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Economic Impact of Vietnam's Tourism on Australia: An Econometric Study

TRAN VAN HOA and JO VU

College of Business, Victoria University,

PO Box 14428 MC, Melbourne, Victoria 8001, Australia.

E-mails: jimmy.tran@vu.edu.au, jo.vu@vu.edu.au

ABSTRACT

Vietnam's tourists (especially international students) to Australia have been regarded as playing an important role in Australia's growth in recent years. In spite of the fact that this activity is, in addition to trade and foreign direct investment, a principal cause of growth in the modern economic integration and globalisation theory, tourism studies from this theory's structural framework, while highly appropriate and with useful insights, have hardly been undertaken. The paper proposes to fill the gap by using a new approach to developing an endogenous model of simultaneous growth and tourism determination equations where trade, FDI and tourism are main contributing factors of growth. In addition, Ironmonger-Lancaster new consumer demand theory determines tourism, and 'economic conditionality' simultaneously influencing growth and tourism in the sense of Johansen is recognised and incorporated. The model is then applied to Australian and Vietnamese data for the post-Japanese tourist boom period of 1992-2015 to provide substantive findings on Vietnam's tourism determination and its contribution to Australia. Major regional policy implications are developed for use by government tourism planners and policy-makers.

Keywords: Vietnam's tourism, Australia's growth, economic integration theory, endogenous growth, economic modelling and forecasts, economic and tourism policy.

JEL: C54, F15, F62, Z32, Z38

1 INTRODUCTION

Tourism has been an important contributing factor to gross domestic product (GDP) growth in world-wide economies. Vietnam, in addition to China and India, with its recent rapid increase in economic growth, increasing living standards and wide-ranging globalisation reforms, has provided a large supply of tourists (especially international students) to the world, and this is especially the case for both geographically and culturally attractive tourist destinations such as Australia. In the case of Australia, not only has the number of tourists from Vietnam exponentially increased since the 1970s (following the Japanese tourist boom of the 1970s and 1980s), its bilateral trade has also greatly expanded (ABS 2018). The economic benefits from these activities have helped to boost not only the health of the Australian economy via its

education sector, but also boosted its growth and stronger political ties and closer co-operation with its major transition trade partner in Asia.

Beginning with the pioneering work of Guthrie (1961), a large literature has developed in the last three decades dealing with the economics of tourism, with diverse focus and methodology (see e.g. Song et al. 2012, for a comprehensive review).

However, with the intense process of increasing globalisation and economic integration (EI) in more recent years (WTO 2018), international attention by policy makers and scholars has been particularly focused on the field of regional trade agreements (RTA) where major activities such as trade, foreign direct investment (FDI) and services (including tourism) have been postulated as the key contributing factors to growth and development. Thereby, improving living standards and alleviating poverty especially in developing economies. In spite of these important developments and growing policy relevance, studies of trade, FDI and tourism in this new structural framework have not been widely undertaken, with few exceptions in trade, official development assistance, and climate change fields such as Tran (2004), Tran (2007), Tran and Limskul (2013).

This paper advances research by addressing this gap in the literature in the field of tourism economics, focussing on the simultaneous endogenous tourism and growth relationships, with the impact of Vietnam's tourism on Australia as a study focus. The plan of the paper is as follows. Section 2 provides a review of the trends and patterns of the main indicators of Australia's growth and Vietnam's trade in tourism to Australia, during the volatile period of 1992-2015. Section 3 develops a model of endogenous growth and tourism based on the EI or RTA theory, gravity theory, Ironmonger-Lancaster consumer demand, and Johansen (1982) factors which are fundamental to determining the effects of Vietnam's tourism to Australia. Section 4 describes the data and presents the empirical findings from the model's estimation using a systems approach, a three-stage least-squares (3SLS), and measurements of its statistical reliability. Section 5 describes policy implications and Section 6 concludes.

## 2 TREND AND PATTERN OF AUSTRALIA'S MAIN GROWTH INDICATORS

The trend of GDP growth (rate of change of real GDP, base=2010) for Australia and Vietnam are compared in Chart 1 for the period 1992-2015. From this chart we note that, Vietnam's economic achievement, due to its development stage low living standard, increasing openness and economic and social reforms, and accompanied by increasing global economic and political influence) surpassed Australia in the period, except during the post Asian financial crisis (AFC) of 1999 where the gap was almost zero. The biggest gap was in 1995 (post-Gulf War), the so-called golden year of Vietnam's recent economic achievement. Although Vietnam's growth slowed after 1995 and Australia's improved after 2010, the gap was still significant in 2015 at 2.59 per cent for Australia versus 6.68 per cent for Vietnam. On average, annual growth was 3.21 per cent for Australia and 6.90 per cent for Vietnam. Interestingly, both countries' economic performance seemed to be affected by the global financial crisis (GFC) but Vietnam, like China, another major transition economy in Asia, was only slightly impacted by the terrorist attacks in New York in 2001.

