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Growth-Government Spending Nexus: The Evidence of Thailand

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Abstract

This paper empirically examines the impact of different types of government expenditure on economic growth in Thailand. A General to Specific Model (GSM) is used to estimate the short-run and long-run effects of such expenditure on growth, employing quarterly data for the period 1993-2014. Our findings indicate that only budgetary and extra-budget fund (EBF) expenditure yield growth enhancing effects in both short-run and long-run timeframes. The effect of the direct loan net of budget deficit financing is not found to be statistically significant due to its potential crowding-out effect on private investment. However, the growth-enhancing effect of EBFs is far smaller when compared with traditional growth engines like private investment and/or budgetary expenditure. These results draw the policy implication that budgetary expenditure remains the most preferable mode for the government to increases spending within the economy. In addition, the role of the government should be supportive to allow the private sector to drive economic growth.

Keywords: Economic growth, Government expenditure, Thailand
JEL Classifications: E62, H61

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1. Introduction

Nowadays, government spending has been garnering considerable research attention. Since 1997 there have been a series of financial and economic crises around the globe which have heightened the call for the increased role of governments in driving forward economies when private sectors are in trouble. An additional urgent task lies in mitigating the side effects arising from managing globalization, especially those involving growing income inequality. A series of policy measures have been introduced to help alleviate the resulting malaise.

The relationship between economic growth and government spending is at best mixed. Traditionally, the effect of government spending on the economy depends on whether it substitutes for, or complements private investment ('crowding out' versus 'crowding in'). When technological progress is endogenously determined as in the (new) endogenous growth theory, there is room for the government to positively affect the technological capability of firms, improve productivity countrywide and promote long-term growth. This potentially takes place through direct spending on infrastructure investment and offering incentives for firms to commit to R&D investment. On the other hand, most government spending is not wholly self-financed as their activities are not purely profit-oriented. Many government-sponsored projects are intended to maximize social welfare. Hence, a rapid increase in government spending without the exercise of due care could potentially dry up public resources, widen budget deficits and eventually lead to a mounting public debt crisis. As a consequence, this may well lead to not only the crowding out of private investment, but also the raising of fiscal liability that may ultimately limit the proportion of investment budgets allocated in the future and jeopardize macroeconomic stability.

Interestingly, government spending in the past decade was more complicated and went beyond merely budgetary expenditure. Policy makers tend to have a high degree of personal discretion when allocating off-budgetary expenditure and are generally not subject to the stringent supervision procedures imposed when channeling budgetary expenditure, which is additionally dependent on parliamentary approval. As argued in Allen et al. (2010), extra-budgetary expenditure accounted for 46 percent of total central government spending over the period 2005-2007. The resurgence of populist politicians in many developing countries twisted the issue into becoming even more complicated. Overtly populist politicians are likely to launch a range of redistribution policies through the use of overly expansive macroeconomic initiatives, some of which are undertaken by specific institutions under government controls. All in all, this makes the actual amount of government spending much greater than budgetary spending figures alone reveal.

Against this backdrop, this paper aims to examine the impact of government expenditure on economic growth. It contributes to the existing literature in two aspects. First, both budgetary and off-budgetary expenditure are included in the analysis. Several previous studies focused on budgetary expenditure so that actual government spending

was only partly captured. Second, time series analysis is employed to examine the Growth-Government Spending nexus in which country-specific factors like institutional considerations and the quality of the bureaucratic system are better encapsulated.This is intended to act as complementary to findings based on panel data analysis.

Thailand represents an interesting case study for two reasons. It is one of the few developing nations which experienced sustained macroeconomic stability over an extended period. One factor attributing to such macroeconomic stability involved the consistent application of conservative fiscal policies. More importantly, government spending focused mainly on basic infrastructure investment that was obviously beneficial for growth. There were occasions where the Thai government increased government spending to cushion internal and external shocks. Such interventions were short-lived. Nonetheless, since the new millennium, there has been a noticeable change in government spending. While there has been an upward trend, some of this increased expenditure has not been undertaken within the confines of the budgetary process. In addition, many populist policies were introduced, such as a four-year debt moratorium for farmers, a one million baht per village funding program, the first-car tax rebate scheme and the rice pledging scheme. While these populist policies were largely driven by income re-distribution considerations, they were also at times undertaken for rent-seeking purposes and could, as such, be counter-productive in nature.

Secondly, to the best to our knowledge so far, there has not been a study examining the growth-government spending nexus in Thailand in depth. In recent years, there have been a number of empirical works examining the impact of government expenditure on economic growth, e.g. Devarajan et al. (1996), Kneller et al. (1999), A fonso et al. (2011), Siriprapanukul and Sudsawat (2013), all of which were based on panel econometric analysis. The advantage of such analysis lies in the fact that it capitalizes on both time series and cross-sectional data sets which capture repeated observations over time involving the same individuals. Nonetheless, statistically found relationships are applied to all observations. This seems to be restrictive given the nature of the issue at hand. In particular, where the effects of government spending on growth are concerned, country-specific factors, such as institutional components and the nature of a particular bureaucratic system, also play an influential role on the relationship concerned.

The rest of the paper is organized as follows. In Section 2 we present an analytical framework of the effects of government spending on the growth process. Section 3 demonstrates the trends and patterns in government spending in Thailand. Section 4 discusses our empirical methodology and results, and Section 5 draws some conclusions.

2. Analytical Framework

2.1 Growth Model and Government Expenditure

Growth theory illustrates the potential factors that can drive long-run economic performance through focusing on the production function approach. According to the endogenous growth framework, technological progress is an endogenous factor and has a crucial role in boosting long-run economic growth. In practice, the prior literature has shown that technological progress can be driven by several significantly economic variables which have the potential to provide stable growth rates in the long-run.

(e.g. Romer, 1986; Maddison, 1987; Caselli et al., 1996; Blalock, 2008). The transmitting of technology through these channels has the potential to broadly provide positive externality to a country.

2.1.1 Direct Government Expenditure on Growth

Government spending can stimulate the productivity of firms through providing technological improvements. Quality infrastructure in this context refers to the complex nexus of institutions engaging firms in the process of absorbing and transferring new technology to companies.Such quality infrastructure may take the form of initiatives such as technology infrastructure (TI) (Justman and Teubal, 1996), public testing and research centers (Shapira, 1992), as well as technology and innovation advisory services. In practice, ensuring quality infrastructure (e.g. certification, standards, and test laboratories) has the potential to boost productivity, thereby enhancing a firm's capability to participate in global value chains that always set restrictions on the quality of products. However, as a matter in fact, multinational enterprises (MNEs) often transfer innovation, instead of innovation processes, to host countries. In addition, local small firms typically encounter difficulties in internalizing the learning process because of the large fixed costs entailed, a lack of required information and limited financial resources. Therefore, the role of public spending is so important in stimulating productivity by facilitating firms to gain access to quality infrastructure. Government expenditure also has the potential to stimulate economic growth through public investment. Actually, the impact of public investment could be either positive or negative on private investment, depending on the nature of the public spending involved. Once public investment is allocated to productive activities, it is expected to complement private investment so that the crowding-in effect of public investment on private investment occurs. This corresponds to the empirical evidence of Jongwanich and Kohpaiboon (2008), who studied the patterns and determinants of private investment in Thailand during 1960-2005; as well as the study of Khan and Kumar (1997), based on 95 developing countries during 1970-90. On the other hand, under conditions of scarce resources government spending might crowd out private investment as well.

An increase in government spending tends to raise fiscal deficit and public debt in the long-run. However, Cottarelli and Jaramillo (2012) pointed out that using front-loaded fiscal adjustment to stabilize the level of public debt could hurt growth in the short-run. Subsequently, this effect would, in turn, exacerbate fiscal indicators, such as

deficits, public debt ratios and financing costs. Hence, although we avoid increasing expenditure because of concerns regarding debt, these obstacles would still occur since the relationship between growth and government spending is complex. It is interesting to note that over the past decades there has been a series of crises and increasing globalization and the repercussions incurred from these events put pressure on the government to use their expenditure to mitigate these obstacles to economic progress. One such obstacle lies in inequality problems.

2.1.2 Indirect Government Expenditure on Growth

Sustainable economic growth is expected to reduce poverty. That is, growth in national income tends to increase the income per capita of the poor. However, in fact, once an economy is growing healthily, an increase in income and wealth might become concentrated among particular groups, especially the rich. The resulting income inequality is an issue that governments in several countries have become concerned with. Therefore, a part of public spending is allocated to mitigating poverty or inequality problems. Findings from the relevant literature have shown that the impact of inequality on growth is mixed. Ostry et al. (2011) found a negative relationship between inequality and growth; concluding that countries with more equal income distribution have greater sustainable growth. Meanwhile, Forbes (2000) indicated that a decrease in inequality tends to reduce growth. Therefore, this seems to represent a challenge for government expenditure strategy makers in reducing inequality and sustaining economic growth simultaneously.

3. Trends and Patterns in Goverment Spending in Thailand

3.1 Definition and Scope of Government Spending

Government expenditure is one domestic instrument governments use to stimulate growth. Recently, the size of this expenditure has not been limited only to the budget outlined in the Annual Budgetary Act, instead its usage has extended beyond that. However, the definition of such expenditure is not universally constant and varies from country to country; here we will refer to it as off-budgetary expenditure. Thus, government spending can be roughly classified into two categories, budgetary expenditure and off-budgetary expenditure.

