Journal of Namibian Studies, 34(2023): 6810–6827 ISSN: 2197-5523 (online)

Exploring the Impacts of Economic Growth, Population and Economic Crisis on Public Education Expenditure in Malaysia

Wong Sing Yun[1], Janice L.H.Nga[2]

Abstract

This paper intends to fill the literature gap by empirically examines the relationship between public education expenditure, economic growth, demography size and economic crisis in Malaysia. Model formulated based on Wagner's law concept, with focus on the effect of economic crisis and population size will be employed. The results supported Wagner's law and demonstrated significance of both population size and economic crisis in determining the public education expenditure. This paper will further contribute useful insight to policymakers to consider the effects' of the demographic variable, economic growth and crisis' impact when making any public education spending policy decision.

Keywords: Public Education Expenditure, Economic Growth, Population, Crisis, Malaysia.

INTRODUCTION

The fundamental role of education as an important factor in human capital development has been well established by many past researchers. Jorgenson and Fraumeni (1992), Mohd Hussin et al. (2012), and Omojimite (2010), Özbal (2021), Le and Tran (2021) supported a significant relationship between education expenditure and economic growth. These findings implied that the increase in public education expenditure contributed to the development of human capital. Similarly, McMahon (1998) concluded that the heavy investment in human capital by households and governments is largely responsible for the high per capita growth in East Asia. A well-developed human capital will increase productivity and boost the nation's economic growth. According to Kitaura and Yakita (2010), education increases the income of individuals and encourages physical capital accumulation. Besides, the increased labour productivity

[1] Faculty of Business, Economics and Accountancy, Universiti Malaysia Sabah Centre for Economic Development and Policy, Universiti Malaysia Sabah, wongsing.yun@ums.edu.my

[2] Faculty of Business, Economics and Accountancy, Universiti Malaysia Sabah Centre for Economic Development and Policy, Universiti Malaysia Sabah, janice@ums.edu.my

through education boosts economic growth. In Malaysia, Sapuan and Sanusi (2010) have highlighted the importance of government education expenditure to human capital development and economic growth. Although much attention has been given to understand the impact of education expenditure on economic growth, however, less focus was given on how economic growth could in turn generate more spending instead? Hence, one of the objectives of this paper to shed light on how economic growth could have a direct impact on the allocation of public education expenditure which will be consistent with Wagner's law. In addition, this paper will also aimed to fill the literature gap by analysing the impact of total population size and economy crisis effects' on the public education expenditure allocation.

As aforementioned, the objective of this paper included the analysis of the demography's influence on the public education expenditure. In the past, many studies had omitted the demography effects on the allocation of public education expenditure. However, the changing demographics are important concern for state and local governments (Ladd and Murray, 2001). Therefore, it would be pertinent to comprehend how the size of the total population could affect public education expenditure. In the wake of the renewed interest on the demographic factor effects, this paper will explore the demographic factor in terms of the size of the total population as the first attempt to elucidate the importance of demographic factor effects. The analysis of the public education expenditure data had shown structural breaks due to the effect of the economic crisis. It was, as such, that the inclusion of the influence of the demographic characteristics in the study was well rationalised. Again, studies in the past are yet to address these periods in the past. Hence, it would be interesting to capture the effect of the economic crisis in explaining the public education expenditure in Malaysia. The new macroeconomic evidence and implications studied in this paper will provide useful design parameters for new public education expenditure policies to be developed.

The contribution of this study will therefore be threefold. Firstly, this paper will extend the analysis of the validity of Wagner's law to be used in explaining the allocation of government education spending. Secondly, this paper attempt to point out the significance of demographic factor in terms of population size in influencing the allocation expenditure. Thirdly, this paper will fill the literature gap by examining the effect of the onset of a major economic crisis in Malaysia on public education expenditure. This paper is structured as follow: An introduction in the first section, followed by literature review on the past findings in section 2. Next, section 3 discussed the theoretical model and Section 4 that explained the empirical model

developed for this study. Subsequently, section 5 provided the results of the findings before it is discussed and concluded in the final section.

LITERATURE REVIEW

One of the most prevalent theories that explained the behavioural pattern of the allocation of public expenditure is Wagner's Law. According to Wagner's law, the growth in real income would lead to an increase in public welfare expenditure (Chatterji et al., 2014). In other words, Wagner's theory postulated the propensity of government expenditure tends to increase as the economy grows. According to Obi et al. (2016), Wagner's law assumed that the existence of an economy and the growth of the government activities grows faster than the economy. The government will be needed to take a more prominent role in managing the rapid economic development. As such, the progress of economic growth will lead to an expansion of public spending. One can postulate that the increase in the size of government expenditures was crucial in supporting the industrial sector development. Uchenna and Evans (2012) argued that the growth in the economy will attract shocks within the system. To mitigate such shocks, the government's role in providing key facilities was fundamental to match the industrial sector growth rate.

