An Experiment of Small Region Input-Output Model:

A Fundamental Economic Structure Approach to Kabupaten Hulu Sungai Tengah

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Kata Kunci: *Analisis input-output – Struktur ekonomi – Pembangunan daerah – Hulu Sungai Tengah, Kalimantan Selatan*

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Abstrak

Dalam semangat otonomi daerah pada tingkat kabupaten dan kota, pemahaman akan struktur ekonomi pada tingkat kabupaten dan kota sangat penting untuk diketahui guna menentukan strategi pembangunan daerah. Berkaitan dengan hal itu, tabel input-output merupakan salah satu alat analisis yang paling baik untuk tujuan tersebut, karena mengambarkan keterkaitan ekonomi antar sektor secara menyeluruh. Tetapi, umumnya kendala yang dihadapi untuk membuat tabel tersebut adalah tingginya biaya untuk membuatnya terutama dengan metode survei.

Makalah ini bertujuan untuk menerapkan metode hibrida dalam pembuatan tabel input-output regional dengan pendekatan struktur ekonomi fundamental di Indonesia. Imansyah (2000) menunjukkan bahwa pendekatan struktur ekonomi fundamental tersebut relatif rendah dari segi biaya dengan tingkat akurasi yang memadai. Konsep struktur ekonomi fundamental yang awalnya dikembangkan Jensen, West dan Hewings (1988) memberikan kemungkinan penggunaannya untuk membuat tabel input-output dimaksud Westhuizen (1997) menerapkan pendekatan ini untuk membuat tabel input-output regional dengan metode hibrida untuk Afrika Selatan.

Di dalam makalah ini, penulis menggunakan bentuk fungsi yang sedikit berbeda dan variabel independen yang berbeda pula dengan penelitian Westhuizen untuk membuat tabel input-output regional kabupaten, yaitu kabupaten Hulu Sungai Tengah (HST), Kalimantan Selatan. Secara holistik, tabel input-output HST dapat mencerminkan besaran dan struktur ekonomi yang tergambar dari tampilan utama tabel tersebut.

1. INTRODUCTION

The aim of this paper is to apply the Fundamental Economic Structure (FES) approach in the construction of small regional input-output table for the sub-provinces in South Kalimantan Province, Kabupaten Hulu Sungai Tengah, representing a rural economy. Jensen, West and Hewings (1988) provided a useful insight into the similarities of regional economies. The information contained in the (FES) can be used to construct another regional input-output table. However, this potential technique has not been fully explored. Van deer Westhuizen (1997) tried to implement this approach for constructing a hybrid regional table in South Africa. Imansyah, West and Jensen (2000) also tried to exercise the approach for constructing small regional input-output model for an urban economy, the city of Banjarmasin.

There seems to be general agreement in input-output analysis that the hybrid method is the most feasible method for constructing regional input-output tables (Lahr 1993; Van deer Westhuizen 1992; West 1990). The hybrid method appears to be the most cost-effective and well within the range of acceptable accuracy. This method mixes the advantages of the survey and the non-survey methods for constructing regional input-output tables and avoids the disadvantages. Accuracy is considered the main advantage of survey methods, while the speed and low cost are well-known characteristic of non-survey methods for constructing regional input-output tables. Lahr (1993) pointed out that only limited papers discuss hybrid methods (for example Boomsma & Oosterhaven 1992; Hansen & Tiebout 1963; Hewings 1977; Hewings & Romanos 1981; West *et al.* 1984; West 1981b, 1990) and only two reference books (Jensen *et al.* 1979; Schaffer *et al.* 1976).

Hybrid methods cover three approaches: top down, bottom up and horizontal. The top down approach is the most recognised and widely used due to the availability of national input-output tables. This approach takes advantage of the availability of national input-output tables as reference tables. On the other hand, the bottom up approach appears to be appropriate for small regions because resources are based on regional data. Therefore, the larger the region, the more data are required. The horizontal approach is usually assumed for updating regional tables. The horizontal approach uses other regional input-output

table as the basis for the first approximation. However, in the hybrid method context, there are some issues that arise, for example, how to choose reference tables and how to insert superior data. There are two important issues for the development of the horizontal approach. The study of economic structure offers one possibility to help analysts determine the choice of reference tables.

Another major issue is the insertion of superior data. As Lahr (1993, p. 288) pointed out: *probably the most open arena in the development of hybrid models is that for insertion superior data.* Many analysts (see Hewings & Romanos 1981; Jensen & West 1980; West 1982) provide a guide for inserting superior data. The algorithm for inserting superior data concentrates on the important components of the input-output tables. However, the study of the main components only may not enough to reduce superior data requirements. The identification of other characteristics of input-output cells including predictability and stability is also necessary when using less superior data requirements.

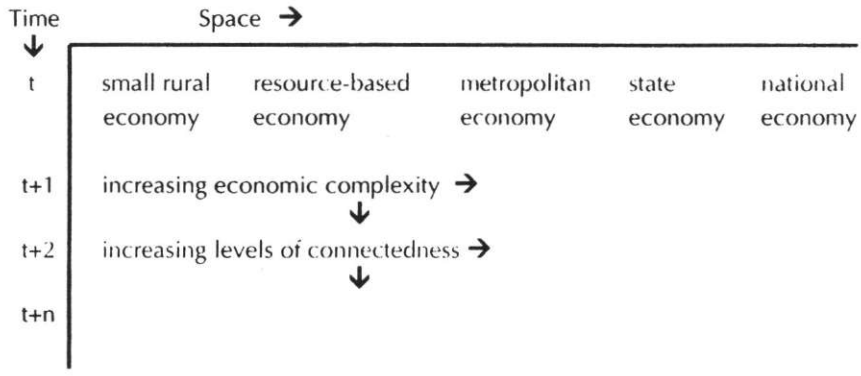
2. THE CONCEPT OF ECONOMIC STRUCTURE

West and Jensen (1987) noted that the term structure is difficult to define. However, the term economic structure in input-output or social accounting matrix systems is considered as the arrangement and strength of the flows among activities in regional and interregional economies (West & Jensen 1987; Hewings, Jensen & West 1987). Borrowing from the dictionary definition, the term structure is defined as *the way in which something is constructed or organized; a supporting framework or the essential parts of thing; a constructed thing; a complex whole* (Turner & Turner 1989). This definition implies that the term structure contains three elements, i.e. organization, essential and construction. Or in other words, it represents the essence of the whole thing and is constructed. Analogous to this definition, it can be applied to an economy. Economic structure has a fundamental pattern which is constructed systematically.

Hewings, Jensen and West (1987) raised the issue of how to distinguish regional economic structure are a range of rural to metropolitan economies. They also discuss how to describe the structure of an economy at a point in time and subsequently evaluate changes in that structure (see **Figure 1**). Raising these inquiries, they explored some measures for evaluation of economic structure. This paper reviews a

comprehensive analytical tool for measuring economic structure. This exploration leads to the identification of fundamental economic structure (Jensen, West & Hewings 1988). They used an innovative approach to examine regional economic structure in Australia. The objective of this approach was to observe the regularities and similarities of regional economic structure over space. This approach attempts to remedy the deficiencies of previous approaches.

Figure 1
Space-time of Regional Economic Structures



Source: Hewings, Jensen and West 1987.

Dewhurst and Jensen (1995) claimed that the study of economic structure using input-output has two paths. The first path is to identify the attributes of the input-output tables *perse* using tools such as pattern analysis and other measures of input-output comparison. The second path analyzes the decomposition of structural changes of economic structure over time. In contrast, West (1998) divided economic structure into three categories. West's description emphasized the measurement tools used in studying economic structure. The first group deals with measures of economic structure using some simple analytical tools, for example simple economic indicators covering value added, employment, gross output, exports and imports. The second group consists of more sophisticated analytical tools like multiplier analysis, pattern analysis, triangulation, and other holistic measures of connectedness. The third

group uses more innovative analytical tools such as the structural decomposition approach, field of influence, fundamental economic structure, and minimal flow analysis.

