EFFECT OF TAX CHANGES ON ECONOMIC GROWTH IN MALAYSIA

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DECLARATION

We hereby declare that:

(1) This undergraduate FYP is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this FYP has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the FYP.

(4) The word count of this research report is 12,966.

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TABLE OF CONTENT

LIST OF TABLES

:

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADF	Augmented Dickey Fuller
ARCH	Autoregressive Conditional Heteroskedasticity
APITR	Average Personal Income Tax Rate
BNM	Bank Negara Malaysia
ECM	Error Correction Model
EG	Engle-Granger
EPF	Employees Provident Fund
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GST	Goods and Services Tax
KPSS	Kwiatkowski-Phillips-Schmidt-Shin
LDHN	Lembaga Hasil Dalam Negeri Malaysia
MSMEs	Malaysia's Micro, Small and Medium Enterprises
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Square
PIT	Personal Income Tax
PP	Phillips Perron
PWT	Penn World Table
R&D	Research and Development
SSA	Sub-Saharan Africa
SST	Sales and Services Tax
VAT	Value-Added Tax

LIST OF APPENDICES

ABSTRACT

Tax is a mandatory contribution collected by governments from individuals or companies to support their expenditures. In this paper, we would like to strengthen the previous empirical literature. Thus, we estimate the effect of tax changes on economic growth in Malaysia from 1970 to 2019. Before estimated equation, we apply different types of unit root test and Johansen Cointegration test as pre-checking tools to ensure the estimated equation provide valid results. After that, we apply OLS method with ARCH test and Jarque-Bera test to examine the effect of tax changes on economic growth in Malaysia. Throughout the findings, we discovered that personal income tax has a positive relationship with Malaysia economic growth in the long run. Additionally, sales and services tax has a negative relationship with Malaysia economic growth in the long run. However, a rise in the personal income tax might affect government spending, which would have a indirect negative impact on economic growth. In addition to sales and services tax influencing government spending, an increase in the sales and services tax has a beneficial effect on economic development.

CHAPTER 1: RESEARCH OVERVIEW

1.1 Research Background

The levy of taxes plays an essential part in fostering the growth of the economy. The government allocated funds from reliable sources of revenue to finance social activities and public projects. The previously mentioned programs and investments included several sectors including education, healthcare, public infrastructure, and other services, all of which played a crucial role in boosting advancement in society and enhancing the overall economic landscape of the nation. Moreover, these investments and initiatives aim to enhance the overall quality of life, create greater opportunities for employment and others across the entire country. In addition to its role in promoting economic growth, taxation policy has influence on trade balance, government spending, foreign direct investment. Therefore, controlling businesses attempt to formulate an effective tax policy with the aim of stimulating economic growth.

Malaysia considered as a developing country and government target to adopt an efficient tax system to help contribute to and maintain the country's economic performance. Based on the data in Figure 1.1, it concludes that the different countries' GDP growth rates are fluctuations and the majority of countries experiencing significant decreases in GDP during periods of financial crisis, including the 1997 Asian Financial Crisis, the Great Recession, and the Covid-19 recession. Unfortunately, Malaysia's GDP also shows an instable and fluctuate during the last several decades. GDP was calculated using private consumption, investment, government expenditure, and net exports and tax revenue has an influence on all of these. Therefore, it is crucial to investigate the effectiveness of tax policy in Malaysia with regard to its impact on the growth of the GDP.

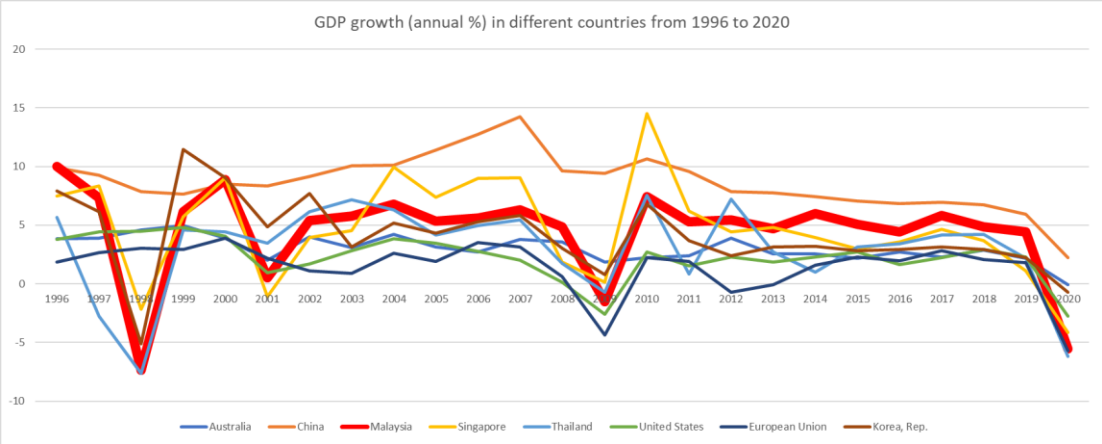

Figure 1.1: GDP growth (annual %) in different countries. Adapted from the World Bank

When compared to the tax revenues on GDP of developed and developing countries (Figure 1.2), Malaysia's tax revenue was around 15% before 2012. After that, the contribution of taxes to Malaysia's GDP started falling and it will reach around 10% in 2020. Look at the figures 1.1 and 1.2, it indicates that the contribution of tax revenues to Australia's GDP is the largest but Australia's GDP growth is lower than China and Singapore. On the other hand, China and Singapore have a low percentage of tax revenues to GDP but they have higher GDP growth rate compared to others. In general, it may be claimed that a higher tax rate has the potential to enhance government tax revenue and stimulate the GDP. However, in the context of this comparison, an issue arises over whether a higher or lower tax rate would be more beneficial to GDP. Hence, an examination will be conducted to determine if Malaysia should retain a high or low rate in order to enhance its GDP.

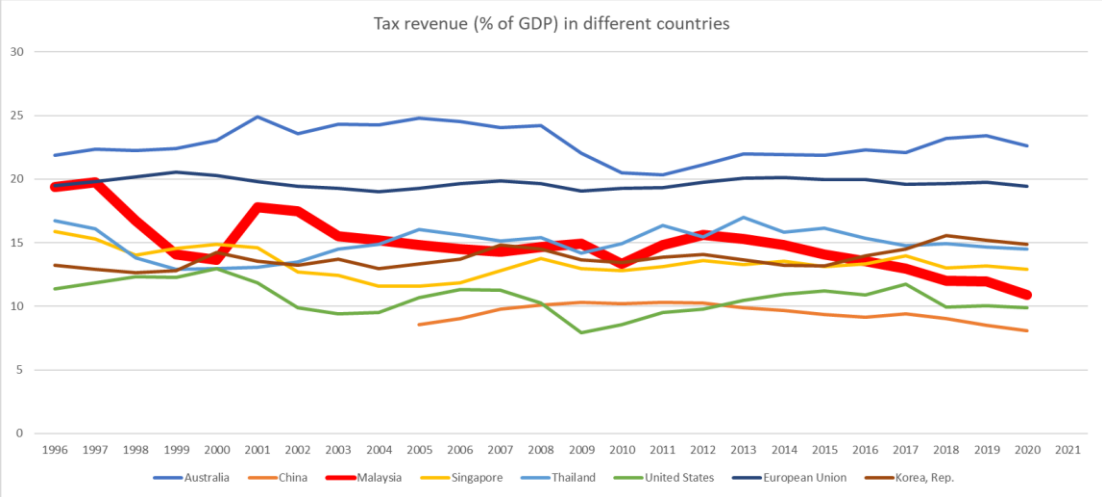

Figure 1.2: Tax revenue (% of GDP) in different countries. Adapted from the World Bank

Malaysia's tax policy has changed a lot over the years, including company income tax, personal income tax, the value-added tax, etc., the purpose of implementing tax policy is to enhance economic development and keep the government's finances in good condition. Take a look at the most recent changes that were made to the tax policy in Malaysia. After Prime Minister Anwar Ibrahim's win in the national election in 2022, the Malaysian government made certain adjustments to the corporate and individual income taxes, as well as indirect taxes in the Malaysia's 2023 budget. The tax on corporate income paid by MSMEs has been lowered. The individual income tax now has changed based on different income levels. Individuals with earnings less than RM100,000 have a reduction in income tax rate, but those with earnings of more than RM100,000 have an increase in income tax rate.

Income tax is a direct tax and it is a system of taxes levied by governments on individuals or corporate (companies). According to the LHDN (Lembaga Hasil Dalam Negeri Malaysia) those Malaysian employees who earn an annual income of at least RM34,000 after the deduction of EPF (Employees Provident Fund) are required to pay the tax. The tax rate for non-residents is 30% of their total income. Following the corporate income tax rate in Malaysia, the Malaysian Government stated that resident and non-resident companies in Malaysia need to pay 24% of corporate income tax

starting from 2016 compared to the last time the tax rate stated at 25% in 2009 (Annuar et al., 2018). The reduction aims to attract foreign investors.

The value-added tax is a kind of consumption tax that is levied on the value added throughout every phase of the manufacturing process for a specific product or services. It is collected throughout the production process and ultimately passed on to the consumer as part of the final sale price. The difference between value-added tax and sales tax is sales tax only needs to be paid once and is paid by the customers while value-added tax needs to be collected multiple times when the production is finished and is paid by the supply chain. For example, Goods and Services Tax (GST) and Sales and Services Tax (SST).

Looking back at the tax policy in 2018, the government made a big change to its tax policy by eliminating the GST and putting in place the SST. As a result, the 6% GST that Malaysia implemented in 2015 was canceled in 2018 and replaced with a 10% SST. (Nutman et al., 2021). Despite this, the SST is not the first time implemented in Malaysia in 2018. When we go back in history, the Sales Tax Act 1972 and the Service Tax Act 1975 were implemented in Malaysia in 1972 and 1975. These are the starting point of SST. The sales tax rate imposed on wholesalers, manufacturers, suppliers and sellers is either 5% or 10% depending on the type of taxable products that are being sold. It is applied to products which are from local or bought from other countries (Sidik, Muhaidin, and Supar). Besides, customers who utilize specific services have to pay a service tax rate of 6%.

According to Abdul Kadir, Aslam, and Zarinah Yusof (2017), The implementation of the GST in Malaysia took effect on 1 April 2015, serving as a substitute for the SST. The decision to install the GST was inspired by the problems discovered in the existing tax system. The scope of taxation for the GST is broader than that of SST. GST is charged on the supply of products and services, including imports. Following the victory of Pakatan Harapan in the 2018 Malaysian general election on 1 June 2018, the GST was abolished. On September 1, 2018, GST was replaced with the

SST. As a result of the implementation of GST, the revenue generated from GST has reached at least RM20 billion and contributed more than RM45 billion by the end of the 2017 fiscal year (Figure 1.3). The revenue from sales and service tax for the period of 2018 to 2022 is between RM5 billion and RM25 billion, it contributed a considerable amount less than the GST did (Figure 1.4).

