

Impact of openness, economic policy reform and regional shocks on trade and growth of Thailand: An econometric study

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Abstract: Thailand has currently enhanced and promoted intensive trade and investment liberalization and implemented long-term growth policy according with current regional economic integration, WTO obligations and globalization. Nevertheless, several recent internal and external factors e.g. the massive SARS and avian flu outbreaks, the Indian Ocean tsunami devastation, the Asia financial crisis and domestic policy reforms (ICSEAD, 2006) have also impeded this policy. While the issues are important for Thailand and developing countries in Asia, only limited research has been undertaken to investigate them. The paper conducts a substantive quantitative study to contribute to these trade and development policy issues. A new econometric modelling policy method, namely the generalized gravity theory (Tran Van Hoa, 2004) is used to develop a simple flexible simultaneous-equation econometric model of Thailand's openness model with its seven major trade partners (ASEAN-4, Australia, the USA, the EU, China, Japan and India). Using data from the ICSEAD, the World Development Indicators and the Bank of Thailand databases, the paper reveals efficient and reliable empirical findings on trade-growth causality, trade determination including the impact of shocks and policy reform on trade and growth between Thailand and its major trade partners over the past two decades. The paper also provides evidence on the linkages between trade in goods, FDI and services and regional economic integration for more credible policy implications.

Key words: trade and investment liberalization; regional economic integration; free trade agreements; trade and growth causality; generalized gravity theory; modelling economic and trade policy

1. Introduction

Asian developing economies have recently intensive implemented trade liberalization policies to promote growth under the multilateral, regional and unilateral frameworks. Thailand is one of these economies achieving miracle in the past two decades. Nevertheless, many challenges consisting of the global economic recession, the Asian financial crisis as well as the SARS and avian flu outbreaks and the Indian Ocean tsunami affect the economy performance of Asia developing economies including Thailand. The development and growth perspective for Thailand in response to and consequences of these internal and external shocks combining with structural or policy reform particularly Thailand's trade and economic relations or co-operations in medium and long term is interested to examine.

The paper undertakes an empirical study utilizing trade-growth time series modelling analysis. The plausible policy implications and recommendations are also proposed. This paper is time series quantitative and

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policy-based study. It contains many important features. Firstly, it reviews current trade liberalizations in the context of multilateral, regional and unilateral frameworks as well as regional economic integration and closer economic relations of Thailand and in the Asian region. Secondly, it proposes and formulates the concept of trade-growth by constructing a plausible and flexible the simultaneous-equation econometric model of trade and growth and trade between Thailand and its seven major trading countries and blocs namely the ASEAN-4, Australia, China, the EU, Japan, India and the USA. Thirdly, the model incorporates the crisis and shocks and policy reforms affect the growth of Thailand. Fourthly, the recent ICSEAD, World Bank and IMF data is used to estimate the model. According to the reliable causality results on trade-growth and the impact of structural changes and shocks on the economy of Thailand in the past two decades, as a result, the discussion of economic and trade policy implications based on the findings are included in the paper.

2. Thailand's recent economic and trade development

The GDP increased gradually from 2,941.74 billion of baths in 1995 to 3,072.61 billions of baht in 1997. However, the GDP decreased significantly to 2,871.98 billions of baht in 1999 due to the Asia economic crisis. The international reserve decreased sharply from 46.5 billions of US dollars in 1995 to 23.1 billions of US dollars in 1997 because of the intensive currency attack beyond the Asia financial crisis. Nevertheless, the international reserve continually increased from 34.8 billions of US dollars to 52.1 billions of US dollars due to the increased balance of payment and the recovery economy between 1999 and 2005. The huge slow down of the exports resulting in the current account balance deficit was about 13.2 billions of US dollars in 1995. The current account deficit decreased to about 3.1 billions of US dollars and then significantly increased to more surpluses to 11.3 billion of dollars in 1999. On the contrary, there was a current account deficit of 3.7 billions of US dollars again in 2005. The balance of trade was fluctuated between 1999 and 2005 from surplus of 8.9 billions of US dollars to deficit of 8.6 billions of US dollars. The balance of payment was surplus of 7.2 billions of US dollars in 1995. There was a considerably balance of payment deficit of 10.6 billions of dollar in 1997. The balance of payment was obviously fluctuated from surplus of 4.6 billions of US dollars in 1999 to surplus of 5.4 billions of US dollars in 2005.

The inflation rate decreased slightly from 5.8% in 1995 to 5.65% in 1997. The inflation rate fluctuated gradually to 0.2% and 1.6% in 2003 and 2005 respectively. In contrast, total debt outstanding increased significantly from 100,039 millions of US dollars in 1995 to 109,276 millions of US dollars in 1997 due to the Asia financial crisis and baht devaluation. However, the total debt continually decreased to 52,040 millions of US dollars in 2005 because of the payment of the IMF loan. The average exchange rate was 24.9 bath per US dollar and depreciated to 31.2 baht per US dollar due to the Asia financial crisis and the manage float system. There was peak depreciation to 45 baht per US dollar in 1999. In 2005, the bath was appreciated to 40.3 baht per US dollar. There was 3.8% of unemployment rate in 1995 and increased considerably to 5% in 1997.

