



ISSN 0971-1554

JOURNAL OF QUANTITATIVE ECONOMICS

New Series Volume 10, No.1

January, 2012

Old Series Volume 26, No. 1

January, 2010

| | |
|---|---|
| Ravindra H. Dholakia & Amey A. Sapre | Speed of Adjustment and Inflation – Unemployment Tradeoff in Developing Countries – Case of India |
| Indrajit Roy & Dipankar Biswas | Construction of Leading Index of Indian Economy: A Weighted-Cumulative Density Function Approach |
| Feng Yao | Efficient Semiparametric Instrumental Variable Estimation under Conditional Heteroskedasticity |
| Radhey S. Singh & Lichun Wang | A Note on Estimation in Seemingly Unrelated Semi-Parametric Regression Models |
| Chin Wen Cheong, Ng Sew Lai, Nurul Afidah Mohmad Yusof & Khor Chia Ying | Asymmetric Fractionally Integrated Volatility Modelling of Asian Equity Markets under the Subprime Mortgage Crisis |
| T.V.S. Ramamohan Rao | Firm Specific Monopoly Power in Differentiated Oligopoly |
| Mohamed El Hedi Arouri, Jamel Jouini, Nhu Tuyen Le & Duc Khuong Nguyen | On the Relationship between World Oil Prices and GCC Stock Markets |
| Tran Van Hoa | ASEAN-India Economic, Trade and Integration Relations: Modelling the Challenges and Opportunities |
| Vikash Gautam | Asset Sales by Manufacturing Firms in India |
| Anup Kumar Bhandari | Global Crisis, Environmental Volatility and Expansion of the Indian Leather Industry |
| Short Paper | |
| Suresh K G & Aviral Kumar Tiwari | Long Run and Short Run Linkages between Stock Indices in Bombay Stock Exchange: A Structural Cointegration Approach |

JOURNAL OF QUANTITATIVE ECONOMICS

(Journal of the Indian Econometric Society)

| | |
|------------------------------------|----------------------|
| <i>New Series Volume 10, No. 1</i> | <i>January, 2012</i> |
| <i>Old Series Volume 26, No. 1</i> | <i>January, 2010</i> |

Managing Editor: D.M. Nachane and Joint Managing Editors: G. Mythili and Rupayan Pal

| | CONTENTS | Page |
|---|---|-------------|
| Ravindra H. Dholakia & Amey A. Sapre | Speed of Adjustment and Inflation – Unemployment Tradeoff in Developing Countries – Case of India | 1 |
| Indrajit Roy & Dipankar Biswas | Construction of Leading Index of Indian Economy: A Weighted-Cumulative Density Function Approach | 17 |
| Feng Yao | Efficient Semiparametric Instrumental Variable Estimation under Conditional Heteroskedasticity | 32 |
| Radhey S. Singh & Lichun Wang | A Note on Estimation in Seemingly Unrelated Semi-Parametric Regression Models | 56 |
| Chin Wen Cheong, Ng Sew Lai, Nurul Afidah Mohamad Yusof & Khor Chia Ying | Asymmetric Fractionally Integrated Volatility Modelling of Asian Equity Markets under the Subprime Mortgage Crisis | 70 |
| T.V.S. Ramamohan Rao | Firm Specific Monopoly Power in Differentiated Oligopoly | 85 |
| Mohamed El Hedi Arouri, Jamel Jouini, Nhu Tuyen Le & Duc Khuong Nguyen | On the Relationship between World Oil Prices and GCC Stock Markets | 98 |
| Tran Van Hoa | ASEAN-India Economic, Trade and Integration Relations: Modelling the Challenges and Opportunities | 121 |
| Vikash Gautam | Asset Sales by Manufacturing Firms in India | 136 |
| Anup Kumar Bhandari | Global Crisis, Environmental Volatility and Expansion of the Indian Leather Industry | 156 |
| Short Paper | | |
| Suresh K G & Aviral Kumar Tiwari | Long Run and Short Run Linkages between Stock Indices in Bombay Stock Exchange: A Structural Cointegration Approach | 177 |

ASEAN-INDIA ECONOMIC, TRADE AND INTEGRATION RELATIONS: MODELLING THE CHALLENGES AND OPPORTUNITIES

TRAN VAN HOA¹

Abstract

The paper provides a rigorous analysis of ASEAN-India economic, trade and integration relations and presents evidence-based scenarios and policy options for improving these relations in the context of 'Look East' policy, 'economic diplomacy', globalisation and post-global financial crisis. The proposed options are robust in the sense of statistical efficiency and credible as meeting the Friedman (1953) and Kydland (2006) data-consistency criterion. Several plausible regional and global scenarios to accommodate major opportunities and the challenges for India vis-à-vis the ASEAN will be proposed for evaluation.

Keywords: ASEAN-India economies, globalisation, regional trade agreements, endogenous growth and trade theory, econometric modelling and forecasts, economic and trade policy.

JEL Classifications: C51, C53, F14, F17, F31

1. Introduction

The recent economic (and geo-political) rise of China and India in the world has attracted extensive international attention, debate, and policy re-evaluation. In Asia, as a result, a focus on India and the Association of the South East Asian Nations (ASEAN) and their relations has become a major regional research and policy study. To partly underscore this interest, the world leaders at the First East Asia Summit in Kuala Lumpur, Malaysia, on 14 Dec 2005, endorsed high-level studies and dialogues on an enlarged ASEAN free trade agreement (AFTA) to promote further regional integration for mutual economic and political benefits between the ASEAN and the world's other trading blocs (e.g., India, the US, the European Union, East Asia, Oceania, and Russia). The endorsement is consistent with India's post-1991 reforms, 'Look East' policy, 'economic diplomacy' and energy diplomacy recently (DFAT 2011). While these policies have been helped by regional reform and co-operation, they have also been hindered to some extent by geo-political regional developments, natural disasters and the global financial crisis (GFC).