3.1.1 Budgetary Expenditure

Budgetary Expenditure in this study refers to the annual spending in each fiscal year of the government under budget appropriation, which must be approved by parliament under the process established by the Budget and Accounting Act. Note that the budget appropriation is either an amount of money able to be spent or incurred debts according to any objectives under a set period of time specified in the Budget Procedures Act, B.E. 2502

The main distinction of this category is that budgetary spending must be created under the budgetary process of the Budget and Accounting Act. This process allows for public scrutiny via the role of parliament. The budgetary process in Thailand necessitates

four steps to be followed in order to create annual budgetary spending. First of all is "budgetary preparation". This process of preparation starts with budget revision and information concerning the expectations of an economy, fiscal status in the future, as well as the capability of collecting revenue. These inputs allow the government to be able to estimate the possible and optimal size of their annual spending. The government has to set budgetary policy corresponding to the operation of government units and state-enterprises, while any government units and state-enterprises have to submit a plan requesting their budget as well. Subsequently, the government budget is able to be formulated. The second step involves "Budget Adaptation" The budget plan will be considered by the cabinet and, in turn, be approved by the legislative assembly. During this procedure, the budget plan could be adjusted. The appropriate budget plan accepted by the legislature will be, in turn, approved by the Senate within twenty days of receipt. After being approved by parliament, the next step involves "Budget Execution". Government units and state-enterprises have to plan their projects and outlays corresponding to the budget allocated. The last step is "Budget monitoring and evaluation" within which the government has to evaluate the efficiency of usage of the budgets allocated in line with the objectives of the budget policy outlined in the Budget Procedures Act, B.E. 2502.

3.1.2 Off-Budgetary Expenditure

Off-budgetary expenditure refers to all spending designated by law as excluded from the Annual Budget Procedures Act; in other words, the phrase off-budgetary expenditure catches all manner of expenditure beyond budgetary spending. Actually, the international definition of off-budgetary spending is not well defined and included items are different in each country.

In Japan, off-budgetary spending consists of a few special accounts, such as special projects, special funds, specific cash flow and so forth. Their off-budgetary expenditure is established under a law concerning the promotion of administrative reform to achieve efficient government, and a further statute concerning special accounting. Another example involves the OECD group. Here off-budget expenditure can be classified into four categories, distinguished from one another by the type of spending involved. These comprise forgoing revenue through preferences to taxpayers (tax expenditures), providing credit to private borrowers (direct and guaranteed loans), imposing private costs on private parties (regulations) and direct expenditure by entities that are excluded from the budget (public enterprises) (Allen, 2007).

Thailand also pursues some kinds of international off-budgetary spending. However, in this study we will cover only two items, extra-budgetary funds expenditure and direct loans of government. These items have become increasingly more important and their volume has become larger. Over the past decade the government has tried to extend their capabilities to implement policies through the role of extra-budgetary funds (EBFs), as well as state-enterprises as quasi-fiscal activities that are potentially a burden

to government as a result of their being financed through the creation of direct loans. Hence, the categories of off-budgetary expenditure considered in this study are as follows:

3.1.2.1 Extra-budgetary Funds (EBFs)

In 2001 a version of the GFS framework designed by the IMF, EBFs and social security fund controlled by the central government highlighted and combined recorded data. However, these extra-budgetary funds are distinguished from the legislative budget because of their differing sources of finance and government supervision of their operations (Allen and Radev, 2006). The definition of EBFs we will apply is "the general government transaction, often with separate banking and institutional arrangements that are not included in the annual state (federal) budget law and budgets of subnational level of government" (Schick., 2007), which represents an internationally standard definition.

This international standardization is quite extensive and Thailand also follows the definition mentioned above. Nonetheless, in practice the standard must be established by specific laws so that government units can employ such funds to serve specific objectives according to particular laws (e.g. lending funds and stabilizing funds). However, there exists double counting within EBFs and budgetary accounts since the government is able to set a budget to compensate for their EBFs as well. Nevertheless, such transactions represent a relatively small proportion of total budgetary expenditure (roughly ten percent of budgetary spending).

3.1.2.2 Government Direct Loans, except Deficit Financing

Government Direct Loans refer to debt directly created by the central government with some specific objective depending on laws or regulations that might differ across countries. For Thailand, according to the Public Debt Management Act B.E. 2548, governments are able to borrow for the purpose of financing budgetary deficit, social and economic development, on-lending and debt restructuring.

In practice, there might be double counting between government direct loans, except deficit financing and EBFs because governments are able to generate debt or release bonds/treasury bills to support their EBFs as well. However, the proportion is very small (less than 0.01% of government direct loans, except deficit financing).

Moreover, direct loans except deficit financing also covers the majority of the costs involved in quasi-fiscal activities for which the government has to compensate state-owned enterprises implementing policies on their behalf, such as the rice pledging scheme, Ban Aua-Ar-Thon Project, and so forth.In general, the IMF defined quasi-fiscal activities (QFA) as "Activities (under the direction of government) of central banks, public financial institutions, and non-financial public enterprises that are fiscal in character- that is, in principle, they can be duplicated by specific fiscal measures, such as taxes, subsidies, other direct expenditures, even though precise quantification can in some cases be very difficult". Thailand still follows this standard definition with the fiscal policy office defining quasi-fiscal activities as "the operation of activities or government policies by others that are not general governments such as central banks, specialized financial

institutions, state enterprises and so forth, which governments could intervene their decision process in order to implement policies that governments purpose. Governments need not pass such budget by congress, but they would be fiscal liabilities if such policies perform fiscal loss". Of course, we can see that the previous definitions are similar in principle even though the definition of QFA in Thailand emphasizes the process of GFA implementation. That is government intervention and the impact of QFA performance that might entail fiscal liabilities in the future.

So far, the main difference between budgetary and off-budgetary expenditure is public scrutiny, thereby necessitating the approving of parliaments and the transparency of public reports of data. That is, budgetary expenditure is more transparent than others since it satisfies all four criteria of transparency (Table 1). Budgetary expenditure is established by the Budget and Accounting Act and it is only one form approved by parliament which represents the process of public consideration, thereby representing parliaments' oversight function. According to the Budget and Accounting Act, annual spending must be recorded and published. In addition, the damage from implementing policies through budgetary measures is treated as an accountability of the government. While the expenditure of extra-budgetary funds is quite similar to budgetary funds, it needs not to be approved by parliament. Although in some advanced countries EBFs are included in the budgetary process, developing countries such as Thailand still treat the spending of extra-budgetary funds as not requiring parliamentary approval. With respect to the other three criteria, the outlays of EBFs are recorded and publicized. Consequently, the outlays of EBFs appear less transparent than on-budgetary outlays. Moreover, quasi-fiscal expenditure entails the lowest level of transparency. That is, governments indirectly fulfill their policies thereby interfering in the consideration processes of their public corporations, which need neither to be supported by law or regulations, nor approved by parliament. In practice, quasi-fiscal expenditure has not been recorded over a long time. Although quasi-fiscal accounts have just been adopted in recent years, overall data is incomplete, which makes corroboration problematic. However, the damage from utilizing quasi-fiscal spending may potentially also be regarded as a fiscal liability.

Table 1: The Transparency Criteria of Government Expenditure in Thailand

Criteria	Budgetary Expenditure	Extra-budgetary Expenditure	
		EBFs	Quasi-fiscal
1.Approved by Parliaments	/		
2.Under Laws/Regulations	/	/	
3.Publicly report expenditure accounts	/	/	
4.The damage is/might be treated as Fiscal liability	/	/	/

Source: Author's collection

3.1.3 The Size of Government Spending

When we talk about government expenditure, most people generally understand the concept in terms of the size of budgetary expenditure, e.g. Zhang and Zou (1998), Roubini and Sachs (1989), Gupta et al. (2005), Gurgul at al. (2012). Of cause, this kind of expenditure has traditionally been widely discussed and analyzed by scholars. One reason for this is that budgetary expenditure must pass the consideration of congress and data is available. However, in fact, there are other government expenditures beyond the scope of the budget. In general, off-budgetary expenditure is not always included in traditional measures of the size of government spending. Actually, some studies considered the concept in terms of consolidated expenditure[2] e.g. Devarajan (1996). However, in past studies there exists a lack of analyzing government direct loans, except deficit financing. Maybe, this is because of the limited data available for such off-budgetary expenditure.

However, consideration of off-budgetary expenditure has become increasingly popular. Governments have used it increasingly over time. The evidence shows that expenditure on EBFs, including social security funds, has accounted for about 46 percent of total central government expenditure. The biggest outlay of both developed and developing countries is social security funding, as shown in Table 2.

Table 2: Extra-budgetary Funds and Social Securities Funding over the Period 2005-2007

Group of countries	EBFs Outlays		Social security fund outlays	
	% of total outlays	% of GDP	% of total outlays	% of GDP
Developed countries	12.2	3.0	36.5	9.4
Developing countries	9.4	2.8	25.4	7.1
All countries	11.1	3.0	35.1	9.1

Source: GFS yearbook 2009, Allen and Radev (2010)

In addition, quasi-fiscal expenditure in the form of direct loans is often applied for state enterprises, individuals and firms who get less opportunity (e.g. the poor and SMEs) to gain access to financial resources. Ratnovski and Narain (2007) found that there is a large share of government support allocated to housing loans and guarantees, accounting for around 40 percent of GDP in the United States and a smaller proportion of around 7-10 percent of GDP in Canada, Japan, and Germany. In addition, among developed countries on average the credit public financing for SMEs is less than that of housing loans that could possibly generate risk as a result of inflation and represent fiscal liabilities in the future.

