Labuan Bulletin
OF INTERNATIONAL BUSINESS & FINANCE
Volume 6, 2008 ISSN 1675-7262

EXPORTS AND DOMESTIC DEMAND: SOME EMPIRICAL EVIDENCE IN ASEAN-5

Hock-Tsen Wong *

School of Business and Economics, Universiti Malaysia Sabah

Abstract

This study examines the importance of exports and domestic demand to economic growth in ASEAN-5, namely Indonesia, Malaysia, the Philippines, Singapore and Thailand before Asia financial crisis, 1997-1998. The results of the Granger causality test show some evidence of bidirectional Granger causality between exports and economic growth and between private consumption and economic growth. The relationship between investment and economic growth and also between government consumption and economic growth is less conclusive. A successful sustained economic growth requires growth in both exports and domestic demand. Moreover, economic growth will increase domestic demand and exports. There is no strong evidence to suggest that the export-led growth (ELG) strategy is a main cause to Asia financial crisis.

JEL Classifications: F10; F40; F43.
Keywords: Exports; Domestic demand; Economic growth; ASEAN-5; Causality

1. Introduction

Exports are said to have an important role to economic growth of a country. An increase in exports could imply that the demand of the country has risen. This could serve to increase output. An increase in exports could promote specialisation in the production of export products, which in turn might increase the productivity of the export sector. This might then lead to a reallocation of resources from the

* Corresponding author: Hock-Tsen Wong, School of Business and Economics, Universiti Malaysia Sabah, Locked Bag No. 2073, 88999 Kota Kinabalu, Sabah, Malaysia. Email address: htwong@ums.edu.my

relatively inefficient non-trade sector to the higher productive export sector. The productivity change might lead to economic growth. Exports that based on comparative advantage would allow the exploitation of economies of scale. This could lead to an increase in economic growth (Giles and Williams, 2000a; 2000b; Ahmad, 2001; ADB, 2005). Exports are said to have contributed to the success of Asian newly industrialised economies (NIEs) and the second tier of Asian NIEs. Moreover, domestic markets of these economies are generally small and therefore, international markets are very important to their exports (The World Bank, 1993).

Kónya (2006) investigates Granger causality between the logarithms of real exports and real gross domestic product (GDP) in twenty-four Organization for Economic Cooperation and Development (OECD) countries over the period from 1960 to 1997. The study uses two different models, namely, a bivariate model (GDP–exports) and a trivariate model (GDP–exports–openness to international trade), both without and with a linear time trend. The panel data is estimated using the Seemingly Unrelated Regressions estimator. Wald tests with country specific bootstrap critical values are used to examine the export-led growth (ELG) hypothesis. For Belgium, Denmark, Iceland, Ireland, Italy, New Zealand, Spain and Sweden, exports are found to Granger cause GDP. For Austria, France, Greece, Japan, Mexico, Norway and Portugal, there is bidirectional Granger causality between exports and GDP. However, for Australia, Korea, Luxembourg, Switzerland, the United Kingdom and the United States, there is no evidence of Granger causality.

The ELG hypothesis is said to contribute to financial crisis and the response of governments in the crisis-hit countries was the attempt to switch from the ELG strategy to the domestic demand-led growth (DDLG) strategy (Palley, 2002: 2-3; ADB, 2005). An increase in exports by all countries in pursuing the ELG hypothesis in the world could lead to a decrease in export prices. This will in turn lead to a decrease in exports and therefore, economic growth in these countries. Moreover, export prices fluctuate in the world markets. Thus, economic growth of the ELG countries could be affected very much by the fluctuation of export prices. Lai (2004) examines the importance of exports and domestic demand to economic growth in Malaysia over the period from 1961 to 2000. Domestic demand is expressed only by private consumption. Moreover, the study focuses only on Malaysia. Furthermore, the study does not focus the importance of exports and domestic demand to economic growth before the crisis.

On the other hand, this study is examines the importance of exports and domestic demand to economic growth in ASEAN-5 before Asia financial crisis. Thus, this study provides some evidence if the ELG strategy is a

factor, which contributes to the crisis. The measures of domestic demand used in this study are private consumption, government consumption and investment. Therefore, this study examines the importance of private consumption, government consumption and investment on exports and economic growth. These countries are chosen as the contribution of their exports to GDP is different. Singapore has the highest ratio of exports to GDP. This is followed by Malaysia, Thailand, the Philippines and Indonesia. Moreover, the contribution of their domestic demand to GDP is different. The Philippines, Indonesia and Thailand have a relatively high ratio of total consumption (private plus government consumption) to GDP whilst Malaysia and Singapore have a relatively low ratio of total consumption to GDP. Investment to GDP is relatively high for Singapore, Malaysia and Thailand whilst the ratio is relatively low for Indonesia and the Philippines (Table 1).[1] Therefore, this study provides some evidence if a country has a higher ratio of exports to GDP or domestic demand to GDP will imply that economic growth in the country is export-led or domestic demand-led, respectively. The Elliot, Rothenberg and Stock (1996) (ERS) and Phillips and Perron (1988) (PP) unit root test statistics are used to examine the stationarity of the data. The Pesaran, Shin and Smith (2001) (PSS) bounds testing approach is used to examine the long-run relationship of exports, domestic demand and economic growth. The Granger causality test is used to examine the nexus of exports, domestic demand and economic growth.