Chart 1: Growth of Australia, Vietnam and Vietnam's Tourism to Australia (%), 1992-2015
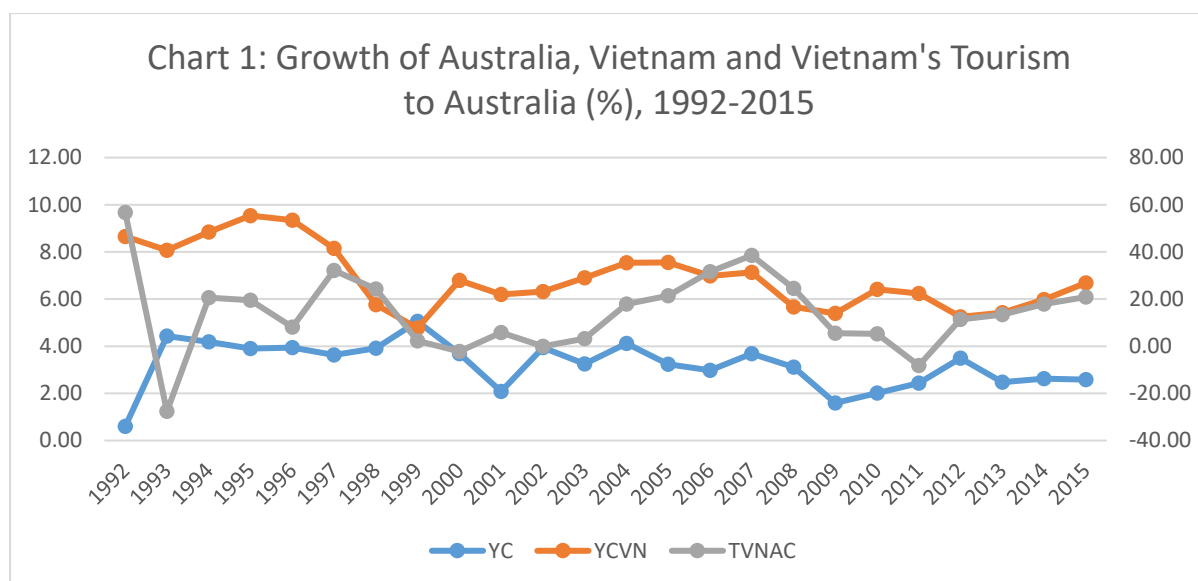
Notes: Sources of data ABS (2018), ERS-USDA (2018). YC and YCVN denote Australia's and Vietnam's annual growth respectively (primary axis), and TVNAC=Vietnamese tourism to Australia (secondary axis).

Chart 1 also describes the annual growth of the number of Vietnam's tourists arriving in Australia during 1992 to 2015. As observed, the data seem to support Australia's tourism agencies and operators' great optimism with large but fluctuating growth in recent years, leading to optimistic future planning and development. More specifically, from a big drop in the rate of Vietnamese tourists arriving during the Gulf War in 1993, the trend appears to also steadily rise from 2000 to a peak in 2007 and then decline rapidly to 2011. Interestingly, this declining trend was observed even during the period where Vietnam's growth was rising (see Chart 1 above). In regard to regional and global crises, the trend for Vietnamese tourists arriving in Australia, was apparently adversely affected by the AFC in 1998 and the GFC in 2009, but less so by the Iraq War in 2003.

In contrast with the fast rising trend of Vietnamese tourists coming to Australia since 1992, Australia's total trade flows, especially overall FDI (both as a percentage of GDP) have more modest growth (refer to Chart 2). In 1992, the trade ratio (or openness) was 25.60 (reflecting relatively moderate openness or modest trade liberalisation) per cent and 0.80 per cent for FDI (reflecting relatively low attraction to foreign investors). In 2015, these figures were 32.60 and 2.24 per cent respectively reflecting modestly rising trade and moderately rising but still low FDI inflows. However, there is an indication that international trade flows to Australia have been slowly rising since 1992, and started rising more noticeably and peaking with the terrorist attacks in New York in 2001 and on the eve of the GFC in 2009. On average, the annual trade ratio was 31.41 per cent and for FDI it was 1.53 per cent for the whole period.

Chart 2: Australia's Openness and FDI /GDP (%), 1992-2015
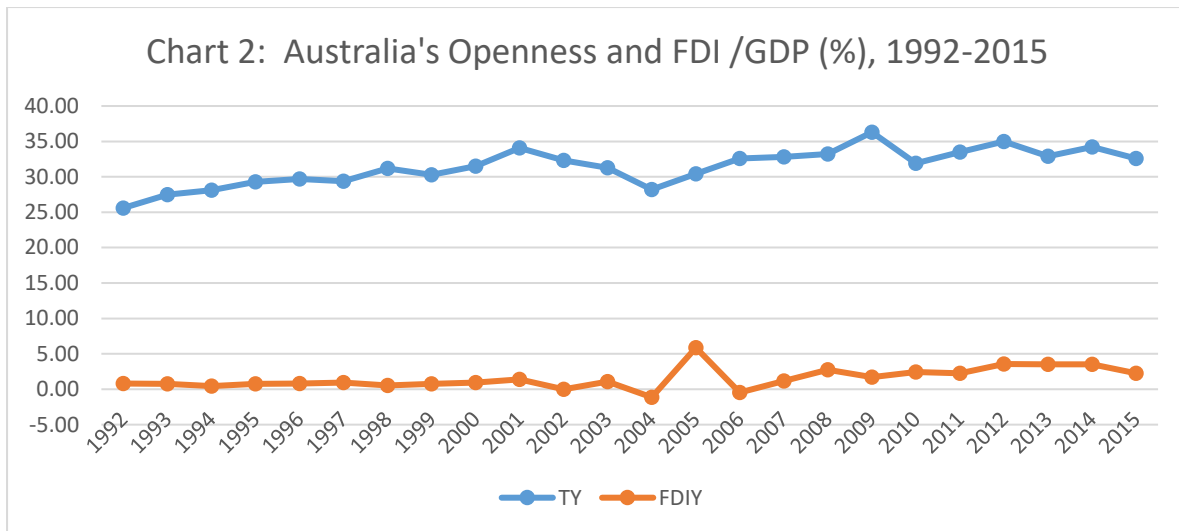
Notes: Source of data ADB (2018). TY=Australian total trade/GDP, and FDIY=FDI/GDP.