[2] The consolidated expenditure is the summation of on-budgetary expenditure and the expenditure of extra-budgetary funds (EBFs) after adjusting double counting transactions.

Why do governments opt to implement their policies through off-budgetary expenditure? This off-budgetary expenditure is designed with the purpose of making room for increasing prudential liquidity without engendering any material impact on the budgetary balance. In addition, because of the relatively simple processes involved, they are often more flexible to implement than on-budgetary measures. This expenditure not only plays a useful role in accelerating economic growth, but could also mitigate poverty and inequalities in income distribution. Therefore, off-budgetary expenditures seem to be potentially invaluable options.

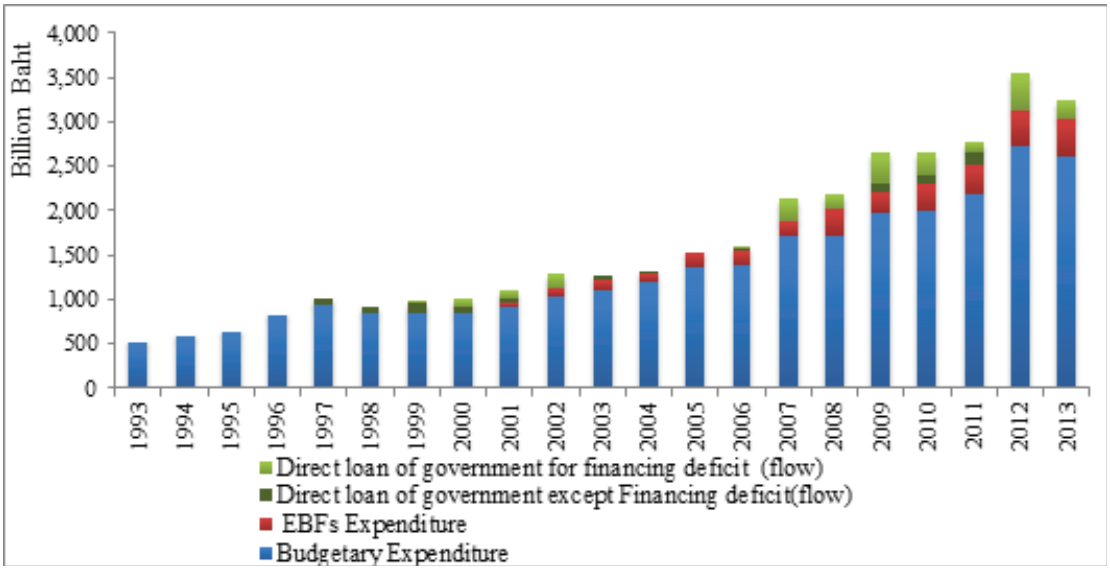
It seems that any consideration of the size of government spending cannot be limited to only analyzing on-budgetary expenditure. Actually, some developed countries integrate the expenditure of EBFs into the budget process, while others also include it within on-budgetary expenditure, such as the United Kingdom (Allen and Radev, 2006). It is desirable for governments to include these outlays in the budget process in order for budget institutions to be able to approve them. This process may reduce deficit bias. Nevertheless, in fact, almost all off-budgetary expenditure is not integrated into the budget process and publicly recorded, especially in low-and middle-income countries (Allen et al., 2010). In addition, quasi-fiscal expenditure is sometimes not included in considerations of government spending size since this expenditure is not directly implemented by governments, although it is controlled by central governments. Therefore, the traditional government spending size calculations that focus only on the on-budgetary expenditure are invalid. An alternative approach to considering the size of expenditure should cover both on-budgetary and off-budgetary spending.

3.2 Trends and Patterns of Government Spending in Thailand

Prior to the onset of the new millennium, fiscal policies were counter-cyclical and conservative. In addition, all spending was channeled through the budgetary process. There were 12 consecutive years of expansionary fiscal policy resulting in budget deficits between 1975 and 1987. The budget deficit from 1975 to 1979 was the result of expansion in the area of administration and defense to ensure political stability and social harmony. The purpose of the deficit between 1980 and 1987 was to cushion the adverse impact of the slowdown of the overall economy and the shortfall in government revenue (Warr, 1996). Similarly, the government experienced budget deficit financing from 1997 to 2002 following the onset of the financial crisis.

The size of the budget deficit was limited to around 3.2 per cent of GDP between 1975 and 1985. This level was relatively low, compared with the average rate for developing countries. Throughout the period under study, government expenditure was mostly financed by public revenue and domestic borrowing, rather than through inflationary means, i.e. borrowing from the Thai central bank, the Bank of Thailand (BOT) (Warr, 1996; Warr, 1999).

Figure 1: Trends and Patterns in Government Expenditure in Thailand during 1993-2013



Note: To avoid double accounting on the budgetary account, all direct loans of government in baht is adjusted, thereby subtracting the direct loans for financing deficit since this term is included within budgetary expenditure. In addition, as the data is provided in terms of stock of debt, taking the first difference and then replacing negative number as zero reflects the flow of government direct loans.

Source: Bureau of the budget, Public Debt Management Office

In the new millennium, the government has paid more attention to off-budgetary spending. The trend of total expenditure has risen from 1,012 billion baht in 2001 to 3,024 billion baht in 2013. Not only annual budgetary expenditure is used, but off-budgetary expenditure has also become increasingly popular, especially the spending of extra-budgetary funds (EBFs), increasing from 3% of total government expenditure in 2001 to 13% in 2013. More importantly, an increase in off-budget expenditure results in an increase in the share of total government expenditure to GDP, from roughly 19% in 2001 to 25% in 2013 – a 6 % increase of the total government spending share has accounted for an increase in budgetary and off-budgetary expenditure equal to 4% and 2%, respectively (Figure 1).

3.2.1 Budgetary Expenditure

Focusing on budgetary expenditure, there are four main types of spending, including principal repayment, replenishment of treasury accounts, current expenditure and capital expenditure. Generally, current expenditure is viewed as consumption expenditure (e.g. wages, salaries of public and government officers), in contrast to capital or investment expenditure, which is referred to as productive, contributing the capacity to promote economic growth in the long-term. Sometimes, principal repayment and replenishment of treasury accounts could be treated as current expenditure since they are unproductive. With respect to trends in the proportion of the four categories during 1989-2014, we found that before the Asian financial crisis in 1997 the main category was

current expenditure, accounting for 57-74% of budgetary expenditure, while capital expenditure stood at roughly 30-35% of budgetary spending. After the Asian financial crisis of 1997, the majority of expenditure still remained as current expenditure, rising from 56% of total budgetary spending in 1997 to 80% in 2014. An increase in current expenditure influenced a reduction in capital expenditure from 41% of budgetary expenditure in 1997 to 17% in 2014, Meanwhile, expenditure on principal repayment remained stable at around 1.5-3% of budgetary expenditure over the past two decades. In addition, according to Section 169, Paragraph 1 of the Thai Constitution B.E. 2550, the government must set expenditure on replenishment when the treasury balance has involved borrowing in the last fiscal year (Srilert, 2014). The evidence shows that replenishment of the treasury accounts has occurred involving a small proportion of budgetary expenditure during the last six years.

Table 3: The Proportion of Budgetary Expenditure Classified by Function during 2009-2014

(Percentage)

Year	General Public Service	Defense	Public Order and Safety	Economic Affairs	Environment Protection	Housing and Community	Health	Recreation, Culture and Religion	Education	Social Protection
2009	20.47	8.58	6.15	20.57	0.24	2.40	9.88	0.76	20.96	9.98
2010	21.65	8.85	6.59	18.64	0.15	1.78	10.77	0.75	21.72	9.09
2011	22.79	8.53	6.13	19.02	0.11	2.24	10.33	0.64	21.40	8.82
2012	17.91	6.94	5.57	20.06	0.07	9.26	10.15	0.82	19.90	9.32
2013	18.44	7.42	5.91	23.65	0.09	3.46	9.72	0.86	20.80	9.65
2014	19.79	7.87	6.61	15.04	0.13	2.81	12.61	0.91	22.66	11.57

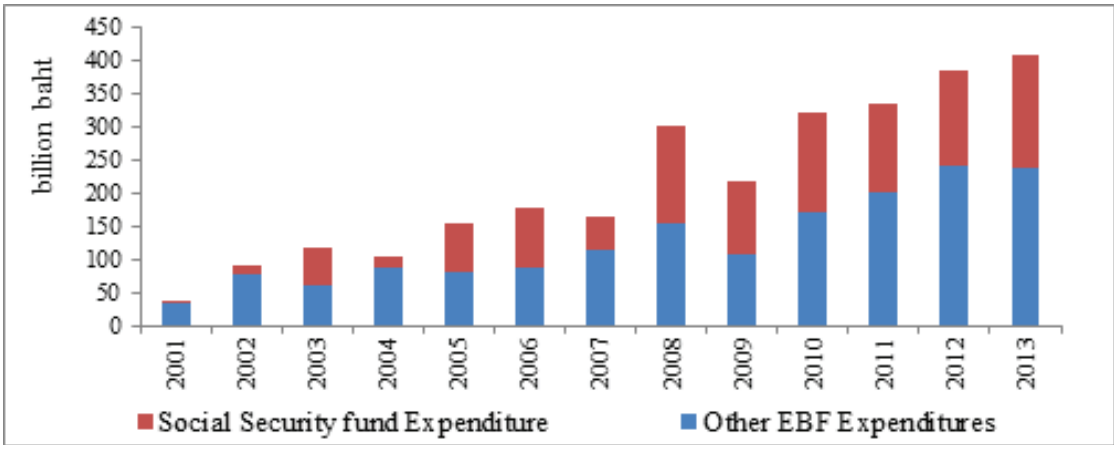
Sources: Bureau of the Budget, Office of the Prime Minister

Another view of budgetary expenditure is shown in Table 3, representing the proportion of types of budgetary expenditure classified by function over the past five years. The first three proportions involve expenditure on economic affairs, general public services and education, accounting for more than half of the total government expenditure (each category lies in the range of 19-22% of total budgetary spending). In addition, there are moderate sized expenditures on social protection, health, defense, and public order and safety (each category is in the range of 6-10% of total budgetary spending). The last grouping classifies a small proportion of expenditure on the environment, recreation, culture, religion and housing and community amenities.

