



Muhammad Handry Imansyah

# **An Efficient Method for Constructing Regional Input-Output Tables**

The Fundamental Economic Structure Approach in  
Indonesia



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*This book is dedicated to my parents,  
Dr. H. M. Hanafiah and Hj. Raguwan,  
and my wife, Lelyana and my twin daughters, Nadila and Nabila*

## ABSTRACT

The objectives of this study are: a) to identify the fundamental economic structure (FES) in Indonesian regional economies; b) to develop a hybrid method for constructing regional input-output tables using the fundamental economic structure approach; c) to evaluate the performance of the fundamental economic structure approach; and d) to apply the model for constructing regional input-output tables in small regions to two districts in South Kalimantan Province. This study tried to identify the fundamental economic structure (FES) developed by Jensen, West and Hewings (1988). The FES framework is used to capture the main features of regional economies in Indonesia. A revised approach of previous FES approach developed by Van der Westhuizen (1992) was established. The FES approach is relatively efficient in terms of using superior data.

The results of the study suggest that the fundamental economic structure in Indonesia has similar pattern with other studies such as Australia and South Africa. However, unlike Australia, Indonesia not only has significant cells in the secondary and tertiary sectors, but some of the primary sectors as well. Subsistence agriculture, Central Government food selfsufficiency policy at the regional level, island economy and limited infrastructure may be the explanations of these phenomena.

In a 21-sector aggregation level, the quadratic and linear models gives the largest proportion of statistically significant cells. The independent variable (economic indicator) providing the largest proportion of statistically significant relationships is TSGO (total sectoral gross output). The results of the evaluation using different tests appear to be consistent across provinces. In most cases, the errors are relatively low on average using different measures. The FES approach is applied to construct input-output tables for Banjarmasin, a typical urban economy, and Hulu Sungai Tengah, a typical rural economy, in South Kalimantan. The performance of FES approach used to construct Banjarmasin and Hulu Sungai Tengah input-output tables is satisfactory in the sense of holistic accuracy because these tables capture the main features of the economies. The work carried out highlighted a number of limitations. A limited number of regional input-output tables available for the study is a major constraint to the FES approach. It is difficult to determine the characteristic of the distribution of the sample tables.

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## LIST OF CONTENTS

	Page
<b>Abstract</b> .....	i
<b>Acknowledgments</b> .....	iii
<b>List of Contents</b> .....	v
<b>List of Tables</b> .....	vii
<b>List of Figures</b> .....	xi
<b>Chapter 1. INTRODUCTION</b> .....	1
1. Background .....	1
1.2. Research Question .....	3
1.3. Objectives of the Study .....	4
1.4. Contribution of the Study .....	4
1.5. Organization of Thesis .....	4
<b>Chapter 2. CONCEPTUAL FRAMEWORK: LITERATURE REVIEW</b> ....	7
2.1. Introduction .....	7
2.2. The Concept of Economic Structure .....	8
2.3. Similarity and Predictability .....	10
2.4. Structural Change and Stability .....	16
2.5. Sensitivity and Importance .....	22
2.6. Overview of the Horizontal Approach .....	27
2.7. Targeting Cells for Superior Data .....	28
2.8. Conclusion and Implications .....	30
<b>Chapter 3. DESCRIPTIVE ANALYSIS OF THE STUDY AREA</b> .....	31
3.1. Introduction .....	31
3.2. Source of Data .....	33
3.3. Regional Economic Structure .....	33
3.4. Demographic, Welfare, Social, Economic and Health Indicators .	41
3.5. Conclusion .....	44
<b>Chapter 4. PROCEDURES OF THE FES APPROACH</b> .....	47
4.1 Introduction .....	47
4.2. Short Review of Hybrid Approaches .....	47
4.3. Initial Implementation of FES Approach .....	49
4.4. A Revised FES Approach .....	51
4.5. Sequence of the FES Procedures .....	58
4.6. Summary and Conclusions .....	63

