China's Sustainable Tourism and Output Growth: A Policy Modelling Study

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Abstract

China has become the world's high-growth and second largest economy since its socialist- orientation opening-up reforms in the early 1980s. Due also to its geographical, cultural and historical attractions, the country has become the world's fourth largest tourism destination and tenth largest tourism earner in 2018 according to the World Tourist Organization. The important role played by tourism in the Chinese economy has been officially recognized by China's National Development and Reform Commission as a strategic pillar industry development priority. In spite of these, rigorous policy-related studies on China's tourism have been limited. The paper is a serious econometric study to investigate the determination of China's tourism and its contribution to the country during the period 1996-2018 for credible data-based policy analysis. Significantly, the study is carried out appropriately from an economic integration (globalization) growth framework, which is also the expenditure (as opposed to production or income) perspective of the United Nations System of National Accounts 1998/2003. Specifically, a multi-simultaneous equation model of endogenous growth and China's tourism determination is developed. The model innovatively incorporates gravity theory and classical consumer demand contributors, Ironmonger-Lancaster new commodity attributes and Johansen policy impact add- and sub-factors (i.e., reforms and crises) explicitly in its economic integration structure. The model is then estimated by system methods with official economic and tourism 1996-2018 data from the World Tourism Organization and international databases. The research will contribute to advances in the literature and the findings provide useful insights and appropriate and much needed evidence-based inputs on the determination and contributors of tourism to China's growth. Recommendations will be provided to key stake-holders such as tourism policy-makers, academic researchers, business analysts and tourism operators for national strategic policy analysis and practical implementation.

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1. Introduction

China has become the world's remarkable high-growth and second largest economy since its socialist- orientation opening-up reforms in the early 1980s. Due also to its geographical, cultural and historical attractions, the country has become the world's fourth largest tourism destination and tenth largest tourism earner in 2018 (UNWTO, 2021). The important role played by tourism in the Chinese economy has been officially recognized by China's National Development and Reform Commission as a strategic pillar industry development priority (Zhao and Liu, 2020). In spite of these, rigorous policy-related studies of China's tourism especially from an appropriate economic integration (expenditure as opposed to production or income) perspective have, while highly desirable, been limited (see however previous studies for other developed and transition countries such as Australia (Tran et al., 2018) and Vietnam (Tran et al., 2020). The paper is a serious econometric study to investigate the determination of China's tourism and its economic contribution to the country during the period 1996-2018 where latest official data are available. The purposes are to provide substantive inputs and insights for China's credible data-based tourism policy analysis in particular and to advance the literature in general.

The plan of the paper is as follows. Section 2 briefly surveys the recent trend of China's tourism, growth, economic integration and key tourism contributing factors, and the impact of regional and global crises and domestic reforms in China during the volatile period 1996-2018. Section 3 briefly describes an appropriate multi-equation model of endogenous growth and tourism determination for China and its special innovative features, and previous similar studies. Section 4 describes the data and estimation methods and presents the empirical findings and, importantly, their statistical modelling characteristics. Major policy implications for sustainable tourism and growth for China are discussed in Section 5 and Section 6 concludes.

## 2. Recent Trends in China's Tourism and Growth

The data for China's key indicators in focus during the period 1996-2018 namely growth (YC, primary axis) and tourism (in million) of short-term (overnight and same day (UNWTO, 2021) visitors (TOM, secondary axis) are given in Figure 1. Its three main economic integration determinants of growth (WTO, 2021) standardized by gross domestic product (GDP) for international comparison, namely openness or total merchandise trade/GDP (TY, primary axis), foreign direct investment/GDP (FDIY, secondary axis), and services/GDP (SY, secondary axis) are given in Figure 2.

Notes: YC=China's growth (primary axis), TOM=China's tourism (in million, secondary axis).
Source: ADB (2021), ERS-USDA (2021), UNWTO (2021).