3.2.2 Extra-Budgetary Expenditure

Extra-budgetary funds (EBFs) are an important instrument of government.[3] Because EBFs are allowed to hold their own assets, they relieve the limit of capability spending of governments. The assets of EBFs have increased sharply from 1,924 billion baht in 2009 to 3,227 billion baht in 2014, most of which belong to funds for social welfare activities accounting for 70% of the total assets of EBFs. In addition, these large assets come from several sources such as donations, borrowing, compensation from governments, and so on. The portion of debt in assets has declined over the past five years from 50% of total assets in 2009 to 27% in 2014, while the compensation of budgetary expenditure to EBFs represents only a small proportion and has also declined from 8% of total assets in 2009 to 6% in 2013.

Figure 2: The Expenditure of Extra-Budgetary Funds during 2001-2012



Source: The Bureau of the Budget

An overview of expenditure from EBFs shows that it has increased over the past decade from 37 billion baht in 2001 to 408 billion baht in 2013. The major constituent of expenditure comes from the Social Welfare Fund whose proportion has increased from 41% of total EBF expenditure in 2009 to 71% in 2014. Most of this is accounted for by the expenditure of the Social Security Fund, accounting for 42% of total extra-budgetary expenditure in 2013, as shown in Figure 2. On the other hand, the proportions of lending funds and support funds have declined since 2009 from 24% and 33% of total EBF expenditure to 21% and 7%, respectively.

[3] Note that EBFs can be classified into five types in terms of the purpose of activities including: (i) Funds for lending (e.g. educational loan funds, Skill Development Funds, Co-op Funds, Land Reform Funds, Revolving Funds for Cottage Industries and Handicrafts); (ii) Funds for production and trade (e.g. Vaccine Production Funds, Revolving Funds for Breeding Plants); (iii) Funds for service (e.g. Civil Aviation Funds, Machines Fund of the Department of Highways); (iv) Funds for social welfare (e.g. Social Security Funds, Pension Funds, National Help Security Funds); and (v) Funds for support (e.g. Fund for Sugar Cane, Thailand Research Funds, General Insurance Fund, Environmental Funds, Fund for the Elderly).

Furthermore, EBFs have often involved a balance between capital and current expenditure over the past five years, although there was a striking proportion recorded for the current category at roughly 98% of total EBF expenditure in 2013 because of the reduction in capital spending on social and welfare funds, which accounted for only 211.44 million baht in 2013. More specifically, most of the expenditure of social and welfare funds is undertaken within current categories reflecting the ratio of current to capital expenditure being greater than one over the past five years. On the other hand, the ratios of support funds and lending funds are less than one indicating that these types of funds involve a large proportion of capital spending relative to current.

3.2.3 Government Direct Loans, except Deficit Financing

As in the aforementioned explanation, government direct loans can be separated into two main categories: (i) government direct loans for financing deficits and (ii) government direct loans for social and economic development, on-lending, and debt restructuring. All of these fall under the Act of Public Debt B.E.2548.

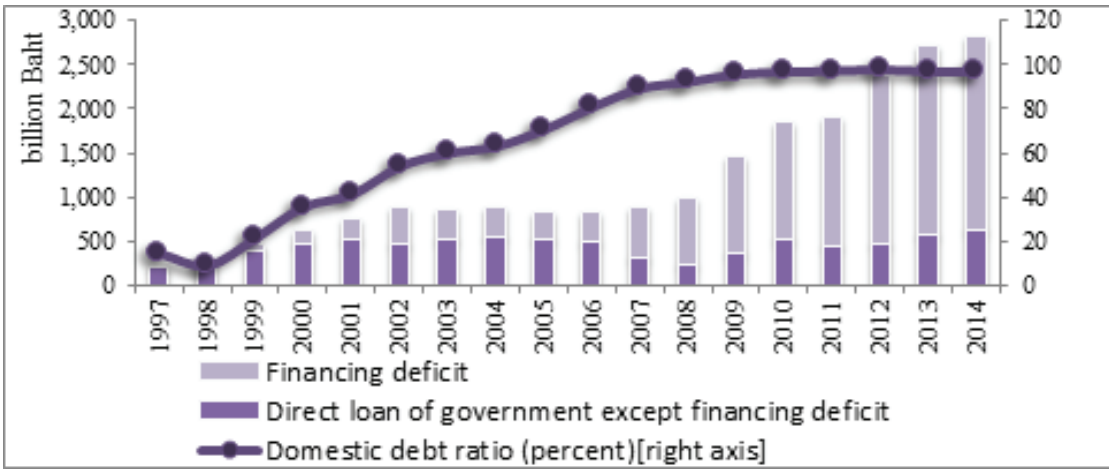
As shown in Figure 3, during 2005-2014 governments tended to use financial resources from the treasury account reflecting the fact that the proportion of deficit financing has increased over time from 38% of government direct loans in 2005 to 78% in 2014. In addition, the government tends to channel finance through domestic resources by releasing long-term bonds. The proportion of the domestic debt of the central government has increased from 9% of total government direct loans in 1998 to 97% in 2014. Hence, there has been a seizing of scarce domestic resources between the government and private sectors, reflecting an increase in the ratio of governmental bills and bonds to the deposits of financial institutions from 0.9 in 2005 to 2.5 in 2014 -- the ratio of government bonds and treasury bills held by the commercial banks or depository financial institutions to their deposits.

After eliminating loans for deficit financing, the trend of government direct loans, except deficit financing (DL) in terms of stocks has been stable at around 500 billion baht over the past two decades, although it dipped during 2007-2008 as a result of the subprime crisis, as shown in Figure 3.4; whereas the flow of DL fluctuated, including increases during the post financial crisis (1999-2001) and post subprime crisis (2009-2010). The majority of the rest involve government direct loans for social and economic development purposes. Most of these loans (roughly 80% of DLs) were taken up by the Thaikhemkang Project, main proposing to stimulate domestic consumption to trigger short term growth during the subprime crisis. However, government direct loans for investment infrastructure, such as the sky train construction project, accounted for only 10% of DL.

In addition, there are several cases involving quasi-fiscal spending being financed by government direct loans, compensating state-owned enterprises that implemented policies for governments. Implementing policy through quasi-fiscal activities represents a flexible method for the government to be released from the limitations of budgetary protocol and enhances their capacity to mitigate social and economic problems under the

restriction of budgetary constructs. In Thailand, there are several forms of quasi-fiscal activities. These include the following actions.

Figure 3: Central Government Debt in Thailand during 1997-2014



Source: Public Debt Management Office

Subsidized Credits: Most quasi-fiscal activities involve subsidized credits. These may be credits with administered lending rates, credits with periods of no lending rate, and loan guarantees. In general, subsidized credits are fulfilled through specialized financial institutions (SFIs). One SFI can hold several projects concurrently, while a project can be implemented through many SFIs.

Price Guarantee Program: A price guarantee of agricultural goods is one quasi-fiscal policy that has been continuously implemented. The popular product requiring a price guarantee is rice. In the past, the rice pledging scheme was operated through funds for helping agriculturists and policies of The Bank for Agriculture and Agricultural Co-operatives. Funds for helping agriculturists use the financial resources from Bank for Agriculture and Agricultural Co-operatives to pledge rice from farmers. After releasing the rice to the market, they will account for their profit/loss. Then, the Council of Ministers will approve compensation from The Bank for Agriculture and Agricultural Co-operatives. However, the refund process may take more than one year. Besides rice, the government has also occasionally pledged other agricultural products, such as corn, cassava and so forth.

3.3 The Relationship between Government Expenditure and Economic Growth

Starting from the pre-crisis period in 1997, the Thai economy performed remarkably well. During 1993-1996 the Thai growth in Gross Domestic Product (GDP) was 8.1% on average, which is larger than neighboring countries, such as the Asian group, as well as East Asia and Pacific areas which recorded 7.16% and 4.04%, respectively. Subsequently, Thailand's economic growth during the Asian currency crisis (1997-1998) contracted to -5.94% on average, while growth in the Asian and East Asia and Pacific regions declined

by approximately 1.36%, as shown in Table 4. In addition, during the period post-crisis the overall economic growth of other countries in Asia has outperformed Thailand (by around 4-5%).

The Thai economy recovered in the aftermath of the financial crisis in 1997 and recorded positive growth again post-1999. However, after that the economic growth fluctuated, suffering from both domestic and external shocks. The low level of economic growth during 2000-2001 resulted from the impact of the external shock of the World Trade Center tragedy and the burst of the dot-com bubble, influencing private decisions to postpone investments. Subsequently, economic growth declined sharply again as a result of the subprime crisis in 2008. The contraction of global demand for goods and services tended to engender a year-on-year decrease in Thai exports and investments at the level of roughly 9% and 5%, respectively. Eventually the economy recovered again in 2009.

