2.0 Literature Review

2.1   Introduction

The use of input-output analysis to evaluate the economic interdependence among sectors through the relation of intermediate to total transactions has been employed by various researchers in planning. For instance, according to Hirschman (1961) there are two types of well known sectoral linkages: backward linkages and forward linkages. Backward linkages coefficients are high in manufacturing industries and are rather low for primary product and services sectors. Whereas, for forward linkages the high coefficients are normally found in sectors which produce relatively little directly to final demand and largely for intermediate demand by other sectors.

2.2 Bharadwaj, K.R. (1966)

" A Note on Structural Interdependence and the Concept of Key Sector"

Bharadwaj, K. R (1966) in his study also laid out two ways of determining structural linkages which are backward linkages and forward linkages. Activity, which absorbs input from other sectors while operating on a positive output level and provides stimulus for the expansion of production of input providing industries, is termed as backward linkage. Forward linkage involves activities that provide inputs to other industries whether through the lower cost of its products or increasing the output levels of the output absorbing industries. The study also pointed out, backward linkages effects is more powerful than forward linkages in their

operation. The capability of a particular sector in generating growth is depends on the strength of these stimulation.

2.3 Yopoulos,P.A. and J.B. Nugent (1973)

" A Balanced Growth Version of the Linkages Hypothesis: A Test"

Yotupolos and Negent (1973) also studied linkages among the sectors. In their study they adopted a method of calculation using the inverse of the Leontief input-output table to compare the pattern of linkages between different countries. However, in this study some weaknesses were found in their procedure, that arise from the unweighted index. Such weaknesses arise because of the assumption that all industries have equal weights.

2.4 Kubo,Y (1985)

" A Cross-Country Comparison of Interindustry Linkages and the Role of Imported Intermediate Inputs"

Kubo, Y. (1985) used input-output data to examine compare the patterns of intermediate input used, the linkage in overall and domestic industrial sectors and roles play by imported intermediate goods in production among nine countries and over time. Chenery and Watanabe's and Ramussen linkage measurements were employed to evaluate the intersectoral linkage relationship. Two types of linkage indeces calculated are the overall linkage and domestic linkage. The former measure includes imported intermediate goods while the latter excludes the imported components. The overall linkage captures the extent of interindustry

relationship which is the underlying intermediate input technology. While the domestic linkage focuses only on the extent of linkages emanating from domestic industrial. To sum up, the difference between the two indices is centred on the role of imported intermediate inputs in production. The study indicates that Taiwan and Korea have the highest overall linkage. On the other hand, Turkey, Colombia and Mexico have shown the lowest overall linkages.

2.5 Mohammed Alauddin, A. R. (1986)

"Identification of Key Sector in the Bangladesh economy: a linkage analysis approach"

Mohammed Alauddin (1986), adds another dimension of application on input-output modeling. He examined the key sectors in Bangladesh economy, using the concept of forward and backward linkages. These sectors are ranked based on their employment and output potential. In this study, he demonstrated the significance of divergence between concepts of "gross" and "net" linkages in sectoral rankings with respect to output and employment, especially in an economy that is highly depend on import. He pointed out that net linkages provide better indicators of structural interdependencies among the productive sectors of economy than that given by gross linkages.

2.6 Bear, W and A R Manuel (1987)

" Structural Changes in Brazil's Industrial Economy, 1960-80"

The study by Bear, W and A R Manuel (1987), was to examine the structured changed in Brazil's economy by comparing the new economic structure in Brazil to the international benchmarks. This study also attempted to describe the changes in Brazil's industrial structures in terms of whether it conforms to or deviates from the expected norms. The study is base on various census and input-output tables in the period 1960 to 1980. To examine the linkage relationship, Rasmussen's forward and backward linkages were used in this study. The results show that sectors which previously had relatively low linkages have become more important and highly linkaged in the import substitution exercise.

2.7 Abdul Aziz, A. R. (1987)

"Identification of Structural Constraints in Sectoral Development Using the Diamond-Lausams Key Sector Method: With West Malaysian Case Study."

In Malaysia, Abdul Aziz, A. R. (1987) analysed the intersectoral relationship. In his study he attempted to describe the empirical determination of key sectors of the West Malaysian economy using the input-output tables for Peninsular Malaysia 1980 from the aspect of employment, income and export-generation capacities and import-use intensity. The analytical framework used by this study is the Rasmussen linkage techniques. The study demonstrated that there were relatively fewer sectors that fulfilled the objectives of maximizing employment, income and exports, while minimizing the negative impact of imports. He asserted that

promoting new activities is crucial not only in earning foreign exchange but saves on

imported input. It also creates high employment and income too. However, due to the

unavailable data, his work was limited to the Peninsular Malaysia only.

2.8 Se-Hark and Kenreth S. Chan(1989)

"A Cross-Country Input-Output Analysis of Intersectoral Relationships between Manufacturing Services and their Employment Implications"

Meanwhile, Se-Hark and Kenreth S.Chan (1989) used 26 countries' input-output tables to examine and evaluate intersectoral relationships between manufacturing and services at different levels of industrialization. Their effort revealed that service sectors tended to rely heavily on the manufacturing sector especially in providing inputs. The study also showed that there was a problem of underestimated employment absorption capacity in manufacturing sectors. This weakness arises is because of the unavailability of incomplete data in intersectoral demand for service inputs and its income. Finally, the study concluded that the relationship between the service and manufacturing sectors during development are symbiotic relationships.

