

Why the Need to Triangulate in the Study of Tourism's Economic Impact

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Abstract: Over the years, Input-Output (I-O) analysis has been popularly used for measuring the economic impact of tourism; but discussions in the literature of data collection methods have not been as prevalent as the discussions of empirical results and ways of modifying the basic I-O model. Due to its strong attachment to the economic multiplier concept, positivism paradigm has been preferred by researchers for estimating the spin-off effects that arise from the tourist expenditure in a region's economy. However, quantitative data obtained from tourism establishments and secondary sources may not be accurate - for example, is the tourism establishment proprietors' estimation of tourist count reliable? This paper suggests the use of triangulation method (including qualitative technique) to cross-check data collected from quantitative technique, so that a researcher can hope to overcome the weakness or intrinsic biases and problems that can emerge from a single-method or single-observer or single-theory study. Overall, the quality of the triangulation's outcome depends to a great extent on how systematic the researcher is in analyzing qualitative material and his or her ability to justify the role of mixed methods in the research.

Key words: Input-Output • Post-positivism • Tourism establishment survey • Quantitative and qualitative methods

INTRODUCTION

The Case for Post-Positivism: From the 16th century, the work of Rene Descartes (1596-1650) and Isaac Newton (1642-1727) have evolved the importance of positivism paradigm in perceiving the natural world. Positivists believe that there is a reasonably clear distinction between facts and values and between what is and what ought to be. Today, research in social sciences can still be said to be dominated by the positivism paradigm.

Tourism researchers estimate the tourist expenditure spin-off effects in a local economy by using structured questionnaires to quantify data. Positivists view reality to be objective, tangible and single [1] and claim qualitative research used by interpretivists is lacking of rigor and validity. On the other hand, interpretivists question the positivists' belief that human behavior is predictable and thus can be controlled because some past theories show that an individual's self-interest can lead him or her to behave differently [2].

Overtime, relativists begin to advocate alternative paradigms such as post-positivism to reconcile the criticisms on positivism and interpretivism.

Post-positivists believe that truth exists but can only be partially comprehended [3]. Knowledge can be discovered through a less stringent scientific methodology which engages quantitative with some qualitative methods. A researcher can adopt the post-positivism philosophy to explain more fully the richness and complexity of human behavior by studying a phenomenon from more than one standpoint [4]. Triangulation can give a more detailed and balanced picture of a phenomenon because this method involves a cross examination of data collected from multiple sources [5].

Bernstein [6] claims that the principal problem that can impede the development of tourism's theoretical paradigm is the use of inappropriate philosophical and methodological approaches; therefore, tourism scholars should have a greater tolerance for eclectic and diverse approaches [7]. Researchers have proposed to integrate the conflicting paradigms, i.e., combining positivism and relativism under a common umbrella [8] for the study of strategic management [9] and tourism strategic research [6]. The proposal to adopt post-positivism paradigm helps to bridge the gap between positivism and interpretivism in the study of tourism's economic impact.

MATERIALS AND METHODS

In view of the ability of tourism sectors in stimulating the growth of other economic sectors, developing countries are trying to expand their tourism businesses; but they do not have a comprehensive understanding of ways to measure the economic impacts of tourism [10].

Quantitative data collected from tourism establishments and secondary data may not be accurate. For example, is the tourism establishment proprietor's estimation of tourist count reliable? As most of the tourism establishments do not record their tourist counts, it is not an easy task for a researcher to prove the reliability of their memories. Epistemologically, Devitt^a and David^b assert that a belief is justified if and only if, it results from a reliable cognitive source.

From the middle part of the 20th century, researchers started to combine the qualitative and quantitative methods [11, 12]. Post positivists had advocated the use of triangulation but are still trying to fit the qualitative methods with the standards of objectivists' reliability and validity [13].

By combining multiple methods and/or observers, a researcher can hope to overcome the weakness or intrinsic biases that can emerge from a single-method or single-observer or single-theory study [11]. Triangulation methods can mean combining different methods and/or theories as well as using multiple

investigators to study a single problem or phenomenon at different times [12].

