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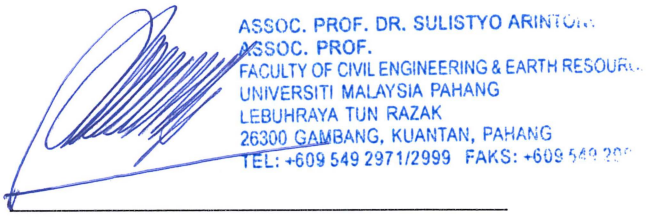

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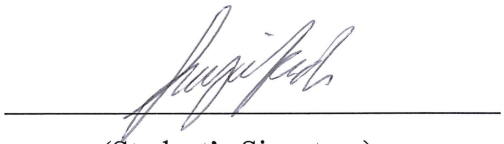

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OWNING AND OPERATING COSTS OF MOTORCYCLE IN MALAYSIA

NORSHAHIRA BINTI ADOM

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ABSTRAK

Projek ini adalah kajian tentang kos memiliki dan motosikal di Malaysia. Di dalam kajian ini, kaedah yang telah dilakukan adalah dengan memasukkan segala maklumat dan data yang diperoleh daripada soal selidik yang telah diedarkan ke dalam Microsoft Excel untuk mendapatkan kos per kilometer yang digunakan setiap tahun bagi setiap motosikal. Pengumpulan data terdiri daripada pelbagai jenis motosikal, kapasiti bagi sesebuah motosikal, tahun mengeluaran dan kilometer yang digunakan untuk motosikal tersebut. Jadi, daripada data yang telah dikumpul, analisis telah dilakukan dan memperoleh jumlah kos pemilikan dan kos operasi motosikal. Data yang terkumpul merupakan data yang diambil daripada kalangan pelajar di UMP dan orang yang menggunakan motosikal di seluruh Malaysia. Akhir sekali, sebagai kesimpulan, kos memiliki dan kos operasi motosikal bergantung kepada jenis motosikal yang digunakan, kapasiti enjin yang digunakan, harga terkini minyak petrol dan jumlah kilometer yang telah digunakan bagi sesebuah motorsikal.

ABSTRACT

This project is a researched about Owning and Operating Cost of Motorcycles in Malaysia. In case study, a method of study has been done, which is to key-in the data collected from questionnaire that has been distributed into Microsoft Excel to get the kilometre used per year for every motorcycles. The data collection consists of various type of motorcycles, capacity engine of motorcycles, year of manufactures and kilometre used for motorcycles. So, from the data collected, the results and analysis were obtained which are the total cost of owning and operating cost of motorcycles. Besides that, the data were collected among the student in UMP and people that using motorcycles around Malaysia. Last but not least, as a conclusion, Owning and operating cost of motorcycles is depending on type of motorcycles used and capacity of engine used.

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CHAPTER 1

INTRODUCTION

1.1 Background of the study

Transportation Industry is one of the most important industries that provide income for country development. Transport can be divided into different modes which are air, water, and land transport, which includes rail road and off-road transport. In that mode, a motorcycle is classified into land transport. Motorcycle is one of the major modes for daily traffic that mainly used to travel several parts around Malaysia. The used of motorcycles is not only to travel, but motorcycles also have been used by Malaysian people to do their daily routine such as go to work or college.

Compared to the public transport, public transport is a shared passenger-transport service which is available for use by the general public, as distinct from modes such as taxi cab, carpooling, hired buses, and transportation network companies, which are not shared by the general public without private arrangement. Public transport modes include city buses, trolley buses, trams and passenger trains, rapid transit and ferries.

People in Malaysia prefer to use motorcycles as their main transport. The reason of using a motorcycle is because of the lower purchase and operating cost of motorcycles. Besides, the size of motorcycles also small compared to the cars which can ease traffic movement and parking area. That is the several reasons Malaysian prefer to use motorcycles as their main transport.