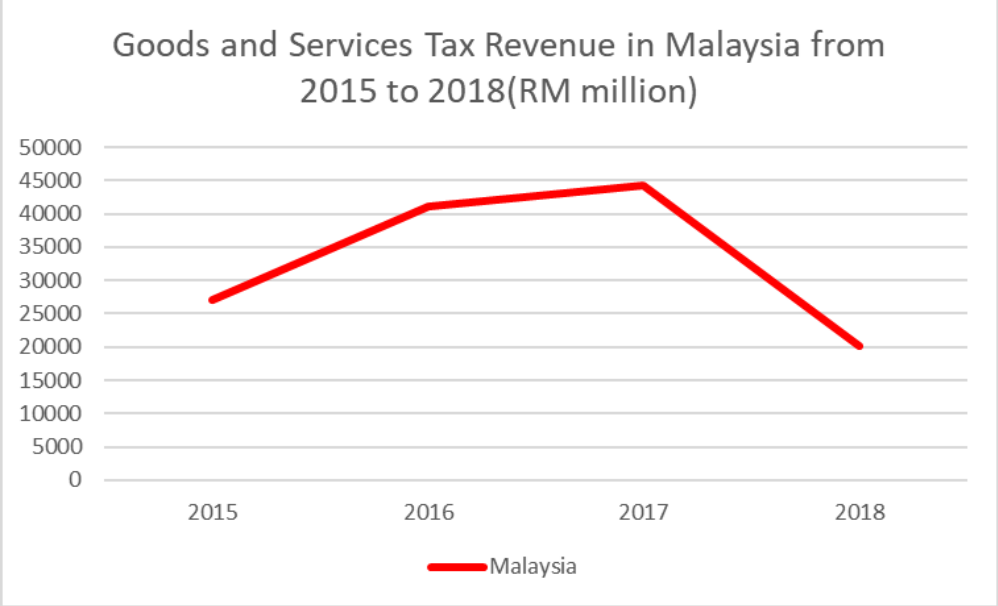

Figure 1.3 Goods and Services Tax Revenue in Malaysia from 2015 to 2018 (RM million). Adapted from the Bank Negara Malaysia

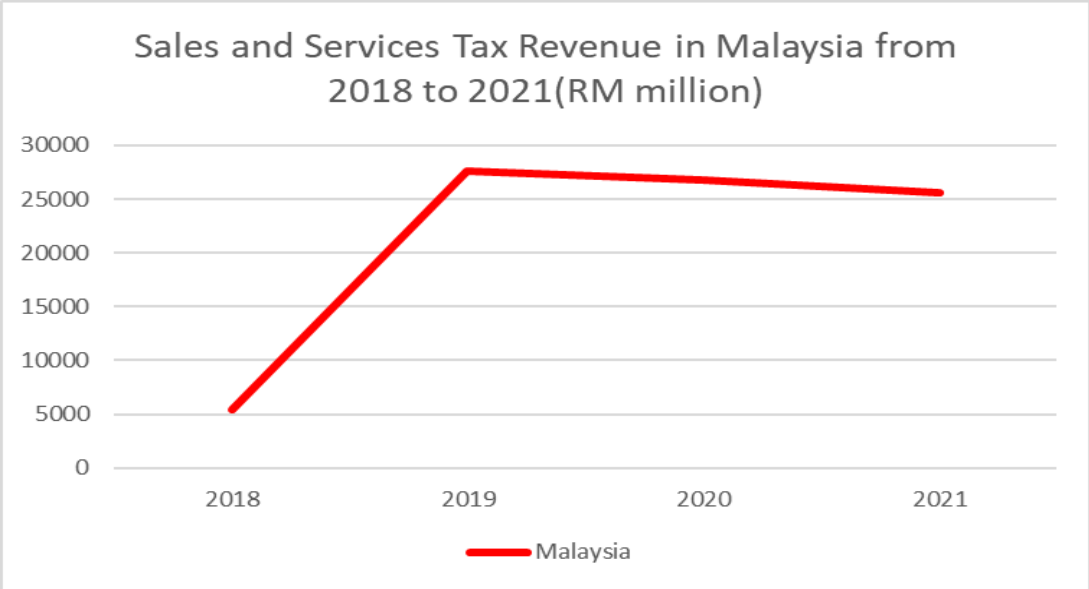

Figure 1.4 Sales and Services Tax Revenue in Malaysia from 2018 to 2021 (RM million). Adapted from the Bank Negara Malaysia

According to the data shown in Figure 1.5, it is evident that Malaysia's budget deficit has seen a significant increase while there has a decline in tax income since 2011. Consequently, this has led to a considerable fall in the country's GDP, especially during the period of transition from GST to SST. This has caused the Malaysian government to be concerned that if the budget deficit continues to increase and becomes a larger budget deficit, the potential consequences of this situation may result in negative impacts on the economy of the country and overall economic development.

Given the previously mentioned problem, the primary aim of this study is to find out the direct and indirect effects of tax income on the economy of Malaysia.

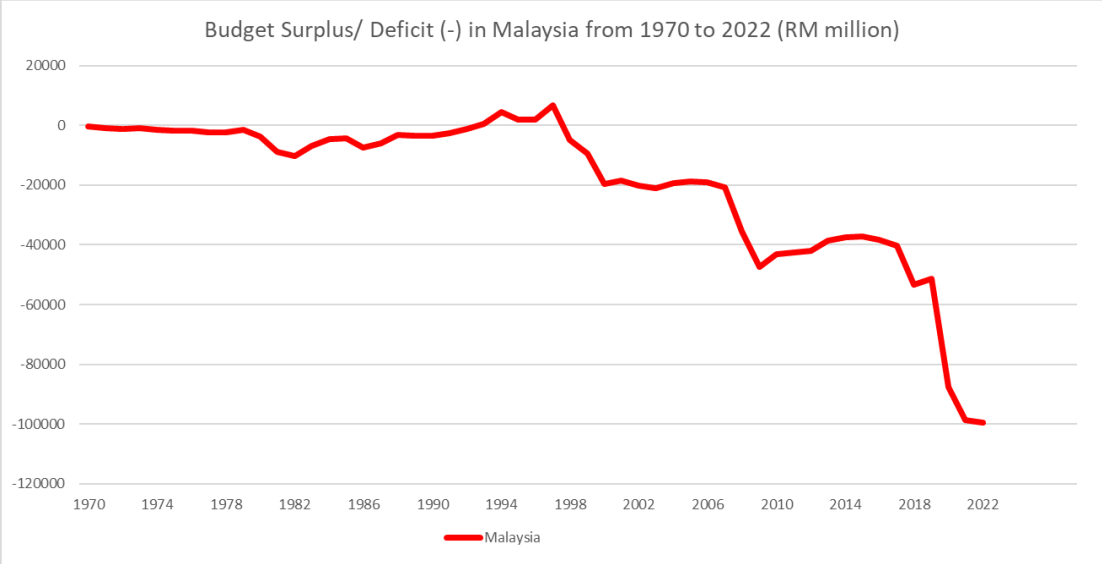

Figure 1.5 Budget Surplus/ Deficit (-) in Malaysia from 1970 to 2022 (RM million). Adapted from the Bank Negara Malaysia

1.2 Research Problem

Tax revenue plays a key role in promoting sustainable development across every country, particularly in developing countries like Malaysia. The reason for the need for increased tax revenue in developing countries is the need to provide sufficient funds for development, public service, reducing poverty, and related activities. This also can foster growth in the economy. (Dickinson and Paape, 2014).

According to Figure 1.2, Malaysia's tax revenue at a proportion of GDP has decreased dramatically in recent years. According to the World Bank (2017), in order to support development and achieve sustainable economic growth, developing countries should have a tax-to-GDP ratio of at least 15%. Malaysia's government is attempting to increase the ratio of overall tax revenue to GDP to more than 15%. Unfortunately, Malaysia's overall tax revenue collection as a proportion of GDP has fallen dramatically since 2011.

In order to achieve a budget surplus in Malaysia, the government has two potential actions: increasing tax revenues or reducing government expenditures. Nevertheless, it is recommended that the government prioritize an increase of tax income as instead of reducing spending. This is because excessive reduction in expenditure will diminish Malaysia's long-term economic growth. Therefore, increasing total tax revenue will be more sustainable in the long term than reducing government spending.

Within the overall framework of this research, it is important to take into account the direct and indirect impacts of tax revenues on the long-term economic of Malaysia.

1.3 Research Objective

The main objective of this study is to investigate the influence of taxes on the economic development of Malaysia, while simultaneously examining the connection between changes in tax revenue and the growth of the economy. The investigation will moreover analyse many perspectives, covering the influence of both direct and indirect taxes on the advancement of economic development. The study's results have the potential to provide insights for policymakers about the establishment and implementation of tax policies that encourage sustainable economic growth and development in Malaysia.

1.3.1 General Objective

The primary aim of this research is to investigate the direct and indirect impacts of taxation and ascertain a relationship between tax revenue and economic expansion in Malaysia.

1.3.2 Specific Objective

1. Investigate the relationship between various types of taxes (direct and indirect) and Malaysia economic growth.

2. Understand the direct and indirect affect of tax in Malaysia's economic growth.

1.3.3 Research Question

1. How do direct and indirect taxes affect Malaysia’s economic growth?

2. What is the direct and indirect impact of taxes on Malaysia's economic growth?

1.4 Research Significance

The significance of this study is multifaceted and pertains to several aspects of the Malaysia economy. The analysis of the effects of tax adjustments on economic growth is a crucial topic, given the significant role of tax policy in the management of economies worldwide. This study has substantial importance for policymakers, academics, and other relevant stakeholders, since its primary objective is to offer an important update to the current information on the topic, specifically within the Malaysian context.

The study's results have important consequences for policymakers, who may use them to make better informed decisions about tax policies that promote economic development, improve income distribution, and enhance social welfare. By understanding the correlation between adjustments in taxation and the growth of the economy, policymakers possess the ability to design tax strategies that adapt to the economic, social.

Furthermore, this study has the potential to offer helpful information to academics and scholars that possess an interest in researching further into the topic matter. This research has the potential to fill in the current gaps in information and enhance the comprehensiveness of knowledge on the correlation between tax adjustments and the process of economic growth in Malaysia. This information has the potential to guide future research and make contributions to the formulation of more efficient policies and strategies aimed at fostering economic growth within the region.

1.5 Structure of Study

This research is organized into five chapters, each of which offers an in-depth analysis of the relationship between changes in tax revenue and the impact on the economic development of Malaysia. Chapter 1 serves as an introductory section that introduces the reader with the study and presents a comprehensive overview of the research. This includes a review of the research background, an overview of the problem statement, a definition of the research goals, a discussion of the research questions, an explanation of the research importance, and an outline of the study's structure. Chapter 2 provides a comprehensive assessment of the relevant research related to the topic, with particular emphasis on three different independent variables: corporate income tax, personal income tax, and sales and service tax. The primary objective is to explore the relationship between these factors and the dependent variable, GDP in Malaysia. The approach used in this study is described in Chapter 3. This chapter describes the theoretical framework that underpins this study, including key

concepts, definitions, and references to prior scholarly literature. It also expands on the sampling design, research design, collecting information techniques, proposed data analysis tools, and diagnostic checking. In Chapter 4, an in-depth examination of the gathered data is presented, using a range of statistical tests and inferential analytic techniques to determine the relationship between the dependent and independent variables. In conclusion, Chapter 5 provides an overview of the most important results from this research, a discussion of the implications those findings have, a highlighting of the limits of the research, and some suggestions for more research on this topic.

1.6 Conclusion

The government has implemented a series of tax reforms in recent years with the aim of stimulating economic development. Nevertheless, there exists little consensus over the efficacy of these tax adjustments in attaining their stated objectives. The main goal of this study is to examine the impact of tax revenues on the financial growth of Malaysia. The aim of this study is to analyze the impact of changes in personal income tax, corporation tax, and sales and service tax rates on key macroeconomic indicators such as gross domestic product (GDP), labor, capital. Furthermore, the research will include additional relevant variables, including trade balance, government spending and foreign direct investment, while using econometric methods to assess the relationship between tax changes and economic development. The investigation's findings will provide valuable insights to stakeholders and policymakers on the collaborative impact of Malaysia's tax policies on economic stimulation.

CHAPTER 2: LITERATURE REVIEW

Rising economic taxes, according to the experience of many nations, have an impact on fiscal policy, prompting economists to call for more research into whether they have a positive or negative impact on RGDP. Reviewing the literature reveals that numerous authors have investigated and analyzed the connection between taxes and economic growth, with results that indicate a marginally negative impact.

