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MEASURING THE ECONOMIC IMPACT OF MIGRATION-INDUCED TOURISM

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Migration induces inbound and outbound tourism flows for a country heavily reliant on migration, such as Australia. Previous research has provided estimates for Australia of the effects of changes in migration on the volume of inbound and outbound tourism. When supplemented with information about tourist spending, estimates can be made of any expenditure changes associated with migration-induced tourism. Such migration-induced tourism expenditures will have economic impacts on the economy. This study estimates the economic impacts of migration-induced inbound and outbound tourism flows using a computable general equilibrium (CGE) model for Australia projecting the effects on key economic variables such as real GDP, real value added, economic welfare, and employment.

Key words: Australia; Tourism; Migration; Economic impacts; Computable general equilibrium model

Introduction

When settlers depart from a source country to reside in a new location, tourism may be stimulated through visits by friends and relatives, and return visits by settlers to their country of origin. In turn, increasing numbers of tourists to a country from a particular origin may result in greater permanent migration to that destination. Despite a growing volume of research exploring these links (Dwyer, Burnley, Forsyth, & Murphy, 1993; Feng & Page, 2000; King, 1994; King & Gamage, 1994; Nguyen & King, 2002; Philpott, 1968, 1973; Rubenstein, 1979; Williams & Hall, 2002), there is a dearth of research on their economic significance to a destination. Given the interrelations between migration and tourism, the neglect of the economic dimension is surprising. Migration levels and patterns will inevitably impact upon tourism flows and the associated expenditure, and thus the greater is our understanding of the likely economic consequences to tourism of a country's migration policies, the greater the level of understanding of the potential gainers and losers within tourism of changes in

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migration numbers, and the more informed will be the quality of public decision making in this area.

Australia is a particularly relevant country to study given the importance of both migration and tourism to its national development. The country has been a high receiver of migrants relative to total population and migration has played a prominent role in the development of the nation, particularly in the post-World War II period. While early migration policy (the so-called White Australia Policy) espoused a preference for British or European migrants, this strategy was progressively amended during the 1970s and 1980s to welcome migrant intakes from Asia. Beginning with the recession of the early 1990s and over the subsequent two decades, Australia's migrant intake has accelerated and diversified. Migrant intakes grew during the 1990s and reached an all time high through much of the early years of this century.

Since World War II migration to Australia has been relatively consistent, despite some highs and lows that have been primarily attributable to economic conditions. About 1 million migrants arrived in Australia in each of the six decades following 1950. During the more recent decades, the most substantial number arrived during the 1980s (over 1.1 million) with over 900,000 arriving in each of the two following decades. In planning for future arrangements, the Australian Government has signaled its intention to apportion migrants entering under different arrangements. At the time of writing, the proposed balance between the skilled and family streams is 67.5% and 32.3%, respectively. This might indicate a strong potential connection with VFR and with business travel. Migration has recently been experiencing high volumes with between 110,000 and 160,000 entering in each of the years between 2003–2004 and 2008–2009 (this reflects the ongoing mineral boom). In 2008–2009, the two largest sources of settlers were New Zealand and the UK, respectively, reflective of historic ties. China and India were in third and fourth places. It is worth noting, however, that the countries placed fourth to seventh as sources are all in Asia. While the prominence of New Zealand and the UK means that it is not accurate to describe Australia's migration program as Asia oriented, there is no question that the prominence of Asian sources in both the skilled and family streams is indicative of an orientation by Australia to its immediate region.

Australia's Minister for Immigration and Citizenship has recently stated how immigration has played a very significant role in Australia's national development, adding to population growth, skilled labor, productivity, and economic growth (Bowen, 2010). Australia's economic growth is significantly enhanced as migrants directly affect the economy through their contribution to supply and demand. Immigration affects the demand side of Australia's economy through: migrants' own spending (food, housing, and leisure activities); business expansion (investment to produce extra goods and services); and expansion of government services (health, education, and welfare). It also affects the supply side of the economy through: labor, skills, and capital introduced into Australia; new businesses developed by migrants; migrant contributions to technology; and adding productive diversity through knowledge of international business markets (Department of Immigration and Citizenship, 2011).

Concurrent with an evolving immigration program, Australia's integration into the international economy has fostered significant growth in international interest, and travel to Australia. Tourism is a relatively large industry for Australia. In 2010–2011 tourism's direct contribution (direct plus indirect) to Australian gross value added (GVA) was $69.1 billion, or 5.3% share of the Australian economy. In 2010–2011, 907,100 people were directly and indirectly employed by spending on tourism, representing 7.9% of total Australian employment. Tourism is also Australia's largest services export industry. In 2010 there were a total of 5.4 million international visitor arrivals to Australia. Tourism exports (international tourism consumption in Australia) were $23.7 billion in 2010–2011, accounting for 9.0% of the national total (Australian Bureau of Statistics, 2011).

