MGT 666

INDUSTRIAL TRAINING REPORT

ROBERT BOSCH AUTOMOTIVE STEERING SDN BHD

15 FEBRUARY 2021 – 30 JULY 2021

BACHELOR OF BUSINESS ADMINISTRATION (HONS). FINANCE

FACULTY OF BUSINESS AND MANAGEMENT

UITM ARAU, PERLIS

MACROECONOMIC DETERMINANTS OF CAR SALES IN ASEAN

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EXECUTIVE SUMMARY

This study investigates the relationship between car sales and macroeconomic variables in ASEAN. This research covers 5 ASEAN countries (Malaysia, Thailand, Vietnam, Philippines and Brunei) and the total sample is 10 years covers from 2010-2019. The macroeconomic variables used in this study are inflation rate and unemployment rate. The objective of this study is to determine the factors that affecting the number of car sales and to identify the most significant factors of independent variables with dependent variable. In order to achieve the objective, the study used secondary data and it analyzed by using descriptive analysis, correlation analysis, and regression analysis. The result of the study shows the inflation rate has significant and negative relationship with car sales meanwhile unemployment does not significant with car sales in ASEAN. The findings in this research were consistent with the previous findings by some researchers.

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PART 3: COMPANY'S PROFILE

ROBERT BOSCH AUTOMOTIVE STEERING SDN BHD

No 2528, Lorong Perusahaan 6, Kawasan Perindustrian Perai, Pulau Pinang.

BACKGROUND OF COMPANY

Bosch has been existing in Malaysia since 1923, represented by Robert Bosch SDN BHD. In Malaysia, Bosch is active in the areas of Mobility Solution, Industrial technology, Consumer goods and Energy and Building Technology. The offices of Robert Bosch SDN BHD located in Selangor and Penang. In Penang, the company has 3 subsidiaries providing car multimedia, power tools and automotive steering. In 2018, Malaysia contributed sales of close to RM 537 million (113 million euro) and employed more than 2,800 associates.

VISSION

We are the worldwide leading supplier of innovative steering systems and play a decisive role in shaping the future of mobility. We finance our growth through our benchmark profitability, securing our long-term market success.

MISSION

We are innovation, technology leaders and provide solutions to our customers which make driving safer, more dynamic, sustainable and comfortable. We are pacemakers of autonomous driving excellence in every function.

ORGANIZATIONAL STRUCTURE

Figure 2: Organizational Structure

PRODUCT AND SERVICES

Robert Bosch Automotive Steering SDN BHD produced manual rack and pinion steering gears, power rack and pinion steering gears. In order to maintain the quality of each rack, pinion and housing aluminum, it will be assembled into steering and follow 10 process which include hardening process, broaching process using the reshaping process, and gear grinding process. Robert Bosch Automotive Steering SDN BHD export their products to China, France, Germany, Japan, Taiwan, Thailand, United Kingdom and United States.

PART 4: TRAINING'S REFLECTION

INTERNSHIP DURATION

15 February 2021 – 30 July 2021 (6 months)

WORKING DAYS

Monday – Friday

WORKING TIME

Monday-Thursday 8:00am-5.30pm

Friday 8:00am-6:00pm

DEPARTMENT

Controlling

TASK

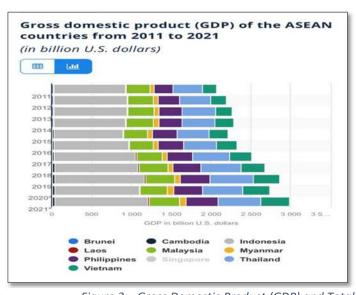Detective control, Asset Audit, Witnessed scrap process.

GAINS AND BENEFITS

Allowance RM800 and 1 day leave per month.