There are many reasons to explain the motivation of the WTO membership for Thailand consisting of improving and harmonizing the tariff system, improving and expanding market access in the potential member countries (WTO, 2000). Since 1995 the Thai government has implemented several obligations of the WTO to reduce and eliminate the market access barriers. However, there are a few quantitative restrictions exists in the agriculture, textile and clothing sectors. Thailand has achieved many successes in trade policy reform to promote trade and the economic cooperation due to the WTO membership, such as the tariff and non-tariff barriers

elimination negotiation, regional trade liberalization and harmonization in the issues of standards and regulations. From 1960s and 1970s, the import substitution policy was adopted to accelerate industrialization. Since 1980s, trade policy has been shifted to export promotion policy because of the economic recession and intense competition environment. Several regimes have been implemented to enhance growth and increase export competitiveness. The industries produce over domestic demand goods has motivated to invest in industrial processing zones for export markets.

From late 1980s to 2000s, the export promotion policy was still the dominant. This policy was adapted more intensively to solving the balance of payment crisis leading to the Asia financial crisis in 1997. The industrialization structure adjustment was implemented to support high quality goods including processed agricultural and manufactured goods. The labor skill development institution was established to increase the skills of labor supporting this policy. The severe competition and the increasing of trade blocs influence the implementation of the FTAs regime. As a result, the regional and bilateral FTAs were the important policy commenced in 2001 to expand high potential markets and increase trade partners.

Presently, it can be said that Thailand has the most ambitious in the region due to its intensive efforts to increase its world export market share through the establishing of both regional and bilateral free trade agreement (Tulyanond, 2005). Free trade agreement with India encompasses only 83 products while with Australia consists of more than 5,500 items and became effective on January 2005. The free trade agreement with Australia is the most comprehensive agreement. The key of the success is the achievement of the extensive market access that each country will afford via intensive tariff reductions. On the other hand, free trade agreements with New Zealand, the United States and Japan are under the negotiating processes. The agreement with the U.S. confronts with many difficulties because it relates with non-trade related issues. These issues consist of corruption, competition policy and government procurement that impede the negotiation process.

The apparently most serve external shock in the region is the Asia financial crisis commenced in Thailand in July 1997. This crisis spread widely and has domino affect on the economy performance of the region. During the late 1980s until the early 1990s, Thailand has liberalized its capital account flow by less restrict and removed barriers on the inflow and outflow of capital via the implementation of the Bangkok International Banking Facility scheme (Phongpaichit and Baker, 2000). Thai commercial banks including firms borrow huge fund from external sources due to the high different interest rates. These foreign funds are invested mainly in the stock market to seeking the benefits from high return. This is the main factor to drive Thailand known as one of the emerging market.

Moreover, the commercial banks and financial firms misuse the foreign short-term borrowings by lending to long-term unproductive projects e.g. real estates. In addition, the credit allocation of these financial institutions is undertaken and determined under insufficient prudential risk assessment resulting in the surged increase in outstanding non-performance loans (NPLs). In May 1999, NPLs of total commercial bank credits reached 47.7 percent (Phongpaichit and Baker, op. cit., 2000). The economic expansion is distorted because of the commercial banks and other financial institutions are unable to inject more credit to the economy. The Thai baht is also attack and speculate intensively simultaneously due to the currency overvaluation.

According to the unprecedented capital outflow combining with trade deficit, the unexpected twin balance of payment deficit, trade and capital account deficit. Besides that, the total outstanding foreign debt of both government and private sector jump up bloody. The Bank of Thailand loses massive international reserves intervening the exchange market to protect the baht attack and speculation. Therefore, it is unavoidable for

Thailand to abandon the fixed exchange rate regime and adopt the managed float system. Several export industries detract and become uncompetitive leading to the huge decrease in export shares and earnings. The high foreign indebt finance companies and commercial banks become insolvency and bankrupt.

The financial institution and system play vital role in enhance the economy performance. During the last decade, apparently dominant domestic reforms are financial sector reforms. The financial reforms have been implemented mainly by the urgent needs of crisis resolution and force the economy back to normal performance situation. High growth and emerging economy of Thailand is driven by the high growth of financial sector (Menkhoff and Suwanaporn, 2007). However, the fragile, unwell planned development and inappropriate functioning of financial sector accelerate the attack of financial crisis began in July 1997.

It can be said that the crises, shocks and policy reform have significant impact on trade and growth for a small developing economy like Thailand. These obstacles can distort the expected benefits from trade liberalization and economic cooperation to member countries. However, the existing methodologies have been currently undertaken in this field of study such as the computable general equilibrium (CGE), the global trade analysis project (GTAP) and the standard gravity theory (GT) are both unable and inappropriate to examine this effect in time series data perspective. In this study, the appropriate and flexible approach with the concept of trade-growth causality time series is conducted to examine the realistically and accurately impact of crises, shocks and policy reform on trade and growth, closer regional economic relations and FTAs for Thailand.

3. FTAs, AFTA and gravity theory

Trade liberalization is the primary objective of FTAs. Moreover, the welfare improvement and mutual economic growth are also regarded as the other important goals of FTAs. To reach this point, it is needed to assurance the causality effect of trade on economic welfare and growth (Tran Van Hoa, 2004). There are other mutually beneficial outcomes in several non-economic perspectives e.g. closer regional and global cooperation as well as stimulating the competitiveness contributing to more realistically regional and global economic integration.