According to Magazzino (2012), the relationship between government expenditure and national output is important for many policy-related issues. For example, recessionary (expansionary) periods impede (enhance) the government's abilities to stimulate their economy through fiscal measures unless the share of government expenditure to economic growth increases (decreases). In addition, the relationship between public expenditure and economic growth had been an enduring issue in economics and public finance literature both in theoretical and empirical assessments. Many of the past studies were found conducted in the interest of investigating whether Wagner's law can explain the behaviour of public expenditure. Some of these studies include Koop and Poirier (1995), Al-Faris (2002), Legrenzi (2004), Wahab (2004), Ghartey (2007), Abdullah and Maamor (2010), Taiwo and Abayomi (2011) that shows support to Wagner's law. Meanwhile, studies such as Ram (1987), Lin (1994), Chletsos and Kollias (1997), Alleyne (1999), Al-Faris (2002), and Durevall and Henrekson (2011) argued that Wagner's law does not hold.

Strong evidence of Wagner's law will demonstrate a rise in income leads to more public expenditure. Several findings by Ram (1987), Alleyne (1999), Al-Faris (2002), Legrenzi (2004), Özbal (2021), Le and Tran (2021) endorsed Wagner's law, showing a positive association between economic growth and public expenditure. Meanwhile, finding by Koop and Poirier (1995), Bagdigen and Centitas (2003), and

Jiranyakul and Tantatape (2007), Suwandaru et al. (2021) were in contrast to Wagner's Law. This showed that despite a lot of studies conducted over the past decades, there had been no consistent evidence found on the significant relationship between public expenditure and economic growth, in a positive or a negative direction. Furthermore, results were found of mixed and controversial for different countries, regions and different periods.

The unending debate on the public expenditure and economic growth relationship was important for economic policy-related issues. The long-run estimation of this relationship allowed one to identify the fiscal policy stance adopted by particular governments. According to Srinivasan (2013), the public expenditure and national output relationship were also highly relevant for the debate on the sustainability of public finances, especially during the phase when governments struggle to restrain government expenditure. In addition, the ambiguous nature of the debate on the relationship between the size of public expenditure and economic growth had motivated many kinds of literature investigating this issue. Building on this existing literature, it would significantly important to dwell on examining the relationship between expenditure and economic growth.

Meanwhile, the demographic effect on public expenditure allocation was examined by several past researchers such as Kelley (1976), Miller (1996), Poterba (1997), Okafor and Eiya (2011), Bischoff and Prasetyia (2015) and Yun and Yusoff (2018). Okafor and Eiya (2011) revealed a positive significant relationship between population size and public education expenditure. This implied that an increase in population size will be followed by a rise in public education expenditure. Kelley (1976), Tayeh and Mustafa (2011) contradict the findings by Okafor and Eiya (2011) by revealing otherwise. Tayeh and Mustafa (2011), and Kelley (1976) contended that the population size negatively affected government spending. An increase in population size causes government spending to decline. This could be reflected that the increase in the population size was not followed by a proportionate increase in public spending. In another study, Yun and Yusoff (2018) considered the demography variables effects (working age population, child population and elderly population) on public education expenditure in Malaysia. Results from their study revealed that the demography variable in terms of working age population has a significant positive relationship with the public education expenditure in the long run.

Meanwhile, Yun et al. (2022) highlighted the intergenerational conflict over public education expenditure in Malaysia. Their result provided empirical evidence that suggested intergenerational conflict has likely put pressure on public education expenditure allocation. On a

separate note, Bischoff and Prasetyia (2015) revealed that the share of education expenditures in overall expenditures tend to be higher for Indonesian municipalities with a larger share of children. However, Chatterji et al. (2014) argued that a lower share of child population significantly enhance education expenditure at the state level instead. In an analysis of Texas counties, Miller (1996) demonstrated that the areas with relatively large elderly populations spend less on education. Another finding by Kurban et al. (2015), however, revealed that the rise in the U.S. elderly share of the population has resulted in an increase of the education spending, rather than a decline.

A separate study by Arvate and Zoghbi (2010) draws light on the intergenerational conflict and public education expenditure analysis. The result of their study showed that elderly population can choose not to reduce public spending on education provided that they co-reside with the young. Gu (2012) revealed that as children population increases, the education expenditure per capita decreases. It was demonstrated that the spatially integrated social learning mechanisms of local education policies are influenced by population structure. Despite these past findings, it remains controversial how significantly different factors such as demographic and socioeconomic variables determine expenditure in education of a country. This provides motivation for this study to demonstrate empirical support to the significance of demographic factor and economy crisis in determining education expenditure.