From Figure 1, we note the country's high and rising growth starting at 7.67 per cent from the aftermath of the Asian financial crisis (AFC) of 1997/98 and peaking before the global financial crisis (GFC) in 2007 at 14.23 per cent. With a mild recovery in 2010 at 10.67 per cent, China's growth had been continuously declining since ending at 6.6 per cent in 2018. The country's average annual growth for the 1996-2018 period is still remarkably high at 9.06 per cent. On the contrary, in this figure, tourism to China shows an exponential growth pattern, starting in 1996 with 51.128 million, punctuated by a small decline in 2003 at 91.662 million due probably to the impact of the New York terrorist attacks in 2001 and the Iraq war in 2003. It peaked at 158.606 million in 2018. China's average annual tourism during the period is large at 112.882 million. From both Figures 1 and 2, it appears that while China is still a transition, socialist and open economy, its tourism and especially growth have been impacted somewhat by regional and global crises. And these should have implications for its tourism and economic policies.

Figure 2: China's Economic Integration Growth Determinants (%), 1996-2018
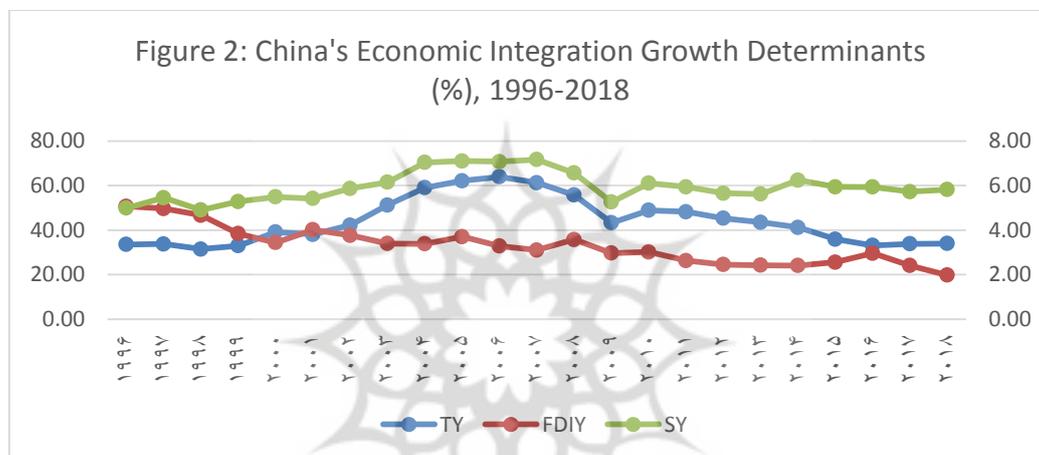
Notes: TY= (exports + imports)/GDP, FDIY=FDI/GDP, SY=services/GDP.
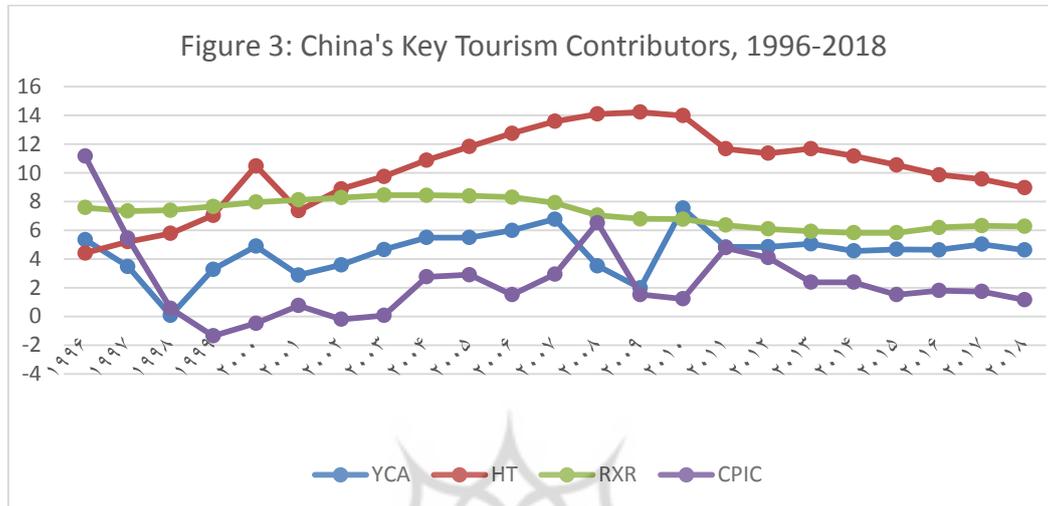**Source: ADB (2021), ERS-USDA (2021), UNWTO (2021).**