However, it seems that most approaches are less comprehensive and holistic in studying economic structure in input-output analysis. Even though Jensen and his associates (1988, 1991) provided a useful insight to study economic structure in a holistic way, these studies still need further development. In addition, most approaches examine economic structure using limited analytical tools. For example, inverse important parameter uses parts to represent the whole structure. This approach describes the table as a whole by identifying more significant elements of the table. Another study focuses on stability or structural change.

Meanwhile, Jensen and his associates emphasize the predictability component. Even though they indicate that the economic structure has some regularities and similarities, they had not verified whether this common pattern exists across countries. Therefore, empirical evidence from different economic environments and development stages is still needed to make a general conclusion for this phenomenon.

There appears to be general agreement that the economic structure of a region or a nation has some common patterns. Inquiry into identification of common patterns or similarities across regions has attracted analysts for many years. Many analysts show evidence that there is a similarity of economic structure for some countries (for example Chenery & Watanabe 1958; Leontief 1963; Simpson & Tsukui 1965). However, the similarities raise further questions, for example, are the similarities across regions or nations predictable, stable and also important?

If the similarities are predictable, it means that the common pattern of economic structure is expected to be similar with other regions when the economic size and development stages are also similar. The predictability of a common pattern of economic structure was found by Jensen, West and Hewings (1988). They found that some parts of economic structure in Australian regional economies are predictable and related to economic size.

Meanwhile, the stability of some components of economic structure refers to the inevitable presence of stability across regions of different economic size. The last issue is importance. This term refers to the parts of an economic structure which is considered significant to the whole system. These previous approaches in studying economic structure were used only partially.

This means that most approaches only concentrate on identifying only one characteristic rather than all characteristics simultaneously. For example, analysts only concentrate on the important elements of the input-output table. Hewings, Sonis and Jensen (1988a; 1988b) indicated that regional economic structure may have three characteristics (stability, predictability and importance) simultaneously. However, they argued that these characteristics are not mutually exclusive. These papers extended the notion of the fundamental economic structure (FES) developed by Jensen West and Hewings (1988). Later, Van der Westhuizen (1992) applied this concept for constructing regional input-output tables. He examined these characteristics using different approaches. This approach tries to study economic structure in a more comprehensive way. Therefore, the FES concept may not consider just one analytical tool. In other words, none of the analytical tools is more important than the others. Several analytical tools may complement each other. Therefore, many analytical tools can be used simultaneously to examine the existence of the FES and identify its characteristics. In addition, the observation of whole characteristics using several approaches will verify the consistency of the existence of the FES concept.

3. HORIZONTAL HYBRID APPROACH

The construction of the horizontal approach heavily relies on reference tables. Unlike the top down approach, the horizontal approach requires reference tables which sometimes are not available for this purpose. If the economic structure in the region in question is very different from available survey-based tables, serious errors may be introduced. The choice of reference tables become very crucial when using the horizontal hybrid approach.

Only Hewings (1977) and Antille (1990) have tried to develop another input-output table by borrowing other input-output coefficients.

Hewings examined this possibility by exchanging regional coefficients between the Washington 1963 and Kansas 1965 survey-based tables. He claimed the application of this method was satisfactory when the RAS method was used. Similarly, Antille (1990) used the German input-output table as a reference table for constructing an input-output table of Switzerland. Problems emerge when there is no available reference table or if the economic structure of the region in question is very different from the available table. For example, the available table may be for an urban and metropolitan economy, but the region in question is a rural and agricultural economy. Hence, the availability of suitable reference tables is the major issue for horizontal approach.

Hewings (1984) argued that there has been a little attempt to demonstrate how a regional economy might change over time as it grows and develops. Regional economies might exhibit similar structures for regions at the same stage of development. The study of economic structure identifies the common patterns of economic structure over time amongst regions.

Among hybrid approaches, the horizontal approach is neglected in the literature. Recent research focuses on the interpretation of tables and the identification of fundamental economic structure (see for example, Jensen, West, & Hewings 1988; Sonis & Hewings 1989).

These studies took advantage of the availability of many regional tables in countries such as Australia. The availability of these regional tables opened the possibility to the identification of fundamental economic structure (FES) which was pioneered by Jensen and his associates (1988, 1991).

Van der Westhuizen (1992) tried to use this information for constructing regional input-output tables. He also examined the FES' properties which are predictable, stable and important (Hewings, Sonis & Jensen 1989a; 1989b). The examination of these properties in a set of regional tables helps the analysts to identify the characteristics of each cell in the inputoutput tables.

The study of such characteristics is not a new phenomenon. However, most analysts concentrate on one characteristic such as importance. The issue of importance or inverse importance dominated the literature of input-output especially for identifying error and

sensitivity (for example, Bullard & Sebald, 1977; Hewings, 1977; Hewings & Romanos, 1981; Jensen & West, 1980; West, 1982). As Xu and Madden (1991) stated, not all elements will significantly affect the whole system. Therefore, those studies of important features are justified.

Other properties such as stability and predictability are neglected. Even though many analysts studied the stability of the coefficients or multipliers of a region or nation in relation to the time dimension (for example Beyers 1972; Conway 1975, 1977; Carter 1970; Feldman, McClain & Palmer, 1987), some analysts paid less attention to stability on spatial dimension.

Many analysts focused on the study of economic structure, seeking the similarities and common patterns of economic structure over space and over time (for example Chenery & Watanabe, 1958; Chenery & Taylor, 1968; Kuznet, 1957; Jensen, West & Hewings, 1988; Jensen, West, Hewings & Sonis, 1988; Syrquin, 1988).

However, there is little attempt to study economic structure in a comprehensive way. Most approaches use a single analytical tool rather than several analytical tools simultaneously to measure economic structure. Sonis, Hewings and Jensen, (1991) suggested using several methods to define economic structure, but empirical work still needs to be done. The approach that uses a set of analytical tools to measure predictability, stability and importance will allow analysts to more comprehensively understand economic structure.

Jensen and his associates, (1988, 1991) indicated that economic structure exhibits a common pattern. This common pattern contains predictable, important and stable components. Jensen *et al.* (1988, 1991) only discusses the predictable component of regional economic structure. Van der Westhuizen, (1992) continues their approach by uncovering whether the predictable components are also important and stable. However, his study is limited by the number of functional forms and analytical tools that he used. Other analytical tools such as field of influence are required to examine the consistency of such common patterns. This approach is used in the current study.

4. GENERAL DESCRIPTION OF KABUPATEN HULU SUNGAI TENGAH

Kabupaten Hulu Sungai Tengah is one of nine regencies and one municipality in South Kalimantan. In 1995, the population of South Kalimantan was 2900400. Its economy of this region varies, with slight reliance on primary sectors such as agriculture and mining. These two sectors contribute approximately 31 per cent: 24.2 per cent for agriculture and 6.8 per cent for mining. However, the manufacturing sectors have become more important in recent years contributing 20 per cent of gross regional domestic product. The manufacturing sectors are dominated by timber manufacturing such as plywood and crumb rubber manufacturing. However, the timber manufacturing relies heavily on imported raw material because South

Kalimantan's forest was depleted in the 1980s. The depletion was the result of extensive cutting for supplying the timber industry without concomitant replanting. Hopefully, the next decade will see an increase in the availability of the raw material due to reforestation in the early 1990s. Other important manufacturing in this area is rubber manufacturing such as smoked sheet rubber and remilled rubber.