According to Knight et al. (2022), the economic downturns would negatively impact state budgets and places education expenditure at risk. This is because state budgets which are funded primarily by sales and income tax revenues are more sensitive to economic fluctuations. In their analysis, they advocated the need for the state leaders to be clear of which state funding streams to be protected during the times of fiscal duress by prioritising finance equity. In addition, state leaders should also advocate for federal support during an economic crisis. Meanwhile, Evans et al. (2019) also examine the impact of the Great Recession on public education finance and employment. The results of their finding demonstrated that inequality of school spending rose sharply during the Great Recession.

It is evident therefore, from the past literatures that the impact of demographic and economy crisis on the public education expenditure are worthy to be looked into. The available studies in Malaysia that seek the understanding of the effect of economy crisis on public education allocation remained relatively less. Hence, this study will contribute to fill up the literature gap within the context of Malaysia by stressing on the impact of economy crisis on the education allocation.

THEORETICAL MODEL

The empirical model for this study is formed based on Wagner's law, Dao (1994), Dao (2017) and consideration of the economic crisis effect. According to Wagner's theory, the public expenditure will grow continuously as the output grows. This suggested a positive relationship between economic growth and government expenditure. According to Guandong and Muturi (2016), Wagner's law advanced and postulated the following conjectures. Firstly, the functions of the states lead to an increased need for public expenditure allocations. Secondly, the modern industrial society was developed called on pressing pressure for higher expenditure. Thirdly, the increase in public expenditure is expected to grow at a much higher proportionate rate and outgrows the national income which results in relative expansion of the public sector. The model for this study was developed based on Wagner's law by introducing economic growth as input in the allocation of public education expenditure. In addition, Wagner's law further implied that the increase in the population size would raise the need for public services, which also leads to an increase in public spending. In the formation of the model for this study, the model developed by Dao (1994) and Dao (2017) was considered. Dao (2017) found that the size of government as measured by the government consumption expenditures is dependent on the population size. Hence, the effect of population size has been incorporated as one of the variables in the model of this study as well. Besides that, this model will contribute to the literature gap by considering the economic crisis effect on the public education expenditure.

EMPIRICAL MODEL AND METHODOLOGY

This study uses annual time series data from 1971 to 2017. All of the series were transformed into logarithmic form to reduce the heteroscedasticity problem. The variables included in this study are public education expenditure (EDU), real gross domestic product (GDP), and total population (TPOP). Table 1 shows the description for each variable.

Table 1: Description of Variables

Variable	Description of Variable	Measurement of Variable	Source	Expected Finding
Public Education Expenditure (EDU)	Public spending on the education sector is part of the government	Ratio to GDP	Economic Planning Unit (EPU)	Dependent Variable

	development expenditures.			
Real Gross Domestic Product (GDP)	Measurement of total production by the entire residents in a country for a certain period before deducting the allocation for fixed capital consumption	Real GDP (Constant LCU)	World Bank	Positive
Total Population (TPOP)	The size of a population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.	Growth Rate	Economic Planning Unit (EPU)	Positive
Dummy	The dummy is used to capture the structural break in the data due to economy crisis.	Dummy variables (with values zero and one)	-	Positive

The logarithm equation for this study is set up as follows:

$$\ln EDU_t = \beta_{19} + \beta_{20} \ln GDP_t + \beta_{21} \ln TPOP_t + \theta DUMMY_t + e_t \quad (1)$$

Where, EDU_t is the public education expenditure at time t; GDP_t is the real gross domestic product; $TPOP_t$ refers to the total population size at time t; $DUMMY_t$ as the dummy variables to consider economic crisis effect; e_t is the error term at time t

The analysis of this paper will first proceed with the unit root tests of Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) to ensure that none of the variables are integrated of order 2, I(2). Subsequently, the lag selection test is conducted to select the appropriate lag length. This study will be employing Autoregressive Distributed Lag (ARDL) bounds

testing approach to examine the relationship between public education expenditure with economic growth, population and economic crisis. Unlike other co-integration approaches, the ARDL bounds testing can be employed irrespective of whether the variables' order of integration is I(0), I(1) or a combination of both. Hence, the adoption of the ARDL technique does not require any pre-tests for unit root tests. However, the ARDL approach will not work in the presence of an integrated stochastic trend of I(2). As such, it is necessary to ensure that none of the variables is integrated into order two, I(2). The following ARDL framework will be estimated for the long-run relationship model:

$$\Delta \ln EDU_t = \delta_4 + \sum_{i=0}^{j} \alpha_{20} \Delta \ln EDU_{t-i} + \sum_{i=0}^{k_1} \alpha_{21} \Delta \ln GDP_{t-i} + \sum_{i=0}^{k_2} \alpha_{22} \Delta \ln TPOP_{t-i} + \gamma_{20} \ln EDU_{t-1} + \gamma_{21} \ln GDP_{t-1} + \gamma_{22} \ln TPOP_{t-1} + \eta DUMMY_t + e_t \quad (2)$$

Next, the Error Correction Model (ECM) is then estimated to analyse the short run relationship between the variables and expenditure in education. Lastly, diagnostic tests such as Breusch-Pagan-Godfrey Heteroscedasticity test, Autoregressive Conditional Heteroscedasticity (ARCH) test, Breusch-Godfrey Serial Correlation LM Test, CUSUM and CUSUM square will be performed to ensure that the models are free from heteroscedasticity, serial correlation problem and are structurally stable.