Three main economic and demographic factors commonly stated to contribute to international tourism are the destination's cost of living (inflation affected), the origin's real exchange rate (Gerakis 1965) or purchasing power, and population growth (supply side). The annual growth rates of these data (base year 2010 for economic data) are given in Chart 3. We note in this chart the very volatile real exchange rate movement in Vietnam and also the high degree of volatility of inflation in Australia especially in the 1990s. Chart 3 indicates that Vietnam's real exchange rate growth peaked during the AFC and was at its lowest level during the GFC. Australia's inflation was interestingly affected by the AFC of 1997 and slightly less by the GFC in 2009. However, Australian inflation has been slowly declining since 2001. With a population of about 94m in 2017, the rate of Vietnam's population annual growth has been slowly declining since 1992 at 1.99 per cent to 0.99 per cent in 2015.

Chart 3: Growth of Vietnam's Real Exchange Rate and Population, and Australia's Inflation (%), 1992-2015
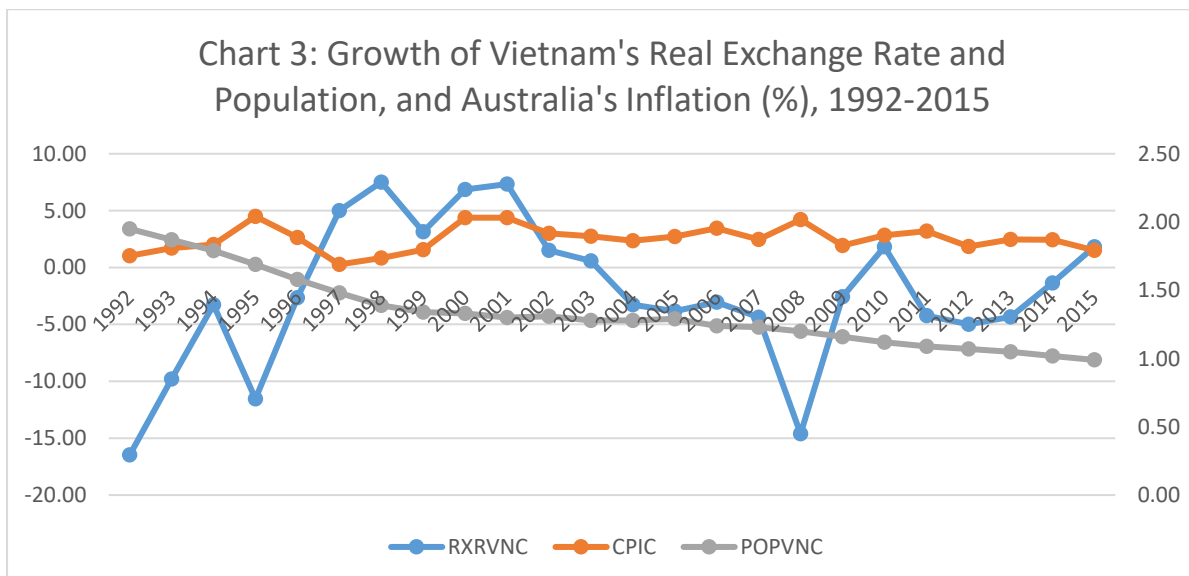
Notes: Source of data ERS-USDA (2017). CPIC=Australia's inflation, RXRVNC=Vietnam's real exchange rate, POPVNC=Vietnam's population.

The discussion above shows the complexity of the trend and movements of the main economic and demographic indicators in Australia and Vietnam. This complexity might be seen

conceptually to impact dynamically on Australia's economic growth, and Vietnam's tourism (especially international students) to Australia during a volatile period of increasing globalisation and regional economic integration, damaging regional and global crises, and major domestic developments and reforms in the period 1992-2015. To address these important emerging and contemporary issues, and to have better, appropriate and credible insight into their potential relationships with policy relevance, we propose to study this twin relationship using a new quantitative multi-equation approach based specifically on economic integration theory, modelling flexibility, and advanced econometric methodology, as described below.

