

PRODUCT VARIETY, TRADE
AND ECONOMIC GROWTH: PANEL DATA
ON SIX ASEAN COUNTRIES

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CHAPTER ONE

INTRODUCTION

1.1. BACKGROUND OF STUDY

The study of economic growth and development is perhaps one of the old-age issues that still preoccupy major discussions in most of economic books and articles dated back as early as the publication of the first influential treatise of Adam Smith, the 1776's '*An Inquiry into the Nature and Causes of the Wealth of Nations*'. What are the determinants of long-run economic growth? Why does the world exhibit persistent and growing economic imbalances between the rich and the poor countries? What are the causes for large variations in both of economic growth rate and of total factor productivity (TFP) growth rate across countries? The above posed questions are few from the fundamental long-list questions of economic growth and development that have been repeatedly addressed by economists and thus shaped the study of economic growth and development.

Right from the inception of the theory of economic growth, macroeconomists always share unanimous consensus on the roles of technological progress in shaping the structure of economy and in influencing the long-run economic growth rate. In this context, Saviotti and Frenken (2008) has provided lucid discussion on the fundamental linkages between technological change, structural change and economic development. Their arguments have been summarized as follow. The dawn of Industrial Revolution has spurred the engine of modern economy through the application of new modes of transportation, mass-production technologies and organizational innovations. Here organizational innovations take place in the sense of better and effective system in

administering, transforming and distributing economic resources. Overall, this process of technological change has altered the structure of modern economy and resulted in a rapid economic growth rate that is ever unforeseen at any time or place in the history.

The analysis of the close connection between technological progress, structural changes and economic development in fact is not new and has been put forward long time ago by developmental economists. For instance, Kuznets (1966, 1971a, 1971b) has argued that “economic growth both required and produced major changes in the structure of the economy (defined as the distribution of inputs or output among the major sectors of the economy)” (Fogel, 2009:16).

Powered by growing efficiency and productivity stimulated by the applications of new technologies and organizational innovations, the present state of economy is characterized by increasingly diversified structures in both of the production side and of the consumption side. New types of products and services become increasingly differentiated. Consequently, the overall path of economic development of the present days is jointly determined by the rates of the incremental increases of efficiency and of creativity. Here efficiency relates to the fall of the ratio of inputs used to produce similar outputs, while creativity is defined as the activity which gives rise to novelty as the result of innovation (Saviotti and Frenken, 2008).

The process of technological progress further also being argued runs not in simple one-direction iteration, but rather, it streams following a circular flow with new activities created by innovations are the true determinants of long term economic development (Schumpeter, 1934 in Saviotti and Frenken, 2008). The circularity of this process ensures that it creates the resources required for innovation, without which the long term continuation of economic development would come to cease (Saviotti and Frenken, 2008).

Given this background, thus, the relevance question remains how to relate the effects of technological progress that transforms the structure of the economy and a country's growth performance? In this particular context, the theory of product differentiation comes into the picture and plays an important role.¹ By inherently collaborating the theory of product differentiation, the latest development in the growth theory, that is, 'new' or 'endogenous' growth model, provides a framework for better insights in the causes and effects of technological changes as a determinant of economic growth.

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Generally speaking, the 'new' growth theory hypothesizes that the number of product types available can proxy the extent of technological progress in the economy. The creation of new types of goods—either formed as quality improvement from the existing ones (i.e., vertical differentiations) or as expansion on the number of types of products (i.e., horizontal differentiation)—is the embodiment of new knowledge on production technology that increases efficiency to produce outputs. In addition, this theory also indicates that international trade and economic growth are intertwined.

Feenstra (2006) argued that trade will lead to a convergence of growth rates across countries provided the international diffusions of knowledge simultaneously exist. Principally through this channel, the process of technological catch-up of the follower countries to the leading edge technological countries occur since the cost of adaptation or imitation is typically cheaper than of invention (Barro and Sala-i-Martin, 1997). Feenstra (1996) also mentioned that there are two inherent avenues by which international trade could transfer technical knowledge. One of those diffusion avenues is the spread of ideas through innovation abroad and communication, while the second

¹ We use the terms of product variety and product differentiation interchangeably.

type of diffusion occurs through direct, hands-on experience with the technologies involved, or in another word, trade in intermediate inputs.

Studying economic growth experienced empirically across countries, the world has hitherto witnessed an astounding economic growth performance of the East Asian countries, which began with Japan's rapid economic development following the post-war economic reconstruction. The striking of East Asian' economic performances for the past few decades are surely not passing unnoticed. There is a growing awareness especially by the western economists of the potency of East Asian' economies to challenge the status-quo of global economy and also to influence the development of theory of economic growth (Fogel, 2009). In 1993, The World Bank even perpetuated their term of 'Asian economic miracles' into economic literature to describe the rapid economic development of East Asian's countries (Fogel, 2009).

1.2. RESEARCH OBJECTIVES

The recent advancement in the theoretical analyses in both of economic growth and international trade studies resulted in the growing appreciation from macroeconomists on the intimate linkage between the development in product variety and the long-run economic growth. In brief, the 'new' growth and trade theories hypothesize that the development in product variety will benefit the overall economic well-being.