From Figure 2 where the trends of the three relevant key economic integration engines of growth, namely openness TY, capital flows FDIY and services SY are depicted, we note that China's openness shows a high and rising trend especially during the expansive times after its WTO membership in 2001 and before the GFC, and a sharp continuous decline since. It started at 33.51 per cent in 1996, peaked at 63.94 per cent in 2006, fell to 43.26 per cent in 2009 due to the GFC, and to 33.99 per cent in 2018. Its annual average was still relatively high at 43.99 per cent. FDIY which was crucial to support the country's official FDI-led growth during the period, shows only a low and declining pattern ranging from the peak of 5.07 per cent in 1996 to a low of 1.98 per cent in 2018. The annual average was 3.30 per cent. As a transition country with early stage financial activities, China's services SY appears to follow the fluctuating pattern of its openness TY, except in recent years where it slowly diverged upwards indicating probably the country's financial activity expansion. SY started at 4.99 per cent in 1996, peaked at 7.17 per cent in 2008 before the GFC, and ended at 5.82 per cent in 2018. Its annual average was 5.95 per cent during the period. In Figure 2, all three key indicators of China's economic integration growth appear to be impacted by regional and global crises and national reforms.

Figure 3 describes the movements of the four representative key contributors to China's

tourism (see the conceptual rationale given in Tran et al., 2018; Tran et al., 2020) during the period 1996-2018. These contributors include China's main trading (tourism sources) partners' economic demand conditions or growth (YCA). China's cost of living (CPIC), China's real exchange rates (RXR), and China's tourism accommodation supply conditions measured as hotel establishments (HT in '000).

Figure 3: China's Key Tourism Contributors, 1996-2018

Notes: YCA=Asia and Oceania's growth, HT=hotel establishments ('000), RXR=real exchange rates, CPIC=China's cost of living or inflation (%).
Source: ADB (2021), ERS-USDA (2021), UNWTO (2021).

The picture from Figure 3 shows a complex group of indicators with diverse and fluctuating movements that may have potential collective impact on China's tourism and subsequently growth. YCA denotes regional growth of China's largest group of tourism sources, namely East Asia and the Pacific (UNWTO, 2021) or its proxy Asia and Oceania (ERS-USDA, 2021), with a high annual average of 4.49 per cent during 1996-2018. This regional growth appears to be seriously affected by the AFC and the GFC but benefitted from regional and global reforms and recoveries. CPIC shows on the other hand a declining and highly volatile trend from the start in 1996 at 11.16 per cent, falling to -1.35 per cent in 1999 after the AFC, and rising to 1.16 per cent in 2018. It has an annual average of 2.40 per cent, a much lower rate than China's growth (Figure 1). The effects of the AFC and the GFC on reducing China's cost of living can be seen from Figure 3. China's real exchange rates show a more stable and slowly appreciating movement from 1996 to 2018 with an annual average of 7.19. The most interesting observation from Figure 3 concerns the hotel establishment indicator HT which increased substantially after China's WTO membership in 2001, peaked at 14.24 thousand in 2009, but slowly declined since after the GFC to 8.96 thousand in 2018.

The 1996-2018 statistical data and their statistical descriptive analysis from Figures 1-3 above for China's major potential determinants of tourism and probably economic integration-based growth (through an indirect complex nation-wide interdependent transmission mechanism) during the country's economic integration or globalized and volatile period show a complex system of relationships. This would severely affect graphical or correlation analysis or related applied computable equilibrium approaches (Johansen, 1982. See also below) for credible findings. In the sections below, we propose to use an econometric approach to

empirically study the causality of China's tourism and growth and their relationship during globalization as postulated by modern tourism economics via gravity theories, classical and new consumer demand theories and Johansen policy-impacted factors.