3   A NEW APPROACH TO ENDOGENOUS GROWTH AND TOURISM MODELLING

Tourism economics research in past decades has been extensive and has covered many areas including approaches, methodological innovation, topics, gaps and future directions (for a comprehensive survey, see Song et al. 2012). However, with the emergence of globalisation and its increasing regional economic integration in recent years, the international focus for growth determination has shifted to trade, FDI and tourism (services) (WTO 2018). In spite of this important development for globalised economies, rigorous studies in general and in tourism in particular, based on its structural framework have hardly been undertaken and reported. However, previous related studies in the specific fields of trade, official development assistance and climate change, have been reported by Tran (2004, 2007), and Tran and Limskul (2013). We describe this new economic integration approach and methodological advances below in order to provide a new perspective and insight into tourism economics research.

The development of a simultaneous-equation model for a growth-tourism causal study, and policy analysis, under an economic integration framework (or Systems of National Accounts 1993/2008 expenditure) is conceptually based on three theories: (a) the basic growth-determination postulates of economic integration (EI) and regional trade agreements (RTAs) (WTO 2018), namely, trade, FDI and tourism (services), (b) gravity theory (including growth in origin and destination countries) (Frankel and Romer 1999) and the extended Ironmonger (1972)-Lancaster (1966) new consumer demand theory where potential factors affecting tourism via its characteristics or attributes are considered, and (c) Johansen (1982) add- and sub-factors, such as domestic reform and external crises, that may affect growth and tourism. They are also supported by previous successful applications as measured by modelling reliability criteria, such as that proposed by Kydland (2006) where good prediction-reality compatibility or 'empirical fit' is a crucial credibility criterion (e.g., Tran 2002a, 2002c, 2004, 2005, Tran and Limskul 2013). The economic-theoretic foundation and econometric specification, and the features of the model can be briefly described as follows.

We consider, for convenience and without loss of generality, a simple model of two simultaneous (circular causality) implicit or arbitrary functions for income (Y) and tourism (T) and their key testable determinant variables. In this model, the underlying theoretical assumptions and testable hypotheses are as follows. First, Australia's growth (Y) is determined principally by trade or openness (O) (WTO 2018), FDI (see also Tang et al., 2007 for the possible relationship between FDI and tourism), China's tourism (T), economic policy (W), and shocks or reforms (S) (Johansen 1982, Tran 2004). Second, tourism is simultaneously determined by both Australia and China's economic demand conditions such as their growth (i.e., Y and YT respectively) (also known as the gravity factors, Frankel and Romer 1999),

destination cost of living or inflation (I), China's real exchange rate (RXR) (Gerakis 1965), FDI (Tang et al., 2007), W and other non-economic factors S. This model incorporates, in one important structural specification aspect, not only economic factors but also geographic or demographic attributes (Frankel and Romer 1999, Johansen 1982) or demographic dynamics (Kydland 2006). Thus for simplicity and in implicit (function-free) functional form, the two functions for Y and T can be written for a sample N as:

$$Y_t = F1\ (a, O_t, FDI_t, T_t, W_t, S_t), \qquad t=1,...,N \qquad (1)$$
$$T_t = F2\ (b, Y_t, YT_t, I_t, RXR_t, FDI_t, W_t, S_t) \qquad t=1,...,N \qquad (2)$$

Where F1 and F2 are two implicit functions linking simultaneously income and tourists to their theoretically plausible and empirically testable determinants (variables), and a and b are two vectors of parameters. In this model, Y may be defined as GNP (gross national product) or, by more popular convention GDP, or income per head of population (Easterly 2007). T is defined as short-term arrivals (tourists), O=exports or imports or, more conventionally, openness (exports plus imports/GDP). FDI denotes foreign direct investment and S is a vector representing shocks or policy reforms. YT is the origin country's growth representing its general economic or demand condition or supply of tourists. W denotes other economic (fiscal, monetary, trade and tourism policy – see Sala-i-Martin 1991), and S represents non-economic variables (e.g., country size or population, policy reforms and external shocks – see Johansen 1982, Blake and Sinclair 2003, Tran 2005, and Smeral 2009 for justification) relevant to a country's growth and tourism policy. Importantly for our empirical study, in addition to Y, YT, O, FDI, T, and S, data for W must be available and consistent with published time-series data in a standard Kuznets-type accounting framework (e.g., system of national accounts, SNA93), or the accounting system of Stone (1988), or the recent World Bank tables.

As (1) and (2) are in implicit form they assume no specific functional form, and therefore are not statistically estimable, and our purpose is ultimately to derive elasticities for their economic variables. Thus, for our empirical implementation, we use planar approximations (thus ignoring higher-order differentials) and invariant transformations (e.g. see Allen 1960, and derivation in Tran 1992) for (1) and (2). The 2-simultaneous equation model (1)-(2) in planar approximations can be written more explicitly in stochastic form and in terms of the rates of change for the continuous economic variables (denoted by *y, yt, o, fdi, t, w, i, rxr, and w*) and binary S of all the included econometrically exogenous and endogenous variables as (for t=1,…,N)

$$y_t = a1 + a2o_t + a3fdi_t + a4t_t + a5w_t + a6S_t + u_{1t}, \qquad (3)$$
$$t_t = b1 + b2y_t + b3yt_t + b4i_t + b5rxr_t + b6fdi_t + b7w_t + b8S_t + u_{2t}. \qquad (4)$$