PART 5: ANALYSIS

CHAPTER I: INTRODUCTION

1.1 BACKGROUND OF THE STUDY

ASEAN is consisting of The Association in Southeast ASEAN Nations which included of 10 countries in Southeast Asia. The 10 members of ASEAN are Malaysia, Indonesia, Thailand, Singapore, Vietnam, Philippines, Myanmar, Cambodia, Laos and Brunei. ASEAN is a territorial intergovernmental cooperation that facilitates economic, political, educational, sociocultural among the countries. Based on the figure 1, In 2020, the total gross domestic product of ASEAN countries amounted 2.8 billion USD and the total population amounted to 680 million inhabitants. In line with the GDP and population of ASEAN, the automotive is the essential industries in enhancing the economic growth of a country. Automotive also act as a main driver to macroeconomic growth, stability and technological advancement in both developed and developing countries. Meanwhile the core automotive industry which include vehicle and parts makers support wide range of business segment. (Johan, 2019) stated that the automotive industry supports the thousands of small and medium enterprises in the value chain from spare parts to the seat leather producers. The automotive industry is linked to other major industries such as banking, insurance, infrastructure and mining industries for steel. The automotive sector is one of the contributors to the country's budget but the sales of automotive are unpredictable from year to year which it will affect the budget income of the country as well the annual government budget.
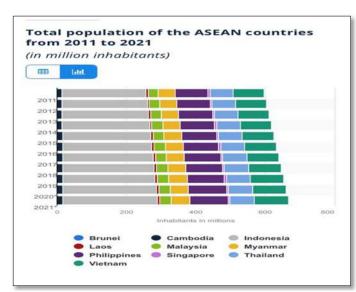

Figure 3:   Gross Domestic Product (GDP) and Total Population of the ASEAN countries from 2011 to 2021

Source: Statista.com, 2021

1.2 PROBLEM STATEMENT

Sales is a term that describe the activities of selling goods or services and it is refer to the operating revenues earned by a company. According to (Patra & Rao, 2020) automotive sales has the trend that fluctuate in the line with economic growth. In late 2019, worldwide country which include ASEAN countries have experienced Pandemic Covid-19. Sluggish sales growth can put a company in hot water to being bankruptcy. Meanwhile a good sale in a company can increase the production output, bring down costs per unit and can generate more sales and profits. Yet, it could not disagree more that sales of new automobiles decreased significantly due to Covid-19 has affected the global automotive industry and automakers because transportation manufacturer depend heavily on supply of parts and components. Based on the data from figure 2, the number of vehicles sold in ASEAN declining from 3.46 million units at year 2019 to 2.45 million units in 2020. This is because the governments restricted the movements of goods across countries and the manufactures had to halt production due to lack of parts and components. This problem also gives impact to the Robert Bosch Automotive Steering since the company produced auto parts and car steering system. Moreover, car sales in automotive sectors were affected by macroeconomics factors which include unemployment, inflation, GDP and interest rate. Inflation has a bad impact to many industries and the car industry is no exception (Zain et al., 2020). Robert Bosch Automotive Steering also affected by the inflation where the increase in price of raw materials leads to increased cost to manufacturers and producers of car's spare parts and components. Meanwhile, unemployment also can be one of the factors affecting sales because an economy unable making full use of workers that are available. The economy will not grow and it may start to slow down due to people spend less.

Number of motor vehicles sold in ASEAN from 2011 to 2020
(in millions)

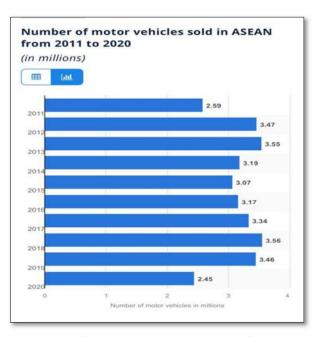| Year	Number of motor vehicles in millions
2011	2.59
2012	3.47
2013	3.55
2014	3.19
2015	3.07
2016	3.17
2017	3.34
2018	3.56
2019	3.46
2020	2.45

Figure 4: Number of motor vehicles sold in ASEAN from 2011 to 2020

Source: Statista.com, 2021

1.3 OBJECTIVE OF STUDY

In general, the purposes of the study to identify the relationship between macroeconomics factors and the car sales of the automotive industry in ASEAN countries that focused on Malaysia, Thailand, Vietnam, Philippines and Brunei. Therefore, this study will provide valuable information for Robert Bosch Automotive Steering on how they can improve their company performance, sales and maximize profit.