	Page
<b>Chapter 5. THE IDENTIFICATION OF THE FUNDAMENTAL ECONOMIC STRUCTURE IN INDONESIA REGIONAL ECONOMIES . . . .</b>	<b>67</b>
5.1. Introduction . . . . .	67
5.2. Methodology . . . . .	68
5.3. Pattern of the Fundamental Economic Structure . . . . .	69
5.4. Summary and Conclusion . . . . .	94
<b>Chapter 6. MODEL VERIFICATION AND VALIDATION . . . . .</b>	<b>99</b>
6.1. Introduction . . . . .	99
6.2. Model Verification and Validation . . . . .	99
6.3. Estimation Procedure to the FES Approach . . . . .	101
6.4. Evaluation Procedures . . . . .	102
6.5. Performance of the Estimated Tables . . . . .	106
6.6. Summary and Conclusion . . . . .	124
<b>Chapter 7. THE APPLICATION OF THE FES APPROACH TO SMALL REGIONS: BANJARMASIN AND HULU SUNGAI TENGAH INPUT-OUTPUT MODELS . . . . .</b>	<b>125</b>
7.1. Introduction . . . . .	125
7.2. Geography and Climate . . . . .	125
7.3. Population and Social Indicators . . . . .	126
7.4. Input-Output Models for Banjarmasin and Hulu Sungai Tengah . . . . .	130
7.5. Summary and Conclusion . . . . .	148
<b>Chapter 8. THE ECONOMIES OF BANJARMASIN AND HULU SUNGAI TENGAH LINKAGES, MULTIPLIERS, AND ELASTICITIES ANALYSIS . . . . .</b>	<b>151</b>
8.1. Introduction . . . . .	151
8.2. Banjarmasin . . . . .	151
8.3. Hulu Sungai Tengah . . . . .	159
8.4. Policy Implications . . . . .	163
8.5. Summary and Conclusion . . . . .	164
<b>Chapter 9. THE SUMMARY AND CONCLUSION . . . . .</b>	<b>165</b>
9.1. Introduction . . . . .	165
9.2. Summary of the Findings . . . . .	165
9.3. Conclusion of the Study . . . . .	168
<b>References . . . . .</b>	<b>171</b>
<b>Appendices . . . . .</b>	<b>197</b>



## LIST OF TABLES

	Page
Table 3.1 Distribution of GRDP (per cent) at Current Prices by Industrial Origin 1988 .....	35
Table 3.2 Ranking of Provinces based on Total and Per Capita of GRDP .....	40
Table 3.3 Selected Social and Demographic Indicators .....	44
Table 3.4 Proportion of Urban and Rural Population below The Poverty Line by Province 1980 and 1987 .....	45
Table 3.5 Infant Mortality Rates by Provinces 1971, 1980 and 1985 .....	46
Table 4.1 Criteria for Developing a Projection Matrix using the Properties of Importance, Stability and Predictability .....	50
Table 4.2 Criteria for Developing Hybrid Table using Revised FES Approach .....	51
Table 4.3 Procedure for Generating Single Regional Input-Output Tables: FES Approach .....	62
Table 5.1 Percentage of Statistically Significant Cells at 90% CL among Models at 21 Sectors Aggregation .....	71
Table 5.2 Percentage of Statistically Significant Cells at 90% CL among Models in Household Sector Only at 21 Sectors Aggregation .....	72
Table 5.3 Percentage of Statistically Significant Cells at 90% CL among Models at Sectors Aggregation .....	73
Table 5.4 Percentage of Statistically Significant Cells at 90% CL among Models at 6 Sectors Aggregation .....	74
Table 5.5 Frequency Distribution for the Best Fit among Models based on the Highest Adjusted $R^2$ at 21 Sectors Aggregation .....	78
Table 5.6. Best Fit among Models based on the Adjusted $R^2$ in One Table for GRDP as an Independent Variable $R^2$ at 21 Sectors Aggregation .....	79
Table 5.7 Best Fit among Models based on the Adjusted $R^2$ in One Table for Population as an Independent Variable .....	80
Table 5.8 Best Fit among Models based on the Adjusted $R^2$ in One Table for TSGO as an Independent Variable .....	81
Table 6.1 Error of Coefficients Matrices for Case P6 (GRDP) .....	110
Table 6.2. Error of Coefficients Matrices for Case P6 (Population) .....	111
Table 6.3. Error of Coefficients Matrices for Case P6 (TSGO) .....	112
Table 6.4 Error of Coefficients Matrices for Case P8 (GRDP) .....	113
Table 6.5 Error of Coefficients Matrices for Case P8 (Population) .....	114