In (3)-(4), y is growth (the rate of change in real GDP) and the equations are linear and interdependent or simultaneous, while a1 and b1 are constant terms, a2-a5 and b2-b7 are the elasticities, and a6 and b8 are impact parameters. The u's are other unknown factors outside the model (Frankel and Romer 1999), or the disturbances with standard statistical properties. In (3)-(4), circular and instantaneous causality in the sense of Granger (1969) or Engle-Granger (1987) exists, or is regarded in our study as a testable hypothesis. In their exact or nonstochastic forms (in which all disturbances are idealistically zero), these equations form the basic structure of the computable general equilibrium/global trade analysis project (CGE/GTAP)) models of the Johansen class, in which all elasticities are usually assumed (calibrated) to be given or known *a priori* and the impact of endogenous or endogenised variables (say T) on Y is

dependent on the exogenous variables and calculated system-wise, using such iterative procedures as the Gauss-Euler algorithm with a known sparse matrix of elasticities.

It can be verified that our so-called flexible (or function-free) growth and tourism equations (3)-(4) in the model above are econometrically identified in the sense of mathematical consistency. They are simultaneous equations in an endogenous growth model that require not ordinary least-squares (OLS), but appropriate system estimation to produce consistent estimates. An impact study of endogenous T (or exogenous W and S) on growth can be analysed directly via its 2SLS (two-stage least-squares or adjusted reduced-form) or instrumental-variables (IV) or by three-stage least-squares (3SLS) estimation; or indirectly via its reduced-form estimation in terms of all the exogenous economic and non-economic variables in the model. Usual diagnostic tests for OLS estimation except R-squared and Durbin-Watson statistic on the estimated residuals in these IV estimation cases are not applicable. It is well-known in the pure theory of econometrics that the use of OLS to estimate equation (3) or (4) for example will, in this case, produce biased parameter estimates and subsequent incorrect policy prescriptions. Therefore, the estimation for our model below is the 3SLS that appropriately and simultaneously take into account the information and effects of the two inter-dependent equations.

An important feature of our modelling approach adopted above is that, contrary to the CGE/GTAP restrictive and so-called confirmatory approach (i.e., the causal functional relations are *a priori* fixed and the values of elasticities are assumed or subjectively given – see also Kydland 2006, for a requirement of data-based calibration for credible policy analysis), our impact study is historically-data-consistent as all required constant terms, elasticities and impact parameters are estimated from the model, and from available official data, and have asymptotically and statistically desirable and consistent properties (an important issue in empirical applications – see Frankel and Romer 1999) when suitable estimation and forecasting methods (e.g., 2SLS or other IV methods such as the 3SLS) are employed. Another important feature is that, contrary to other SNA93-based or Keynesian system-wide modelling approaches, our impact study has general flexibility in modelling the specification rationale and in implementation, assuming explicitly no *a priori* functional forms (e.g., linear, log, log-linear) for the equations in the model (for the relevance of this approach in preferred applied modelling, see Minier 2007), and it can handle data on trade or budget deficits (having therefore negative values) and real rate of interest when inflation exceeds the nominal interest rate. The usual method of routine log transformations for all variables in a single or multi-equation econometric model cannot do this.

It is interesting to note that, from our model's dynamic construct (Morley 2009), the impact may be regarded as long run in the context of Engel-Granger (1987) co-integration or long run causality, if all variables in the equations are integrated by degree one I(1) or as short run causality in the context of Granger (1969) causality if they are all integrated by degree zero I(0).

4   EMPIRICAL IMPLEMENTATION AND SUBSTANTIVE FINDINGS

4.1. DATA

Data sources

In addition to the key economic and tourism variables mentioned in Section 2 earlier, W in the tourism equation (4) includes conventional demand - theoretically Australia's cost of living and Vietnam's international trade real exchange rates, and FDI (Tang et al, 2007). Data for the estimation were obtained from the ABS (2018), ADB (2018), UNCTAD (2018) and USDA-ERS (2018) databases. All economic and trade data are in real values or equivalent. In our study, all original data are obtained or derived as annual, and then transformed to their ratios (when appropriate). The ratio variables include merchandise trade and FDI. Other non-ratio variables include population (a gravity factor proxy for time-series models, Frankel and Romer 1999), inflation, real exchange rates, and qualitative variables representing the occurrence of the economic, financial and other major crises, policy shift or reforms over the period 1992 to 2015.

Variables definition and data processing

The qualitative binary variables reflect, in a conventional manner, the major domestic, regional and global event dates, with the assumption of long-term non-decaying effects on growth and tourism. All non-binary variables are then converted to their percentage rates of change. The use of this percentage measurement (which is equivalent to log-difference for small changes) is a main feature of our policy modelling and impact approach, as it deals with empirical implementation of the implicit functions (1) and (2) and avoids the problems of restrictive and potentially unsuitable *a priori* known functional forms (see above), and also of logarithmic transformations for negative data (such as budget (fiscal) deficits, and real interest rates or current account deficits). In addition, in the model, we assume a unidirectional direction of trade, and endogenous tourism to growth in a 'causal' context. That is, the model deals with Vietnam's trade (in goods, FDI and endogenous tourism) and their causal impact on Australia's growth and not vice versa. Major reforms and crises and economic variables that have been identified or assumed as exogenous or acceptable instrumental variables, affecting Australia's growth and Vietnam's tourism to Australia, are listed in the empirical findings table in the next section.

