An Economic Analysis of the Philippine Tourism Industry

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The archipelagic nature of the Philippines, as well as its colonial heritage, offers a wealth of scenic views that invite both locals and foreigners to participate in tourism-related activities. According the Department of Tourism (2011), the industry is one of the three largest industries in the country. This study aims to measure the economic impact of tourism to the Philippine economy through the use of input-output analysis. The tourism industry is mainly a consumer of inputs and producer of final goods, hence, its impact on the output is relatively higher. Also, its interdependence with other industries as shown by the linkage indices prove that other sectors do benefit from the tourism sector. The government should promote tourism in the country. The past government administration applied holiday economics to help boost tourism domestically. The current administration may choose to consider continuing the program.

Keywords: Input-output analysis, tourism, linkages, impact multipliers

INTRODUCTION

The archipelagic nature of the Philippines, as well as its colonial heritage, offers a wealth of scenic views that invite both locals and foreigners to participate in tourism-related activities. According the Department of Tourism (2011), the industry is one of the three largest industries in the country, where most of the visitors came from East Asia, Korea in particular. It can be noted that the highest inflow of visitors arrived during December 2010. This may be attributed to the warm weather of the country relative to their countries of origin.

Figure 1 shows that there has been an increasing trend in international tourist receipts as a percentage of gross domestic product (GDP), which remained higher than international tourist expenditures or imports since the Asian financial crisis in 1998 until the year 2008 or after the global financial crisis. Since tourism can be considered as a luxury, there is a need for us to provide a proper economic analysis on the behavior of its consumers and its possible impact to the domestic economy, in order to prepare for possible shocks like financial crises.

Tourism involves public goods that may impose costs on the government to maintain. Since tourists

Figure 1. International tourism trade of the Philippines from 1995 to 2010 (World Bank, 2012).

are the main consumers of these goods, it makes sense that they be charged a tax. Tourism-related businesses are also prone to pay taxes as well. Nowadays, there exists a wide array of tourist tax that can be imposed such as: airport tax, trekking tax, sales tax, environmental tax, and so forth.

The increasing demand for tourism in the Philippines makes it important for us to measure its impact to the economy.

LITERATURE AND RESEARCH METHODS ON TOURISM IN THE PHILIPPINES

There are several ways to measure the economic impact of tourism to an economy. Hara (2008) identified statistical and non-stochastic methods, which include input-output analysis, social accounting matrix modeling, and tourism satellite accounts. Despite the limitations presented in Briassoulis' (1991) study, input-output analysis has remained to be the "workhorse" model (Lindberg, 2001) in measuring the economic impact of tourism. Zhou, Yanagida, Chakravorty, & Leung (1997) applied both input-output analysis and computable general equilibrium analysis to the Hawaiian economy and showed that both methods were able to identify the same industries that are related to tourism.

Considering the growing contribution of the tourism industry to the Philippine economy, only a few attempts were done to measure its impact. Arroyo and San Buenaventura (1983) did a study on the economic and social impact of the tourism sector in Pagsanjan, Laguna. They modified the 1978 national input-output table to approximate the local economy, with an assumption that the coefficients produced will be the same at the national level. They found that tourism is an important source of employment; however, income distribution in the locality is unaffected. Furthermore, linkages with the agricultural and manufacturing sector are negligible. Since this study has been done, transportation and accommodations have improved.

A more recent study on the Philippine Tourism Satellite Account was done using the 1994 input-output tables along with the 1998 Labor Force Survey and other statistical data gathered by different government agencies (Virola, Remulla, Amoro, & Say, 2001). They were able to show the output of tourism industries as well as the demand for tourism demonstrated through visitor arrivals, lengths of stay, and so forth. However, the difference in the data sources presents constraints in calculating forward and backward linkages. One may argue that it would be better to construct a tourism satellite account to analyze the industry, but considering the nature of data in the country,

the input-output tables can produce more useful insights for policy-making purposes.

