THE EFFECT OF AGGREGATE MISMATCHES AMONG TERTIARY EDUCATED WORKERS ON ECONOMIC GROWTH IN MALAYSIA, 1984 – 2016.

ZAHARAH BINTI ZAINAL ABIDIN

SULTAN IDRIS EDUCATION UNIVERSITY

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KESAN KETIDAKSEPADANAN AGREGAT DI KALANGAN PEKERJA BERPENDIDIKAN TERTIARI TERHADAP PERTUMBUHAN EKONOMI MALAYSIA, 1984-2016.

ABSTRAK

Kajian ini bertujuan meneliti insiden dan kesan ketidaksepadanan agregat dalam pasaran buruh dalam kalangan pekerja pendidikan tertiari terhadap pertumbuhan ekonomi, iaitu Keluaran Dalam Negara Kasar (KDNK) di Malaysia antara tahun 1984 - 2016. Selain itu, kajian ini juga menilai hubungan jangka panjang serta hubungan penyebab kausaliti antara ketidaksepadanan agregat dan pemboleh ubah makro yang lain terhadap pertumbuhan ekonomi Malaysia. Ketidaksepadanan agregat merujuk kepada kelayakan pendidikan pekerja melebihi atau kurang daripada kehendak pekerjaan yang dijalankan. Kajian ini berbentuk kuantitatif menggunakan kaedah analisis ekonometrik siri masa Model Vektor Pembetulan Rawak (VECM). Selain dari KDNK dan ketidaksepadanan agregat, data siri masa 33 tahun ini melibatkan lima pemboleh ubah bebas lain iaitu penggunaan, pelaburan, perbelanjaan kerajaan, eksport bersih dan pendidikan yang dikumpulkan dari pelbagai sumber seperti Jabatan Statistik dan Bank Dunia. Empat analisis utama digunakan iaitu analisis diskriptif, analisis integrasi (Ujian Punca Unit Dickey Fuller, Pemilihan Lag dan Ujian Kestabilan Vektor Auto Regresiv) diikuti dengan analisis ko-integrasi Johnsen dan ujian peneyebab kausaliti. Berdasarkan analisis deskriptif, secara purata 7.7 peratus daripada keseluruhan pekerja berpendidikan tertiari di Malaysia mengalami insiden ketidaksepadanan agregat dalam pekerjaan mereka. Manakala ujian Ko-integrasi pula menunjukkan bahawa terdapat kesan negatif dalam hubungan jangka panjang di antara insiden ketidaksepadanan agregat dan KDNK di Malaysia dengan signifikan pada aras 0.01. Analisis penganggaran VECM menunjukkan bahawa insiden ketidaksepadanan agregat di kalangan pekerja berpendidikan tertiari mempunyai penyebab jangka panjang terhadap KDNK. Dalam jangka pendek, ujian Wald mendedahkan bahawa terdapat hubungan dua hala antara KDNK dan ketidaksepadanan agregat. Akhir sekali, persamaan hubungan jangka panjang mendedahkan bahawa ketidaksepadanan mempunyai hubungan negatif yang signifikan ke atas KDNK. Kesimpulannya, peningkatan pekerja dalam ketidaksepadanan dalam pasaran buruh akan memperlahankan pertumbuhan ekonomi negara memandangkan insiden tersebut memberi kesan negatif terhadap KDNK. Oleh itu, adalah penting bagi pihak-pihak berkepentingan seperti kerajaan, firma dan individu memainkan peranan dalam mengurangkan insiden ini di peringkat makro.

ABSTRACT

This study aims to investigate the incidence and the outcome of aggregate mismatch in the labour market among tertiary-educated workers on economic growth, Gross Domestic Product (GDP) in Malaysia between 1984 - 2016. In addition, the thesis also evaluates long-term relationships and granger causal between the aggregate mismatch and other macro variables to Malaysia's economic growth. The aggregate mismatch refers to workers' own actual qualification level is either higher or lower than that is required by the job. The study employed econometric time-series analysis using Vector Error Correction Model (VECM). Apart from the GDP and the aggregate mismatch, the time-series data over 33 years consist of the other five controlled variables, i.e.- private consumption, investment, government expenditure, net export and education. The variables were collected from various sources such as the Departments of Statistic Malaysia and the World Bank. Four types of analysis were employed - descriptive analysis, integration analysis (Unit Root Test Augmented Dickey Fuller Unit, Lag Selection and Vector Auto Regressive) followed by Johansen co-integration analysis and granger causality test. Based on the descriptive analysis, it was found that on average, 7.7 percent of the tertiary-educated workers were considered being in mismatched jobs. Subsequently, the co-integration test showed at least one direction of causation between GDP and the aggregate mismatch and other variables. The VECM revealed a long-run Granger causality of aggregate mismatch and other variables toward GDP. In the short term, however, the Wald test only revealed a bi-directional causality between GDP and the aggregate mismatch. Finally, the long-run relationship equation showed a significant negative relationship between the aggregate mismatch and GDP. In conclusion, increasing in the number of mismatched workers at the aggregate level in the labour market would slow down the country's economic performance as it negatively affects the growth. It is important, therefore, for stakeholders such as governments, firms and individuals to play roles in reducing the mismatch at the macro level.