Given the continued high migration numbers and the importance of tourism to Australia's economic growth, the interrelations between the two merit detailed study. Lack of attention to the migration-induced effects on tourism is curious given its potential to drive tourism flows both into and out of Australia with the associated expenditure leakages and injections.

It is not just the inbound tourism effects of migration that requires attention. Of the $32.8 billion allocated to Australian outbound travel in 2008–2009, it is estimated that $5.5 billion was consumed in Australia before or after the trip (Tourism Research Australia, 2010).

This article is the first that we know of to attempt to estimate the economic impacts on an economy of migration-induced tourism. While various aspects of migration-tourism interrelations have been studied by researchers, none to date have explored the economic effects of migration-induced tourism on key economic variables such as gross domestic product (GDP), employment, and economic welfare. Given the importance of both migration and tourism to Australia it serves as an obvious context to explore the economic impacts. We explore the impact on tourism both into Australia and also the impact of outbound tourism stimulated by migration.

The structure of this article is as follows. Section two highlights some of the important migration–tourism links that have been uncovered in the relevant literature. Several earlier studies have estimated migration-induced demand elasticities for Australia (Dwyer et al., 1993; Hollander, 1982; Jackson, 1990; Smith & Toms, 1978). However, given the changing patterns of migration to Australia, we cannot rely on earlier studies to produce the elasticity measures reflecting today's migration and tourism profiles. A model of tourism demand incorporating migration-related variables has been developed to estimate migration-related tourism (inbound and outbound) demand elasticities that are used in the present study. Section three applies these elasticities to estimate the numbers of inbound and outbound tourists resulting from an assumed 10% increase in migration numbers in Australia. Multiplying the tourist numbers by the expenditures incurred by a "representative" or "average" tourist, the tourist flow, data are converted into tourist expenditure data associated with migrant-induced tourism both inbound and outbound. In section four, the impacts of the tourism-related expenditure on key economic variables such as GDP, employment, government revenue, and economic welfare are estimated. A computable general equilibrium (CGE) model is used to project the economic impacts on Australia of the migration-induced tourism inflows and outflows. Section five discusses some of the policy implications of the analysis and issues for further research.

Migration-Induced Tourism Flows

A large number of research studies have attempted to identify factors influencing tourism demand, and the extent of their influence. Researchers have suggested that there are a wide range of factors affecting tourism demand (Crouch, 1994; Lim, 1999; Saayman & Saayman, 2008). Very few of these demand models have included migration-related items as independent variables in the equations. In recent years, only a small number of research papers have explored the influence of migrant numbers on tourism flows (Dwyer et al. 1993; Hollander, 1982; Jackson, 1990; Seetaram, 2012, in press; Seetaram & Dwyer, 2009, Smith & Toms, 1978). These studies indicate that migration generates flows of tourism both into and out of destinations. However, they collectively suffer from two weaknesses that undermine our confidence in the accuracy of the elasticity values for the present time. One is that the data used are limited and outdated. The earlier studies simply did not have either of the migration or tourism data for sufficient years to warrant confidence in the elasticity values that were estimated using regression analysis (Seetaram, 2012, in press; Seetaram & Dwyer, 2009). The second concern applies to the migration data in particular. Given the changes in Australia's migration profile, which has progressively switched from European to Asian dominated, their relevance to the present time may be questioned. Recent research on international students in Australia has shown differences between the behavioral patterns of visiting friends and relatives from overseas who come to Australia during the period that the student is enrolled or for graduations (Davidson et al., 2011). Though international students are distinct from migrants, the typical undergraduate spends 3 or 4 years in Australia with some becoming permanent residents. The researchers noted that many respondents overall and most in the case of Asian students, felt that there was a strong possibility that their parents would travel to Australia to attend graduations. Approximately 80% of Chinese, Indian and Korean respondents indicated that their parents would maybe or definitely attend their graduation (Davidson et al., 2011). These observations indicate variability between VFR behavioral patterns generally and between Asian and non-Asian VFRs in particular.

Recognizing that the estimation of the economic impacts of migration-induced tourism requires accurate elasticity measures of the responsiveness of tourism flows (inbound and outbound) to migration numbers, the authors constructed a model of tourism demand, but modified to include migration variables.