The paper is, in addition to descriptive analysis, an evidence-based contribution to this ASEAN-India trade, economic and regional integration area and with an emphasis on significant

¹ Professor and Director, Vietnam and East Asia Summit Research Program, Centre for Strategic Economic Studies, Victoria University, Australia, Email: jimmy.tran@vu.edu.au; Website: <http://www.staff.vu.edu.au/CSESBL/>

and credible policy implications. As its novel features, it adapts the endogenous growth-trade theory and improved flexible modelling policy approach that has won international acclaim (see earlier description in Tran Van Hoa, 2002a 2004, 2005, 2007c, 2008, 2010) to construct a new causality model of ASEAN-India trade-growth-political economy. Using historical harmonised data from the Reserve Bank of India (RBI) and the Asian Development Bank (ADB) and advanced econometric estimation methods, the paper provides efficient and robust empirical findings on the determinants of ASEAN-India trade in goods, foreign direct investment (FDI) and services, and their linkage to economic growth for more credible policy analysis in the sense of Friedman (1953) and Kydland (2006) realism. Implications of the findings for ASEAN-India relations in the context of challenges and opportunities in economic and trade policy of an enlarged AFTA or East Asia Summit (EAS) free trade agreement (FTA), and regional post-GFC co-operation are also discussed.

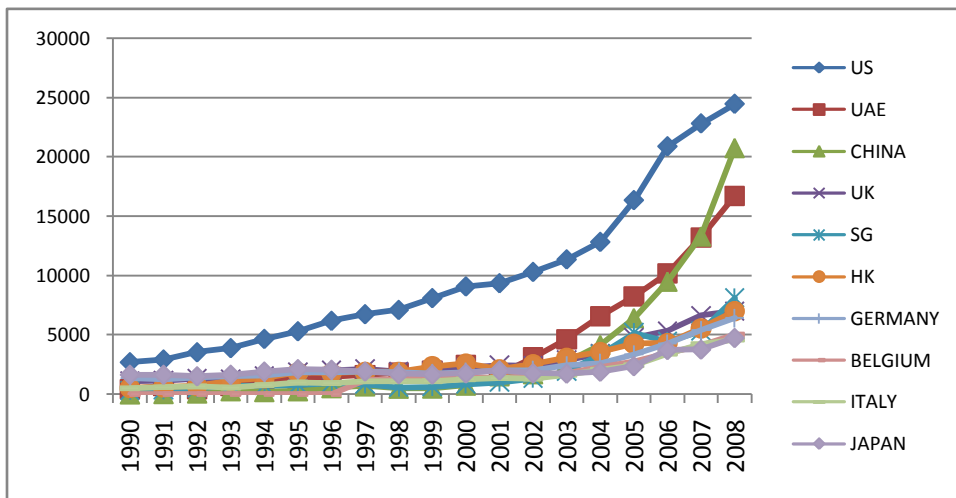
2. Trends and Major Features of India Trade Relations with ASEAN and Its Major Partners

Since its independence in 1947, India has regarded itself as a major international player. It has been at the forefront of developing country activism, a member of the Non-Aligned Movement (NAM), the United Nations and the Commonwealth. Recently, the country has sought to expand its cooperation with East Asia and ASEAN (DFAT 2011). For nearly four decades since independence however, India's economic development through a number of expansive five-year plans had been relatively sluggish and apparently failed to some extent to realise the country's full economic potential. As a result of the balance-of-payments and investment crises in 1991 and the subsequent introduction of the reform process, 'economic diplomacy', and the 'Look East' policy with Asia, India is showing clear signs of realising what the country can and want to achieve and as an international player. We note that while India is the major power in South Asia and its relations with its neighbours had traditionally governed the tenor of foreign relations in the region, its major strategic focus has sought more recently to broaden this focus, notably towards East Asia in general and ASEAN in particular (DFAT 2011).

Like Australia, India has been pursuing a combined multilateral, regional and bilateral approach to trade policy with its major trade partners. For example, while the country is a WTO member, it also has an India-Sri Lanka FTA in operation since 2002, signed a Comprehensive Economic Cooperation Agreement with Singapore in June 2005, and entered the first stage of an India-Thailand FTA in September 2004, although there has been no further implementation of this FTA. In late 1995, India was granted full dialogue partner status with ASEAN and was admitted as a member of the ASEAN Regional Forum in July 1996. An ASEAN-India FTA was signed in 2009. India, together with Australia and New Zealand, is also an EAS member.

In late 1995, India was granted full dialogue partner status with ASEAN, and was admitted as a member of the ASEAN Regional Forum in July 1996. In 2002, it participated in its first summit meeting with ASEAN. In 2003, India signed three significant agreements with ASEAN including the important ASEAN-friendly Treaty of Amity and Cooperation. On 14 December 2005, India attended the First East Asia Summit (EAS) meeting where, with the world's major trading bloc leaders, it endorsed an enlarged ASEAN and subsequently EAS FTA. As it stands now however, India is not an APEC (Asia-Pacific Economic Co-operation, a group spearheaded by Australia) member.

As a result of this national eco-political approach with apparently clear leadership foresight, the world's trading blocs have seen rapid growth and its strong dynamics in trade with India. India's recent growth and the trends and patterns of trade with its top-10 trading blocs during 1990 and 2008 are given in Charts 1 (exports) and 2 (imports). During the period 1990-2008, the average share of the top-10 trade to India's total trade is 55.74 per cent for exports and 42.75 for imports. In terms of total trade, the data show that, with a modest pre-reform start of US\$17.81 billion in 1990, India's total exports reached US\$187.35 billion in 2008 (or a rise of 52.9 per cent annual average). The country's imports also show a faster rising trend with US\$23.99 billion in 1990 and peaked at US\$299.49 billion in 2008 (or an increase of 63.8 per cent annual average). Largest increases in India's exports and imports however seem to coincide with the country's WTO membership in 1995 and especially early 2000s reform.