EMPIRICAL FINDINGS

The unit root test is used to examine the time series data on both at the level and first differences by carrying out the Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) test to ensure that none of the variables is of I(2). The Augmented Dickey-Fuller (ADF) and Philip-Perron (PP) test results showed that all of the variables were stationary after the first difference. Table 2 illustrated the Augmented Dickey-Fuller (ADF) result. While Table 3 showed the Philip-Perron (PP) result.

Table 2. Augmented Dickey-Fuller (ADF) Test Result

Augmented Dickey-Fuller (ADF) Test				
Variable	Level		First Difference	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept
LNEDU	-2.575597	-2.976264	-4.748463*	-4.754423*
LNGDP	-2.083240	-1.634443	-5.686354*	-5.958088*
LNTPOP	1.017697	-2.990552	-5.186193*	-5.892749*

*Significant at 1% significance level

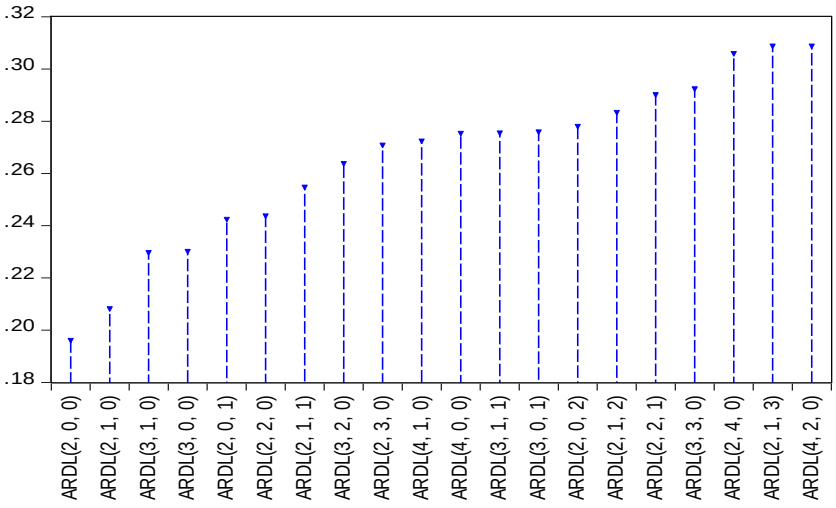
Table 3. Phillips Perron (PP) Test Result

Phillips Perron (PP) Test				
Variable	Level		First Difference	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept
LNEDU	-2.409762	-2.252747	-4.373514*	-4.308992*
LNGDP	-2.012364	-1.702603	-5.646841*	-5.958864*
LNTPOP	-1.383712	-2.784258	-12.00636*	-28.78064*

*Significant at 1% significance level

The selection of lag length was performed by using either the Akaike Information Criterion (AIC) or the Schwartz Bayesian Criterion (SBC). According to Marashdeh (2005), Akaike Information Criterion (AIC) tends to select the maximum relevant lag length. Figure 1 shows the best 20 models based on the Akaike Information Criterion (AIC) selection. The Akaike Information Criterion (AIC) had suggested ARDL (2,0,0) as the most appropriate model for the model as illustrated in Figure 1.

Figure 1: Top 20 ARDL Models Based on AIC



ARDL cointegration is more robust when there is a single long-run relationship between the underlying variables in a small sample size (Nkoro and Uko, 2016). Hence, this study will apply the cointegration technique of Autoregressive Distributed Lag (ARDL) or bound cointegration technique, and estimate and interpret the findings within the context of the ARDL cointegration framework.

Table 4. ARDL Bounds Test for Cointegration

Test Statistic	Value	Significance Level	Bound Critical Values	
			I(0)	I(1)
F-Statistic	4.170440***	10%	2.788	3.540
		5%	3.368	4.203
		1%	4.800	5.725

***Significant at 10% significance level

The computed F-statistic of 4.170440 was higher than the upper bound critical value at a 10 per cent level of significance. Thus, the null hypothesis of no cointegration is rejected at a 10 per cent level of significance. The existence of a long-run relationship among the variables was confirmed. The empirical results of the long-run model are presented in the following Table 5.