This paper suggests the use of triangulation in the study of tourism's economic impact. Researchers can start by using two-study designs or integrated designs to collect the quantitative and qualitative data [14] which are then inserted into the Input-Output table (Table 1).

Overview of Input-output (I-O) Model: As tourism's economic impact analysis measures the spin-off effects created by the injection of new money in a region's economy - i.e., tourist spending - it is necessary for researchers to estimate the amount of a tourism establishment's business activity that results from the tourist expenditure. For example, if a tourism establishment has spent \$1000 for purchase of inputs and 80% of its business contributions are from tourists, then only \$800 should be inputted into the I-O table for computation of spin-off effects.

I-O model is a popular analytical technique used by many researchers [15-17] because the model can analyze the intersectoral relationships among the producing sectors of the economy, final demand sectors and value added sources as a consequence of the revenue earned from tourists. I-O model can also be modified to relax certain of its restrictive assumptions [15]; with careful modifications, researchers can render it into a more reliable analytical tool. Table 2 shows the framework of an I-O table.

Table 1: Research designs for the collection of quantitative and qualitative data

Research Design	Description	Objective
Two-study designs		
Sequential two-study design	Qualitative data and quantitative data are collected and analyzed in sequential order.	Investigate under researched field, to develop hypotheses or create instruments for subsequent quantitative measurement, or provide explanations.
Concurrent two-study design	Both quantitative and qualitative data are collected and analyzed in separate procedures.	Cross-validate or corroborate findings of the two approaches.
Integrated designs		
Integrated elaboration design	Quantitative data is analyzed using qualitative procedures.	Investigate and understand the problem in depth, derive new theoretical insights.
Integrated generalization design	Qualitative material is collected and transformed into categorical data for further quantitative analysis.	Derive both theory and generalizable results.

Source: Srnka and Koeszegi [14]

^aStanford Encyclopedia of Philosophy. <http://plato.stanford.edu/entries/epistemology> and <http://plato.stanford.edu/entries/critical-theory>.

Table 2: Basic structure of an Input-Output table

		Sales to								
		Intermediate demand or Productive sectors quadrant Sector <i>j</i>					Final demand quadrant Sector			
Purchases from sector <i>i</i>	1	2	3	...	M	H	I	G	E	
1	X ₁₁	X ₁₂	X ₁₃	...	X _{1m}	C ₁	I ₁	G ₁	E ₁	X ₁
2	X ₂₁	X ₂₂	X ₂₃	...	X _{2m}	C ₂	I ₂	G ₂	E ₂	X ₂
3	X ₃₁	X ₃₂	X ₃₃	...	X _{3m}	C ₃	I ₃	G ₃	E ₃	X ₃
:	:	:	:	:	:	:	:	:	:	:
M	X _{m1}	X _{m2}	X _{m3}	...	X _{mm}	C _m	I _m	G _m	E _m	X _m
		Primary input quadrant								
Wages & salaries	W ₁	W ₂	W ₃	...	W _m					
Profit & dividends	P ₁	P ₂	P ₃	...	P _m					
Taxes	T ₁	T ₂	T ₃	...	T _m					
Imports	M ₁	M ₂	M ₃	...	M _m					
Total Inputs (purchase)	X ₁	X ₂	X ₃	...	X _m	C	I	G	E	X

Source: Fletcher [18]

Where

- X : Output
- C : Household consumption
- I : Investment (private)
- G : Government expenditure
- E : Exports
- M : Imports
- W : Wages & salaries
- P : Profits & dividends
- T : Taxes

Final Demand Sectors:

- H : Household consumption sector
- I : Investment expenditure sector
- G : Government expenditure
- E : Export sector / tourist expenditure

I-O model is assuming that general equilibrium exists in a region's economy, which means that a sector's total value of output is similar to the total cost of input purchased by the respective sector. Tourist expenditure in each productive sector can be viewed as an export demand because it represents an injection of new revenues from outside regions to the local economy [18].