Thus,

$$LV_{ijk} = \alpha_1 LY_i + \alpha_2 LP_{ij} + \alpha_3 LAF_{ij} + \alpha_4 LM_{i/j} + \alpha_5 LPeak_{i/j} + \alpha_6 LPOP_i + \varepsilon_i$$

where:

i is the tourism-generating country and j is the destination;

k is the purpose of travel and takes the values of 1, 2, and 3 (1 = total; 2 = VFR; and 3= non-VFR);

α and λ are the parameters to be estimated;

LV_{ijk} represents the number of short-term travel flows from country i to destination j;

LY_i represents the income in country i. It is proxied by the GDP per capita in the home country;

LP_{ij} represents the relative price between origin i and destination j. It is proxied by the real exchange rate between the home and the destination;

LAF_{ij} represents the transportation cost from origin i to destination j. It is proxied by the return average economy airfare from the home country to the destination;

$LM_{i/j}$ and $LPeak_{i/j}$ are the migration variables;

$LM_{i/j}$ represents the estimated resident population of Australia born in origin i (for model on arrivals) or in destination j (for model on departures);

$LPeak_{i/j}$ is the number of years lapsed since migration from origin i (in model of inbound tourism) or destination j (in models of outbound tourism) peaked;

$LPOP_i$ is the population of the country of origin;

ε_i is the idiosyncratic error term.

The variables are in the logarithmic form implying that the estimated coefficients are the respective demand elasticities. The model was used to estimate the effects of changes in migration, as measured by the total number of persons born overseas, and also the time elapsing since the peak of the migration flow, on both inbound and outbound tourism. Migration related tourism demand elasticities were derived for Australia using this demand function. A cross section of countries contributing migrants was used and elasticity measures were estimated for the year 2006, the most recent year for which census data are available. The t-statistics are given in parentheses.

Diagnostic tests were performed in order to verify the robustness of the results obtained. The F-statistics for overall validity of the model rejected the null hypothesis of all explanatory variables being simultaneously equal to zero for all six models. A DW statistic close to 2 show that autocorrelation is not a problem, granted that this is a cross-section study. As per the Jarque-Bera statistics it can be concluded that errors are normally distributed. However, Model 5 and 7 rejected the null hypothesis of homoscedasticity. This implies that unless heteroscedasticity is dealt with in these two models, the validity of inference performed will be questionable. Note that these results were confirmed by the White (1980) test for heteroscedasticity. Therefore, Model 5 and 7 were estimated using the White (1980) Heteroskedasticity Consistent Covariances method while the remaining were estimated using OLS. The AIC, and Schwarz criteria, show that Model 2 is the superior model and the $\overline{R}^2$ for this model shows that 74% of the variations in the dependent variable can be explained by variations in the independent variables. Note that the estimations were performed using data for the year 2006 as more recent data on immigration are not available. It is possible that overtime consumers' behavior may have changed (Smeral, 2012) and that using more recent dataset may yield different migration elasticities.

Inbound Tourism

The elasticity estimates of present interest are the migration elasticities. The results outlined in Table 1 indicate that a 10% increase in the migration variable (number of overseas born Australian residents) will prompt an increase in total arrivals by 5.9% in VFR arrivals by 5.6% and in non-VFR arrivals by 7.1%. This suggests that migration flows are less important than income levels or destination price competitiveness as an influence on tourism into Australia, but are nonetheless an important determining factor in influencing inbound tourism to Australia. The other migration variable, LPEAK, was not statistically significant at the 10% level.