Table 4: GDP Growth of Several Countries during 1993-2014

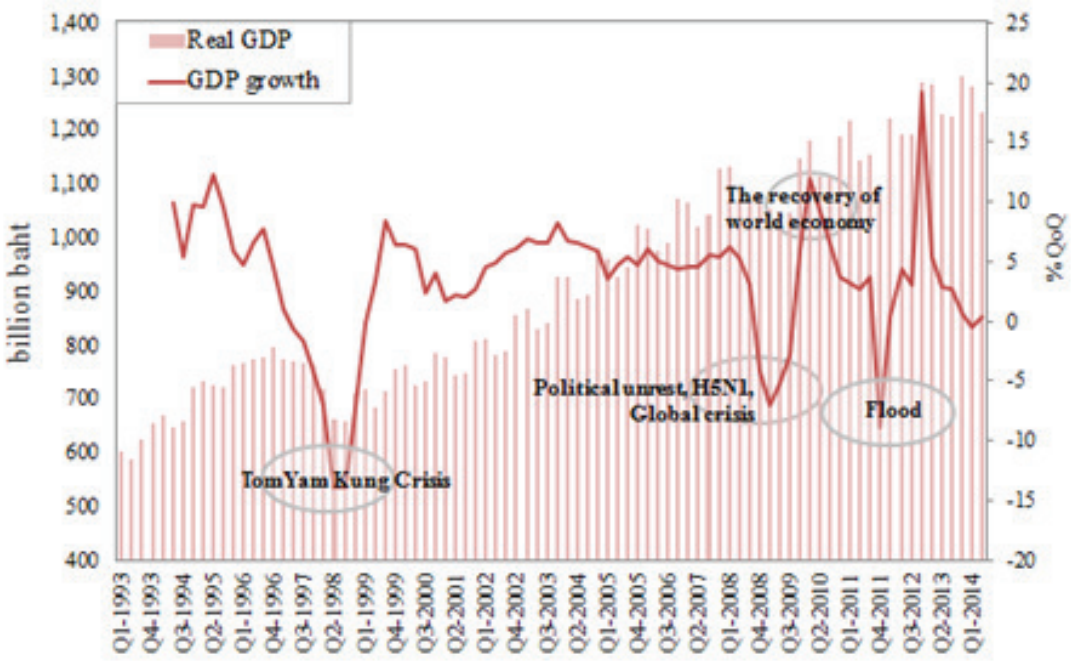
	Year (percentage)						
	1993-1996	**1997-1998**	**1999-2001**	**2002-2004**	**2005-2007**	**2008-2010**	**2011-2013**
Thailand	8.09	-5.94	3.78	6.26	4.91	2.65	3.17
Asian	7.16	1.36	5.25	6.31	5.89	4.38	4.91
East Asia and Pacific	4.04	1.37	3.22	4.09	5.26	3.48	4.13
Low income	2.83	3.63	3.83	4.41	6.37	5.67	6.16
High income	1.22	2.47	3.67	3.95	4.68	1.06	2.58
World	2.73	3.12	3.15	2.99	3.87	1.16	2.43

Source: World Development Indicator (WDI) and author's calculations

In addition to external shocks, a series of periods of intense political unrest represent the main domestic shocks influencing the fluctuations in economic growth. The uncertainty of the political situation began during 2005-2006 with political protests resulting in a coup. Economic growth slumped dramatically a further two times in 2008 and 2010 because of additional political turmoil leading to a decrease in investment confidence in Thailand. In addition, in the last quarter of 2011 the Thai economy contracted sharply once again in response to the flooding disaster in Bangkok and the central plains.

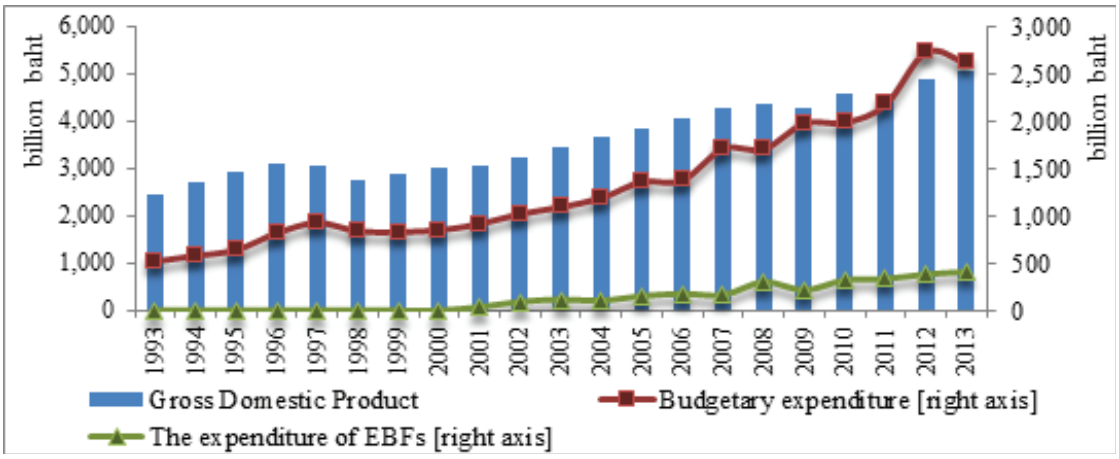
These shocks drove fluctuations in economic growth, as well as having profound impacts on the standard of living of both Thais and expatriates. Therefore, the unrest typically called for the introduction of counter-cyclical government spending on growth. That is, we expect that once economic growth suffers from unexpected shocks, the government will inject money into the economic system so as to boost economic expansion.

Figure 4: Real GDP and GDP Growth of Thailand during 1993-2014



Source: National Economic and Social Development Board

Figure 5: Real Gross Domestic Product and Government Expenditure in Thailand during 1993-2013



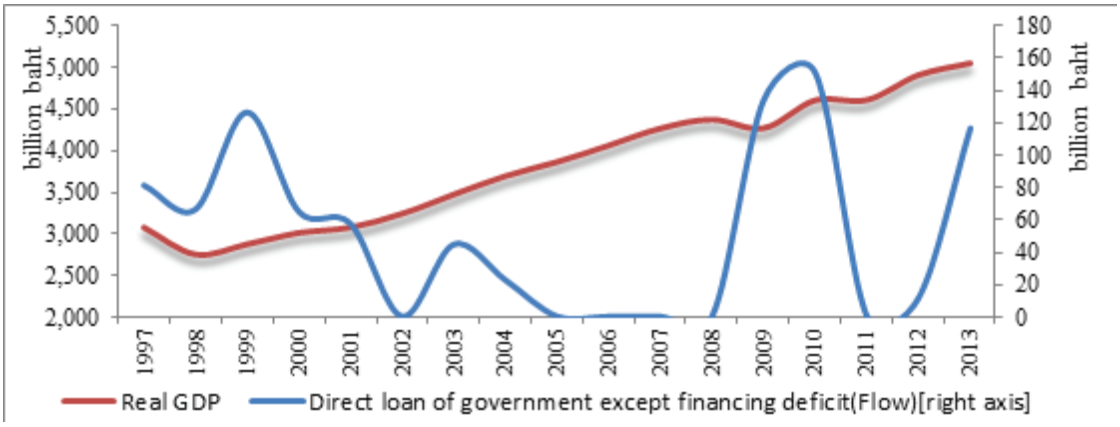
Source: Public Debt Management Office, Bank of Thailand, Fiscal Policy Office

As shown in Figure 5, the relationship between categories of government expenditure seems to be pro-cyclical with economic growth. The correlations between economic performance and budgetary expenditure, as well as the expenditure of extra-budgetary funds (EBFs), are equal to 0.66 and 0.77, respectively. This means that as budgetary spending or the spending of EBFs increase, economic growth also rises.

The post Asian financial crisis period of 2001-2006 represented a period of stimulating economic growth in order to mitigate the negative side effects on people's

standard of living as a result of the turmoil experienced. The government tried to generate many projects using considerable amounts of spending. The expenditure instruments were not only limited to budgetary expenditure, but were also expanded to include off-budgetary spending strategies involving exploiting extra-budgetary funds (EBFs) and generating new direct loans. As shown in Figure 6, government direct loans, except deficit financing (DL) does not move in line with economic performance. However, during unusual situations such as the period after the Asian financial crisis of 1998-2001, the period of the subprime crisis and the domestic political unrest of 2008-2009, as well as during the flooding disaster in the last quarter of 2011, it was demonstrated that the series of budgetary expenditure and DL were countercyclical with economic performance. For example, the government tried to inject spending to stimulate economic contraction in 2009 with the Help the Nation Check Project.

Figure 6: Real Gross Domestic Product and Direct Government (flow) Debt in Thailand during 2005-2014



Source: Public Debt Management Office, and Author's calculations

4. Empirical Methodolohy

4.1 Empirical Model

In this paper, our empirical model is based on a growth equation as it is the standard practice in the literature (Alshahrani and Alsadiq, 2014). It starts with the production function where output (value added) is a function of three types of primary inputs, namely labor (L), human capital (H) and physical capital (K). Output is affected by technological progress (A). All are expressed in Equation 1.

$$Y = f\left(A, K, H, L\right) \tag{1}$$

For simplicity, a Cobb-Douglas functional form is used (Equation 2).

$$Y = AK^{\alpha}H^{\phi}L^{\beta} \tag{2}$$

Equation 3 is the log-transformation of Equation 2 presented per worker.

$$\ln y = \ln A + \alpha \ln(\mathrm{k}) + \beta \ln(h) \quad (3)$$

Note that the small letter denotes the per worker level, i.e. *y, k* and *h* stand for output, physical capital and human capital per worker, respectively. According to endogenous growth theory, technological progress could be influenced by a number of factors. As reviewed in the growth literature examining the effect of government expenditure on growth, three factors, i.e. trade openness, distortion of tax and budget balances, are included as the controlling variables.