2.1 Tax Revenue and Economic Growth

Many academics have explored the link between tax burdens and economic development in various countries (Baiardi et al., 2018). There are three reasons for the negative relationship between economic growth rate and taxes. Firstly, citizens of high-tax countries may migrate to low-tax countries because the cost of living in high-tax countries may become higher. Secondly, marginal tax rates can distort price signals, which can discourage foreign investors from relocating to countries with high tax rates since they won't be able to maximize profits. Thirdly, high taxes reduce work incentives, leading to lower tax revenues. The reason is that people may not feel that the rewards for working hard are worth it, which can negatively impact individuals and the overall economy (Al-tarawneh et al., 2020) .To make use of strong investment opportunities and lower tax rates, local investors will start investing in foreign countries. To make taxation and infrastructure crucial for economic progress (Stoilova, 2017).

Revenue collection methods vary by every country. Some countries choose to raise taxes, while others do not alter their taxation policies. In Malaysia, tax collection has a negative relation. However, boosting government money in any way can stifle economic progress (Engen and Skinner, 1996). In recent research, it also prove that the reduction of personal and corporate income taxes has been shown to have a positive effect on economic growth, household consumption, and investment. Conversely, an

increase in indirect taxes has been shown to have a negative impact on these variables. With the exception of indirect tax policy, all tax policies result in lower levels of real GDP and investment in the economy (Solaymani, 2020a). In the long run, a marginal tax rate increase of 1% will probably result in a reduction of Malaysia's economic growth by around 0.25% (Fah, 2019a). Classical growth theory posits that economic growth is contingent upon finite resources and the expansion of a nation's population. Consequently, this theory suggests that economic growth tends to diminish over the long term. In contrast, neoclassical economic growth theory predicts that with the participation of labor, capital, and technology, the economy would attain a stable state. Thus, according to this theory, more labour and capital can lead to short-run economic equilibrium, however technology will operate as an external factor with a significant impact on the economy's overall performance (Solow, 1956). For the positive side, Macek (2015) argues that through increased tax revenue, the government gains additional resources that can be utilized to support a range of activities aimed at fostering growth, such as infrastructure development, growth of human resources, start-up project support, and a variety of other activities. Hummaira et al. (2021) shows that there is a favorable association between taxation and economic growth in Malaysia, Thailand and Singapore. For the negative side, Ahmad et al. (2018) investigates the relationship between Pakistan's economic growth and real tax receipts. They employ a time series dataset from 1974 to 2010 and the ARDL boundary approach for their cointegration stud and discover that the level of all taxes has a detrimental influence on economic growth. If overall tax revenue grows by 1%, the economic growth rate will fall by 1.25%. According to the explanation above, tax collecting has positive as well as negative effects on growth. (Loganathan et al., 2017a) prove that the Malaysia economic growth has a inverted U-shape effect. Initially, taxes can boost economic growth up to a certain level, but going beyond that can have the opposite effect.

2.2 Direct tax and Economic Growth

The empirical literature on taxation illustrates several conclusions about the influence of direct taxes on economic growth. Stoilova and Patonov (2013) discovered that a tax system based on direct taxes is considerably more efficient in promoting European Union countries economic growth as compared to other regions This data clearly shows that direct tax collection has a large positive influence on these countries long-term economic growth. This can be attributed to the fact that direct taxes are levied on individuals or entities based on their income or profits, which ensures a steady and predictable flow of revenue for the government. The construction of infrastructure, research and development, and other efforts that help foster economic growth can then be supported by this reliable revenue stream. Furthermore, the European Union countries, who have a more advanced and effective tax administration system than other regions, are likely to have an intensified favorable impact of direct taxes on economic growth. On the other hand, Umoru and Anyiwe (2013) point out that direct taxable income has a statistically significant and positive impact on Nigeria's economic growth. This suggests that the implementation of direct tax policies may be an effective tool to increase the country's short-term growth rate, which will probably boost economic growth in the short term.

2.2.1 Personal Income Tax and Economic Growth

Ferede and Dahlby (2012a) investigated the influence of Canadian provincial governments' rates of taxation on economic growth. They specifically looked at how personal income tax (PIT) rates affected investment and growth while accounting for the variations in fixed effects between provinces. After adjusting for these fixed effects, their research showed that personal income tax rates had no significant effect on either investment or growth rate. On the other hand, this study demonstrates the greatest long-term negative impact of income tax on GDP per capita. If this detrimental effect on GDP per capita is not addressed, it could take up to nine quarters before the

equilibrium is restored. The reductions in income tax rates may boost growth when combined with spending cuts (Gale and Samwick, 2014). Besides, using panel data from 1975 to 2010, Dackehag and Hansson (2012) investigated the relationship between income taxation and economic growth in the 25 wealthy OECD countries. The findings indicate that corporate and individual income taxes both have a negative effect on the economy's long term growth. However, there is a stronger link between corporate profits and economic expansion. Using econometric analysis, the author comes to the conclusion that progressive taxation has a greater detrimental impact on real GDP.

Furthermore, Mertens and Ravn (2013) discovered an inverse relationship between real GDP per person and the average personal income tax rate (APITR). According to the study, "a one percentage point reduction in the APITR lead to a growth in real GDP per capita of 1.4% on effect, and by up to 1.8% after three quarters." A 1% drop in revenue from taxation as measured by GDP from a change in the rate of personal income tax has a multiplicative effect on the economy, increasing GDP by 2.5%. Karel and Morten (2013) observed that lowering the average personal income tax rate by one percentage point, real GDP per capita increases by 1.4% in the first quarter and by up to 1.8% after three quarters. Furthermore, a one-point reduction in the average corporate income tax rate improves real GDP per capita by 0.4% in the first quarter and 0.6% after a year. As a result, they have a negative interaction.

On the other hand, according to Lin and Jia (2019) 's findings of regression and correlation analysis show that the GDP per capita on personal income tax is positive and substantial. As a result, the greater the tax, the more income tax that may be collected. Additionally, Yakita (2003) research underscores the notion that taxes on wages tend to have a positive correlation with the advancement of economic growth. Furthermore, Terefe and Teera

(2018) used the Error Correction Model (ECM) and Augmented Dickey-Fuller (ADF) and discovered the same positive relationship between GDP per capita and inflation. They emphasized that when a country's economy increases, so does its tax base in proportion to its income. However, according to the Nguyen and Darsono (2022), it identifies a negative impact of tax revenue on economic growth based on statistical evidence in Southeast Asian Countries which include Malaysia. But the results indicate that higher tax revenue could actually mitigate the negative effects of taxes, ultimately promoting economic growth, so they also have positive effects. The reason is that lower tax revenue might stimulate saving and investment, but it also carries the drawback of increasing government deficits. Establishing a causal relationship between tax rates and economic growth can be complicated, with some studies showing that income taxes have a negative effect on economic growth, but others finding a positive relationship.

2.2.2 Corporate Income Tax and Economic Growth

The adjustment on corporate income tax also will bring direct and indirect to the economic growth of a country. According to our basic theory, when corporate income tax increase will lead to a decrease in economic growth. Based on the research Gechert and Heimberger (2022) analyzing different countries during different periods shows that the reduction of corporate income tax will have an indirect effect on increased economic growth because it will attract more foreign direct investment. According to the findings of Annuar et al. (2018), a reduction in tax rates was discovered to have a positive effect on the growth of corporate profits in Malaysia. The reduction in corporate tax rates has been found to positively impact firm productivity. By lowering taxes, corporations are able to allocate more resources into production elements, resulting in improved output. It has the potential to result in a rise in the

financial profits of the company, which in turn leads to an upsurge in overall economic growth.

The researcher Alm and Rogers (2010) estimated the data from 1959 to 1997 on the United States and there is a positive relationship between corporate tax revenues and state economic growth. Besides, one of the research projects Angelopoulos (2007) analyze 23 countries from the year 1970 to 2000 and found that there is a weakly positively related to economic growth on the corporate income tax. The reduction in corporate income tax could enhance the economic growth under the balanced budget scenario, a research by (Solaymani, 2020b) on the Malaysia economy.

However, the researcher Iwaisako (2016) found that some countries reducing the corporate income tax will be jeoparadize to economic growth. Secondly, the researcher analyze 27 country in Asia which including Malaysia from 2011 to 2015, they found that the corporate income tax might reduce the return on innovation and the amount spent on R&D, both of which have a indirect negative effect influence on growth (Saidin et al., 2016). The researcher (Ferraro et al., 2020) investigates the mechanisms of product variety and product quality innovation in the United States and shows that the reduction in corporate income tax rate will reduce the R&D incentives. Thus, there is an indirect effect on the economic growth. In another frequently cited journal from Lee and Gordon (2005) discovered a negative correlation between this and economic growth in a cross-sectional data set encompassing 70 countries, including Malaysia, from 1970 to 1997. This is because the low corporate income tax rate will result in lower personal tax revenue. At the end, it will influence the economic growth..

Furthermore, Arnold et al (2011) used the annual data for 21 OECD countries for the period 1971 to 2004 and concluded that a rising in corporate income tax will result a greater negative impact on economic growth. There are two researchers Arnold (2008) and Vartia (2008), who use a large data set of enterprises and industries from OECD nations to evaluate the influence of corporate income taxes on company and industry productivity. Both publications find that corporate income taxes have a negative effect on productivity, providing indirect evidence that corporation taxes damage the growth.

In other cases, the research from Prillaman and Meier (2014) analyzing the 50 states of the United States from 1977 to 2005 found that there is no relationship between when reduction in the corporate income tax rate. On the other hand, Ojede and Yamarik (2012) analyze different tax rate systems from 48 states of the United States data from the year 1968 to 2008 on economic growth. They increased the corporate income tax rate from 7.3% to 9.5% while the service tax rate remained constant, and found that there are no short-term or long-term impacts on state-level growth. On the other hand, some research projects show that no matter whether a country increases or decreases the corporate income tax, it does not really bring a strong impact on a country's economic growth.

In other cases, based on research (Suzuki,2021) shows the reduction of corporate income tax brings both positive and negative impacts on economic growth. This means the reduction does not necessarily decrease economic growth or it will harm the growth. Specifically, it will cause the entry of many companies thus the growth maximizing corporate income tax rate is likely to be positive. Furthermore, the research (Gale et al., 2015) stated that there is inconsistency when the cuts in corporate income tax rate will lead to growth. Widmalm's (2001) study evaluated the influence of tax structure on growth in

the economy, defined as the percentage of tax revenues collected from corporate income taxes, as a measure of tax progressivity. Her findings show that there is no such association for the share of business tax receipts. This may appear odd given that the corporation tax rate is widely seen as more distorting than personal income taxes.

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2.3 Indirect Tax and Economic Growth

In addition to direct tax, indirect tax is considered a tax and influences economic growth. Looking at the past studies,Poterba et al. (1985) focused on the economies of the United Kingdom and the United States and explored the economic effects that resulted from shifting from direct to indirect taxation throughout certain time periods. According to the findings of the study, switching from direct to indirect taxes results in a decrease in real production, an increase in prices, and a rise in after-tax earnings in the short term, but it does not have a major impact on the long run. Based on the same concept, Madsen and Damania (1996) had conducted using a sample of 22 OECD countries. They made the observation by investigating tax transformation from direct to indirect taxes had no effect on economic activity in the long term. In a recent study, researchers show that changes in the structure of indirect taxes will have significant positive effects on economic growth in the medium term (Bâzgan, 2018). In Malaysia, the tax collection will bring negative impact on economic growth and financial development in long run but did not have a significant impact in short run (Loganathan et al., 2020a), besides the implementation of GST reduce the production cost conversely SST increase the production cost (Syeddin et al., 2021a). By doing a comparative analysis of various tax types, it becomes clear that the taxation structure in Malaysia highlights the Goods and Services Tax (GST) as being most sensitive to fluctuations in economic growth and brings highest negative influence (Fah, 2019b).