Specifically, this study intends to:

1. To examine the relationship between independent variables (inflation rate and unemployment rate) and dependent variables (car sales).

2. To identify the most significant factors of independent variables that influences the dependent variable of automotive industry.

1.4 THEORETICAL FRAMEWORK

1.4.1 DEPENDENT VARIABLE

For this study the dependent variable that has been chosen is the car sales of automotive industry in ASEAN.

1.4.2 INDEPENDENT VARIABLE

Independent variables can be determined as the macroeconomic factors that lead to the affecting of the dependent variable. In this study, there are independent variables that have been identified which are inflation rate and unemployment rate.
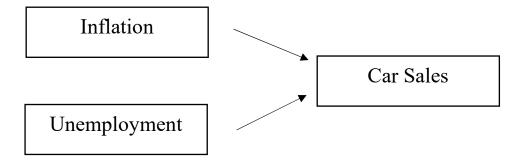
Figure 5: Research Framework

1.5 SCOPE OF STUDY

1.5.1 Dependent and Independent Variable

This study focuses on the performance of automotive industry towards macroeconomic variables and used the car sales of automotive sector in ASEAN countries as the dependent variable and the inflation rate and unemployment rate as independent variables.

1.5.2 Data collection method

Data collected from the secondary data that has been taken from World Bank publications, Statista.com, OICA, Knoema.com and ASEAN Secretariat.

1.5.3 Time frame

The data had been taken for 10 years from year 2010 until 2019.

1.6 LIMITATION OF STUDY

1.6.1 Information constraint

The difficulty in getting and collecting the appropriate data and information that relates to the research requirements is one of the limitations.

1.6.2 Time constraint

The use of World Bank is less efficient because some of the year and countries do not have the data. Hence, we have limited time to compile all the data that we need to run later in Stata for further analysis.

CHAPTER II: LITERATURE REVIEW

A few empirical studies have been conducted and examined the relationship between car sales and various macroeconomic factors and the finding are generally mixed. However, different researchers studied different macroeconomics factors such as gross domestic product (GDP), interest rate, unemployment rate, income level, inflation rate and exchange rate. This research examines two macroeconomic variables which are inflation rate and unemployment rate. The research is based on a regional economy that consists of five countries and on 10 years of historical performance. These factors render this research unique. The five countries from ASEAN members are Malaysia, Thailand, Vietnam, Philippines and Brunei.

Car Sales

(Johan, 2019) studies the macroeconomic determinants of car and motorcycle sales in Indonesia which focused on 5 macroeconomics variables (gross domestic product, inflation, growth of GDP, interest rate and exchange rate). The study found that the gross domestic product and changes in a gross domestic product have a significant influence on car and motorcycle sales in Indonesia.

(Zain et al., 2020) examine the macroeconomic indicators and the sales volume of car sales in Proton. The result shows that the inflation and unemployment significantly to the car sales for Proton while GDP, and interest rate do not have significant with the car sales.

Other than that, gross domestic product (GDP) has a constructive effect to many car sales in Malaysia. The interest rate, unemployment rate, and inflation rate negatively affect many car sales in Malaysia (Islam et al., 2016).

Inflation

Inflation is the first variable that will be discussed in this study. Inflation happens when there is a steady increase in the price of goods and services in the economy, and it is a serious issue feared by many businesses, government and consumers.

A finding by (Islam et al., 2016) is the inflation has negative relationship with car sales. When the inflation rate increase by 1%, the car sales decline by 2,409 units. This is because the inflation rate has increased the price of the car and cause the car sales decrease due to real purchasing power of consumer have declined.

Meanwhile, (Zain et al., 2020) conducted the macroeconomic indicators and the sales volume of car sales in Proton. The study found that the relationship between the inflation and car sales has a negative and significant relationship towards car sales in Proton. An increase in 1% of inflation rate can decrease the car sales by 13.53% in Proton.

Unemployment

Unemployment rate is indeed a matter of concern in many countries including Malaysia. The cost of unemployment is direct to the individuals when the individuals lose their jobs due to a drop in income and reduced their spending (Ganong & Noel, 2016).

