



UNIVERSITI PUTRA MALAYSIA

***ROLE OF STRUCTURAL CHANGE AND COMPETITIVENESS
ON PRODUCTIVITY IN ASEAN-5***

SUBRAMANIAM A/L MUNUSAMY

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**ROLE OF STRUCTURAL CHANGE AND COMPETITIVENESS ON PRODUCTIVITY IN
ASEAN-5**

By

SUBRAMANIAM A/L MUNUSAMY

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfillment of the
Requirements for the Degree of Master of Science**

June 2015

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Abstract of thesis presented to the senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science

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By

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June 2015

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This study intends to investigate the dynamic role of structural change and competitiveness on the labor productivity of ASEAN-5, namely Indonesia, Malaysia, Philippines, Singapore and Thailand. Using the well-known shift-share analysis of panel data between 1975 and 2005, this study found a strong presence of structural bonus hypothesis in the services sector. Thus, it confirms the ability of ASEAN-5 to reallocate labor resources from low to high productive sectors which resulted in the aggregate productivity growth of the services sector. However, the prevalence of Boumol's structural burden implied that the structural change has implicated negative effect on the aggregate growth of industry in the most of ASEAN-5 countries except for Thailand. Besides shifting labor force away from progressive sectors towards 'stagnated' sectors with low productivity growth, structural change appears to weaken the aggregate growth of labor productivity in the industry. In the long run, it increases the chances of labor force to get 'trapped' in the stagnant industries and tend to diminish income per capita growth. Moreover, regression analysis from 2006 to 2012 finds a robust relationship between labor productivity growth and competitiveness that largely rest in the foreign market capitalization. Equally, private spending on R&D as well as FDI and technology transfer played a major role in raising labor productivity level within the ASEAN-5. This study, therefore, proposes country-specific institutional policies that emphasize in a stable macroeconomic environment, comprehensive assessment of partial industrialization conditions and government intervention in the facilitation of free trade and Research and Development (R&D) are essential the key determinant factors in salient structural change and compete in ASEAN-5.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

PERANAN PERUBAHAN STRUKTUR DAN PERSAINGAN TERHADAP PRODUKTIVITI DI ASEAN-5

Oleh

SUBRAMANIAM A/L MUNUSAMY

Jun 2015

Pengerusi: Hanny Zurina Binti Hamzah, PhD
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Kajian ini berhasrat untuk mengkaji peranan dinamik perubahan struktur dan persaingan terhadap produktiviti buruh di ASEAN-5, iaitu Indonesia, Malaysia, Filipina, Singapura dan Thailand. Dengan menggunakan kaedah terkemuka Analisis 'Shift-share' ke atas data panel dari 1975 hingga 2005, kajian ini mendapati terdapat kehadiran hipotesis 'Struktur-bonus' di dalam sektor perkhidmatan. Justeru, ia mengesahkan bahawa kebolehan ASEAN-5 untuk mengalihkan tenaga buruh dari sektor yang kurang produktif ke sektor yang lebih produktif mengakibatkan peningkatan produktiviti agregat sektor perkhidmatan. Walaubagaimanapun, kewujudan 'Struktur-beban Boumol' menunjukkan kesan negatif daripada perubahan struktur ke atas sektor industri di kebanyakan ASEAN-5 kecuali di Thailand. Selain mengalihkan sumber buruh dari sektor progresif ke sektor kurang produktif yang berstagnasi, perubahan struktur didapati seolah-olah melemahkan pertumbuhan produktiviti buruh di sektor industri. Dalam jangka masa panjang, ia meningkatkan kemungkinan tenaga buruh menjadi 'terperangkap' di sektor yang 'berstagnasi', dan mungkin akan mengecutkan pertumbuhan pendapatan per-kapita. Selain itu, analisis regresi dari tahun 2006 hingga 2012 mendapati bahawa hubungan yang mantap antara pertumbuhan produktiviti buruh dan daya saing yang sebahagian besarnya bergantung kepada penguasaan pasaran asing. Tidak kurangnya, perbelanjaan swasta dalam Penyelidikan dan Pembangunan (R & D), serta pelaburan asing (FDI) dan pemindahan teknologi juga memainkan peranan penting dalam meningkatkan tahap produktiviti buruh di ASEAN – 5. Oleh itu, kajian ini mencadangkan bahawa pengubalan dasar di peringkat negara yang menekankan persekitaran makroekonomi yang stabil, penilaian yang menyeluruh ke atas keadaan 'perindustrian separa' dan campur tangan kerajaan dalam memudahkan perdagangan bebas serta Penyelidikan dan Pembangunan (R&D) adalah faktor utama yang melicinkan perubahan struktur dan daya saing di ASEAN-5.

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I certify that a Thesis Examination Committee has met on 12 June 2015 to conduct the final examination of Subramaniam a/l Munusamy on his thesis entitled “Role of Structural Change and Competitiveness on Productivity in ASEAN-5” in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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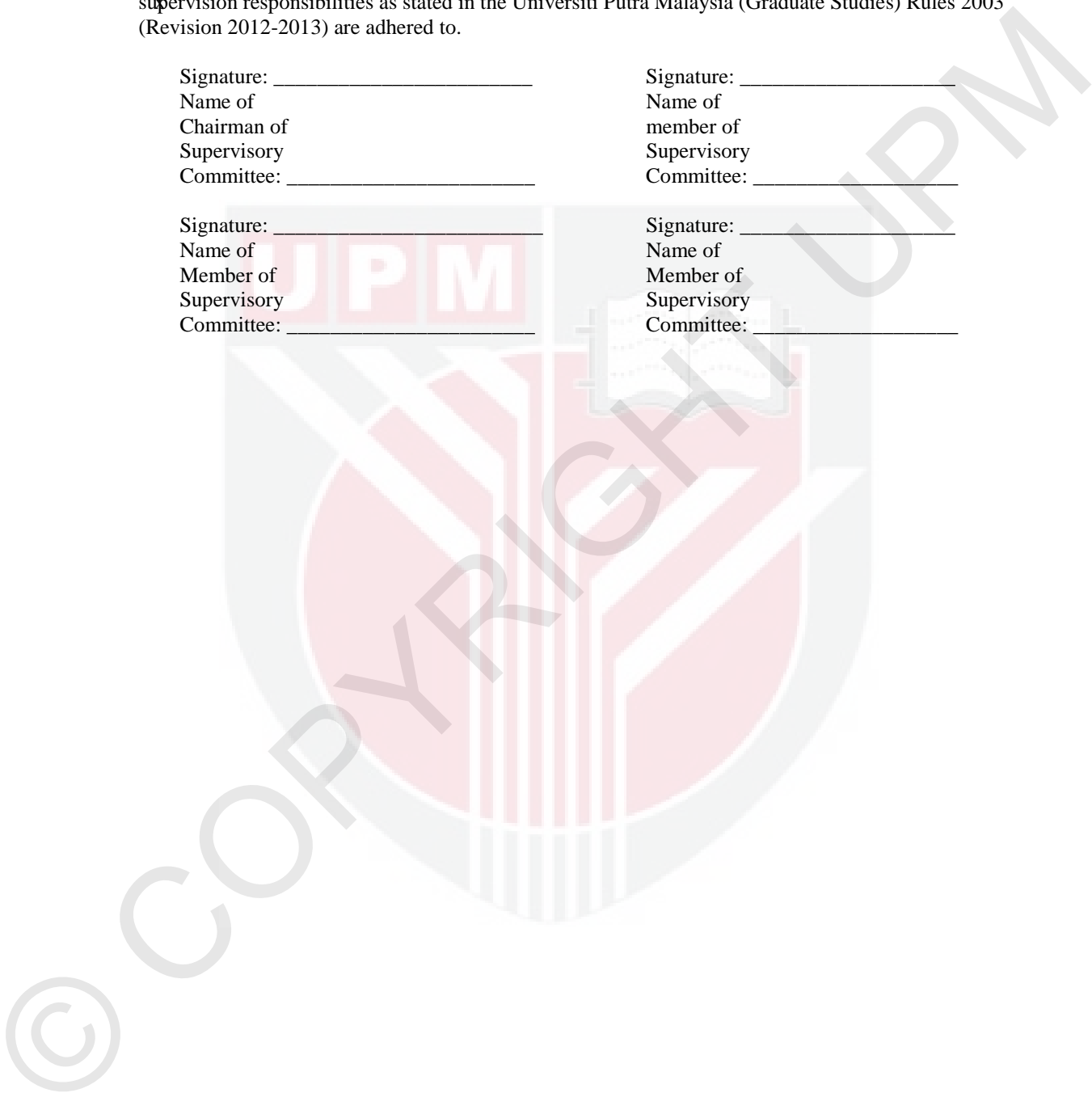


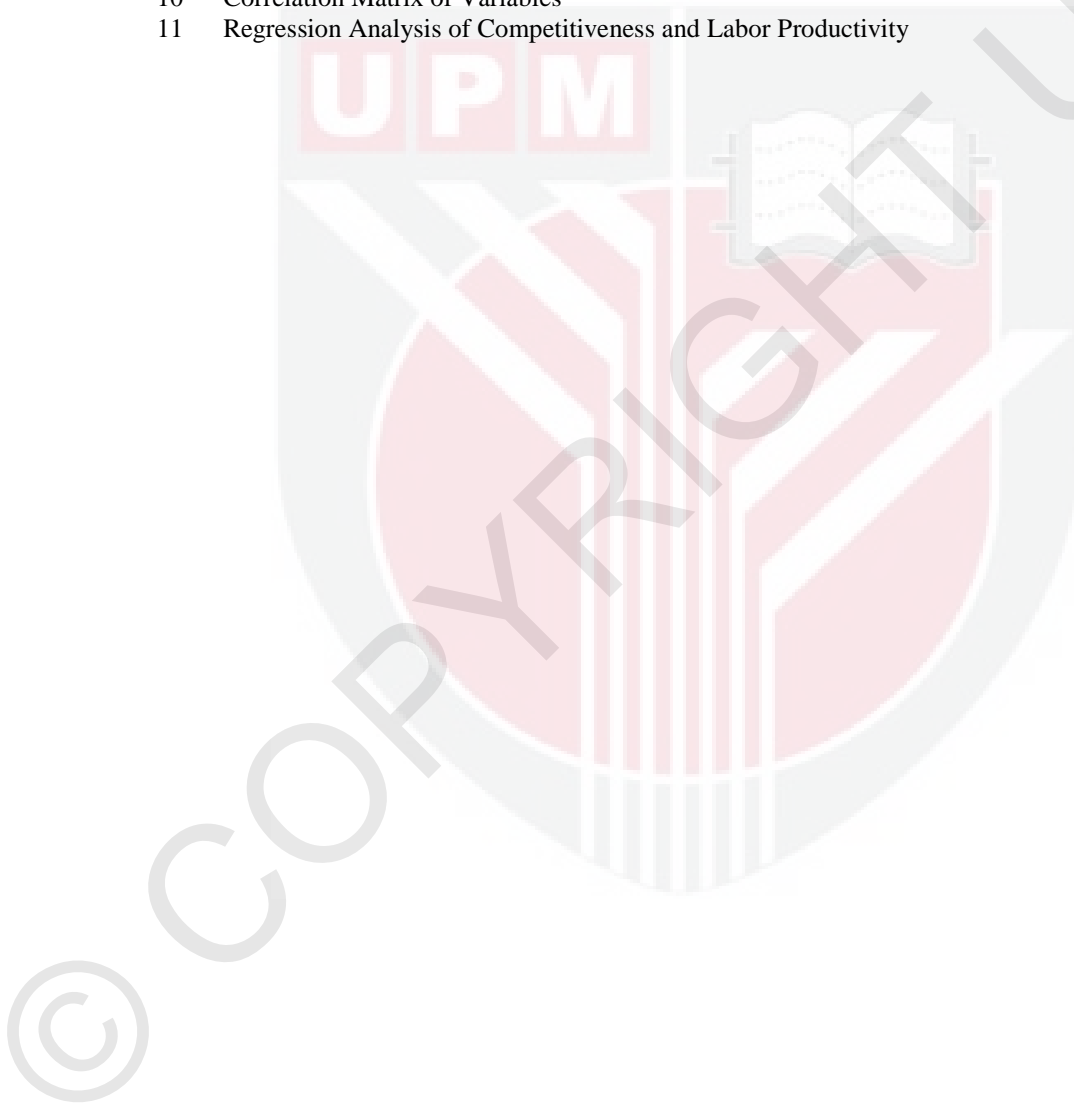
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LIST OF ABBREVIATIONS