Table 1

Demand Elasticities for Short-Term Arrivals and Departures, Australia, 2006

	Short-Term Arrivals			Short-Term Departures		
	1: Total	2: VR	3: Non-VR	4: Total	5: VR	6: Non-VR
LY	0.98*** (3.90)	0.80*** (4.50)	1.01*** (3.57)			
LP	−0.97** (−2.05)	−0.16*** (−2.50)	−1.01** (−2.01)	−0.61** (−2.23)	−0.28** (−2.17)	−0.61** (−2.02)
LAF	−0.48** (−2.12)	−0.33* (−1.92)	−0.51* (−1.86)	−0.30 (−0.90)	−0.22 (−1.12)	−0.37 (−1.02)
LM	0.59*** (6.52)	0.66*** (9.39)	0.56*** (5.61)	0.72*** (7.14)	0.71*** (8.83)	0.69*** (7.46)
LPEAK	−0.14 (−0.41)	−0.02 (−0.07)	−0.21 (−0.55)	0.18 (0.43)	0.19 (0.61)	0.15 (0.33)
LPOP	0.08 (1.11)	0.02 (0.39)	0.09 (0.94)	0.09* (1.86)	0.11* (1.82)	0.19* (1.86)
Diagnostic testing and statistics						
$\bar{R}^2$	0.58	0.74	0.51	0.35	0.28	0.28
DW	1.950	1.86	1.932	2.22	1.84	2.28
Model validity						
F-Stats (6,23)	996.69 ($p = 0.00$)	1155.61 ($p = 0.00$)	782.84 ($p = 0.00$)	1182.72 ($p = 0.00$)	1794.76 ($p = 0.00$)	892.94 ($p = 0.00$)
AIC	2.77	2.01	3.05	2.31	2.58	3.39
Schwarz criteria	3.06	2.30	3.33	2.54	2.72	3.53
Normality of error term						
Jarque-Bera	0.701 ($p = 0.70$)	0.74 ($p = 0.69$)	0.12 ($p = 0.94$)	2.04 ($p = 0.44$)	0.81 ($p = 0.67$)	2.12 ($p = 0.35$)
*Breusch-Pagan -Godfrey test for heteroscedasticity**						
F-Stats	1.47 ($p = 0.23$)	0.83 ($p = 0.51$)	2.33 ($p = 0.67$)	4.40[a] ($p = 0.01$)	0.013 ($p = 0.91$)	4.74[a] ($p = 0.00$)
*Breusch-Pagan test for serial correlation**						
F-Stats	0.03 ($p = 0.86$)	0.83 ($p = 0.81$)	0.08 ($p = 0.78$)	0.57 ($p = 0.46$)	1.23 ($p = 0.32$)	0.67 ($p = 0.42$)

Source: Estimated by authors using Eviews 6. Short-term international visitor arrivals refer to visitors staying less than 1 year in Australia, while short term departures refer to residents who travel overseas for less than 1 year (ABS Cat. 3401.0).

*,**,***Significant at the 1%, 5%, and 10% level, respectively. One lag was used for both tests.

[a]Test results indicate the presence of heteroscedasticity, therefore the respective models were estimated using the White method. All other regressions were performed using Ordinary Least Square.

The other elasticities are of interest, though not critical to our study. The income elasticities displayed in Table 1 for 2006 show that a rise of incomes by 10% will lead to an increase of international arrivals by 9.8%, 8.0%, and 10.1%, respectively, for total, VFR, and non-VFR categories. A 10% rise in relative living costs in Australia was found to cause a drop in total arrivals by 9.7%, a very small reduction in VFR arrivals by 1.6%, and in non-VFR arrivals by 10.1%. By way of contrast, a 10% rise in airfares in 2005 would lead to a 4.8% fall in total arrivals during the following year (2006), causing a fall in the expected number of VFR travelers by 3.3% and in non-VFR arrivals by 5.1%. The results indicate that airfares are less influential in determining arrivals into Australia than living costs within Australia.

Outbound Tourism

Table 1 also shows international departure elasticities from Australia for total departures, VFR departures, and non-VFR departures for 2006. The estimated coefficients have the expected sign. Table 1 indicates that for 2006, the stock of migrants played a determining role in the travel decisions of Australian residents. A change in the stock of migration has a similar effect on the travel flows of all three groups. The elasticities for the three groups of travelers (i.e., total, VFR, and non-VFR) were 0.72, 0.71, and 0.69, respectively, implying that a 10% increase in migrant numbers would generate increased outbound tourism in these markets of 7.2%, 7.1%, and 6.9%.

In contrast to these high elasticity values associated with migration stock, LPEAK is not statistically significant for any of the traveler groups. That is, the duration of residency in Australia does not appear to have any significant effect on travel flows from Australia. On the other hand, income in Australia is an important determinant of international departures. A 10% increase in Australia's GDP leads to increases in total departures of 8.0%, VFR 5.9%, and non-VFR of 8.5%. A 10% deterioration in destination price competitiveness will prompt a fall in Australian departures by 6.1%, while VFR travel would be expected to fall by 2.8% and non-VFR travel by 6.1%. A 10% increase in airfares in 2005 would prompt a fall in demand for outbound tourism by less than 4% for each of the three of traveler categories, with VFR flows particularly unresponsive at 2.2%. This relatively low elasticity may be attributable to consumers being "locked in" to contracts, once an air ticket has been purchased, which prevent any alteration in travel plans if better deals become available.

The constructed model and its results have several advantages for our present purpose. One is that, in contrast to the earlier studies, this study allows migration related elasticities to be estimated for VFR tourism as well as total tourism. Another reason is that it fits in well with the modeling work—we can use the results for 2006 in conjunction with our CGE model calibrated to the early 2000s. A third, and very important reason, is that since Australia's migration profile has changed over the years, it is appropriate to use the most recent data to estimate the relevant elasticities. Estimates of migration-induced tourism demand elasticities enable projections of visitor flows only. In the following section the expenditure associated with migration-induced tourism is estimated.