NEGERI *State*	MOTOSIKAL *Motorcycle*	MOTOKAR *Motorcar*	BAS *Bus*	TEKSI *Taxi*	KERETA SEWA PANDU SENDIRI *Hire & Drive Car*	KENDERAAN BARANG-BARANG *Goods Vehicle*	LAIN-LAIN *Others*	JUMLAH *Total*
PERLIS	78,263	23,868	176	126	79	1,998	2,281	106,791
KEDAH	895,435	320,739	2,956	2,331	1,384	40,025	30,947	1,293,817
PULAU PINANG	1,346,531	1,081,715	5,164	3,784	1,735	78,180	39,626	2,556,735
PERAK	1,308,482	736,210	4,699	3,665	878	76,011	60,190	2,190,135
SELANGOR	1,342,398	1,085,737	6,773	15,322	2,202	188,492	138,808	2,779,732
W.P. KUALA LUMPUR	1,770,360	3,720,213	19,002	55,371	46,331	268,007	238,654	6,117,938
NEGERI SEMBILAN	531,677	329,952	2,483	1,933	564	48,687	16,471	931,767
MELAKA	449,980	328,242	1,692	1,558	434	28,352	14,092	824,350
JOHOR	1,786,021	1,420,665	8,712	12,624	2,758	150,258	97,921	3,478,959
PAHANG	569,530	365,682	1,967	1,892	982	46,415	28,945	1,015,413
TERENGGANU	369,304	199,191	1,069	927	328	22,230	13,451	606,500
KELANTAN	524,619	291,052	2,020	1,522	587	29,885	16,657	866,342
SABAH	362,369	614,021	7,169	4,629	3,908	123,376	99,434	1,214,906
SARAWAK	754,778	747,282	3,117	2,436	1,700	94,912	100,888	1,705,113
PORTAL RAKAN NIAGA	5,043	607,127	0	29	15	1,159	81	613,454
MALAYSIA	**12,094,790**	**11,871,696**	**66,999**	**108,149**	**63,885**	**1,197,987**	**898,446**	**26,301,952**

Figure 1.1 Total vehicles by type and state in Malaysia, 2015

Source: Transport Statistic Malaysia 2015

Study on case relating to motorcycle ownership is still comparatively new especially in Malaysia. However, there have been study handle across the world on vehicle ownership such as the study on the effect of modal shift to motorcycles particularly from cars on congestion and network performance conducted by the U.K. Department of Transport (DfT) and Tranport for London (TfL) in year 2001. The study involved the development of both the motorcycle ownership models and motorcyclist mode-choice models. The important descriptive factors in the motorcycle ownership models are gender, age, personal income, car ownership, family structure, motorcycle purchase cost and location of residents.

1.2 Problem Statement

Most of the people that have their own transport did not consider the real cost of owning a transport carefully. Most of Malaysian only considered the cost of fuel they spend every day. Therefore, this case study is carried out for the purpose of knowing the exact amount of costs accepted by the user of motorcycles in Malaysia. People also can know the exact cost per kilometre for owning and operating motorcycles.

1.3 Objectives

To study on:

1) To analyse the owning and operating costs of motorcycles
2) To compare travel cost by motorcycles and public transport

1.4 Scope of Study

This study involves all motorcycle users in Malaysia especially student of Universiti Malaysia Pahang (UMP). The data calculation is about owning and operating cost of motorcycle which consists of:

1) Brand of the motorcycle
2) Capacity engine of motorcycles
3) Year of manufacture
4) Total kilometre used
5) Price of bus ticket

1.5 Significant of Study

If Malaysian people know the exact cost of owning and operating of motorcycles, they can make a comparison with the cost of using a public transport such as Rapid Kuantan bus for near area or long distance public transport such as Cepat Express Bus. From that, they can make a better selection to reduce their cost.

Due to the increasing of cost living in Malaysia, the results from this case study can be used as a reference in helping Malaysians to know the exact amount of money that has been spent to their motorcycle. This study also can determine the cost per kilometre used for motorcycles. With that, the results of this case study can be used to persuade people to switch to public transport for most of their daily activities requiring transportation.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Literature review is the chapter that will discuss about the present understanding substantive discovery, as well as the theoretical and methodological contributions to a particular topic. For this case study, the topic is about owning and operating cost of motorcycles in Malaysia. Therefore, all of the information involves in calculation of the cost of owning and operating a motorcycles need to be discuss in this chapter. Examples of the things need to be considered to calculate the cost of having motorcycles are the petrol fuel, the road tax, the insurance and the maintenance and repair. All the reading materials have been used as the references to describe and explain about the cost related with the motorcycles and method to get the data collected.