3. A New model of China's tourism and growth

Numerous studies have been carried out in recent years to investigate China's tourism and sometimes with growth. These include studies published in Chinese in China and in English in international journals. For example, Zhong et al. (2013) review 333 articles on China's tourism, policies and impacts published in English-language academic journals during 1978 to 2012. Huang and Chen (2016) review 129 articles published in 2015 in China with the finding that tourism demand and quantitative analysis is a shifted focus. Song et al. (2012) provide a comprehensive survey of tourism research themes and methodologies. Wu et al. (2017) discuss generally new developments in tourism with a similar finding that tourism research has shifted to the demand perspective. More recently, Zhao and Liu (2020) describe the evolution and new trends of China's tourism and policies under the country's official guidance. In spite of these extensive and varied studies, rigorous studies of China's tourism and growth under the country's current economic integration or globalization stage and with appropriate data-based policy recommendations are, while highly desirable, have been very limited. The gap is addressed in the sections below from an econometric approach using the data described in Section 2 and other related contributing factors.

To rigorously explore the causal relationship between China's growth and tourism, economic integration growth contributors (TY, FDIY and SY), and also key testable tourism determinants (such as YCA, RXR, HT, and CPIC) and, importantly, major crisis events or reforms for China in an economic integration structure, an econometric model for China is developed as follows.

Adopting a new class of so-called economic integration models for growth causality study as proposed previously in Tran (2004, 2007; Tran and Limskul, 2013; Tran and Vu, 2018; Tran et al., 2018; Tran, 2019; Tran and Vu, 2020, Tran et al., 2020), 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), (1) and (2), and their key testable determinant variables in an economic integration growth framework. In this model, the underlying theoretical assumptions and testable hypotheses are as follows. First, China's income (Y) is determined principally not by conventional production (ie., capital and labor) or income (i.e., wages and profits) factors but by economic integration engines of growth, namely, trade openness (O) (WTO, 2021), FDI (see also Tang et al. 2007 for the possible relationship between FDI and tourism), services (F), and additionally by China's tourism (T), economic policy (W), and shocks or reforms (S) (Johansen, 1982; Tran, 2004). Second, tourism is simultaneously determined by both China's and its tourism sources' economic demand conditions such as their GDP (i.e., Y and YT respectively) (also known as the gravity factors, Frankel and Romer, 1999), China's cost of living or inflation (I), its real exchange rate (RXR) (Gerakis, 1965), FDI (Tang et al., 2007), W and other non-economic factors S. Conceptually, 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 importantly in implicit (function-free) functional form, the two functions for Y and T can be written for a sample N as:

$$Y_t = F1\ (a,\ O_t,\ FDI_t,\ F_t,\ T_t,\ W_t,\ S_t),$$
$$t=1,…,N \tag{1}$$

$$T_t = F2\ (b, Y_t,\ YT_t,\ I_t,\ RXR_t,\ FDI_t,\ W_t,\ S_t)$$
$$t = 1, \ldots, N \tag{2}$$

where F1 and F2 are two implicit functions linking simultaneously income and tourists to their theoretically plausible and empirically testable causal determinants (variables), and a and b are two vectors of parameters. In this model, Y may be defined as GNP (gross national product), per capita income (Easterly, 2007) or more popularly by convention real GDP which is adopted in this study. T is defined as short-term arrivals (overnight tourists and same day excursionists), O = exports or imports or, more conventionally, openness (exports plus imports/GDP). FDI denotes foreign direct investment, F for services, and S is a vector representing shocks or policy reforms. YT is the tourism source countries' income representing their 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 China's growth and tourism policy. Importantly for our feasible empirical study especially for developing or transition economies where data are often limited, in addition to the official time-series data for Y, YT, O, FDI, F, and T, and identification of relevant influencing national and global events in S, continuous or discrete data for W must be available and consistent with published time-series data from national statistical offices in a standard Kuznets-type accounting framework (e.g., System of National Accounts, SNA93/08), or the accounting system of Stone (1988), or the recent World Bank tables.

As (1) and (2) are in implicit form they assume importantly flexibility or no specific *a priori* functional form, and therefore are not statistically estimable. Since our purpose is

ultimately to derive elasticities for their economic variables, we use planar approximations (thus ignoring higher-order differentials) and invariant transformations (e.g., see Allen 1960; and derivation in Tran, 1992; and previous related studies cited above) for (1) and (2) to write more explicitly in stochastic form and in terms of the rates of change for the continuous economic variables (denoted by *y, yt, o, fdi, f, t, w, i, rxr, and w*) and binary S of all the included econometrically exogenous and endogenous variables as (for t=1,…,N)

$$y_t = a1 + a2o_t + a3fdi_t + a4s_t + a5t_t + a6w_t + a7S_t + u_{1t}, \tag{3}$$

$$t_t = b1 + b2y_t + b3yt_t + b4i_t + b5rxr_t + b6fdi_t + b7w_t + b8S_t + u_{2t}. \tag{4}$$

where 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–a6 and b2–b7 are the elasticities (see Tran, 1992), and a7 and b8 are impact parameters. The u's are other unknown factors outside the model (Frankel and Romer, 1999), or the usual disturbances with standard statistical properties.