Regarding efficiency, indirect taxes are less efficient than direct taxes due to the substantial inequality of indirect taxes and their diminishing impact on production and sales (Stoilova and Patonov, 2013). Apeti and Edoh's (2023) study indicates the efficiency of indirect tax is lower than direct tax in developing countries. On the other hand, the results of statistical studies (Nguyen, 2019a) indicate that taxes have a positive impact on the economic development of Vietnam. However, the effects of a direct tax and those of an indirect tax are not identical. Indirect taxes have a positive effect and contribute to the growth of Vietnam's economy, whereas direct taxes have little or no impact on economic activity (Nguyen, 2019b). A study conducted by Hakim et al. (2022) investigates the relationship between direct tax and indirect tax in 47 developed chakiountries and 90 developing countries and the results indicate that indirect tax has a negative relationship with economic growth and GDP per capita. However, indirect taxes appear to be inversely associated to FDI, implying that investors are afraid to invest in nations that levy GST.

2.3.1 Value-added tax and Economic Growth

Value-added tax (VAT) plays a significant role in indirect tax. Based on previous research, countries with VAT have about 4.5% more revenue-to-GDP than those without (Keen and Lockwood, 2010a). Richer nations and those with open economies benefit more from the VAT because they can collect more taxes on imports and handle the tax more efficiently (Keen and Lockwood, 2010b). The implementation of VAT has a large and positive influence on the ratio of taxes to gross domestic product in SSA (Sub-Saharan Africa) countries (Ebeke, et al., 2016). However, the previous argued that the increase in VAT would decrease economic growth due to the increase in VAT would result in a decrease in consumption and total demand or production. Consequently, economic growth would decline (Kolahi and Noor, 2016). The VAT system increases the impact of efficient government spending on economic growth in both developed and developing nations, with developed countries obtaining

greater outcomes (Chan et al., 2017). There is another study that shows that even VAT has a positive impact on the human development index but the utilization of VAT is inefficient to improve quality of life in Nigeria (George-Anokwuru, 2023).

In the short term, an increase in the VAT rate reduces aggregate consumption by the same amount, but over the long term, the reduction is somewhat larger (Alm and El-Ganainy, 2013) There is a positive relationship between the GDP and the VAT both in the long run and the short run in China (Ayoub and Mukherjee,2019). The previous study suggests that the substitution of value-added taxes for retail sales taxes resulted in an increase in the amount of investment (Smart and Bird, 2009; Ferede and Dahlby, 2012b, Ufier, 2014a). The implementation of VAT resulted in a decrease in both inflation and the proportion of government spending (Ufier, 2014b)

2.4 Hypothesis Testing

This research is to made to investigate how the changes in tax rate will affect the economic growth in Malaysia. Thus, there are 3 hypothesis that were made as shown below.

Hypothesis 1

H0: There is no negative impact of taxes on Malaysia's economic growth.

H1: There is negative impact of taxes on Malaysia's economic growth.

It is expected to have a negative relationship between tax and economic growth in Malaysia economy. It was assumed that keep increasing the tax rate would decrease Malaysia's economic growth.

Hypothesis 2

H0: There is no direct or indirect impact of tax on Malaysia's economic growth.

H1: There is direct or indirect impact of tax on Malaysia's economic growth.

It is expected to the changes of tax will influence other macroeconomics factors. This impact will indirectly Malaysia's economic growth. The increase in tax rate will affect government spending and foreign direct investment and indirectly influence the growth of economic (Nguyen and Darsono, 2022; Gechert and Heimberger, 2022)

Table 2.4

Expected relationship with RGDP.

Variables	Unit Measurement	Expected relationship with RGDP
Corporate income tax	RM/million	Negative
Personal income tax	RM/million	Negative
Sales and services tax	RM/million	Negative

2.5 Gap of Literature Reviews

After a thorough review of the previous publications, it becomes obvious that the collection of convincing data strongly supports the concept that taxes have different impacts on economic growth. Therefore, it can be concluded from previous analysis that various forms of taxation can have various impacts on economic growth, which may be either significant or insignificant. Furthermore, it has been noticed that a number of studies conducted by researchers haven't included the indirect impact of taxes as a variable in their analysis of the influence of taxation on the Malaysian

economy. Hence, our research seeks to clarify the direct and indirect effects of taxation on the Malaysian economy. In Chapter 3, we will apply a model to derive hypotheses that may be tested with testing by observation. These hypotheses will consist of an interaction term and also a quadratic component. In our following research, we seek to put greater emphasis on the impact of corporate tax, goods and service tax, and personal income tax on the economic growth.

CHAPTER 3: METHODOLOGY

3.1 Theoretical Framework

The Solow growth model, which was the first growth model, can be used to investigate the connection between a country's long-term standard of living and growth. The Solow growth model states that the only factor contributing to long-term increases in output per capita is productivity growth. However, this model does not explain how productivity growth is determined, it only takes it into account as an exogenous factor. This restriction led to the development of another growth model, the endogenous growth model, which explains how productivity growth can be endogenous to change the model's policy. The steady growth rates will also be accelerated by an increase in innovation, public goods, and the accumulation of physical and human capital.

The Solow model will be used as our theoretical framework for this study. Robert Solow and Trevor Swan created the Solow model, which is a neoclassical model of economic growth that assumes that technological progress is exogenous. Therefore, the Cobb-Douglas production function is widely used in the Solow model to represent the relationship between level of technology, capital, labor and output.

The model assumes that production is a function of labor (L), capital (K), and innovation or technological variable (A), and is represented as follows:

$$y = k^{a} L^{1-a}, \qquad 0<\alpha<1 \tag{1}$$

$$y = Ak^{a} L^{1-a} \tag{2}$$

A nation's overall economic activity can be significantly impacted by the tax's effect on labour, capital, and innovation because it can affect how resources are

allocated and how people and businesses behave. Higher labour taxes may reduce the incentives to work, which may result in lower employment rates, while higher capital taxes may deter investment and innovation, which may result in slower economic growth. On the other hand, tax incentives and lower tax rates on innovation can promote research and development, which will result in the development of new goods and services as well as increased global market competitiveness.

3.1.1 Labor

When taxes are increased on individual or business, it may lead the the disposable income decrease and demand for good and services reduce. The resulting effect may be a reduction in work effort, as individuals may be less inclined to work because of the higher tax burden. In individual perspectives, this reduction in work effort can have a knock-on effect on the labor market, with fewer people looking for work or fewer hours at work. On the other hand, business will try to reduce the production and workforce, the unemployment rate increase. As a result, the output of goods and services may end up being reduced, leading to slower economic growth and less overall prosperity. On the contrary, the reduction in tax on individual and business can increase the consumer spending and business investment. It leads the employment increase and stimulate economic growth.

3.1.2 Capital

Higher labour taxes may deter people from looking for work, and higher taxes on investments may reduce capital accumulation and potentially discourage innovation. Therefore, tax policies can have a significant impact on

both labour, investment decisions and cost of capital. While the tax on capital gain increase, it may discourage the investment and capital for business decrease. Besides, businesses may have less incentive to allocate resources towards research and development (R&D) or expand their operational capacities, which could eventually result in a reduction in productivity and economic growth. The other effect of high tax rates for businesses is certain countries with high tax rates move their operation to countries with low tax rates.

3.2 Empirical Framework

The application of logarithmic transformation may convert a highly skewed variable into a more standardized dataset. Analysis of variables having nonlinear relationships may have a negatively skewed probability of producing mistakes. Theoretically, researchers want to generate the minimal possible error when making a prediction. Hence, the Cobb-Douglas production function transform to logarithmic:

$$ln\, Y = C + \beta_1 ln\, K + (1 - \beta_1)\, ln\, L + \varepsilon_t \quad (3)$$

3.2.1 Investigate the effect of tax on economic growth in Malaysia

$$\ln RGDP_t = \beta_1 \ln K_t + (1 - \beta_1) \ln L_t + \beta_2 \ln Tax_{it} + \beta_j \sum control_{it} + \varepsilon_t \quad (4)$$

Where;

$RGDP_t$ = Real Gross Domestic Product, in RM million

K_t = Capital over a period, in RM million

L_t = Labour over a period

Tax_{it} = Types of tax over a period, which i = corporate income tax ($corp$) , personal income tax (inc), sales and services tax with goods and services tax (sst)

$control_{it}$ = control variables over a period, which i = trade balance (TB) , government spending (GS) , foreign direct investment (FDI) .

Where the marginal effect of tax on growth is given by

$$\frac{d \ln RGDP_t}{d \ln tax_{it}} = \beta_2$$

In this Equation 4, we try to extend the Cobb-Douglas production equation by including different kinds of taxation. However, equation 4 does not include the constant level of technology because the variables make the our results statistically insignificant. Additionally, we include other control variables due to RGDP growth in the real world is influenced not only by capital and labour, but also by other macroeconomic factors, such as trade balance, government spending and foreign direct investment. In Equation 4, we combine SST and GST because the implementation period for GST is four years and the sample size is so small that it will affect the results and cause issues when performing data in EViews. The aim of equation 4 is to figure out how taxes affect Malaysia's economic growth.

3.2.2 Investigate the direct and indirect effect of tax on economic growth in Malaysia

$$\ln RGDP_t = \beta_1 \ln K_t + (1 - \beta_1) \ln L_t + \beta_2 \ln Tax_{it} + \beta_i \sum control_{it}$$

$$+\boldsymbol{\beta_j} (\mathbf{ln}\, \boldsymbol{tax_{it}} \times \sum \boldsymbol{control_{it}}) + \varepsilon_t \quad (5)$$

Where the direct and indirect effect of tax on growth is given by

$$\frac{d \ln RGDP_t}{d \ln tax_{it}} = \underbrace{\beta_2}_{direct} + \underbrace{\beta_j \sum control_{it}}_{indirect}$$

It is necessary to insert an interaction term into equation 5 in order to evaluate the indirect effect of taxes. This inclusion allows for a look of how the influence of one variable changes in response to changes in another variable. The interaction term allows us to investigate how changes in tax policy affect control variables and also how control variables affect RGDP, which is indirect impact of tax.

$$\ln RGDP_t = \beta_1 \ln K_t + (1 - \beta_1) \ln L_t + \beta_2 \ln Tax_{it} + \beta_3 (\ln Tax_{it})^2 + \beta_i \sum control_{it} + \beta_j (\ln Tax_{it} \times \sum control_{it}) + \varepsilon_t \quad (6)$$

Where the marginal effect of tax on growth is given by

$$\frac{d \ln RGDP_t}{d \ln tax_t} = \underbrace{\beta_2 + 2\beta_3 \ln tax_t}_{direct} + \underbrace{\beta_j \sum control_{it}}_{indirect}$$

As known, the relationship in the real world would not strictly linear and the relationship may be change over a time. Therefore, we use non-linear equation and consider quadratic effect of tax in equation 6. This leads to a more accurate representation of how variables interact.

3.3 Research Design

The framework for achieving goals and responding to queries is referred to as the research design. A framework for the study will be made possible by clearly defining the methods used to collect, understand, and analyze the data. To obtain the appropriate information when solving the problem, the study's goals should also be mentioned. (Zikmund, Babin, Carr, and Griffin, 2010) Therefore, choosing the appropriate research design is essential.

Research types can be classified according to their purpose and nature, and generally divided into three categories, including descriptive research, exploratory research and causal research. Exploratory research aims to clarify and outline the nature and scope of the problem, it emphasizes understanding the problem rather than testing specific hypotheses, and hopes to further investigate the problem. Descriptive research, on the other hand, is research conducted to gain a deeper understanding of the characteristics of a group or phenomenon, thus providing information about a particular situation. While causality research explains the relationship between cause and effect by determining the relationship between variables, and can predict the future development trend.

In this study, causal research is chosen as the research type, because the research purpose is to determine the connection between dependent and independent variables. Causal research is a quantitative research method that manipulates and controls

variables to determine the causal relationship between them. Thus, such studies can provide information on causal relationships between certain variables and provide a reliable basis for future predictions.

3.4 Sampling Design

This study is a census of all Malaysia RGDP and different types of tax between the year 1970 to 2019.