2.2 Registration of motorcycles in Malaysia

Based on the Road Transport Department Malaysia (JPJ), in 2005 to 2008, there has been increase in the number of motorcycles registrations in Malaysia. But in year 2009, the number of registration decrease from 543,122 to 441,545. The following year which is 2010 to 2011, the number of motorcycles registration continues rising. Figure 2.1 shows the number of motorcycles registrations according to the year:

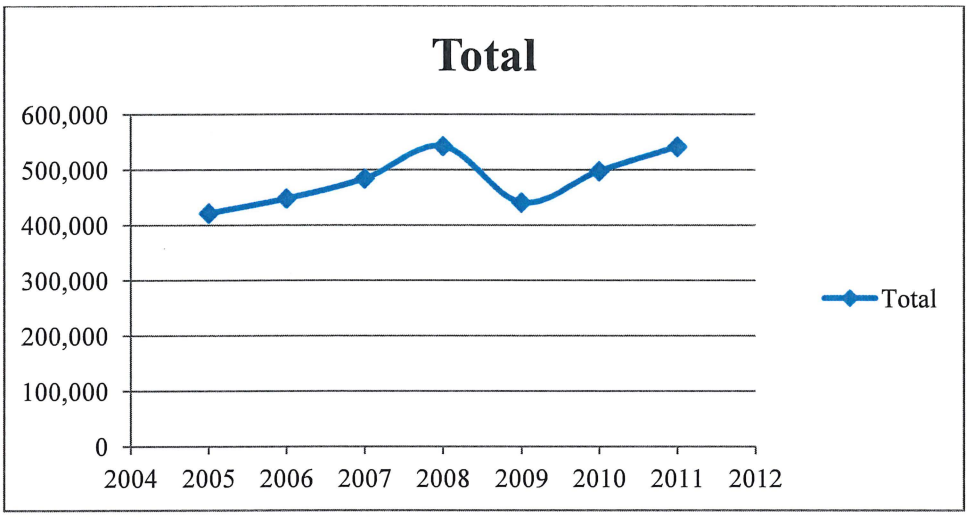

Figure 2.1 Number of Motorcycles Registrations According to Year

Source: Road Transport Department, Malaysia

2.3 Owning and operating cost of motorcycles

There are something that needs to be considered in calculating the cost of owning and operating cost of motorcycles. The cost for owning and operating motorcycles included several type of element. To calculate the cost of owning and operating of motorcycles, some of the thing that needs to be considered is the type of motorcycles, cost of buying, year of manufacture, and the kilometre used.

2.3.1 Type of motorcycle in Malaysia

Motorcycles can be categories into local brand and imported brand. In Malaysia, some of example of local brand is Modenas, Kriss, SYM and Demak. Local brand usually lower in price compared to imported brand. Some brand of motorcycle that has been imported in Malaysia is Yamaha, Suzuki, Honda and Kawasaki. Motorcycles also can be classified into two classes based on their size of engine capacity. The first one is motorcycle that have capacity under 150cc (<150cc) and the second one is the capacity above 150cc (>150cc). Majority of Malaysian used motorcycle under 150cc for daily used.

2.3.1.1 Honda

Figure 2.2 Example of imported brand named Honda

Source: Ban Guan Thye websit http://www.motorcycleonline.com.my/

2.3.1.2 Yamaha

Figure 2.3 Example of imported brand named Yamaha

Source: Ban Guan Thye websit http://www.motorcycleonline.com.my/

2.3.1.3 Kawasaki

Figure 2.4 Example of imported brand named Kawasaki

Source: Ban Guan Thye websit http://www.motorcycleonline.com.my/

2.3.1.4 Suzuki

Figure 2.5 Example of imported brand named Suzuki

Souce: Ban Guan Thye websit http://www.motorcycleonline.com.my/

2.3.1.5 SYM

Figure 2.6 Example of local brand named SYM

Source: Ban Guan Thye websit http://www.motorcycleonline.com.my/

2.3.1.6 Modenas

Figure 2.7 Example of local brand named Modenas

Source: Ban Guan Thye websit http://www.motorcycleonline.com.my/

2.3.1.7 Kriss

Figure 2.8 Example local brand named Kriss

Source: Ban Guan Thye websit http://www.motorcycleonline.com.my/

2.3.1.8 Demak

Figure 2.9 Example local brand named Demak

Sources: Ban Guan Thye websit http://www.motorcycleonline.com.my/

2.3.2 Cost of fuel (Ron95)

Table 2.1 Price of fuel per litre

RON 95 (RM/litre)	RON 97 (RM/litre)	DIESEL (RM/litre)
2.12	**2.40**	**2.03**
+0.04 compare previous week	**+0.04 compare previous week**	**+0.04 compare previous month**

Source: Petrol price Malaysia website(Latest petrol price in Malaysia, 2017)

Price of petrol in Malaysia keeps changing. As of the end of 2014, Malaysia has removed its fuel subsidy program and the fuel price will be levitate depends on international price. Fuel price will be showed at the earlier of each month. Most of the people in Malaysia use Ron95 as their choices of petrol. Ron97 only used for high-powered motorcycles only.