The main features of the model can be described as follows (see also Tran (2004, 2007; Tran and Limskul, 2013; Tran and Vu, 2018; Tran et al., 2018; Tran, 2019; Tran and Vu, 2020, Tran et al., 2020)). As specified in (1) and (2) and as testable hypotheses, the model in its implicit form can deal with any possible complex nonlinear functional relationship between growth and tourism without requiring arbitrary and restrictive extraneous information about their relationship, and explicitly, in a causal economic integration growth framework. In its transformed form for empirical implementation given in (3)–(4), circular and instantaneous causality in the sense of Granger (1969) or Engle-Granger (1987) and within the economic integration framework exists, or is

regarded in our study as a testable hypothesis. A system estimation method such as the 3SLS (three-stage least-squares) is therefore econometrically appropriate. In their exact or non-stochastic forms (in which all disturbances are idealistically zero), these estimated equations form the basic structure of a time-series data-based class of the computable general equilibrium/global trade analysis project (CGE/GTAP)) models of the Johansen class, in which all elasticities and impact parameters are not assumed (calibrated) to be given or known *a priori* and the impact of endogenous or endogenized 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. In econometric studies, the impact is usually carried out by reduced-form analysis.

   Significantly, it should be noted that, in the model's estimation construct (3)–(4) with the variables in the form of the rate of change or, equivalently, log-differences (for small changes), the resulting parameter estimates are the elasticities (see above and Tran, 1992) that may be regarded as short-run causality in the sense of Granger (1969) when the variables are integrated of degree 0 or they may be regarded as long-run causality or co-integration in the sense of Engle-Granger (1987) when the variables are integrated of degree 1. Other important properties of the approach are given for example in Tran et al. (2018). 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. The three-stage least-squares estimation method with relevant instrumental variables (see Table 1) is suitable and adopted.

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 China's cost of living, international trade real exchange rates, FDI (Tang et al., 2007), and the supply of hotel accommodation, measured by hotel establishments. Data for the estimation were obtained from the UNWTO (2021), ADB (2021), UNCTAD (2021) and ERS-USDA (2021) 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, FDI and services, all divided by the GDP. 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 1996 to 2018.

   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 linear or log-linear 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 comprehensive trade to growth in a "causal" context. That is, the model deals with China's trade (in goods, FDI, and services) and their causal impact on China'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 simultaneously China's growth and tourism, are listed in the empirical findings table in the next section.

The p-values for the Phillips-Perron unit root test for all variables in the model are given as: China's growth = 0.850, East Asia and Pacific growth = 0.096, China's tourism = 0.066, openness = 0.019, FDI/GDP = 0.087, services/GDP = 0.021, RXR = 0.453, China's inflation = 0.237, hotel establishments = 0.016, and population = 0.672. Showing all variables used in the estimation are stationary at the 1% significance level. The empirical findings reported below are thus not spurious.

4.2. The estimated model and modelling performance

To provide insights into China's tourism, and with the various key contributing factors to endogenous growth and tourism (the instrumental variables), the model (3)–(4) has been appropriately estimated, as mentioned earlier, by the 3SLS using the available official data for the period 1996–2018. The basic findings on the parameter estimates (elasticities for economic, trade, tourism and demographic variables and impact parameters for event variables) are reported in Table 1 below, and their standard evaluation in this modelling approach are given in Figures 4 and 5 and Table 2. As mentioned above, the model

is identified according to the order identification tests, and all included (non-binary) variables have been found to be statistically stationary according to the usual unit root tests.