In 1995, the population of Hulu Sungai Tengah was 229273. The population density was 156 people per square kilometres. The age structure of the population was dominated by the young. On the one hand, this is beneficial because most of the population is in the productive age range. On the other hand, it is disadvantage for the community unless the local government can create employment for young people.

Table 1
Composition of Population by Age Group (Percent)
Hulu Sungai Tengah, 1996

Age Group	Male	Female	Total
0-9	21.97	20.73	21.37
10-19	22.47	21.97	21.13
20-49	41.11	44.13	42.75
50+	14.45	14.97	14.75
Total	**100**	**100**	**100**

Source: Statistics Office, Social and Economic Survey 1996.

5. AN OVERVIEW OF THE FES APPROACH

The construction of Hulu Sungai Tengah input-output tables uses the FES approach. Its application as outlined in Imansyah (2000) suggests that the FES approach is relatively cost-effective with acceptable accuracy in a holistic sense. The FES approach is used for the first approximation of the tables. However, the analyst can intervene at any step to improve the accuracy of the tables if any reliable data are available. Imansyah (2000) outlined an efficient method for constructing regional input-output table in Indonesia using the FES approach.

5.1. Sources of Data

The secondary data for constructing an input-output model for Hulu Sungai Tengah are available at the sub-province level in most sectors. Central Bureau of Statistics (CBS), with its representative office at every government level, conducts surveys of the industrial cost structure of large and medium enterprises at the province level every year. The detailed location of the aggregate industry can be obtained from the CBS. Therefore, these data can be used to construct cost structures at the sub-province level. In addition, almost every government office of primary sectors in every sub-province such as agriculture, fishery and livestock, collect cost structure data on a yearly basis. Hence, these data can be used for the primary sectors. Consumption patterns of households can be obtained from the Statistics Office in every sub-province that conducts surveys of people welfare indicators. Local government expenditure can be obtained from government budget and revenue.

5.2. The Construction of Input-Output Table

The procedures to construct Hulu Sungai Tengah Input-Output Table employs the sequence outlined in the **Appendix 1**.

The sequence of the Hulu Sungai Tengah Input-Output Tables construction is as follows[1]:

Step 1 calculates the transaction cells using the result of a regression estimation. The results of the estimation are sent to step 7.

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1 This sequence begins at step 7 of general procedures in Appendix 1 as step 1 because the procedure uses the available prototype table.

Step 2 checks the stability of the unpredictable cells. The unpredictable cells that are below the threshold in step 2 identify the stability of these cells. The measure to identify the stable cells is the coefficients of variation (CV). To make step 2 consistent with step 1, the coefficients' format is converted into a transaction format by multiplying the coefficients with the total sectoral gross output of respective columns for the Hulu Sungai Tengah. The results of the estimation are used in step 7.

Step 3 identifies the most important cells that cannot be estimated by predictable and stable properties. This step is crucial for the final accuracy of the table. Identification in this step leads to improving the accuracy because the identified important cells use superior data. At this step, superior data will be inserted as most superior data are available. Most important sectors are primary and some secondary sectors. The unimportant cells can use a less accurate estimation by means other than superior data because the cells are relatively unimportant to the whole system. Therefore, these unstable and unpredictable cells will be checked to determine whether these cells are important.

Sensitivity analysis is used by measuring from the top 25 per cent of cells which are to be considered as the most important cells. The identified important cells go to step 6 for the collection of superior data. The estimation of identified unimportant cells uses average coefficients of regional input-output tables. The coefficients are then converted into transactions format by multiplying the coefficients with the total sectoral gross output from the respective column of the Hulu Sungai Tengah.

Step 6 collects superior data for intermediate cells. The superior data is needed to fill the identified important cells that cannot be estimated using the FES approach. At this step, most secondary data from Statistical Office are available. These data go to step 7 to be supplemented with others data for constructing intermediate transaction cells.

Step 7 combines the results of steps 2, 3, 5, and 6 to construct prototype intermediate transaction cells.

Step 8 collects superior data for final demands and primary inputs. This final demand, especially household consumption, must be estimated as accurately as possible. Household consumption pattern can be estimated using social economic surveys on a yearly basis. Government

consumption patterns is estimated using government budgets of the Hulu Sungai Tengah Regency.

Capital formation is one of the most difficult to estimate. The Office of the Department of Trade and Industry can provide some data that can be used for estimating capital formation The representative office of the Bank of Indonesia (the Central Bank) also publishes data that can be used to estimate the capital formation by sector. All these data from different sources can be used to ensure consistency. The change of stocks can be treated as a residual.

Exports and imports of food commodities are estimated by using balance sheets of food commodities published by local governments on an annual basis. If it is not available, the gap and surplus between local production and local consumption is considered imports and exports. For other sectors, some data from the Office of the Department of Trade and Industry are also available for estimating exports. Some publication data from the representative office of the Bank of Indonesia (the Central Bank) contains export data by sectors.

For the primary input quadrant, most sectors have labour expenditure data, therefore, estimating primary inputs is relatively easier. Other value added is treated as residual.

Step 9 combines the results of steps 7 and 8. This step derives the initial prototype transaction table.

Step 10 reconciles the prototype transaction table. In this step, reconciliation and checks are necessary for consistency because the table developed in the previous step is very coarse. The process involves balancing the column and row sums and using a modified RAS to reconcile other minor differences. This step produces a final prototype transaction table.

Step 11 performs a sensitivity analysis to identify the most sensitive cells in the prototype table. This step carries out a sensitivity analysis to identify the most significant cells affecting the multipliers in the table. This step involves the scrutiny of the structure and features of the regional economy for Hulu Sungai Tengah. If the result differs substantially from the analysts' expectations, in other words, if there is a suspicion of a significant error in some important cells, the following step must be carried out.

In step 12, the insertion of additional superior data is carried out to ensure accuracy if the previous step indicates a significant error. In this step, final checking, balancing and adjustment are carried out to complete the final table.

Step 13 calculates the inverse matrices and multipliers. The output income and employment multipliers are calculated for the final transaction table.

The input-output tables of the Hulu Sungai Tengah are presented in the **Appendix 3**, and sectoral classification is in **Appendix 2**.

5.3. Model Validation

Generally, the validation process is to evaluate the model. In a holistic sense, the economic structure and size of the Hulu Sungai Tengah input-output table reflects the real situation of regional economy. In addition, Hulu Sungai Tengah input-output table represents the size and structure of Hulu Sungai Tengah economy. Jensen (1980) stated that there are two types of accuraccy, type A and type B accuracy. Type A accuracy emphasizes the table accuracy. This type A accuracy reflects the approximation of derived input-output table to the unknown "true" table. On the other hand, type B accuracy is model accuracy, which represents the operational model of derived input-output to the economy in question. With regard to model validation, type A cannot be obtained because the "true" table is not available for comparison. Therefore, type B accuracy is the most feasible to obtain.

Jensen (1980) argued that the most effective test of table accuracy is the extent to which a table represents the main features of the economy in question. This implies that analyst should focuse on the more significant interactions or the larger coefficients rather than the analytical insignificant cells of the table.

In a holistic sense, Hulu Sungai Tengah input output tables reflect the size and structure of these economies which capture the main features its regional economies.

6. THE SIZE AND STRUCTURE OF THE HULU SUNGAI TENGAH INPUT-OUTPUT TABLE

6.1. The Structure of Total Gross Output and Final Demand

The structure of total gross output is dominated by other value added. Other value added contributed 46.28 per cent of Hulu Sungai Tengah's total gross output. Intermediate inputs accounted for 26.73 per cent of the total gross output while imports contributed only 6.94 per cent of the total gross output. The high local input purchases and the low imports for this region indicate that the manufacturing sectors have not been fully developed because the manufacturing sectors consist of a few sectors that process local resources, such as rubber manufacturing. In other words, the other manufacturing sectors comprise manufacturing sector that uses simple technology and produce resource-based, less diversified manufacturing. Most of these manufacturing sectors use local inputs.