The p-values for the augmented Dickey-Fuller/weighted symmetric unit root test for all variables in the model are given as: Australia's growth=0.115, Vietnam's growth=0.001/0.723, Vietnamese tourism to Australia=0.131, Openness=0.152, FDI/GDP=0.217, Vietnam's RXR=0.705, Australian inflation=0.969, and Vietnam's population=0.001/0.870.

## 4.2. THE ESTIMATED MODEL AND MODELLING PERFORMANCE

To provide insights into Vietnam's tourism to Australia, and the various key contributing factors to growth and endogenous tourism in Australia, the model (3)-(4) has been appropriately estimated, as mentioned earlier, by the 3SLS using the available data for the period 1992-2015. The basic findings are reported in Table 1 below. The model is identified according to the order identification tests, and most included (non-binary) variables have been found to be statistically stationary according to the usual unit root tests. The modelling performance of the estimated equations as measured by the Kydland (2006) data-model compatibility or simply 'empirical fit' criterion, and displayed graphically in Charts 4-5. In addition, modelling performance is measured by their empirical statistical characteristics, using Theil-MSE decomposition, and given in Table 2. As mentioned earlier, other standard diagnostic tests available for OLS estimation and residuals are not appropriate for 3SLS residuals. As assessed by these various modelling diagnostics available and reported, the estimated model first performs very well in emulating the volatile movements, peaks and

troughs, especially the turning points of Australia's growth and Vietnam's tourism data over the sample period. Second, the Theil-MSE findings show the closeness of data, and the model first two moments, and the especially high covariance of 0.974 and 0.893 for the growth and tourism equations respectively. The model's residuals have also been tested for evidence of unit roots, with a p-value of 0.497 for growth and 0.203 for tourism establishing statistical stationary. In addition, in the estimated model, the values for R^2 (0.877 for growth and 0.652 for tourism) and DW (1.991 for growth and 2.025 for tourism) appear acceptable and show no first-order autocorrelation problem.
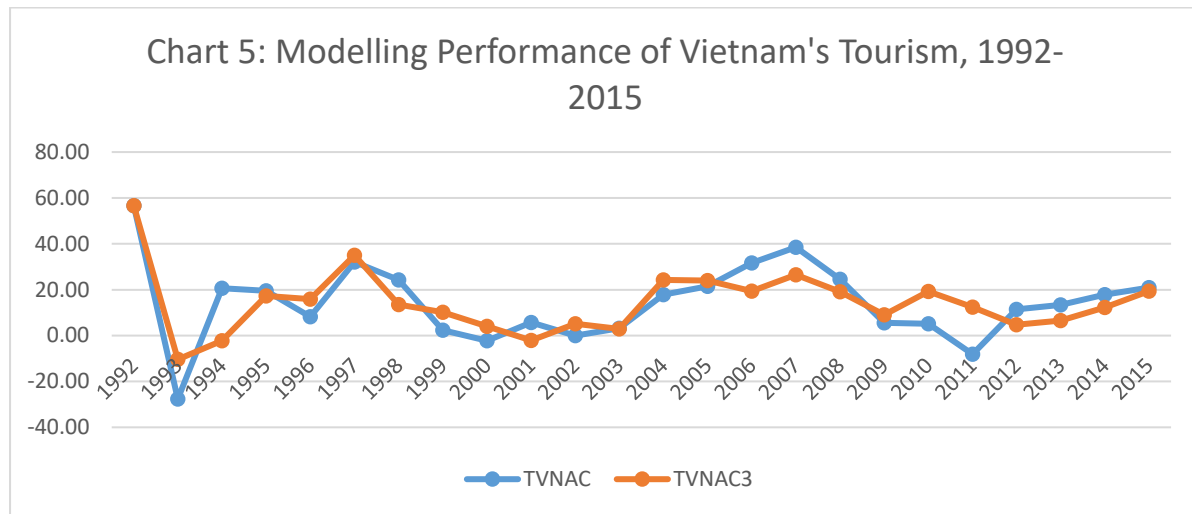
Table 1: Impact of Endogenous Vietnam's Tourism on Australian Growth. 3SLS Estimates. 1992-2015

Variables	Australian Growth	Vietnam's Tourism
Const	1.520**	76.943
Total Trade/GDP	-0.025*	
FDI/GDP	-0.0001	-0.002
Vietnam's Tourism	-0.010	
Gulf War 1993	3.562**	-63.791**
AFC 1997	-0.795*	31.213*
Post-AFC 1999/2000	0.988**	-23.923**
New York Terrorist Attacks 2001	-0.771**	
Pre-GFC 2007		2.713
GFC 2008/2009	-1.672**	
Australia's Growth		0.826
Vietnam's Growth		10.719**
Vietnam's Population		-64.705*
Vietnam's Real Exchange Rate		-0.775
Australia's Inflation	-0.301**	-0.175
Euro Recovery 2011/2012	0.729**	-11.771
RSQ	0.877	0.652
DW Statistics	1.991	2.025
ADF Test on Residuals	0.497	0.203

Notes: AFC=Asian Financial Crisis, GFC=Global Financial Crisis, RSQ=R-squared, *=Significant at the 10 per cent level, **=Significant at the 5 per cent level, ADF=p-value of the Augmented Dickey-Fuller Unit Root Test. Software used for estimation=TSP-Oxmetrics6.