Technical coefficients matrix a_{ij} is computed by dividing the cell matrix (X_{ij}) of each productive sector with the correspondence column matrix (X_j) that represents the total value of input purchased by sector j . The coefficient matrix a_{ij} shows the proportion of inputs that must be purchased by each sector j from sectors i in order to produce one unit of output [19].

The economic spin-off effects can be measured by I-O multiplier by transforming the technical coefficients into Leontief inverse matrix [18, 20, 21]. Using standard matrix notation, the model may be represented by the following system [20, 22],

$$\Delta X = A \Delta X + \Delta T \tag{1}$$

$$\Delta P = B \Delta X \tag{2}$$

$$\Delta L = E \Delta X \tag{3}$$

Where

- ΔX = $n \times 1$ vector of the change in gross output
- ΔP = $k \times 1$ vector of the change in primary factor input
- ΔL = $l \times 1$ vector of the change in employment resulting from the change in gross output
- ΔT = $n \times 1$ vector of the change in tourist expenditure by category
- A = $n \times n$ matrix of intermediate consumption coefficient
- B = $k \times n$ matrix of coefficients representing usage of primary factors
- E = $l \times n$ matrix of employment coefficients

Then, solve the equations above,

From (1) $\Delta X (I - A) = \Delta T$

Thus, $\Delta X = (I - A)\Delta T \tag{4}$

Substitute of equation (4) into equations (2) and (3) gives

$$\Delta P = B(I - A)^{-1}\Delta T \quad (5)$$

$$\Delta L = E(I - A)^{-1}\Delta T \quad (6)$$

The inverse of technology matrix $(I - A)^{-1}$ is known as the multiplier matrix or Leontief inverse L_{ij} , that indicates the additional (or reduce) amount of gross output in sector i that is required, directly and indirectly, to meet the increase (or decrease) of one unit of final demand (or tourist expenditure) in sector j [18-22].

Some Basic Problems and Possible Answers for I-O Analysis

The Reliability of I-O Data Cannot Be Easily Measured Using Statistical Reliability: Literature of I-O analysis seldom presents their data with appropriate measures of statistical reliability because in this type of quantitative economic analysis, very few measurements are involved to measure the amount of money received and spent by the tourism establishment [23]; and the establishments' expenditure patterns are heterogeneous. Problem also arises in obtaining a "population count" for all tourism establishments sector by sector to form the bases of meaningful samples - for example, the difficulty of identifying and counting the number of restaurants that are patronized by tourists. Therefore, statistical testing of the data's reliability is difficult if not meaningless [24].

Although probability sampling is principally designed to reduce the sampling bias, it may not be applicable for the population of tourism establishments. On the contrary, non-probability approach may be more appropriate. Using quantitative approach, questionnaires should be distributed to the tourism establishments which have higher number of patronage tourists and are willing to response with the facilitation of the interviewers. Subsequently, qualitative approach such as non-participant observation should be carried out to cross-check the proprietors' oral testimony of tourist count.

The Total Sales and Purchases Estimates for Each Productive Sector in I-O Table Rarely Equal: In constructing an I-O table, one of the major problems confronted by researchers is to get the total amount of sales estimate (X_i) that is similar to the total amount of purchases estimate (X_j) for the same productive sector [25, 26]. The estimates of output sales and input purchases can be collected via quantitative approach -

i.e., by distributing questionnaire to the tourism establishment sample. If the tourism establishment sample has a detailed record of their business activities that arise from the income earned from tourist expenditure in complete detail, an error-free I-O table probably is attainable. To ensure that the row and column matrix estimates are correct, the data sources should be absolutely reliable [26]. Therefore, an additional data collection - i.e., qualitative method should be used to cross-check the quantitative data.

Deficiencies of Quantitative and Qualitative Data for I-O Table: Although the tourism establishment survey has been widely employed in the collection of quantitative data, the quantitative method has certain deficiencies. In many cases both primary and secondary data are incomplete or unavailable for a smaller region. It is not possible for researchers to cross-check the accuracy of establishments' sales and purchases estimates because the establishments within the sample do not have records of tourist count, revenue earned from tourists versus local residents, geographic origin of the customers and suppliers, or may feel reluctant to disclose their information. Many researchers tend to assume that available historical or accounting is true and reliable [27, 28].