ASEAN	Association of Southeast Asian Nation
TFP	Total Factor Productivity
GDP	Gross Domestic Product
WDI	World Development Indicators
APO	Asian Productivity Organization
ADB	Asian Development Bank
USD	United States Dollar
PPP	Purchasing Power Parity
WEF	World Economic Forum
EC	European Commission
ICT	Information Communication and Technology
FDI	Foreign Direct Investment
CI	Competitive Intelligence
R&D	Research and Development
OECD	Organisation for Economic Co-operation and Development
GGDC	Groningen Growth and Development Centre
NSIs	National Statistical Institutes
LFS	Labor Force Survey
LCU	Local Currency Unit
ISIC	International Standard Industrial Classification
VA	Value Added
PSTN	Public Switched Telephone Network
MNEs	Multinational Enterprises
GCI	Global Competitiveness Index
UNESCO	United Nations Educational, Scientific and Cultural Organization
WHO	World Health Organization
WRI	World Resources Institute
IEA	International Energy Agency
GDSDS	General Data Dissemination System
IMF	International Monetary Fund
DQAF	Data Quality Assessment Framework
OLS	Ordinary Least Squares
FE	Fixed Effect
CPI	Competitiveness Productivity and Innovation

CHAPTER 1

INTRODUCTION

1.0 Introduction

In recent years, there is growing concern about several economies, particularly Asian nations, getting 'trapped' in critical junctures of economic transition. This is generally in regard to the weaker and slower income growth between development stages. Several economies are merely 'trapped' between a low income factor-driven stage and a middle or high income stage of investment-driven and innovation-driven stage respectively. Even though some countries have achieved significant growth in the development process, then they appear to be stalled and unable to shift into the next level of development. Economic growth and development generally perceive as an increase in the standard of living arising with sustained growth from a classic low income economy to a modern high income economy. Commonly, economic development encompasses extensive growth, such as output improvement and resource allocation to intensive growth that has productivity increases, innovation and new employment. However, the process of transformation is not obviously autonomous at different levels of economic position with basic challenges. As an economy develops, so do its productivity and structural base as well as its global competitiveness. At the initial stage of an economy that depends largely on a primary source, productivity and competitiveness are not as important as the later stage that contributes to about half of growth in development economies. Since the economic transition is highly related to productivity and past performance in competitiveness, therefore it was the concern of this study to investigate this issue further.

Although the scientific community often defined productivity in many different perspectives, this study defined productivity as the differences in the efficiency of production as measured by labor productivity¹. From a general perspective, labor productivity measurement refers to the single - factor productivity of a single input to output. The main purpose of productivity measurement is to analyze how well resources are being used in the process of development and allows valuable insights into the long term growth potential of an economy. Productivity is often considered as a key source of economic growth and competitiveness, besides being a comparable indicator for international assessment.

Productivity growth can result from competitive improvements in innovation, reduced the technical inefficiency and technological diffusion (Pilat, 1996). Thus, diffusion of new technology is the result of openness to international competition that forces firms to adopt better efficient production processes at a micro level. This eventually reduces inefficiency and enhances productivity at all levels, especially in operation and management. However, one should not be confused in differentiating productivity and competitiveness. Productivity in general refers to the internal capability of an organization or country, while competitiveness refers to the relative position of them against the international market (Onsel et al., 2008). In contrast, competitiveness also depends on the productivity in which a nation uses its human, capital and natural resources. Although the defining competitiveness in exact terms is often difficult, this study presumed competitiveness as the ability of a nation to raise standards of living by enhancing sustainable growth by improving output, employment and eventually labor productivity to raise the ability to compete in the international market (Boltho, 1996 and Aiginger, 1998).

Another key driving factor behind the productivity and competitiveness within the growth model is structural change. Structural change, also known as structural transformation, can be generally defined as effective distribution of factors of production to achieve better productivity that is much needed in a

¹Refers to measurement of output per worker since Total factor productivity (TFP) highly regarded as a residual of inputs and a benchmark to capital productivity that includes performance of both labor and capital input,(See Isakkson, Ng, & Robyn, 2005; Duarte & Restuccia, 2010).

nation's development. The development is about how to transform the productive sector of an economy and accumulating capacity that is necessary to this process. Undeniably, structural change has been contributing to growth processes significantly by reallocating resources from low productivity sectors to high productivity sectors (Kuznet, 1966; Fan et al., 2003). If resources do not shift promptly to higher productive sectors or if there is no significant deepening², the transformation tends to be slow and stagnates the economy. Several observations had confirmed that the structuring of output and employment changes during the process of development and gaining a new sector is mostly at the expense of earlier sectors. For example, a fall in the agricultural sector was highly influenced by a rise in the manufacturing sector before a gradual gain in the service sector (Raiser, Schaffer & Schuchhardt, 2004). The most salient features of structural transformation in development are the secular decline in the agricultural share of output and employment with a consequential increase in the share of the industry and service sectors. Nevertheless, in contrast, structural change can also halt productivity growth if the economic structure fails in effective relocation of factor inputs (Sanchez & Roura, 2009). This study, therefore, examined the impact of structural change and competitiveness on labor productivity in the five ASEAN (ASEAN-5) member countries that are Singapore, Malaysia, Thailand, Philippines and Indonesia.

1.1 Background of Study

In the past four decades, many of the Asian nations have experienced rapid growth, but have also grown differences during the period. Several Asian countries, namely Japan, Hong Kong, Singapore, Taiwan and Korea have been experiencing significant structural changes over the four decades while the rest of the Asian economies are at a slow pace without significant deepening. Many economies are merely trapped in between development stages, particularly countries in the ASEAN region. Indeed, the major challenge now for some of the ASEAN-5 is to evade being trapped in the middle income stage. Despite developing a moderate level of industrial base and a larger service sector, most of these economies still remain in the middle income stage (Felipe, 2013). As ASEAN is entering a new phase of integration towards building the ASEAN Community by 2015, a profound understanding of issues related to growth is much needed to ensure successful cooperation and integration. Although the priority issues in growth may differ in each country, collectively it is imperative for ASEAN-5 to achieve effective structural reform through productivity and competitiveness improvement. As agriculture is still the largest employer and the shift of excess labor to a low productive service sector is 'bypassing industrialization'³, it raises serious concerns among the scientific community to further investigate this trending issue of 'partial industrialization' and its implications. This has been discussed in brief in the following subsection.

Typically, structural change occurs at shifts in the sector shares of GDP as income per capita rises (Nabar and Yan, 2013). At low levels of income per capita, the primary sector of agriculture contributes largely to GDP and overall employment. At the middle income level, the secondary sector of manufacturing and industry replaces the earlier role of the primary sector. As a nation advances, demand shifts extensively towards services while manufacturing expenditures and employment stabilize before relatively dropping. This development usually reflects the deindustrialization phase of an economy that is caused by differences in labor productivity between manufacturing and services. Consistent improvement of labor productivity in manufacturing implies greater pressure on the services sector to absorb excess labor from manufacturing. Thus, during the industrialization and deindustrialization processes, the services sector greatly absorbs both agriculture and later manufacturing employment. This process often referred as an inverted 'U' trend in the development process of advanced nations particularly in OECD countries. Finally, at a higher level of income, the economy moves into a service-based structure that contributes the biggest share to GDP value added and employment.

Based on the following graphical analysis Figure 1 to Figure 6 of structural transformation in ASEAN-5 from 1990 to 2012, development process appears to be not progressing as several economies seem to

²Refers to per worker output of capital input (see Felipe, 2013)

³Also known as partial industrialization that refers to shift of output and employment from agriculture to services by skipping industrialization and de-industrialization process (see Felipe, 2012).

"trapped" in development. The term 'development trap' generally refers to the inability of a country to shift from low level economic activity to high level activity in the development process. Indeed, this study had also attempted to examine the structural transformation in ASEAN-5 prior to 1990 to affirm prevalence of development trap in the development process.

1.1.1 Structural Change in ASEAN Growth

The analysis in Figure 1 and Figure 2 show structural transformation of value added output and employment in Indonesia from in the last 23 years between 1990 and 2012 respectively. Although the drop in the agriculture value added in line with its falling employment, agriculture's share of employment remains high at almost 40% of total employment until 2008. However, the least employed sector of industry with only 20% employment had contributed the largest 50% share of value added output during the most recent years.