Chart 4: Modelling Performance of Australia's Growth, 1992-2015
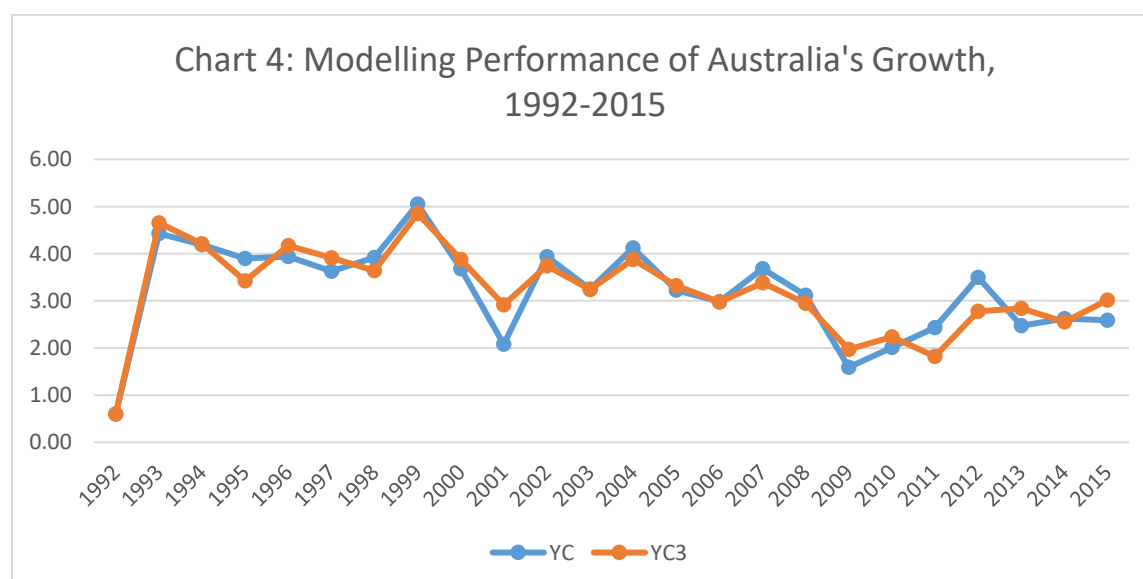
Notes: Own calculations. YC, YC3=Australian growth and its 3SLS prediction.

Chart 5: Modelling Performance of Vietnam's Tourism, 1992-2015

Notes: Own calculations. TVNAC, TVNAC3=Vietnam's tourism to Australia and its 3SLS prediction.

Table 2: Friedman-Kydland Modelling Performance
Statistical Characteristics of the Estimated Model of Growth and Tourism, 1992-2015
Theil-MSE Decomposition

	Australia's Growth		Vietnam's Tourism	
	Data	Model	Data	Model
Mean	3.206	3.206	14.288	14.287
Stand Dev	1.011	0.953	17.044	13.760
RSQ		0.876		0.652
MSE		0.348		9.847
Mean Error		0.000		0.000
Bias		0.000		0.000
Variance		0.026		0.107
Covariance		0.974		0.893

Note: For Tables 4-5, RSQ=R-squared, MSE=mean-squared error, Bias+Variance+Covariance=1 (See Pindyck and Rubinfeld, 1998).

The discussions of the findings and policy implications for Vietnam's tourism to Australia, and its impact on Australian growth based on these empirical findings, are given in Section 5.

5   GENERAL FINDINGS AND POLICY IMPLICATIONS

As mentioned earlier, the literature of tourism and its impact and contribution to economic growth since the early 1960s has been extensive with diverse empirical and simulation findings (see Song et al. 2012). However, in recent years, fast rising globalisation and widespread economic integration (WTO 2018) has focussed the sources of growth on international trade (or openness), FDI flows, and services (in which tourism is the major component), rather than the traditional production sector of the economy. This requires new directions in research and policy analysis that better reflects these global developments.

This paper makes use of this contemporary focus to develop a new approach to address these developments, the so-called economic integration or system of national accounts (SNA) expenditure approach (Tran 2004, Tran 2007, Tran and Limskul 2013), to provide substantive

evidence for policy analysis in the specific case of Vietnam's tourism, and its impact on Australia's growth. The findings by 3SLS estimation using 1992-2015 data of the models (3) and (4) with reported results in Table 1, show interesting results and insights for the impact of globalisation, Vietnam's tourism and regional and global crises on Australia's growth, and, importantly, the major contributing factors to Vietnam's tourism to Australia for strategic policy analysis.