METHODOLOGY

The input-output model is used to examine the interdependence between industries in an economy. In constructing the input-output table, the National Statistical Coordination Board [NSCB] (2006) assumed that all outputs produced by an industry have the same input structure and an output has the same input structure no matter what industry produces it. Given these assumptions, we can write that the total output of the ith sector (x_i) is the sum of the inter-industry sales of sector i to sector j (z_{ij}) and the final demand for the ith sector's product (f_i):

$$x_i = \sum_{j=1}^{n} z_{ij} + f_i \qquad (1)$$

We derive the matrix of technical coefficients (A) from this by dividing the intermediate transactions matrix (Z) by the total inputs, where:

$$a_{ij} = \frac{z_{ij}}{x_j} \qquad (2)$$

We assume that a_{ij} is fixed. This means that the proportion of sector i's input to sector j's output does not vary. We can rewrite equation (2) as

$$z_{ij} = a_{ij} x_j \qquad (3)$$

and substitute this into equation (1) so that

$$x_i = \sum_{j=1}^{n} a_{ij} x_j + f_i \qquad (4)$$

which can be re-expressed as:

$$(1 - a_{ij}) x_i = \sum_{j=1}^{n} a_{ij} x_j + f_i \qquad (5)$$

In matrix notation, equation 5 gives us:

$$(I - A)X = \sum_{j=1}^{n} Ax + f_j \qquad (6)$$

and

$$X = (I - A)^{-1} Y \qquad (7)$$

where $(I - A)^{-1}$ is the inverse matrix.

From the inverse matrix, we can now derive the multipliers that will estimate the economic impact of an exogenous change in the hotel and restaurant sector to output, gross domestic product and income.

Output multiplier. Blair and Miller (2009) defined an output multiplier for a specific sector as the total value of production in all sectors of the economy that is necessary in order to satisfy a dollar's worth of final demand for the said sector's output. We can solve this using the equation:

$$O_j = \sum_{i=1}^{n} a_{ij} \qquad (8)$$

where O_j = output multiplier of sector j

a_{ij} = ij^{th} element of the Leontief inverse matrix
n = dimension of the Leontief inverse

Domestic multiplier. The domestic multiplier indicates the change in gross domestic product brought about by a dollar increase in final demand in a sector (Jones, 2011). The domestic multiplier can be found using the equation:

$$DOM_j = \sum_{i=1}^{n} (D_{ij} + ID_{ij}) \qquad (9)$$

where DOM_j = domestic multiplier of sector j
           D_{ij} = direct impact of a change in final demand for sector j on sector i
           ID_{ij} = indirect impact of a change in final demand for sector j on sector i

Income multiplier. Households purchase goods and services using the income that they receive. The income multiplier allows us to explore the impact of a change in final demand for sector j on households' income (Blair & Miller, 2009). It can be derived using the equation:

$$IM_j = CE * (I - A)_j^{-1} \tag{10}$$

where IM_j = income multiplier of sector j
         CE = compensation row of the technical coefficients matrix
         $(I - A)_j^{-1}$ = the jth column of the Leontief inverse matrix

We can extend our analysis to estimate the inter-industrial linkage of an industry to other industries as a user of inputs and as a provider of inputs to other industries.

Backward linkage. This serves as an indicator of an industry's relative importance as a user of inputs from the production sector. Blair and Miller (2009) suggested the use of a normalized index of the power of dispersion. The index is derived as:

$$BL = \frac{\sum\limits_{i=1}^{60} r_{ij}}{\frac{1}{n} \left(\sum\limits_{i=1}^{n} \sum\limits_{j=1}^{n} r_{ij} \right)} \tag{11}$$

where r_{ij} = ij^{th} element of the Leontief inverse matrix.

Forward linkage. This serves as an indicator of an industry's relative importance as a supplier of inputs from the production sector. Similar to backward linkage, we will use a normalized index to measure its importance. The index is derived as:

$$FL = \frac{\sum\limits_{j=1}^{n} r_{ij}}{\frac{1}{n} \left(\sum\limits_{i=1}^{n} \sum\limits_{j=1}^{n} r_{ij} \right)} \tag{12}$$

where $r_{\{ij\}}$ = element of the Leontief inverse matrix.