	<b>Page</b>
Table 6.6 Error of Coefficients Matrices for Case P8 (TSGO) .....	115
Table 6.7 The Rank of Sectors With The Highest Absolute Percentage Error (APE) for Type I Output Multipliers by Province .....	117
Table 6.8 The Rank of Sectors With The Highest Absolute Percentage Error (APE) for Type II Output Multipliers by Province .....	118
Table 6.9 The Rank of Sectors With The Highest Absolute Percentage Error (APE) for Type I Income Multipliers by Province .....	121
Table 6.10 The Rank of Sectors With The Highest Absolute Percentage Error (APE) for Type I Income Multipliers by Province .....	122
Table 7.1 Composition of Population by Age Group (per cent), Banjarmasin 1995	126
Table 7.2 Ratios of Gross and Net Enrolment by Sex and Education Level, Banjarmasin 1995 .....	127
Table 7.3 Composition of Population by Expenditure Distribution, Banjarmasin 1994 .....	128
Table 7.4 Composition of Population by Age Group (per cent), Hulu Sungai Tengah 1996 .....	129
Table 7.5 Ratios of Gross and Net Enrolment by Sex and Education Level, Hulu Sungai Tengah 1996 .....	129
Table 7.6 Composition of Population by Expenditure Distribution, Hulu Sungai Tengah .....	130
Table 7.7. Expenditure Composition of the Banjarmasin Input-Output Table 1995	142
Table 7.8 Expenditure Composition of the Hulu Sungai Tengah Input-Output Table 1995 .....	146
Table 8.1 The Top 10 Sectors with the Highest Backward Linkage, Banjarmasin Input-Output Table 1995 .....	152
Table 8.2 The Top 10 Sectors with the Highest Forward Linkage, Banjarmasin Input- Output Table 1995 .....	153
Table 8.3 The Top 10 Sectors for Output, Income and Employment Multipliers, Banjarmasin Input-Output Table 1995 .....	155
Table 8.4 The Top 10 Sectors for Output, Income and Employment Elasticity, Banjarmasin Input-Output Table 1995 .....	158
Table 8.5 The Top 10 Sectors with the Highest Backward Linkage, Hulu Sungai Tengah Input-Output Table 1995 .....	159

	<b>Page</b>
Table 8.6 The Top 10 Sectors with the Highest Forward Linkage, Hulu Sungai Tengah Input-Output Table 1995 .....	160
Table 8.7 The Top 10 Sectors for Output, Income and Employment Multipliers, Hulu Sungai Tengah Input-Output Table 1995 .....	161
Table 8.8 The Top 10 Sectors for Output, Income and Employment Elasticity, Hulu Sungai Tengah Input-Output Table 1995 .....	163

## LIST OF FIGURES

	Page
Figure 1.1 Fundamental and Non-Fundamental Areas of Australian Input-Output Tables .....	3
Figure 2.1 Space time of Regional Economic Structure .....	10
Figure 2.2 Tiered Representation of Input-Output Structure .....	16
Figure 2.3 Complexity of the Fundamental Economic Structure .....	24
Figure 3.1 Map of Indonesia and Surrounding Countries .....	32
Figure 3.2 GRDP Distribution by Province and by Industrial Origin .....	34
Figure 3.3 Distribution of GRDP Per Capita and Economic Growth by Province .....	39
Figure 4.1 Venn Diagram of Transaction, Predictable, Stable and Importance Cells ..	58
Figure 4.2 Scheme of Hybrid Procedure using the FES Approach .....	65
Figure 5.1 Pattern of Predictability of Cells for Model E (Quadratic) with TSGO as an Independent Variable .....	82
Figure 5.2 The Pattern of Stable Cells based on Coefficient of Variation .....	86
Figure 5.3 Coefficient Pattern of Household Consumption FES Layer Across Provinces .....	87
Figure 5.4 The Pattern of Stability of the FES for Each Province .....	88
Figure 5.5 The Most Sensitive Cells for the First 25% of the Average Reference Regional Tables .....	95
Figure 5.6 The Largest Field of Influence for the First 25% of the Average Reference Regional Tables .....	96
Figure 6.1 Error Pattern of Estimated Table for Case P8 (GRDP) .....	108
Figure 6.2 Error Pattern of Estimated Table for Case P8 (Population) .....	108
Figure 6.3 Error Pattern of Estimated Table for Case P8 (TSGO) .....	109
Figure 6.4 Error Pattern of Type I Output Multipliers by Sector for Each Province	119
Figure 7.1 The Structure of Gross Output, Banjarmasin Input-Output Table 1995 ..	137
Figure 7.2 The Composition of Final Demand, Banjarmasin Input-Output Table 1995 .....	138
Figure 7.3 Sectoral Distribution of Gross Output Banjarmasin Input-Output Table 1995 .....	140
Figure 7.4 Sectoral Distribution of Gross Output Banjarmasin Input-Output Table 1995 .....	141
Figure 7.5 Sectoral Distribution of Gross Imports Banjarmasin Input-Output Table 1995 .....	151