Source to Charts 1-4: ADB 2010, and own calculations

Chart 1. India's Top-10 Export Destination Trend, In Us\$ Millions

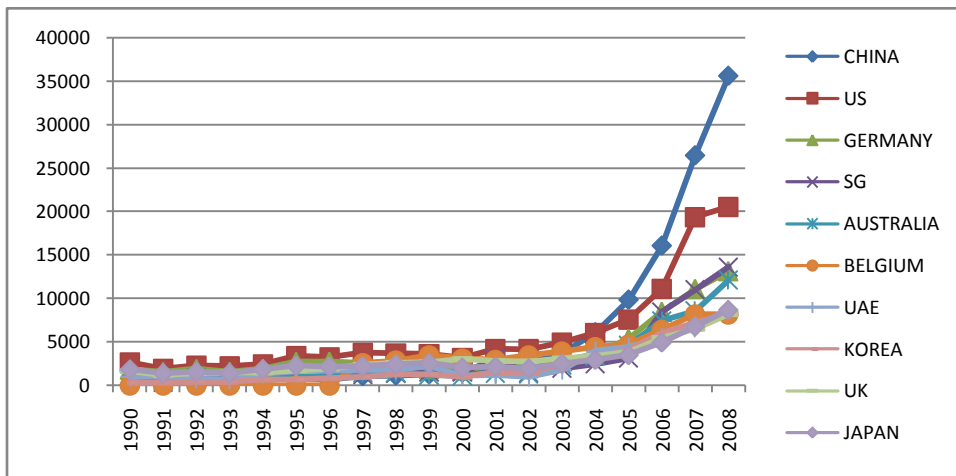


Chart 2. India's Top-10 Import Source Trend, In Us\$ Millions

In terms of market shares, the data in Chart 3 show that, in 2008, the US was still India's largest export market (13.07 per cent), followed by China (11.09 per cent) and the UAE (8.93 per cent). However, also in 2008, India's largest import source (Chart 4) was China (11.89 per cent), followed by the US (6.86 per cent) and Singapore (4.55 per cent). Japan, a major trading country in Asia, had been playing however a small role in trade with India with 2.54 per cent and 2.90 per cent of export and import shares respectively.

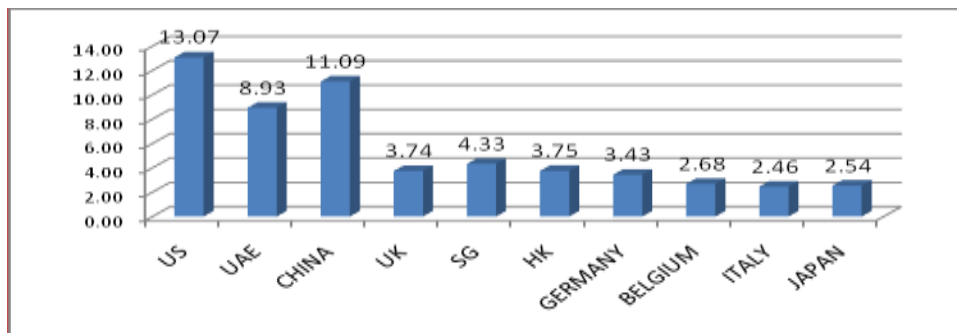


Chart 3. India's Top-10 Export Destination Shares, 2008

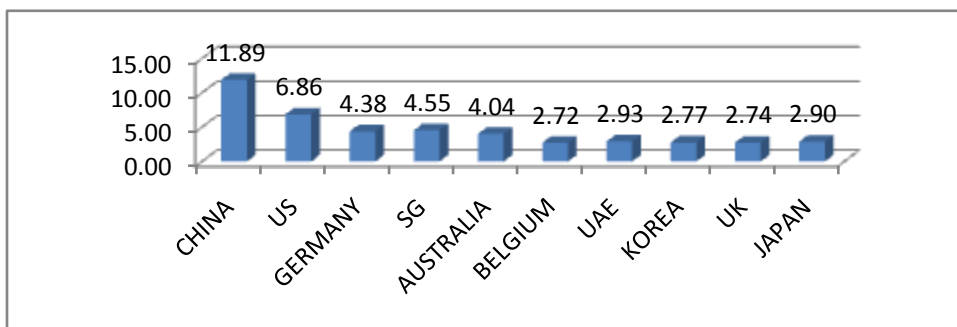
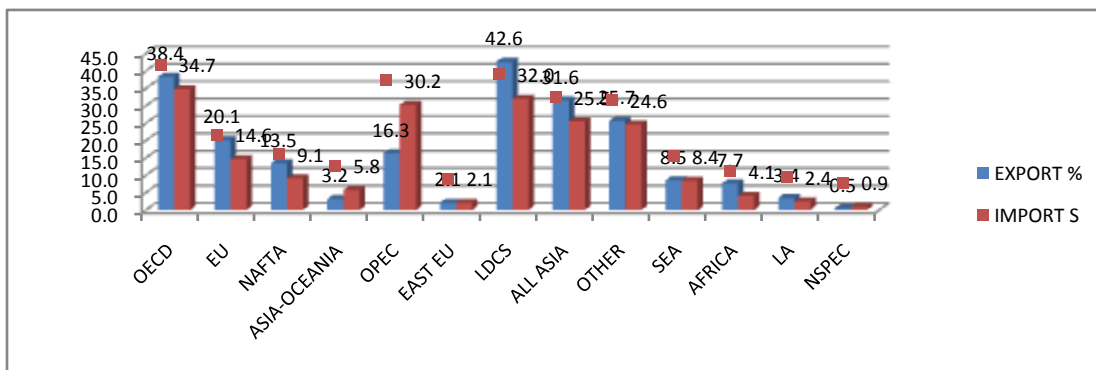


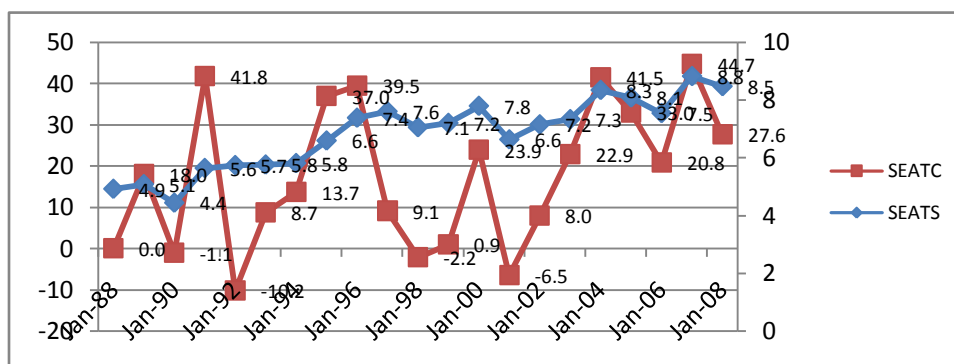
Chart 4. India's Top-10 Import Source Shares, 2008

The shares of India's total trade with its world trade partners (12 countries or blocs) in 2008 are given in Chart 5. The data here indicate that while all developing countries' trade with India accounted for 42.6 per cent and 32.0 per cent of its exports and imports respectively, ASEAN (denoted by SEA) trade with India played only a small part in India's global markets (8.6 per cent for exports and 8.4 per cent of imports). ASEAN-India historical total trade (exports+imports) share and the growth of this trade over the period 1988 to 2008 are given in Chart 6. The chart also shows the fast growing but volatile trend of ASEAN-India trade (SEATC) especially during the pre-reform early 1990s period and the 1997 Asia economic crisis, and less so after its early-2000s reform. The impact of regional and global crises and domestic reforms on ASEAN-India trade seems to be an important causal factor. The chart indicates however only a slowly and steadily rising trend of its share in India's total global trade (SEATS).