The trade policy of AFTA was first drafted by the ASEAN Declaration of 8 August 1967. This declaration aimed to stimulate economic growth in the region via trade policy and other various economic cooperation schemes. The intensive framework to enhance the ASEAN economic cooperation was developed in the Fourth ASEAN Summit in Singapore in January 1992 through the AFTA. In November 2004, the Tenth ASEAN Summit was held in Vientiane, Laos. The implementation period of the Vientiane Action Program (VAP) is between 2004 and 2010. The ASEAN Investment Area (AIA) is the important vision of the ASEAN to stimulate investment liberalization and facilitation. The cooperation policies have been launched to increase the efficient of trade in goods, services and other aspects.

High tariffs were in the domestic meat and dairy, fruit and vegetable, sugar, beverage and tobacco manufacturing industries. Thailand did not apply quantitative restrictions on agriculture food imports; many of the tariff quotas established under the Uruguay Round were not used in practice to restrict imports; instead, lower or zero duties were frequently applied when imports of the products concerned were needed for the domestic processing industries. For the few products whose importation was impeded by high tariffs, partners to the AFTA had unlimited access to market of Thailand as of 2000 at rates not exceeding 20% thereby generating substantial pressure on certain domestic agriculture food sectors. The textiles and clothing industry provided an example of

the recent tariff instability in the manufacturing sector, causing unpredictability for importers. Thailand did not protect its textile and clothing industry with import quotas; however, quantitative restrictions and safeguards in export markets substantially restricted its exports (Nagai, 2004).

4. Review literature

A common characteristic discussed in most of current literature is trade liberalization causes economic growth particularly in developing countries. According to Gilbert (2000), it is claimed that, based on an endogenous growth model trade policies have significant effects on growth rate. In this study, natural trade was constructed apart from openness policies. It can be concluded that natural trade that is the proportion of imports and exports to GDP and openness policies are good complementary determinants of growth. Nowak (2003) notes that trade openness are catalyst of output and total factor productivity growth. The linkage between trade openness, capital accumulation and output growth was tested upon this study to support this conclusion.

At the regional level, Kohpaiboon (2003) highlights the effect of trade policy regimes in conditioning the impact of foreign direct investment (FDI) on growth in host country in Thailand. It is found that the impact of FDI on growth will be greater if the host country implements an export oriented policy comparing to an import substitution policy. Tran Van Hoa (2004a and 2004b) provides an empirical evidence to support the claim that trade; crises and policy reform affect growth. A simultaneous-equation econometric model of growth and trade of China and its five major partners was constructed to examine this relationship supported by the GGT. Romalis (2005) suggests that trade liberalization carried out by large trading partners' leads to trade expansion in other countries inducing by providing the greater market access. This claim was supported by an empirical analysis using tariff barriers of the USA as an instrument of developing countries' openness.

At the national level, only a few studies have concentrated on trade liberalization and growth in Thailand and in an enlarged ASEAN context. There are gaps in the knowledge in terms of how the recent developments in global economic integration and regional FTAs in Asia have affected openness policy implementation in Thailand. Furthermore, the literatures does construct and not estimate an econometric model of openness, trade and growth policy of Thailand and extend it to an enlarged ASEAN context and propose appropriate and plausible policy implications from the findings.

5. Trade-growth model to study the impact of shocks and policy reform on Thailand's trade and growth

As a novel methodology for our study and also based on related previous studies and the contributions of the study, the impact of openness on trade and growth and the generalized gravity theory (GGT) (Tran Van Hoa, 2002, 2004a and 2004b) can be linked by two simultaneous implicit functions for trade and growth to be estimated. As a result, the model of Thailand's openness can be described as follows.

The estimated model that consists generically of 2 equations can be written in mathematically arbitrary form as:

Equation 1: Trade-Growth Equation

$$Y=f(T, CS) \quad (1)$$

Where growth (Y) is defined as GDP, T is defined the as degree of trade participation or density which is measured from the exports plus imports value of goods excluding services, and CS is defined as internal or

external crises and shocks or policy reform. Based on this equation, the relationship between openness, trade and growth is examined through the operation of the variable T according to the traditional trade theory. Under this aspect, the specialization and competitiveness of production of goods that possess the comparative advantages leads growth (Appleyard and Field, 1998).

Equation 2: Trade Equation

$$T=f(Y, X, TH, Z, CS) \quad (2)$$

Where T is defined as the exports plus imports value of goods. X is defined as other economic variables (fiscal, monetary, trade and industry policy) whereas Z is defined as non-economic variable e.g. economic size. Thus, in our study, the conventional trade equation is extended in the case of Thailand by including the other variables that affect Thailand's trade and growth (TH). These variables are FDI and trade in services. These economic and non-economic variables are associated with the countries' development and growth (Johansen, 1982; Romer, 1993; Frankel and Romer, 1999; Rose, 2000; Otto, et al., 2002; Tran Van Hoa, 2004a and 2004b).

The two-equation model above assumes essentially that Thailand's multilateral, regional and bilateral trade (T) with its trading partners cause Thailand's growth (Y). However, this trade (T) is also affected by its partner's GDP and other economic and trade-related activities (Cope and Helpman, op. cit.) and internal and external shocks and policy reform in Thailand and in its trading partners (Tran Van Hoa, op. cit.). Therefore, these variables are significant and necessary to include into the model.