The rest of this study is structured as follows. Section 2 provides a literature review of this study. Section 3 explains the data and methodology used in this study and section 4 presents empirical results and discussions. The last section includes some concluding remarks.

2. A Literature Review

The ELG hypothesis implies that an increase in exports would lead to an increase in economic growth. There are many reasons to explain the ELG hypothesis. An increase in exports could imply that the demand of the country has risen. Thus, this could serve to increase output (Giles and Williams, 2000a, 2000b; ADB, 2005). There is also possible for the growth-led export (GLE) hypothesis, that is, an increase in economic growth would lead to more exports (Liu, Haiyan and Romily, 1997: 1680). Economic growth also increases domestic demand. Thus, a better understanding of economic growth is therefore required to examine the nexus of exports, domestic demand and economic growth.

[1] See Table 2 for the growth rates of economy, exports, private consumption, government consumption and investment in ASEAN-5, 1960-1996. Generally, the growth rates were relatively high in all the countries.

Table 1
Exports, Private Consumption, Government Consumption and Investment to GDP, 1960-1996 (%)

Year	Exports	Private Consumption (C)	Government Consumption (G)	C+G	Investment
Indonesia					
1960-1969	10.2	86.9	10.4	97.3	-
1970-1979	21.3	69.5	10.0	79.5	-
1980-1989	24.9	58.6	10.4	69.0	24.3
1990-1996	27.0	60.7	8.6	69.3	27.9
Malaysia					
1960-1969	48.0	64.5	15.4	79.9	14.9
1970-1979	46.4	55.7	16.3	72.0	23.0
1980-1989	57.8	50.9	15.9	66.8	30.3
1990-1996	83.1	49.2	12.7	61.9	38.7
Philippines					
1960-1969	15.0	75.4	8.6	84.0	16.2
1970-1979	18.1	67.8	9.0	76.8	20.4
1980-1989	24.7	68.5	8.5	77.0	22.3
1990-1996	32.6	74.0	10.6	84.6	22.4
Singapore					
1960-1969	113.8	79.3	10.0	89.3	17.7
1970-1979	104.8	60.8	11.1	71.9	35.6
1980-1989	140.6	47.1	11.3	58.4	40.2
1990-1996	135.1	43.7	9.2	52.9	34.4
Thailand					
1960-1969	18.1	70.5	10.0	80.5	19.1
1970-1979	19.0	67.8	10.8	78.6	23.8
1980-1989	25.9	61.9	12.1	74.0	28.6
1990-1996	37.9	54.6	9.8	64.4	40.4

Source: *International Financial Statistics*, IMF.

Generally, the empirical evidence of the relationship between exports and economic growth is mixed in the literature. Mookerjee (2006) uses a meta-analysis on a sample of seventy-six studies for the ELG hypothesis. The results show that the use of aggregate exports reduces the evidence of the ELG hypothesis. Conversely, the use of manufactured exports and oil exports increases the evidence of the ELG hypothesis. The study also shows that the definition of economic growth, the functional form, the use of variables measured in logarithms, the frequency of the data and the regional location of countries matter. Moreover, the study documents the presence of publication bias in the literature. Thus, the empirical evidence in the literature is less conclusive.

It is argued that markets in developed economies may not large enough for more exports from less developing economies (LDEs) (Palley, 2002; Felipe, 2003). Moreover, depending on the ELG strategy may not result

in sustained long-run economic growth in LDEs as volatility and unpredictability in international markets. The ELG strategy is also argued for mainly contributed to Asian financial crisis, 1997-1998. The response of governments in the crisis-hit countries was the attempt to switch from the ELG strategy to the DDLG strategy (Palley, 2002: 2-3; ADB, 2005).