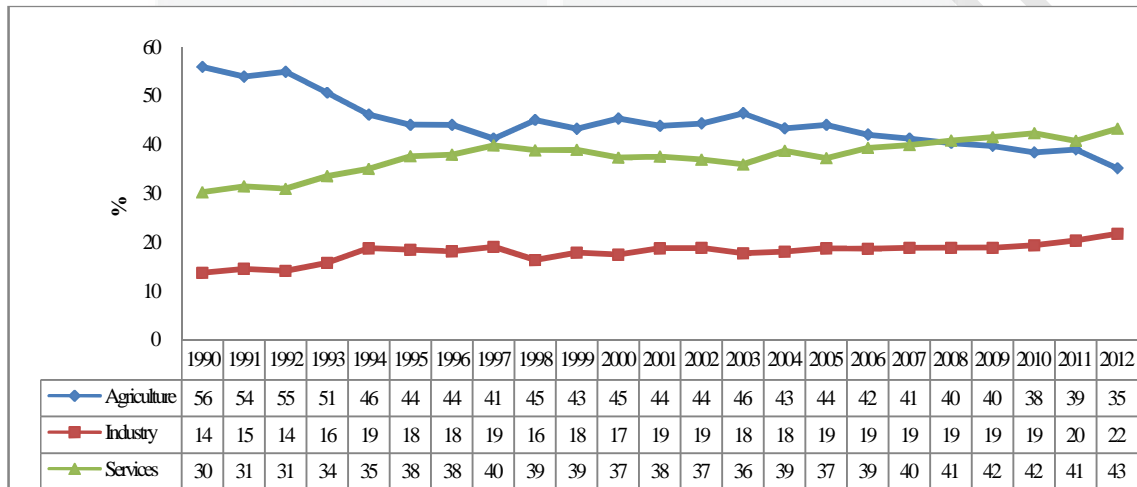


Figure 1. Employment share (% total employment) of Indonesia, 1990 to 2012
(Source: World Development Indicators Database, World Bank)

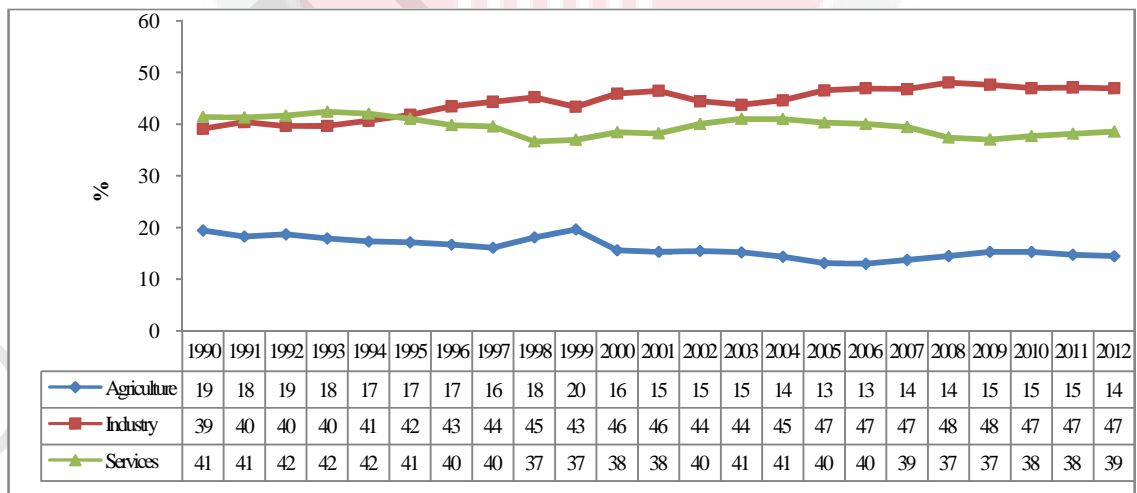


Figure 2. Value added output (% GDP) in Indonesia, 1990 to 2012
(Source: World Development Indicators Database, World Bank)

Ironically, the most employed sectors of Indonesian services had only contributed approximately 40% of value added output despite having employed 45% of the labor force.

The Figure 3 and Figure 4 show that the agriculture value added in Malaysia had plummeted from 15% to 10% as to fall in agriculture employment from 25% to 10% between 1990 and 2012. The second most employed sector of industry had seen a weaker improvement in industrial employment from 28% to 30% compared to its 40% ambiguous contribution to value added output over the last 23 years. However, the services sector employment had increased from 45% to above 60% while its value added output had only seen a small increment from 40% to below 50% share.

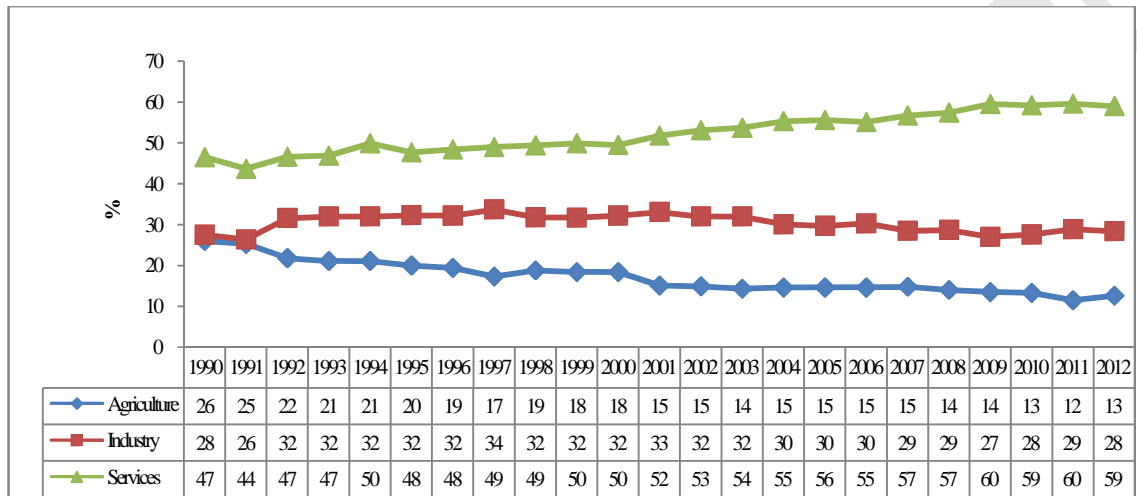


Figure 3. Employment share (% total employment) of Malaysia, 1990 to 2012
(Source: World Development Indicators Database, World Bank)

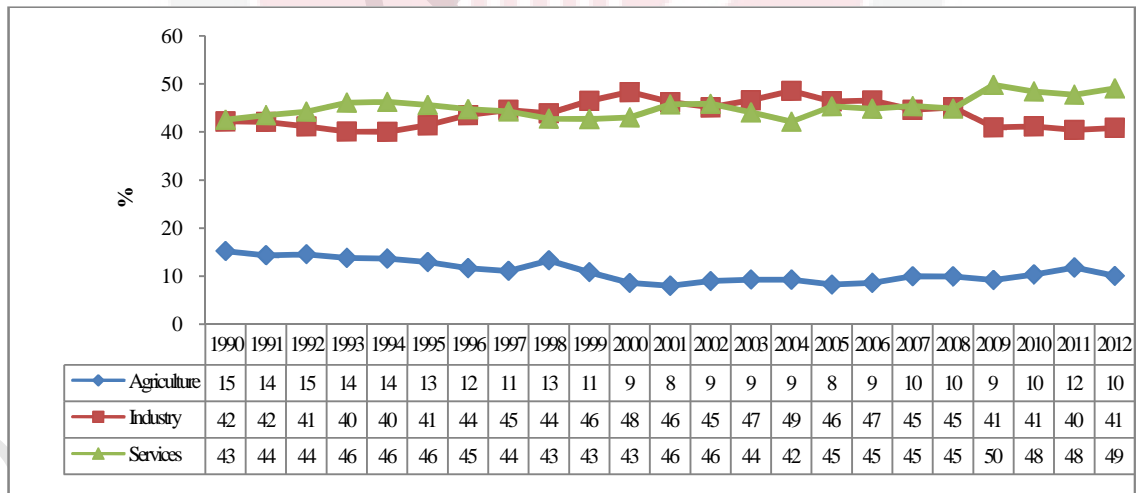


Figure 4. Value added output (% GDP) of Malaysia, 1990 to 2012
(Source: World Development Indicators (WDI) Database, World Bank)

Figure 5 indicates that agriculture employment in the Philippines had diminished from the highest 45% in 1990 to 30% as second most employed sector in 2012 compared to drop in output (Figure 6) from 20% to 10% during the same period. Industrial employment and output seem to maintain its share around 16%

and 30% respectively during the same observation period. The most employed sector of Philippines, services had increased its share of employment from 40% in 1990 to 53% in 2012 as of improvement in the value added output 40% to 60% respectively.

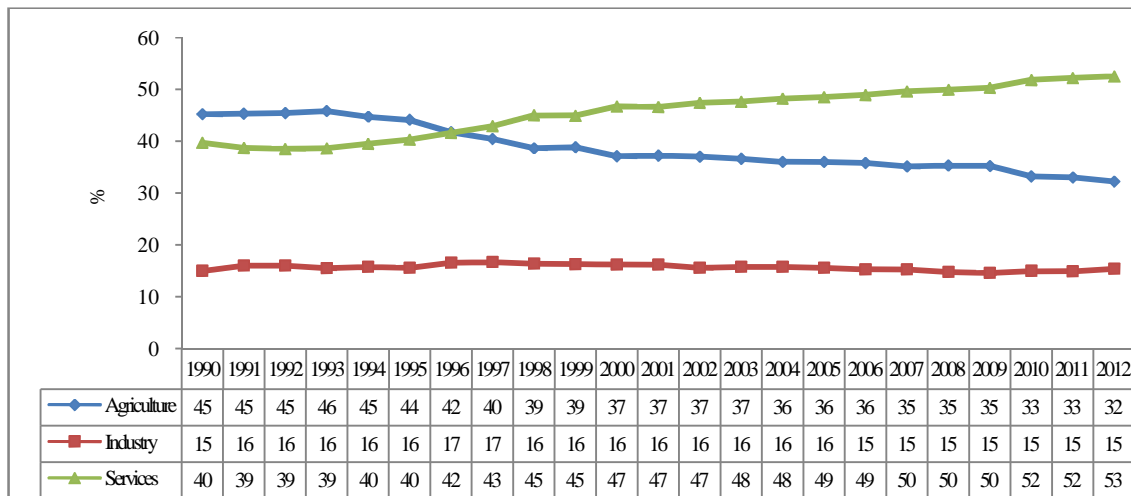


Figure 5. Employment share (% total employment) in Philippines, 1990 to 2012
(Source: World Development Indicators Database, World Bank)

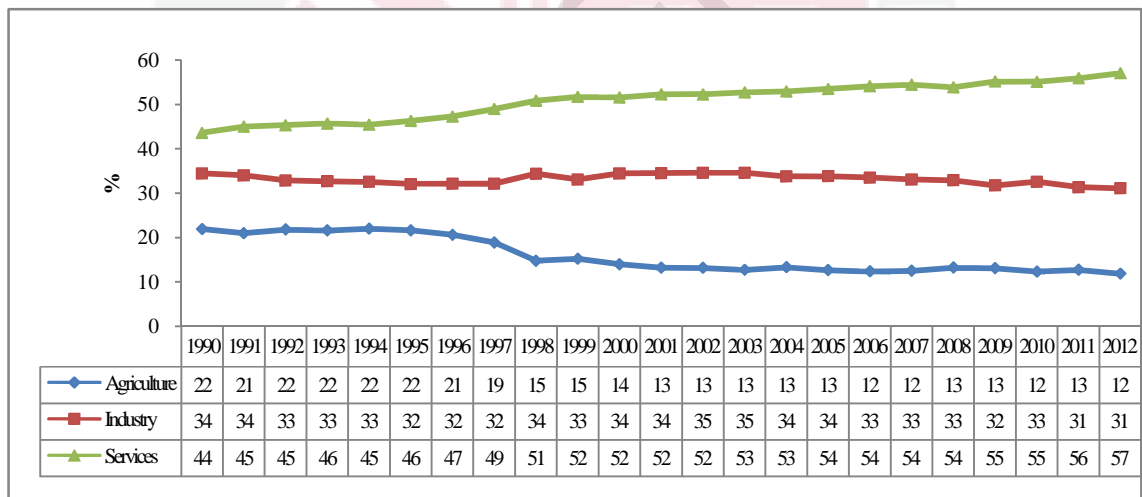


Figure 6 Value added output (% GDP) of the Philippines, 1990 to 2012
(Source: World Development Indicators Database, World Bank)

Structural transformation in Singapore (Figure 7 and Figure 8) implies that the share of agriculture employment and value added output remain below 1% between 1990 and 2012. However, industrial employment had seen a greater fall from 38% in 1990 to 22% in 2012 while its value added output remained hovering around 30% to GDP. Employment in services sector had increased steadily from 62% in 1990 to 74% in 2012 compared to slower growth of value added from 69% to 75% respectively.