3.5 Data Collection Methods

This study only utilizes secondary data in order to conduct the analysis of time series. Secondary data refers to research data that has been obtained in the past and documented by other scholars and distributed through multiple channels, including scholarly journals, literary works, and official government publications. Given that the variables under investigation in this study related to economic factors, it is not possible for the researchers to gather data on these variables through surveys or interviews.

The research study only focuses on Malaysia as the sole involved country. The dataset may be classified as a time series due to its fundamental characteristic of being a series of data points that have been recorded at different durations. A time series refers to a collection of data that is organized in yearly, semiannual, quarterly, and monthly intervals. The research will use data gathered on a yearly basis covering from 1970 to 2019, totaling 49 observation. Subsequently, the data will be submitted to EViews 13 software for the purpose of conducting data testing. It is necessary to guarantee the accuracy and reliability of the information collected., the collection of current data

involves referencing reputable sources such as BNM, the World Bank, and the Penn World Table (PWT).

3.5.1 Source of data and definitions

Variables	Definition	Source of data
RGDP	Real Gross Domestic Product in Malaysia	PWT (Penn World Table)
K	Capital in Malaysia	PWT (Penn World Table)
L	Labour in Malaysia	PWT (Penn World Table)
Tax_{corp}	Corporate income tax in Malaysia	BNM (Bank Negara Malaysia)
Tax_{inc}	Personal income tax in Malaysia	BNM (Bank Negara Malaysia)
Tax_{sst}	Sales and Service tax (SST) and Goods and Service tax (GST) in Malaysia	BNM (Bank Negara Malaysia)
TB	Trade balance in Malaysia	BNM (Bank Negara Malaysia)
GS	Government spending in Malaysia	BNM (Bank Negara Malaysia)

Variables	Definition	Source of data
FDI	Foreign direct investment in Malaysia	World Bank

3.6 Proposed Data Analysis Tool

3.6.1 Unit Root Test

The use of the unit root test is a popular econometric methodology performed to assess the stationarity of a given time series. This may be done by comparing the results of the test to the original data. The time series variable may be defined as having a unit root according to the null hypothesis. This further shows that the time series variable exhibits non-constant. Conversely, the data put out by the alternative hypothesis indicates that the time series variable might potentially be categorized as exhibiting stationarity. When the data in a time series are considered stationary, this also indicates that the variance, mean and covariance of the data in the time series are all regarded to be constants.

Furthermore, when including non-stationary time series variables into a regression model, the outcome typically exhibits a substantially high R-squared value (close to 1) together with a considerably low Durbin-Watson statistic (R2 > DW). Additionally, it suggests a strong statistical significance of the independent variable in influencing the dependent variable (Reject H0 in t-test

at a significance level of 0.01), despite the lack of relevance between these two variables in both theoretical and practical contexts.

3.6.2 Augmented Dickey Fuller (ADF)

When examining the relationship between variables within a certain time series, it is crucial to assess the stationarity of the underlying variables. Hence, the Augmented Dickey Fuller (ADF) test is used to assess the stationarity or non-stationarity of time series data, with the aim of mitigating spurious regression problems.

The ADF model shows in the equation with intercept and trend:

$$\Delta Y_t = \beta_1 + \beta_{2t} + \gamma Y_{t-1} + \alpha_i \sum_{i=2}^{p} \Delta y_{t=i} + u_t$$

In the equation, we described the case with intercept and trend. Y_t is the variable which are types of tax, labour, capital and level of technology, u_t is the white noise residual term with zero mean and constant variables, t is the time trend, Δ is the differencing operator. $\{\beta_1 , \beta_2 , \gamma , \alpha_{\ldots\ldots}\alpha_i\}$ is the set of parameters.

Testing for hypothesis using ADF

$H_0 : \gamma = 0 \ (Y_t \ is \ non - stationary / \ unit \ root)$
$H_1 : \gamma < 0 \ (Y_t \ is \ stationary)$

Dickey and Fuller (1979) and Mushtaq (2011) have shown that if the test statistic is lower than the crucial value at a certain significance level (1%, 5%, 10%), it is appropriate to reject the null hypothesis and conclude that the variables are stationary. In the other hands, we should not reject it and contain unit root and non-stationary if the null hypothesis of γ equal to zero.

3.6.3 Phillips-Perron (PP)

The Phillips-Perron (PP) test is often used as an alternative method to evaluate the stationarity of a time series, beside the ADF test. The test in question is likely to be the ADF test. In contrast, the PP test employs a non-parametric methodology to address the issue of serial correlation in the error term, without using delayed difference factors. The purpose of this study is to conduct a PP test. The results of this test will provide a similar conclusion to those of the ADF test.

Testing for hypothesis using PP

$H_0: \gamma = 0 \ (Y_t \ is \ non - stationary / \ unit \ root)$

$H_1: \gamma < 0 \ (Y_t \ is \ stationary)$

3.6.4 Kwiatkowski-Phillips-Schmidt-Shin (KPSS)

The KPSS test, sometimes referred to as the Kwiatkowski-Phillips-Schmidt-Shin test, is a statistical test used to assess the stationarity of a given series with respect to a deterministic trend. The key difference between the ADF test and KPSS tests is to their respective methodologies for evaluating stationarity. The KPSS test is designed to assess the existence of deterministic

trends, wherein the slope of the trend within the series does not go through permanent changes. In basically, despite experiencing a disruption, the series has a tendency to restore its initial path.

Testing for hypothesis using KPSS

$H_0: \gamma = 0 \ (Y_t \ is \ non-stationary / \ unit \ root)$

$H_1: \gamma < 0 \ (Y_t \ is \ stationary)$

3.6.5 Johansen Cointegration Test

The Johansen cointegration test is used to assess the long-term correlation among several time series and to identify the responsiveness of variables to changes occurring within a particular period. Due to the Engle-Granger (EG) cointegration test only allows the detection of a single cointegrating relationship, therefore we use Johansen cointegration test for multiple cointegration relationship. In the Johansen cointegration test, two test statistics are used to determine whether or not cointegration exists.

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^{g} \ln(1 - \widehat{\lambda_i})$$

$$\lambda_{max}(r, r+1) = -T \sum_{i=r+1}^{g} \ln(1 - \widehat{\lambda_{r+1}})$$

Under the null hypothesis, the number of cointegrating vectors is denoted by r, λ_i represents the estimated ordered eigenvalue of the matrix.

Testing for hypothesis use Johansen cointegration test

$H_0: r = 0 \quad (no\ cointegrating\ vectors)$

$H_1: 0 < r \leq g \ (contains\ cointegrating\ vectors)$

If the test statistic exceeds the critical value, it is appropriate to reject the null hypothesis; conversely, if the test statistic falls below the crucial value, the null hypothesis should not be rejected. While the null hypothesis is rejected, meaning there is no cointegrating test, we need to perform next steps until the null hypothesis is not rejected (Brooks, C., 2019)

Next steps

$H_0: r = 2 \quad (no\ cointegrating\ vectors)$

$H_1: 2 < r \leq g \ (contains\ cointegrating\ vectors)$

If still reject null hypothesis, perform next steps:

$H_0: r = 2 \quad (no\ cointegrating\ vectors)$

$H_1: 2 < r \leq g \ (contains\ cointegrating\ vectors)$

.

.

$H_0: r = g - 1 \quad (no\ cointegrating\ vectors)$

$H_1: r = g \quad (contains\ cointegrating\ vectors)$

Nonetheless, if we would be able determine that no cointegrating vectors exist, and the test would be finished.. (Brooks, C., 2019).

3.7 Diagnostic Checking

If the model exhibits econometric issues such as heteroscedasticity, multicollinearity, or autocorrelation, among others, the resulting findings may be biased and inaccurate. In order to guarantee the estimated models are reliable and provide accurate results, the diagnostic checking will be done in this study to recognize the potential problem. Hence, the ARCH test, Breusch-Godfrey test and Jarque-Bera test will be conducted in this study.

3.7.1 Breusch-Godfrey test for autocorrelation

The autocorrelation problem may have occurred in the regression model and it led the estimation inefficiently. The Breusch-Godfrey test is a tool to identify this problem in residuals at different lags in linear or non-linear models. In addition to allowing lagged values of the dependent variables, the BG test also allows high-order aggressive schemes, such as AR(1), AR(2), etc.

Testing for hypothesis use Breusch-Godfrey test

$$u_t = \alpha_0 + \alpha_1 X_t + \alpha_2 X_{2t} + p_1 u_{t-1} + p_2 u_{t-2}$$

$$H_0 : p_1 = p_2 = \cdots = p_p = 0 \quad (There\ is\ no\ autocorrelation)$$

$$H_1 : p_1, p_2, \ldots, p_p \neq 0 \quad (There\ is\ autocorrelation)$$

p refers to the number of lags. In the result, if the p-value of Chi-Square test is less than 0.05 significant level, we reject H_0 and conclude that there has

autocorrelation problem among the residuals at some order less than or equal to p.

3.7.2 ARCH test for Heteroscedasticity

The presence of heteroscedasticity suggests that the variability of the residuals is not constant across different levels of the measured values. In the case that heteroscedasticity is present, it indicates that the population used in the regression exhibits inconsistent variance. Consequently, the outcomes of the study may be considered invalid. The ARCH test is a statistical method used to identify and assess the presence of heteroscedasticity issues in a dataset. The ARCH test has significance in the analysis of volatility and its potential for future forecasting.

$$u_t^2 = \gamma_0 + \gamma_1 u_{t-1}^2 + \gamma_1 u_{t-2}^2 + \cdots + \gamma_q u_{t-q}^2 + v_t$$

Testing for hypothesis use ARCH test

$$H_0 : \gamma_0 = \gamma_1 = \cdots = \gamma_q = 0 \quad (There\ is\ no\ ARCH\ effect)$$
$$H_1 : \gamma_0, \gamma_1, \ldots, \gamma_q \neq 0 \quad (There\ is\ ARCH\ effect)$$

y refers to parameters. In the result, if the p-value of F-statistics is less than significant level (0.05), we reject and conclude there is ARCH effect, heteroscedasticity problem.

3.7.3 Jarque-Bera test for normality

Jarque-Bera test is used for large data sets and one of tools to determine the data is normality and this test is used for large data. While the data is normal distribution or close to normal means the data collected is consistent and can describe the real-life situation.

$$JB = \left[\frac{S^2}{6} + \frac{(K-3)^2}{24}\right]$$

Testing for hypothesis use Jarque-Bera test

H_0 : *The data is normal distributed*

H_1 : *The data is not normal distributed*

In the result, if the p-value is less than significant level (0.05), we reject and conclude the residuals of the equation is not normal distributed.

CHAPTER 4: DATA ANALYSIS

The significance of this chapter is to describe the research methods generated by the E-views software and how to evaluate the results. To begin, we will apply the unit root test to determine the stationarity of all variables, unit root test, such as the ADF (Augmented Dickey-Fuller), PP (Philips Perron), and the KPSS (Kwiatkowski-Phillips-Schmidt-Shin) test. The long-run connection between the variables will subsequently be examined using ordinary least squares (OLS). Finally, diagnostic tests such as the ARCH test, serial correlation LM test, and JB test will be employed in this study.

4.1 Unit Root Test

As we all know, if we apply variables with unit roots, the predicted result displayed in Eview may be deceptive. In straightforward terms, the estimated result suggests that the independent factors have a large influence on the dependent variable (T-test rejection of the null hypothesis at 0.01 significance level) even though these two variables are insignificant in practise or according to theory. This is referred to as a false regression problem. To eliminate spurious regression, we performed unit root tests by using ADF, PP, and KPSS tests for all variables we have chosen that including Real Gross Domestic Product (GDP), Capital (K), Labor (L), Corporate Tax (CORP), Income Tax (INC), Sales and Service Tax (SST), Trade Balance (TB), Government Spending (GS), Foreign Direct Investment (FDI).