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LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
AM	Aggregate Mismatch
C	Private Consumption
I	Investment
G	Government Expenditure
NX	Net Exports
Edu	Education Spending
MASCO	Malaysia Standard Classification of Occupations
VECM	Vector Error Correction Model

CHAPTER 1

INTRODUCTION

1.1 Introduction

Demand for higher education in Malaysia has tremendously surged among the younger generation in the last four decades – from only roughly 43,000 in 1985 to over 600,000 in 2015 (National Higher Education, 2016). This scenario had led to a situation where the higher educational institutions (HIEs) produced a greater number of graduates 22,848 in 1985 to almost 300,000 in 2015 which is expected to increase continuously every year. Consequently, the total number of highly educated workforce has also significantly escalated from a mere 6 percent to over 27 percent between 1982 and 2015.[1]

[1]Higher Education refers to tertiary education, including graduate and postgraduate education, but excludes vocational education (The World Bank, 2012).

This evolution has been partly explained firstly, by the expansion in compulsory schooling, and secondly, due to the increasing number of higher educational institutions and other parts of training diversification offered by the HEIs (World Bank, 2011). Unfortunately, the job vacancies in this particular group do not meet the demand thus resulting to a mismatch incidence where highly educated workers have been placed in jobs which do not correspond to actual educational background (field of study or level of education) (Zakariya, Jalil, Yin, Norasibah, & Khoo, 2017; Zakariya, 2017). Such incidence not only leads to productivity, but also to a decrease in the individual and firm level, which might have an impact on the economic growth as the country could not utilise their skills in the labour market.

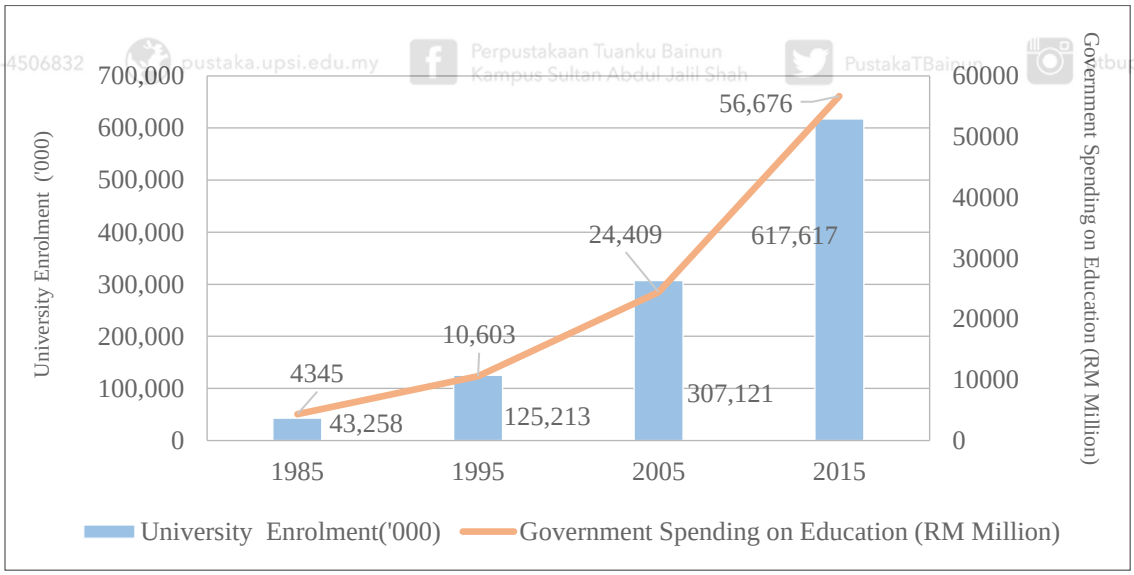
Therefore, this thesis attempts to explore to what extent the incidence of aggregate mismatch has impacted the macro-economic level i.e. – economic growth. Many researches have documented on the relationship between education and growth (Hanushek, 2009) and what we do not know is what would happen to growth once mismatch incidence is considered (SAM,2018). To further explore this scenario, this chapter is, therefore, divided into ten main areas. The second part focuses on the background of the study which is followed by the problem statement in section three. Research objectives and research questions are respectively outlined in the fourth and fifth sections. The sixth section elaborates the significances and contributions of the study, whereas the seventh section provides the definition and the key terms used throughout this thesis, followed by the limitations of structural break. Next, section nine explains the structure of the thesis. Finally, section 1.10 discusses the conclusions of the chapter.