6. An empirical estimation of the trade-growth model incorporating FDI and services

The extended relevant model to implement the empirical study on the possible causality impact between Thailand's openness and growth can be explained by following two-equation simultaneous model can explain its major partners or blocs on growth. This two-equation simultaneous estimated model can be written in stochastic and rate of change (Δ) forms (Allen, 1960; Tran Van Hoa, 2004a and 2004b for the proof of the derivation) by the following:

$$\Delta Y = \chi_1 + \chi_2 \Delta T + \chi_3 CS + \varepsilon_1 \quad (3)$$

$$\Delta T = \eta_1 + \eta_2 \Delta Y + \eta_3 \Delta X + \eta_4 \Delta Z + \eta_5 CS + \varepsilon_2 \quad (4)$$

It can be seen that equation (3) and (4) are linear, interdependent. Both circular and instantaneous causality can be observed in these equations.

In order to estimate and implement the model which is equation (3) and (4) to explore the trade and growth causal relationship between Thailand and selected enlarged markets, the geographical elements (distance and area) can be fixed; population can be the proxy for economic size, conventional economic determinants and other associated factors can be used (Johansen, 1982; Frankel and Rose, 1998; Frankel and Romer, 1999; Rose, 2000; Tran Van Hoa, 2004a and 2004b).

The extended GGT model (that is the GGT model with Thailand's special structural and development characteristics) is used to examine the impact of trade liberalization with Thailand's selected ASEAN and other trading markets in an enlarged ASEAN on Thailand's growth can be expressed both in the structural equation (5) and the reduced form (6) supported by the followings structural and reduced equations (Johansen, 1982; Barro and Helpman, 1991; Coe and Helpman, 1993; Romer, 1993; Frankel and Romer, 1999; Rose, 2000; Otto, et al., 2002; Tran Van Hoa, 2004a and 2004b).

$$\Delta Y = \alpha_1 + \alpha_2 \Delta T + \alpha_3 \Delta FDI + \alpha_4 \Delta SER + \alpha_5 CS + \varepsilon_1 \quad (5)$$

$$\Delta T = \beta_1 + \beta_2 \Delta YT + \beta_3 \Delta FP + \beta_4 \Delta MP + \beta_5 \Delta IN + \beta_6 \Delta TE + \beta_7 \Delta IS + \beta_8 \Delta POP + \beta_9 CS + \varepsilon_2 \quad (6)$$

From the above, it can be said that Thailand's trade (T) with its multilateral, regional and selected bilateral FTAs comply with external crises and shocks and foreign direct investment (FDI) and trade in services (SER) cause Thailand's growth (Y). However, this trade (T) is also affected by its partner's GDP and other economic and trade-related activities (Cope and Helpman, op. cit.) or internal or external shocks or policy reform in Thailand and in its trading partners (Tran Van Hoa, op. cit.).

As a result, it can be implied from the reduced form of equation (6) that trade of Thailand's partners is affected by various exogenous factors such as GDP (YT), inflation (IN) – see Romer (1993), fiscal policy (FP), monetary policy (MP), trade policy and exchange rate (TE) – see Rose (2000), industry structure (IS) – see Otto et al. (2002), population (POP) – see Frankel and Romer (1999) and internal or external shocks or policy reform – see Johansen (1982) and Tran Van Hoa (2004a and 2004b) – of Thailand. CS is defined as the qualitative time-series data dealing with external shocks and policy reforms resulting in the temporally and permanent effects on trade and growth.

The estimated model for intra-ASEAN regional and bilateral trade-growth for Thailand trading partners used in this study can be obtained from the two-simultaneous equations above, equation (5) and (6). Consequently, these equations can be rewritten to estimate and for impact analysis as:

$$\Delta YTH = \alpha_1 + \alpha_2 \Delta TASY + \alpha_3 \Delta FDIY + \alpha_4 \Delta SERY + \alpha_5 CS88 + \alpha_6 CS97 + \alpha_7 CS02 + \varepsilon_1 \quad (7)$$

$$\Delta TASY = \beta_1 + \beta_2 \Delta YAS + \beta_3 \Delta GBY + \beta_4 \Delta MSY + \beta_5 \Delta RT + \beta_6 \Delta IN + \beta_7 \Delta EX + \beta_8 \Delta UN + \beta_9 \Delta POP + \beta_{10} CS88 + \beta_{11} CS97 + \beta_{12} CS02 + \varepsilon_2 \quad (8)$$

In deriving equations (7) and (8) for 2 trading countries or blocs, it is assumed that country 1's trade affecting its growth and this trade itself is essentially a demand equation for either imports from country 2 or exports to country 2 or vice versa or both are testable hypotheses. Where in terms of the rates of change, YTH is Thailand's GDP, TASY is selected ASEAN-4's (Indonesia, Malaysia, Philippines and Singapore) total trade (imports plus exports) to Thailand divided by Thailand's GDP, GBY is government budget divided by GDP, YAS is ASEAN-4's GDP. FDIY is total inward foreign direct investment and SERY is total services. These variables are also divided by Thailand's GDP. All variables in the model excluding dummy variables are expressed in rates of change form so the measurement units for trading countries' variables are irrelevant.