Table 1: China's Tourism and Impact on Growth. 3SLS Estimates. 1996–2018.

| Variables	Growth	Variables	Tourism
Const	7.941		11.341
Trade/GDP	-0.026	China's Growth Partner's Growth	-1.729*
FDI/GDP	-0.016		1.812**
Services/GDP	0.025	FDI.GDP	-0.035
Tourism	0.014	Exchange Rates	0.909**
Inflation	0.144**		-0.387
		AFC 1998	-3.743
Post AFC 1999	-0.310		-4.610
Post AFC 2000	1.025		
		Hotels Openness	0.064 -0.011
Post AFC 2001	0.228		3.447
Iraq War 2003	2.133**		-17.400**
2007	2.762**	Post Iraq War 2004	28.029**
GFC 2008	-4.667**	Post GFC 2009	-8.642**
2010	0.885		
2012	-3.014**	2013	-4.988**
2016	-0.550	2017	2.437
RSQ	0.916		0.868
DW	2.192		2.253
PP-p value	0.130		0.198

Notes: AFC = Asian Financial Crisis, GFC = Global Financial Crisis, RSQ = R-squared, ** = Significant at the 5 per cent level, * = Significant at the 10 per cent level, PP p-value = Phillips-Perron p-value of the unit root test on the residuals. Software used for estimation = TSP-Oxmetrics 6.
Source: Authors

The modelling performance of the estimated equations for China's growth and tourism using our approach has also been measured, importantly, by the Friedman (1953)-Kydland (2006) data-model compatibility or simply "empirical fit" criterion (Figures (4)–(5)) which, unlike many other empirical models in related studies, show excellent fits. More specifically, the estimated model emulates very well the volatile peaks, troughs and the turning points of both growth

and tourism in China over the whole sample period and especially over the deeply turbulent period of the global financial crisis 2008–2009 and the so-called euro crisis in the early 2010s.

Figure 4: Friedmand-Kydland Modelling Performance, China's Growth (%), 1996-2018
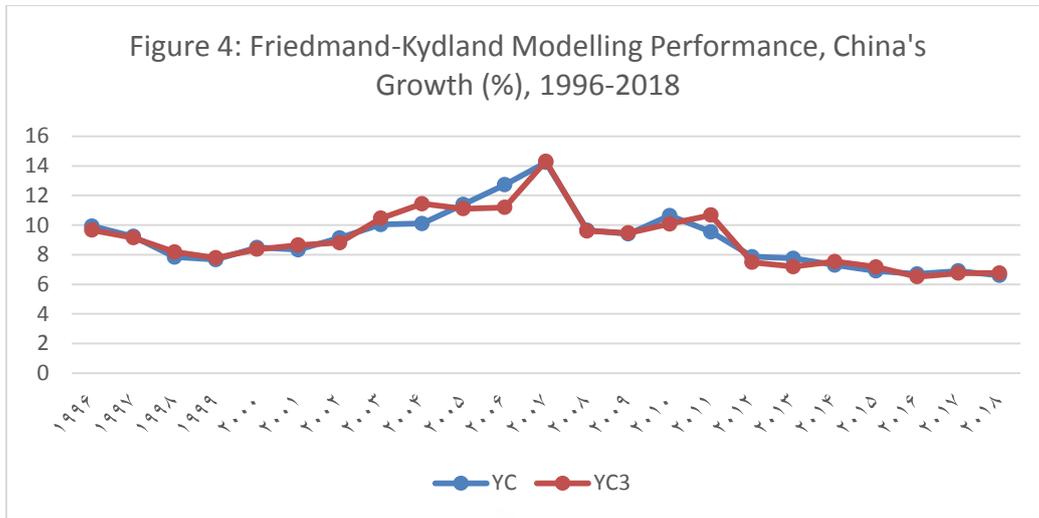
Notes to Figures 4–5: YC and YC3 = China's growth and its 3SLS estimate, T and T3 = China's tourism and its 3SLS estimate.