Source to Charts 5 and 6: RBI 2010, and own calculations.

Chart 5. India's World Trade Partner Shares, 2008



Note: SEATS and SEATC are share and growth, respectively, of ASEAN-India trade.

Chart 6. ASEAN-India Trade Growth And Share

The relatively minor role played by the ASEAN in India's global trade activities and economic performance and the volatile nature of ASEAN-India trade in recent years, as depicted by the information given in the charts above, indicate both the challenges and opportunities in future ASEAN-India economic and trade relations, and their strategic study is highly desirable from both basic and practical perspectives. A number of approaches [theoretical, scenario or computable general equilibrium (CGE), and political economy] have been carried out but with limited success to deal with these challenges and opportunities. An adaptation of an alternative modelling approach with credible outcomes and policy recommendations will be proposed below.

3. The WTO, Enlarged ASEAN, India's Look East Policy and Economic Diplomacy

As discussed above, India, like Australia and many other countries in the world, has sought multilateral, plurilateral and bilateral trade agreements with its major trading partners for essentially its own economic benefits. Conceptually, a number of different opinions and interpretations have emerged as a result of growing FTAs and regional trade agreements (RTAs) worldwide and especially in the Asian region. On the one hand, it is claimed, mainly by multilateral trade advocates, commissioned consultants and government trade officials, that

bilateral and multilateral trade systems can be mutually reinforcing. For example, FTAs can accelerate trade liberalisation and somehow set a high standard for the multilateral system. In addition, the experience and skills gained through FTA negotiations can be of use to multilateral trade negotiations within the World Trade Organisation (DFAT 2011).

On the other hand, it is claimed, chiefly by independent academics that the WTO is not a multilateral FTA but a negotiated trade agreement, the objectives of which are far less comprehensive or encompassing than those of an FTA (see also the DFAT citation above for the Australian government's view on this). More specifically, while the initial rules of the WTO have been slowly relaxed to more appropriately encompass not only trade in goods and trade-related services and trade-related investment [through TRIMS (trade-related investment measures), TRIPS (agreement on trade-related aspects of intellectual property rights), and TRIPS Plus), they are still inadequate in a modern global economy where different countries or different regions still are governed by their different development stages, different sets of 'national treatment or benefits', different human and physical endowments, and subsequently vastly different growth paths.

In the 'hurried' development of the WTO rules to govern FTAs (or even regional trade agreements or RTAs), some of these rules are regarded by key WTO members (such as Australia) as really in need of clarification (DFAT 2011). The 2001 Doha Meeting of the WTO and the Sutherland report prepared for the WTO in 2004 indicate clearly these concerns and recommend clarifying and improving effective disciplines and meaningful procedures to deal more appropriately with FTAs and their relationship with the WTO. The adoption of a new transparency mechanism by WTO members on 14 December 2006 also reflects some improvement in this respect. However, the current debacles of the Doha Round between the US, the EU (developed countries) on the one hand and Brazil and India (developing countries) on the other hand which led to suspension of WTO negotiations in 2006 clearly show the preference of FTAs over the multilateral trading system as it stands or is projected (see also other criticisms of the WTO in Lloyd 2010). Studies on an APEC (Asia-Pacific Economic Co-operation) FTA were considered by the APEC leaders at their annual meeting in Sydney early in September 2007. And an APEC FTA has been regarded as a middle system between the WTO and the EAS FTA framework. At this stage however, while scenario or confirmatory study of those RTA and FTA proposals is extensive (ASEAN 2011), rigorous and substantive studies incorporating RTA developments and India's reform, 'Look East' policy, and 'economic diplomacy' amidst the GFC and with credible or reliable policy recommendations for improved informed debates and policy discussions are still very limited.

As a response to this challenge and to provide credible policy outcomes for ASEAN-India relations, a causal econometric model of ASEAN-India growth and trade incorporating endogenous growth and trade theories, the possible effects of the WTO, RTAs, economic reforms and regional and global economic and financial crises is developed below. The objective is to provide significant and reliable inputs for use by academics and other researchers, RTA negotiators, and policy-makers for more credible economic, trade and external relations policy analysis. The model can also be used to provide empirical support (or a lack of it) to India's recent reforms, 'Look East' policy, 'economic diplomacy', and credible scenarios for FTA, RTA and other plurilateral and multilateral co-operation and framework.

4. A Model of ASEAN-India Trade and Economic Growth or Economic Integration Policy Analysis

In a number of recent papers, Tran Van Hoa (op cit.) introduces a simple, effective, generic and flexible multi-equation modelling approach (the so-called endogenous growth-trade theory or EGT for short) to empirically study trade and its causal link to growth in major developing countries in Asia. The major and novel features of a model based on the EGT approach are briefly: unlike other popular modelling studies in this genre (eg, CGE and growth regression), (i) it incorporates explicitly the interdependence (reverse causality or endogeneity) between trade, growth and, significantly, major macroeconomic conditionality or activities affecting simultaneously both trade and growth in the trading economies (Krueger, 2007); (ii) it assumes complex nonlinearity in the functional form; (iii) it incorporates merchandise trade, FDI, services, and other reform and non-economic events that have affected ASEAN-India trade and growth in recent years (Johansen 1982; Tran Van Hoa 2001, 2002b, and *op. cit.*).

Other existing modelling approaches which have been used for this kind of study are inappropriate or not credible for policy uses because of their structural and econometric limitations and, therefore, a lack of realism. For example, the CGE is essentially scenarios-based or confirmatory with its assumed causal relationships and given impact parameters (see Hertel et al., 2007 for an improvement). The gravity theory (Frankel and Romer 1999) has not been able to treat endogeneity and is also beset with serious cross-country heterogeneity. The growth regression is econometrically fragile (Levine and Renelt 1992) and lacks the well-known circular causality in the sense of Marshall or Haavelmo among economic (eg, trade, growth, monetary, fiscal and industry policies) activities (see also Krueger 2007). The specification of a linear function for empirical trade-growth studies has been increasingly regarded as unsuitable (Minier 2007). Previous studies have also demonstrated the excellent modelling performance of the EGT approach when this performance is assessed by the Friedman (1953) or Kydland data-model consistency (2006) criterion. In addition, as the economic variables in the EGT-based model (being planar approximations to any functional form) are expressed as their rates of change, all parameters are simply the elasticities, the central concept in economic theory. Finally, the model has full dynamics interpretation: the model's findings can be regarded as short-run or Granger causality outcomes if all these variables are integrated of degree zero or $I(0)$, or they can be interpreted as long-run outcomes in the sense of Engle and Granger cointegration causality if all of these variables are $I(1)$.