Table 2
The Growth Rates of Economy, Exports, Private Consumption, Government Consumption and Investment in ASEAN-5, 1960-1996 (%, 2000 = 100)

Year	Economy	Exports	Private Consumption	Government Consumption	Investment
Indonesia					
1966-1969	4.3	3.9	8.2	5.7	-
1970-1979	4.1	4.7	8.0	6.1	7.0
1980-1989	3.6	5.3	7.9	6.2	7.0
1990-1996	3.3	6.1	7.8	5.9	7.1
Malaysia					
1960-1969	-	-	4.3	3.0	2.9
1970-1979	3.0	4.8	4.9	3.6	4.0
1980-1989	3.5	5.7	5.5	4.3	5.0
1990-1996	3.8	6.7	6.0	4.7	5.8
Philippines					
1960-1969	4.4	6.1	7.6	5.5	6.2
1970-1979	4.0	6.0	7.3	5.3	6.1
1980-1989	3.4	5.9	6.9	4.8	5.8
1990-1996	2.7	5.7	6.6	4.6	5.4
Singapore					
1960-1969	3.0	3.6	3.3	1.4	2.1
1970-1979	2.8	4.6	4.0	2.3	3.5
1980-1989	4.5	5.8	4.7	3.3	4.5
1990-1996	5.2	6.8	5.6	4.1	5.4
Thailand					
1960-1969	2.2	4.1	5.4	3.5	4.3
1970-1979	2.5	4.6	6.0	4.1	4.9
1980-1989	2.8	5.4	6.3	4.6	5.5
1990-1996	3.3	6.6	6.8	5.1	6.5

Source: *International Financial Statistics*, IMF.

ADB (2005) conducts a simple analysis based on national account identity and reports that over-expansionary in the private sector and growing trade deficits are among the major factors that have contributed to Asian financial crisis, 1997-1998. These results are contradicted to the arguments of Palley (2002) that the ELG strategy was partly to blame for the crisis and led to bias against the domestic demand sector. Thus, the ELG strategy is not a cause for the crisis.

Ahmad and Harnhirun (1996) investigate Granger causality between exports growth and economic growth in five member countries of Association of Southeast Asian Nations, namely Indonesia, Malaysia, the Philippines, Singapore and Thailand (ASEAN-5) over the period generally from 1966 to 1988. The cointegration and Granger causality methodology are used. The findings support the hypothesis that economic growth Granger causes exports in all the countries, rather than economic growth being export-led. Lai (2004) examines the importance of exports and domestic demand to economic growth in Malaysia over the period from 1961 to 2000. The Johansen (1988) cointegration methodology is used. The results show that there exists short run bidirectional Granger causality among exports, domestic demand and economic growth. Thus, the results support the ELG and DDLG hypotheses. Moreover, the results are not supportive for the ELG hypothesis in the long run. The study concludes that the use of domestic demand as the catalyst for economic growth is important as highly significant positive impact of domestic demand on economic growth.

3. Methodology and Data

In the literature of the ELG hypothesis, the bivariate model of exports and economic growth is usually used. Thus, the measure of domestic demand is included in the bivariate model to examine the relationship between exports, domestic demand and economic growth. Moreover, this study examines the relationship between private consumption, government consumption or investment as a measure of domestic demand with export and economics growth. More specifically, this study estimates three models:[2]

$$\text{Model 1} \qquad \ln Y_t = \beta_{11} \ln X_t + \beta_{12} \ln C_t + u_{1,t} \tag{1}$$

$$\text{Model 2} \qquad \ln Y_t = \beta_{21} \ln X_t + \beta_{22} \ln C_t + \beta_{23} \ln G_t + u_{2,t} \tag{2}$$

$$\text{Model 3} \qquad \ln Y_t = \beta_{31} \ln X_t + \beta_{32} \ln I_t + u_{3,t} \tag{3}$$

where ln is logarithm; Y_t is GDP per capita; X_t is exports; C_t is private consumption; G_t is government consumption; I_t is investment and $u_{i,t}$ (i = 1, 2, 3) is a disturbance term.

The ERS and PP unit root test statistics are used to examine the stationarity of the data. The ERS unit root test statistic is shown to have a higher power for small sample size (Elliot, Rothenberg and Stock,

[2] See Lai (2004: 342) for a discussion of the estimating problem for the model, which includes domestic demand and exports as regressors for GDP.

1996). The PP unit root test statistic is known to be more robust in an error term process, i.e. an error term is allowed to be weakly heterogenous (Phillips and Perron, 1988). The PPS bounds testing approach is used to examine the long-run relationship among variables in the model. The PPS bounds testing approach is said to have superior properties in small sample size and does not impose restrictive assumption that all the regressors are to be integrated of the same order, that is, regressors could be the mixture of *I*(0) and *I*(1). More specifically, the bounds testing approach is conducted in the following way. Firstly, the unrestricted error correction model is estimated:[3]

$$\Delta \ln Z_t = \beta_{40} + \sum_{i=0}^{a} \beta_{41i} \Delta \ln X_{t-i} + \sum_{i=0}^{a} \beta_{42i} \Delta \ln W_{t-i} + \sum_{i=0}^{a} \beta_{43i} \Delta \ln Z_{t-i} + \beta_{44} \ln X_{t-1} + \beta_{45} \ln W_{t-1} + \beta_{46} \ln Z_{t-1} + u_{4,t} \quad (4)$$