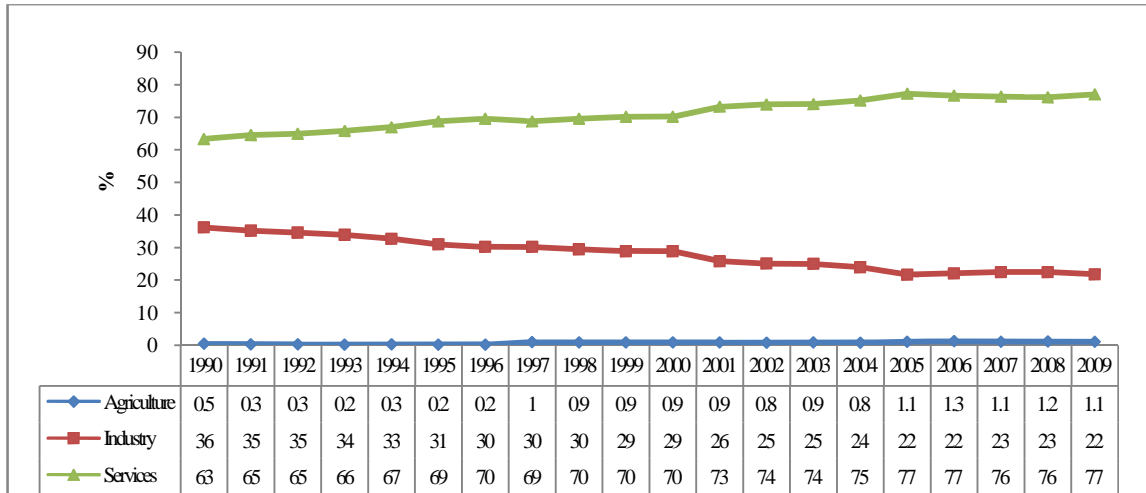


Figure 7. Employment share (% total employment) of Singapore, 1990 to 2012
 (Source: World Development Indicators Database, World Bank)

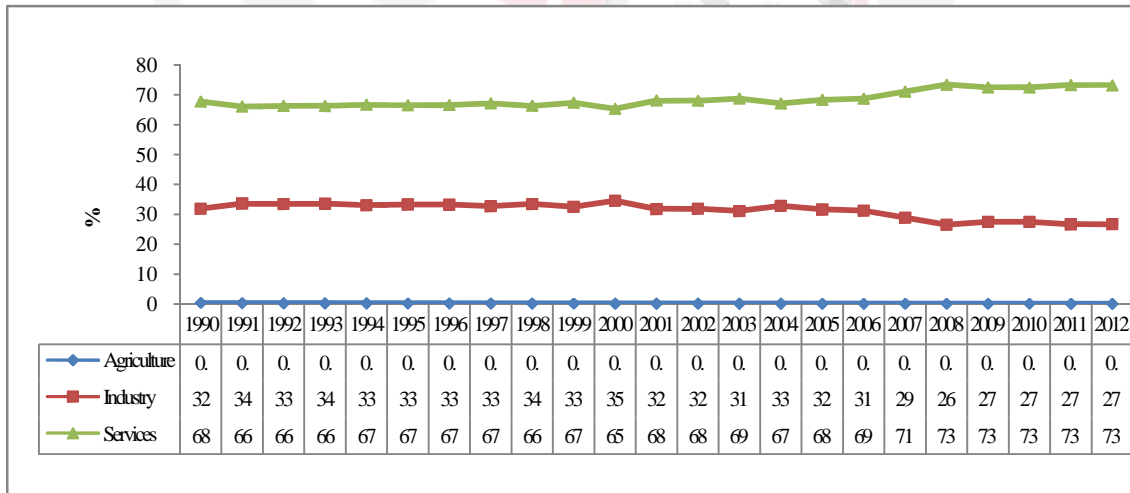


Figure 8. Value added output (% GDP) of Singapore, 1990 to 2012
 (Source: World Development Indicators Database, World Bank)

The figure 9 and Figure 10 show the structural transformation in Thailand from 1990 to 2012. Based on the graphical illustration, although agriculture employment had plummeted from 65% in 1990 to 40% in 2012, it still remains as top employed sector in 2012 equaling service sector share of employment. Agriculture value added output remained hovering around 12% throughout the observation period. In contrast to the rest of ASEAN-5, industrial employment in Thailand had seen higher absorption of 12% in 1990 to almost 20% in 2012 that resulted in a greater jump in the value added output from 31% to 47% during the respective time period. Services sector in Thailand had experienced diminishing contribution of the value added output from 50% in 1990 to 40% in 2012 despite having moved enormous share of employment from 20% to 41% respectively.

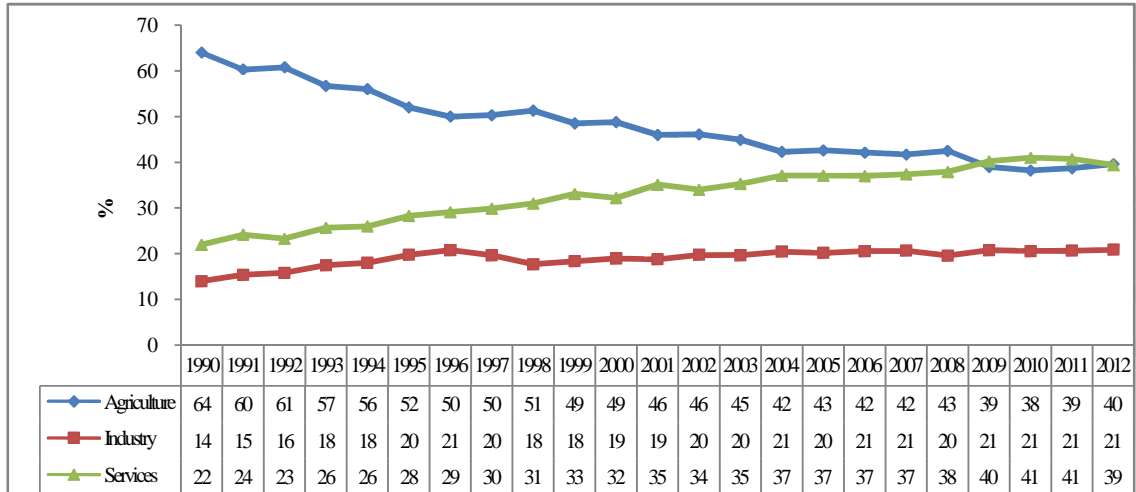


Figure 9. Employment share (% total employment) of Thailand, 1990 to 2012
 (Source: World Development Indicators Database, World Bank)

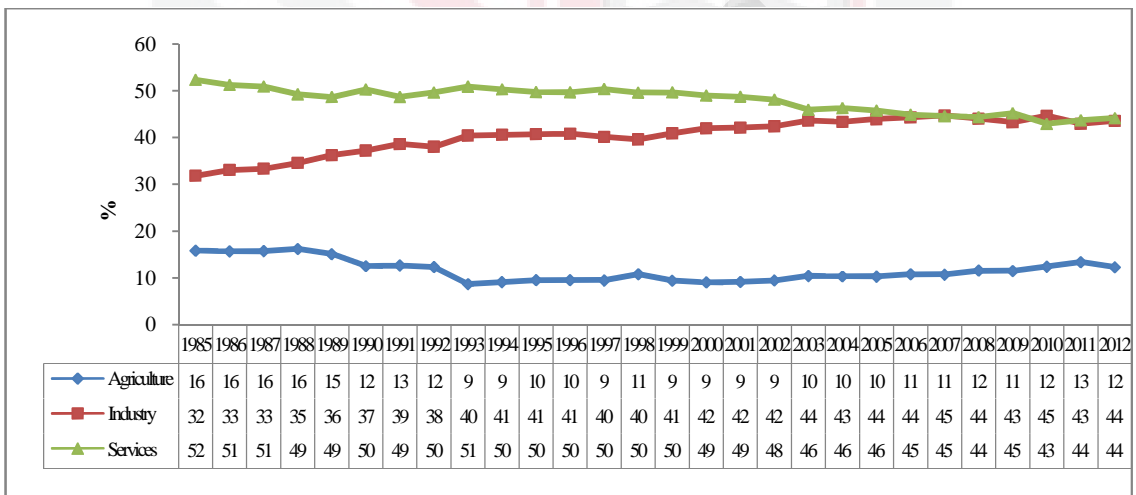


Figure 10. Value added output (% GDP) of Thailand, 1990 to 2012
 (Source: World Development Indicators Database, World Bank)

At a glance, agriculture output in ASEAN-5 is still hovering at a relatively substantial rate of 10% to 20% of GDP in the last two decades, except in Singapore that is below 1%, significantly lower than the 5% benchmark in developing economies, especially in Australia and Japan (3%), United Kingdom and United States (2%) (Felipe, 2012). Employment in Thailand and Indonesia still heavily depends on agriculture with between 30% and 40% of total employment almost equaling services employment. Although this trend seems to drop gradually, it raises serious concern on its labor productivity imbalance. Identical industrial value added in Indonesia, Malaysia and Thailand show that industry contributes around 40% to GDP, similar to the services share of output growth. Nevertheless, the employment share of industry in these countries contributes a smaller share below 30% in total employment compared to the higher services share of 40% and 60% in Indonesia, Thailand and Malaysia respectively.

The continuing development of "industrial bypassing" or "partial industrialization" in ASEAN has been extensively examined by several international organizations like the Asian Development Bank (ADB) and the World Bank. Often, industrialization is a process much needed in development that difficult to bypass in order to become a high income nation (Felipe, 2012). During the industrialization process, share of industry will increase up to a threshold point before the decline to mark de-industrialization. An economy is considered industrialized and de-industrialized in both output and employment if it satisfies two criteria. First, an industrialized country shall attain at least 18% shares of output and employment in any seven years moving average for a 42 % chance of achieving high income nation while only 5% chances for economies with smaller manufacturing sector (Felipe, 2012). Second, a country is considered de-industrialized if at least a 5% point difference is attained between the maximum and the average of output and employment (Felipe, 2012). However, according to the ADB report (Table 1), none of the ASEAN-5 satisfies both criteria except for industrialization. Although all of the ASEAN-5 countries have industrialized in output, several economies still have not attained the industrialized stage in employment. Similarly, deindustrialization has been a major challenging factor for all of the ASEAN-5. Being an "Asia factory," Singapore seems to be advanced only in employment while its manufacturing output is still at the industrialized and not de-industrialized stage. Both the manufacturing employment and output of Malaysia has just industrialized and has not de-industrialized. Consequently, for the rest of the ASEAN-5, namely Indonesia, Philippines and Thailand, manufacturing employment still have not been industrialized despite the already industrialized output.