Migration-Induced Tourism Expenditure

Migration-induced tourism flows for any destination have associated inflows and outflows of expenditure. Suppose there is a 10% increase in migration to Australia. That is, migration is assumed to have been 10% greater than it actually was. The assumed percentage is not of critical importance because the analysis that follows is equally applicable whatever the increase is assumed to be. The same analysis will apply whether the increase is 1% or 100%. Table 2 estimates the change in total expenditure into and out of Australia associated with changes in tourism flows induced by the higher migration numbers. We report both the expenditure changes associated with total tourism and VFR tourism, for both inbound and outbound flows. (To save space we do not analyze the residual category, non-VFR tourism.)

Table 2 is constructed as follows. The top row shows the inbound and outbound tourism for Australia, in terms of the total tourism and the VFR tourism flows. These tourist numbers are based on published government statistics (Tourism Australia, 2007). The second row shows the elasticity

Table 2
Estimated Migration-Induced Tourism Numbers and Expenditure, Inbound and Outbound Travel, Australia, 2006

	Inbound		Outbound	
	Total	VFR	Total	VFR
Number of arrivals/departures 2006	5,036,900	5,036,900	4,121,700	955,940
Migration elasticity	0.591	0.658	0.716	0.708
Arrivals/departures after increase in migration	5,334,739	958,038	4,416,743	1,023,636
Migration-induced change in arrivals/departures (‘000)	298	59	295	68
Expenditure per trip	$3,926	$2,367	$4,295	$2,577
Total expenditure	$1.170 billion	$0.139 billion	$1.267 billion	$0.175 billion

Source: Own estimates; Tourism Australia (2007).

of tourism with respect to migration, as estimated in Part 2. These elasticities are used to estimate the change in tourism induced by the higher level of migration. This is shown in the next row. Using data from Australia’s International Visitor Survey (Tourism Australia, 2007), expenditures per trip, increase in expenditures due to higher migration than previously are calculated.

Some comments are warranted on the nature of the shock we are imposing on the economy. One interpretation is that an increase in migration means that we are considering a higher level of migration in the past, but with the Australian economy basically the same. We are asking the question of what would have happened if more migrants had come to Australia. Alternatively, we could pose the question of what would have happened if more migrants had come to Australia, and investigate all of the different implications of this higher migration. In short, it could be that many things would change as a result of migration—it would be necessary to track a host of effects that migration might set in train (higher investment, labor market impacts, etc.), and these could have an effect on tourism. We take the first interpretation; to take the second we would need to undertake a much more comprehensive study of the effects of migration than is appropriate for this article.

Assuming that migration levels are 10% greater than those that actually occurred in 2006, Table 2 shows that the additional total tourism is associated with inbound expenditure of $1.17 billion into the Australian economy and the VFR component of this is associated with $0.139 billion expenditure. For outbound tourism, the additional expenditure that leaks overseas due to the greater migration numbers is $1.267 billion for total tourism and $0.175 billion for VFR tourism. These estimates are used as the shocks to be modeled. This is undertaken in the section below.

Economic Impacts of Migration-Induced Tourism

In this section we estimate the impact that a higher level of migration will have on the Australian economy through its impact on inbound and outbound tourism. The expenditure data in Table 2 must now be converted into economic impacts. An economic impact analysis estimates the changes that take place in an economy due to some existing or proposed project, action, event, or policy. As typically employed in tourism research and policy analysis, economic impact analyses trace the flows of spending associated with tourism activity in an economy through business, households, and government to identify the resulting changes in economic variables such as sales, output, government tax revenues, household income, value added, and employment. The change in expenditure in the last row of Table 2 is the demand shock used to generate the impacts on the Australian economy. The economic impact variables of interest are set out in Table 3. Of these, changes in real GDP, changes in real GVA, and employment are perhaps the standard variables considered in economic impact analysis of tourism shocks (Blake, Sinclair, & Gillham 2006).