However, the rapid extension in the theoretical framework of this study does not move parallel with the number of empirical studies that directly test the hypothesis empirically. The availability of this study is even becoming extremely exceptional in the case of observing developing countries in general and ASEAN's countries in particular. We consider the lack of empirical testing as rather inadequate, given the fact that most of ASEAN's countries are exhibiting a sustained high economic growth rate

that was even dubbed “growth miracles”. Based on this background, this study therefore aims to fill this gap by empirically test the linkage between the degree of product variety and economic growth in ASEAN’s countries.

In a nutshell, the tasks of this study are twofold. The first task is to measure the extent of product varieties in the observed countries, which will be achieved by computing the product variety index. The second task is to empirically test the direct long-run correlation between the change in the index of product variety and economic growth. As such, this study observes this linkage about a number of countries based on the availability of the data. Thus, regarding the econometrics part, we utilize panel data estimation to capture the full dimension of the data.

Based on the background of this study, the following research objectives have been identified:

1. To compile product variety measurements offered in the literature;
2. To observe the economic and trade performance of ASEAN’s countries;
3. To compute the index of product variety for ASEAN’s countries;
4. To conduct empirical testing on the direct linkage between the index of product variety and economic growth.

1.3. SIGNIFICANCE OF STUDY

The benefit that will be derived from this are many. Firstly, this study will help to provide another perspective on the possible catalyst for the rapid ASEAN’s economic growth, and thus increase our understanding about ASEAN’s economic experiences in particular. Also, this may help shed more light on the possible route through which economic growth may take place in general. Secondly, this study will also expose the policy maker to the possibility of alternative economic policy in order to promote

economic growth. Finally, this study compliments the existing literature due to its empirical nature. In this particular context, to the best of knowledge of the author, no empirical works had been conducted to observe this linkage exclusively on developing countries or even ASEAN's data. The closest studies analogous with this study are the study conducted by Feenstra, Madani, Yang and Liang (1997) who observed the linkage for only South Korea and Taiwan, Funke and Ruhwedel (2001b) study with OECD data, Feenstra and Kee (2008) and Saviotti and Frenken (2008) studies on broad dataset combining both developed and developing countries. Meanwhile, Funke and Ruhwedel (2001a) took different route by observing the linkage between product variety and export performance of East Asia countries.

1.4. LIMITATION OF STUDY

Two main limitations have been identified in this study. In theoretical front, this study assumes that, the rate of product variety growth is given exogenously. Therefore, even though product variety of an economy is taken endogenously into production function and assumed to grow in correspondence with the global technologies, our model lacks of explanations on how the country itself expands its technical know-how on the new product types. In other words, our model provides no in-depth analysis of parameter 'A' of production function. This indication will be much of clearly reflected upon the discussion in the chapter four.

In empirical front, the main obstacle of this study is the existence of highly disaggregate production data. In general, the rule of thumb in the assessment of the degree of product variety is to use the highest as possible the level of disaggregation data to get better estimation of product variety. Therefore, the most suitable data for this line of study, as suggested by Funke and Ruhwedel (2001b), is the national output data.

Since the availability of national output data is relatively sparse, even for developed economies, economists propose to use trade data as a base for assessing product variety. However, we find that for several ASEAN's economies, particularly, Brunei Darussalam, Cambodia, Lao People Democratic Republic and Myanmar, a complete time series data were not available and accessible. Specifically, we find that these countries have several years of missing data for the period after 2000. Also, they have no observations for the period prior to 2000. Therefore, we abandon our initial purpose to cover all ASEAN countries and limit our observation to only the remaining members, i.e., Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam. Starting from this point onward, we will refer this set of countries as ASEAN-6.

In summary, this study possesses two technical limitations in empirical front, first, not all of ASEAN's countries are covered and second, the level of disaggregation of trade data is rather high. Specifically we inevitably ought to use the 3-digit level of SITC revision 3—the highest disaggregation trade data at which the sum of the total trade values are still consistent with the sum in the highest level of aggregation and also the longest time series data available for the ASEAN-6's countries.

1.5. ORGANIZATION OF THE STUDY

This paper is organized into six chapters. Chapter one outlines the research proposal of this study. Chapter two covers the theoretical foundations and literature review. This chapter is subdivided into two main categories. The first category deals with the theoretical underpinnings. Two theories are covered in this subsection, i.e., the theory of product variety and the modern growth theory. The second category focuses on the application of product variety framework. This subsection is also subdivided into three subjects, i.e., the practical definitions of product variety commonly used in empirical

works, an overview on empirical studies and a compilation on the direct measures of product variety.

Chapter three observes the empirical trends of the economic data that are relevant with the objectives of this study. This chapter is thus intended to encapsulate the stylized facts on economic growth and development of the ASEAN-6' countries in the period of observation of this study. Three themes are discussed in this chapter, i.e., economic growth, international trade and the introduction on the data of product variety. In essence, this overall trend of economic performances can be thought of as the footing from which the later empirical model is constructed and tested for.

Chapter four discusses economic modeling and research method of this study. This chapter is essentially provided to highlight in detail the utilized product variety index, the rationalization and construction of the empirical economic model and an overview of the econometric method and testing utilized in this study.

Chapter five presents the discussions on the empirical findings of this study. This chapter is subdivided into two main categories. The first part of this chapter discusses the outputs from the computation of product variety index while the second part of this chapter explains the results from empirical testing of the model outlined in the chapter four. The last chapter, chapter six, provides summary of the main findings and conclusions of this study, and outlines suggestions for future research.