The variables GBY, MSY, RT, IN, EX, UN and POP denoted for respectively fiscal and monetary policy, interest rates, inflation, exchange rates, industry policy, Thailand's population. The ε 's are the disturbances representing other unknown factors but with effects on YTH and TASY respectively (see Frankel and Romer, 1999). CS is a qualitative time-series variable representing internal or external shocks having either temporally or permanently effects on trade and growth with discrete values. The total trade of all these partners divided by Thailand's GDP is used in the multilateral trade model. The other selected Thailand's FTAs estimated are consisting of Thailand-USA, Thailand-EU, Thailand-China, Thailand-Japan, Thailand-India and Thailand-Australia. The trade-growth models for these multilateral and selected bilateral trades are constructed similarly.

Most of obtained data is annually and ratio transformation is employed. Trade (imports plus exports), government budget and money supply (M2) are divided by GDP. Unemployment rates are defined as open unemployment divided by labor force. All trade and economic data used in the study are at current prices in dollars. Besides that, three internal and external crises and shocks are determined which including the capital flow liberalization of 1988 (CS88), the Asia currency and financial crisis of 1997 (CS97) and the financial institutions

policy reforms of 2002 (CS02).

The empirical finding implications of the above model can be used to study the relationship or transmission mechanism including the linkages between Thailand's growth and trade with its major trading partners. Besides that, this empirically supported relationship can be regarded as the evidence to propose the enhancement of trade, services and investment from trade liberalization for Thailand in the context of regional and bilateral FTAs. The implications for Thailand's trade and closer economic relation policy are also proposed based on the empirical findings.

7. An econometric findings on Thailand's trade with its major partners and Thailand's growth and the interpretation of the main estimation results

This part describes the final and preferred empirical findings for 8 models including total, regional and bilateral trade-growth models and base on equations (7) and (8) in the previous section for Thailand and its seven major trading partners and blocs are given in the following tables. These final and preferred estimated models are developed and tested by preliminary incorporate the expected dummy variables affecting growth such as the WTO membership and the village-funding scheme. It is found that these dummy variables give both unexpected and insignificance in some models resulting in the omission of these dummy variables in the final and preferred models. These bilateral FTAs or trading blocs consist of Thailand-ASEAN (4), Thailand-USA FTA, Thailand-EU proposed FTA, Thailand-China FTA, Thailand-Japan FTA, Thailand-India FTA and Thailand-Australia FTA. The ASEAN-4 consists of Indonesia, Malaysia, the Philippines and Singapore. Because of the importance of the estimation methods employed that lead to different results despite the same model and data used in the process. Consequently, two techniques have been used to for each model based on the aim of statistical efficiency comparison. These are consisting of the OLS and 2SLS (an IV) as well as the cases of without FDI and services, with FDI and with both FDI and services respectively. The 2SLS (an IV) is used to obtain the better results for the comparison perspective.

Table 1 Estimation results of the national GDP and openness with FDI and services between 1984 and 2005 for regional and bilateral trade

Models/Methods	Thailand-ASEAN4		Thailand-Australia		Thailand-China		Thailand-EU	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
Variables								
Constant	7.059	6.666	8.388**	9.488**	5.581	4.562	6.649	6.822
Openness/GDP	0.158	0.236	-0.057	-0.176	0.069	0.010	0.230	0.197
FDI/GDP	-0.004	0.000	-0.003	0.019	-0.012	-0.012	-0.032	-0.029
Services/GDP	-0.179	-0.191	-0.177	-0.220	-0.077	-0.042	-0.166	-0.165
Capital liberalization 1988	8.382*	8.303***	7.936	6.684	9.860**	10.450**	9.763***	9.587*
Asia crisis 1997	-23.654***	-23.941***	-21.933***	-19.582***	-24.235***	-24.755***	-24.155***	-23.999***
Financial reforms 2002	19.065***	19.434***	17.866***	16.933***	19.412***	19.902***	21.052***	20.657***
R ²	0.629	0.623	0.616	0.561	0.639	0.632	0.619	0.619
Adjusted R ²	0.481	0.472	0.463	0.386	0.495	0.485	0.467	0.466
F-VALUE	4.244	4.128	4.019	3.688	4.431	4.375	4.066	4.020
S.E.	8.635	8.708	8.783	9.395	8.518	8.603	8.752	8.756
DW	1.978	2.161	1.551	1.512	1.812	1.901	1.834	1.810
Models/Methods	Thailand-India		Thailand-Japan		Thailand-USA			
	OLS	2SLS	OLS	2SLS	OLS	2SLS		

(to be continued)

Variables							
Constant	7.792*	7.881*	7.523**	7.571**	7.849*	7.815*	
Openness/GDP	0.026	0.024	0.395***	0.377***	0.003	0.024	
FDI/GDP	-0.012	-0.010	-0.023	-0.022	-0.014	-0.016	
Services/GDP	-0.178	-0.190	-0.260	-0.260	-0.157	-0.163	
Capital liberalization 1988	8.471*	8.406*	7.176*	7.530*	8.547*	8.567*	
Asia crisis 1997	-23.461***	-23.475***	-22.982***	-23.876*	-23.096***	-23.234***	
Financial reforms 2002	19.031***	19.554***	20.456***	20.920*	18.366***	18.660***	
R ²	0.608	0.608	0.737	0.735	0.604	0.603	
Adjusted R ²	0.451	0.441	0.631	0.630	0.445	0.444	
F-VALUE	3.871	3.618	6.991	6.990	3.806	3.803	
S.E.	8.885	9.184	7.280	7.295	8.931	8.935	
DW	1.854	1.838	2.451	2.409	1.694	1.705	

Notes: *** Significant at the 5% level; ** Significant at the 10% level and * Significant at the 15% level.