where Δ is the first difference operator; Z_t, X_t and W_t are a series, respectively and $u_{3,t}$ is a disturbance term. Secondly, the Wald or *F*-statistic is computed to test the null hypothesis, $H_0 : \beta_{44} = \beta_{45} = \beta_{46} = 0$ against the alternative hypothesis, $H_a : \beta_{44} \neq \beta_{45} \neq \beta_{46} \neq 0$. The critical bounds values can be obtained from Pesaran, Shin and Smith (2001). If the Wald or *F*-statistic falls outside the upper bound, the null hypothesis of no cointegration is rejected. In other words, $\ln Z_t$, $\ln X_t$ and $\ln W_t$ are said to be cointegrated. However, no conclusive inference could be made for the Wald or *F*-statistic falls inside the critical bounds, unless the order of integration of the regressors is known. If the Wald or *F*-statistic falls below the lower bound, the null hypothesis of no cointegration can not be rejected (Pesaran, Shin and Smith, 2001).

In the Granger (1969) sense of a variable X causes another variable Y if the current value of Y can better be predicted by using the past values of X.[4] When series are cointegrated, the simple Granger causality test becomes inappropriate and the testing of Granger causality shall be in the error correction models (ECMs). For Model 1, the ECMs are:

$$\Delta \ln Y_t = \beta_{50} + \sum_{i=1}^{a} \beta_{51i} \Delta \ln X_{t-i} + \sum_{i=1}^{b} \beta_{52i} \Delta \ln C_{t-i} + \sum_{i=1}^{c} \beta_{53i} \Delta \ln Y_{t-i} + \beta_{54} EC_{1,t-1} + u_{5,t} \ , \quad (5)$$

$$\Delta \ln X_t = \beta_{60} + \sum_{i=1}^{d} \beta_{61i} \Delta \ln X_{t-i} + \sum_{i=1}^{e} \beta_{62i} \Delta \ln C_{t-i} + \sum_{i=1}^{f} \beta_{63i} \Delta \ln Y_{t-i} + \beta_{64} EC_{2,t-1} + u_{6,t} \ , \quad (6)$$

[3] In this study, a in Equation (4) is set to three at the beginning of the estimation.
[4] See Granger (1988) for more explanation of causality.

$$\Delta \ln C_t = \beta_{70} + \sum_{i=1}^{g} \beta_{71i} \Delta \ln X_{t-i} + \sum_{i=1}^{h} \beta_{72i} \Delta \ln C_{t-i} + \sum_{i=1}^{j} \beta_{73i} \Delta \ln Y_{t-i} + \beta_{74} EC_{3,t-1} + u_{7,t} , \quad (7)$$

where $u_{i,t}$ (i = 5, 6, 7) is a disturbance term and $EC_{i,t-1}$ (i = 1, 2, 3) is the one period lagged of error correction terms, which shows the short-run endogenous adjustment to bring the system back to its long-run equilibrium. The joint test of lagged variables, that is, $\Delta \ln Y_t$, $\Delta \ln X_t$ and $\Delta \ln C_t$, by mean of the *F*-statistic is significantly different from zero, implies the presence of Granger causality. For example, if the joint test of lagged variables of $\Delta \ln X_t$ in Equation (5) is significantly different from zero, then it implies that exports growth Granger causes economic growth. The minimum final prediction error (FPE) criterion proposed by Akaike (1970) is used to determine the optimal lags of the model.[5]

Nominal GDP, population, exports, private consumption, government consumption, investment, GDP deflator (2000 = 100), export price index (2000 = 100), consumer price index (2000 = 100) and exchange rate against the United States (US) dollar were obtained from *International Financial Statistics*, International Monetary Fund (IMF).[6,7] GDP per capita is expressed by nominal GDP divided by GDP deflator (2000 = 100) and then divided by population (millions). Exports, private consumption, government consumption and investment are expressed in the price of the year 2000 and in the US dollar (millions). Population is in millions. The sample is over the period from 1960 to 1996, except Indonesia and Malaysia. The samples for Indonesia and Malaysia are over the period from 1966 to 1996 and over the period from 1970 to 1996, respectively.

4. Empirical Results and Discussions

The results of the ERS and PP unit root test statistics are reported in Table 3. The lag length used to estimate the ERS unit root test statistic is based on Akaike (1973) information criterion, which initially is set to four. For the PP unit root test statistic, it is computed based on three truncation lags after considering truncation lags one, two and three.

---

[5] Granger (1988: 203) shows that there are two types of causality, namely (i) the long-run causality, which implies by the significance of *t*-statistic on the coefficient of the one period lagged of error correction term, and (ii) the short-run causality, which implies by the significance of *F*-statistic on the coefficient(s) of the lagged value(s) of a variable.

[6] Investment is expressed by total gross fixed capital formation.

[7] For Malaysia, exports price index was obtained from *The World Tables*, The World Bank. The based year for export price index is in the year 1995. However, it has been converted to the year 2000.