The Model

The flexible causality model for ASEAN-India trade and growth is built on the work of Frankel and Romer (1999), Tran Van Hoa (op cit.), and emerging developments on contemporary economy-wide policy modelling for developing economies (Krueger 2007) and appropriate inferential analysis (Kilian 2009). It contains testable determinant hypotheses for ASEAN-India relations to study the causal aspects of trade and growth and with features relevant to ASEAN's and India's development in the past 20 years or so (where data are available). The model and its relevant variables (see justification below) can be written for illustration say for GDP and trade in goods (T) in implicit form as $(GDP, GDPP, T, FDI, F, S, XR, TT)=0$, or as two normalised implicit and related structural functions $GDP(.)$ and $T(.)$ [other functions for other endogenised variables can be similarly specified]

$$\text{GDP}=\text{GDP}(\text{T},\text{FDI},\text{F},\text{S}) \quad \dots (1)$$

$$\text{T}=\text{T}(\text{GDP},\text{GDPP},\text{XR},\text{TT},\text{S}) \quad \dots (2)$$

where FDI=foreign direct investment, F=financial services, S=crises, reform or RTA events, GDPP=trade partner GDP, XR=real exchange rates, and TT=terms of trade. As the model is implicit and can be highly nonlinear, it is not statistically estimable. For empirical implementation, Tran Van Hoa (1992) has demonstrated that the model can be written mathematically equivalently, using Taylor's series planar approximations and invariant transformations (see Baier and Bergstrand, 2008, for a more recent use), as two linear stochastic interdependent equations

$$\text{Y}\%=\text{a}1 + \text{a}2\text{T}\% + \text{a}3\text{FDI}\% + \text{a}4\text{F}\% + \text{a}5\text{S} + \text{u}1 \quad \dots (3)$$

$$\text{T}\%=\text{b}1 + \text{b}2\text{Y}\% + \text{b}3\text{YT}\% + \text{b}4\text{XR}\% + \text{b}5\text{TT}\% + \text{b}6\text{S} + \text{u}2 \quad \dots (4)$$

where % indicates the rate of change, the u's denote error terms, and the a's and b's are the elasticities (a2-a4, b2-b5) or simply impact parameters (a5, b6). The model's theoretical rationale can be described briefly as follows. In (1) and (3), India's GDP growth (Y%), in consistence with the FTA-RTA scope (ASEAN, 2010) and non-steady-state political economy (McMahon *et al.* 2009), is assumed to be (or to be tested) as being dependent on its trade in goods with the ASEAN (T), other factors of production [such as FDI (capital) and financial services (F) or labour], crises, shocks, policy reforms or RTA events (S). But this India-ASEAN trade (T) is also causally affected by India's GDP and ASEAN's GDP (and indirectly FDI and F) as expressed in (2) and (4). In (2) and (4), ASEAN-India trade is simply a derived demand equation for tradable goods as stipulated in standard microeconomic and international trade theory. The equations for endogenous FDI and services or other suitably endogenised variables in the more complete model can be similarly structurally specified.

As a simultaneous-equation model, the use of regression or maximum likelihood estimation methods will have to assume exogeneity in the RHS variables and, as a result, produce biased, inconsistent or unreliable findings, and *a fortiori* not credible policy outcomes. When all parameters in (3) and (4) are *a priori* assumed or given and the equations are made non-stochastic (ie, u1=u2=0), the model can be interpreted as a simplified time-varying version of the CGE analysis and its uses and policy recommendations can be simply regarded as scenario setting or confirmatory in nature.

As the multi-equation model (3)-(4) has jointly dependent variables and equations, an instrumental-variables (IV) system method such as the 3SLS or the generalised method of moments (GMM) is more appropriate statistically (in terms of parametric consistency criteria) and economic-theoretically (in terms of Marshall and Haavelmo economy-wide transmission mechanism reality, and the increasingly recognised influence of a country's economic 'conditionality' on its domestic and international activities) (Krueger 2007; Kilian 2009). Appropriate IVs for the model include exogenously determined variables affecting (relevant to) growth and trade in the ASEAN and India and satisfying their statistical exogeneity requirements. Assuming, for convenience and for lack of sufficient sampling sizes for the data, that GDP of India's trade partner in focus (ie, ASEAN) is a proxy for all variables reflecting their own economic activities in addition to policies and shocks in the ASEAN. Then, the IVs for our EGT model for ASEAN-India include the exogenous factors such as ASEAN's GDP (named YT), fiscal policy (FP), monetary policy (MP), inflation pressure (INF) – see Romer (1993), real exchange rates (XR) – see Rose (2000), industry policy (IP) – see Otto *et al.* (2002), population (POP)/a gravity

factor – see Frankel and Romer (1999), and structural change (S) – see Johansen (1982) and Tran Van Hoa (2004) in India. The tests for significant causality between India's trade with the ASEAN and its impact on the country's growth are then based on the estimation and testing of (3) above by the GMM, conventional diagnostics testing procedures, and, more importantly, the Friedman (1953)-Kydland (2006) model-data consistency or realism criterion.

The Data

Trade, economic and 'conditionality' or IV data for the estimation were obtained from the available harmonised annual time-series of the databases of the United Nations, the Asian Development Bank, and the Reserve Bank of India/India's Department of Commerce. Higher-frequency data were not used due to the unavailability of continuous time-series for the whole dataset. For consistency with previous studies, all economic data (except GDP growth) are in current value. In our study, all original data are obtained as annual and then transformed to their ratios (when appropriate). The ratio variables include ASEAN-India trade (T) in goods (exports + imports), FDI, financial services (F), money supply (M3), government budget (G) and debt (D), all divided by India's GDP. Other non-ratio variables include population (a gravity theory factor proxy) and binary variables representing the occurrence of the economic, financial and other major crises, policy shift or reforms over the period 1990 to 2008. All non-binary variables are then converted to their percentage rates of change. The use of this percentage measurement is a main feature of our EGT approach and avoids the problem of *a priori* known functional forms (see above) and also of logarithmic transformations for negative data [such as budget (fiscal) or current account deficits]. In this paper, we have focused on a unidirectional direction of trade and growth below in a 'dual' context, that is, India's trade with the ASEAN and its possible causal impact on India's growth (the so-called India's perspective). The existence of this causality is the foundation of ASEAN-India trade agreements or relations as discussed.