Data sources: *World Development Indicators Database*, World Bank (2004) and *ICSEAD Database* (2004).

From Table 1, it can be noted the important following findings. First, while having high success in modelling output growth as defined by change in GDP is difficult, the estimated model of Thai growth via each trading partners has considerably high modelling performance that is R² reaching up to almost and more than 60 percent in almost estimated models and especially more than 70 percent for Thailand and Japan model. Second, when considering the dynamic features of this estimated model using graph plots and Durbin-Watson statistics, it can be observed that there is no serious first or higher autocorrelation attitude. Third, openness as defined by total trade/GDP in case between Thailand and Japan has positive and significant impact. For other models, the openness has positive but insignificant impact except Thailand and Australia model has negative but insignificant impact. In the case of Thailand and India model, the openness is positive in OLS and negative in 2SLS but insignificant impact. FDI has both positive and negative but insignificant impact in all estimated models. Similarly, services are negative but insignificant in all estimated models. Finally, the combination of three crises and shocks into the model reveals the different results. The financial crisis of 1997 has the obviously negative and significant impact whereas the capital liberalization and financial institutions and system reforms policies have considerably positive and significant impact on the economic performance of Thailand in the estimated period in all models.

The modelling performance is highest for the Thailand-Japan and Thailand-China respectively in terms of R², adjusted R², sum squares of errors and the Durbin-Watson statistics. The Durbin-Watson statistics is high enough to conclude that the serious first or higher autocorrelation induce does not exist in all estimated models. Second, the estimation result of independent variables is different in each model. As a result, it can be described by the followings. It is found that openness is positive and significant impact in the case of total trade model and bilateral trade model of Thailand-Japan FTA. In regards to the FDI and services are both positive and negative but insignificant in all estimated models. Finally, it can be seen that crises and shocks contribute the different impact on the economic performance of Thailand during the period of study in all models. The Asian financial crisis of 1997 is apparently and considerably negative and significant impact as the origin of contagion effects in the region. On the other hand, the capital flow liberalization of 1988 and the financial institutions and system reform policies of 2002 are obviously positive and significant on the economic performance and recovery of Thailand in the entire estimated period.

The economic interpretation regards to the main estimation results in the previous part can be discussed by the followings. The structure GGT models used for Thailand's openness model in this study consisting of both the main and conventional components of the determinants and relationship between trade and growth. Consequently, these major components and relationship can be examined for the 8 countries and blocs under this research. In regard to comparative aspect, the estimation results of GGT models are fairly compatible with other similar previous studies of different methods of trade-growth studies such as the CGE, the GT or other quantitative trade-growth studies. The empirical findings on trade-growth correlation that trade has been broadened by incorporating services and investment as well as the impact of crises, shocks and policy reform explained contribute to several new and interesting economic interpretations.

The findings can also be seen as the empirical support or rejection of these current trade liberalization policy negotiation and implementation initiatives of Thailand under the multilateral, regional and bilateral contexts. Moreover, these findings can be attributed to the important, credible and practical implications and recommendations for creating FTA and related economic cooperation dialogues according to the keen interesting of Thailand.

With regarding to empirical results show that trade with its global trading partners as defined by the relative openness size to its GDP, only in the specific case of multilateral and bilateral with Japan have a gradual support in term of statistically significant and Thailand's growth beneficial determinants. Besides that, according to the empirical findings, Thailand gains most from its bilateral trade with Japan. This result can be strongly supported by the fact that trade value and volume with Japan is the highest comparing to other trade partners in this study. This claim can be linked to the priority setting consideration of trade and economic cooperation for policy makers in Thailand to gain the mutual benefits from Thailand-Japan FTA. In addition, it can be said that trade is the essential key drivers for the Thai economy in current decades (NESDB, 2005).

More specifically, it can be said that trade liberalization benefits Thailand most in term of bilateral Thailand-Japan FTA. The positive and significant impact of openness can be explained by the generalized gravity theory due to the geographical distance, location and transportation cost advantage and economic size of Japan. As a result, the negotiation and implementation of Thailand-Japan FTA including other trade related and economic cooperation issues should be set in the top priority.

The combination of trade in goods, services and investment is the dominant feature of this study. Both services and investment have negative but insignificant impact. These findings can be attributed to the volatility and small proportion of GDP during the estimation period and inward FDI is mainly to the manufacturing sector. The impact of inward FDI on GDP manufactured can be observed more clearly than on total GDP. Nevertheless, not only trade in goods but also trade in services and investment can be regarded as the important elements of nearly all current FTA negotiations coverage to enhance the economic performance of Thailand and other partners of the FTAs. Additionally, the effort to include the framework of competition law and policy to accelerate trade in services and investment has strongly undertaken in almost all recent FTAs (Tran Van Hoa, 2004).