Generally, the results of the ERS and PP unit root test statistics show that all the variables are non-stationary in their levels but become stationary after taking the first differences, except export, private consumption and investment of Indonesia, GDP per capita and investment of Malaysia and investment of Thailand. For export and private consumption of Indonesia, the results of the ERS and PP test statistics show no evidence of a unit root. For investment of Indonesia and GDP per capita and investment of Malaysia, the result of the ERS test statistic shows evidence of a unit root while the result of the PP test statistic shows no evidence of a unit root. For investment of Thailand, the result of the ERS test statistic shows no evidence of a unit root while the result of the PP test statistic shows evidence of a unit root. However, they could be considered as a borderline case. Thus, all the variables in this study are said to be a unit root process.

Table 3
The Results of the Elliot, Rothenberg and Stock (1996) (ERS) and Phillips and Perron (1988) (PP) Test Statistics

Variable	$t_{\gamma 1}$	$t_{\gamma 2}$
Indonesia		
$\ln Y_t$	-2.8412(4)	-2.5362(3)
$\Delta \ln Y_t$	-5.9349***(0)	-7.4680***(3)
$\ln X_t$	-3.4714**(0)	-6.4402***(3)
$\Delta \ln X_t$	-1.0810(4)	-10.4165***(3)
$\ln C_t$	-3.2680**(0)	-3.4615*(3)
$\Delta \ln C_t$	-6.2024***(0)	-9.3262***(3)
$\ln G_t$	-2.1295(0)	-2.1434(3)
$\Delta \ln G_t$	-6.1832***(0)	-7.3206***(3)
$\ln I_t$	-2.6728(1)	-1.4678(3)
$\Delta \ln I_t$	-2.9051*(0)	-2.7437(3)
Malaysia		
$\ln Y_t$	-2.3814(1)	-2.3366(3)
$\Delta \ln Y_t$	-3.0431*(0)	-2.7716(3)
$\ln X_t$	-1.4804(0)	-1.1926(3)
$\Delta \ln X_t$	-5.1148***(1)	-4.3349***(3)
$\ln C_t$	-2.7851(1)	-2.0389(3)
$\Delta \ln C_t$	-4.2941***(1)	-3.6564**(3)
$\ln G_t$	-1.8623(2)	-1.3641(3)
$\Delta \ln G_t$	-4.6245***(0)	-4.7872***(3)
$\ln I_t$	-2.5525(3)	-2.0280(3)
$\Delta \ln I_t$	-3.9958***(1)	-2.7740(3)

Table 3 (Continue)

Variable	$t_{\gamma 1}$	$t_{\gamma 2}$
Philippines		
$\ln Y_t$	-2.5476(1)	-2.2191(3)
$\Delta \ln Y_t$	-4.7540***(0)	-4.7338***(3)
$\ln X_t$	-2.4792(0)	-2.5318(3)
$\Delta \ln X_t$	-6.8449***(0)	-6.7041***(3)
$\ln C_t$	-2.7694(1)	-2.4290(3)
$\Delta \ln C_t$	-5.1676***(0)	-5.1494***(3)
$\ln G_t$	-2.6047(1)	-2.1627(3)
$\Delta \ln G_t$	-4.8009***(0)	-4.7951***(3)
$\ln I_t$	-2.4195(1)	-2.0377(3)
$\Delta \ln I_t$	-4.3241***(0)	-4.2798***(3)
Singapore		
$\ln Y_t$	-2.6387(1)	-2.1245(3)
$\Delta \ln Y_t$	-3.5480**(0)	-3.4054*(3)
$\ln X_t$	-2.1798(1)	-2.8839(3)
$\Delta \ln X_t$	-3.7466***(0)	-4.2955***(3)
$\ln C_t$	-2.7772(1)	-1.7384(3)
$\Delta \ln C_t$	-3.2935***(0)	-3.3857*(3)
$\ln G_t$	-2.6416(2)	-2.1860(3)
$\Delta \ln G_t$	-4.9694***(0)	-4.9146***(3)
$\ln I_t$	-2.0514(1)	-2.8491(3)
$\Delta \ln I_t$	-3.1151*(2)	-3.1120*(3)
Thailand		
$\ln Y_t$	-2.3814(1)	-2.3366(3)
$\Delta \ln Y_t$	-3.0431*(0)	-2.7716(3)
$\ln X_t$	-1.4804(0)	-1.1926(3)
$\Delta \ln X_t$	-5.1148***(1)	-4.3349***(3)
$\ln C_t$	-2.7851(1)	-2.0389(3)
$\Delta \ln C_t$	-4.2941***(1)	-3.6564**(3)
$\ln G_t$	-1.8623(2)	-1.3641(3)
$\Delta \ln G_t$	-4.6245***(0)	-4.7872***(3)
$\ln I_t$	-2.5525(3)	-2.0280(3)
$\Delta \ln I_t$	-3.9958***(1)	-2.7740(3)

Notes: $t_{\gamma 1}$ denotes the ERS t-statistic. $t_{\gamma 2}$ enotes the PP t-statistic. All the unit root test statistics are estimated based on the model with a drift and a time trend. Values in parentheses are the lag length used in the estimation of the unit root test statistics. *** Denotes significance at the 1% level. ** Denotes significance at the 5% level. * Denotes significance at the 10% level.