Table 5. Long Run Coefficients Estimates of ARDL (1,2,2,2,2,0,1,2,0) Model

Dependent Variable: LNEDU

Independent Variables	Coefficient	T-Statistic	Probability
LNGDP	0.714386*	4.230938	0.0001
LNTPOP	1.373828**	2.153525	0.0375
C	-20.77868*	-4.304593	0.0001

*Significant at 1% significance level, **Significant at 5% significance level

Dummy variables were used to account for the major shifts in the public education expenditure allocation due to the economic crisis that resulted in structural breaks in the data. For the period of economic crisis, the dummy would take the value of 1 and for the rest of the period will take the value of 0. As observed from the public education expenditure data analysis, a major structural break was observed between the year 2001/2002, 2004/2005 and 2009/2010. The long-run model of the corresponding ARDL (2,2,0) can be written as follow:

$$LNEDU_t = 0.714386LNGDP_t + 1.373828LNTPOP_t - 20.77868 \quad (3)$$

The estimation of the ARDL long-run model demonstrated that the real GDP and growth of the total population were both positively significant. This indicated a 1 per cent increase in real GDP will lead to a 0.71 per cent increase in public education spending. Meanwhile, a 1 per cent increase in the total population leads to a 1.37 point increase in government education spending. The impact of the economic crisis will be further discussed in the estimation of the conditional error correction model in the subsequent section. Examination of the ARDL bound testing model revealed a robust finding of a long-run relationship between the variables. Subsequently, the ARDL model of the cointegrating vector was re-parameterized into the Error Correction Model (ECM). The following Table 6 illustrated the ECM model estimation result.

Table 6. ECM Model Estimation

Error Correction Model			
Dependent Variable: D(LNEDU)			
Variable	Coefficient	t-statistic	P-Value
Error Correction Term (-1)	-0.396113*	(-4.238510)	[0.0001]
D(LNEDU(-1))	0.432953*	(3.310087)	[0.0020]
DUMMY	0.197175***	(1.744016)	[0.0890]

*Significant at 1% significance level, *** Significant at 10% significance level

The coefficient of error correction term (ECT) showed the speed of adjustment towards long-run equilibrium. The negative and significant sign of the ECT coefficient validated the existence of a co-integrated long-run relationship between the variables in the model. The value of the ECT coefficient further indicated the speed of adjustment for the models. The short-run elasticity coefficients associated with the long-run relationships as estimated by the error correction model (ECM) highlighted the short-run relationship between the variables.

Based on the short-run findings, a negative and significant coefficient of error correction (ECT) was demonstrated. The negative significant value of its error correction term (ECT) implied that the dependent variable will fall to adjust towards the equilibrium, giving rise to a stable long-run relationship. The value of the error correction term (ECT) of -0.396113 indicated that the short-run disequilibrium was corrected in the long-run equilibrium at a rate of approximately 40% in the following period.

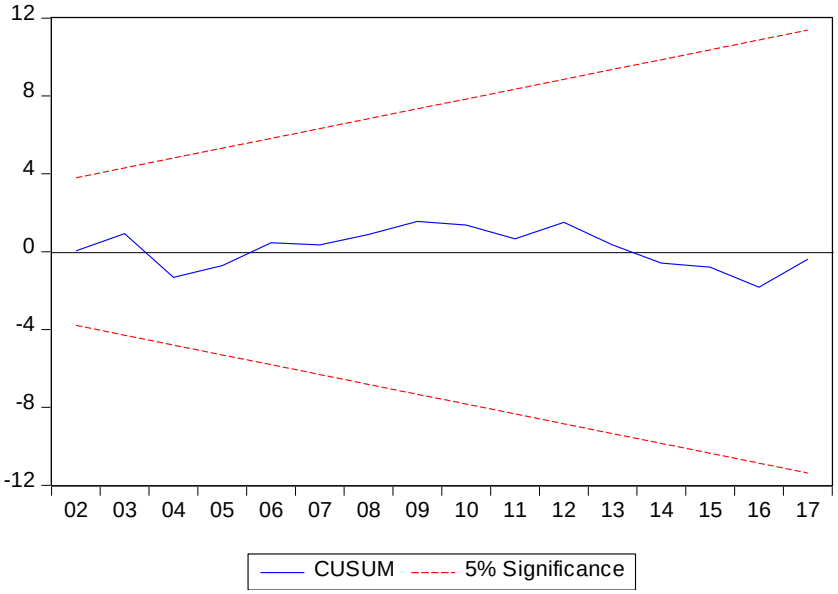
The introduction of a dummy in the model was to illustrate the effect of the economic crisis which had resulted in a structural break in the data. The significance of the following error correctional model showed the importance of economic crisis in determining public education expenditure. The dummy was found to be significantly

associated with government education spending. In addition, the short-run estimation of this model also highlighted the significance of lagged education spending in explaining public education expenditure. This means that the previous year's public education expenditure was taken into consideration in the determination of public education spending.