"Net" backward linkage. This measure identifies the relative importance of an industry by comparing the resulting output from the industry's final demand and the output of said industry resulting from all other industries in the economy (Dietzenbacher, 2005). It can be derived from:

$$NBL_j = \frac{\sum\limits_{j=1}^{n} x_{ij}}{\sum\limits_{i=1}^{n} x_{ji}} \tag{13}$$

It can be noted that input-output analysis has its shortcomings such as assuming linearity of technical production functions, homogeneity in production of goods and services and the absence of supply constraints, which may lead to overestimation of a sectors impact on the economy (Australian Bureau of Statistics, 2009). However, Zhou et al. (1997) have shown that the Input-Output model is able to identify the same sectors as the computable general equilibrium (CGE) model.

RESULTS

This paper uses the latest input-output table released, the 60 x 60 2000 input-output table of the Philippines from the NSCB (2006). This table includes the Hotel and Restaurant Sector, which will be used to measure tourism activities. The

year 2000 Input-Output table is the latest table available from the NSCB (2006). Despite the nature of the data, we can still get useful insights assuming that there is no change in the economy's structure. The choice of the 60x60 matrix is due to the fact that it captures the proxy sector for tourism, is not as disaggregated as the 240x240 industry matrix, thus combining industries that are more related to each other, which makes comparing inter-industry relationships more convenient.

IMPACT MULTIPLIERS

Output multiplier. For every peso increase in final demand for hotel and restaurants will result to a total increase of 1.865 peso in the output of the economy. This means that there is a peso increase for the hotel and restaurant industry will contribute a 0.865 peso increase on the output of its own as well as its related industries. Using a round-by-round calculation, we can identify that hotel and restaurant sector's total output increased by 1.11 pesos which further increases the output of other industries namely, private personal services, electrical machinery, food manufacturers, and private business services.

Domestic multiplier. The domestic multiplier indicates the change in gross domestic product brought about by a peso increase in final demand in the hotel and restaurant industry. If the final demand for the hotel and restaurant industry increases by a peso, there will be a 0.97 peso increase in country's gross domestic product. An alternative way of interpreting the domestic multiplier is to assume a peso increase in the exports of the hotel and restaurant industry will lead to a 0.97 peso decline in the country's balance of payments deficit.

Income multiplier. Compared to the other sectors, the hotel and restaurant industry ranks 21st when it comes to income improvement brought about by an increase in final demand for each sector. The top mover in terms of income improvement is the government services

sector. This may be due to the principle that the government has the most number of employees. An additional peso in final demand for the hotel and restaurant industry will generate an additional 0.29 peso increase in household income. Though it is not one of the main drivers of the economy, the industry still plays a big role in improving the lives of Filipinos where tourism thrives.

LINKAGES

Backward linkage. The hotel and restaurant sector ranked at 28 out of 60 sectors and its index of power of dispersion is 1.013106. This implies that its interdependence with other sectors for raw materials may not be as high relative to other sectors like air transport. However, it still sends a significant stimulus to suppliers as a result of increased demand for tourism. We should not discount the fact that the hotel and restaurant sector is doing its share of consuming intermediate inputs from other sectors.

Forward linkages. As a supplier of raw materials to other sectors, the hotel and restaurant sector is ranked 32 with an index of power of dispersion having a value of 0.720131. Its below average index simply means that the hotel and restaurant sector mainly provides final goods to the economy. This is because the hotel and restaurant sector provides goods and services that cannot be used as an input in the production of other products.