1.2 Background of the Study

The main factor that plays a crucial role in economic development is education. This can be seen when the country with highly educated people will enjoy higher economic progress as shown in many developed countries such as Japan, South Korea and Singapore compared to the low educated nations (Malaysia Education Blueprint, 2013). Therefore, the higher education system is very important in developing the knowledge of society, as it affects the national development process (Arus, 2014).

At an individual level, achievement in higher education allows individuals to develop their skills, improve their social status, and gain entrance to a network that could pave the way for social improvement (Organisation for Economic Co-operation and Development (OECD), 2013). This is deemed a main tool to increase the human capital level of the workforce. At the national level, an increase in the number of highly educated workers in their workforce allows greater productivity measured as gross domestic product (GDP). This is because education is generally perceived as a key ingredient for improving the countries' economic well-being, via higher productivity and more innovations. This view seems to be in line with the augmented neoclassical growth theory (Mankiw et al., 1992) where education can increase the human capital inherent in the labour force, which in turn leads to labour productivity improvement and thus transitional growth towards a higher equilibrium level of output.

Countries can strengthen their economies and their capability to grow and attract high-wage employers by investing in education and increasing the number of workers who are well educated. Providing greater access to high quality education will not only develop the economic opportunity for residents, but also likely will do more to support the overall economic performance. In line with this aspiration, there is no wonder why the government of Malaysia have come forward by spending a lot of resources and efforts in education, especially higher education in order to increase the number of pupils enrolled at tertiary level. This is outlined in Figure 1.1 which shows the data of university enrolment and government spending on education since 1985.



Sources: Department of Statistics, Malaysia.

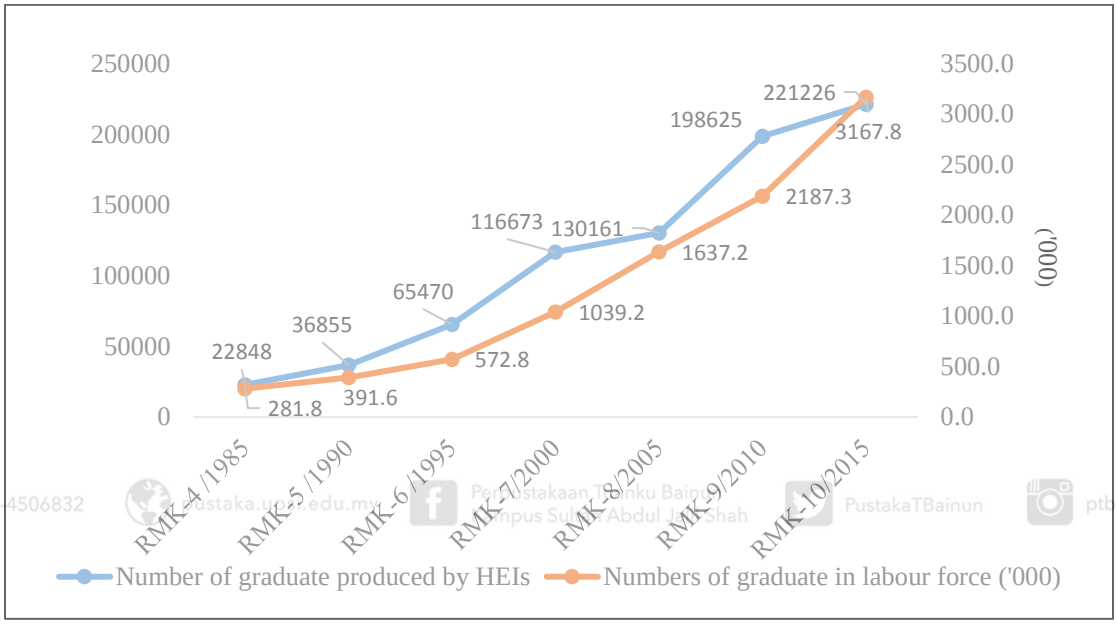
Figure 1.1. The Data of University Enrolment and Government Spending on Education from Year 1985 to 2015.