Trade openness (*OPEN*) is introduced as one important controlling variable. When a country allows goods and services to cross borders freely, advanced technology embodied in goods and services could positively affect technological progress. In addition, participating in foreign markets allows firms to enhance their productivity. This results in technological progress (Lopez, 2005). Hence, a coefficient corresponding to trade openness is expected to be positive.

Distortionary Taxation (*TAX*) is introduced to capture the possible effects of existing distortionary taxation that could alter the decisions of private/household investment away from productive activities. As argued in Kneller et al. (1999), *TAX* is referred to as item which could alter the path of resource allocation. This could affect the resource allocation of workers, including savings and time allocation, all of which potentially influence investment capacity and long-term economic growth. Hence, the presence of *TAX* could negatively affect economic growth so that a negative corresponding coefficient is expected.

Budget Surplus (*BUDS*) is designed to capture a country's fiscal policy discipline. When a country keeps running a budget deficit, this drives accumulation of public debt. Eventually this may cause the country to increase tax in the future to finance the accumulated debt and thus constrain long-term economic growth (Kneller at al., 1999; Afonso and Alegre, 2011; Siriprapanukul, 2013). Therefore, we theoretically expect a positive relationship between BUDS and economic growth.

The key variable at the center of this study is government expenditure (*G*). In this study, *G* is the sum of three categories, including budgetary expenditure (*BUD*), extra-budgetary fund expenditure (*EBF*) and direct loan net of budget deficit financing (*DL*). Obviously, *BUD* represents the main government spending channel and has usually been examined in previous studies based on panel data cross-country analysis. *EBF* is introduced to capture the increasing importance of this category in *G*. While *DL* has been ignored in the previous cross-country studies, it has become an increasingly important mode of government expenditure used in Thailand.

To examine the effect of government expenditure on economic growth, we perform four actions concerning model specifications. Firstly, we start with a narrow definition of *G* where only *BUD* included in the model (Model 1) to make the result comparable to the findings in cross-country studies. Secondly, the broad definition of *G*, the summation of the three categories is used (Model 2). Note that Model 2 using the broad definition of *G*

is based on the implicit assumption that each expenditure category has an identical effect on growth. The differences in each category could have different effects on growth, so that we perform a regression in which each category is introduced as a separate explanatory variable (Model 3). Finally, the model is performed where G is classified into two groups, budgetary expenditure and off-budgetary expenditure (Model 4). The latter is the sum of *EBF* and *DL*.

All in all, the empirical model in this study is as follows:

$$y = g\left(k, h, OPEN, TAX, BUDS, G\right) \tag{4}$$

where y = output per worker
k = physical capital per worker
h = human capital
OPEN = trade openness
TAX = distortionary taxation
BUDS = budgetary surplus
G = government expenditure defined;
G1 = *BUD*, Budgetary expenditure
G2 = Sum of *BUD, EBF* and *DL*
G3 = *BUD, EBF,* and DL as a separate controlling variable
G4 = *BUD* and *OBUD*, Off-budgetary expenditure (*EBF*+*DL*).

4.2 Variable Measurement and Data Sources

Output per worker is measured by real gross domestic product per capita (*GDP*) at a constant 1988 price. k is measured by the ratio of private investment to *GDP* where h is proxied by the secondary education attainment index. While there are various alternative proxies of human capital, such as the average schooling year as well as human development index developed by a number of international institutes, the choice is made based on data availability over the covering period. We use the yearly data and then make it constant in each quarter from the fourth quarter in this year to the fourth quarter in the year after, corresponding to the regularly scheduled attendance of high schools in Thailand, which the number of students in secondary schools does not change much during semesters.

As argued in Edwards (1998), there is no unique measure of openness of trade policy regimes. In this study, the ratio of total merchandise trade (imports + exports) to *GDP* is used simply because of data availability. In this study, we follow the definition used in Kneller et al. (1999), where taxation on income and profits, social security contributions, taxation on payrolls and manpower and taxation on properties are classified as distortionary tax. *TAX* is the sum of these items as a share of *GDP. BUDS* is measured by the ratio of budgetary revenue to budgetary expenditure. This is equivalent to the log difference between revenue and expenditure.

BUD represents annual expenditure according to the Budgetary Act. It is the summation of budgetary expenditure in the central budgetary (Article 4), budgetary

expenditure to administrative agencies and controlled units of government (Articles 5 - 25), budgetary expenditure to independent units under the constitution (Article 26), budgetary expenditure to stated enterprises (Article 27) and budgetary expenditure for supporting extra-budgetary funds (Article. 28). *EBF* is defined according to the Act of Treasury Reserves B.E. 2491 whereas *DL* is government direct loans, except deficit financing, reported by the Thailand Public Debt Management Office. Foreign debt is transformed into the Thai baht currency. Note that *EBF* and *DL* quarterly data were not available before 2001 and 2005 respectively. That is, we use the *EBF* data from q4:2001 and DL data from q3:2005 to Q2:2014.

All variables except *EBF* and *DL* are collected from q1:1993 to q2:2014. The data related to National Income Accounts, such as *GDP* (Output), output per worker, gross fixed capital formation per worker, and external trade are from the office of National Economic and Social Development Board (*NESDB*). Secondary education attainment is derived from the World Banks' database. Data related to budget expenditure and revenue is from the Bank of Thailand (*BOT*), Information and Communication Technology Center of the Ministry of Finance and Thailand Public Debt Management Office.

4.3 Econometric Procedures

Our econometric procedure in this study starts with examining the time series properties of all variables. Both Augmented Dickey-Fuller (*ADF*) unit root test and Phillip-Perron (PP) test are performed. As reported in Table 5, all variables are not integrated in the same order. *BUD, EBF+DL, BUDS,* and *OPEN* are found to be stationary(I(0)), whereas the others are non-stationary(I(1)).

Table 5: Unit Roots Tests

	Augmented Dickey-Fuller Test				Philips-Perron Test			
	Level		First Different		Level		First Different	
	Stat	p-value	Stat	p-value	Stat	p-value	Stat	p-value
Y	-2.27	0.44	-9.7	0.00***	-2.35	0.4	-9.7	0.00***
G_{BUD}	-7.43	0.00***	-15.78	0.00***	-7.57	0.00***	-27.41	0.00***
G_{EBF}	-1.76	0.72	-9.64	0.00***	-1.89	0.65	-9.63	0.00***
G_{DL}	-0.99	0.94	-12.04	0.00***	-2.88	0.17	-15.98	0.00***
G_{EBF+DL}	-4.06	0.02**	-147.48	0.00***	-16.4	0.00**	-9.29	0.00***
$G_{BUD+EBF+DL}$	-1.26	0.89	-12.52	0.00***	-2.79	0.21	-13.09	0.00***
k	-2.16	0.5	-3.12	0.11	-1.63	0.77	-8.09	0.00***
h	-2.21	0.48	-8.02	0.00***	-2.27	0.45	-8.1	0.00***
TAX	-1.83	0.68	-9.73	0.00***	-2.49	0.33	-10.32	0.00***
BUDS	-6.36	0.00***	-10.4	0.00***	-6.56	0.00***	-23.39	0.00***
OPEN	-3.38	0.06*	-7.57	0.00***	-2.93	0.16	-7.54	0.00***

Note: ** and * indicate significance at 1% and 5% levels, respectively. The optimal lag length for ADF test is determined by SIC, with a maximum of eleven lags considered. The PP test is selected using a Newey-West Bandwidth

Source: Author's calculations

In circumstance where the variables of interest do not have the same order of integration, the fashionable cointegration econometric procedures, such as the two-step residual-based procedure adopted by Engle and Granger (1987), and the system-based reduced rank regression approach of Johansen (1991, 1995), are not applicable. Hence, we use the 'general to specific modelling or GSM' procedure developed in Hendry et al., (1984) , which can be applied for a mixture of stationary and non-stationary data. In addition, GSM performs well in a finite sample size in providing precise estimates and valid t-statistics, even in the presence of endogenous explanatory variables (Inder, 1993; Hendry, 1995).

The GSM procedure is to embed the relationship being investigated within a sufficiently complex dynamic specification, including lagged dependent and independent variables, so that a parsimonious specification of the model can be uncovered. Under this procedure, estimation begins with an autoregressive distribution lag (ARDL) specification of an appropriate lag order:

$$Y_t = \alpha + \sum_{i=1}^{m} A_i Y_{t-i} + \sum_{j=1}^{k}\sum_{i=0}^{m} B_{ij} X_{j,t-i} + \mu_t \tag{5}$$

where α is a constant, Y_t is the endogenous variable, $X_{j,t}$ is the j^{th} explanatory variable and A_i and B_{ij} are the parameters.