6.2. The Sectoral Distribution

In Hulu Sungai Tengah, services, trade, other manufacturing, and paddy sectors dominated the sectoral distribution of total gross output. These four sectors contributed 50 per cent of total gross output. The services sector alone contributed 15.6 per cent. Rubber manufacturing was the major manufacturing sector in Hulu Sungai Tengah. Other sectors contributed less than 10 per cent. A detailed description of the sectoral distribution of total gross output, value added, exports and imports is shown in **Figure 2**.

Figure 2
The Structure of Gross Output, Hulu Sungai Tengah 1995
(Rp '000000)

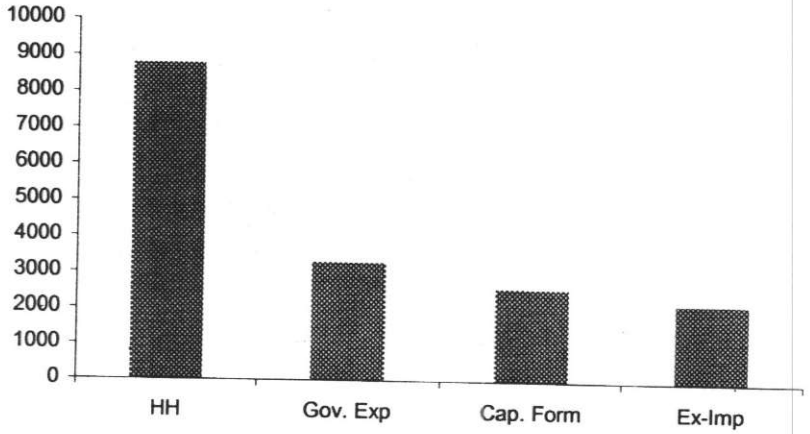
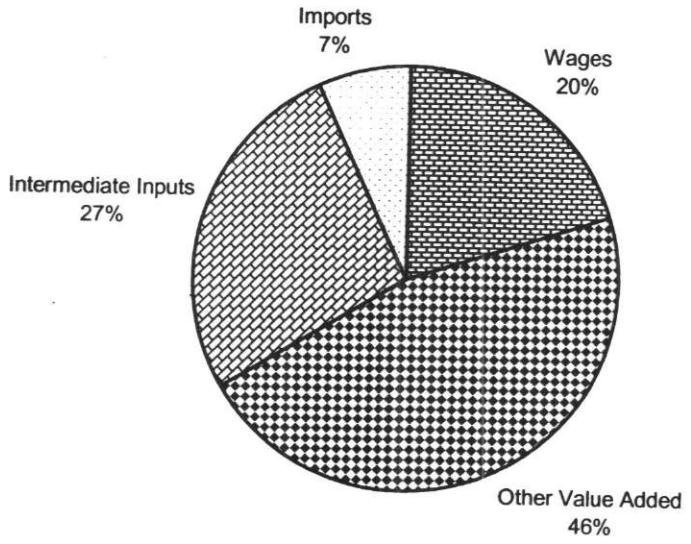


Figure 3
The Composition of Final Demand, Hulu Sungai Tengah 1995



The value added was distributed evenly, however, four sectors had more than 10 percent of their share in value added. These four sectors, namely services, trade, paddy and other manufacturing, contributed 57.2 percent.

Exports were dominated by paddy, other manufacturing, and livestock. Other manufacturing was dominated by rubber manufacturing which is exported to other countries. Paddy and livestock are exported to other regencies.

Other manufacturing was the sector with the highest import of inputs in Hulu Sungai Tengah. Livestock was the second largest sector to imported inputs. Hulu Sungai Tengah does not have a livestock feed mill, therefore, most livestock feed is imported from outside the province. Financial institution and rent is the third sector with the highest imported inputs.

The services, paddy, and other agriculture sectors hold the highest share of sectoral distribution in wages and salaries. The employment distribution by sector also revealed that the services, paddy and other agriculture sectors provide the highest employment. A detailed description of employment can be found in the **Appendix 4.**

6.3. The Sectoral Purchasing Distribution

Table 2 presents the relative importance of local interindustry linkages. This table shows that the sectors with the highest local purchases are food manufacturing and other manufacturing. Food manufacturing purchased 64.21 per cent of its inputs from the local economy, which tends to boost the local economy. Other manufacturing buys approximately 56.11 per cent of its inputs from local industries. Other manufacturing is dominated by rubber manufacturing. Balassa (1979) and Leamer (1984) (cited by Syrquin & Chenery, 1992) suggest that the pattern of development tends to go through "stages of comparative advantage". This pattern moves from resource-intensive commodities to labour-intensive and then to more capital and skilled intensive goods. Rubber manufacturing can be considered as resource-intensive commodities. Rubber is one of the major agricultural products in Hulu Sungai Tengah. The results suggest that Hulu Sungai Tengah was on the

first step of the development pattern in 1995 according to Balassa and Leamer.

However, food manufacturing, services, and other manufacturing sector are still the highest for local purchases including payments to households. This means that these sectors are very important to the local economy with respect to local inputs and labour. On the other hand, sector 21 (the service sector) was ranked first for payments to the households (**see Table 2** column 7). The other agriculture sector was ranked second in Hulu Sungai Tengah.

This means that these sectors were the major source of income for local people. These results were similar to the phenomena in Banjarmasin (Imansyah, West and Jensen, 2000) confirmed that these two regions, Banjarmasin and Hulu Sungai Tengah had yet to begin their industrialisation. However, Banjarmasin's economy was slightly more advance than the Hulu Sungai Tengah economy. The expenditure of payment to the households sector ranged from 9.12 per cent to 48.36 per cent.

Table 2 shows utilities as the sector with the highest imports. This sector received most of its inputs such as oil from outside the sub-province. The second highest sector using imported inputs was the livestock sector followed by the construction sector. The livestock sector depends on imported inputs, especially for livestock feed.

6.4. Linkage Analysis, Multipliers Analysis, and Elasticity Analysis

6.4.1. Linkage Analysis

Rasmussen (1956) and Hirschman (1958) proposed that linkage analysis can be used to determine development strategies. They used backward and forward linkages to determine sectoral priorities. However, many researches criticise this approach because it has some drawbacks. However, this analysis used with other forms of analysis has some benefit.

The sectors with the highest output backward linkages in Hulu Sungai Tengah are sector 10 (food manufacturing) and 13 (other manufacturing). Rubber is one of major agriculture products in Hulu Sungai Tengah. This abundance of rubber drives rubber manufacturing

to dominate the other manufacturing sector making its backward linkage very high.

The sector with the highest income backward linkages are food manufacturing followed by other manufacturing. This indicates that these sectors generate income for their supplier of inputs. Other sectors, such as transportation and communication, and services also show high income backward linkages (see **Table 3**).

The sector with the highest employment backward linkage is other manufacturing with food manufacturing taking second place. Other sectors in the top five are mineral manufacturing, forestry, and transportation.