Table 1. Industrialization, deindustrialization and nonindustrialization in ASEAN-5

	Industrialized and De-industrialized	Industrialized and not de-industrialized	Not industrialized
Indonesia		Output	Employment
Malaysia		Output & employment	
Philippines		Output	Employment
Singapore	Employment	Output	
Thailand		Output	Employment

Source: ADB Report, 2012

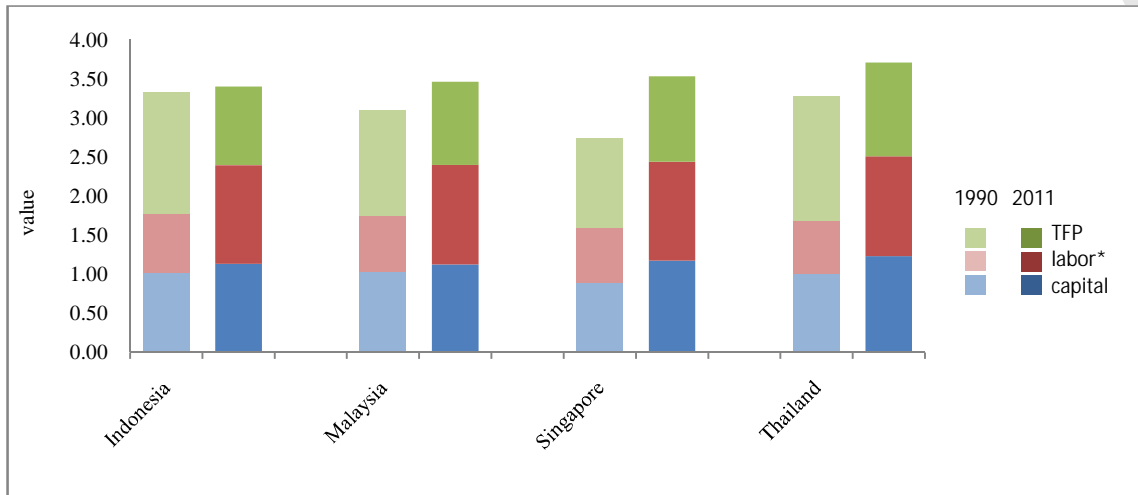
Based on the above background, structural change in ASEAN-5 in the last two decades can be summarized as below;

- 1) Although the agriculture sector no longer is the largest contributor to GDP in ASEAN-5, agriculture employment still accounts for the biggest share in total employment in Indonesia, Philippines and Thailand. In other words, more labor employed in the agriculture sector was producing lesser output with relatively low output per worker in a less efficient and unproductive environment.
- 2) Despite the positive industrialization trend in the ASEAN-5, advancement towards de-industrialization seems to be vague as industrial employment is trapped within the not-industrialized stage.
- 3) Despite having to move labor from traditional agriculture to modern services sector, services is unable to contribute a relatively bigger output share, compared to the industry in the most of ASEAN-5 except in Singapore and Philippines.

1.1.2 Productivity growth in ASEAN-5

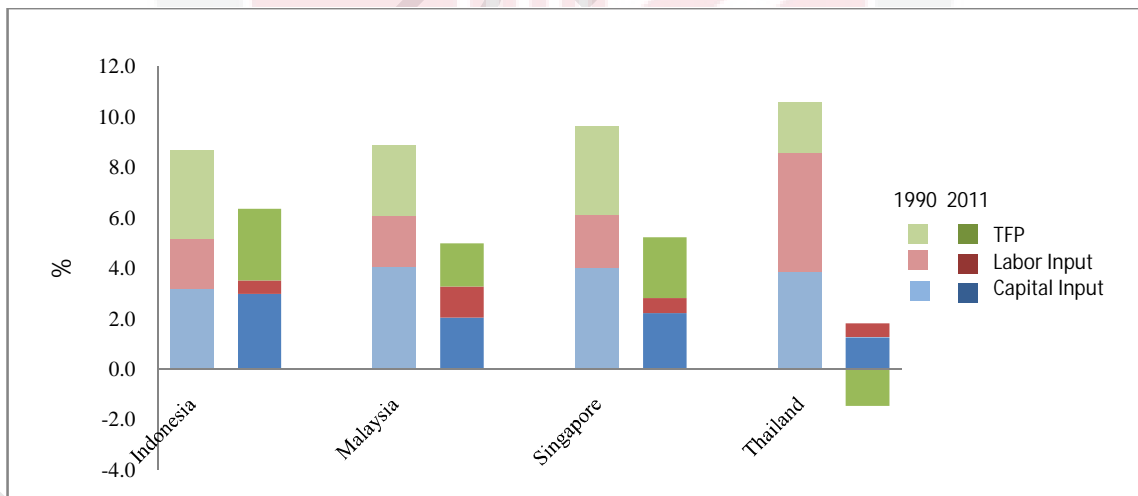
Over the decades, economic growth in Asia has been predominantly influenced by the contribution of capital input; however the role of labor input should not be underestimated (Felipe, 2013). Based on the Productivity Index of Asian Productivity Organization (APO) shown in Figure 11, ASEAN-5 economies

had a slower increase in aggregate productivity⁴ in 2011 compared to 1990⁵. In general, labor productivity plays a bigger role in overall aggregate productivity around a 1.5 point index in 2011, up from below a 1 point value of 1990. Labor productivity accounted for almost half of overall productivity compared to the combined half of total factor productivity (TFP) and capital productivity. Despite minor improvements in overall aggregate productivity, output growth in ASEAN-5 (Figure 12) dropped in 2011 compared to 1990, indicating a possible lead into an income trap.



*based on hours worked.
Data for the Philippines is not available.
Based on Year 2000=1

Figure 11. Aggregate Productivity Share in ASEAN-5, 1990 and 2011
(Source: APO database 2013.01)



*Data for Philippines not available

Figure 12. Output Growth Share in ASEAN-5, 1990 and 2011
(Source: APO database 2013.01)

⁴ Refers to sum of labor productivity, capital productivity and TFP

⁵ Data limited to 2011 due to changes in disaggregated measurement

Thailand faced a huge reduction in output growth from 10% in 1990 to below 2% in 2011 due to the negative contribution of TFP. Except for Thailand, both capital and TFP inputs rendered highly positive impact on output growth more than the labor input in contrast to the contribution to aggregate productivity.

GDP income per person employed,⁶ or in the more accepted term of labor productivity in Figure 13 indicates Singapore at the top position, having successfully surpassed other Asian advance economies like Japan and South Korea (Korea, Republic) from below USD \$30,000 in 1990 to USD \$50,000 in 2012 with relatively smaller labor input compared to other ASEAN-5 members. Labor productivity in Indonesia, Malaysia, Philippines and Thailand are increasing at slower rates similar to growth in overall aggregate productivity. Overall, although capital input contributed positively to the output growth in this region, especially in the major ASEAN-5 member countries, labor productivity and TFP still play pivotal roles in aggregate productivity, an important factor in the effective economic transformation. A country that ensures effective labor reallocation in production eventually attains a higher value from each person employed in the economy.

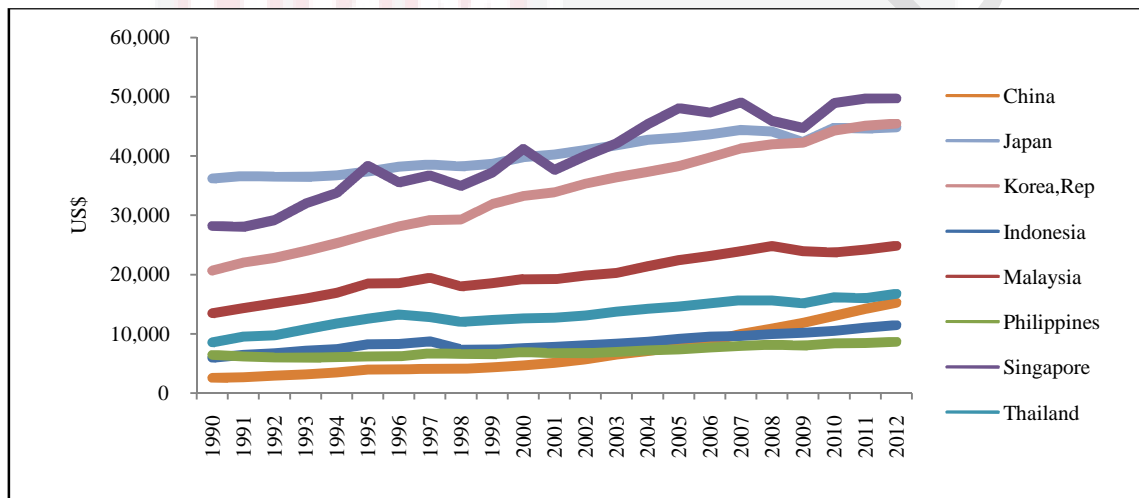


Figure 13. GDP per person employed (labor productivity) at constant purchasing power parity (PPP) 1990

(Source: World Bank. World Development Indicators Database)

1.1.3 Competitiveness in ASEAN Growth

The competitiveness term is often subject to debate and so far is not uniformly defined or measured. Several sources define competitiveness as the long term potential of growth related to productivity, while others link it to exchange rate value in the short term (Porter, 1990; Reinert, 1994; Krugman, 1994). Nevertheless, this study defined competitiveness in the former term in accordance with the World Economic Forum (WEF) and European Commission (EC) as productivity is a long term determinant of competitiveness. Changes in the sectoral production share are closely related to its structural transformation and productivity. Growth in one sector is often from changes of the other sectors or causes changes in the latter. Structural changes from a high level of agricultural production to manufacturing and ultimately to the services sector illustrates that technological progress; productivity growth and sectoral income elasticity are major factors in this process (Krüger, 2008; Silva and Teixeira, 2008).

⁶ Cross country comparison of per-worker measure of labor productivity performance is based on companionable definition with reference to GDP per worker. See APO Databook 2013.

The competitiveness of a country or region determines the achievement of economic outcome, especially GDP per capita at purchasing power parity (PPP). Since GDP per capita at PPP (Figure 14) measures the ratio between output and employment, it is generally accepted as a key determinant of the actual standard of living in a country (Wong, Shankar & Toh, 2010). Overall, the growth of income or prosperity in ASEAN-5 is largely moving at a slower pace between the members, with the exception of Singapore. Indeed, GDP per capita of Singapore increased tremendously above Japan and Korea while the rest of ASEAN-5 still below the yearly average⁷.