5. Substantive Findings and their Policy Modelling Realism Properties

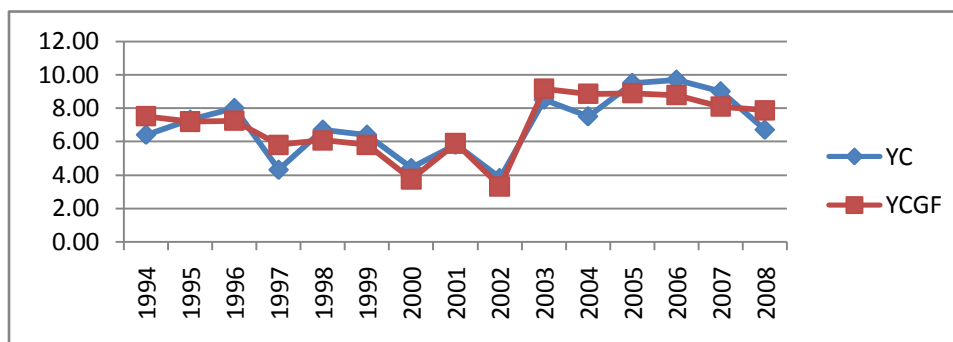
The empirical findings for the structural growth (3) and trade (4) equations in our EGT-based model of India's growth as a result of trade with the ASEAN are given in the table below together with their conventional (R, F, DW) and advanced diagnostic (time-varying parameters and GMM over-identifying restrictions) tests.

Judged from the table, the standard statistical performance of the estimated EGT-based models for ASEAN-India growth and trade above appears good in terms of the conventional R², F, DW, and CuSumSq values. The performance or realism of the models can also be more appropriately and accurately evaluated by the Kydland (2006) data-model consistency criterion where the trend gap and discrepancy between historical data and predictions have to be tight and small. The criterion was advocated earlier by Milton Friedman (1953) in the sense of model (theory) and reality consistency and it seems to be overlooked by serious modellers and policy-makers alike in recent years. This observation-by-observation modelling performance is given in Chart 7 for India's growth and in Chart 8 for its total trade with the ASEAN.

Table. ASEAN-India Trade and Its Impact on India's Growth EGT-based Modelling in Flexible Structural Form 1990-2008

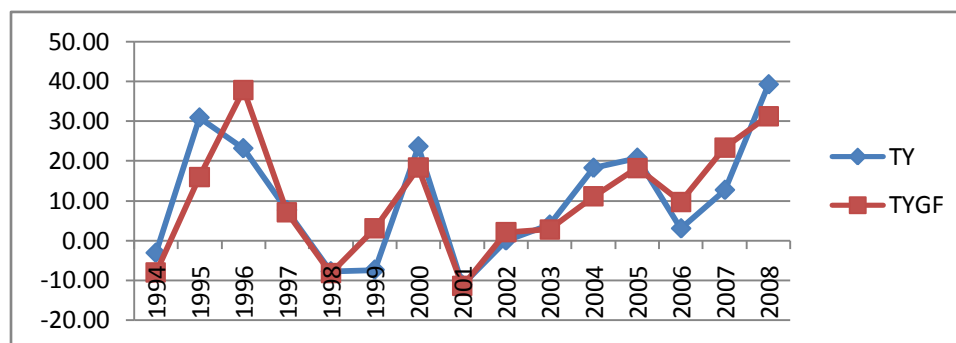
| | <i>India Growth OLS Growth Regression</i> | <i>GMM EGT Structural</i> | <i>ASEAN-India Trade OLS Growth Regression</i> | <i>GMM EGT Structural</i> |
|---------------------------|---|-------------------------------|--|-------------------------------|
| Const | 8.068** | 7.673** | 8.833 | -2.546 |
| ASEAN-India- Trade/GDP | -0.029 | -0.014 | | |
| FDI/GDP | -0.006 | -0.002 | | |
| Services/GDP | 0.002** | 0.002** | | |
| India Growth | | | -2.350 | -0.663 |
| ASEAN Growth | | | 4.951** | 5.222** |
| Real Exchange Rate | | | -2.390** | -2.481** |
| Terms of Trade | | | -0.720* | -0.835** |
| Asia Crisis 1997 | -2.092* | -1.690** | | |
| Terrorist Attacks 2001 | -1.919 | -2.458** | -16.466* | -16.514** |
| India Reforms 2004 | 5.420** | 5.491** | 21.974 | 16.719** |
| Pre-GFC 2007 | -0.702 | -0.835 | 16.184 | 20.993** |
| R-Squared | 0.806 | 0.777 | 0.763 | 0.735 |
| F | 4.131** | | 3.222* | |
| DW | 2.156 | 2.015 | 2.267 | 2.393 |
| CuSumSq Test p | 0.250 | | 0.133 | |
| Hansen Test p | | 0.089 | | 0.089 |

Notes. **=Significant at 5%, *=Significant at 10%, CuSumSq Test p=Brown-Durbin-Evans test for significant time-varying regression coefficients, Hansen test p=test of over-identifying restrictions in GMM estimation.



Note: YC and YCGF=India's growth and its prediction by EGT-GMM modelling.

Chart 7. EGT-based Modelling Performance of India's Growth – Friedman-Kydland Criterion



Note: TY and TYGF=ASEAN-India trade/GDP and its prediction by EGT-GMM modelling.

Chart 8. EGT-based Modelling Performance of ASEAN-India Trade – Friedman-Kydland Criterion

A visual indicates that the models emulate very well the troughs, peaks and turning points of India's growth and its trade with the ASEAN (as well as endogenous FDI and services – not reported here). While the modelling performance of India growth is interesting as the two major troughs attributable to the 1997 Asian financial crisis and the 2001 World Trade Centre terrorist attacks were accurately emulated, the ASEAN-India trade is particularly interesting as this trade experienced a highly volatile period of early 1990s (reform), mid-1990s (Asian crisis), mid-2000s (reform) and late 2000s (pre-GFC) in the Indian economy.