Equation (5) can be rearranged by subtracting Y_{t-1} on both sides and turning the set of explanatory variables in terms of differences representing the short-run dynamics. The lagged levels of both dependent and explanatory variables are still left in the rearranged functional form on the right-hand-side in order to capture the long-term multiplier of the system.

$$\Delta Y_t = \alpha + \sum_{i=1}^{m-1} A_i^* \Delta Y_{t-1} + \sum_{j=1}^{k}\sum_{i=0}^{m-1} B_{ij}^* \Delta X_{j,t-1} + C_0 Y_{t-m} + \sum_{j=1}^{k} C_1 X_{j,t-m} + \mu_t \tag{6}$$

where $= A_i^* = -\left[I - \sum_{i=1}^{m-1} A_i\right], B_{ij}^* = \left[\sum_{i=0}^{m-1} B_{ij}\right], \quad C_0 = -\left[I - \sum_{i=1}^{m} A_i\right], C_1 = \left[\sum_{i=0}^{m} B_{ij}\right]$ the long-term multiplier of the system is given by $C_0^{-1} C_1$.

Equation (6) is known as an error correction mechanism (ECM) representation of the model. This is the particular formulation generally used as the 'maintained hypothesis' of the specification search. The estimation procedure involves first estimating the unrestricted equation (6), and then progressively simplifying it by restricting statistically insignificant coefficients to zero and reformulating the lag patterns in terms of levels and differences to achieve orthogonality. As part of the specification search, it is necessary to check rigorously at every stage even the more general of models for possible misspecification. Such checks will involve both a visual examination of the residual from the estimated model and the tests for serial correlation, heteroskedasticity and normality,

as well as the appropriateness of the functional form. In particular, any suggestion of autocorrelation in the residual should lead to a rethink about the form of the general model. Moreover, a structural stability test is conducted by employing the RESET. Above all, theoretical consistency must be borne in mind throughout the testing down procedure.

To apply the GSM procedure to the empirical model in this study, all variables in Equation 1 are re-arranged in Equation 7;

$$\Delta \ln y_t = \alpha_0 + \sum_{j=0} \alpha_{1j} \Delta \ln k_{t-j} + \sum_{j=0} \alpha_{2j} \Delta \ln \mathrm{BUDS}_{t-j} + \sum_{j=0} \alpha_{3j} \Delta TAX_{t-j} + \sum_{j=0} \alpha_{5j} \Delta \ln \mathrm{G}_{i,t-j} + \lambda \begin{pmatrix} \ln y_{t-j-1} - [\delta_1 \ln k_{t-j-1} + \delta_2 \ln h_{t-j-1} + \delta_3 \ln \mathrm{BUDS}_{t-j-1} + \delta_4 \ln TAX_{t-j-1} \\ + \delta_1 \ln OPEN_{t-j-1}] \end{pmatrix} \quad (7)$$

In Equation 7, the short-term relationship is captured by the first line, whereas the blanket in the second line reflects the long-term relationship. λ in Equation 7 is the speed of adjustment. All notations in Equation 7 are similar to those in Equation 6 above. Note that in the short-run relationship, we exclude h and OPEN as their effect tends to be long-term. For example, any change in h would take time to have an effect on economic growth. Its effect is unlikely to be observed from quarter to quarter.

4.4 Estimated Results

Table 6 presents the results of Models 1-4. Generally, all models perform well in all diagnostic tests. These four model specifications (Model1-4) are appropriate for interpreting since they pass residual diagnostic tests. (Table A.2 in Appendix) The Breusch-Godfrey Serial Correlation LM Test is used to confirm that there is no serial correlation in the model. The results of LM test indicated that all models cannot reject the null hypothesis; that is no serial correlation at 0.01 significance levels. Another task is to check heteroskedasticity by using the White Test. The results indicate that we cannot reject the null hypothesis that there is no heteroskedasticity problem at 0.01 significance levels. In addition, all four models also pass the test of normality distribution of residuals and the test of functional form at a small significance level. The Augmented Dickey-Fuller Unit Root Test indicates all models have a cointegration relation, implying that there exist long-term relationships between variables in the models.

Table 6: The Estimated Results

Dependent Variables: per capita growth

Variables	Model 1	Model 2	Model 3	Model 4	Model 3.1
ΔG_{BUD}	0.10**		0.16**	0.15**	0.00
	(0.04)		(0.06)	(0.06)	(0.02)
ΔG_{EBF}			0.01*		0.01**
			(0.01)		(0.01)

Dependent Variables: per capita growth

Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 3.1**
ΔG_{DL}			0.00		0.00
			(0.00)		0.00
ΔG_{EBF+DL}				0.00	
				0.00	
$\Delta G_{BUD+EBF+DL}$		0.06*			
		0.00			
Δk	0.20***	0.26***	0.17*	0.19**	0.19***
	(0.04)	(0.04)	(0.09)	(0.08)	(0.04)
ΔBUDS	0.09**	0.07	0.17**	0.15**	
	(0.04)	(0.02)	(0.04)	(0.07)	
Y (lag)	-0.40***	-0.40***	-0.51***	-0.50***	-0.42***
	(0.10)	(0.07)	(0.07)	(0.10)	(0.07)
G_{BUD} (lag)	0.12**		0.11*	0.15*	0.04
	(0.05)		(0.06)	(0.07)	(0.06)
G_{EBF} (lag)			0.02*		0.02***
			(0.01)		(0.01)
G_{DL}(lag)			(0.00)		0.00
			0.00		0.00
G_{EBF+DL}(lag)				0.00	
				0.00	
$G_{BUD+EBF+DL}$(lag)		0.07			
		(0.01)			
k(lag)	0.08***	0.10*	0.11***	0.07***	0.11***
	(0.02)	(0.02)	(0.03)	(0.30)	(0.03)
h(lag)	0.20*	0.38*	0.32***	0.34**	0.34**
	(0.11)	(0.10)	(0.13)	(0.14)	(0.13)
TAX(lag)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
	(0.02)	(0.02)	(0.03)	(0.06)	(0.03)
BUDS(lag)	0.09*	(0.01)	0.17*	0.18**	0.02
	(0.04)	(0.03)	(0.05)	(0.08)	(0.04)
OPEN(lag)	0.10*	0.16***	0.13*	0.14***	0.13***
	(0.04)	(0.04)	(0.02)	(0.02)	(0.03)
D_{AFC}	-0.02**	-0.01*			
	(0.01)	0.00			
D_{POL}	-0.05***	-0.02**	-0.03**	-0.02*	-0.06***
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
D_{FL}	-0.17***	-0.13***	-0.16***	-0.13***	-0.17***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Constant term	3.31***	3.59***	4.24***	4.43***	4.12***
	(0.84)	(1.07)	(0.66)	(1.14)	0.00

Dependent Variables: per capita growth

Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 3.1**
Adjusted R-square	0.68	0.79	0.88	0.83	0.62
ARDL	(0,1,1,0,0,1,0)	(0,1,1,0,0,1,0)	(0,1,1,1,1,0,0,1,0)	(0,1,1,1,0,0,1,0)	(0,1,1,1,1,0,0,1,0)
observations	86.00	86.00	38.00	51.00	38.00

Long-run result (from Model 3)

$$Y = 8.31^{***} + 0.21G^{**}_{BUD,t-1} + 0.04G^{**}_{RBF,t-1} - 0.002G^{*}_{DL,t-1} + 0.22k^{***}_{t-1} + 0.63h^{***}_{t-1} - 0.02TAX_{t-1} + 0.33BUDS^{*}_{t-1} + 0.26OPEN^{*}_{t-1} - 0.06\mathrm{D}^{***}_{\mathrm{POL}} - 0.31\mathrm{D}^{***}_{\mathrm{FL}}$$

Note: *,**,*** indicate 0.1, 0.05, 0.01 statistical significance levels , respectively;
There are three dummy variables including: DAFC measures the impact of Asian financial crisis during q3:1997-q4:1999, DPOL represents the political unrest during q2:2010-q3:2010, DFL denotes the impact of flooding in q4:2011.

Source: Author's calculations

Based on the adjusted R-squared, Model 3 outperforms the others where all three categories of government spending are treated as separate explanatory variables. Coefficients corresponding to k, h, and OPEN are positive and statistically significant as theoretically expected in all models. Private investment is the key driver promoting growth in both the short- and long term. A one per cent increase in private investment could lead to an economic growth of 0.17 per cent in the short term. The growth enhancing effect in the long term is even larger at 0.22 per cent. Similarly, the positive and statistically significant coefficient of h confirms the key role in promoting long-run economic growth. The corresponding coefficient is 0.32.

OPEN plays a role in promoting long term economic growth. Based on the Thai experience, TAX does not have a negative effect on economic growth. The statistical insignificance of coefficients corresponding to TAX rather suggest that taxation on income and profits, social security contributions, taxation on payrolls and manpower and taxation on properties do not have distortion effects. As suggested in the previous study (i.e. Jongwanich and Kohpaiboon, 2008), credit availability is one determinant of private investment so that it might overshadow distortionary tax deterring any decision to allocate the time and resources of the private agents.

The coefficient associated with BUDS is statistically significant and attains a positive value only in the short term. The long-term coefficient is marginally significant at a 0.1 significance level. This suggests that when expenditure goes hand-in-hand with revenue, it promotes growth in both the short- and long-term. Note that the statistical significance of the short-term coefficient is a puzzle. In particular, the positive value suggests that all other things being equal, a rise in government revenue (the numerator in the BUDS formula) promotes short-term economic growth. To a certain extent, this is counter-intuitive. We re-examine this issue by dropping BUDS in the short-term relationship, as reported in Table 6 (Model 3.1). The result is resilient to that of Model 3, except for minor changes on estimated coefficients with some variables.