One of the ways to enhance the reliability of the collected quantitative data is to cross-check the proprietors' oral testimony of the number of patronage tourists. This paper is suggesting the use of an additional tool of data collection - i.e., qualitative survey - to count the tourist volume in a different sample of establishments. Observation method is recommended to record the number of tourists who are seen entering a selected tourism establishment premise. This method involves multiple observers to count the number of tourists and local residents who enter the sample of establishments for a certain number of days in each survey month [29] during both peak and non-peak periods. By selecting sectoral samples that are representative of a local economy and with careful craftsmen, a researcher can hope to reduce the possibility of biasness in the collected data.

The researcher shall then compare the quantitative and qualitative data's findings for discrepancy. The predominant assumption of a triangulation strategy is that the results produced by multi-method should be converging on a single perspective of the investigated phenomenon [30]. However, not all social science researchers agree with this assumption because actual research practices may not conform to expectation or

different methods may produce different findings [30]. For example, an unusually large number of tourists may visit a venue when the recording is undertaken.

It is necessary to discuss the meaning of objectivity in a post-positivism paradigm shift. In discussing this issue, it is better to understand the distinction between the quantitative and qualitative senses of objectivity. In the quantitative sense of objectivity, an individual's view is considered to be subjective and the collective view of many individuals is an objective one [30]. House [30] claims that in the qualitative sense of objectivity, "being objective means that the observation is factual". The quantitative notion of objectivity seems to underlie that the use of any single method, just like the view of any single individual, will necessarily be subjective and therefore biased [30]. Consequently, triangulation can be used as a way to get a collective view of many individuals so that the results are objective [30]. Given that human beings are biased, triangulation may produce three different results: convergence, inconsistency and contradiction.

Irrespective of the type of result that can be produced by a triangulation method, a researcher's task is to make sense of the multiple findings and to provide logic and plausibility of explanations for public discussion. Overall, the quality of the outcome depends to a great extent on how systematic the researcher is in analyzing qualitative materials [30] and his or her ability to justify the role of the mixed methods used.

CONCLUSION

One of the ways to solve the basic problems of an I-O table is to enhance the reliability of the quantitative data by developing appropriate multiple data collection methods. In the study of tourism's economic impact analysis, quantitative data can be collected by distributing questionnaires to the samples of tourists and tourism establishments. Subsequently, observation technique can be carried out to cross-check the tourist count in a few selected tourism establishments. Although the findings produced by quantitative and qualitative data may be converging, inconsistent, or contradicting, the value of triangulation lies in providing more and better evidence so that a researcher can construct meaningful proposition or explanation about the social world. Researchers should not argue over whether quantitative data or qualitative data are more superior. Instead, a researcher's task is to make sense of the multiple findings - by constructing explanations

for the data and about the data - for public discussion. He or she should also be transparent in reporting the data collection procedures while providing logic and plausibility of explanation.