The results of the unit root test statistics generally show that all the variables are said to be integrated of the same order. Thus, this study proceeds to examine the long-run relationship among variables in the models. The results of the *F*-statistic for the PPS bounds testing approach are reported in Table 4. For most of the models, there is long-run relationship among variables in the models. For series are cointegrated, the ECMs are estimated. On the other hand, the VAR models are estimated for the testing of Granger causality. The results of the Granger causality test are reported in Table 5.[8] For Indonesia, the result of the *F*-statistic shows that exports is found to Granger cause GDP per capita, GDP per capita is found to Granger cause private consumption and government consumption and investment is found to Granger cause GDP per capita. For Malaysia, there is some evidence of bidirectional Granger causality between exports and GDP per capita and between private consumption and government consumption and GDP per capita is found to Granger cause GDP per capita. For the Philippines, there is some evidence of bidirectional Granger causality between exports and private consumption and GDP per capita and investment Granger cause GDP per capita, respectively. For Singapore, GDP per capita is found to Granger cause exports and private consumption. For Thailand, there is bidirectional Granger causality between exports and GDP per capita, between private consumption and GDP per capita and between government consumption and GDP per capita and GDP per capita is found to Granger cause private investment.

The finding that domestic demand and economic growth reinforce each other is consistent with the argument of Palley (2002), amongst others. However, the relationship between investment and economic growth and also between government consumption and economic growth is less conclusive. Moreover, this study finds no strong evidence to support that the DDLG hypothesis is preferred than the ELG hypothesis, which is claimed by Palley (2002), amongst others. Ahmad and Harnhirun (1996) report that economic growth Granger causes exports in ASEAN-5, rather than economic growth being export-led. Conversely, this study finds that both the ELG and DDLG hypothesis are important to economic growth. Moreover, economic growth is important to exports and domestic demand. There is no evidence to suggest that a country that has a higher ratio of exports to GDP or domestic demand to GDP will imply that economic growth in the country is export-led or domestic demand-led. There is also no strong evidence to suggest that ASEAN-5 mainly adopted the ELG strategy before Asia financial crisis and thus, it is not a main cause for the crisis. ADB (2005) reports that the ELG strategy is not a critical factor that contributes to the crisis.

[8] The plots of cumulative sum of recursive errors (CUSUM) and cumulative sum of squares of recursive errors (CUSUMSQ) statistics, which are not reported, show no evidence of the ECMs instability.

On the whole, a successful and sustained economic growth requires growth in economy, exports and domestic demand. In order to achieve a stable economic growth, a country shall diversify its exports and composition of exports as export prices fluctuate in the world markets. Moreover, a country shall focus on higher-value added exports as their contribution to economic growth is higher. At the same time, a country shall also promote domestic consumption, which could reduce the dependency of exports. An increase of government consumption or investment could have a significant impact on economic growth. Thus, government consumption or investment could be used as policies to promote economic growth. Economic growth dependent mainly on exports or domestic demand may not be stable or optimal.

Table 4
The Results of the Pesaran, Shin and Smith (2001) (PPS) Bounds Testing Approach for Cointegration (*F*-statistic)

	Indonesia	**Malaysia**	**Philippines**	**Singapore**	**Thailand**
Model 1					
$\Delta \ln Y_t$	3.2570	6.2859*	2.6888	14.9090*	4.3425
$\Delta \ln X_t$	0.4978	4.3205	4.1458	3.8814	3.1315
$\Delta \ln C_t$	5.0017*	6.2859*	4.5403	12.2839*	1.1977
Model 2					
$\Delta \ln Y_t$	3.8098	2.7856	3.0367	12.2678*	2.9218
$\Delta \ln X_t$	2.6205	3.8700	7.7270*	10.0880*	2.8363
$\Delta \ln C_t$	3.7483	1.8263	6.0968*	1.6249	2.1056
$\Delta \ln G_t$	6.0773*	3.1659	2.0124	3.3761	3.1173
Model 3					
$\Delta \ln Y_t$	8.3191*	2.9992	1.0178	9.8670*	3.7209
$\Delta \ln X_t$	10.8452*	4.3071	15.8930*	0.8607	4.1853
$\Delta \ln I_t$	24.9310*	12.2883*	0.7211	2.2772	3.7646

Notes: The critical values for unrestrictive intercept and no trend case with two (three) regressors at the 5% level are 3.79 (3.23) for lower critical bound and 4.85 (4.35) for upper critical bound. * Denotes cointegrated and significance at the 5% level.