(Zain et al., 2020) found that the unemployment has a negative and significant relationship towards car sales in Proton. When 1 unit increase in unemployment, the car sales in Proton will decrease 33.74%.

Another study conducted by (Islam et al., 2016), with the same finding where the unemployment rate has negative relationship with the car sales in Malaysia. This means that when unemployment increase, the car sales in Malaysia will decrease. If the unemployment rate increase by 1%, the car sales will decrease by 38,866 unit.

According to the study by (Nawi et al., 2013), unemployment rate has a negative relationship with car sales. From their finding, when the unemployment rate increased by 1 percent, the car sales decreased by 1.52 percent.

CHAPTER III: RESEARCH METHODOLOGY

3.1 MODEL USED

This research tests the effects of macroeconomic variables on car sales in the ASEAN countries. The research has two macroeconomic factors which are inflation rate and unemployment rate. The macroeconomic data is based on World Bank, Statista.com, OIC, Knoema.com and ASEAN Secretariat. The data from spanning the years 2010 to 2019 and the samples are 5 ASEAN countries which are Malaysia, Thailand, Vietnam, Philippines and Brunei. This research using a regression statistic model.

$$\text{Car sales}_{it} = \beta_0 + \beta_1 \text{INFLATION}_{it} + \beta_2 \text{UNEMPLOYMENT}_{it} + \varepsilon_{it}$$

3.2 HYPOTHESIS

This study was based on the following null and alternate hypothesis:

Hypothesis 1

Ho: There is no significant relationship between the car sales and inflation rate.

H1: There is a significant relationship between the car sales and inflation rate.

Hypothesis 2

Ho: There is no significant relationship between the car sales and unemployment rate.

H1: There is a significant relationship between the car sales and unemployment rate.

CHAPTER IV: FINDINGS AND ANALYSIS

4.1 DESCRIPTIVE ANALYSIS

Table 4.1: Descriptive statistics for car sales and macroeconomic variables.

Variables	N	Mean	SD	Min	Max
Car sales	50	416874.4	368262.4	10500	1423580
Inflation	50	2.5532	3.20373	-0.26	18.68
Unemployment	50	3.6266	2.49834	0.21	9.3

Table 4.1 discussed the summary of descriptive statistic for car sales and macroeconomic factors in ASEAN countries. The table shows there are 50 samples of observation. Based on the table 4.1, Mean for the inflation rate is 2.5532 and the standard deviation calculated is 3.20373. For unemployment rate, the mean and standard deviation calculated are 3.6266 and 2.49834. Besides, the car sales show a mean is 416874.4 and standard deviation is 368262.4. For maximum and minimum value, car sales show 1423580 and 10500. The maximum value for inflation is 18.68 where it is represented by Vietnam while the minimum value for inflation is -0.26. The unemployment rate has minimum value of 0.21 which it is from Thailand and maximum value of 9.3 represented by Brunei.

4.2 REGRESSION ANALYSIS

The chosen model is Fixed effect but with heteroskedasticity problem. The results suggested to conduct Fixed Effect Regression with cluster option.

Table 4.2: Macroeconomic variables affecting car sales.

	â€œRandom
Inflation	-11944.4129***
	(-3.02)
Unemployment	-36254.9385
	(-0.81)
Constant	578853.0156**
	(2.09)
N	50.0000
r2	
r2_a	
r2_w	0.0006
r2_b	0.7489
r2_o	0.5691
F	
p	0.0026
chi2	11.9135

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Notes: (1) Definition of Variable: Inflation=inflation rate, Unemployment=unemployment rate. (2) Figures in parenthesis are t-statistic.

Regression model:

CAR SALES = 578853.0156 + (36254.9385) UNEMPLOYMENT + (11944.4129) INFLATION + e

As shown in the table 4.2, the regression result indicated that adjusted R^2 is 0.5691 where the two independent variables explain 57% of the variance in the car sales. The remaining 43% is explained by other variables that were not included in this model. The results of the regression also suggest that inflation has a significant relationship with Car sales. In addition, the result also suggest that inflation is negatively related to the car sales and unemployment do not appear to be significantly related to car sales. The result show inflation rate has negative result where when the inflation rate increase by 1%, the car sales decline by 11944 units.