	Page
Figure 7.6 Sectoral Distribution of Gross Value Added Output Banjarmasin Input-Output Table 1995 .....	142
Figure 7.7 The Structure of Gross Output, Hulu Sungai Tengah Input-Output Table 1995 .....	144
Figure 7.8 The Composition of Final Demand, Hulu Sungai Tengah Input-Output Table 1995 .....	144
Figure 7.9 Sectoral Distribution of Gross Output Hulu Sungai Tengah Input-Output Table 1995 .....	146
Figure 7.10 Sectoral Distribution of Gross Exports Hulu Sungai Tengah Input-Output Table 1995 .....	147
Figure 7.11 Sectoral Distribution of Gross Imports Hulu Sungai Tengah Input-Output Table 1995 .....	147
Figure 7.12 Sectoral Distribution of Gross Value Added Output Hulu Sungai Tengah Input Table 1995 .....	148
Figure 8.1 Relative Importance of Initial, First, Industrial and Consumption Effects from Rp 1 Increase of Sectoral Sales to Final Demand, Banjarmasin Input-Output Table 1995 .....	156
Figure 8.2 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 .....	161

## Chapter 1

### Introduction

#### 1.1. Background

In developing countries, the development process is biased towards urban-industrial growth in large and metropolitan areas rather than agricultural growth in small and rural areas (Hansen, 1992). Large regions will tend to move ahead, while many small regions will be left behind. Therefore, an appropriate strategy is necessary to accelerate the development in small and rural areas. However, the availability of analytical and planning tools is still limited for policy-makers. The availability of these tools is affected by limited resources such as funds and skilled personnel for local government. Input-output is one such tool which is beneficial for this purpose.

Regional economic structure can be uniquely represented by input-output tables. However, the construction of input-output tables is relatively expensive, especially for small local government. Indonesia faces this problem. Regional input-output tables are beneficial for helping policy-makers determine development strategy. Even though Jensen, Mandeville, and Karunaratne (1979) developed a hybrid technique to generate input-output tables, called GRIT (Generation of Regional Input-Output Tables), the construction of input-output tables for small regions from a national table still requires many modifications.

Jensen, West, and Hewings (1988) provide a useful insight into the development of a horizontal approach for constructing regional input-output tables. They found that study of regional economic structure can lead to the identification of the fundamental economic structure (FES). Jensen, West, and Hewings (1988) studied the regional economic structure in Queensland, and found that there is a regular pattern and several similarities between regions in Queensland. This finding leads to the notion of the fundamental economic structure (FES) concept. This regular pattern varies across regions depending upon its economic activities. Nevertheless, some parts of the economic structure are inevitably present. These common parts are what is referred to as the fundamental economic structure (FES). The structure generally relates to population activities such as services and manufacturing. However, these findings have not been fully explored and the possibility observed that it could be used for constructing regional input-output tables. Van der Westhuizen (1992) used this potential approach for constructing regional input-output tables using South African data. This research confirmed the findings of the Jensen, West, and Hewings' study. However, these studies were limited in terms of the use of functional forms used to identify the FES. A number of similar studies in different economic environments and using different functional forms to make some general conclusions would therefore be

highly desirable.

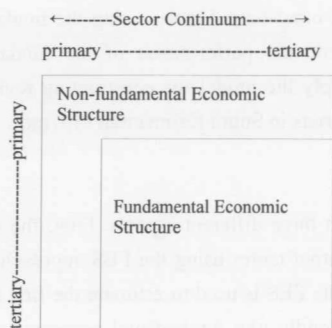
Jensen (1990) maintained his advocacy for the hybrid method as the most reliable method for constructing regional input-output tables in terms of time and cost. He provided a new perspective in the construction of regional input-output tables. As Jensen *et al.* (1988) indicated, economic structure is more similar than it is different. They provided a foundation for forming an economic taxonomy by measuring the economic structure. Therefore, when one knows the similarities of basic economic structures between regions at a similar level of economic development, then one can use this information to estimate the basic economic structure for other regions with the same level of economic development. In other words, the economic structure of an economy is predictable across regions.