Table 5
The Results of the Granger Causality Test

	Indonesia				
Model 1	EC_{t-1}	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln C_{t-i}$	
$\Delta \ln Y_t$	-	-	2.2361	7.6769***	
$\Delta \ln X_t$	-	0.3228	-	5.5488**	
$\Delta \ln C_t$	-0.5259	8.1460***	1.4587	-	
Model 2	EC_{t-1}	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln C_{t-i}$	$\Delta \ln G_{t-i}$
$\Delta \ln Y_t$	-	-	3.3667*	5.9522**	1.1388
$\Delta \ln X_t$	-	.12156	-	5.5435**	0.8307
$\Delta \ln C_t$	-	13.0697***	1.3148	-	0.0351
$\Delta \ln G_t$	0.7156	6.0858**	0.0646	4.8227**	-
Model 3	EC_{t-1}	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln I_{t-i}$	
$\Delta \ln Y_t$	-2.8438**	-	1.6223	39.0354***	
$\Delta \ln X_t$	-2.0884*	-	0.0846	1.5517	
$\Delta \ln I_t$	1.9726*	1.3826	3.9573**	-	
	Malaysia				
Model 1	EC_{t-1}	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln C_{t-i}$	
$\Delta \ln Y_t$	-2.6345**	-	5.5020**	3.9244**	
$\Delta \ln X_t$	-	5.6817*	-	1.2681	
$\Delta \ln C_t$	4.4009***	15.8739***	21.5238***	-	
Model 2	EC_{t-1}	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln C_{t-i}$	$\Delta \ln G_{t-i}$
$\Delta \ln Y_t$	-	-	3.8659**	0.0120	5.0462**
$\Delta \ln X_t$	-	2.1573	-	6.7683**	2.0230
$\Delta \ln C_t$	-	0.6541	11.4582***	-	5.2698**
$\Delta \ln G_t$	-	2.4841	1.2616	5.9745**	
Model 3	EC_{t-1}	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln I_{t-i}$	
$\Delta \ln Y_t$	-	-	5.4279**	2.5474	
$\Delta \ln X_t$	-	3.2154*	-	0.2947	
$\Delta \ln I_t$	-0.0693	1.8945	4.0643**	-	

Table 5 (Continued)

	Philippines				
Model 1	EC_{t-1}	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln C_{t-i}$	
$\Delta \ln Y_t$	-	-	2.3119	2.9053	
$\Delta \ln X_t$	-	21.7813***	-	15.1654***	
$\Delta \ln C_t$	-	6.1047**	3.7382	-	
Model 2	EC_{t-1}	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln C_{t-i}$	$\Delta \ln G_{t-i}$
$\Delta \ln Y_t$	-	-	1.2911	5.3401**	3.9383
$\Delta \ln X_t$	-3.7484***	38.2583***	-	8.6809***	11.9451***
$\Delta \ln C_t$	0.9460	1.9349	6.4954**	-	1.5454
$\Delta \ln G_t$	-	2.2153	11.0418***	5.9508*	-
Model 3	EC_{t-1}	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln I_{t-i}$	
$\Delta \ln Y_t$	-	-	7.2405**	8.9141*	
$\Delta \ln X_t$	-2.5826**	13.1207***	-	5.8378**	
$\Delta \ln I_t$	-	3.8867	21.2692***	-	
	Singapore				
Model 1	EC_{t-1}	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln C_{t-i}$	
$\Delta \ln Y_t$	1.1292	-	0.0276	2.1236	
$\Delta \ln X_t$	-	0.2695	-	10.1080***	
$\Delta \ln C_t$	-2.3162**	8.6966***	0.0041	-	
Model 2	EC_{t-1}	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln C_{t-i}$	$\Delta \ln G_{t-i}$
$\Delta \ln Y_t$	-2.3064**	-	0.6376	0.0233	0.4247
$\Delta \ln X_t$	-2.1513**	5.7583**	-	13.8506***	0.3146
$\Delta \ln C_t$	-	8.5336***	0.7118	-	1.4580
$\Delta \ln G_t$	-	4.1721	1.8454	2.8830	-
Model 3	EC_{t-1}	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln I_{t-i}$	
$\Delta \ln Y_t$	0.9514	-	0.3504	1.6209	
$\Delta \ln X_t$	-	20.8725***	-	5.4465*	
$\Delta \ln I_t$	-	2.6485	2.9240*	-	

Table 5 (Continued)

	Thailand			
Model 1	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln C_{t-i}$	
$\Delta \ln Y_t$	-	5.8044*	2.8706	
$\Delta \ln X_t$	3.1945*	-	0.6750	
$\Delta \ln C_t$	1.6692	1.3812	-	
Model 2	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln C_{t-i}$	$\Delta \ln G_{t-i}$
$\Delta \ln Y_t$	-	12.9143***	12.2894***	7.8713***
$\Delta \ln X_t$	0.7304	-	2.6659	1.5001
$\Delta \ln C_t$	8.2426**	1.5111	-	6.7720***
$\Delta \ln G_t$	6.0377***	9.0526***	10.1924***	-
Model 3	$\Delta \ln Y_{t-i}$	$\Delta \ln X_{t-i}$	$\Delta \ln I_{t-i}$	
$\Delta \ln Y_t$	-	9.0796***	4.0035	
$\Delta \ln X_t$	3.7830*	-	0.0935	
$\Delta \ln I_t$	10.2930***	10.3010***	-	