Source: Authors

Figure 5: Friedman-Kydland Modelling Performance, China's Tourism (%), 1996-2018.
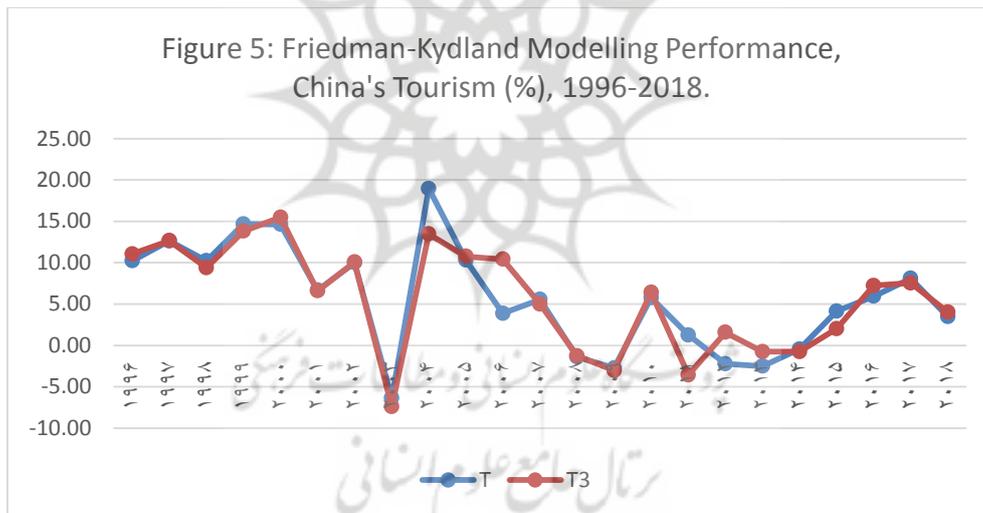
Source: Authors

In addition, modelling performance is measured by their empirical statistical characteristics, using Theil-MSE decomposition, and given in Table 2. Other standard diagnostic tests available for OLS estimation and residuals are not appropriate for 3SLS residuals. As assessed by these various modelling diagnostics reported in Figures (3)–(4) and Table 2, the estimated model first performs very well in emulating the trend and volatile movements of China's growth and tourism data over the whole sample period 1996–2018. Second, the Theil-MSE findings show the closeness of data in the form of the model's first two moments bias (m_b), variance (m_s), and especially the high covariance (m_c) of 0.997 and 0.994 for the growth and tourism equations respectively. The model's residuals have also been tested for evidence of unit roots, with a Phillips-Perron p-value of 0.130 for growth and 0.198 for tourism establishing statistical stationarity and modelling

credibility. In addition, in the estimated model, the values for R^2 (0.916 for growth and 0.868 for tourism) and DW (2.197 for growth and 2.253 for tourism) appear acceptable and show no first-order autocorrelation problem.

Table 2. Modelling performance—THEIL-MSE decomposition.

	Growth		Tourism	
	Actual	3SLS	Actual	3SLS
Mean	9.060	9.060	5.683	5.683
St. Dev.	1.943	1.912	6.529	6.347
Corr. Coef.	0.957		0.931	
RMSE	0.555		2.337	
Mean Error	0.000		0.000	
m_b	0.000		0.000	
m_s	0.003		0.006	
m_c	0.997		0.994	

Note: $m_b + m_s + m_c = 1$. See Pindyck and Rubinfeld (1998).
Source: Authors

The discussions of the findings and policy implications for China's growth and tourism determination are based on these empirical findings, and given in Section 5.

5. General findings and major policy implications

As mentioned earlier, the literature of tourism and its impact and contribution to economic growth in general and with respect to China in particular since the early 1960s has been extensive with diverse empirical and simulation findings (for reviews, see Song et al., 2012; Zhong et al., 2013; Huang and Chen, 2016; Wu et al., 2017; and Zhao and Liu, 2020). However, in recent years, fast rising globalization and widespread economic integration through for example free trade agreements (WTO 2021) has focused the sources of growth on international trade (or openness), FDI flows, and services (in which tourism is the major component), rather than on the traditional production or income perspective of the economy as adopted by a large number of studies. This requires new directions in fundamental research and policy analysis that better reflect these global developments and provide appropriate and credible recommendations.