REFERENCES

1. Riley, R.W., 1996. Using Grounded Theory Analysis to Reveal the Underlying Dimensions of Prestige in Leisure Travel. *J. Travel and Tourism Marketing*, 5(1/2): 21-40.
2. Frank, R., T. Gilovich and D. Regan, 1993. Does Studying Economics Inhibit Cooperation?. *J. Economic Perspectives*, 7: 159-172.
3. Riley, R.W. and L.L. Love, 2000. The State of Qualitative Tourism Research. *Annals of Tourism Res.*, 27(1): 164-187.
4. Cohen, L. and L. Manion, 1986. *Research Methods in Education*. London: Croom Helm.
5. Altrichter, H., P. Posch and B. Somekh, 1996. *Teachers Investigate Their Work; An Introduction to the Methods of Action Research*. London: Routledge.
6. Echtner, C.M. and J. Tazim, 1997. The Disciplinary Dilemma of Tourism Studies. *Annals of Tourism Res.*, 24(4): 868-883.
7. Pearce, P.L., 1993. Defining Tourism Study as a Specialism: A Justification and Implications. *TEOROS International*, 1: 25-32.
8. Ansoff, H., 1987. The Emerging Paradigm of Strategic Behavior. *Strategic Management J.*, 8: 501-515.
9. Smirch, L. and C. Stubbart, 1985. Strategic Management in an Enacted World. *Academy of Management Review*, 10: 724-736.
10. Durbarray, R., 2004. Tourism and Economic Growth: the Case of Mauritius. *Tourism Economics*, 10(4): 389-401.
11. Decrop, A., 1999. Triangulation in Qualitative Tourism Research. *Tourism Management*, 20: 157-161.
12. Denzin, N.K., 1978. *Sociological Methods: A Sourcebook*. New York: McGraw Hill.
13. Harisson, J., L. MacGibbon and M. Morton, 2001. Regimes of Trustworthiness in Qualitative Research: The Rigors of Reciprocity. *Qualitative J.*, 7(3): 323-345.
14. Srnka, K.J. and S.T. Koeszegi, 2007. From Words to Numbers: How to Transform Qualitative Data Into Meaningful Quantitative Results. *Simple the Best Res.*, 59: 29-57.

15. Briassoulis, H., 1991. Methodological Issues: Tourism Input-Output Analysis. *Annals of Tourism Res.*, 18: 485-495.
16. Loomis, J.B. and L. Caughlan, 2006. The Importance of Adjusting for Trip Purpose in Regional Economic Analyses of Tourist Destinations. *Tourism Economics*, 12(1): 33-43.
17. Tohmo, T., 2005. Economic Impacts of Cultural Events on Local Economies: an Input- Output analysis of the Kaustinen Folk Music Festival. *Tourism Economics*, 11(3): 431-451.
18. Fletcher, J., 1989. Input-Output Analysis and Tourism Impact Studies. *Annals of Tourism Res.*, 16: 514-529.
19. Dietzenbacher, E., 2002. Interregional Multipliers Looking Backward, Looking Forward. *Regional Studies*, 36(2): 125-136.
20. Archer, B. and J. Fletcher, 1996. The Economic Impact of Tourism in the Seychelles. *Annals of Tourism Res.*, 23(1): 32-47.
21. Milne, S.S., 1987. Differential multipliers. *Annals of Tourism Res.*, 14(4): 499-515.
22. Wanhill, S., 1988. Tourism Multipliers under Capacity Constraints. *The Service Industries J.*, 8: 136-142.
23. Leontief, W., 1955. Some Basic Problems of Empirical Input-Output Analysis. In *Input-Output Analysis: An Appraisal* (pp. 9-52). [http:// www.nber.org/ chapters/c2864](http://www.nber.org/chapters/c2864).
24. Archer, B., 1995. Importance of Tourism for the Economy of Bermuda. *Annals of Tourism Res.*, 22(4): 918-930.
25. Gerking, S.D., 1979. Reconciling Reconciliation Procedures in Regional Input-Output Analysis. *International Regional Science Review*, 4: 23-36.
26. Jensen, M. and D. McGaurr, 1976. Reconciliation of Purchases and Sales Estimates in an Input-Output Table. *Urban Studies*, 13: 59-65.
27. Frechtling, D.C., 2006. An Assessment of Visitor Expenditure Methods and Models. *J. Travel Res.*, 45: 26-35.
28. Mules, T., 1999. Estimating the Economic Impact of an Event on a Local Government Area, Region, State or Territory. In: *Valuing Tourism: Methods and Techniques*. Occasional Paper Number 28. Canberra: Bureau of Tourism Research.
29. Fairweather, J.R. and D.G. Simmons, 1998. Estimating The Number of Visitors to Kaikoura over One year by Developing a Vehicle Observation Method. *Tourism Research and Education Centre (TREC) report; no.2*. Lincoln University: Tourism Research and Education Centre.
30. Mathison, S., 1988. Why Triangulate?. *Educational Res.*, 17: 13-17.