Table 2
Expenditure Composition of Hulu Sungai Tengah Input-Output Table, 1995

Rank	Sector Number	Local Purchase	Sector Number	Local Purchase*	Sector Number	Payment to Household	Sector Number	Imports
1	10	64.21%	10	72.31%	21	47.82%	15	50.72%
2	13	56.11%	21	68.82%	3	36.67%	4	32.29%
3	18	47.04%	13	63.85%	1	31.89%	13	17.22%
4	19	41.86%	11	58.96%	11	29.09%	10	12.15%
5	16	37.24%	18	56.40%	8	25.68%	16	8.96%
6	15	36.47%	19	51.18%	16	12.63%	19	7.22%
7	4	31.65%	16	49.87%	6	11.73%	5	5.61%
8	11	29.87%	3	45.53%	5	11.71%	1	4.84%
9	21	21.00%	15	41.56%	17	11.04%	6	3.87%
10	20	20.21%	1	38.29%	20	9.88%	3	3.84%
11	17	17.66%	4	34.95%	2	9.42%	18	3.79%
12	5	9.12%	8	32.17%	18	9.35%	2	2.53%
13	6	9.05%	20	30.09%	19	9.32%	20	1.96%
14	3	8.86%	17	28.70%	10	8.10%	17	1.81%

Note: * including payment to the household.

The overall pattern of sector ranking for output, income, and employment backward linkages is similar. The only difference is the first and the second rank position.

The sectors with the highest output forward linkages in Hulu Sungai Tengah are mineral manufacturing and transportation and communication. The other agriculture, financial institutions and rent, and restaurants and hotels sectors are also among the top five. The highest

income forward linkage is mineral manufacturing followed by transportation and communication. The sector with the highest employment forward linkage is sector 5 (forestry). This suggests that forestry provides employment for its downstream sectors. Other sectors among the top five are mineral manufacturing, other food crops, restaurants and hotels and financial institutions and rent.

Figure 4

Sectoral Distribution of Gross Output

Hulu Sungai Tengah Input Output Table 1995 (Rp'000000)

SECTOR	AMOUNT	%	GROSS OUTPUT (Rp in million)
1	38930.0	10.8	
2	3340.5	0.9	
3	27603.0	7.7	
4	16545.0	4.6	
5	1345.0	0.4	
6	22648.0	6.3	
7	0.0	0.0	
8	1707.0	0.5	
9	0.0	0.0	
10	10105.0	2.8	
11	681.0	0.2	
12	0.0	0.0	
13	41928.0	11.7	
14	0.0	0.0	
15	2742.0	0.8	
16	18096.0	5.0	
17	47311.0	13.2	
18	17489.0	4.9	
19	29573.0	8.2	
20	22914.0	6.4	
21	55928.0	15.6	
TOTAL	358885.5	100.0	
AVERAGE	17089.8		
MAXIMUM	55928.0		
MINIMUM	0.0		
STD DEV	17626.7		

Figure 5

Sectoral Distribution of Exports

Hulu Sungai Tengah Input Output Table 1995 (Rp'000000)

SECTOR	AMOUNT	%	EXPORTS (Rp in million)
1	16186.6	34.2	
2	0.0	0.0	
3	7588.1	16.1	
4	6665.2	14.1	
5	825.0	1.7	
6	4400.3	9.3	
7	0.0	0.0	
8	0.0	0.0	
9	0.0	0.0	
10	10.8	0.0	
11	0.0	0.0	
12	0.0	0.0	
13	11599.2	24.5	
14	0.0	0.0	
15	0.0	0.0	
16	0.0	0.0	
17	0.0	0.0	
18	0.0	0.0	
19	0.0	0.0	
20	0.0	0.0	
21	0.0	0.0	
TOTAL	47275.3	100.0	
AVERAGE	2251.2		
MAXIMUM	16186.6		
MINIMUM	0.0		
STD DEV	4539.7		

Figure 6

Sectoral Distribution of Imports

Hulu Sungai Tengah Input Output Table 1995 (Rp'000000)

SECTOR	AMOUNT	%	IMPORTS (Rp in million)
1	1885.8	7.6	
2	84.4	0.3	
3	1060.1	4.3	
4	5343.2	21.4	
5	75.5	0.3	
6	876.8	3.5	
7	0.0	0.0	
8	24.6	0.1	
9	0.0	0.0	
10	1227.6	4.9	
11	1.6	0.0	
12	0.0	0.0	
13	7218.3	29.0	
14	0.0	0.0	
15	1390.9	5.6	
16	1620.6	6.5	
17	857.9	3.4	
18	662.3	2.7	
19	2135.4	8.6	
20	449.9	1.8	
21	0.0	0.0	
TOTAL	24915.0	100.0	
AVERAGE	1186.4		
MAXIMUM	7218.3		
MINIMUM	0.0		
STD DEV	1851.5		

Figure 7

Sectoral Distribution of Value Added

Hulu Sungai Tengah Input Output Table 1995 (Rp'000000)

SECTOR	AMOUNT	%	VALUE ADDED (Rp in million)
1	34553.5	14.5	
2	3072.3	1.3	
3	24096.7	10.1	
4	5965.0	2.5	
5	1146.9	0.5	
6	19722.5	8.3	
7	0.0	0.0	
8	1571.7	0.7	
9	0.0	0.0	
10	2388.5	1.0	
11	475.9	0.2	
12	0.0	0.0	
13	11184.5	4.7	
14	0.0	0.0	
15	351.1	0.1	
16	9730.3	4.1	
17	38035.9	16.0	
18	8599.1	3.6	
19	15056.5	6.3	
20	17842.8	7.5	
21	44162.9	18.6	
TOTAL	238034.2	100.0	
AVERAGE	11335.0		
MAXIMUM	44162.9		
MINIMUM	0.0		
STD DEV	13715.0		

Table 3

The Top 10 Sectors with the Highest Backward Linkage

Hulu Sungai Tengah Input-Output Table, 1995

Rank	Output BL Sector No.	Income BL Sector No.	Employment BL Sector No.
1	10	10	13
2	13	13	10
3	18	19	11
4	19	21	5
5	16	18	19
6	15	16	18
7	4	15	3
8	11	11	15
9	21	20	16
10	20	17	4

Note: BL=Backward Linkage

Table 4
The Top 10 Sectors with the Highest Forward Linkage
Hulu Sungai Tengah Input-Output Table, 1995

Rank	Output FL Sector No.	Income FL Sector No.	Employment FL Sector No.
1	11	11	5
2	19	19	11
3	3	1	2
4	20	15	18
5	18	3	20
6	15	17	19
7	17	20	17
8	8	18	15
9	4	2	4
10	5	5	3

Note: FL=Forward Linkage

6.4.2. Multiplier Analysis

In this study, the interpretation of multipliers uses a revised definition (West and Jensen 1980). West and Jensen's paper suggested the revision because of inconsistencies in the interpretation of conventional multipliers. Their paper provided a redefinition of *input-output* multipliers that is consistent from output to income and employment multipliers. However, they preserved the essence of conventional multipliers. They avoided the terms, ***direct*** and ***indirect***, because these terms confused meaning.

The revised terms follow[2]:

1. The initial effects refer to the Dollar increase of a dollar in sales. This is the stimulus.
2. The first round effect refers to the effect of first round of purchase by the sector supplying the additional Dollar output.

2 For detail see West and Jensen (1980).

3. Industrial support effect refers to second and subsequent effects as successive rounds of output are needed to increase the economy due to following the first round impacts.
4. Consumption induced effect is defined in the conventional way.

6.4.2.1. Output Multipliers

Two types of output multipliers are calculated. The type I output multiplier or simple output multiplier is calculated from the open model and excludes consumption induced effects. The type II output multiplier includes consumption induced effects and is calculated from the closed model with respect to the household sector.

The highest type I output multiplier is sector 10 (food manufacturing) followed by sector 13 (other manufacturing). This type I output multiplier of food manufacturing indicates that the contribution of the initial, the first round effect, and the industrial support effect from all sectors for each one rupiah increase in sales of other manufacturing output to final demand. For example, an increase of one rupiah in sales to final demand of food manufacturing requires an increase of Rp 2.27 from all sectors in the local economy including consumption induced effects. The results show that food manufacturing provides three-quarter of the initial effect for the first round effect and industrial support effect . This means that this sector has high interaction with other sectors in the local economy.

