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Evaluating tourism's economic effects: Comparison of different approaches

Jeetesh Kumar^{a,*}, Kashif Hussain^a

^a*School of Hospitality, Tourism and Culinary Arts, Taylor's University, No.1, Jalan Taylor's, 47500 Subang Jaya, Selangor, Malaysia*

Abstract

There are several models available to evaluate the economic impact of tourism. All are different from each other in terms of nature, structure, result driven, demand of the data and complexity. Most of the time it is not sure that model is appropriate for the situation where it is been applied. Numerous practices including 'Multiplier Analysis' and 'Input-Output Analysis' are still frequently used for estimation of economic impacts of tourism in change of traveller's expenditure. All the existing techniques have serious limitations, and therefore, alternative techniques have been proposed to address the existing problems. Amongst these models are 'Computable General Equilibrium (CGE) model' and 'Money Generation Model (MGM)' that are comprehensively used in Australia, the United Kingdom, the United States and Canada to estimate economic impacts of changes and policies, across many sectors. Within the tourism industry, CGE technique has not been used broadly, resulting in poor estimation of economic impacts of tourism. Considering it, this paper will support the arguments of CGE and MGM modelling as the favoured practises in analysing the economic impacts of tourism and will discuss its prospective for the future research in this area.

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1. Introduction

Tourism industry is considered as the most potential star industry in the 21st century as well as the most vital service industry in the world. Tourism has major economic significance for a country, the receipts from international tourism are a valuable source of earning for all countries, particularly, the development (Rogers, 2003; Dwyer &

* Corresponding author. Tel.: +6-010-253-5574; fax: +6-035-629-5333.

E-mail address: jeetesh.kumar@taylors.edu.my

Mistilis, 1999). Traveller's spending generates income for both public and private sectors, besides generating wages and employment opportunities.

There is significant difference between different models/ approaches of the economic impacts of tourism. Not only in terms of nature and precision of results vary, but data demands, complexity and underlying assumptions also differ. Most of time, it is not clear whether the models chosen are appropriate for the specific situation to which they are applied. Changes in tourism or policy modification should be considered, which has high impact on the economy. Though the approaches for economic impact estimation in tourism perspective are not proper, techniques such as multiplier analysis and input-output analysis are still being used to estimate impacts in traveller's expenditure. Such techniques has some severe restrictions. Hence alternative techniques such as Computable General Equilibrium (CGE) model and Money Generation Model (MGM) are comprehensively used in Australia, the United Kingdom, the United States and Canada to estimate economic impacts of tourism.

In the literature a wide range of limitations and weaknesses of the input-output approach can be found, such as linear homogeneous production functions, the lack of capacity constraints and existence of the unemployment (Briassoulis, 1991; Archer & Fletcher, 1990; and Stynes, 1997).

2. Literature Review

2.1. *Tourism economic impact estimation: several approaches*

It has long been recognised that tourism can have an impact on economic activity. All categories of tourism changes, such as additional tourism to a country or region, perhaps encouraged by promotion or by changes in air transport arrangements, tax changes, and special events such as festivals or sporting events, will have an impact on patterns of economic activity overall in the economy, and especially in the locality which is directly affected. Until now the leading approach for economic impact estimation of tourism is input-output analysis (Fletcher, 1994; Frechtling, 1999; Crompton & Shuster, 2001 and Tyrrell & Johnston, 2001). Social accounting matrix is also well-known approach (Wagner, 1997) but again here is also same criticism against input-output approach. Generally, a change in traveller's spending will lead to additional activity in related industries, and the overall change associated with it will be greater than the initial boost in spending; hence there is a multiplier effect (Archer, 1977; Frechtling & Horvath, 1998). Sometimes the economic effect of a change in tourism will be estimated using a standard multiplier, ideally determined from previous Input–Output studies (Archer & Fletcher, 1996). Alternatively, an Input–Output model may be specially adapted to analyse the change in question (Wanhill, 1988; West & Gamage, 2001).

Literature on economic impact assessment in tourism, mention about five major models are, Input-Output models, Keynesian models, exports base models, CGE models and ad hoc models. All these models are very appropriate and can be used in several circumstances for the regions but in actual all model are quite different from each other.