In 1985, the education expenditure was only RM 4.4 billion, which steadily increased to RM 24.4 billion and RM 56.7 billion, in 2005 and 2015, respectively. This huge investment is to encourage individuals to further their study at tertiary level, hence improve the quality of the labour force. There has been positive outcomes seen in the same figure where the number of students enrolled at tertiary level has been on an increasing trend from 43 000 in 1985 to nearly 620 000 in 2015, an increase of 14.3 times (Department of Statistics Malaysia, 2015).[2]

In addition, the government has also allocated roughly RM 1.65 billion in the form of scholarships via the Department of Public Service (PSD) to finance a total number of 49,060 existing student sponsorship i.e. 41,324 for local students and 7,736 students abroad (Wan, Sirat, & Razak, 2018). Due to the huge investment in education, the number of graduates produced by Higher Education Institutions (HEIs) in Malaysia as a whole recorded a growing trend. As shown in Figure 1.2, during the Fourth Malaysia Plan (Malaysia, 1985), the total number of graduates produced by HEIs was 22,168 (blue line), and the number increased to 116,673 in the Seventh Malaysia Plan (Malaysia, 2000) and nearly 200,000 (orange line) in Tenth Malaysia Plan (Malaysia, 2015). At the same time, the number of highly educated workers who joined the labour market has also been increased as shown in the right axis of Figure 1.2.

[2] Employed person with tertiary level refers to Postgraduate university degree, first university level, Diploma and certificate level 4 as defined in Malaysia Labour Force Survey (LFS), Department of Statistics.

For example, in 1985, there were only 282,000 highly educated workers in the labour force and the figure had increased to more than 3.1 million in 2015 and it is expected to increase continuously in the future.

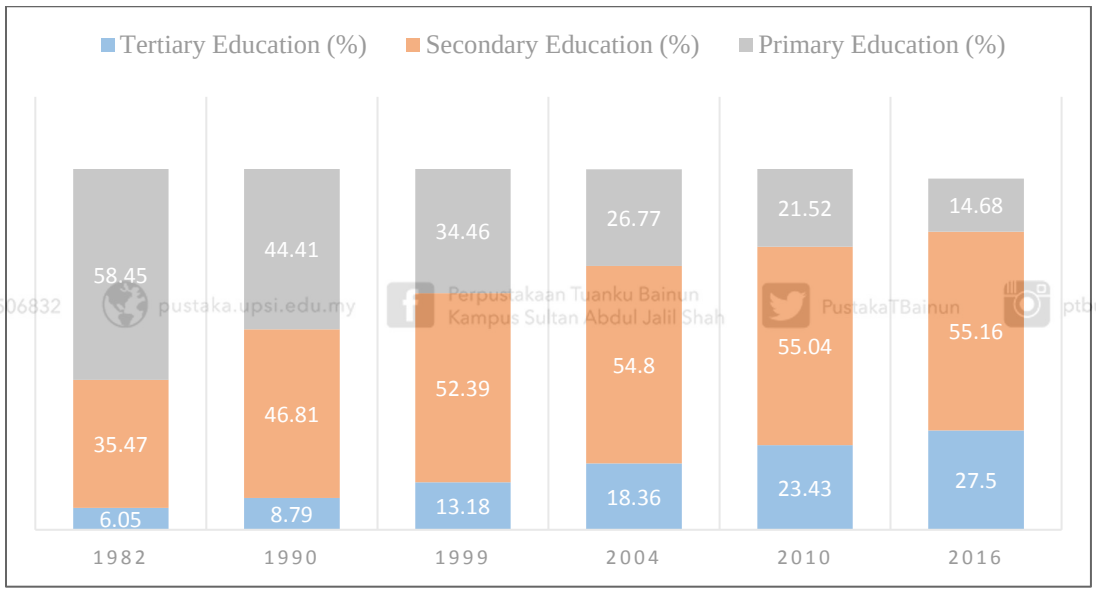


Sources: Department of Statistics, Malaysia.

Figure 1.2. Number of Graduates Produced by Higher Education Institutions and Number of Graduates in the Labour Force, Malaysia, 1982-2015.