The other important feature of estimated GGT models in this study is the specification and combination of shocks, crises and policy reform variables. These variables contain sudden or gradual with short-term and long-term effects that can not be observed this feature in other related methods and the CGE model e.g. The GTAP and the GT. First is the capital liberalization of 1988 resulted in freer borrowing from abroad mainly by several financial institutions. Second is the Asia financial crisis of 1997 commenced in Thailand in July 1997 resulting in the floating of Thai baht and contagion effect spread to other countries in the region. Third is the financial

institutions and system reform of 2002 to strengthen the fragile financial institutions and system of Thailand and to protect the crisis reoccurrence.

According to the empirical findings, it shows that the capital liberalization of 1988 can be considered as essential and significant benefits policy reform for economic performance of Thailand in nearly all GGT models. This can be explained that Thailand received extremely huge portfolio investment inflows and bank loans in the late 1980s because of large interest rate between onshore and offshore markets resulting in the expansion of credit and investment. The Asia financial crisis of 1997 had obvious massive damage impact on economic performance of Thailand in all GGT models. The financial institutions and system reform has obvious positive and significant impact on Thailand's economic performance. This finding can be contributed to establish of the Thai Asset Management Corporation (TAMC) to manage, restructuring and solve the debts particularly NPLs. As a result, the external debts declined to 36 per cent in 2003 (ICSEAD, 2003).

8. The modelling reliability

The explanation of modelling reliability is included in this section. To complete this task for trade-growth model in a simultaneous-equation context, it needs to calculate the reliable proxy for T from its reduced form for each of the estimations. The standard evaluation criteria including the correlation coefficient, the root mean square errors (RMSE) and the Theil Inequality Coefficient decompositions, namely Um (bias), Us (variance), and Uc (covariance) are calculated to evaluate the proxy performance of T comparing to its actual T in each estimated GGT model.

Table 2 Reliability of trade in goods in models on Thailand's trade with its major trading partners, openness/GDP, 1984 to 2005

Model	Total trade	Thailand-ASEAN (4)	Thailand-Australia	Thailand-China
Correlation coefficient	0.879	0.840	0.741	0.805
RMSE	2.040	1.184	1.166	0.873
Mean error	1.615	0.940	0.899	0.707
Um	0.000	0.000	0.000	0.000
Us	0.005	0.003	0.005	0.002
Uc	0.995	0.997	0.995	0.998
Model	Thailand-EU	Thailand-India	Thailand-Japan	Thailand-USA
Correlation coefficient	0.853	0.117	0.890	0.253
RMSE	1.981	20.635	3.640	9.191
Mean error	1.597	16.811	2.870	7.146
Um	0.000	0.000	0.000	0.000
Us	0.007	0.147	0.026	0.127
Uc	0.993	0.853	0.973	0.873

Notes: $Um+Us+Uc=1$ (See Pindyck and Rubinfeld, 1998). The estimates are based on E-views calculation.

From the Table 2, it can be said that the proxy for T is very good estimated to T in all models excluding Thailand-India and Thailand-USA models. The correlation coefficients of all models except these two models are apparently higher than 70 per cent up to nearly 90 per cent for Thailand-Japan model. The calculated RMSE, mean error and the bias, variance and covariance are gradual except for the Thailand-India and Thailand-USA models. Consequently, these empirical findings can be used to support the robustness and reliability of estimation results by the OLS and 2SLS (IV). Furthermore, these empirical results can also be used as the guidelines to

propose the credible policy implications and recommendations in the proceeding section.

The next step to complete the estimation results interpretation is to compare the actual trade flows and their estimates from the estimated GGT models. The results of this procedure can be shown and explained by the following figures.