2.1.1. *IO-models*

IO-tables are used to describe the relationship between different industries in the economic sector. By looking at the spending patterns with regards to total sales for all industries, the direct and secondary impacts can be estimated through input output model. Although there are some more assumption for IO-models (Bonn and Harrington, 2008; Briassoulis, 1991). There should have maintained criteria for consumption side for household and supply or production side. Household should buy in the same quantity and should have similarity in the quantity produced by the firms and firms can only change production levels by buying inputs from the same suppliers in the same proportion.

For IO-models it is also important that every sector should use same technology to the production of same products. Daniels (2004) mentioned that all jobs created in this process are new jobs and full time permanent jobs and wages are fixed. Following steps get involves for the calculation of tourism impacts by using IO model (Hórvath and Frechtling, 1999; Miller and Blair, 2009).

- Output multipliers can be calculated by using IO-table (Leontief inverse matrix).
- Tourism output – direct output can be calculated via vector of final tourist demand ($n \times 1$).
- Total impacts on output can be calculated through multiplying Leontief inverse matrix with direct output

There are different IO models are available such as Fletcher (1989) shows that capacity limitations can be included in the analysis, Daniels (2004) extend IO-models with occupation based modelling, West and Gamage (2001) develop a non-linear IO-model and Cai, Leung and Mak, (2006) extend IO-model with linkage analysis.

Further Wagner (1997) discussed that there are models similar in structure to IO-models, such as social accounting matrices (SAMs) instead of IO-tables. SAM also exposes details about the transfer of money between industries. Thus, multipliers based on a SAM account for the distributional consequences of ‘shocks to final demand’ and allow for a more detailed calculation of secondary impacts. Although these adjustments and extensions do not give IO-models the same level of sophistication as CGE-models (Dwyer, Forsyth and Spurr, 2006)

2.1.2. Keynesian models

For any of the tourist destination, impacts of new injected money can be analyzed through a Keynesian model. Because the money inflow refers to the income for household and the firms in terms of extra sales. Schaffer (1999) refers that this way households and firms get extra income and try to save more. Extra income for households also leads to extra consumption. This creates the round of consumption and sales and the process continues, every round has some leakages as well in terms of saving, taxes and import items which reduces the effects (Schaffer, 1999; Pao, 2005):

2.1.3. Export base models

Export base models can be divided into two, basic and non-basic. Basic industries produce the products for the markets outside the region and make possible to get inject the money in the country and non-basic industries produce for the local markets and redistribute the money in the region. Basic industries and the new income also creates the multiplier effect, therefore tourism sector is also being considered as a basic industry (Archer, 1982; Egan and Nield, 2003).

According to the literature such as Copeland, (1991); Egan and Nield, (2003); Dwyer, Forsyth and Spurr, (2004) there are not such resource limitations for the export base models, which leads the visitor’s spending towards positive economic impacts. Some more there are no negative impacts due to distribution of production factors and inflation factor.

2.1.4. CGE models

In broad sense equilibrium (GE) models has sufficient conventions to overcome all other models mentioned earlier. Most of the output are theoretically induced by the multiplier effects. Some more production factor can be relocated across different industries. All the industries in the economy can be taken as whole (Copeland, 1991; Dwyer et al, 2004). Hence there are few factors for the CGE models,

- Inflation factor can change the buying – consumption patterns
- Reducing the resources for other activities by making available all the resources for the particular production capacity
- Diversion of the customers from old to new products
- Increase in tax rate
- Unemployment factor

CGE models can occur in several forms such as model structure, density and supposition. In general we use to see CGE models as extended IO-models (Pao, 2005; Zhang, 2002).

2.1.5. *Ad hoc models*

Here Ad hoc model refers to Archer's model, an easy solution for high demand of IO-models. This model was developed by Archer and Owen (1972), which was based on Keynesian theory and IO-model. The model included all the sectors relevant to the tourism industry. Ad hoc model has been tested on many regions and is well known in the literature (Milne, 1987).