The increasing number of graduates in the labour force has led to improving the quality of workforce as a whole (Jajri, 2010). Figure 1.3 shows that the number of workers with tertiary and secondary education has increased between 1982 and 2016 whereas the total number of workers with primary education has been on the decline over the same period. Specifically, in 1982, the percentage of persons employed with tertiary education has increased by 6.05 percent to 8.79 percent in 1990, which continuously surged to 27.5 percent in 2016, i.e -an increase by 3.13 times since 1980.

A similar trend has also been recorded for secondary education, from just 35% in 1982 to 55% in 2016. By contrast, the percentage of persons employed with primary education has shown a decreasing trend from 58.5% percent in 1982 to 14.7% in 2016 (Department of Statistics Malaysia, 2016). In terms of human capital development, the increasing percentage of employed person with tertiary education is a positive indicator as it increases the accumulation of human capital in the country.



Sources: Department of Statistics, Malaysia.

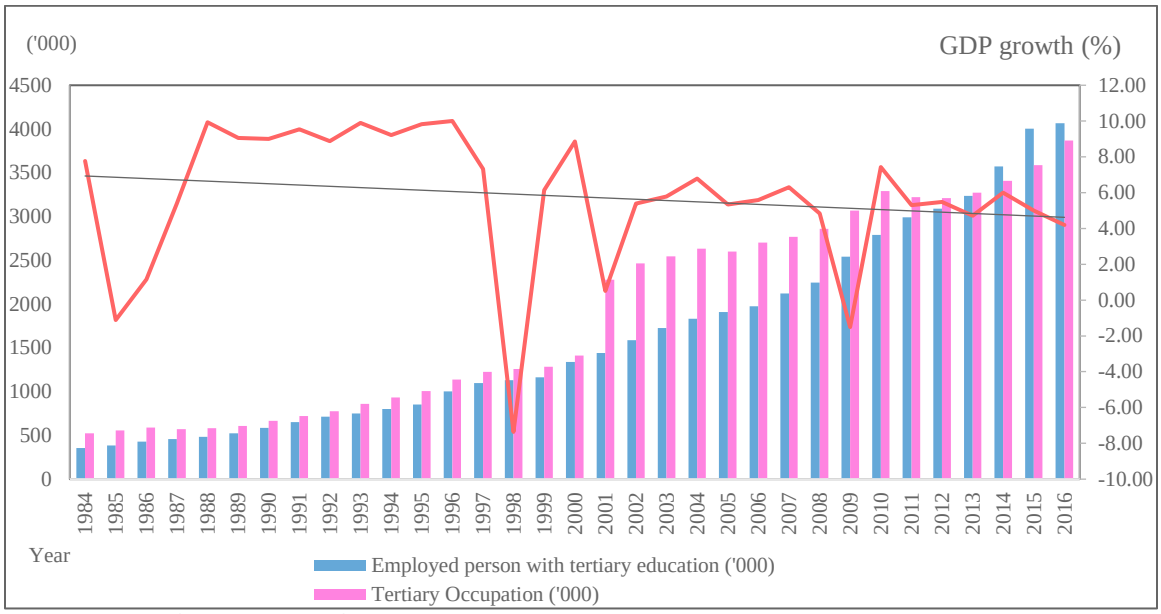
*Figure 1.3.*The Percentages of Employed Person by Educational Level from 1982 to 2016.

In addition, increasing the number of highly educated workforce may also increase the innovation, the new knowledge of new technologies, products, and processes which promote the growth of a country as highlighted in the endogenous growth (Aghion and Durlauf, 2005).

This is because highly educated workers not only allow the country to move forward with new technologies and competitive products, but also enables the country to assist in the transmission of knowledge required in order to understand and process new information, and to successfully implement/apply new technologies invented by other countries (UNCTAD, 2014).

In reality, there are actually a number of outstanding challenges facing the Malaysian labour market despite the good progress and significant resources that have been devoted to enhance the quality of labour force in the last decade. Apart from the increasing number of graduates unemployment,[3] there are some evidences on the increasing number of highly educated workers who do not match with the number of job opportunities for this group which resulted to skills shortage and skills mismatch. Skills shortage can be described as not having enough workers with a particular skill to meet demand (Zakariya, 2017). With such increments, it allow the country to increase the supply of educated and skilled workers in the labour market, hence improving the quality of the persons employed in terms of educational attainment. Figure 1.4 examines the relationship between the growth rate in Gross Domestic Product and the discrepancy between persons employed with Tertiary and Tertiary Occupation from 1984 to 2016.

[3] Though the general unemployment rate has remained at around 3.5% between 2000 and 2015, graduate unemployment has increased from 15.2% to 34% over the same period (Department of Statistics, 2016).