Table 4.1

Results of Unit Root Test

	ADF		PP		KPSS	
	Level	**1st difference**	**Level**	**1st difference**	**Level**	**1st difference**
$\boldsymbol{ln\ RGDP}$	-3.0275	-6.7316***	-2.8953	-6.7619***	0.9427	0.4794**
$\boldsymbol{ln\ K}$	-0.6565	-3.5641**	-0.0686	-2.8302*	0.9392	0.0498
$\boldsymbol{ln\ L}$	-1.5218	-6.4447***	-1.7017	-6.4447***	0.9392	0.2403
$\boldsymbol{ln\ Tax_{corp}}$	-1.7111	-6.1640***	-1.7281	-6.1640***	0.9298	0.2365
$\boldsymbol{ln\ Tax_{inc}}$	-1.3418	-6.8067***	-1.3418	-6.8067***	0.4295	0.3532*
$\boldsymbol{ln\ Tax_{sst}}$	-2.3676	-6.2538***	-3.4237	-7.1528***	0.893	0.4280*
$\boldsymbol{ln\ TB}$	-1.8246	-4.5031***	-1.6979	-11.3377***	0.6442	0.5000**
$\boldsymbol{ln\ GS}$	-2.6408	-7.8000***	-3.4195	-4.5021***	0.926	0 4792**
$\boldsymbol{ln\ FDI}$	-3.2379	-8.3522***	-2.9775	-22.8529***	0.8403	0.247

*Note: *, **, *** indicate the rejection of the null hypothesis at 1%, 5%, and 10% significance levels.*

The unit-roots test is employed in statistics to determine if a time series variable is stationary or non-stationary. Table 4.1 displays the results of all the time series data we picked for the ADF, PP, and KPSS tests. The null hypothesis for these three-unit root tests likewise shows that the time series data has a unit root (i.e., it is non-stationary), but the other possibility implies that the time series data is stationary. According to Table 4.1, some of the t-statistics for all series data at the level of are similarly insignificant to reject the null hypothesis at 1%, 5%, or 10% significance. In other words, the level form of this time series data suggests that they are non-stationary. As a result, these variables have unit roots and may produce misleading regression difficulties when the model is estimated.

The null hypothesis for unit root tests was rejected at either a significance level of 1% or 5% when ADF, PP, and KPSS tests were performed at the first difference for

each variable. The findings of ADF and PP were quite comparable between these two unit root testing. As a result, we can confidently infer that the time series data we selected are stationary in their first difference form. However, the results of KPSS test are not similar to ADF and PP test results where capital (K), labor (L), corporate tax (Corp) and foreign direct investment (FDI) are not stationary, the rest they are stationary. Therefore, the results show that all variables are stationary at first difference with intercept and the results are significant at 1 percent and 5 percent.

The findings we receive are consistent with earlier research that most macroeconomic and financial series are predicted to have a unit root and that we can obtain stationary when we first differentiate our data (first order, I (1)). As a result, it is critical that we apply these three unit root tests before predicting the relationship between the variables we have chosen to avoid false regression difficulties (high R square, low Durbin-Watson statistic).

4.2 Johansen Cointegration Test

We are employing the Johansen assessment to explore the present cointegration link among the factors. The main distinctive difference from the Engle-Granger test is that the Johansen test tolerates more than one cointegrating relationship between variables.

Table 4.2

Results of Johansen Cointegration Test

Hypothesized no. of CF(s)	**Trace Statistic**	**5% CV Trace**	**Max-Eigen Statistic**	**5% CV Max-Eigenvalue**
0	**253.2243**	**197.3709**	**61.08123**	**58.43354**
≤1	192.1431	159.5297	48.5673	52.36261

≤2	143.5758	125.6154	41.40582	46.23142
≤3	102.1699	95.75366	34.21112	40.07757
≤4	67.95883	69.81889	31.51184	33.87687
≤5	36.44699	47.85613	15.21349	27.58434
≤6	21.23350	29.79707	13.28134	21.13162
≤7	7.952156	15.49471	7.837707	14.2646
≤8	0.114449	3.841465	0.114449	3.841465

We have assumed the number of cointegrating vectors to determine whether there is an existing co-integrated relationship among the variables using trace test and Eigenvalue statistic at 5% significance level. The result shows that both the trace statistic (253.2243 > 197.3709) and Eigenvalue statistic (61.08123 > 58.43354) are higher than the critical value.

H0: There is no long-run relationship between the variables.
H1: There is a long-run relationship between the variables.

Reject the null hypothesis as a trace test and Eigenvalue statistic is larger than CV (5%) when the number of cointegrated variables is 0. Hence, there is a cointegrated relationship between variables. In summary, our variables, corporate income tax, personal income tax, and value-added tax are affecting each other in the long run.

4.3 Regression result

There is a long-run relationship among the variables based on the findings of the cointegration test and all the variables are stationary at first difference. Consequently, when utilising ordinary least squares (OLS) to regress stationary variables, the issue of spurious regression will not arise. As a result, the estimation outcomes hold significance, enabling an explanation of the relationship between the

variables. To determine the most suitable equation for explaining the correlation between the independent and dependent variables, a series of multi-stage regressions are conducted. This involves fitting the model with various control variables and considering the indirect impact of taxation. The OLS method is used for the regression analysis, and the Newey-West coefficient covariance is used to solve the issue of heteroscedasticity in the dataset.

The regression results are displayed in Tables 4.3.1 and 4.32. The tables presented in this study display the outcomes of a method of estimation that was conducted on a dataset consisting of time series data from Malaysia. To determine the correlation between different tax types and the economic growth of Malaysia, the model specifications are produced from equation 5 by employing different tax combinations. Therefore, the specifications for Models 1 to 5 are obtained. The equation for Models 6 to 9 was established in order to simplify the investigation and analysis of the changes in different types of taxes, while simultaneously controlling additional factors such as spending by the government, trade balance, and foreign direct investment.

Tables 4.3.1 to 4.3.2 exhibit the results of the growth regression analysis, where the dependent variable is the annualized rate of real GDP growth. The multi-stage regression analysis started with model 1, according to the Cobb-Douglas production function, this only comprised capital and labour as independent variables, which are on the right side of the equation. The constant level of technology is removed as it has the potential to impact the outcomes and misrepresent the relationship where 1 (coefficient of capital) > 1. The next step is to investigate the relationship between various types of taxes and economic growth. In this study, the individual effects of the corporate and personal income tax, sales tax, and GST on economic growth in Malaysia are examined separately in model 2 to 4. The regression coefficient of the tax variable in each model measures the effect of taxation on the economic growth of Malaysia. Based on the analysis of model 1 to 4, it can be concluded that both capital and labour consistently exert a positive influence on economic growth, with the statistical significance of the

data at a 1% level. When conducting a thorough analysis of each individual type of tax, it becomes clear that they have a positive relationship with economic growth. However, only the variables of corporate income tax and sales and service tax demonstrate statistical significance at the 1% level in Model 2 and Model 1. The result of personal income tax in Model 3 is insignificant and not reliable. Besides that, there has a high R squared and thus a strong goodness of fit and more variability is explained by the models. model 1 to 3 suffers with heteroscedasticity and model specification error, to reject null hypothesis which are used by the ARCH test and JB test. model 4 encounters a similar issue, with the exception that it assumes a normal distribution.

In model 5, we combine all the tax variables in order to examine their whole impact. The sign of the corporate income tax coefficient shifted from positive to negative, it suggests that it has a negative influence on economic growth due to a drop in overall taxation efficiency. However, the corporate income tax regression coefficient is not statistically significant, therefore the finding is unable to be accepted. The factors of capital, labour, personal income tax, and sales and services tax continue to have a positive effect. However, the sales and services tax has become insignificant at level 10%. Additionally, the issues of heteroscedasticity and model specification remain but with a high JB test statistics, which considered as normally distributed. In this research, the tax-GDP ratio was not included in the model analysis due to its lack of statistical significance, as indicated by the results presented in Appendices 1.1.

In model 6 to 9, several control variables have been included to examine the diverse impacts of different tax types on the process of economic growth. The analytical methodology applied includes multiple macroeconomic indicators, in order to identify and evaluate the impact of tax factors. In model 6, it was shown that all tax components exhibited positive impacts on economic growth. However, it is important to note that only the personal income tax exhibited a statistically significant influence, whereas the effects of other taxes insignificant when insert the trade balance as the control variables. Although the model 7 to 9 showed a good fit with the data and

consistently having a positive impact on economic growth, the various types of tax variables show strong statistical insignificant.

Additionally, we examined how taxes, government spending, and foreign direct investment interact in model 10 due to we were interested in both direct and indirect effects. Our study revealed significant indirect impacts in the relationships between corporate income tax and foreign direct investment, corporate income tax and government spending, and sales and services tax and government spending. This observation illustrates the interconnectedness of these variables. In the course of examining Models 6 to 10, it came to light that these models faced certain statistical challenges. The models encountered serial correlation and heteroscedasticity but the assumption of normality was satisfied.

In model 11 and 12, we use powers of 2 for the tax rate to see how it responds as it gradually increases. This helps us reveal detailed patterns in how tax rates change can impact the overall economy in time to time. It is critical to capture any non-linear effects in economic models since many real-world relationships in economics and other areas are not strictly linear. The relationship between variables does not always follow a straight line, and there may be diminishing or increasing returns or other complicated behaviours that cannot be fully described by a simple linear relationship. Hence, the tax variables were included in order to prepare for potential non-linear impacts. The equation aims to explain the relationship between these variables and the growth of real GDP in Malaysia, taking into account individual effects and possible interactions. After adding the non-linear impacts of tax into model 12, the majority of the independent variables is found in significant at level 5%. However, the variables related to corporate income tax exhibit insignificance. In the context of the model 12, the issue of heteroscedasticity is solved by a higher ARCH test statistic. Additionally, the normality assumption is found to be met. However, the problem of serial correlation remains.

Table 4.3.1:
Growth Regression for Malaysia using Ordinary Least Square (OLS)

$ln\ RGDP$	(1)	(2)	(3)	(4)	(5)
$ln\ K$	0.7766	0.6235	0.7565	0.7067	0.7072
	(0.0037) ***	(0.0494) ***	(0.0178) ***	(0.0235) ***	(0.0355) ***
$ln\ L$	0.2234	0.3765	0.2435	0.2933	0.2928
$ln\ Tax_{corp}$		0.0882			-0.0107
		(0.0283) ***			(0.0557)
$ln\ Tax_{inc}$			0.0135		0.0066
			(0.0109)		(0.0022) ***
$ln\ Tax_{sst}$				0.0459	0.0513
				(0.0157) ***	(0.0467)
$ln\ TB$					
$ln\ GS$					
$ln\ FDI$					
$ln\ Tax_{corp} \times ln\ FDI$					
$ln\ Tax_{corp} \times ln\ GS$					
$ln\ Tax_{inc} \times ln\ GS$					
$ln\ Tax_{sst} \times ln\ GS$					
R-squared	0.9895	0.9943	0.9905	0.9962	0.9965
Adjusted R-squared	0.9895	0.9941	0.9903	0.9961	0.9962
Durbin-Watson stat	0.1816	0.3507	0.2524	0.3008	0.392
Diagnostic Checking					
Breusch-Godfrey	0.0000	0.0000	0.0000	0.0000	0.0000
ARCH	0.0000	0.0002	0.0000	0.0000	0.0000
Jarque-Bera	0.0000	0.0011	0.0000	0.2403	0.3286

Note: *, **, ***, represents the rejection of null hypothesis at 10%, 5%, and 1% level of significance respectively.

