

The Importance of Transportation and Financial Sectors in the Malaysian Service Industries: An Input-Output Analysis

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Abstract. The service sector in Malaysia had become an important sector in the economy since the year 2000. It contributed more than 55% of the gross domestic product (GDP) in 2008. It has surpassed the manufacturing and the agricultural sectors contribution to the national GDP which contributed only 29.1% and 7.5% respectively during the same period. However, two sub-sectors, which are the transportation and communication as well as financial sub-sectors showed an increase of 7.2% average growth in 2010. This is more than the overall average of all the service sector growth in 2010 which recorded 6.8% growth. Moreover, in 2010, the share of the GDP of these two sub-sectors account for 20% of the overall economy. This paper attempts to study the capability of these sub-sectors in generation of output as well as value-added to the overall Malaysian economy. The methodological approach is through the use of input-output approach which utilizes the multiplier analysis. The results of the study are beneficial for policymakers in order to make meaningful and benevolent planning for future expansion of the economy.

Keywords: Service Sub-Sectors, Input-Output Analysis, Multiplier Analysis.

1. Introduction

During the first three decades since interdependence in 1957, the Malaysian economy was affluently a commodity-based economy, i.e. agricultural based economy. However, in the late eighties and the nineties, it shifted to the product-based economy, which is manufacturing. The shift was a result of replacing the “import substitution” to “export promotion” policy by the government at that time.

The post 2000 scenario, however, saw the emergence of the service sector as a powerful sector that created tremendous wealth in the global economy. One of the major causes of the shift to this scenario was the easier access to communication among countries through the use of ICT (information and telecommunication technology) in conducting trade of goods and services. Further, after the year 2000, the growth of trade in services had grown at a faster rate compared to the rate of growth of trade in goods. For example, in 2007, the World Trade Organization (WTO) had shown that trade in commercial services grew at 18% compared to the growth of trade in goods of only 15%, (see World Trade Development) [1]. In retrospect, most advanced countries today are competing to export commercial services throughout the globe. These include the countries of the European Union, the United States and Japan. Then, other middle-income and high-income developing countries, including Malaysia follow the same stride to enhance their service sector in endeavouring to secure better economic development.

2. Malaysian Service Sectors

For the years, after the Asian recession in the late nineties, the service sector has been growing in its size and contribution to the Malaysian economy, particularly after 2002. According to the Malaysian Economic Report 2010 [2], the growth of service sector remained steady in 2008. The overall expansion of all service sectors in Malaysia in 2008 was 7.2%, while the rate was decreasing in 2009 to 2.1% but further increased to 6.8% in 2010. The decline in growth rate of service sector in 2009 was still considered as fairly good because that year the Malaysian economy was experiencing a negative growth of -1.75% in the overall economy. Table 1 shows the performance of the services sector between 2008 and 2010.

From the table, it indicates that all sectors show positive growth in all years from 2008 to 2010, except for transport and storage and utilities which showed negative growth in 2009. The largest growth in 2008 was seen in government services growing at 11.1% followed by wholesale and trade services of 9.8% and finance and insurance of 7.7%. On the other hand, the years of 2009 and 2010 the communication service showed the largest growth in both years, recording a 5.7% and 8.5% growth respectively.

Table 1: The Performance of the Services Sector in Malaysia, 2008 to 2010.

Service Sub-sectors	Percentage growth (%)			Share to GDP (%)		
	2008	2009	2010	2008	2009	2010
Transport and storage	6.1	-3.3	6.9	3.8	3.8	3.8
Communications	7.3	5.7	8.5	3.9	4.2	4.4
Finance and insurance	7.7	3.0	6.1	11.0	11.7	11.8
Real Estate and Business	1.5	1.0	5.7	5.1	5.4	5.4
Utilities	2.1	-1.4	8.2	2.9	3.0	2.9
Wholesale and Retail	9.8	1.2	4.0	12.8	13.3	13.5
Hotel and Restaurants	7.3	3.2	5.0	2.4	2.6	2.6
Other Services	5.2	4.9	2.8	5.7	6.2	6.3
Government Services	11.1	2.6	4.9	7.4	7.8	7.8
Overall Sector	7.2	2.1	6.8	55.0	57.9	58.5

Source: Economic Report Malaysia 2010, National Accounts: GDP 2000-2010, DOSM 2011.

From the same Table 1, the share of GDP of all the service sectors to the whole economy was increasing steadily from 55.0% in 2008, to 57.9% in 2009 and 58.5% in 2010. In 2010, the largest share to the GDP was first shown by wholesale and trade services (13.5%) followed by the financial services sector of (11.8%) and government services of (7.8%). However if we aggregate the transport and telecommunication as well as the financial services sector together, the total share accounts to 20% of the overall economy. It is an enthusiastic move to focus our study to these two sub-sectors.

3. Objectives

The main objective of this study is to analyze the importance of the transportation, telecommunication and the financial services industries in the Malaysian economy. It attempts to determine the production as well as the value added multipliers of these sub-sectors in the economy.