Sources: Extracted from Department of Statistics, Malaysia (multiple year).
Note: Occupation with tertiary level refer to Professional, Technicians and Associate Professionals (MASCO)[4]
Employed person with tertiary level refers to Postgraduate university degree, first university level, Diploma and certificate level 4 (Malaysia Labour Force Survey).

Figure 1.4. The Correlation between the Growth Rate in Gross Domestic Product and The Discrepancy between Employed Person with Tertiary and Tertiary Occupation From 1984 to 2016.

As shown in Figure 1.4, Malaysia has experienced, at least two major incidences, in the last three decades. Firstly, between 1984 and 2000, the Malaysian labour market has experienced a shortage of skilled workers, especially among the tertiary educated graduates.[5] The number of jobs provided that requires tertiary education exceeded the number of available workers who had such qualification. For example, in 1984, there were around 525,000 jobs at tertiary level available as compared to 357,000 tertiary educated worker. This resulted to almost 169,000 shortage of skilled workers although this incidence continue to decrease every year.

[4]Using the Malaysia Standard Classification of Occupations (MASCO), occupations are categorised by educational level where workers in the Technician, Professional and Associate Professional require tertiary education; workers in the Clerical Support Workers, Service and Sales Workers, Skilled Agricultural, Forestry and Fishery Workers and Craft and Related Trades Workers require secondary or post-secondary education; and lastly workers in Plant and Machine-operators, and Assemblers First Primary education require primary education.

[5] Skill shortages happen when employers find it hard to get staff with the right skills for the job (Cedefop, 2010),

In 1996, the number of skills shortage workers decreased to 168,500 and continuously declined to 73600 in 2000. Skill shortage incidence has caused the firms to hire unqualified workers with post-secondary education to fill the vacancies (World Bank, 2008).[6] In general, there seems to be a connection, especially a negative relationship between GDP and mismatch. According to the literature, mismatch has been linked to labour productivity (McGowan & Andrews 2015) and there appears to have a significant negative effect on economic growth (Morgado et al., 2015).

Gross Domestic Product (GDP) is well explained by conventional variables such as Consumption (C), Investment (I), Government expenditure (G), Exports (X) and Imports (M). These are well established in the literature with significant impact between conventional variables and GDP. For example, export is a primary factor that can lead to economic growth (see, Ozturk, 2012; Saned & Hussain, 2015; Acaravci & Shafiullah et al., 2017). In addition, Ghorbani and Motallebi (2009) established that import is also related to the increase in economic growth. Furthermore,household consumption and investment have recently contributed a significant portion of Malaysian GDP (Karim, Bakri, & Zaidi, 2012). According to Gupta and Chakraborty (2006) researchers have emphasised that education can contribute to economic growth indirectly through the accumulation of human capital. However, in terms of mismatch, most of the literature only focused on the impacts at individual and firm level.

[6] The survey (World Bank, 2009) reported that firms in the manufacturing sectors take about four to six weeks to fill a vacancy for a professional or a skilled production worker which seems quite long time.

1.3 Problem Statement

As mentioned in the earlier section, the total number of students pursuing studies at tertiary level has been growing due to the following reasons: (i) an increase in the number of enrolment in university at tertiary level and (ii) second, an increase in government spending on education. Not surprisingly, the total number of graduates produced by both public and private HEIs) has increased which has led to a greater number of graduates available in the labour force as shown in Figure 1.2. According to Figure 1.4, at the same period, there is a link between GDP and Mismatch. Before 2000, the figure shows that when the gap between employed persons with tertiary education and when tertiary occupation is small, the GDP growth is increased. This suggests that the economy did not have the capacity to provide sufficient job vacancies for tertiary educated labour force. Otherwise, it would suggest that the economy failed to utilise educated workers in terms of skill and knowledge, hence leading to a reduction in workers' productivity and growth.

Secondly, starting from 2001 onwards, HEIs produced a large number of graduates every year and at the same time, the economy cannot accommodate or absorb all of them with enough high paying job. For instance, in 2004, the number of employed persons with tertiary education were 1,832.2 thousand compared to 1,420. 6 thousand tertiary jobs available. This resulted in a situation where 411.6 thousand employed persons were forced to choose an occupation with secondary or primary education and the number of occupation that did not match their actual qualification level or field of study.

Unfortunately, such incidence has been on the rise since then which has reached 1,161.1 thousand in 2012 and 1,651.4 thousand in 2016. In addition, after 2000, the pace of the GDP growth has slowed down compared to first twenty year. Therefore, the GDP growth failed to provide job vacancies after year 2000.