"Net" backward linkage. The hotel and restaurant sector has a "net" backward linkage of 1.65451 and is ranked 20th highest in the economy. The highest being the ownership of dwellings, government services, and fisheries, most of which are basic necessities. The coefficient tells us that the output generated by the final demand in the hotel and restaurant sector for other sectors is larger than the amount of output generated by other sectors' final demand, which further translates its relevance to the economy. Although the backward linkage and the forward linkage indices show that the hotel and restaurant sector

is not a key sector in the economy, the "net" backward linkage shows otherwise.

CONCLUSIONS

We can say that the Philippine tourism industry does have an impact in the economy. Although its impact is not as significant as expected, it does contribute to the welfare of the citizens by increasing their income and at the same time reduce balance of payments deficit through the influx of foreign currency brought in by tourists. However, these results are based on the economic performance in 2000, but we assume that the structure of the economy did not change over time. Considering the growth in number of tourists and the increasing volume of investments in tourism-related businesses, these may have changed as well.

The linkage indices prove that other sectors do benefit from the tourism sector; hence, the government should promote tourism in the country. The past government administration applied holiday economics to help boost tourism domestically. The current administration may choose to consider reviving this program.

With a high frequency of airlines providing convenient means of transportation for tourists, we can improve the performance of this industry through marketing and rethinking our tax policy. Most of the countries in Southeast Asia do not charge terminal fees. In the Philippines, everyone is charged US$15 for terminal fee regardless of the destination. Lowering or waiving this fee for domestic flight passenger can encourage more people to travel within the country. In January 2012, the Manila International Airport Authority declared a lower charge of US$11 for terminal fee effective February 2012 (Araullo, 2012). The impact of this policy is yet to be observed. These policies will not only help those who are involved in the hotel and restaurant sector, but also those in private personal services, electrical machinery, food manufactures, and private business services which are key sectors that benefit from tourism-related activities.

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APPENDIX A

Table of Backward Linkage Index, Forward Linkage Index, "Net" Backward Linkage Index and Income Multipliers

IO Codes	Description	Backward Linkage	Rank	Forward Linkage	Rank	"Net" Backward Linkage	Rank	Income Multipliers	Rank
1	Palay	0.76141	55	0.84449	21	0.10203	47	0.437434	4
2	Corn	0.74124	56	0.65514	43	0.36821	43	0.501250	3
3	Coconut	0.65294	59	0.60825	49	1.88735	15	0.409440	7
4	Banana	0.87355	45	0.59890	52	2.36929	8	0.418499	6
5	Sugarcane	0.86388	46	0.59256	54	0.00901	49	0.321188	14
6	Other crops and agricultural services	0.71214	57	1.15241	14	2.28790	11	0.318078	16
7	Livestock	0.88950	40	0.83943	22	0.52695	41	0.341871	12
8	Poultry	0.96165	32	0.71793	35	0.88723	36	0.320768	15
9	Fishery	0.96165	32	0.73541	28	3.27129	3	0.247988	39
10	Forestry	0.77388	54	0.74081	27	1.59223	22	0.155609	59
11	Copper	0.65306	58	0.68188	38	-9.43083	58	0.220014	46
12	Gold	0.93000	35	0.66247	40	0.92174	35	0.209387	50
13	Chromite	0.91207	36	0.54327	58	2.82282	7	0.241718	42
14	Nickel	0.90830	38	0.54346	57	3.11467	5	0.229514	44
15	Other metallics	0.87847	44	0.60723	50	-114.14929	60	0.190781	53
16	Stone quarrying, clay and sand pits	0.78864	52	0.65057	44	-0.18633	54	0.267616	28
17	Other non-metallics	0.96799	30	2.36440	4	-55.20031	59	0.218956	47
18	Food manufactures	0.89244	39	2.07687	6	0.87449	37	0.314011	17
19	Beverage industries	1.20947	9	0.72012	33	1.36347	26	0.247979	40
20	Tobacco manufactures	1.06469	24	0.64461	45	1.64069	21	0.168678	58
21	Textile manufactures	1.07248	23	1.36351	11	-0.09187	52	0.293623	22
22	Footwear, wearing apparel	1.24760	6	0.61697	48	1.67272	19	0.285932	25
23	Wood and wood products	1.17144	13	1.08599	15	0.32375	44	0.238797	43
24	Furniture and fixtures	1.10233	19	0.71029	37	0.93228	34	0.308903	19
25	Paper and paper products	1.20721	10	1.72404	8	-0.29070	56	0.256990	35
26	Publishing and printing	1.34569	2	0.72314	30	0.39720	42	0.257525	34
27	Leather and leather products	1.24856	5	0.80256	25	0.66498	39	0.312793	18
28	Rubber products	1.16030	15	0.71874	34	0.20691	45	0.296881	20