To estimate the economic impacts of changes in expenditure associated with migrant-induced tourism an economic model is required. A CGE model is used for our purposes. CGE models recognize that relative prices of land, labor, and capital may

Table 3
Economic Impacts on Australia of Increased Migration-Induced Inbound and Outbound Tourism

	Inbound Tourism		Outbound Tourism	
Macroeconomic Variables	Migration-Induced Impacts Inbound Total Tourism	Migration-Induced Impacts Inbound VFR Tourism	Migration-Induced Impacts Outbound Total Tourism	Migration-Induced Impacts Outbound VFR Tourism
Expenditure shock	$1.170 billion	$0.139 billion	$1.267 billion	$0.175 billion
1 Real household consumption ($ million)	−4.45	−.53	125.56	17.34
2. Real investment ($ million)	0	0	0	0
3. Real gross domestic product ($ million)	74.40	8.84	−28.11	−3.88
4. Real value added ($ million)	70.49	8.37	9.71	1.34
5. Real exports ($ million)	17.48	2.08	0.60	0.08
6. Real Imports ($ million)	17.48	2.08	0.581	0.08
7. Employment (jobs)	3563.77	423.38	−2912.53	−402.22
8. Real welfare ($ million)	74.40	8.84	−27.56	−3.81
9. Real wage index	0	0	0.07	0.020
10. Real terms of trade effect on exports ($ million)	194.07	23.06	−127.26	−17.57
11. Real exports of nontourism G&S ($ million)	−1009.75	−119.96	893.88	123.44
12. Real exports of tourism G&S ($ million)	1026.94	122.00	28.40	3.92
13. Tourism tax revenue (nominal change, ($ million)	90.84	10.79	1.147	0.16
14. Consumer price index %	0.20	0.02	−0.33	−0.05
15. Exports price index (%)	0.13	0.02	0.14	0.02
16. Real international trade balance (%)	0	0	0	0

Source: Own estimates.

change due to increased tourism flows, causing businesses to change the composition of their inputs. When there are capacity constraints, the prices of inputs and wages will increase in the face of an increase in demand. These price rises, including (for some destinations) any upward pressure on the exchange rate due to increased foreign expenditure associated with the increased visitor numbers, will limit the extent of economic expansion and may even lead to contractions in economic activity in some sectors.

The simulations relating to the economic impacts of migration-induced tourism flows were derived from the M2RNSW model, which is a modified version of the M2R model. This is an adaptation of the standard MONASH Multi-regional Forecasting (MMRF) model for Australia, but with the incorporation of explicit tourism sector modeling (Adams, 2008). MMRF provides results for economic variables on a year-on-year basis. It employs dynamic properties that have been styled on a national CGE model, MONASH (Dixon & Rimmer, 2002). It is a recursive-dynamic multiregional CGE model, linking a sequence of single-period equilibria via stock-flow relationships. The model captures the behavior of economic agents in each of Australia's eight states and territories. In each region there are 26 industries, a representative household, importers and exporters, and a regional government. The model also has a federal government that interacts with economic agents in each region. Production by industries, consumption by householders, and investment are modeled in accordance with conventional economic theory. The eight regions are linked via interstate movements of commodities and factors of production (particularly labor). The model treats producers as operating in a competitive market. Producers choose their inputs so as to minimize the costs of producing a particular quantity of output, subject to a given production technology. Substitution is allowed between commodity inputs from different geographical sources, and between labor, capital, and land. If there is no change in relative prices, producers will vary their inputs in direct proportion to their output. However, if a particular input becomes relatively expensive compared with substitutable inputs, producers will substitute towards the cheaper inputs. Consumers in MMRF are also assumed to be optimizing agents. They choose goods according to their preference pattern and relative prices, but are constrained by their amount of disposable income.

The authors have used the tourism specific model, M2RNSW, based on MMRF, to estimate the economic impacts of various shocks to Australian tourism, including increased inbound visitation to Australia overall and to the individual states in particular (Dwyer, Forsyth, Spurr, & Van Ho, 2003), the effects of SARS on Australian tourism (Dwyer, Forsyth, Spurr, & Van Ho, 2006) and of special events (Dwyer, Forsyth, & Spurr, 2005, 2006). We use this in the simulations of the impacts of migration and tourism on the economy. This model is a one period model, which has two regions—New South Wales and the rest of Australia—as well as the whole of Australia. Given that we are not interested in regional impacts for this exercise, we only report results for the national economy.

There is an assumption of effective full employment, which is plausible for Australia in light of its recent performance. In 2006 Australia's unemployment rate was 4.9% and in 2007 was 4.4%. This placed Australia as having one of the lowest unemployment rates of all developed economies. While this rate has risen following the Global Financial Crisis it was still only 5.1% as of July 2011 associated with an unprecedented mineral boom that the economy is experiencing (Australian Bureau of Statistics, 2011).

Table 3 shows the estimated migration-induced impacts on the Australian economy for 2006 for both inbound and outbound tourism, in total and for VFR. The model simulations are based on the following assumptions:

- real national employment is fixed but real wage is flexible
- real international trade balance is fixed
- capital stock is fixed
- investment is fixed

These assumptions are the standard short run assumptions that have been employed by the authors in previous modeling exercises (Dwyer, Forsyth, Spurr, & Van Ho, 2003, 2006). The fixed capital stock, along with no unemployment gives a very conservative base case—with capital flexible, long run impacts on GDP, welfare, and employment could be expected to be larger.