In other words, from the Figure 1.4, there seems to be a connection, in particular, a negative relationship between GDP and mismatch. Although the mismatch tends to be a short phenomenon among workers, the fact that some studies found that such incidence seems to be persistence in economy (Jaoul-Grammare & Guironnet, 2009; Ramos, Surinach, & Artís, 2012; SAM, 2018). Under such circumstances, failure to utilise workers' skills and knowledge for a long period may impact the growth, as the negative effect at individual and firm level could be translated into national level. Put into context of the overall output of an economy, the costs of the incidence is likely to reduce the country's GDP.[7]

In addition, according to the neoclassical growth model of Solow (1956), there are two key variables which can determine the growth which is physical capital stock and quantity of labour. Jajri (2010) highlighted that the extended neoclassical growth model adopts an endogenous growth concept by introducing effective labour as a factor of production, where the human capital is embodied in the measure. This model suggests that endogenously accumulated human capital has a direct impact on the productivity of labour.

[7]In a study by Wald (2004) showed that the cost of over-qualification in Canada in terms of annual employee earnings could be placed at $19.6 billion if 25% of employed persons were over-educated. The costs of the incidence would then represent about 1.9 per cent of the Canadian GDP.

Many studies have been conducted to look at the relationship between human capital and economic growth. Educational level is always used as a proxy to human capital (Jajri, 2010).Theoretically, when the effective labour is used, output growth is enhanced and will achieve a higher rate than the labour force (Jajri, 2010).

Therefore, this study will investigate whether the aggregate mismatch will affect the growth in Malaysia. It would be possible the aggregate mismatch might have a positive impact on growth because mismatched workers tend to have greater skills and knowledge than non mismatched workers, therefore, there might be positive spillover effects on other co-workers as a whole (Battu, Belfield, & Sloane, 2003; Noor Fazlin et al. 2017). Thus, the incidence of the mismatch could have positive or negative effects on growth, because acknowledging the previous study only focused on the impacts on individual and firm level. This study will extend the impacts of aggregate mismatch on growth in Malaysia. In order to test the robustness of the estimation, additional macroeconomic variables, namely, consumption, investment, government expenditure, exports and import are added to the thesis as an explanatory variable.

1.4 Research Objectives

Based on a discussion highlighted in the previous section, the general objective of this thesis is to explore the incidence and the effect of aggregate mismatch on economic growth in Malaysia for the period between 1984 to 2016. Three specific objectives are outlined herewith:

1.4.1 To explore the incidence of aggregate mismatch between 1984 and 2016.

1.4.2 To evaluate a long run relationship between the aggregate mismatch and other selected macroeconomic variables namely; consumption, investment, government expenditure, net export and education) and economic growth between 1984 and 2016.

1.4.3 To assess the causal effect between the aggregate mismatch and other selected macroeconomic variables (consumption, investment, government expenditure, net export and education) and economic growth between 1984 and 2016.

1.5 Research Questions

Based on the research objectives, the following three questions need to be addressed:

1.5.1 Does the incidence of aggregate mismatch exists among workers in the labour force in Malaysia?

1.5.2 Does the aggregate mismatch and other selected macroeconomic variables (consumption, investment, government expenditure, net export and education) have a long term relationship with economic growth?

1.5.3 Does the aggregate mismatch and other selected macroeconomic variables (consumption, investment, government expenditure, net export and education) have a causal effect on economic growth in Malaysia?

1.6 Contribution and Significance of this Study

The general aim of this study is to investigate the effect of aggregate mismatches among tertiary educated workers in the labour market have on the economic growth in Malaysia. Therefore, in achieving its research objectives, this thesis has established two types of contributions. First, the study provides empirical evidence on the effect of mismatch economic growth in the mismatch literature in general and in Malaysia specifically. From past reviews, there are negative effects of mismatch at an individual and firm level, where the mismatch incurred non-transitory costs associated with a low level of job satisfaction which decreases the productivity of workers (McGuinness, 2006). The negative effects of individuals indirectly also reduces productivity at firm level (Zakariya, 2012). By doing so, this thesis will enhance the behaviour of mismatch at macro level especially on growth.

Second, it contributes to the mismatch literature with respect to the relationship between mismatch and economic growth in Malaysia. This is because, the finding of this study will provide the result whether the mismatch has a negative or positive effect on economic growth. If the mismatch has negative effects on economic growth, this study will investigate whether the negative effects of mismatch influence the economic growth either in the short or long term. In addition, the study of mismatch will provide an implication on the economy, where its positive result will lead to similar benefits from both mismatch, and the economic growth. Meanwhile, if the implication on the economic growth is negative, this means that the primary concern of the government is needed. To date, the mismatch have been extensively studied with effect on the individual's earning outcome, job satisfaction, job search and quit intention and workplace performance.