6. Implications For ASEAN-India Trade, India's Regional Economic Integration Policy and External Relations

This section discusses major implications of our EGT-based model's substantive empirical findings for informed debate or even for use in negotiations or trade policy formulation relevant to economic and trade relations between India and the ASEAN within the framework of globalisation, India's bilateral and plurilateral (ASEAN-India) trade agreements or ASEAN Plus and EAS FTA.

Does ASEAN-India Trade Significantly Contribute India's Growth? - The major claim by supporters and exponents of India's 'Look East' policy and 'economic diplomacy' that this engagement with Asia will enhance India's economic performance and export growth (in addition to regional political stability and co-operation). Our empirical findings by two different kinds of model specification and estimation (ie, growth regression-OLS and EGT-GMM) reported above appear not to support this expectation. The findings are robust with respect to several modelling specifications [or 'computational experiments' as advocated by Kydland (2006) recently] of a bilateral kind between India and the ASEAN. There are three important policy implications here. First, the findings would also not be surprising due to a relatively small share that ASEAN-India trade had played in India's global trade explosion since its important reform in the early 1990s (Charts 5-6). This is a major challenge for India's trade policy with the ASEAN to expand this share in the near future. Second, appropriate policy should be designed to maintain stability in this trade which might have affected the benefits to India's economic growth. Third, the findings also indicate that ample opportunities exist for India to expand its trade with the ASEAN via trade

promotion, RTAs, and economic and trade co-operation. Recent rising ASEAN-India trade indicates favourable progress in this direction.

What determines ASEAN-India Trade? - One interesting finding from our model is that India's real exchange rate fluctuations (defined as the rate of change in XR) significantly reduce ASEAN-India trade, and its terms of trade changes also statistically dampen it. Equally interesting is the unexpected evidence that India's growth (or a source of demand) has no impact on ASEAN-India trade. What are then the real drivers of ASEAN-India trade? Our findings show that while the real and highly significant drivers of ASEAN-India trade is ASEAN's economic development and, more importantly, India's economic and trade reform policy, this trade can however be seriously and adversely affected by major regional crises such as the 1997 Asian economic meltdown and global terrorist attacks. Some implications for India's policy-makers for improved ASEAN-India trade may be clear: enhancement of India's reforms and regional co-operation through FTAs and partnerships to promote regional economic growth, development and political stability.

Growth Regression versus Flexible EGT Simultaneous-Equation Modelling - Most contemporary trade-growth studies are based on either a descriptive correlational or non-causal approach, CGE or growth regression analysis, all favoured by commissioned consultants, neoclassical economists, and institutional economics and trade experts. The problems of reliability, fragility and policy credibility with these approaches are well-known. The EGT findings reported in the table show the large difference in responses and impact parameter estimates not only in magnitude and in significance level between growth regression and EGT approaches being applied to Eqts (3) and (4). An important methodological implication is that, by ignoring reverse causality or endogeneity in economic and trade activities and the deep influence of a country's economic 'conditionality' on these activities, a model and its policy recommendations should be interpreted and used only with great reservation. From another perspective, various researchers on high-growth economies such as Korea (eg, Harvie and Lee 2002) have claimed that Korea's growth had been supported by the so-called East Asia Economic Model. This model is not a big-bang framework where all economic, trade, industry and administration reforms emerge and have impact in a very short time span (eg, in one government election term), but it consists in fact of a sequence of policy reforms (of for example the monetary, fiscal and industry kind), that were gradually introduced over a number of years and deeply imprinted in the activities or infrastructure of the economy. This aspect of policy modelling cannot be captured by a growth regression approach where it is usually overlooked. In this context, the GMM-based findings from our EGT models are more appropriate for econometric study and efficient policy analysis as they have taken into account this aspect in the form of an auxiliary structural equation or a series of auxiliary structural equations and the IVs representing India's economic 'conditionality'.

Are FDI and Services Important Engines of India's Growth? - The findings reported show that FDI at least at its aggregate level and despite its fairly recent strong trend, does not make a positive and significant contribution to India's economic performance. The volume and effective utilisation of FDI may be two reasons for this empirical non-significance. An expected finding is however that India's net services are found to be a beneficial and highly significant factor to India's economic performance. This can be explained in a number of ways. First, India's services have been widely regarded as a key sector for its export income, and our findings simply lend strong statistical support to this perception. Second, there may be complementarity or

substitutability between India's FDI and net services. This aspect of international trade would need further research.

The Role of Domestic Reforms and Regional Shocks in India's Trade and Economic Performance - While sudden crises, shocks and major gradual policy reforms have been acknowledged (even by CGE pioneers) as important sources of fluctuations in economic performance worldwide (see Johansen 1982; Tran Van Hoa 2001, 2002b, and *op. cit.*), they have rarely been incorporated in such well-known economic policy modelling studies as descriptive or graphical analysis, the CGE, gravity theory, growth regression, or in a more realistic (or multiple structural breaks and with temporary or non-decaying effects) manner in the often-used long-term causality cointegration analysis. A novel modelling feature of the EGT approach is in its flexibility in accommodating these events. The findings from the table above indicate that all three major events focused in our study (ie, the Asian crisis of 1997, terrorist attacks on the World Trade Centre in New York and on the Pentagon in Washing DC in 2001, and India's further reforms (ie, 'Look East' and 'economic diplomacy' in the early 2000s) do have a strong impact on India's economic growth and especially ASEAN-India trade. The findings of a severe adverse and strongly significant impact of the 2 July 1997 Asian crisis and 11 September 2001 attacks on India's growth are only to confirm the well-supported views and facts on these regional and global crises' serious contagion (Tran Van Hoa 2001, 2002b). However, the beneficial effects of good economic governance or constructive policy reforms such as India's 'Look East' policy and 'economic diplomacy' of the early 2000s seem to have been substantiated empirically from our models. These lend credibility to our modelling study and its policy recommendations. Another implication of the findings for similar impact studies is that, due to the far-reaching effects of crises, shocks and policy change on a large number of sectors in an economy (the present GFC is a good example), the need to specify these aspects of structural change in a multi-equation or even single-equation policy model for credible predictive policy analysis is clearly desirable and appropriate.