Where government expenditure is concerned, three remarks can be addressed. Firstly, coefficients vary across expenditure categories. Only BUD and EBFs have growth enhancing effects in both the short- and long-term. Note that the statistical significance of BUD is marginal, whereas that of EBFs is at the 5 per cent or better level. In contrast, the coefficient corresponding to DL is not statistically significant in both the short- and long-term. The statistical insignificance of DL is potentially a result of the crowding-out effect of DL on private investment. As claimed in Jongwanich and Kohpaiboon (2008), there was evidence of credit constraints for private investors. This is more likely to be experienced by small and medium enterprises (SMEs). The credit constraints tend to be more severe after financial crises where local financial institutes have been conservative. They are likely to act in favor of large enterprises in allocating their lending funds, as well as government bonds and/or government guaranteed bonds. The latter would result in a crowding out effect on private investment from SMEs.

Secondly, even though EBFs could have growth-enhancing effects in both the short- and long-term, its coefficients are far smaller as opposed to traditional growth engines like private investment and/or budgetary expenditure. For example, in the short-term BUD's coefficient is ten times higher than that of EBFs. The difference in coefficient magnitude is also large in the case of long-term relationships. The limited growth-enhancing effect reflects the nature of EBFs becoming a sought-after tool for politicians to perform populist policies. Irrefutably, some EBF projects are used as pro-poor and/or income redistribution policies, whereas many EBFs are prone to corruption and rent-seeking activities. The magnitude of the growth-enhancing effect would reflect the relative importance of the pro-poor and/or redistribution policies. The larger the magnitude, the more important the pro-poor policies component can be seen as being. This finding raises policy awareness for governments worldwide in opting to rely on EBFs as a tool for increasing public spending.

Lastly, the statistical significance of the coefficients corresponding to BUD is marginal, reflecting the increasing importance of current expenditure in total budgetary expenditure after the Asian financial crisis (See also Section 3). The effect of current expenditure on economic growth tends to be short-term as it is unlikely to enhance production capacity, the foundation for the country's long term economic growth. When the estimation period is shortened and covers only 2005q4 onwards, the statistical significance of the long-term coefficient is marginal, as shown in Model 3; the short-term coefficient is still positive and statistically significant at 0.05 levels.

Turning to extra-budgetary expenditure, firstly we discerned that the outlay of extra-budgetary funds includes quite a balanced proportion between current and capital expenditure. The majority of current spending comes from social and security funds, while the main capital expenditure belongs to lending funds for education. As a consequence, the overall impact of outlays of EBFs is neutral on economic growth.

The second extra-budgetary instrument involves government direct loans, except deficit financing. An increase in government direct loans proved unable to support firms'

productivity and potentially crowded out private investment as well. The evidence supports the fact that during the study period (2005-2014) the government tended to release long-term bonds to finance the cost of their policies. The domestic proportion rose from 70% of total direct government debt in 2005 to 97% in 2014. Subsequently, there was a seizing of scarce domestic resources between government and private sectors, reflecting an increase in the ratio of governmental bills and bonds to deposits of financial institutions from 0.9 in 2005 to 2.5 in 2014 --the ratio of government bonds and treasury bills held by commercial banks or depository financial institutions to their deposits. Moreover, the large proportion of direct government loans, except deficit financing was as a result of the Thaikemkang Project, designed to stimulate short-term domestic consumption, while only a small proportion was set aside for investment in infrastructure.

5. Conclusion

This paper examines the growth-government expenditure nexus, using Thailand as a case study. Our analysis starts with a discussion of the trends and patterns within government expenditure in Thailand over the past twenty-five years, beginning from 1993. The evidence reveals that total government expenditure has increased over time, especially in the new millennium wherein successive administrations have paid more attention to off-budgetary spending. An increase in the total government expenditure share of GDP from 19% in 2001 to 25% in 2013 is accounted for by an increase in both budgetary and off-budgetary categories equal to 4% and 2%, respectively.

Budgetary expenditure has gone up over the past two decades. The majority of such spending involves current expenditure (roughly 80% of budgetary spending in 2014). It is of note that there has been a switch away from capital expenditure since the Asian financial crisis.

Besides budgetary spending, off-budgetary expenditure can be classified into two categories, including extra-budgetary funds (EBFs), and government direct loans, except deficit financing (DL). EBFs have been popular since the onset of the new millennium. The majority of such spending comes from social welfare funds (e.g. the Social Security Fund and National Health Fund) having increased from 41% of EBF expenditure in 2009 to 71% in 2014. Meanwhile, the stock of DL has remained stable at around 500 billion baht over the past two decades, although it dipped during 2007-2008 as a result of the subprime crisis, whereas the flow of DL fluctuated and often increased during the post crises eras of 1999-2001 and 2009-2010. In addition, the government has tended to finance through domestic resource channels by releasing long-term bonds. The proportion of domestic debt of the central government has increased from 9% of government direct loans in 1998 to 97% in 2014. Hence, it seems that there has been some competitive seizing of scarce domestic resources between the government and private sectors.

The time series analysis in this study revealed that while some categories of government expenditure have the potential to promote economic growth in both the short

and long term, the effect is far lower as opposed to private investment. This is also true in terms of improving human capital. We did not find statistical evidence that distortionary tax has a negative effect on economic growth based on the evidence of Thailand. When expenditure goes hand-in-hand with revenue, this would promote growth in the long-run.

Only budgetary expenditure and extra-budget funds expenditure have growth enhancing effects in both the short- and long-term. The effect of the direct loan net of budget deficit financing is not found statistically due to its potential crowding-out effect on private investment. Even though EBFs could have a growth-enhancing effect in both the short- and long-term, its coefficients are far smaller as opposed to traditional growth engines like private investment and/or budgetary expenditure. The limited growth-enhancing effect reflects the lesser importance of pro-poor and/or redistribution policies in Thailand. The larger the magnitude, the more important the pro-poor policies component has been found to be. This finding raises policy awareness for governments worldwide in opting to rely on EBFs as a tool for increasing public spending. Finally, the weak statistical relationship between budgetary expenditure and growth found in this study reflects the increasing importance of current expenditure in total budgetary spending.

Two policy implications can be drawn from this study. Firstly, while extra-budgetary fund expenditure has the potential to promote economic growth in both the short and long-term and is flexible when used as a tool, there exists the inherent risk that EBFs may result in unproductive populist policies and the accumulation of public debt with only a negligible positive effect on economic growth. Budgetary expenditure remains the most preferable mode for the government to increase its expenditure when seeking to drive the economy forwards. This is especially true for pro-poor and/or income redistribution activities that are in high demand in order to mitigate the negative side effects of increasing economic globalization.

Secondly, how the government expenditure is spent matters more as opposed to the particular expenditure category. Our results point to the relative importance of private sector-led growth models. The role of government should be supportive to allow the private sector to spur economic growth. The most effective way to allocate government spending in order to promote growth lies in gearing expenditure towards activities complementing private investment. This includes enhancing infrastructure capabilities, as well as improving human capital. Such investment would potentially create a conductive investment climate for private firms to invest.

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Appendix

Table A.1: Descriptive Statistics

	Real GDP	Budgetary expenditure	EBF expenditure	Direct loan[1]	Export	Import	Gross domestic Investment	Human capital	Distortionary Tax	Total Tax Revenue
Mean	916716	337989	57687	470485.4	583329	476895	227450	66	123229	308871
Median	877474	279130	53396	485362.5	577655	436376	232490	66	95196	264831
Maximum	1298289	836822	189368	628826.0	946388	767889	344533	87	387547	688500
Minimum	588137	104518	3440	239524.0	244038	235878	125715	33	25201	121610
Std. Dev.	201696	170019	39963	90654.05	213962	151241	54966	14.45	87133	143187
Skewness	0.291	0.917	1.547	-0.586360	0.146	0.339	-0.076	-0.357	1.293	0.857
Kurtosis	1.778	3.206	5.578	2.869	1.732	1.916	2.195	2.380	3.850	2.726
Jarque-Bera	6.567	12.224	34.476	2.204	6.065	5.853	2.404	3.209	26.583	10.798
Probability	0.037	0.002	0.000	0.332	0.048	0.053	0.300	0.200	0.000	0.004
unit	mB	mB	mB	mB	mB	mB	mB	(index)	mB	mB
Observations	86	86	51	38	86	86	86	86	86	86
Date start	Q1:1993	Q1:1993	Q4:2001	Q3:2005	Q1:1993	Q1:1993	Q1:1993	Q1:1993	Q1:1993	Q1:1993

Note: 1 direct government loans, except deficit financing in the stock term.
Source: NESDB.

Table A.2: Residual Diagnostic Tests

Robustness Test	Model 1	Model 2	Model 3	Model 4	Model 3.2
LM	1.18	0.71	1.99	0.51	1.62
White	1.90	2.01	1.66	0.77	1.55
JBN	1.66	0.33	0.06	0.97	1.19
Ramsey RESET	2.72	0.18	0.03	0.46	1.10
DF	-8.27***	-7.20***	-7.49***	-6.70***	-6.11***

Notes: ***indicate 0.01 significance levels. LM Breusch–Godfrey serial correlation LM test; RESET Ramsey test for functional form mis-specification; JBN Jarque–Bera test of the normality of residuals; White Heteroskedasticity Test; DF Dickey–Fuller test for residual stationarity (augmentation was not needed in terms of both the Akaike Information criterion and the Schwarz Bayesian criterion).
Source: Author's estimations.