1.7 Operational Definition

1.7.1 Gross Domestic Product (GDP)

Ghosh, (2007) defined gross domestic product (GDP) as the market value of all final goods and services formed in a country in a given time period. According to the Department of Statistics Malaysia (2015), GDP is the total value of goods and services rendered in a certain period after deducting the cost of goods and services used in the production process. GDP can also be considered as a cost factor after deduction of tax indirectly and addition with subsidies (The World Bank, 2012a). Therefore, GDP refers to all products and services that are produced inside the borders of the country. In addition, according to The World Bank (2012a), there are two types of GDP, i.e. Nominal GDP and Real GDP. Nominal GDP is the total value of a nationally manufactured product value based on the value of money in the current year whereas Real GDP is the total value of a nationally manufactured output measured by the value of a base year.

1.7.2 Aggregate Mismatch

According to Cedepof (2010), mismatch has arisen in the form of over-education and under-education that leads to the incidence of vertical mismatch (inadequacy of educational level and occupation) and horizontal mismatches (not in line with the field of study and occupation). Adopting the techniques of the European Commission, Handel et al. (2016) focused on the working people when estimating aggregate education incompatibility where non-compliance is defined as the spread between the aggregate distribution of workers' actual education and the education required by the job.

Based on the above definitions, aggregate mismatch in this thesis refers to the discrepancy between the number of tertiary educated workers and the number of jobs available in the economy which require tertiary education. If the discrepancy is a negative value, it leads to under-education incidence whereas a positive value refers to over-education incidence. The combination of both incidence will result in aggregate mismatch. To simplify, aggregate mismatch results from an oversupply of highly educated workers relative to the demand for them (Cappelli, 2015).

1.8 Limitation of Structural Break

This thesis will only consider the time series data from 1984 to 2016 (n = 33 observations). The numbers are sufficient to run the time series. But, it seems insufficient to conduct a structural break analysis. The time series data of 33 years is irrelevant to use structural breaks. Other than that, the data used only applies to Malaysia which is not comparable to other countries. According to Gaughan (2009) pointed out that, in the time series model, in order to make accounting to break the structure, requires more data to estimate and more effort to clarify. In addition, if the break is uncertain, the unit root test is more suitable (Enders, 2004).

1.9 Structure of the Thesis

In order to explore the incidence of aggregate mismatch and economic growth, this thesis has been structured into five major chapters. Chapter Two will extensively discuss about past studies related to mismatch and its impacts on an individual, firm performance or at country level (if any) with special reference to be given to theoretical measurements of mismatch and empirical method. This chapter will also discuss the overview of the relationship between education and other selected macroeconomic variables and its impact on economic growth followed by conceptual framework at the end of the chapter.

Chapter Three focuses mainly on the aspects of methodology which consist of research design, research method, sources of data, data analysis and others. The main concern of this chapter is the measurement of mismatch and empirical method of growth accounting. On top of that, this chapter also discusses the integration test in terms of unit root, granger causality and co-integration test and summary of hypothesis testing. In Chapter Four, the main focus is about the presentation, analysing and discussion of the results. Three main analyses are provided in this chapter in accordance with the objective of the study – descriptive analysis, long run relationship and causality. Wherever possible, the results are also compared to previous studies. Chapter Five provides a summary of the findings, a discussion of the implications of the study and some recommendations.

1.10 Summary

This thesis examines the impact of aggregate mismatch on economic growth in the Malaysian labour market for a period of 33 years, from 1984 – 2016. Previous studies have found a series of negative effects of mismatch at individual and firm level in terms of lower earning and firm productivity, lower job satisfaction and higher job turnover. In doing so, the current thesis has to some point extended the available research in this area at national level. Nevertheless, it is very well documented in the literature that education tends to have a possible outcome of growth. However, there is very little information about what would happen if job matching between education and job occupied is taken into account. The mismatch might have a positive effect on economic growth similar to the one found in educational and economic growth literature as the mismatched workers tend to have greater skill and knowledge. But, it is also possible that the aggregate mismatch may have a negative impact on economic growth given its negative impact on individual and firm levels. Apart from the aggregate mismatch, the thesis also explores the effect of other macroeconomic variables on growth, namely private consumption, investments, government expenditure, net exports and education.