve will shift to the left to restore equilibrium then the output (Y) will return to its nature rate of output and the price rises further. By the same token, AD-AS framework depicts the mechanism rationalized in Wagner's law. An increase in Y (real GDP) raises C (as the households use part of the additional income for buying goods and services) and I increases as well through accelerator effect. The government spending (G) is exogenously determined by the government. Wagner's law views government spending as endogenous factor that is driven by the growth of national income. Consequently, changes of the component expenditures (C , I , and G) will directly influence AD (shifting in AD curve to the right). Thus, the real GDP (output) increases in the short-run. Over time, short-run AS curve decreases (shifts to left) to restore equilibrium, and the price increases further but real GDP returns to its nature rate - no real effect). This mechanism is similar to the Keynesian AD-AS framework as mentioned above.

The AD-AS framework suggests no long-run relationship (no co-integration) between government expenditure (G) and economic growth (Y). Thus, the co-integration approach is not in line with these macroeconomics theses, at least from the classical view of AD-AS framework. Both the Wagner's law and Keynesian hypothesis are short-run phenomenon in which the causality testing approach does help to identify the short-run inter-action between government expenditure and economic growth.

On the other hand, as policy variable - government expenditure there are reallocation resources (budgeted spending) among the components of government expenditure; increasing the expenditure on a particular component may lower the allocation on other components and this mechanism determinates the total of government expenditures. Thus, the overall (net) result of Keynesian hypothesis or Wagner's law is ambiguous. For instance, increasing expenditure on administrative will increase consumption as the government servants will spend part of the income for purchasing goods and services, thus real GDP increases – Keynesian hypothesis, while higher defense spending such as purchases of military items will rise imports (since Malaysia does not produce the major military items but imports from overseas), then it lowers the net exports and consequently real GDP decreases. Clearly, it does inform the 'net' impacts of disaggregated government components on output. The use of disaggregated data of government expenditure in testing these theses is not well-motivated (such as Samudram, et al., 2009; Tan, 2003; Tang, 2009).

4. Empirical illustrations

After concerning the empirical literature and conceptual refreshment made above, this section provides an initial empirical clarification about the empirical support on Wagner's law and Keynesian hypothesis for Malaysia.

In general, for the case of Malaysia, the government expenditure broadly consists of development expenditure and operation expenditure. More precisely, the Federal government development expenditure includes defense and security, economic services (i.e. agriculture and rural development, trade and industry, transport public utilities and others), and social services (i.e. education, health, housing, social and community services), and general administration, while the government operation

expenditure consists of emoluments, pension and gratuities, debt service charges, supplies and services, subsidies, asset acquisition, other grants and transfers, and other expenditure.

The data of real GDP and real government expenditure (in index, 100=2000) are obtained from World Development Indicators (World Bank, on-line) for 1960-2005. Conceptually, the time series plots of the two macroeconomics variables as in Figure 1 illustrate two episodes of 'outliers' approximately in 1985 and 1997 rather than of 'structural breaks' since the trend (slope) and intercept of the series remain unchanged over time. By the same token, there is a positive correlation between real GDP and real government expenditure as illustrated in Figure 2 (Scatter plot).

Figure 1 : Time series plots of real GDP and real government expenditure in Malaysia (1960-2005)