4.3 CORRELATION ANALYSIS

	CAR SALES	INFLATION	UNEMPLOYEMNT
CAR SALES	1.0000		
INFLATION	-0.1192	1.0000	
UNEMPLOYMENT	-0.6355	-0.4163	1.0000

Table 4.3 Correlation Analysis on car sales and macroeconomic factors

To determine the level of relationship between each tested variable, correlation analysis has been carried out. Table 4.3 reported the correlation analysis on car sales and macroeconomic factors. As shown in the table above, inflation and unemployment have negative relationship with car sales which indicated -0.1192 and -0.6355. It can be concluded that all the variables show that they have relationship with car sale in negative correlation.

DISCUSSIONS

The research result for inflation is significantly related and showed that there is a negative effect on car sales. Negative relationship means that if inflation increases, the car sales will decrease where this is in line with higher consumer price index can causes demand for car sales is lower. In addition, rising inflation affects the ability to allocate costs and impacts the purchasing power by consumers.

In the previous study, this result is consistent with (Zain et al., 2020), (Johan et al., 2020), (Islam et al., 2016) (Nawi et al., 2013) and (Muhammad et al., 2012) where they found that inflation rate is significant and it shows a negative relationship in car sales. Moreover, the previous study by (Johan, 2019) does not consistent with this study where the inflation does not influence car sales in Indonesia. It stated that the higher inflation, the higher interest rate that will reduce the payment capacity of the consumer.

Inflation results from an increase in production costs or an increase in demand for products and services. The price increase because the production costs increase such as raw material. So, companies in automotive sector might increase the prices of car sales. In result, demand for car sales is decrease. This situation can relate with Robert Bosch Automotive Steering where the company produce car spare parts and export the product to ASEAN country. When inflation exist and the cost of raw material is increase, the company cannot produce and export high volume of production due to high price. The company will slow their car spare part supply to the companies that sell the car such as Proton, Perodua, Mazda, BMW and others. In result, the car sales and demand by consumers will decrease due to increase in price.

RECOMMENDATIONS

Inflation can cause the price of goods increase and the purchasing power by consumers will be decrease. In order to cope with inflation, Robert Bosch Automotive Steering need to find some solutions to increase the company's sales.

For example, reduce the labor salary for a while to cover the production cost. This is because wages are the biggest expenses for business and it causing the production costs increase. If the company raises prices due to the rise in worker wages, cost-plus inflation will occur. With this idea, the company still can run the production with low volume and produce high quality product with additional features to attract consumer. If only fewer item available with good quality, the demand will be increase where the consumers are willing to pay more to obtain the it. It can lead to increase in car sales so that the company can still export the product over the country.

Other than that, the company in automotive industry must renegotiate contracts and terms with suppliers if they willing to give discounts for paying early or buying bulk the raw material. With this idea, it can increase the output and also can limit the effects of inflation. the company can run the business as usual and export to the ASEAN company. So that the company can focus on revenue and productivity growth.

CONCLUSION

This study analyzed the correlation between the car sales and macroeconomic factors for the period between 2010 to 2019 in five ASEAN countries which are Malaysia, Thailand, Vietnam, Philippines and Brunei. This research focuses on two macroeconomic factors which are inflation rate and unemployment rate. The finding shows the inflation rate has a negative relationship with car sales in ASEAN. This proves that inflation is an important factor determinant for the automotive industry in ASEAN. The company and businesses in automotive industry needs to study the inflation in determining production and sales plans including plant growth or capacity expansion. Lastly, there are some limitations in this research such as data limitation. This is because no data for latest year on car sales and macroeconomic variables.

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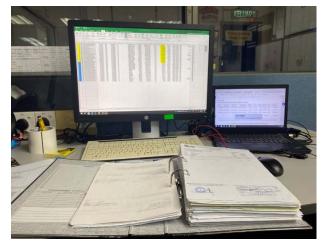
APPENDIX

REPORT INTERN 2021