The highest type II output multipliers, which takes into account the household sector, is the food manufacturing sector followed by other manufacturing sector. In addition, the consumption induced effects of food manufacturing is higher than that for other manufacturing.

Table 5

Output, Income and Employment Multipliers
Hulu Sungai Tengah Input-Output Table 1995

Rank	Output Multipliers				Income Multipliers				Employment Multipliers			
	TYPE I		TYPE II		TYPE I		TYPE II		TYPE I		TYPE II	
	Sector	No.	Sector	No.	Sector	No.	Sector	No.	Sector	No.	Sector	No.
1	10	1.7858	10	2.2699	10	3.3233	10	4.2985	13	8.6886	20	13.4065
2	13	1.7255	21	2.2646	13	3.0851	13	3.9905	20	4.8521	13	11.4079
3	18	1.6897	13	2.1550	4	2.5593	4	3.3104	10	3.7789	10	4.9881
4	19	1.5932	19	2.0159	19	2.5205	19	3.2602	19	2.6675	19	4.5992
5	16	1.5502	18	2.0126	15	2.3286	15	3.0119	16	1.9572	16	3.0904
6	15	1.5044	11	1.9864	18	1.9195	18	2.4829	4	1.7405	21	2.6237
7	4	1.4928	16	1.9127	16	1.5955	16	2.0637	18	1.6047	18	2.2189
8	11	1.3805	3	1.8164	20	1.4305	20	1.8503	11	1.4163	4	2.0983
9	20	1.2833	15	1.7178	17	1.3509	17	1.7473	17	1.2967	17	1.8885
10	21	1.2805	1	1.6863	5	1.1590	5	1.4991	15	1.2067	11	1.6752

Figure 8

Relative Importance of Initial, First, Industrial, and Consumption Effects from a Rp 1 Increase of Sectoral Sales to Final Demand
Hulu Sungai Tengah Input-Output Table 1995

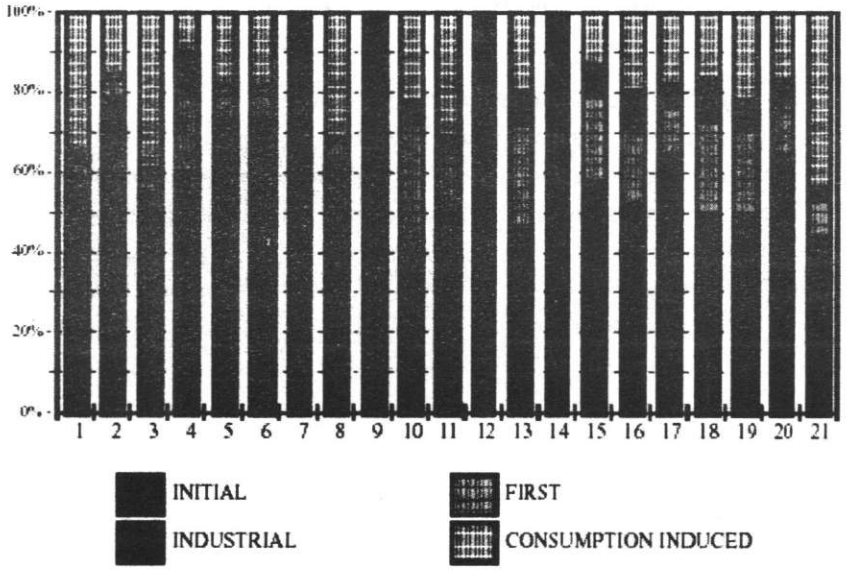


Figure 8 provides important information about the relative importance of initial, first round, industrial support, and consumption induced effects. The food manufacturing and other manufacturing sectors show a relatively high first round effect. This indicates that these sectors have a large effect on sectors from which food manufacturing and other manufacturing purchase their direct inputs. The sectors with the highest industrial effect are livestock and construction. This means that these sectors have a high interaction rate with other sectors. However, the services, other agriculture, and paddy sectors show a relatively high consumer induced effect. This indicates that these sectors have a high interaction with the household sector. Seven sectors show a consumption induced effect of more than 20 per cent. This means that these sectors have a high interaction with the household sector.

6.4.2.2. Income Multipliers

The sector with the highest type I and type II income multipliers is sector 10 (food manufacturing). The other sectors among the top five are sector 13 (other manufacturing), sector 4 (livestock), sector 19 (transportation and communication), and sector 15 (utilities).

The food manufacturing sector ranks consistently in the first place for output multipliers. This indicates that this sector generates income and output. It means that food manufacturing is important for the Hulu Sungai Tengah economy.

6.4.2.3. Employment Multipliers

The sector with the highest type I employment multiplier is sector 13 (other manufacturing) followed by sector 20 (financial institutions and rent). This indicates that Hulu Sungai Tengah's manufacturing sector has a higher labour productivity compared with the other sectors. The other manufacturing sector consists of crumb rubber and smoked sheet rubber. The sector's relatively low employment distribution compared with its relatively high distribution in wages and salaries suggests that this sector provides relatively high income jobs. For example, if other manufacturing sector increases one million Rupiah in sales to final demand, this sector will provide another 8.6 jobs.

The sector with the second highest type II employment multiplier is sector 13 (other manufacturing) while type I employment multiplier is sector 20 (financial institutions and rent). The food manufacturing sector consistently ranks first for type I output and income multipliers but it falls to third position for type I and II employment multipliers.

6.4.3. ELASTICITY ANALYSIS

The input-output elasticity approach proposed by Mattas and Shrestha (1991) provided a new insight for the determination of sectoral priorities. They claimed that their approach was better than linkages analysis and multipliers analysis because it took into account the sectors' share of the output. Their approach allows policy makers to concentrate not only on the highest linkages and multipliers but also on the sectors' share of an economy. A summary of the formulas of the elasticity follows[3]:

$$OE_{xyj} = \sum_i b_{ij}(y_j / x) \quad \ldots\ldots (1)$$

OE_{xyj} = the percentage change in total output due to a percentage change in the final demand of sector j

$x = \Sigma x_i$

b_{ij} = the element of Leontief matrix

y_j = final demand of sector j

$$EE_{xyj} = [\sum_i (l_i / x_j) b_{ij} / (l_j / x_j)](y_j / x) \quad \ldots\ldots (2)$$

EE_{xyj} = the percentage change in employment due to a percentage change in the final demand of sector j

l_i = employment (number of person)

l_i/x_j = employment coefficients

3 For detail see Mattas and Shrestha (1991).

$$IE_{xyj} = [\sum_i (h_i / x_j) b_{ij} / (h_j / x_j)](y_j / x) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

IE_{xyj} = the percentage change in income due to a percentage change in the final demand of sector j

h_i = wages and salaries

h_i/x_j = income coefficients

Sector with the highest ranking for output, income and employment elasticities is sector 13 (other manufacturing). Three sectors consistently perform well for all elasticities: services; transportation and communication; and trade. They differ only in their rank position. Using elasticities allows analysts to determine relatively consistent sectoral priorities for some sectors to increase output, income and employment simultaneously.

Table 6

The Top Ten of Output, Income, and Employment Elasticity
Hulu Sungai Tengah Input-Output Table 1995

Rank	Output Sector No	Income Sector No.	Employment Sector No.
1	13	13	13
2	21	19	20
3	17	21	19
4	19	17	21
5	1	4	17
6	3	1	1
7	18	10	10
8	20	18	16
9	16	20	3
10	6	3	4

6.5.1. Concluding Remark and Policy Implication

The FES approach was used for the first approximation required to construct input-output tables for Hulu Sungai Tengah. The suitable data needed to construct input-output models for Hulu Sungai Tengah was available at the sub-province level.