This paper makes use of this contemporary focus to develop a new approach to address these developments, the so-called economic integration or United Nations System of National Accounts (SNA 98/03) expenditure approach (Tran, 2004; Tran, 2007; Tran and Limskul, 2013; Tran and Vu, 2018; Tran et al., 2018; Tran, 2019; Tran and Vu, 2020); Tran et al,, 2020). The objective was to provide substantive evidence for credible and appropriate policy analysis in the specific case of China's sustainable tourism, and its impact on the country's growth. The findings by 3SLS estimation using official 1996–2018 data of the model's two equations (3)–(4) with reported results in Table 1 and their modelling characteristics (Figures (3) and (4) and Table 2), show interesting credible results and insights for the impact of globalization, tourism and regional and global crises on China's growth, and, importantly, the major contributing factors to China's tourism for meaningful policy analysis.

It should be noted that, as these findings are from an endogenous and simultaneous multi-equation economic integration econometric study with acceptable empirical fit (see above), these time-series data-based findings represent another perspective of macro-economic modelling and using official real-life data, and, as expected, 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, regression analysis (see details of these approaches in Song et al. 2012) and related studies.

The main findings are as follows. First, to the principal research question of whether tourism contributes to growth in China during the turbulent period 1996–2018 that is marked by major domestic reforms and regional (the

Asian financial crisis of 1997/98), regional wars (the Iraq War in 2003), and global crises (the GFC in 2008 and the euro crisis in the early 2010s), the findings show that the answer is in the affirmative (elasticity = 0.014) but statistically weak. This supports nevertheless not only the government of China's development priority on tourism as a national pillar industry but also the casual observations of the official international data (UNWTO, 2021). Further research is necessary in this respect. Second, to the important question of what determines significantly China's tourism, the findings show that it is the income or economic conditions of the main source countries for China's tourism, namely, East Asia and the Pacific (UNWTO, 2021) (elasticity = 1.812). To underscore this importance, it is noted that, in 2018, 92,06 per cent of China's tourism came from this region (UNWTO, 2021). Third, the thesis that growth is determined simply by economic integration or globalization (via enhanced merchandise trade, FDI and services) is not supported in our empirical study. This finding may be due to the characteristics of China as a transition economy (namely, being socialist with not full open market features), the deep country-wise simultaneous transmission mechanism of globalization and growth and other activities, or simply the short available data sample we used. Importantly and additionally, China's rising costs of living do apparently deter its tourism but weakly, and they affect positively its growth. In addition, the supply of tourism accommodation via hotel establishments and especially rising real exchange rates in China have also positive impact on its tourism. However, domestic reforms and regional and global crises do have strong impact on China's growth and especially tourism predominantly in the turbulent years of the recent period.

Several important implications can be derived from the findings. First, the study appears to lend empirical support to China's priority policy to promote and support tourism (Zhao and Liu, 2020) by either appropriate

tourism development, tourism labor supply and management support, or infrastructure and partnership investment. Second, this policy is crucial for sustainable tourism in China amid rising globalization as international tourism is globally and regionally competitive especially for major developing economies in Asia in recent years. This policy will also have the outcome of increasing tourism with positive impact first on the economy and second, on its official eco-social development programs. However, as our study's findings also indicate, the real impact on China's tourism and economy involves many factors lying outside the country's control. These include importantly the source countries' income in East Asia and the Pacific (where the majority of China's tourism come from, UNWTO, 2021) and especially regional or global shocks that are highly relevant but have been overlooked in numerous major related contemporary studies. The cases of recent US-China trade-disputes and specially the Covid-19 pandemic that induced trade and therefore income decline globally, are specific examples of these important influencing factors. Importantly, the competitiveness of tourism attraction by other regional and global tourism destinations may be another major issue for consideration in strategic sustainable policy formulation.

6.Conclusion
The paper addresses two important contemporary issues in Asia, namely, tourism determination in China and its contribution to the country's economic growth amid the lack of rigorous studies taking into account the structure of modern economic integration theory appropriately for globally integrated economies. The new approach introduced in the paper is thus particularly consistent with contemporary global economic and trade policy developments and modelling methodological advances. It is highly relevant to studying what motivated growing tourism to China, and whether it has had any significant impact on its economy during the volatile

period 1996–2018 where the country and region had experienced great shocks and reforms. The study has provided a number of interesting and useful results for practical and sustainable tourism policy analysis in China. The findings and policy implications are also supported by rigorous economic-theoretic considerations and robust advanced econometric modelling analysis. Finally, the approach adopted is in the so-called economic integration class of econometric modelling and generic, and has wide applications in related fields of impact research and policy analysis.

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