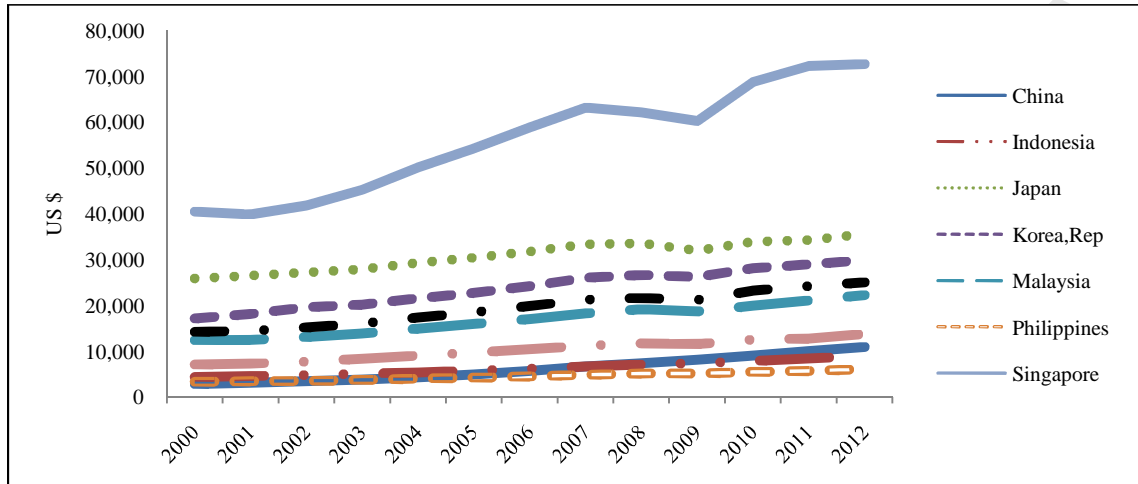


Figure 14. GDP Per capita at PPP, 2000 to 2012
(Source: World Bank. World Development Indicators Database)

Besides that, Singapore has achieved the highest per capita income within the ASEAN-5 with the second highest global competitiveness ranking (Table 2). Obviously, these positions are conditioned by the development of the innovation driven stage. Based on the economic theory on stages of development, a country in the factor-driven stage competes based on its factor endowment of natural resources and unskilled labor that is primarily less productive. As a country gains a better competitive position that improves labor productivity, it will move into the efficiency-driven stage. In this case, Thailand and Indonesia are already at stage 2 of being efficiency-driven while Philippines are in a transition process. Malaysia seems to be at an advanced transition stage of development between stage 2 of efficiency-driven and the final stage of innovation-driven.

Singapore's phenomenal trend is consistent with its lead position in the global competitiveness (Figure 15) improved from 5.46 index value in 2006-2007 to 5.61 in 2013-2014 leaving behind other advanced Asian countries like Japan, South Korea and China. Beside Singapore, competitiveness performance of Philippines and Indonesia also up from 3.98 and 4.18 in 2006-2007 to 4.29 and 4.53 in 2013-2014 respectively. However, competitiveness of Thailand and Malaysia appear weakened from 4.76 and 5.15 in 2006-2007 to 4.54 and 5.03 index value in 2013-2014 respectively. In general, global competitiveness performance in ASEAN-5 between 2006 and 2014 appears to be weak without significant upgrading.

⁷Yearly average refers to average calculation for the indicated countries only

Table 2. Development Stages of ASEAN-5 based on Income, 2013-2014

GDP per-capita (US\$) thresholds	Stage 1 Factor Driven	Transition (Stage 1 to 2)	Stage 2 Efficiency-driven	Transition (Stage 2 to 3)	Stage 3 Innovation – driven	Global Ranking
>17,000					Singapore	2
9,000 – 17,000				Malaysia		24
3,000 – 8,999			Thailand Indonesia			37 38
2,000 – 2,999		Philippines				59
<2,000						

Source: Global Competitiveness Report, 2013-2014

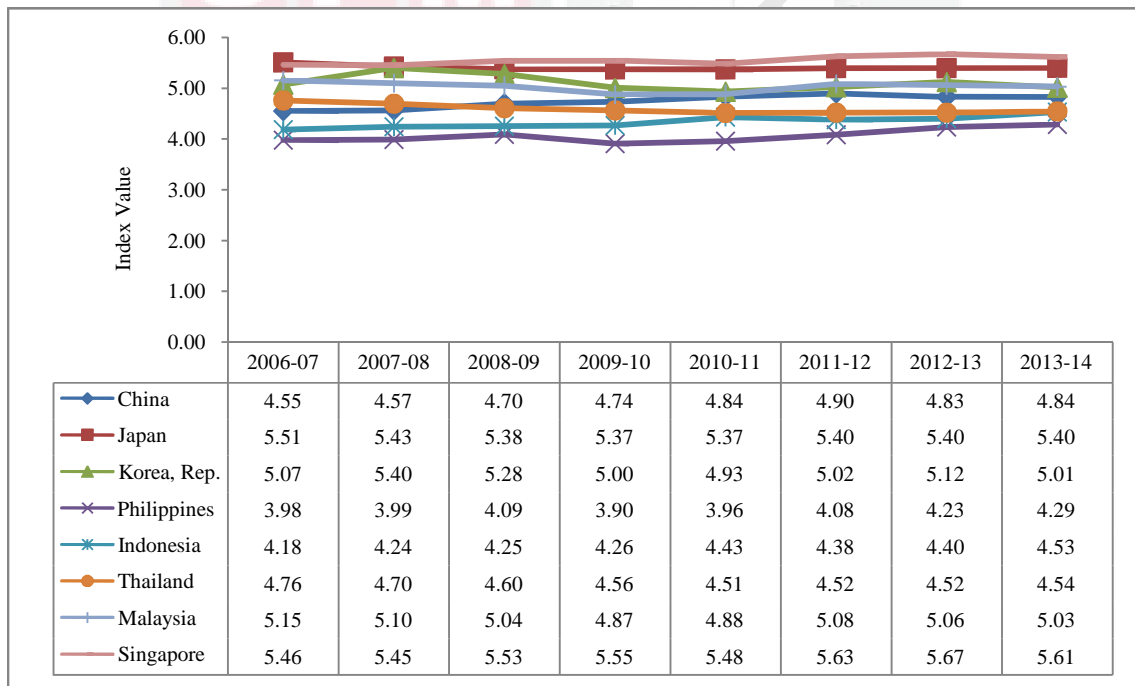


Figure 15. Economic Competitiveness of Asia, 2006 to 2014
(Source: Global Competitiveness Report (GCR) ,World Economic Forum)

In a more specific observation, other competitiveness indicators that are closely linked to labor productivity include Information and Communication Technology (ICT) such as fixed broadband and mobile phone subscription, human capital development, such as secondary and tertiary enrollment as well as other competitive enabler indicators of foreign market size and Foreign Direct Investment (FDI) (Carayannis & Grogoroudis, 2012; Alvarez & Marin, 2013; World Bank, 2005). There are approximately 25.4 persons in 100 people subscribe to fixed broadband services (Figure 16) in Singapore in 2012 compared to only 8.4 persons (Malaysia), 6.5 (Thailand), 2.2 (Philippines) and 1.2 (Indonesia). Similarly, mobile phone subscription per 100 persons also found to be higher in Singapore with 153 persons compared to 141 (Malaysia), 120 (Thailand), 115 (Indonesia) and 107 (Philippines).

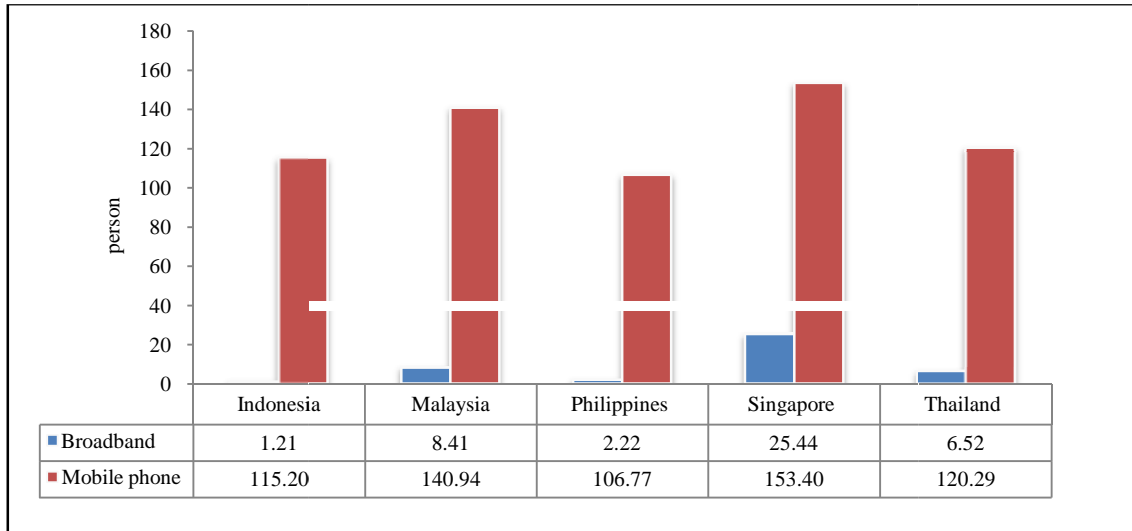


Figure 16. Fix broadband and mobile phone subscription per 100 persons in ASEAN-5, 2012
(Source: World Development Indicators Database, World Bank)

Beside ICT, human capital development, especially secondary and tertiary enrollment (Figure 17) in Singapore also appear to project lead performance with almost 107% in 2012 compared to 67% (Malaysia), 83% (Indonesia), 85% (Philippines) and 78% (Thailand) likewise the tertiary education in Singapore indicates 81% enrollment compared to the rest of ASEAN-5 36% (Malaysia), 32% (Indonesia), 46% (Thailand) and 28% (Philippines).

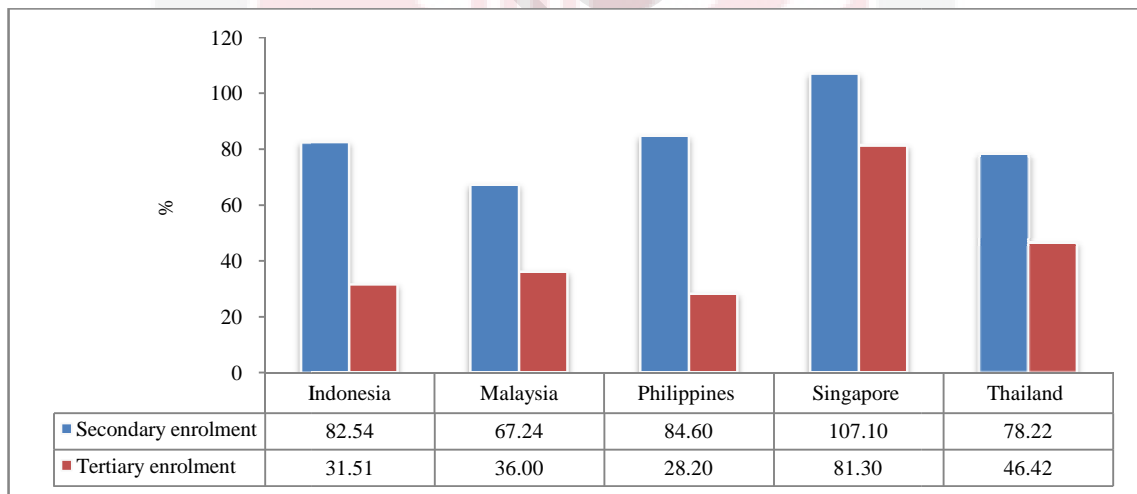


Figure 17. Secondary and tertiary enrollment (gross %) in ASEAN-5, 2012
(Source: World Development Indicators Database, World Bank)

In addition, other competitiveness enabler indicators of foreign market size and FDI suggest that Singapore remains at the top compared to the rest of ASEAN-5 in 2012 (Figure 18). Foreign market size of Singapore stood at six point index value compared to 5.9 (Thailand), 5.8 (Malaysia), 5.6 (Indonesia) and 5.1 (Philippines). Similarly, FDI in Singapore registered 5.8 index value in comparison 5.3 (Malaysia), five point index value in the Philippines, 4.9 (Thailand) and 4.8 (Indonesia).