Table 7. Diagnostic Testing

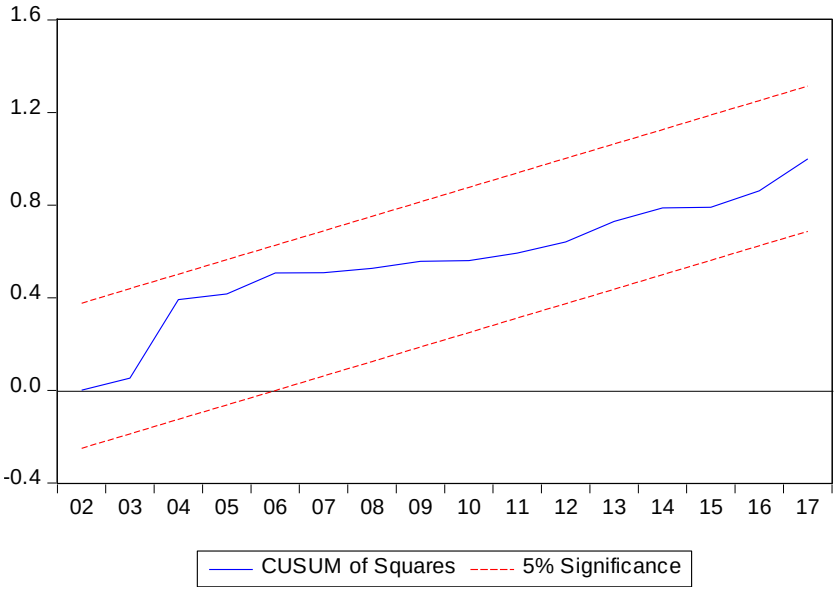
Breusch-Pagan-Godfrey Heteroscedasticity Test			
F-statistic	1.004170	Prob. F (5,39)	0.4282
Obs*R-squared	5.132526	Prob. Chi-Square (5)	0.3999
Autoregressive Conditional Heteroscedasticity (ARCH) Test			
F-statistic	0.207678	Prob. F (1,42)	0.6509
Obs*R-squared	0.216497	Prob. Chi-Square (1)	0.6417
Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.946240	Prob. F (2,37)	0.3974
Obs*R-squared	2.189667	Prob. Chi-Square (2)	0.3346
Normality Test			
Jarque-Bera	2.869860	Probability	0.238132

Figure 2. Cusum Stability Test



Source: Generated from Eviews10

Figure 3. Cusum Of Squares Stability Test



Source: Generated from Eviews10

Diagnostic tests were carried out to ensure that the models are free from serial correlation problems, heteroscedasticity, structurally stable and free from model specification error. The results from the diagnostic tests conducted as illustrated in Table 7 showed that the models are free from heteroscedasticity and autocorrelation problems. Both the CUSUM and CUSUM of Squares plot is within five per cent of the critical bands, hence, indicating that the models are structurally stable and free from misspecification error.

DISCUSSION AND CONCLUSION

A significant positive relationship has been demonstrated between government education expenditure and economic growth. The findings from this paper provided robust support for Wagner's law in the long term. It can be interpreted from the findings that the level of public education expenditure increases when the economy expanded in the long run. The pro-cyclical behaviour of the public education expenditure found has supported Wagner's law claim which predicts government would adjust its expenditure to match the demand of the society.

Besides that, the findings from this paper had further provided a discussion on the demography influence on public education expenditure which had remained to be relatively less explored in the past. Hence, the result from this paper filled the gap in the literature by focussing on the impact of total population size changes on public

education expenditure. The significant finding of these demography factors had concluded that the behaviour of the government level of education expenditure was influenced by the size of the population. The higher the size of the population, the greater the demand for education. Hence, the increase in population size would induce a greater increase in public education expenditure.

Apart from this, this paper had explore the effect of the economic crisis on public education expenditure. A dummy variable was introduced to capture the economic crisis effect which had caused a structural break in the data. The significant association proven between the dummy variable and public education expenditure provided new empirical evidence, filling the gap in the literature. To the best of our knowledge, none of the existing literature had discussed the effects of the economic crisis on public education expenditure. The study of the effects of the economic crisis was supported by Peacock and Wiseman (1961). The pattern of allocation of resources to education varies under different and changing economic conditions (Tilak, 1989). Finding from this study demonstrated a significant impact of the economic crisis in explaining public education expenditure.

Finally, this study provided substantial theoretical contributions and useful policy implications that serve as important knowledge and information that can be used for future policy making and education reforms. Overall, the allocation of the public education expenditure in Malaysia was best explained by Wagner's law in the long run. In the long run, the worsening of an economic condition such as a recession does adversely influence growth. However, the given empirical evidence showed that the public education expenditure tends to behave pro-cyclical in the long run in response to the changes in the economic conditions. The finding of the paper helped to explain the behavioural pattern of the government public education expenditure which was greatly influenced by the economic conditions and demographic size. In addition, the concrete evidence from this paper provide some useful insight for policy makers to consider the demographic factor and economy crisis effects when determining the local expenditure in education.