Food manufacturing and other manufacturing are the sectors that show a relatively high first round effect. This indicates that this sector has a high effect on its own sector. The sectors show that the highest industrial effects are livestock and construction. However, the services, other agriculture, and paddy sectors show a relatively high consumer induced effect. Rubber is one of major agriculture products in Hulu Sungai Tengah. Its effect on other manufacturing is significant. The sectors with the highest income backward linkage is food manufacturing followed by other manufacturing. The highest employment backward linkage is other manufacturing with food manufacturing ranking second.

Other value added dominated the structure of total gross output. Other value added contributed 46.28 per cent of total gross output. Intermediate inputs accounted for 26.73 percent of total gross output. Imports contributed only 6.94 per cent. The sectoral distribution of the total gross output was dominated by services, trade, and other manufacturing. The dominant activity in the other manufacturing sector was rubber manufacturing. Paddy, other manufacturing and livestock dominated exports. The sectors with the highest local purchases were food manufacturing and other manufacturing. Other manufacturing purchased 64.21 percent of its inputs from the local economy.

Generally, the validation process is to evaluate the model. In a holistic sense, the economic structure and size of the Hulu Sungai Tengah input-output table represents the size and structure of its economy which captures the main features its regional economies. Hulu Sungai Tengah is more dependant on a few sectors and is more closure and more self-reliance. This indicates that the economy of Hulu Sungai Tengah is in the early stage of development.

Elasticity analysis shows sector 13 (other manufacturing), sector 19 (transportation and communication) and sector 16 (construction) as the top priorities in Banjarmasin. Therefore, if local government wants to boost local economy, policy makers should target these three sectors

because they simultaneously generate a high impact on output, income and employment simultaneously.

On the other hand, sector 21 (services), sector 19 (transportation and communication), and sector 17 (trade) are the key sectors to generate a high impact on output, income and employment simultaneously in Hulu Sungai Tengah. Therefore, policy makers can focus on these sectors to boost local economy.

The policy implications of these results suggest that some sectors generate output, income, and employment simultaneously in the same sector due to an increase in sales to final demand. In conclusion, the sectoral priorities for Hulu Sungai Tengah are a continuum of more secondary and tertiary sectors, even though Hulu Sungai Tengah still relies heavily on primary sectors.

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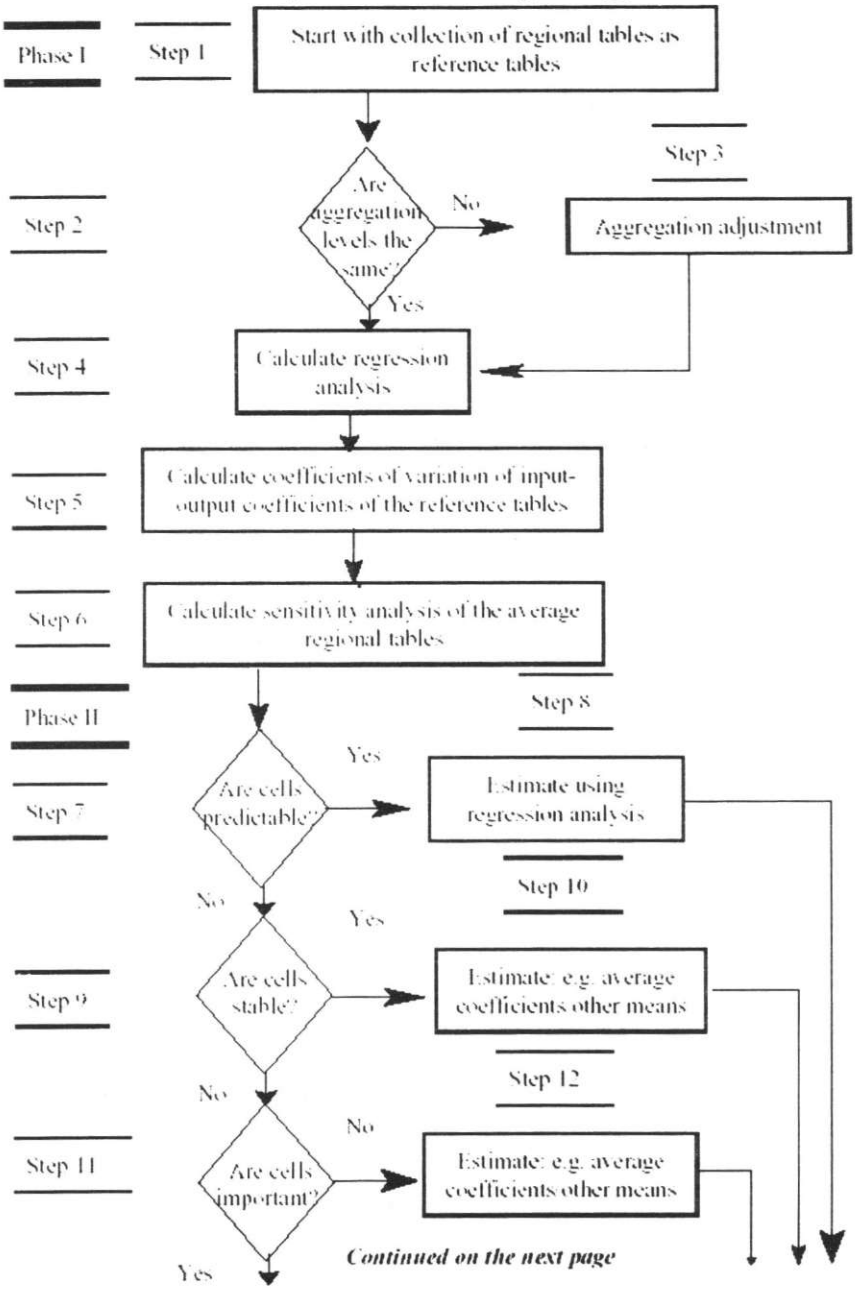
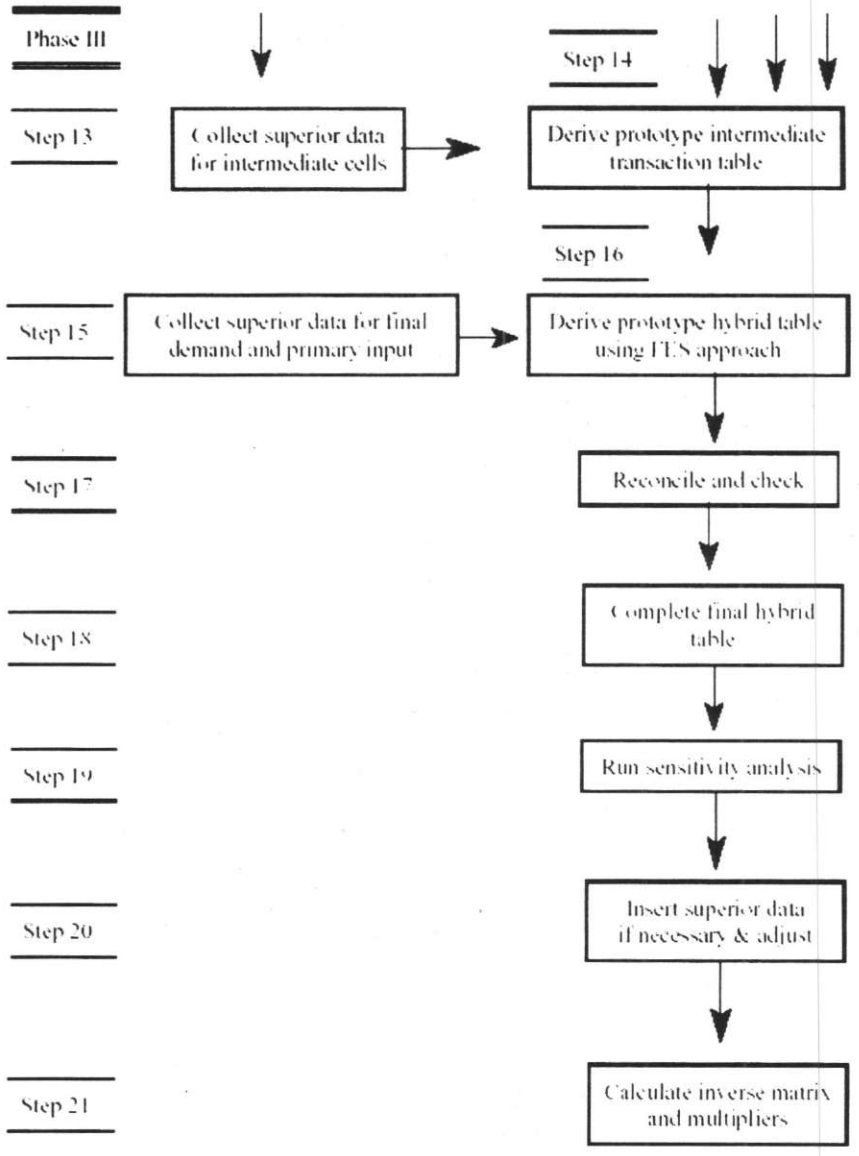
APPENDICES