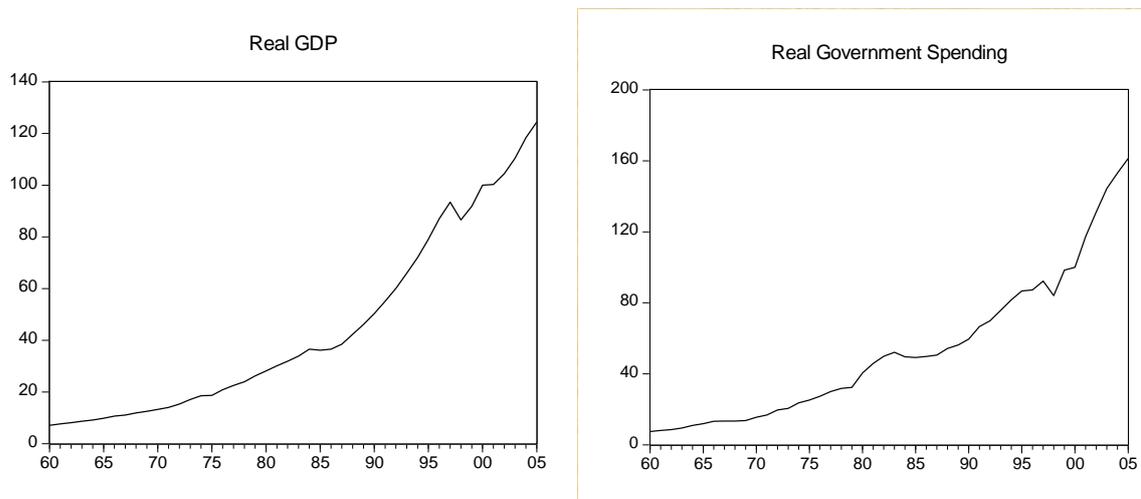


Figure 2 : Time series plots of real GDP and real government expenditure in Malaysia (log)

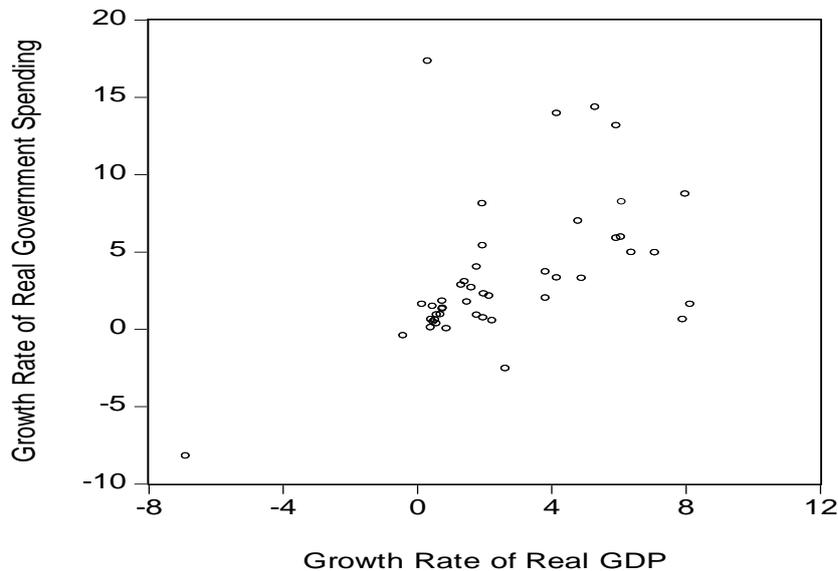


Table 1 reports the summary of VAR(d) selection tests. The optimum lag order for VAR is three lags, VAR(3). The variables G and Y were transformed into first differences to ensure stationary, and to capture the short-run dynamics between the variables. The results of Granger's non-causality are reported in Table 2, and the p-values for both specifications are below 0.10 level, suggesting there is a bi-

directional causality between government expenditure, and economic growth for Malaysian in the short-run. In order words, this conventionally empirical exercise confirms Wagner's law and Keynesian view on the government expenditure, and economic growth nexus for Malaysia over the period 1960-2005.

Table 1 VAR(d) selection tests

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-217.8023		NA	155.4509	10.72206	10.80565
1	-212.5545	9.727756	146.3445	10.66119	10.91196	10.75251
2	-201.3677	19.64505	103.2657	10.31062	10.72856	10.46281
3	-190.7328	17.63842*	75.03571*	9.986964*	10.57209*	10.20003*
4	-187.4576	5.112408	78.34284	10.02232	10.77462	10.29627

Notes * indicates lag order selected by the criterion LR: sequential modified LR test statistic (each test at 5% level) FPE: Final prediction error AIC: Akaike information criterion SC: Schwarz information criterion HQ: Hannan-Quinn information criterion.

Table 2 Granger's non-causality results

Hypothesis	Chi-square (p-value)
$\Delta G \not\Rightarrow \Delta Y$	6.417 (0.093)
$\Delta Y \not\Rightarrow \Delta G$	7.669 (0.053)

' $\not\Rightarrow$ ' denotes 'does not Granger-cause'

On the other hand, the issue related to structural break has been taken into account, at least by a formal testing procedure – Quandt-Andrews unknown breakpoints tests (Andrews, 1993; Andrews and Ploberger, 1994). In general, this testing approach is applicable for considering one or more unknown structural breakpoints of an empirical equation over a given sample period. The three different test statistics (the Sup or Maximum statistic, the Exp statistic, and the Ave statistic) are applicable to test the null hypothesis of no breakpoints (structural breaks) within a number of possible dates tested - testing the 'stability' of an equation in interest.

