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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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.

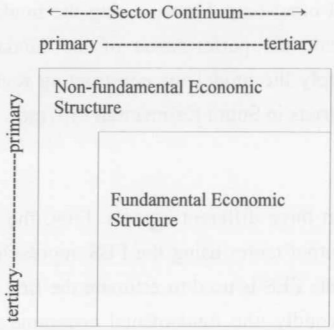
Many analysts believe that the evolutionary path of economic structure is considered to be *unilinear* (see, for instance, Hewings, Sonis & Jensen 1988a, 1988b; Cuello 1994). If this hypothesis is to be accepted, then the change of economic structure is predictable, and the notion of the fundamental 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 occurs, 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.