2.1.6. *Money generation model*

Economic impact analysis shares the way to relate different event with the local communities like, in the report USDI-NPS (1995 cited in Stynes and Ya-Yen, 2003) national parks with local community. In the NPS report Money Generation Model helps to estimate the local economic impacts of the tourist spending visiting parks in the local area. Impacts of spending in terms of sales, income, jobs and tax revenue. There is updated version of Money Generation Model is available known as MGM2 which also estimates the economic impacts of spending pattern of visitors to particular region.

MGM2 was designed in 2000 (Stynes, Propst, Chang, and Sun, 2000). MGM2 gives guidelines regarding selection of tourists spending averages and economic multipliers. In the case if local data is lacking, MGM2 offers suitable default values for economic multipliers. MGM2 model is based on very simple equation, three major input for the model are required to estimate the economic impacts for particular region (Stynes et al, 2000).

Economic Impacts = Visits * Spending per Visit * Regional Economic Multipliers

- Number of visits
- Spending averages
- Economic multiplier

MGM or MGM2 offers a spreadsheet template for spending and regional multiplier to compare and compute changes in sales, local income, jobs, taxes and value added for the area. MGM2 model recommends to divide tourist in multiple segments which helps to understand and calculate differences in spending patterns of different age groups. The results of MGM or MGM2 model can be used to assess different available management, developing and designing marketing campaign.

3. What is wrong with old approaches?

These old approaches are seriously inadequate as a means of estimating the net impact on an economy resulting from changes in tourism expenditure. They are based on extremely unrealistic assumptions, and on incomplete representations of the ways economies work (Briassoulis, 1991). Not surprisingly, they give misleading results.

Input–Output models estimate the increase in economic activity associated with some tourism expenditure change, by calculating the increase in output directly, and adding the extra output in related industries, such as supplier industries. They assume that resources, such as labour, land and capital, flow freely to the tourism and related industries. These resources are effectively assumed to be not used elsewhere; they do not come from other industries, and do not result in reductions in output elsewhere. In this way, Input–Output and multiplier techniques count the positive influences on economic activity, but ignore the negative influences. These negative influences can be just as large as the positive influences and, in certain cases, even larger (McDougall, 1995; Adams & Parmenter, 1999 and Dwyer, Forsyth, Spurr & Ho, 2003).

Input–Output models can be seen as essentially an interim measure. When first developed, the general equilibrium effects of changes were recognised, but it was not possible to handle them in empirical models. Now that computable general equilibrium (CGE) models are available, we have at our disposal workable and flexible models which represent the whole economy, in which resource constraints and feedback effects are explicitly recognised. For measuring changes in both overall economic activity, and in particular aspects of activity, such as employment, tax receipts, imports, exports, and outputs of specific industries, Input–Output analysis has been superseded.

4. Conclusion

The article provides an overview and comparison of several models can be used to evaluate economic impacts of tourism industry. A supreme model for EIA with regards to their application could be CGE and MGM. Computable general equilibrium model and Money generation model analysis are now in widespread use for analysing the impacts on economies of various changes, such as policy shifts or demand changes, etc. CGE and MGM approaches have been applied several times to tourism questions, however their use has not gained widespread acceptance as researchers and consultants continue to uncritically apply older approaches. One problem with using CGE models is that the results they produce are often not what users expect, and in some cases, want, to hear. Users (who are conditioned by familiarity with results from Input–Output or multiplier analyses) often expect large impacts on economic activity to come from tourism shocks such as tourism booms or special events. This may appear to be a weakness of the approach, and it does make it difficult to convince users of the validity of the results (Hunn & Mangan, 1999).

Assessment of the economic impacts of tourism has had a resurgence in recent years as CGE and MGM models have been developed, their structure debated, assumptions analysed and results discussed. The aim of this paper has been to give a perspective on the power of this new technique of analysis over the older technique of impacts assessment and to indicate its potential to drive future research in this area that is more relevant to real world tourism destinations. Further, an avenue for future research can be comparing the models by using several model for the same case study instead of just comparing the literature. Finding can be compared to reach any of the suitable concluding point regarding accuracy of the models.

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