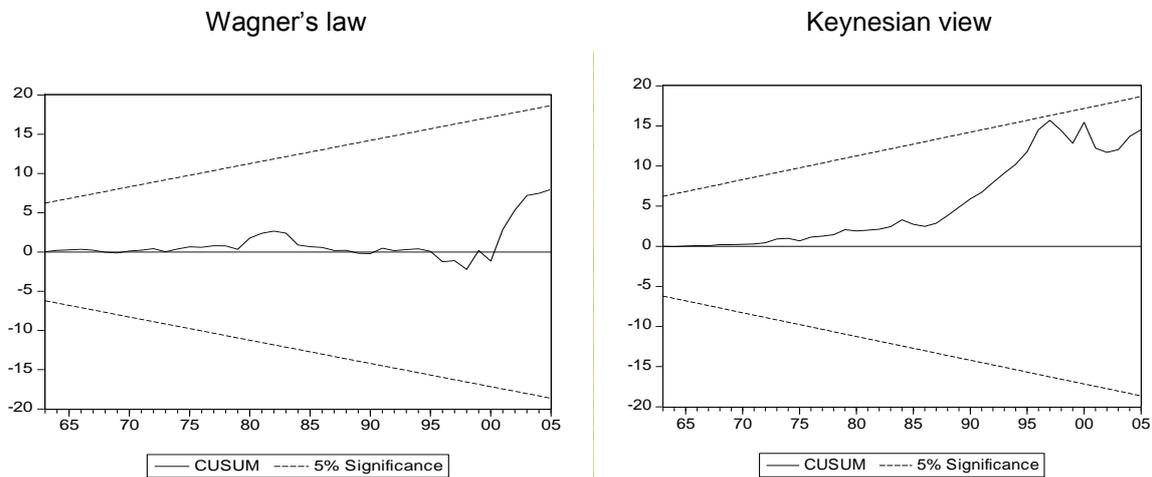
Table 3 represents the results of Quandt-Andrews unknown breakpoint tests for two short-run equations i.e $\Delta G = a + b\Delta Y + e$ and $\Delta Y = a' + b'\Delta G + e'$ (Δ stands for first-differenced) which are conceptually informed by Wagner's law and Keynesian view, respectively. Initially, the tests suggest two possible break dates i.e. 1988 and/or 19982, but the overall results do not reject the null of no breakpoints within trimmed data³ since the p-values greater than 0.10 level. However, the plots CUSUM tests suggest stability of both hypotheses at least, at 0.10 level.

² These two suggested break dates 1988 and 1998 are in line with the last two recessions occurred in Malaysia.

Table 3 Quandt-Andrews unknown breakpoint test

	$\Delta G = a + b\Delta Y + e$ [Wagner's law] Test statistics (p-value)	$\Delta Y = a' + b'\Delta G + e'$ [Keynesian view] Test statistics (p-value)
Maximum LR F-statistic	7.281 (0.266) (suggested break date, 1998)	6.924 (0.302) (suggested break date, 1988)
Maximum Wald F-statistic	7.281 (0.266) (suggested break date, 1998)	6.924 (0.302) (suggested break date, 1988)
Exp LR F-statistic	1.287 (0.388)	2.026 (0.175)
Exp Wald F-statistic	1.287 (0.388)	2.026 (0.175)
Ave LR F-statistic	1.424 (0.590)	3.260 (0.144)
Ave Wald F-statistic	1.424 (0.590)	3.260 (0.144)

Note: The p-values are the Hansen p-values.



5. Conclusions

This article provides a comprehensive review on the previous empirical works on the relationships between government expenditure and economic growth for a small open economy – Malaysia. On the hand, a careful elaboration on empirical rationale of Wagner's law and Keynesian thesis via a simplified AD-AS framework has been documented in this article. There is an empirical support of both Wagner's law and Keynesian view in Malaysia over 1960-2005 as the empirical results showed by this article – the Granger's non-causality tests suggest two-way causal relationships between government expenditure and economic growth for Malaysian.

³ By default or a standard practice for this "trimming" is 15%, in which the test excludes the first and last 7.5% of the observations.

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