ACKNOWLEDGEMENT

The authors wish to acknowledge that this publication was supported by Universiti Malaysia Sabah (UMS) through Skim Pensyarah Lantikan Baru (SLB2254) grant.

Bibliography

Abdullah, H. & Maamor, S. (2010). Relationship between National Product and Malaysian Government Development Expenditure: Wagner's Law Validity Application. International Journal of Business and Management, 5(1), 88-97.

Al-Faris, A.F. (2002). Public Expenditure and Economic Growth in the Gulf Cooperation Council Countries. Applied Economics, 34(9), 1187 – 1193.

Alleyne, D. (1999). Testing for Wagner's Law in Jamaica, Guyana, Barbados, and Trinidad and Tobago: Is there a spurious relationship?. Social and Economic Studies, 48(3), 121-135.

Arvate, P.R. & Zoghbi, A.C.P. (2010). Intergenerational conflict and public education expenditure when there is co-residence between the elderly and young. Economics of Education Review, 29(6), 1165-1175.

Bagdigen, M. and Cetintas, H. (2003). Causality between Public Expenditure and Economic Growth: The Turkish Case. Journal of Economic and Social Research. 1(6): 53 – 72.

Bischoff, I. & Prasetyia, F. (2015). Determinants of Local Public Expenditures on Education: Empirical Evidence for Indonesian Districts between 2005 and 2012. Joint Discussion Paper Series in Economics No. 32.

Chartterji, M., Mohan, S. & Dastidar, S.G. (2014). Determinants of Public Education Expenditure: Evidence from Indian States. Scottish Institute for Research in Economics Discussion Paper. University of Dundee.

Chletsos, M. & Kollias, C. (1997). Testing Wagner's law using disaggregated public expenditure data in the case of Greece: 1958-93. Applied Economics, 29(3), 371-377.

Dao, M.Q. (1994). Determinants of the size of government. Journal for Studies in Economics and Econometrics. 18, 1–14.

Dao, M.Q. (2017). Determinants of the size of government in high-income countries. Bulletin of Applied Economics, 4(1), 35.

Durevall, D. & Henrekson, M. (2011). The Futile Quest for a Grand Explanation of Long-Run Government Expenditure. Journal of Public Economics, 95(7-8), 708-722.

Economic Planning Unit. (2018). http://www.epu.gov.my/public-sector.

Evans, W. N., Schwab, R. M., & Wagner, K. L. (2019). The Great Recession and public education. Education Finance and Policy, 14(2), 298-326.

Ghartey, E.E. (2007). An Empirical Study of Economic Growth and Expanding Role of Government in Ghana: 1965-2004. The Journal of Economic Asymmetries, 4(1), 133-148.

Gu, J.F. (2012). Spatial Dynamics and Determinants of Country-Level Education Expenditure in China. Asia Pacific Education Review, 13(4), 617-634.

Guandong, B.Y.D. & Muturi, W.M. (2016). The relationship between public expenditure and economic growth in South Sudan. International Journal of Economics, Commerce and Management, 4(6), 235-259.

Jiranyakul, K. & Brahmasrene, T. (2007). The Relationship between Government Expenditures and Economic Growth in Thailand. Journal of Economics and Economic Education Research, 8(1), 93 – 103.

Jorgenson, D.W. & Fraumeni, B.M. (1992). Investment in Education and U.S. Economic Growth. The Scandinavian Journal of Economics, 94, 51-70.

Kelley, A.C. (1976). Demographic Change and the Size of the Government Sector. Southern Economic Journal, 43(2), 1056-1066.

Kitaura, K. & Yakita, A. (2010). School Education, Learning-by-Doing, and Fertility in Economic Development. Review of Development Economics, 14(4), 736-749.

Knight, D. S., Hassairi, N., Candelaria, C. A., Sun, M., & Plecki, M. L. (2022). Prioritizing School Finance Equity during an Economic Downturn: Recommendations for State Policy Makers. Education Finance and Policy, 17(1), 188-199.

Koop, G. & Poirier, D.J. (1995). An Empirical Investigation of Wagner's Hypothesis by Using a Model Occurrence Framework. Journal of the Royal Statistical Society, 158(1), 123-141.

Kurban, H., Gallagher, R.M. & Persky, J.J. (2015). Demographic Changes and Education Expenditures: A Reinterpretation. Economics of Education Review, 45, 103-108.

Ladd, H.F. & Murray, S.E., (2001). Intergenerational conflict reconsidered: County demographic structure and the demand for public education. Economics of Education Review, 20(4): 343-357.