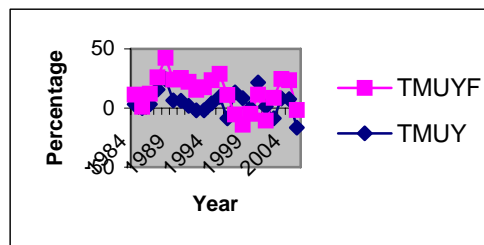


Fig. 1 Multilateral trade

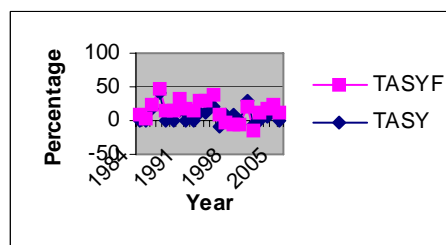


Fig. 2 Thailand-ASEAN (4) regional trade

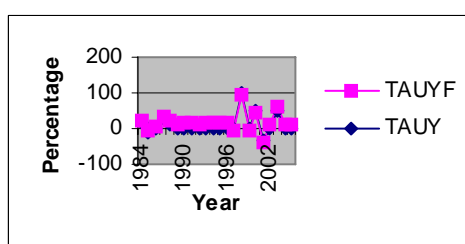


Fig. 3 Thailand- Australia bilateral trade

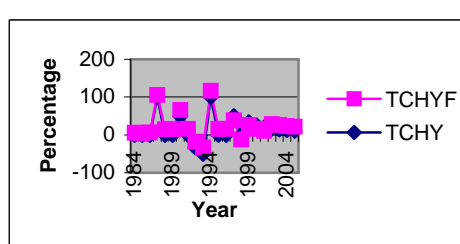


Fig. 4 Thailand-China bilateral trade

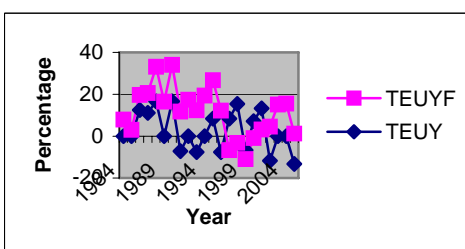


Fig. 5 Thailand-EU trade

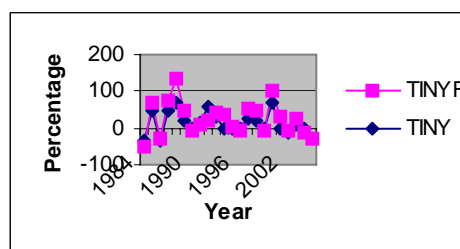


Fig. 6 Thailand-India bilateral trade

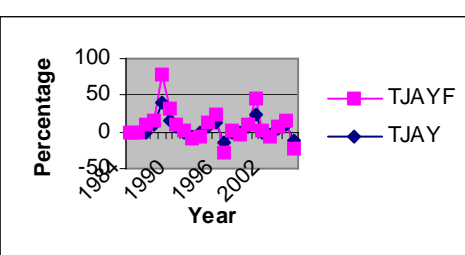


Fig. 7 Thailand-Japan bilateral trade

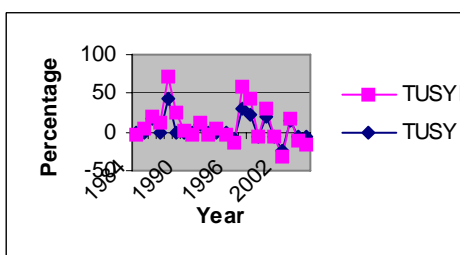


Fig. 8 Thailand-USA bilateral trade

The figures of actual and trade flows and selected trading partners and their estimates from estimated GGT models can be plotted by Figure 1 to Figure 8. It can be seen that the using of new modelling flexible approach of simultaneous-equation and functional free GGT approach, the estimated proxy for T apparently imitates all troughs, peaks and turning points of the actual T in nearly all models especially bilateral trade models between Thailand and Australia, Thailand and China, Thailand and Japan. The other important aspect of this property is

expressed in term of rates of changes of changes of economic variables leads to its modelling success.

9. Concluding remarks and suggested future research

To summary, this modelling and policy based study is carried out to strongly support the claim that trade liberalization and openness is an essential engine of growth for developing countries. The application of extended GGT model included the crises; shock and policy reform of Thailand and its major trade partners and blocs is estimated. From the implication perspective, it is strongly suggested that Thailand has to implement trade liberalization according the multilateral, regional and unilateral contexts. Thailand has to collectively and mutually more intensive cooperation with other developing countries to raise bargaining power to reap the more benefits and guaranteeing the fair regulations of the next negotiations in terms of the new issues such as services, investment, intellectual property rights, competition policy, anti-dumping and countervailing duties and labor and environment standards.

In regard to the unilateral trade liberalization, the inward-oriented policy has been replaced by intensive export-oriented policy in 1980s due to the ineffectiveness of the former during the last two decades (Akraanee, et al., 1991). The high tariff rates in most import categories are decreased massively especially the raw materials and intermediate products including the semi-manufactured products using the finish manufactured products production. The non-tariffs barriers subjected to both imports and exports are also more alleviated.

The domestic policy reforms are mainly motivated by the urgent crisis solution requirement. To recovery the economy, the financial institution and system is the top priority sector needed to restore. The FIDF and TAMC have been built up to solve the serve NPLs problem of this sector via debt restructuring. Most of other neighbors in Southeast Asia request the assistance packages from the IMF including Thailand due to the rapidly contagion effect.

The recommendations can be proposed apart from the above implications. For Thailand, as small developing countries, the effective outward-oriented as well as the trade and investment liberalization schemes are necessary to enhance long-term growth and competitiveness. Thailand has switched from inward-oriented toward an obvious intensive outward-oriented trade policy last two decades and currently deals with negotiating and implementing many bilateral FTAs with both inside and outside the region. As a consequence, it is very essential for economic and trade policy makers to recognize and implement this policy to enhance growth and competitiveness in the long run. Therefore, it is need to guarantee the possible mutual benefits from multilateral, regional and bilateral trade liberalization implementation to the economy. More specifically, the bilateral trade liberalization must be the building blocks to regional and multilateral trade liberalization to reach this ultimate preferable goal.

Many suggestions for further studies can be outlined based on this study. Firstly, it is possible and useful to estimate the impact of openness on growth by using other alternative models e.g. the CGE, GTAP or classical gravity model. The openness estimation results will be more positive and significance in all or almost model. However, these effects are static due to the model characteristic. Other estimation methods can also be employed such as weighted least squares and co-integration. Secondly, the comparison study between trade openness of in different sectors (agriculture and manufacturing) or trade in services liberalization is very useful to further undertaken. Finally, the longer estimation period can be extended depends on the availability of data.

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