Many analysts believe that the evolutionary path of economic structure is considered to be *unilinear* (see, for instance, Hewings, Sonis & Jensen 1988a, 1988b; Cuello 1994). If this hypothesis is to be accepted, then the change of economic structure is predictable, and the notion of the fundamental economic structure is useful for such a purpose: as the fundamental economic structure concept is identified, the economic structure can be predicted. The concept of the fundamental economic structure takes advantage of the identification of the important, stable and predictable components of the input-output tables.

With respect to the fundamental economic structure concept, the cell entries of the input-output table can be classified into two groups (Jensen *et al.* 1991). The location of cell entries between these two groups is shown in Figure 1.1. Using the FES concept in the table construction, one concentrates most of the limited resources on the cell entries of the non-fundamental economic structure (NFES) group. The cell entries of the FES group can use indirect estimation such as borrowing from other regional tables with similar development levels or using some other aggregate measures.

In summary, the fundamental economic structure exists at predictable levels across regions in Australia and also in South Africa. However, there is still a question whether this phenomenon occurs in other economic situations. If it does occur, to what extent are the fundamental economic structures similar and to what extent can it be used as an input into input-output table construction methodologies?

Figure 1.1  
Fundamental and Non-fundamental Areas of Australian Input-Output Tables



Source: Jensen 1990, Figure 1.

## 1.2. Research Question

Balanced development process across regions in Indonesia is a fundamental issue. However, the central government faces limited funds to speed up regional development. Therefore, the identification of key sectors is necessary to accelerate the development in every region. Unfortunately, limited data and analytical tools are major constraints for this purpose.

Input-output analysis is one of the most appropriate tools to identify key sectors. In addition, input-output analysis represents an interaction of production and consumption for a region. However, supporting the construction of input-output tables usually overburdens the financial capacity of a small local government.

The fundamental economic structure concept provides a foundation for developing a hybrid method of input-output tables. Therefore, the development of a hybrid method which is cost-effective, while maintaining acceptable accuracy, will be beneficial for regional planning, especially in developing countries like Indonesia. There is a question whether the fundamental economic structure exists or not in Indonesia. If so, to what extent are the regional similarities that demonstrate the fundamental economic structure? Can this concept be applied in any situation? These questions will be tested by this empirical study in Indonesia.



### **1.3. Objectives of the Study**

The objectives of the study are as follows: a) to identify the fundamental economic structure (FES) in Indonesian regional economies; b) to develop a hybrid method for constructing regional input-output tables using the fundamental economic structure approach; c) to evaluate the performance of the fundamental economic structure approach; and d) to apply the model for constructing regional input-output tables in small regions to two districts in South Kalimantan Province.

### **1.4. Contribution of the Study**

This study contributes in three different aspects. First, the development of a method for constructing input-output tables using the FES approach is established. In the spirit of the hybrid method, the FES is used to estimate the first approximation of regional input-output tables. Secondly, the fundamental economic structure (FES) is identified in Indonesian regional economies. The means of identifying the FES properties, such as predictability, stability, and importance, using different analytical tools, is demonstrated. Thirdly, the estimated FES is used to estimate two regional input-output in South Kalimantan Province in Indonesia.

### **1.5. Organization of Thesis**

Chapter 2 reviews the relevant literature and establishes the conceptual framework of the study. This chapter develops the concept of economic structure. Some characteristics of economic structure such as similarity and predictability, structural change and stability, sensitivity and importance are briefly addressed. These concepts are clearly defined, and recent approaches to their measurement are reviewed. An overview of the hybrid input-output construction method is also discussed.

Chapter 3 provides an overview of the Indonesian regional economies, but focuses on the study area. The regional economic structure in the study area is compared to other provinces. Other social and demographic indicators are also discussed.

Chapter 4 presents the procedures of the hybrid method using the FES approach. This chapter provides the step-by-step approach of the FES for constructing regional input-output tables. The general procedures of the FES approach are briefly discussed.

Chapter 5 identifies the fundamental economic structure in the Indonesia regions. This chapter discusses the characteristics of the fundamental economic structure, such as predictability, stability, and importance. These characteristics have been identified in the Indonesian context using several approaches.