Table 4.3.2:
Growth Regression for Malaysia using Ordinary Least Square (OLS)

$\ln RGDP$	（6）	（7）	（8）	（9）	（10）
$\ln K$	0.7542	0.5726	0.574	0.5019	0.3373
	(0.0527) ***	(0.0877) **	(0.0687) ***	(0.1230) ***	(0.1217) ***
$\ln L$	0.2458	0.4274	0.426	0.4981	0.6627
$\ln Tax_{corp}$	0.0094	-0.0375	0.0118	0.0051	-0.3807
	(0.0551)	(0.044)	(0.0494)	(0.0457)	(0.2418)
$\ln Tax_{inc}$	0.0057	0.004	0.004	0.0022	0.1546
	(0.0020) ***	-0.003	-0.0025	-0.0027	(0.3050)
$\ln Tax_{sst}$	0.0225	0.0494	0.0560	0.0356	0.5673
	(0.0429)	(0.2121)	(0.0397)	(0.037)	(0.2386) **
$\ln TB$	-0.0180			-0.0120	0.0005
	(0.0101) *			(0.0124)	(0.0111)
$\ln GS$		0.0657		0.0562	-0.1518
		-0.0409		-0.0488	(0.0838) *
$\ln FDI$			0.0262	0.0207	0.1664
			(0.0123) ***	(0.0105) *	(0.0626) **
$\ln Tax_{corp} \times \ln FDI$					-0.0163
					（0.0063） **
$\ln Tax_{corp} \times \ln GS$					0.0503
					（0.0216） **
$\ln Tax_{inc} \times \ln GS$					-0.0090
					（0.0176）
$\ln Tax_{sst} \times \ln GS$					-0.0320
					（0.0155） **
R-squared	0.9963	0.9968	0.9905	0.9971	0.9982
Adjusted R-squared	0.9959	0.9965	0.9903	0.9967	0.9977
Durbin-Watson stat	0.4231	0.369	0.2524	0.4465	0.6914
Diagnostic Checking					
Breusch-Godfrey	0.0000	0.0000	0.0000	0.0000	0.0000
ARCH	0.0003	0.0000	0.0015	0.0026	0.0241
Jarque-Bera	0.3182	0.3430	0.6376	0.2117	0.9002

Note: *, **, ***, represents the rejection of null hypothesis at 10%, 5%, and 1% level of significance respectively.

Table 4.3.3:
Growth Regression for Malaysia using Ordinary Least Square (OLS)

$\boldsymbol{ln\ RGDP}$	（11）	（12）
$\boldsymbol{ln\ K}$	0.4592	0.6743
	(0.1295) ***	(0.1358) ***
$\boldsymbol{ln\ L}$	0.5408	0.3257
$\boldsymbol{ln\ Tax_{corp}}$	-0.0047	0.5518
	(0.2765)	(0.6837)
$\boldsymbol{(ln\ Tax_{corp})^2}$	0.0061	-0.0639
	(0.0158)	(0.0710)
$\boldsymbol{ln\ Tax_{inc}}$	0.0752	0.3456
	(0.1123)	(0.1059) ***
$\boldsymbol{(ln\ Tax_{inc})^2}$	-0.0075	0.0469
	(0.0108)	(0.0265) **
$\boldsymbol{ln\ Tax_{sst}}$	0.2083	-0.4361
	(0.1107) *	(0.2674) ***
$\boldsymbol{(ln\ Tax_{sst})^2}$	-0.0087	-0.0299
	(0.0069)	(0.0079) ***
$\boldsymbol{ln\ TB}$	-0.0055	-0.0119
	(0.0101)	(0.0091) **
$\boldsymbol{ln\ GS}$	-0.0041	-0.5630
	(0.0407)	(0.1728) ***
$\boldsymbol{ln\ FDI}$	0.0073	0.1718
	(0.0105)	(0.0624) ***
$\boldsymbol{(ln\ Tax_{corp})^2 \times ln\ FDI}$		-0.0045
		(0.0022) **
$\boldsymbol{(ln\ Tax_{corp})^2 \times ln\ GS}$		-0.0016
		(0.0006) **
$\boldsymbol{(ln\ Tax_{inc})^2 \times ln\ GS}$		-0.0046
		(0.0018) **
$\boldsymbol{(ln\ Tax_{sst})^2 \times ln\ GS}$		0.0632
		(0.0190) ***
R-squared	0.9981	0.999
Adjusted R-squared	0.9976	0.9986
Durbin-Watson stat	0.8518	1.1716
Diagnostic Checking		
Breusch-Godfrey	0.0000	0.0076

ARCH	0.0647	0.3589
Jarque-Bera	0.8518	0.4461

Note: *, **, ***, represents the rejection of null hypothesis at 10%, 5%, and 1% level of significance respectively.

4.4 Interpretation of Equation

Following multiple-step regression, the final equation is determined, and the predicted coefficient for model 12 is interpreted:

$$\ln RGDP_t = 0.6743 \ln K + 0.3257 \ln L + 0.5518 \ln Tax_{corp} - 0.0639\left(\ln Tax_{corp}\right)^2$$
$$+ 0.3456 \ln Tax_{inc} + 0.0469(\ln Tax_{inc})^2 - 0.4361 \ln Tax_{sst}$$
$$-0.0299(\ln Tax_{sst})^2 - 0.0119 \ln TB - 0.5630 \ln GS + 0.1718 \ln FDI$$
$$+0.0045 \left[\left(\ln Tax_{corp}\right)^2 \times \ln FDI\right] - 0.0016 \left[\left(\ln Tax_{corp}\right)^2 \times \ln GS\right]$$
$$- 0.0046 \left[(\ln Tax_{inc})^2 \times \ln GS\right] + 0.0632 \left[(\ln Tax_{sst})^2 \times \ln GS\right]$$

R-squared: 0.999
D-W test statistics: 1.1716

The sign of the coefficient of corporate income tax is consistent with previous findings of Gechert and Heimberger (2022), Alm and Rogers (2010). However, the quadratic effect of corporate income tax is negative sign. In the result of the model, it can conclude that the linear effect of corporate income tax increases by 1%, RGDP increases by 0.5518%. The quadratic effect of corporate income tax is negative, meaning that when corporate income tax increases by one unit, the curvature of the

relationship decreases by 0.0639 units. The quadratic effect also depends on the value of corporate income tax itself, so the marginal effect of corporate income tax is not constant, but decreasing. However, both regression coefficients are not statistically significant, thus this finding can't be considered credible empirical data. The interaction between corporate income tax and government spending is negative means the effect of ln_taxrate_corp depends on the level of government spending, and vice versa. The higher the government spending, the more negative the effect of corporate tax rate on real GDP, and the higher the corporate tax rate, the more negative the effect of government spending on RGDP. Based on the previous research of Gechert and Heimberger (2022), our result of interaction term between corporate income tax and foreign direct investment is consistent with them. When corporate income tax increase by 1% , it will affect the FDI and decrease the RGDP growth.

Based on the equation illustrated, the coefficient of personal income tax is interpreted as 1% increase result in 0.3456% increase in RGDP growth. This demonstrates that personal income taxes have a positive impact on economic growth. It is consistent with the result of Lin and Jia (2019) Yakita (2003) Besides, the quadratic effect of personal income tax show a positive sign and the parabola is concave up, which means the economic growth increase as the personal income tax rate increases initially until a certain point. After that, the economic growth will start diminishing when the personal income tax keep increasing. This result is consistent with (Loganathan et al.,2017b).

In this section, we found that indirect tax, which is sales and services tax, has a negative impact on RGDP growth in Malaysia. Our results tend to be consistent with the previous research (Loganathan et al., 2020b), (Syeddin et al., 2021b) and Hakim et al. (2022). As 1% increase in sales and services tax, Malaysia's economic growth decreased by 0.4361%. Besides, the negative sign of non-linear effect on sales and services tax is negative sign means the parabola is concave down. It means that the rate of sales and service tax has a negative and nonlinear impact on real GDP. The greater

the sales and service tax rate, the lower the real GDP until reach a certain point and increase eventually.

Table 4.4.1 and table 4.4.2 presents the direct and indirect impact of personal income tax and sales and services tax on government spending. In the table 4.4.1 and 4.4.2 the horizontal and vertical value is taken the minimum and maximum value in the data. Through observation from table 4.4.1, when there is an increase in government spending but personal income tax remains unchanged, it might result in a shift of economic growth from positive to negative. Hence, it is recommended that the personal income tax rate be raised in the future, along an increase in government spending, as a means of decreasing the government debt. On the contrary, if personal income taxes increase while government spending remains constant, it will have a direct negative effect on economic growth. Nevertheless, despite the increase in tax revenue, there was not an equivalent rise in government spending. Consequently, this indirect effect is likely to have a negative effect on economic growth. Based on the findings shown in Table 4.4.2, it can be concluded that a significant rise in government spending has the potential to generate advantages in terms of economic growth. The implementation of an increased sales and services tax has the potential to generate income for the government while also stimulating economic growth in Malaysia.

Table 4.4.1

The effect of direct and indirect effect of personal income tax on Malaysia economic growth

	$\ln GS$							
$\ln Tax_{inc}$	11	12	13	14	15	16	17	18
5	0.3086	0.2626	0.2166	0.1706	0.1246	0.0786	0.0326	-0.0134
6	0.3012	0.246	0.1908	0.1356	0.0804	0.0252	-0.03	-0.0852
7	0.2938	0.2294	0.165	0.1006	0.0362	-0.0282	-0.0926	-0.157
8	0.2864	0.2128	0.1392	0.0656	-0.008	-0.0816	-0.1552	-0.2288
9	0.279	0.1962	0.1134	0.0306	-0.0522	-0.135	-0.2178	-0.3006
10	0.2716	0.1796	0.0876	-0.0044	-0.0964	-0.1884	-0.2804	-0.3724
11	0.2642	0.163	0.0618	-0.0394	-0.1406	-0.2418	-0.343	-0.4442

Table 4.4.2

The effect of direct and indirect effect of sales and services on Malaysia economic growth

	$\ln GS$							
$\ln Tax_{SST}$	11	12	13	14	15	16	17	18
4.5	5.5516	6.1204	6.6892	7.258	7.8268	8.3956	8.9644	9.5332
5.5	6.8822	7.5774	8.2726	8.9678	9.663	10.3582	11.0534	11.7486
6.5	8.2128	9.0344	9.856	10.6776	11.4992	12.3208	13.1424	13.964
7.5	9.5434	10.4914	11.4394	12.3874	13.3354	14.2834	15.2314	16.1794
8.5	10.874	11.9484	13.0228	14.0972	15.1716	16.246	17.3204	18.3948
9.5	12.2046	13.4054	14.6062	15.807	17.0078	18.2086	19.4094	20.6102
10.5	13.5352	14.8624	16.1896	17.5168	18.844	20.1712	21.4984	22.8256
11.5	14.8658	16.3194	17.773	19.2266	20.6802	22.1338	23.5874	25.041

CHAPTER 5: CONCLUSION

The purpose of this study is to estimate the effect of tax changes on the economic growth in Malaysia from the year 1970 to 2019. The overview of our study, policy implications, limitations, and recommendations will be explored in this chapter.

5.1 Summary of the Study

First and foremost, our findings show that the direct effect of personal income tax and economic growth have a statistically significant positive relationship, but the direct effect of sales and services tax and economic growth have a negative relationship. This empirical evidence demonstrating a positive relationship between personal income taxes and economic development states that increased tax revenues could actually offset the negative effects of taxes by boosting economic growth instead. The negative relationship between sales and services tax indicates that an increase in the sales and services tax would reduce consumption, total demand, or production (Hamid, 2023). As a result, economic growth would decrease.

Secondly, we considered the quadratic effect of different types of tax. It shows that the personal income tax initially increases until a certain point diminishing eventually. It might be claimed that an increase in tax income results in an equal increase in government revenue, which can then be utilised to invest in various projects aimed at stimulating economic growth and activity. The continuous rise in personal income tax rates serves as an obstacle for individuals to engage in increased labour efforts, thereby resulting in a reduction in workforce participation and subsequent decline in overall output. Conversely, an increase in sales and services tax would

decrease the economic growth initially and start increasing until reach a certain point. The effect can be explained that the sales and services tax negatively affect the purchasing power and demand of consumers, thereby reducing economic growth. However, sales and services tax have the potential to boost economic growth if they are collected and used effectively, such as by broadening the tax base, reducing tax evasion, and raising public spending.