Notes: Values under column EC_{t-1} are *t*-statistic. Values under columns $\Delta \ln Y_{t-i}, \Delta \ln C_{t-i}, \Delta \ln X_{t-i}$, $\Delta \ln G_{t-i}$ and $\Delta \ln I_{t-i}$ are the *F*-statistic. *** Denotes significance at the 1% level. ** Denotes significance at the 5% level. * Denotes significance at the 10% level.

5. Concluding Remarks

This study has investigated the importance of exports and domestic demand on economic growth in ASEAN-5. Generally, the results of the ERS and PP unit root test statistics show that all the variables in this study are said to be integrated of order one. Moreover, the results of the PPS cointegration method show that most of the models are cointegrated. Thus, the findings suggest a long-run relationship among variables in the models. The results of the Granger causality test show some evidence bidirectional Granger causality between exports and GDP per capita and between private consumption and GDP per capita. The relationship between investment and economic growth and also between government consumption and economic growth is less conclusive. Thus, exports and domestic demand are both important to economic growth and economic growth is important to domestic demand and exports in ASEAN-5. A successful sustained economic growth requires growth in both exports and domestic demand. Moreover, economic growth will increase domestic demand and exports. There is no strong evidence to suggest that the ELG strategy is a main cause to Asia financial crisis.

Acknowledgement

The author would like to thank TC Tang from Monash University Malaysia for proposing the idea of the role of domestic demand and for providing the export and import price data of Malaysia. All the remaining errors are the author's.

References

Ahmad, J. (2001) Causality between exports and economic growth: what do the econometric studies tell us? *Pacific Economic Review*, 6, 147 – 167.

Ahmad, J. and Harnhirun, S. (1996) Cointegration and causality between exports and economic growth: evidence from the ASEAN countries. *Canadian Journal of Economics*, 96, 413 – 416.

Akaike, H. (1970) Statistical predictor identification. *Annals of the Institute of Statistical Mathematics*, 22, 203 – 217.

Akaike, H. (1973) Maximum likelihood identification of Gaussian autoregressive moving average models. *Biometrika*, 60, 255 – 265.

Asia Development Bank (ADB) (2005) *Asian Development Outlook 2005*. Asia Development Bank.

Elliot, G., Rothenberg, T.J. and Stock, J.H. (1996) Efficient tests for an autoregressive unit root. *Econometrica*, 64, 813 – 836.

Felipe, J. (2003) Is export-led growth passed? implications for developing Asia. *Working Paper*, No. 48. Economic Research Department, Asian Development Bank.

Giles, J.A. and Williams, C.L. (2000a) Export-led growth: a survey of the empirical literature and some non-causality results, part 1. *Journal of International Trade and Economic Development*, 9, 265 – 341.

Giles, J.A. and Williams, C.L. (2000b) Export-led growth: a survey of the empirical literature and some non-causality results, part 2. *Journal of International Trade and Economic Development*, 9, 445 – 470.

Granger, C.W.J. (1969) Investigating causal relations by econometric models and cross spectral models. *Econometrica*, 37, 424 – 438.

Granger, C.W.J. (1988) Some recent development in a concept of causality. *Journal of Econometrics*, 39, 199 – 211.

Johansen, S. (1988) Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control*, 12, 231 – 254.

Kónya, L. (2006) Exports and growth: Granger causality analysis on OECD countries with a panel data approach. *Economic Modelling*, 23, 978 – 992.

Lai, Y.W. (2004) The role of domestic demand in the economic growth of Malaysia: a cointegration analysis. *International Economic Journal*, 18, 337 – 352.

Liu, X., Haiyan, S. and Romily, P. (1997) An empirical investigation of the causal relationship between openness and economic growth in China. *Applied Economics*, 29, 1679 – 1687.

Mookerjee, R. (2006) A meta-analysis of the export growth hypothesis. *Economics Letters*, 91, 395 – 401.

Palley, T.I. (2002) A new development paradigm: domestic demand-led growth. *Discussion Paper, Foreign Policy in Focus, Albuquerque, New Mexico*.

Pesaran, M.H., Shin, Y. and Smith, R.J. (2001) Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16, 289 – 326.

Phillips, P.C.B. and Perron, P. (1988) Testing for a unit root in time series regression. *Biometrika*, 75, 335 – 346.

The World Bank (1993) The East Asian miracle: economic growth and public policy. *A World Bank Policy Research Report*.