It should be noted that, as these findings are from an endogenous and simultaneous multi-equation econometric study with acceptable empirical fit (see above), these time-series data-based findings represent another perspective of macro-economic modelling and real-life data, and may not be consistent with expectations or with other findings from alternative approaches such as input-output analysis, CGE simulation, Granger short-term causality, Engle-Granger long-term co-integration, or regression analysis (see details of these approaches in Song et al. 2012).

First, during the period of mainly slow and declining growth in Australia and fluctuating and declining growth in Vietnam since the GFC in 2008, the growth findings show that in the age of increasing globalisation with expected higher growth, trade (elasticity = -0.025) and FDI (elasticity= -0.001), had unexpectedly no positive impact on Australia's growth. An explanation for this could be that Australia, with its long history of being a quite open free-market economy, did not benefit significantly from more globalisation, or from increased trade and FDI which had been historically low on a relative international basis. This macro-economic effect in contrast to micro-economic expectations needs further research. In addition, the findings show that Vietnam's tourism to Australia, in this environment, did not have some positive macro-economic impact (elasticity=-0.010) on Australia. Australia's growth was significantly impeded by its inflationary pressure (elasticity=-0.301). On the other hand, the six major crises or recoveries during the sampling period 1992-2015, namely the Gulf War (impact=3.562), the AFC (-0.795) and post-AFC crisis recovery (impact=0.988) of 1999, the terrorist attacks on New York in 2001 (impact=-0.771), the GFC (impact=-1.671) starting in October 2008, and the 2012 post-Euro crisis recovery (impact=0.729) were all seen to have significantly affected Australia's growth. One implication is that while global crises with wide-spread contagion were expected for Australia, the regional recovery after the AFC in 1999 possibly reflects the importance of the closer trade and economic relationship and crisis management between Australia and its neighbouring Asian economies (Tran 2002).

Second, the findings on tourism determination not only recognise endogeneity in Australian growth, but also provide useful and important insights into what determines or motivates Vietnam's tourism to Australia. As a special de-commodity in the consumer demand basket with international characteristics or attributes, Vietnam's tourism is seen as being affected by both Australia's growth (elasticity=0.826) and especially statistically by Vietnam's growth (elasticity=10.719). While Australia's growth might reflect higher costs of visit to Vietnamese tourists, this does not seem to have reduce them coming. The high and positive impact of Vietnam's growth on its tourism to Australia indicates particularly the importance of rising income in Vietnam to its tourism to Australia. This may have the effect of diversion of Vietnamese tourists from other alternative attractive destinations such as Asia and Europe. This is an outcome that would raise international tourism competition, and be of interest to Australia's tourism agencies and policy-makers that may lead to beneficial tourism innovation in Australia.

The findings also show interestingly that, even with its less restrictive population policy than China, its population growth has continuously declined since the early 1990s. This decline has some impact on Vietnam's tourism (elasticity=-64.705) to Australia. These tourists also considered the country's real exchange rates as a cost deterrent to travelling (elasticity=-0.775). The finding is however not statistically significant. In addition, the cost of living in Australia seems to have deterred Vietnam's tourists (elasticity=-0.175) from coming to Australia, although the evidence is also statistically insignificant. It is also an important finding that the impact of FDI on Vietnam's tourism to Australia (elasticity=-0.002) through, as normally speculated, investment in tourism infrastructure, was found to be non-existent. Finally, it is interesting that major crises and reforms such as the Gulf War in 1993 (impact=-63.791), the AFC (impact=31.213), and its post-AFC recovery 2000 (impact=-23.923), all affected (statistically significantly) Vietnam's tourism to Australia. However, the pre-GFC in 2007 and the Euro recovery that emerged in 2011 (Tran 2002b) did not appear to have affected Vietnam's tourism to Australia.

6   CONCLUSION

The paper addresses two important contemporary issues, namely, the contribution of Vietnam's growing tourism to Australia's economic growth and the lack of rigorous studies taking into account the structure of modern economic integration theory, as applied to these two globalised trade partners. The new approach introduced in the paper, which is particularly consistent with contemporary global economic and trade policy developments and modelling methodological advances, to studying what motivated Vietnam's tourism to Australia, and whether it has had any impact on the Australian economy during the volatile period 1992-2015, has provided a number of interesting results. These results are useful for further scholarly analysis and also of policy relevance for tourism and economic policy-makers. The main conclusions are: As part of the globalising process, Vietnam's tourism to Australia, while growing exponentially in the past decades and currently regarded as a critical contribution to Australia's growth, has been found to exert no significant impact, at least at the macro-economic level, and Vietnam's rising income determines principally its rising number of tourists to Australia. The economic relationships in Vietnam's tourism to Australia have been complex, and dependant on both Australia's and Vietnam's economic demand and supply conditions, and international competition, as well as regional and global crises and reform developments. The findings are supported by rigorous economic-theoretic considerations and robust econometric modelling analysis.

Further research on an enlarged multi-equation economic integration model of endogenous growth and tourism, and extended data, would be desirable to provide further useful insights for scholarly study, and for policy analysis in this important field.

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