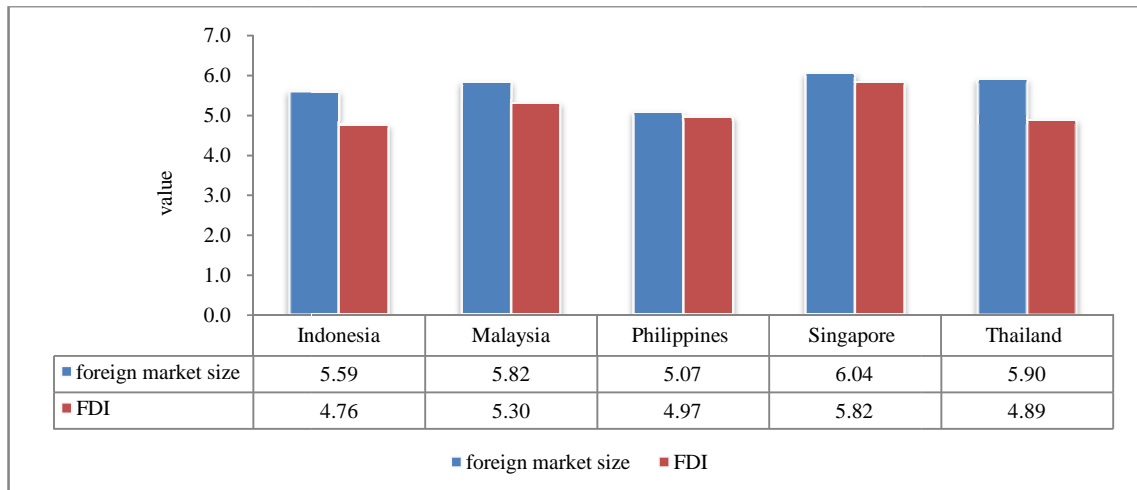


Figure 18. Foreign market size and FDI index of ASEAN-5, 2012

Source: Global Competitiveness Report, 2012-2013

Based on graphical analysis, all of ASEAN-5 except for Singapore appears to be attained a weaker comparable performance in competitiveness indicators. Although Indonesia and Philippines, begin to show positive improvement in their competitiveness, Thailand has been less competitive lately compared to the year 2006. However, labor productivity and per capita income of Thailand seem to be an exception to its sliding performance of competitiveness. Several patterns that stand out from these observations include firstly, ASEAN-5 countries attain comparable positions in income and competitiveness despite similar patterns of structural transformation and labor productivity. Secondly, favorable structural change and competitiveness in the ASEAN-5 are important factors that improve the nations' income level and productivity.

1.2 Problem Statement

The salient economic transformation is obviously the most desired condition for any nation to achieve higher income status. However, the effective transformation requires profound knowledge on sources of economic changes in the national and international levels. The key important features of structural change require the process where an economy moves from subsistence agriculture to a modern industrial sector that absorbs an increasing proportion of the labor force (Jorgenson, 1966; Ranis & Fei, 1961; Robinson, 1971). However, in most of the ASEAN-5, the drop in agricultural employment is still weak compared to its value added output. . Ironically, a tremendous increase in services employment, rather than in the industrial sector is inconsistent with the observed trend of inverted "U" in industrialized nations in the EU and several Asian countries such as Germany, Britain and Japan. Commonly, output and employment share of industry, especially the manufacturing tend to increase to a certain level of income at first due to the industrialization process before decline during deindustrialization phase (Felipe, 2012). This is mainly as a result of efficient reallocation of economic activity from low productivity to high productivity sectors and renders a positive effect on structural change.

Ironically, structural change may have a negative impact on aggregate productivity growth if resources shift to sectors with slower productivity growth. With regards to the reallocation of resources from the low productive agriculture sector to the high productive sector of industry, it was again overlapped by the low productive services sector in all the ASEAN-5 except for Singapore. Industrial value added contributed a relatively higher share to GDP despite a lower employment rate, whereas agriculture and services contributed a lesser value added using higher labor input. The general inference at this point indicates that although output per worker or labor productivity in the services sector tends to be little higher than

agriculture, it is still low compared to labor productivity in the industrial sector that contributes almost as high as the services share in GDP growth.

Despite decreasing labor input to output growth, labor productivity contributes almost an equivalent share as TFP in the ASEAN-5. It is therefore labor productivity has been the central focus of this study in examining structural change in ASEAN-5. However, to what extent structural change in the ASEAN-5 influences its labor productivity remains unanswered and has not been empirically analyzed much so far. Therefore, this study evaluated the intermediate mechanism between sectoral labor reallocation and labor productivity.

Economic performance ultimately hinges on the competitive performance of firms and industries at the disaggregate level of national and international performance at an aggregated level. Therefore the preparation of the necessary elements to monitor competitiveness provides impetus to knowledge on the link between competitiveness, structural change and labor productivity. Often, this knowledge is obtained from the industrial structure of specialization capabilities at the firm level. Therefore, monitoring industrial structure requires close attention to structural upgrading between and within sectors.

Based on the background of this study, competitiveness of ASEAN-5 appears to be weak with ambiguous performance, especially in the fast growing economies of Malaysia and Thailand. Despite positive improvement in the less advanced economies of the Philippines and Indonesia, income level of these economies does not improve much compared to the leader Singapore. Besides that, it was also obvious that competitiveness performance of ASEAN-5 has established strong linkage between income, labor productivity and other competitiveness enabler indicators, ICT, human capital and macroeconomic factors. Nevertheless, what is less known to date is whether the above mentioned competitiveness indicators contribute significantly to the labor productivity growth that is highly needed in the salient structural transformation in the ASEAN-5.

1.3 Research Questions

The major questions to address this issue require stronger empirical analysis that can establish the relationship between economic structure and overall productivity growth:

- 1) How does structural change contribute to ASEAN-5 labor productivity growth?
- 2) To what extent have the factors of competitiveness been influencing labor productivity within ASEAN-5 members?

1.4. Research Objective

This study aimed to:

- 1) Investigate the contribution of structural change to labor productivity growth in ASEAN-5.
- 2) To ascertain the role of competitiveness in labor productivity of ASEAN-5.

1.5. Significance of Study

The review drawn from previous literatures were insufficient in explaining the characteristics of structural transformation at the sectoral levels and how agriculture, industry and services affects the overall performance of labor productivity with reference to competitiveness levels. So far, this has not been studied empirically in depth from the ASEAN perspective, except for a number of related studies in the European Union (EU) region. Although theoretical review of structural change greatly emphasized the role of labor productivity in the development process, the vast majority of studies seemed to be interested in finding the general view of structural change in single sector using multiple-factor approach of total

factor productivity (TFP). Therefore, this study closed the literature gap and shed light upon the relationship between structural change, and labor productivity from 1976 to 2005 while the contribution of competitiveness from 2006 to 2012. Indeed, the analysis in two different time period renders most valuable substance between the past performance of structural change and competitiveness in ASEAN-5. In addition, it also provides an historical insights for framework and future policy formulation at the national level that directly affect resource reallocation towards the most productive sector to be free from the transformation "trap." The remainder of this study arranged as follow. The detail debate on literature review presented in the Chapter two followed by methodological analysis in Chapter three, results and discussion in Chapter four and conclusion in Chapter five.



REFERENCES

- Abramovitz, M. (1986). Catching up, forging ahead and falling behind. *Journal of Economic History*, 46(2), 385-406.
- Aghion, P., Howitt, P. (2006). Joseph Schumpeter Lecture Appropriate Growth Policy: A Unifying Framework. *Journal of the European Economic Association*, 4, (2-3), S. 269314.
- Aiginger K. (1998). A framework for evaluating the dynamic competitiveness of countries. *Structural Change and Economic Dynamics*, 9(2), 159-188
- Alvarez, I., Marin, R. (2013). FDI and technology as leveraging factors of competitiveness in developing countries, *Journal of International Management*, 19(3) 232-246
- APO productivity Database (September 30, 2014). Retrieved 10th, December, 2014, from <http://www.apo-tokyo.org/wedo/measurement>
- Ark, Inklaar & McGuckin (2003). *ICT and productivity in Europe and the United States where do the differences come from?* Working Paper Series EPWP 03 (05). The Conference Board and Growth and Development Center retrieved from http://www.conferenceboard.org/publications/publication_detail.cfm. Publication id = 1124.
- Ark & Inklaar (2005). *Catching up or getting stuck? Europe's troubles to exploit ICT's productivity potential*. Research Memorandum GD-79, Groningen Growth and Development Centre. Retrieved from www.euklems.net/pub/no7.pdf.
- Ashby, L.D. (1968). The shift-share analysis: A reply. *Southern Economics Journal*, 34(3), 423-425.
- Boltho, A. (1996). The assessment: International competitiveness. *Oxford Review of Economic Policy*, 12 (3), 1-16. DOI: 10.1093/oxrep/12.3.1
- Broeck M.D, Guscina A & Mehrez G. (2012). *Assessing competitiveness using industry unit labor cost: An application to Slovakia*. IMF working paper WP/12/107. International Monetary Fund (IMF). Retrieved from <http://www.imf.org/external/pubs/cat/longres.aspx?sk=25881>
- Carayannis, E., & Grigoroudis, E. (2012). Linking innovation, productivity, and competitiveness: Implications for policy and practice. *Journal of Technology Transfer*, 39 (2), 199-218. DOI 10.1007/s10961-012-9295-2.
- Carayannis, E., & Gonzalez, E. (2003). *Creativity and innovation = competitiveness? When, how, and why?* In L. V. Shavinina (Ed.), *The international handbook on innovation* (pp. 587-606). Amsterdam: Pergamon.
- Carayannis, E. G., & Sagi, J. (2001). "New" vs. "old" economy: Insights on competitiveness in the global IT industry. *Technovation*, 21(8), 501-514.
- Chenery, H.B. (1960). Patterns of industrial growth, *American Economic Review*, 50 (4), 624-654.
- Chenery, H.B., & Taylor, L. (1968). Development Patterns: Among Countries and Over Time. *The Review of Economics and Statistics*, 50(4), 91-416.
- Duarte, M. & Restuccia, D. (2010). The role of the structural transformation in aggregate productivity. *Quarterly Journal of Economics*, 125(1), 129-173. DOI: 10.1162/qjec.2010.125.1.129