4. Methodological Approach

The relevant methodological approach in this exercise is to utilize the input-output approach of analysis. This approach shows the relationship between the flows of the various sectors in the economy, whereby the relationship between the producers and the consumers as well as the interdependence among the industries can be shown. It can also track the flow of goods and services from one industry to another. This flow of commodities supplied and used is systematically compiled in the form of input-output tables, see Sauian, Aznan and Khairol Azmi, 2011 [3].

4.1. Input-Output Framework

The basic input-output table has four quadrants. The first quadrant is the intermediate input quadrant which is referred to as the heart of the input-output table, (see Hj Ismail 2007) [4]. The second quadrant represents the final demand where it is considered as the output of the producing sectors, i.e the distribution of sectors consisting household expenditure, government expenditure, gross fixed capital formation and exports. On the other hand, the third quadrant shows the primary inputs quadrant, which consists of the distribution of sectors comprising wages, operating surplus, value-added, indirect taxes, subsidies and depreciation, while the fourth quadrant represents the primary inputs directly linked to final demand, see for instance, Jensen 1986, Miller and Blair 2009 and O’Cornor and Henry 1975[5, 6,7].

The input-output tables describe the complex process of production, the use of goods and services and the way in which income and value-added products are generated within the various sectors of the economy, where the set of producers of similar goods and services forms a homogenous industry, (see Sauian, 2007)[8]. Through a set of tables during a period, the structural change in the economy and the specific sector’s economic characteristics can be revealed.

In essence, the symmetric input-output table is a product or industry matrix describing the domestic production processes and the transactions in products of the national economy in detail. For example, a two-sector input-output table allows us to understand the industrial relationship between agriculture and the rest of the economy, thus highlighting the implication for structural and policy analysis as in Pizzoli, 2004 [9].

Therefore, input-output analysis has multifarious applications. For instance, it offers a static view of the structural relationship among the different sectors in the economy (typically national or regional) for a certain period of time, generally a year. The relationship is expressed purely in monetary terms, as noted in Lee and Mokhtarian, 2004 [10]. Other applications of input-output tables are determining the technical capability of production, labour productivity and comparing the technological standard of one country compared vis-à-vis other countries. Similarly, the study of economic linkages among the various sectors of the economy can easily be discovered.

4.2. Multiplier Analysis

The multiplier analysis is also known as the impact analysis. Multiplier analysis measures the total change throughout the economy from one unit change of a given sector. For instance, for every one dollar of final demand for a product of a sector generates direct and indirect income to the economy as a whole. The relationship between the initial spending and the total effect generated by the spending is known as the impact of that sector to the economy as a whole.

In this analysis, we use only the production and value-added multipliers because they are among the simplest form of various multipliers. They are considered useful because each multiplier is expressed as a ratio of the sum of direct and indirect production or income change resulting from a unit change of final demand in that sector. The induced output and induced value added are obtained from the following Leontif's matrix equations:

$$X = [I - A^d]^{-1} F_{ik}^d \quad (1)$$

$$V = v [I - A^d]^{-1} F_{ik}^d \quad (2)$$

where: X is the matrix of the domestic output, $[I - A^d]^{-1}$ is the interdependence coefficient matrix of domestic economy, V is the matrix of the value-added, F^d is the final demand vector of final demand of domestic good and services, k is the vector of private consumption, government consumption, investment and export and v denotes the value added coefficients row vector and "i" is the respective sector under consideration. In retrospect, this approach neglects the import vector and in normal circumstance, the input-output table used actually has the imports of the non-competitive type. The equations (1) and (2) divided by the final demand by item will give inducement effects of production and value added respectively.

5. Data Sources

The data used are based on the input-output tables of Malaysia 2000[11] and 2005[12], which were published in 2005 and 2010 respectively. The total number of sectors, in this analysis is aggregated into 12 economic sectors, while the transportation and communication sub-sectors is considered as transportation sectors only and finance and insurance sub-sectors is merged into just financial sub-sector. Other sources of data include Economic Report Malaysia 2010, Annual National Accounts: Gross Domestic Product 2000-2010[13] and the Economic Transformation Programme: A roadmap for Malaysia 2010[14].

6. Results and Analysis

The results of the exercise which focus on the calculation of the output and value-added multipliers can be obtained in the following sub-sections:

6.1. The Output Multiplier

The domestic output multiplier or the production inducement effect indicates the amount of domestic production induced by an additional unit of final demand in the particular economic activity. The results for the production inducement effect are shown in Table 2. From the table, it shows that the largest output multiplier for the year 2000 is from construction services (1.36) followed by government services (1.19), manufacturing (1.12) and hotel and restaurant services (1.07). However, transportation and financial services only ranked at 6th and 11th placement respectively in 2000.

The situation changed in the year 2005. The largest output multiplier went to the manufacturing sector which recorded a value of 2.69. This means that for a change in a unit of final demand in manufacturing

sector, the overall production in the economy grew 2.69 times. Looking at the service sector, the government services sector showed the largest output multiplier of 1.28, followed by hotel and restaurant services which recorded a value of 1.0.