Appendix A continued...

IO Codes	Description	Backward Linkage	Rank	Forward Linkage	Rank	"Net" Backward Linkage	Rank	Income Multipliers	Rank
29	Chemical and chemical products	1.20238	11	3.77656	1	-0.28054	55	0.261445	31
30	Products of petroleum and coal	1.22786	7	2.87118	2	0.15887	46	0.204767	51
31	Non-metallic mineral products	1.15656	16	0.98660	17	0.01825	48	0.255840	36
32	Basic metal industries	1.19996	12	1.69647	9	-0.38110	57	0.211242	48
33	Metal fabrication	1.22229	8	1.17870	12	-0.10195	53	0.251515	37
34	Machinery except electrical	1.11265	18	0.85575	19	1.46373	24	0.182530	56
35	Electrical machinery	1.11671	17	1.53797	10	1.17928	32	0.267242	29
36	Transport equipment	1.29991	3	0.93119	18	0.87072	38	0.250222	38
37	Miscellaneous manufactures	1.09778	22	0.85254	20	1.09629	33	0.288825	24
38	Construction	1.05752	25	0.72030	31	2.01082	13	0.360758	11
39	Electricity	0.85911	48	1.77429	7	1.18183	31	0.181188	57
40	Steam	0.88056	43	0.68033	39	0.00000	50	0.182666	55
41	Water	0.78693	53	0.62574	46	1.73122	18	0.290420	23
42	Land transport	1.10025	21	0.81206	24	1.46746	23	0.259304	33
43	Water transport	1.03602	26	0.65938	41	1.23086	30	0.190663	54
44	Air transport	1.37747	1	0.71458	36	0.52747	40	0.274573	27
45	Storage and services incidental to transportation	1.16748	14	0.61852	47	1.28108	28	0.260283	32
46	Communication	0.88871	42	1.01566	16	1.88051	17	0.244841	41
47	Trade	0.90835	37	2.39658	3	1.88342	16	0.265414	30
48	Banks	0.95135	34	1.15882	13	1.23817	29	0.279028	26
49	Non-banks	0.85800	49	0.65579	42	2.82307	6	0.225260	45
50	Insurance	0.86246	47	0.72494	29	2.13859	12	0.195482	52
51	Real Estate	0.82885	51	0.82051	23	1.37338	25	0.209400	49
52	Ownership of dwellings	0.60774	60	0.54326	59	16.59309	1	0.020541	60
53	Government services	0.84062	50	0.54326	59	3.61301	2	0.770489	1
54	Private education	0.88883	41	0.55268	56	3.15866	4	0.548405	2
55	Private health and social services	0.96807	29	0.59587	53	2.34051	9	0.423515	5
56	Private business services	0.99467	28	2.29237	5	-0.00006	51	0.405403	8
57	Hotels and restaurants	1.01311	27	0.72013	32	1.65451	20	0.293982	21

Appendix A continued...

IO Codes	Description	Backward Linkage	Rank	Forward Linkage	Rank	"Net" Backward Linkage	Rank	Income Multipliers	Rank
58	Private recreational services	0.96647	31	0.60388	51	2.29163	10	0.386047	9
59	Private personal services	1.25132	4	0.79959	26	1.30002	27	0.340169	13
60	Other private services	1.10169	20	0.55908	55	1.94003	14	0.383876	10