2.9 Bhalla,Y.S. and Yue Ma. (1990)

"Sectoral Interdependence in the Chinese Economy in Comparative Perspective"

A.S Bhalla and Yue Ma (1990) also emphasized input-output analysis. They attempted to describe sectoral interdependence between agricultural and non-

agricultural sectors, especially the interdependent relationship between agriculture and industry. Hirschman's concept of linkage and key sectors was adopted in this study. The result of this study shows that sectoral interdependence in the Chinese economy is low. Moreover most heavy industries tended to induce high linkages (total) and low total employment generation through additional investments because of the concentration of linkages. The reason for the low sectoral interdependence is due to local self-reliance and vertical integration adopted during the Mao period. Meanwhile, the shifting in macroeconomic policy will influence the degree of sectoral interdependence too. The study suggested that a better balance between agricultural and industrial growth should be promoted via agricultural investment, agricultural terms of trade, rural industry and structure of heavy industry.

2.10 Cocjrame, S.G. (1990)

" Input-Output linkages in a Frontier Region of Indonesia"

Cocjrame, S.G. (1990), on the other hand used the input-output model to study the multipliers and linkages in the frontier region of Indonesia. Their study suggested that households have the highest linkages with the various sectors in economy. At the same time they also revealed that households play an important role in determining the results of the inverse matrix. By incorporating, output, income and employment multipliers it was shown that agriculture, forestry and food and beverages sectors have the highest rank. By using Rasmussen linkage measures the results indicated that manufacturing and services are the key sector, which investment

priority should focus on. However, through the hypothetical extraction methods, primary production sectors were identified as sectors which should be prioritised.

2.11 Clements, B. J. (1991)

"Interindustry linkages and economic development : The Case Of Brazil Reconsidered"

Clements, B. J. (1991) also used the input-output model of the Brazilian economy in 1975 to study the linkages using the method suggested by Cella to asses the relationship between sectoral performance and to determine whether the Brazilian economic development is linkage intensive. The study showed that high levels of total linkages does not mean a high value for both forward and backward linkage. The study also indicated that in the Brazilian economy, modern industrial sectors are not necessarily associated with high linkages. This study revealed the differences in key sectors based on backward and forward linkages. Sectors with high levels of backward linkage per unit of output are more favourable based on criteria such as the reliance on domestic suppliers and employment generation. However, sectors with high forward linkage per unit of output does not work well in this regard as this kind of linkage is more reliant on imported inputs. Therefore, development strategy which stresses on key sectors based on high backward linkage will favor employment generation. The result also shows that there is no relationship between the linkage measure with domestic resource cost.

2.12 Poot, H (1991)

" Interindustry Linkages In Indonesian Manufacturing"

To analyse the intersectoral linkages in the manufacturing sector, Poot, H (1991), carried out the study on the Indonesian non-oil manufacturing sector, using the 1985 input-output table data to examine the contribution of manufacturing, particularly non-oil manufacturing to the Indonesian economy and to assess interindustry linkages. The study shows those exports of non-oil manufacturing sector becomes the main factor in accelerating growth.

2.13 Nor'ini Harin (1991)

" Malaysian Forest Based Industries in the Economic Input Output Model"

Nor'ini Harin (1991) focused on examining the interdependence or economic linkages between the forest-based industries (FBI) sector with other sectors. The analysis contributes towards the understanding of FBI's interdependence and determines the likely sectors that will be affected if there are any changes in forest policy. Based on the 1983 Malaysian input–output tables, the result the of study shows that sawmill and other wood mills are identified as the strategic sector to prioritize. Forestry, furniture and fixtures are indicated as having medium potential for development.

2.14 Dhawan, S. and K. K. Saxena (1992)

" Sectoral Linkages and Key Sectors of Indian Economy"

Dhawan, S. and K K Saxena (1992) applied the input output analysis based on the Indian economy. Their study attempted to examine and compute the sectoral linkages in order to identify key sectors of the Indian economy for three years namaely, 1973-74,1978-79 and 1983-84. In this study, they demonstrated several sets of methods for estimating intersectoral linkage. The Leontief model was used to estimate the backward linkage from the demand side. While the supply side Ghosh model was adopted to estimate the forward linkages. Output to output multipliers and Rasmussen's linkages measures were used to estimated the backward and forward linkages They pointed out that most sectors in developing countries have higher backward linkage while base on the demand side measure. Sector with high backward linkages depend highly on capital intensive intermediate goods. Therefore, these sectors will reduce the employment. Consequently, employment generation may be neglected.

2.15 Khamurudin Mohd Noor (1996)

"An Input-Output Framework for the Economic Impact Analysis of Industrialization Policies for the Wood-Based Industry in Sarawak"

The study carried out by Khamurudin Mohd Noor (1996) evaluated the probable success of the forest industry development policy in Sarawak. To determine the harvest period for 1990-2005 in Sarawak the study adopted the equilibrium projections of production and international markets. In order to know the

16

influences of the forest industry on other sectors of economy, the input-output analysis was applied to evaluate the interrelationships with the Sarawak economic system. In this study there are two ways to explain the relationship of sectors. First, the base year of 1990 is evaluated to establish the "current" picture. Second, the current interrelationship is utilized to explained the economic impact of various hypothetical policy changes, such as the restriction of log production and log export on the forest sectors on the economy.