Results for a number of variables are provided. GDP is often regarded as a measure of how much better off a country is as a consequence of a change in economic activity. When the inputs are unchanged, this is approximately true. However, when inputs change, it is necessary to factor in the costs of these inputs—this is not done when GDP estimates are prepared. To correct for this, we also report Economic Welfare, which is approximately equal to GDP less the cost of changes in factor inputs. This is a better measure of how much better off a country is as a result of a change. Our measure is an approximation of Dixon's (2009), who provides the most explicit welfare measure, save for a small term of trade effect. Given the short-run assumption and no change in factor inputs, GDP and economic welfare are much the same—economic welfare is reported since this is the variable, not GDP, which measures how much better off an economy is.

Inbound Tourism

Increased migration-induced inbound tourism expenditure is projected to have a positive impact on the economy on measures of economic activity such as GDP. Table 3 indicates that a 10% increase in migrants will increase GDP by $74.40 million. In the full employment case, this will lead to a net economic welfare benefit of an equivalent amount since there are no changes in factors (labor, capital) employed. In this case, where there is no increase in factors used, there is still a modest increase in GDP and welfare but additional tourism largely crowds out other economic activity. The impact on the economy of the additional spending associated with additional VFR tourism will be a gain of $8.84 million in GDP and economic welfare. The lower impact of VFR tourism is due to the fact that VFR tourism only accounts for about a fifth of total tourism, and VFR tourists spend less per visit (as shown in Table 2). Under the assumptions used, additional tourism exports crowd out other exports to preserve the trade balance. In this full employment case, there is still an impact on jobs since real wages are variable, and full employment is defined by a fixed wages bill.

If the currently low level of unemployment was to rise, the impact on the economy would be considerably greater given greater stimulation of economic activity. GDP would increase more due to a reduced crowding out effect. Economic welfare also increases, but by rather less than GDP. This is because some of the additional GDP is made possible by the increase use of factors—in this case, additional labor, which is not free. The increase in employment would also be greater.

Outbound Tourism

Table 3 also shows the estimated migration-induced effects on outbound tourism in total and for VFR by Australian residents for the year 2006. There is estimated to be a $28.11 million negative impact on GDP from increased total outbound tourism, including a $3.88 million reduced GDP from the change in outbound VFR tourism alone. Economic impacts associated with migration-induced outbound tourism include a reduction of $27.56 million in real welfare and reduced employment of 2,912 persons. The impact on the economy of the reduced spending associated with additional outbound VFR tourism will be a loss of $3.88 million in GDP and economic welfare, and 402 jobs. This accords with our expectation that the additional outbound tourism would have a negative impact on economic measures. An impact of inbound expenditure need not be the reverse of a similar sized outbound expenditure as the impact of the latter depends on what expenditure is made within Australia by outbound travelers. In contrast to inbound tourism, which is a relatively highly taxed export industry in Australia, outbound tourism has some impacts on taxes, but not to the same extent. There is no certainty that additional outbound tourism will be negative for GDP—it depends on how taxes and other distortions are affected by the change. Outbound tourism must be funded out of domestic income, and this implies less spending on other goods and services, such as domestic tourism or other goods and services. In these simulations, it is assumed that an increase in outbound tourism is funded from reduced spending on consumption in general. An alternative assumption could be that it is funded from a reduction in domestic tourism. Both will impact upon the economy, particularly through its effect on taxes and indeed on other distortions (Dwyer et al., 1993).

Combined Effects

Simulations from our model suggest that the impacts of a change in migration-induced tourism expenditure are greater for inbound tourism than for outbound travel. The additional inbound tourism will increase Australia's GDP by $74.40 million while the additional outbound tourism reduces it by $28.11 million. Taken together, the results indicate a net gain to Australia's GDP and economic welfare of $46.29 million and 651 jobs. For the VFR market, the positive migration induced effect on GDP of $8.84 million for inbound tourism exceeds the negative migration-induced effect on GDP of $3.88 million for outbound tourism. Taken together, the results indicate a net gain to Australia's GDP and economic welfare of $4.96 million and 21.16 jobs from changes in the VFR market.