Appendix 1

Scheme of Hybrid Procedure using FES Approach




Phase III
Step 13
Collect superior data for intermediate cells
Step 14
Derive prototype intermediate transaction table
Step 16
Step 15
Collect superior data for final demand and primary input
Derive prototype hybrid table using I-E/S approach
Step 17
Reconcile and check
Step 18
Complete final hybrid table
Step 19
Run sensitivity analysis
Step 20
Insert superior data if necessary & adjust
Step 21
Calculate inverse matrix and multipliers

Appendix 2
Sectors Classification

1.	Paddy
2.	Other Food Crops
3.	Other Agriculture
4.	Livestock
5.	Forestry
6.	Fishery
7.	Other Mining
8.	Mineral Mining
9.	Oil Mining
10.	Food Manufacturing
11.	Mineral Manufacturing
12.	Handicraft
13.	Other Manufacturing
14.	Oil and Gas Refinery
15.	Utilities
16.	Construction
17.	Trade
18.	Restaurant and Hotel
19.	Transp. & Communication
20.	Financial Inst. and Rent
21.	Services
HH1.	Household Consumption Expenditure
F2.	Government Consumption Expenditure
F3.	Capital Formation
F4.	Change in stock
F5.	Export
P1.	Wages and Salaries
P2.	Other Value Added
P3.	Import

Appendix 3

Hulu Sungai Tengah Input-Output Table 1995, Producer Price (Rp million)

SECTOR	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	669	0	0	46	0	0	0	0	0	3859	0	0	0	0
2	0	36	258	6	1	2	0	0	0	100	77	0	0	0
3	0	0	555	23	5	0	0	0	0	332	18	0	10855	0
4	0	13	5	2712	0	0	0	0	0	134	48	0	1	0
5	0	1	20	0	45	6	0	0	0	0	0	0	285	0
6	0	0	2	5	1	653	0	2	0	37	0	0	1	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	2	0	0	4	0	30	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	101	0	76	0	0	0	474	0	0	0	0
11	0	0	0	0	9	3	0	0	0	0	4	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	591	27	371	1821	1	47	0	0	0	4	2	0	2213	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	1	8	3	1	34	0	4	0	12	1	0	97	0
16	36	2	5	8	2	53	0	3	0	19	1	0	268	0
17	671	41	573	279	7	431	0	33	0	686	25	0	5554	0
18	0	15	194	3	37	168	0	17	0	40	11	0	173	0
19	115	7	140	84	2	198	0	12	0	573	8	0	3346	0
20	373	15	155	22	4	167	0	17	0	96	3	0	282	0
21	36	26	113	124	8	211	0	21	0	121	2	0	420	0
TOTAL	2491	184	2446	5237	123	2049	0	111	0	6489	203	0	23525	0
P1	12416	315	10122	546	157	2656	0	438	0	818	198	0	3245	0
P2	22137	2758	13975	5419	989	17066	0	1133	0	1570	278	0	7940	0
P3	1886	84	1060	5343	75	877	0	25	0	1228	2	0	7218	0
TOTAL	38930	3340	27603	16545	1345	22648	0	1707	0	10105	681	0	41928	0
Employment	25045	7351	28803	2353	9009	9237	0	570	0	1355	534	0	2218	

SECTOR	15	16	17	18	19	20	21	TOTAL	HH1	F2	F3	F4	F5	TOTAL
1	0	0	0	0	0	0	0	4574	0	0	140	18030	16187	38930
2	0	0	104	57	0	0	34	675	2946	0	0	-281	0	3340
3	0	0	0	28	440	1	1	12258	5081	19	1029	1627	7588	27603
4	0	0	0	1640	4	0	116	4674	3123	0	0	2083	6665	16545
5	0	14	0	0	0	1	0	375	583	0	0	-438	825	1345
6	0	0	272	51	14	0	9	1046	14512	0	0	2689	4400	22648
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	473	0	0	0	0	5	515	1473	0	0	-281	0	1707
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	2	7	112	27	1	151	952	10654	0	0	-1511	11	10105
11	0	50	2	2	419	5	33	528	107	7	33	6	0	681
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	2	1904	85	15	74	22	51	7231	8837	249	618	13394	11599	41928
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	22	5	177	54	25	260	284	986	1609	92	0	56	0	2742
16	19	214	187	338	481	429	238	2349	1132	669	18270	-4323	0	18096
17	598	577	728	1856	1156	844	2358	16418	8619	1092	5028	16153	0	47311
18	10	1110	3095	145	754	593	255	6619	1398	1567	0	7905	0	17489
19	314	185	1367	3224	3997	463	1071	15105	8601	1601	1109	3157	0	29573
20	14	2020	1380	526	546	1461	2117	9199	11289	625	0	1800	0	22914
21	22	182	954	179	4440	552	5021	12434	8001	26315	901	8276	0	55928
TOTAL	1000	6739	8357	8228	12379	4631	11745	95936	87965	32236	27128	68341	47275	358882
P1	140	2286	5221	1636	2758	2263	26744	71959	0	0	0	0	0	71959
P2	211	7451	32875	6963	12301	15570	17439	166076	0	0	0	0	0	166076
P3	1391	1621	858	662	2135	450	0	24915	0	0	0	0	0	24915
TOTAL	2742	18096	47311	17489	29573	22914	55928	358886	87965	32236	27128	68341	47275	621831
Employment	981	1939	7181	3080	2168	228	13005	115057	0	0	0	0	0	115057

Appendix 4

Sectoral Distribution

Hulu Sungai Tengah I-O Table (Rp.000000)

SECTOR	AMOUNT	%	EMPLOYMENT (U)
1	25045.0	21.8	
2	7351.0	6.4	
3	28803.0	25.0	
4	2353.0	2.0	
5	9009.0	7.8	
6	9237.0	8.0	
7	0.0	0.0	
8	570.0	0.5	
9	0.0	0.0	
10	1355.0	1.2	
11	534.0	0.5	
12	0.0	0.0	
13	2218.0	1.9	
14	0.0	0.0	
15	981.0	0.9	
16	1939.0	1.7	
17	7181.0	6.2	
18	3080.0	2.7	
19	2168.0	1.9	
20	228.0	0.2	
21	13005.0	11.3	
TOTAL	115057.0	100.0	
AVERAGE	5478.9		
MAXIMUM	28803.0		
MINIMUM	0.0		
STD DEV	8060.9		