It is also interesting to note that in 2005, the transportation sector is ranked 4th while the financial sector is ranked 7th in the output multiplier rankings. Both sub-sectors showed increase in rankings from previous placement of 6th and 11th respectively. This shows that their capabilities to induce growth in the output production in 2005 are better as compared to the year 2000.

Table 2: The Output Multipliers for 2000 and 2005.

Economic Sectors	Output multipliers			
	Year 2000	Ranking	Year 2005	Ranking
1. Agriculture, Forestry, Fishery	0.64	9	0.36	12
2. Mining and Quarrying	0.92	7	0.67	8
3. Manufacturing	1.12	3	2.69	1
4. Utilities	0.55	10	0.54	10
5. Construction	1.36	1	0.76	5
6. Wholesale and Retail	0.42	12	0.51	11
7. Hotel and Restaurant	1.07	4	1.00	3
8. Transport and Telecommunication	0.93	6	0.91	4
9. Finance and Insurance	0.48	11	0.71	7
10. Real Estate	0.88	8	0.74	6
11. Business Services	1.07	5	0.63	9
12. Government Services	1.19	2	1.28	2
Average	0.89	-	0.90	-

Source: Computed from Input-Output Tables Malaysia 2000 and 2005.

6.2. The Value-Added Multiplier

As in the previous section for output inducement effect, the value added inducement effect can be depicted from Table 3. Table 3 shows that in 2000, the value-added inducement effect is greatest in real estate services (0.91) followed by agriculture (0.86), finance and insurance (0.85) and wholesale trade (also 0.85). However, transportation and communication services sector is emplaced in the 9th slot showing a value-added multiplier of 0.66.

Table 3: The Value-Added Multipliers for 2000 and 2005.

Economic Sectors	Output multipliers			
	Year 2000	Ranking	Year 2005	Ranking
1. Agriculture, Forestry, Fishery	0.86	2	0.81	4
2. Mining and Quarrying	0.76	6	0.92	3
3. Manufacturing	0.54	12	2.57	1
4. Utilities	0.80	5	0.65	8
5. Construction	0.60	11	0.40	11
6. Wholesale and Retail	0.85	4	0.47	10
7. Hotel and Restaurant	0.66	10	0.67	7
8. Transport and Telecommunication	0.66	9	1.15	2
9. Finance and Insurance	0.85	3	0.57	9
10. Real Estate	0.91	1	0.72	6
11. Business Services	0.71	8	0.39	12
12. Government Services	0.74	7	0.77	5
Average	0.75	-	0.84	-

Source: Computed from Input-Output Tables Malaysia 2000 and 2005.

For the year 2005, on the other hand, the manufacturing sector has the highest value-added multiplier of 2.57. This was followed by the transportation and communication services sector (1.15), mining (0.92), agriculture (0.81) and government services (0.77). Regretfully, the value of value-added multiplier in finance and insurance was only 0.57 and placed 9th in the value-added rankings.

Taking into consideration of the two-subsectors of transportation and communication as well as the finance and insurance sector, there is a great leap for the transportation and communication sector in the capability to induce value-added effect as it increases from 0.66 to 1.15. On the other hand, the finance and insurance sub-sector has dropped its inducement capability to induce value-added from 0.85 to 0.57. The reason for this is explained by the fact that, in actual fact that the drop was due to the real inducement effect of insurance sub-sector which was calculated to be 0.35 only, (see Mansor, 2010) [15].

As mentioned earlier, the effect of the lower value of the value-added multiplier was due to the effect of the insurance sector. When calculated independently for the financial sector (without insurance) the actual value-added multiplier was 0.82.

7. Concluding Remarks

From this exercise, it reveals that the output as well as the value-added multipliers of all the given sectors of the economy could be calculated. In fact we could determine the rankings of all the relevant sectors in the overall economy. As far as output multiplier is concerned, the year 2005 saw an increase in rankings of both transportation and financial sub-sectors compared to the year 2000. This means that the capability of inducing production within these two sub-sectors is increasing. On the other hand, for the case of value-added multiplier, the year 2005 showed a remarkable increase of value-added multiplier in the transportation service sub-sector with second place ranking compared to all other sectors in the economy but there was a drop in ranking for the financial sub-sector in comparison to the year 2000.

By and large, the induced effects of both transportation and financial sub-sectors in generating output as well as value-added are considered as moderate. But we should bear in mind that the input-output tables are produced about four to five years behind time. It is therefore important to take some consideration into the use of the current trend of the GDP contributions of these two sub-sectors. In retrospect, in 2010 the two sectors recorded 20% contribution to the GDP of the overall economy. Moreover, the transportation and financial sub-sectors contributed 34.2% of the share to GDP to the overall service industries. It is also interesting to note that transportation and communication sub-sector is one of the many sectors in Malaysia which is included in the special project of the NTP (New Transformation Programme) by the government. Hence, both analyses of the output and value-added multipliers using input-output approach are good yardsticks to measure the capability of various sectors in the generation of national income.

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