Thus, the simulations indicate that migration, through its effect on tourism, has a beneficial effect on the economy. However these results need to be put into perspective. They are the result of a number of assumptions—about how outbound tourists, for example, fund their travel. Alternative assumptions, such as that outbound tourism is funded by a reduction in domestic tourism, would have different implications. The approach we use can be used with alternative estimates of tourism migration elasticities, of course. Given the uncertainties surrounding the estimates of two impacts that are in different directions, one should be careful in interpreting the net balance.

Research Extensions

The results indicate that both migration-induced total and VFR tourism have economic impacts on a destination. This contrasts with the lack of recognition of VFR as a market segment and a largely unexamined assumption that it contributes relatively little to local economies and tourism industries (Page & Connell, 2009, p. 94). The results of this study lend support to recent arguments that VFR-related expenditure is greater than is commonly thought (Backer, 2010, 2012; Seaton & Palmer, 1997). Indeed, our analysis may underestimate the economic significance of migration-induced VFR tourism, since it has omitted the additional tourist dollars expended by residents hosting their friends and relatives. These costs to hosts, while not strictly classifiable as tourism expenditures, may be an important source of revenue generation associated with migration-related VFR tourists. At present, there appear to be no studies of the expenditure associated with hosting of migration-induced tourists by family and friends. Nor do we have information about the extent of their work activities in Australia. While incorporating host spending into migration-induced VFR expenditure would be a useful exercise, it needs to be recognized that host expenditure would not make much difference to the overall economic impact of VFR tourism, since expenditure on visitors would come from reduced expenditure on other goods and services that hosts make. However, it will make a difference to the expenditure in tourism goods and services, and this is important for the tourism industry.

Several researchers have argued that VFR travel also has economic importance because it tends to have a stabilizing effect on an economy and is less vulnerable to market fluctuations and seasonality factors (McKercher, 1995; Seaton & Palmer, 1997). Citing VFR tourism's high relative performance in previous low economic times, King (1994) has proposed that targeted VFR strategies may be appropriate during economic declines to help buffer against business downturns. The stabilizing effect of migrant-induced VFR travel has, to our knowledge, received no attention from researchers, despite its potential to inform the destination marketing effort.

In comparison to other market segments, there has been little research into VFR travelers, their motivations, behaviors and characteristics, and the factors that influence their choices (Backer, 2007, 2011). Further research should progress in the context of migration-induced VFR to determine points of comparison and difference with standard VFR tourism flows. The greater is our understanding of such factors the better will be our understanding of the determinants of migration-related tourist spending volumes and patterns.

Ideally, the tourism industry should disperse income and employment opportunities widely throughout a destination. Indeed, promoting greater dispersal of tourists and their spending is an important item in the Australian government's policy agenda. The government-commissioned Jackson Report (Commonwealth of Australia, 2009) acknowledged that "tourism provides opportunities for regional and remote communities to grow jobs, diversify their economic base, and generate higher standards of living. Nearly half of total tourism expenditure (47 per cent) occurs in the regions" (p. 10). However, little is known about the dispersal of migrant-induced tourism expenditure or its economic impacts. As interest increases regarding the effects of dispersal of migrant arrivals, the economic impact on regional economies will become a subject of increasing interest. The approach taken in this article can provide the basis for more detailed study of the economic impacts of migration induced tourism in different regions across Australia.

Conclusions

This study assessed the impact on the Australian economy of migration through its effect in tourism. Given the estimated elasticities, the impacts on macrovariables such as GDP and employment were seen to be moderately significant. The article emphasizes that migration impacts on tourism in two ways: inbound and outbound tourism. While additional migration-related inbound tourism has a positive impact on measures such as GDP, migration stimulates outbound tourism as well, with a negative impact on the economy. Our simulations suggest that the positive effects of inbound tourism outweigh the negative effects of outbound. The model simulations are conservative, and give rise to small effects. They assume full employment—if unemployment were assumed, impacts would be greater due to greater stimulation of economic activity. In addition, the capital stock is assumed unchanged—if more tourism were to lead to an increase in the capital stock, the impacts would be larger. However, as for any form of economic modeling, the results obtained depend on the assumptions made.

Understanding the relationship between tourism and migration is particularly timely for destination management in Australia as the prospect of a "big Australia" (population of about 35 million) becomes an increasingly public debate. With population growth being fueled by migration, it becomes increasingly important to model the economic impacts of the source of these migrants. Since migrants to Australia are prompted by a variety of motives (e.g., skilled migration, family reunion, and humanitarian), it is critical to understand how these reasons are interrelated in economic terms. While the industry cannot influence the external factors it faces, it can address the limitations and capacity constraints it faces internally. Investment in new and renewed tourism product catering for the changes in consumer preferences associated with migrant-induced tourism can create new opportunities, further leverage Australia's competitive strengths, and enhance its economic impacts.

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