Implications for India's 'Look East' Policy, 'Economic Diplomacy', Globalisation, and Regional Geo-political Competition and Trade Agreements -

The paper has been focused chiefly on adapting the EGT approach to studying ASEAN-India trade and its effect on India's growth, in the context of increasing globalisation and RTAs, major national policy reforms, and the emergence of severe crises and shocks. The findings show the negligible impact of this trade on India's economic growth in the past, but, significantly, this trade is profoundly affected by economic development in the ASEAN. ASEAN-India trade is closely tied to ASEAN growth. The findings also show the important effects of policy reform and crises on India's growth and ASEAN-India trade. These findings on this trade's impact and the difficulties encountered in FTA negotiations and implementation of a number of ASEAN-India bilateral FTAs (eg, India-Singapore and India-Thailand) pose great challenges to ASEAN-India negotiators and policy-makers. Opportunities are however plentiful to promote closer economic relations or geo-political co-operation and to enhance trade between India and the ASEAN in particular and between India and Asia (especially China which is currently the regional focus) in general, for regional mutual benefits. An EASFTA in operation would be a central trade policy for India to pursue in the near future in this context. It is also consistent with India's sound and beneficial 'Look East' policy and 'economic diplomacy'.

References

- ADB (Asian Development Bank) (2011), http://www.adb.org/Documents/Books/Key_Indicators/2010/Country.asp. Accessed 15 Jan 2011.
- ASEAN (2011), <http://www.aseansec.org/20100.htm>. Accessed 15 Jan 2011.
- Baier, S. L. & Bergstrand, J. H. (2008) "Bonus Vetus OLS: A Simple Method for Approximating International Trade-Cost Effects using the Gravity Equation", *Journal of International Economics*, 77(10), 77–85.
- DFAT (Department of Foreign Affairs and Trade) (2011), <http://www.dfat.gov.au/geo/india/index.html>. Accessed 15 Jan 2011.
- Frankel, J. A. and D. Romer (1999) "Does Trade Cause Growth?", *American Economic Review*, 89(3), 379-99.
- Friedman, M. (1953) *Essays in Positive Economics*, Chicago University Press, Chicago
- Harvie, C. and Lee, H-H (2002) "New Regionalism in East Asia: How Does It Relate to the East Asia Economic Model?", *ASEAN Economic Bulletin*, 19(2), 123-40.
- Hertel, T., Hummels, D., Ivanic, M. and Keeney, R. (2007) "How Confident Can We Be of CGE-based Assessments of Free Trade Agreements?", *Economic Modelling*, 24(4), 611-635.
- Johansen, L. (1982) "Econometric Models and Economic Planning and Policy: Some Trends and Problems," in M. Hazewinkle and A. H. G. Rinnooy Kan, (Eds) *Current Developments in the Interface: Economics, Econometrics, Mathematics*, Reidel, Boston, 91-122.
- Kilian, L. (2009) "Not All Oil Price Shocks Are Alike: Disentangling Demand and Supply Shocks in the Crude Oil Market", *American Economic Review*, 99(3), 1053-69.
- Krueger, A. O. (2007) *Understanding Context and Interlinkages in Development Policy: Policy Formulation and Implementation*, American Economic Association Meeting, 5-7 January 2007, Chicago.
- Kydland, F. E. (2006) "Quantitative Aggregate Economics", *American Economic Review*, 96(5), 1373-1383.
- Levine, R. and Renelt, D. (1992) "A Sensitivity Analysis of Cross-Country Growth Regressions", *American Economic Review*, 82(4), 942-63.
- Lloyd, P. J. (2010) "How the WTO Could Be Improved?", *International Economics Studies*, 34(1) New Issue, 1-6.
- McMahon, G., Esfahani, H.S. and Squire, L. (eds) (2009) *Diversity in Economic Growth*, Edward Elgar, Cheltenham.
- Minier, J. (2007) *Nonlinearities and Robustness in Growth Regressions*, American Economic Association Meeting, 5-7 January 2007, Chicago
- Otto, G., G. Voss and L Willard (2002) *Understanding OECD Output Correlation*, Seminar paper, Department of Economics, University of Wollongong, May 2002.
- Reserve Bank of India (2011), <http://www.rbi.org.in/scripts/Statistics.aspx>. Accessed 15 Jan 2011.
- Romer, D. (1993) "Openness and Inflation: Theory and Evidence", *Quarterly Journal of Economics*, 108(4), 869-903.

- Rose, A.K. (2000) "One Money, One Market: The effects of Common Currencies on Trade", *Economic Policy*, 15(30), 9-30.
- Tran Van Hoa (1992) "Modelling Output Growth: A New Approach", *Economics Letters*, 38(3), 279-284.
- Tran Van Hoa (2001) *The Asia Recovery*, Edward Elgar, London.
- Tran Van Hoa (2002a) "New Asian Regionalism and ASEAN+3 Free Trade Agreement: Theoretical and Empirical Foundation, Policy Challenges and Growth Prospects", *Chulalongkorn Journal of Economics (Thailand)*, 14(3), 366-384.
- Tran Van Hoa (2002b) (Ed.) *Economic Crisis Management*, Edward Elgar, Mass.
- Tran Van Hoa (2004) "Korea's Trade, Growth of Trade and the World Economy in Post-crisis ASEAN+3 Free Trade Agreement: An Econometric and Policy Analysis", *Journal of the Korean Economy*, 5(2), 73-108.
- Tran Van Hoa (2005) "New Asian Regionalism: Evidence on the Impact of ASEAN+3 Free Trade Agreement on Its Member Countries", *Journal of Quantitative Economics*, 3(2), July 2005, 98-109.
- Tran Van Hoa (2007a) "Causal Empirics and Political Economy of Official Development Assistance and Development in Asia: The Case of Vietnam", *Journal of the Korean Economy*, 8(1), 91-119.
- Tran Van Hoa (2007b) "Foreign Aid and Development in Thailand: Causality and Political Economy", *Thammasat Economic Journal (Thailand)*, 25(4), 127-154.
- Tran Van Hoa (2007c) *India-Asia Trade Relations: Implications for Growth, 'Look East' Policy and Economic Diplomacy*, paper presented at the 90th Annual Conference of the Indian Economic Association, University of Kashmir, India, 25-27 October 2007.
- Tran Van Hoa (2008) "Australia-China Free Trade Agreement: Causal Empirics and Political Economy", commissioned paper for *Australian Economic Papers*, 27(1), 19-29.
- Tran Van Hoa (2010) "Impact of the WTO Membership, Regional Economic Integration and Structural Change on China's Trade and Growth", *Review of Development Economics*, 14(3), 577-591.