- Easterly, W., & Levine, R. (2002). *It's not factor accumulation: Stylized facts and growth models*. Working Paper 164, Central Bank of Chile, Santiago.
- Estabén, J. (1999). *Regional convergence in Europe and the industry-mix: A shift-share analysis*. Institut d'Anàlisi Econòmica, CSIC, Barcelona.
- Estabén, J. (1972). Shift-share analysis revisited. *Regional and Urban Economics*, 2(3), 249-261.
- Expanding Opportunities and Building Competencies for young people; A new agenda for secondary education (2005)*. The International Bank of Reconstruction and Development. The World Bank.
- Fagerberg, J., Sollie, G. (1987). The method of constant market share analysis reconsidered. *Applied Economics*, 19(12), 1571-1583. DOI:10.1080/00036848700000084
- Fagerberg, J. (2000). Technological progress, structural change and productivity growth: A comparative study. *Structural Change and Economic Dynamics*, 11(4), 393-411.
- Fagerberg, J., Srholec M. (2007). The competitiveness of nations: Why some countries prosper while other fall behind. *World Development*, 35(10), 1595-1620.
- Fan S., Zhang X., & Robinson S. (2003). Structural change and economic growth in China. *Review of Development Economics*, 7(3), 360-377. DOI: 10.1111/1467-9361.00196
- Felipe, J. (2012). *Tracking the middle-income trap: What is it, who is in it, and why? Part 1*, Working Paper Series No.306, ADB Economics.
- Foellmi, R., & Zweimüller, J. (2005). *Structural Change and the Kaldor Facts of Economic Growth*. IEW - Working Papers 111, Institute for Empirical Research in Economics - University of Zurich.
- Godin, B., (2004). The obsession for competitiveness and its impact on statistics: The construction of high-technology indicators. *Research Policy*, 33(8), 1217-1229.
- Griffith, R., Redding, S., & Reenen, J.V. (2004). Mapping the two faces of R&D: Productivity growth in a panel of OECD industries. *The Review of Economics and Statistics*, 86 (4), 883-895.
- Grossman, G., & E. Helpman. (1991). Quality ladders in the theory of growth. *Review of Economic Studies*, 58(1), 43-61.
- Grupp, H., & Maital, S. (2001). *Managing new product development: A microeconomic toolbox*. Cheltenham and Northampton: Edward Elgar Publishing.
- Godin, B. (2004). *The obsession for competitiveness and its impact on statistics: The construction of high-technology indicators*. Working Paper No.25, Canadian Science and Innovation Indicators Consortium (CSIIC).
- Gordon, R.J. & Sichel, D.E., (2002). *Productivity Growth and the New Economy*. Brookings Papers on Economic Activity, 2002(2), 245-262. DOI: 10.1353/eca.2003.0005.
- Gouyette, C., & Perelman, S. (1997). Productivity convergence in OECD service industries. *Structural Change and Economic Dynamics*, 8(3), 279-295.
- Herrndorf B., Rogerson R., & Valentinyi A. (2013). *Growth and structural transformation*. NBER Working Paper Series 18996. Retrieved from <http://www.nber.org/papers/w18996>.

- Ibrahim A.R., & Muhamad A. W., (1-4 August 2000). *Productivity measurement in the services sector*. Report on the APO Symposium on Productivity Measurement in the Service Sector, Kuala Lumpur, Malaysia (SYP-12-00). Published by the Asian Productivity Organization. Retrieved from http://www.apo-tokyo.org/00e-books/IS-12_ProdMeasure.htm
- Isaksson, A., Ng, T.H., & Robyn, G. (2005). *Productivity in developing countries: Trends and policies*. United Nation Industrial Development Organization, Vienna.
- Jong P. D., & Tsiachristas A.(2008) . *Can labour force participation growth and productivity growth be combined?*. Spring Review by the SYSDM Correspondent for the Netherlands. European Employment Observatory.
- Jorgenson, D. (1966). The embodiment hypothesis , *Journal of Political Economy*,74(1), 1-17.
- Kalbacher, J.Z. (1979). Shift-share analysis: A modified approach. *Agricultural Economics Research*, 33(1).
- Kao, C., Wu, W.Y., Hsieh, W.J., Wang, T.Y., Lin, C. & Chen, L.H. (2007). Measuring the national competitiveness of South Asian countries. *European Journal of Operational Research*, 187, 613-628.
- Ketels, C.M. (2006). Michael Porter's competitiveness framework: Recent learnings and new research priorities. *Journal of Industrial Competitiveness Trade*, 6(2), 115-136. DOI 10.1007/s10842-006-9474-7.
- Knudsen, D.C. (2000). Shift-share analysis: further examination of models for the description of economic change. *Socio-Economic Planning Sciences*, 34 (3),177-198.
- Krugman, P. (1994). Competitiveness: A Dangerous Obsession. *Foreign Affairs*, 73(2), 28-44.
- Kuznet, S. (1966). *Modern economic growth: Rate, structure and spread*. New Haven and London: Yale University Press, New York: pp.529.
- Kuznets, S. (1971). *Economic growth of nations*, Cambridge: Harvard University Press.
- Laitner J. (2000). Structural change and economic growth. *Review of Economic Studies*, 67(3), 545-561
- Lucas, R.E.(1993). Making a miracle. *Econometrica*, 61(2), 251-272.
- Lucas, R.E.(1988). On the mechanics of economic development," *Journal of Monetary Economics*, 22(1), 3-42.
- Mitschke, A. (2008). *The influence of national competition policy on the international competitiveness of nations*. Physica-Verlag, A Springer Company, Germany. DOI: 10.1007/978-3-7908-2036-2.
- Murphy, K.M., Shleifer, A., & Vishny, R.W. (1989). Industrialization and big push. *Journal of Political Economy*, 97(5), 1003-1026.
- Nabar, M., & Yan, K. (2013). *Sector-level productivity, structural change, and rebalancing in china*. IMF Working Paper WP/13/240, International Monetary Fund,
- Nelson, R.R., & Winter, S.G. (1982). *An evolutionary theory of economic change*. The Belknap Press of Harvard University Press. P.195-246.

- Onsel, S., Ulegin, F., Ulusoy, G., Aktas, E., Kabak, O., & Topcu Y.I. (2008). A new perspective on the competitiveness of nations. *Socio-economic Planning Sciences*, 42(4), 221–246.
- Peneder, M. (2002). Industrial structure and aggregate growth. *Structural Change and Economic Dynamics*, 14(4), 427-448.
- Pilat, Dirk. (1996). *Labour productivity levels in OECD countries: Estimates for manufacturing and selected service sectors*. Working Paper No. 169.OECD. Retrieved from <http://www.oecd-ilibrary.org/> .DOI :[10.1787/18151973](https://doi.org/10.1787/18151973).
- Porter M. E. (1990). *The Competitive Advantage of Nations*, London, Macmillan.
- Raiser, M., Schaffer, M., & Schuchhardt, J. (2004). Benchmarking structural change in transition. *Structural Change and Economic Dynamics*, 15(1), 47-81
- Ranis, G., & Fei, J. C. H. (1961). A Theory of Economic Development, *American Economic Review*, Vol. 51 (4), 533–565.
- Reinert, E.S. (1994). *Competitiveness and its predecessors - a 500-year cross-national perspective*. The STEP Report Series. STEP Group. Retrieved from <https://ideas.repec.org/p/stp/stpre/1994r03.html>
- Rigby D.L, Anderson W.P., (1993). Employment change, growth and productivity in Canadian manufacturing: And extension and application of shift-share analysis. *Canadian Journal of Regional Science*, 16(1), 69-88.
- Robinson, S. (1971). Sources of growth in less developed countries: A cross-section study. *The Quarterly Journal of Economics*, 85(3) 391-408.
- Romer, P.M. (1989). *Endogenous technological change*. Working Paper No.3210. NBER Working Paper Series, Retrieved from <http://www.nber.org/papers/w3210>
- Rose, A., Miernyk, W., 1989. Input–output analysis: the first fifty years. *Economic Systems Research*, 1(2), 229–272
- Sahlberg, P. (2006). Education reform for raising economic competitiveness. *Journal of Educational Change*, 7(4), 259-287. DOI 10.1007/s10833-005-4884-6.
- Sanchez, A.M., & Roura, J.R.C. (2009). Is growth of services an obstacle to productivity growth? A comparative analysis. *Structural Change and Economic Dynamics*, 20(4), 254-265.
- Selting, A.C., & Loveridge, S. (1992). *A summary of the literature on shift-share analysis*. Staff Paper P92-13, Department of Agriculture and Applied Economics. University of Minnesota. Retrieved from <http://purl.umn.edu/14086>
- Siggel, E. (2006). International competitiveness and comparative advantage: A survey and a proposal for measurement. *Journal of Industrial Competitiveness Trade*, 6(2), 137-159. DOI 10.1007/s10842-006-8430-x.
- Silva, E.G., & Teixeira, A.A.C. (2008). Surveying structural change: Seminal contributions and a bibliometric account. *Structural Change and Economic Dynamics*, 19(4), 273–300.

- Singh, L (2004). Technological progress, structural change and productivity growth in the manufacturing sector of South Korea. *World Review of Science Technology and Sustainable Development*, 1(1), 37-49.
- Teo, T.S.H., & Choo, W.Y. (2001). Assessing the impact of using the internet for competitive intelligence. *Information & Management*, 39 (1), 67-83. DOI: [10.1016/S0378-7206\(01\)00080-5](https://doi.org/10.1016/S0378-7206(01)00080-5)
- Timmer, M.P., & Szirmai, A. (2000). Productivity growth in Asian manufacturing: The structural bonus hypothesis examined. *Structural Change and Economic Dynamics*, 11(4), 371-392.
- Timmer, M.P., & Vries, G.J. (2007). *A Cross-country database for sectoral employment and productivity in Asia and Latin America, 1950-2005*. Research Memorandum GD-98. Groningen Growth and Development Centre. Retrieved from <http://irs.ub.rug.nl/ppn/317331795>
- Todaro, M.P., & Smith, S.C. (2012). *Economic development (11th Edition)*. Addison-Wesley. 109-121.
- Wang T.Y, Chien S.C & Kao C. (2007). The role of technology development in national competitiveness-evidence from South East Asia Countries. *Technological Forecasting & Social Change*, 74(8), 1357-1373
- Wang T.Y, Lee H.Y, Zamora, Elvira A, Talisayon S.D, Supangco et al. (2004). A research framework for evaluating the competitiveness of developing countries: an example of the Philippines, *Asia Pacific Management. Review*, 9(20), 301-321.
- West, M.R. (2012). Education and global competitiveness: Lessons for the United States from international evidence. *Issues in Science and Technology*, 28(3), 37-44.
- Wong, M-H., Shankar, R. and Toh, R. (2011). *ASEAN Competitiveness Report 2010*, Singapore: Asia Competitiveness Institute 28-50.
- Yun, M. (2004). *Competition, competitiveness and development: Lessons from developing countries. Chapter IV*. UNCTAD/DITC/CLP/2004/1. United Nation Conference on Trade and Development, Geneva