Le, M.P. & Tran, T.M., (2021). Government Education Expenditure and Economic Growth Nexus: Empirical Evidence from Vietnam. The Journal of Asian Finance, Economics and Business, 8(7), 413-421.

Legrenzi, G. (2004). The Displacement Effect in the Growth of Governments. Public Choice, 120(1-2), 191-204.

Lin, S.A.Y. (1994). Government Spending and Economic Growth. Applied Economics, 26(1), 83 – 94.

Magazzino, C. (2012). Wagner versus Keynes: Public Spending and National Income in Italy. Journal of Policy Modeling, 34(6), 890-905.

Marashdeh, H. (2005). Stock Market Integration in the MENA Region: An Application of the ARDL Bounds Testing Approach. Working Paper 05-27. Department of Economics, University of Wollongong.

McMahon, W.W. (1998). Education and growth in East Asia. Economics of Education Review, 17(2), 159-172.

Mohd Hussin, M.Y., Fidlizan Muhammad, Mohd Fauzi Abu @ Hussin & Abdul Razak, A. (2012). Education Expenditure and Economic Growth: A Causal Analysis for Malaysia. Journal of Economics and Sustainable Development, 3(7), 71-81.

Miller, C., (1996). Demographics and spending for public education: a test of interest group influence. Economics of Education Review, 15(2), 175-185.

Nkoro, E. & Uko, A.K. (2016). Autoregressive Distributed Lag (ARDL) cointegration technique: application and interpretation. Journal of Statistical and Econometric Methods, 5(4): 63-91.

Obi, C.U., Ekesiobi, S.C., Dimnwobi, S.K. & Mgbemena, E.M. (2016). Government Education Spending and Education Outcome in Nigeria. International Journal of Economics, Finance and Management Sciences, 4(4), 223 – 234.

Okafor,C. & Eiya, O. (2011). Determinants of Growth in Government Expenditure: An Empirical Analysis of Nigeria. Research Journal of Business Management, 5(1), 44-50.

Omojimite, B.U. (2010). Education and Economic Growth in Nigeria: A Granger Causality Analysis. African Research Review, 4(3a), 90-108.

Özbal, O.E. (2021). Dynamic effects of higher education expenditures on human capital and economic growth: an evaluation of OECD countries. Policy Reviews in Higher Education, 5(2), 174-196.

Peacock, A.T. & Wiseman, J. (1961). The Growth of Public Expenditure in the United Kingdom. pp 12 – 34. Princeton University Press.

Poterba, J.M. (1997). Demographic Structure and the Political Economy of Public Education. Journal of Policy Analysis and Management, 16(1), 48-66.

Ram, R. (1987). Wagner's Hypothesis in Time-Series and Cross-Section Perspectives: Evidence from "Real" Data for 115 Countries. The Review of Economics and Statistics, 69(2), 194-204.

Sapuan, N.M. & Sanusi, N.A. (2010). Assessing the Effect of Public Social Expenditure and Human Capital Development on Malaysian Economic Growth: A Bound Testing Approach. Knowledge Management International Conference 2010. 25-27.

Srinivasan, P. (2013). Causality between Public Expenditure and Economic Growth: The Indian Case. International Journal of Economics and Management, 7(2), 335-347.

Suwandaru, A., Alghamdi, T. & Nurwanto, N. (2021). Empirical analysis on public expenditure for education and economic growth: Evidence from Indonesia. Economies, 9(4), 146.

Taiwo, M. & Abayomi, T. (2011). Government Expenditure and Economic Development: Empirical Evidence from Nigeria. European Journal of Business and Management, 3(9), 18-28.

Tayeh, N.A. & Mustafa, M.H. (2011). The Determinants of Public Expenditures in Jordan. International Journal of Business and Social Science, 2(8), 45-49.

Tilak, J.B.G. (1989). Economic Slowdown and Education Recession in Latin America. IDS Bulletin, 20(1), 31 – 40.

Uchenna, E. & Evans, O.S. (2012). Government Expenditure in Nigeria: An Examination of Tri-Theoretical Mantras. Journal of Economic and Social Research, 14(2), 27-52.

Wahab, M. (2004). Economic Growth and Government Expenditure: Evidence from a New Test Specification. Applied Economics, 36(19), 2125 – 2135.

World Bank. World development indicators database, (2018). https://databank.worldbank.org/source/world-development-indicators.

Yun, W. S., & Yusoff, R. (2018). The determinants of public education expenditure in Malaysia. Jurnal Ekonomi Malaysia, 52(2), 109-122.

Yun, W. S., Ansar, R., & Madli, F. (2022). Intergenerational Conflict between Young and Old on Public Education Spending: A Revisit. Journal of International Business, Economics and Entrepreneurship, 7(2), 14-14.