Last but not least, our analysis included the incorporation of the interaction term. The negative relationship between the interaction term of personal income tax and government spending and economic growth is found. The interaction term between the sales and services tax and government spending on economic growth, on the other hand, is positive.

5.2 Policy Implication

This research investigates the effect of tax changes on economic growth. As a result, we are running the investigation from 1970 to 2019 by using Malaysia data. Based on the research results, we may conclude that the relationship between taxation and economic growth is negative. According to the fundamental theory, increasing the tax rate could reduces economic growth by way of reducing aggregate demand in the direct effect.

The analysis of this paper suggests some of the policy implications that could be considered. Fiscal policy is one of the tax policy tools available to the government for influencing a country's economic development and recovery. The expansionary policy under the discretionary fiscal actions include increasing government spending, and reduction in tax (Law, 2016). The tax rate is the proportion of income or profit paid as tax by a person or a business. It has the potential to influence Malaysian economic growth through altering taxpayer incentives and behavior. A lower tax rate

could boost economic activity by boosting taxpayers' disposable income and profitability. Thus, to enhance economic opportunity and provide adequate income support for the low-income group (B40), the policy maker could offer tax incentives that encourage employment, upskilling, entrepreneurship, and social welfare to reduce unemployment (Singh,2023). According to the LHDN (Lembaga Hasil Dalam Negeri) Malaysia, the individual tax rate for the taxpayer whose chargable income is between RM5,001 to RM 20,000 is around 2% in 2013 while it reduced to 1% in the year 2015. Without an uncertainty, our result suggest to the policy maker is to reduce the taxation to increase the economic growth in Malaysia.

However, decreasing the tax rate does not ensure that economic growth would improve. Consider about the indirect effect, no matters increase or decrease the tax, it may led to decrease economic growth by increasing the budget deficit (William and Andrew, 2016). In addition, the effect of the tax on economic growth is depends on how the government balance the budget, provide the goods and services, enhance the productivity. The composition of various forms of taxes which is the direct and indirect tax that we always mentioned in the whole content collected by the government, is referred to as tax structure. It could influence Malaysian economic growth through influencing the efficiency and equity of the tax system. The policy that is often implemented by modifying the quantity or structure of government expenditure and taxation also known as fiscal policy (Tahiri, 2022). To balance the tax rate and spending in tax structure, the government might implement a fiscal policy rule that prohibits an operational deficit in any given year to show a credible commitment to long-term fiscal sustainability through yearly budget discipline (UKEssays, 2018).

In our suggestion, if the government wish to rise the economic growth, the fiscal policy is appropriate for policymakers since it is transparent and simple to manage.

5.3 Limitation and Recommendation of Study

The study contains certain flaws, which will be highlighted in the next sections. It is critical for researchers to acknowledge the study's shortcomings and flaws so that researchers can gain insight from it and discover appropriate strategies to fix or increase these limits when conducting future investigations. First, our study specifically concentrates on the nation of Malaysia to investigate the influence of taxation on economic growth. Besides, our findings occurred autocorrelation problem and it may affect the assumption. So here, for the extension studies, we recommend that future researchers can cover other developed countries to find out whether taxation always has the positive impact on economic growth as the theory suggested.

Secondly, in our research, we found a problem where higher taxes lead most taxpayers to participate in the underground economy. This can lead to limits on the development potential of the formal economy, as it weakens the capacity of governments and limits the efficient allocation and investment of resources. However, we did not take into account the impact of taxation on the underground economy, and therefore on economic growth. In the future, researchers can focus on the limitations of our findings and conduct better analyses.

Furthermore, the lack of diversity in this study was another limitation we encountered. In this study, we only focus on Malaysia. Consequently, we propose that upcoming studies explore developing and underdeveloped nations. This exploration could determine whether the influence of taxation on economic growth aligns with that observed in developed countries or diverges significantly.

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Appendices

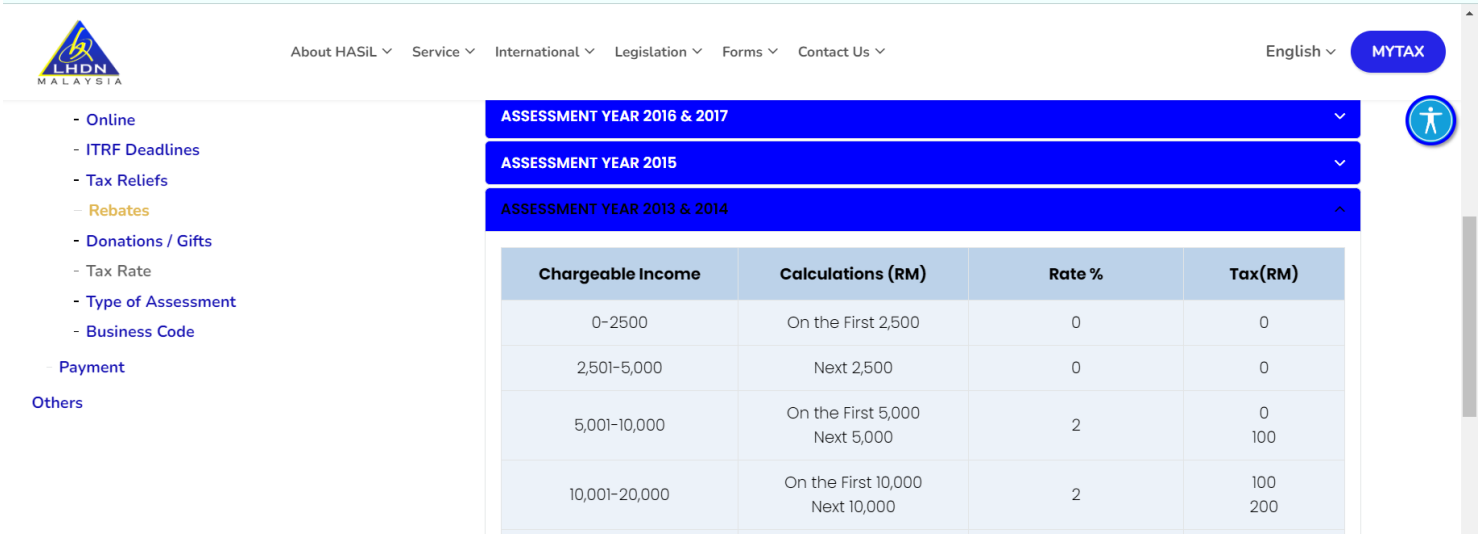
Appendices A

Growth Regression for Malaysia using Ordinary Least Square (OLS)

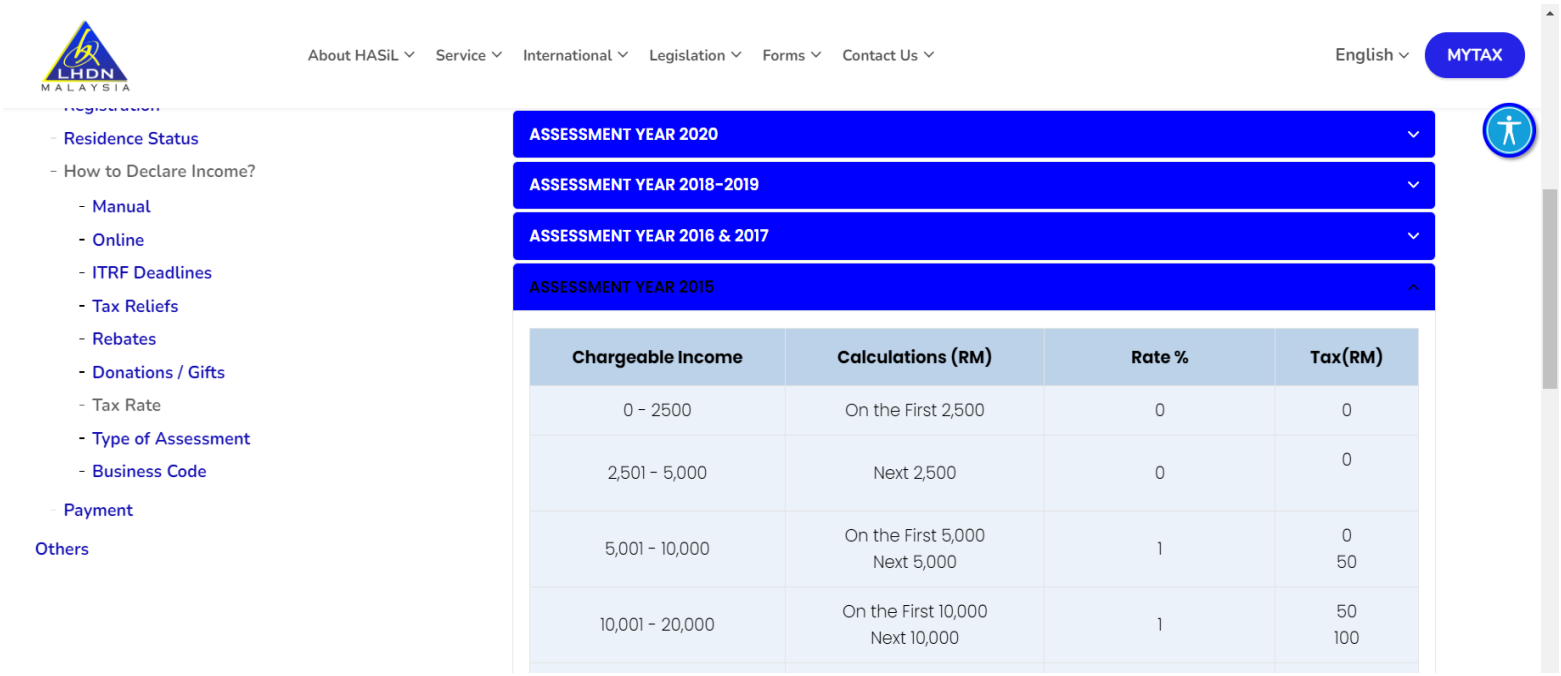
$ln\ RGDP$	(a1)	(a2)	(a3)	(a4)
$ln\ K$	0.8391	0.843	0.8161	0.7965
	(0.02) ***	(0.0376) ***	(0.0247) ***	(0.0266) ***
$ln\ L$	0.1609	0.157	0.1839	0.2035
$ln\ \frac{Tax_{corp}}{ngdp}$	0.0191			-0.034
	(0.0061)			(0.0778)
$ln\ \frac{Tax_{inc}}{ngdp}$		0.0194		-0.067
		(0.0112)		(0.0785)
$ln\ \frac{Tax_{sst}}{ngdp}$			0.0109	0.1038
			(0.071)	(0.0514)
R-squared	0.9913	0.9951	0.9949	0.9956
Adjusted R-squared	0.9912	0.9913	0.9948	0.9953
Durbin-Watson stat	0.2413	0.2425	0.2945	0.3081
Diagnostic Checking				
Breusch-Godfrey	0.0000	0.0000	0.0000	0.0000
ARCH	0.0000	0.0000	0.0000	0.0003
Jarque-Bera	0.0000	0.0000	0.5490	0.4060

Appendices B

Reduction of the individual tax



Chargeable Income	Calculations (RM)	Rate %	Tax(RM)
0-2500	On the First 2,500	0	0
2,501-5,000	Next 2,500	0	0
5,001-10,000	On the First 5,000 Next 5,000	2	0 100
10,001-20,000	On the First 10,000 Next 10,000	2	100 200



Chargeable Income	Calculations (RM)	Rate %	Tax(RM)
0 - 2500	On the First 2,500	0	0
2,501 - 5,000	Next 2,500	0	0
5,001 - 10,000	On the First 5,000 Next 5,000	1	0 50
10,001 - 20,000	On the First 10,000 Next 10,000	1	50 100