2.3.3 Road tax and Insurance

i. Motor Vehicle Licence (MFI) for motorcycles with an engine capacity of 150cc and below is maintained at existing levels.

ii. Motor Vehicle Licence (MFI) rates for motorcycles with more than 150cc capacity is set at a fixed rate as follows:

Table 2.2 MFI rates for motorcycles with more than 150cc engine capacity

Engine Capacity	Rate
151cc to 200cc	RM30.00
201cc to 250cc	RM50.00
251cc to 500cc	RM180.00
501cc to 800cc	RM250.00
Over 800cc	RM350.00

Source:

For insurance, there are many insurance companies in Malaysia. The most well know insurance company is Allianz. For cars and motorcycles, Allianz insurance divide into three different classes which is car and motor comprehensive cover, car and motor third party cover and the third one is car and motor third party, fire and theft cover. Of course each of this class has different cost. For motorcycles, usually the period time for the insurance is 12 months.

2.3.4 Maintenance

To obtain the best possible result from the investment, surely keep the machine in such condition will give a long and satisfactory service. There are a few aspect need to be consider during maintenance and repair. As an example, for the oil filter, it can be change every 5000 kilometre or three months and for the clutch system, it can be change every 10000 kilometre or six months.

2.4 Public Transport

Nowadays, Malaysia facing with an explosive growth in vehicle ownership and utilization, which led to traffic congestion and pollution. In this situation, government policy encourages people to use public transportation. However, Malaysia are prefer to use private vehicle become many reasons including bad quality of services. In this regard, public transport operators are forced to place emphasis on the monitoring and improvements of the services provided. The rapid increase in the use of personal transportation has its roots in the weak Malaysian public transport system. As a result, traffic congestion, accidents, air pollution and need for parking space among other evils, have escalated. (Gunn and Rohr, 2004)

Malaysia has well developed transport networks and efficient rail links. Its international ports and airports are well connected to bus and train services, making travel to, from and around the country easy and efficient (Angloinfo, 2017). Most domestic transport in Malaysia is comfortable and reasonably priced, with air travel the most expensive. It is advisable to book domestic transport well in advance during the main festivals, such as Chinese New Year, Hari Raya Pusa and Hari Raya Haji. Domestic flights and domestic express bus services are often sold out weeks before these festivals.

Transportation in larger cities is good with many different means of transport. In Kuala Lumpur, for example, there are buses, minibuses, taxis, pedicabs, as well as trains. In Malaysian towns and cities various modes of transport are used, including ferry services. In cities the rail network is a good way to get around, especially the KL Monorail and transit trains.

Figure 2.10 Rapid Kuantan Busses (for short distant)

Source: Rapid Kuantan website

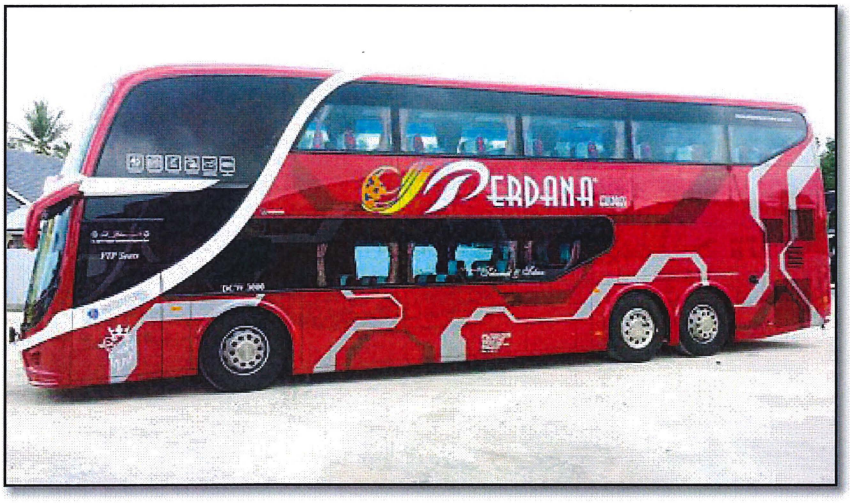

Figure 2.11 Perdana Express (for long distant)

Source: Bus online ticket website http://www.busonlineticket.com/bus/perdana-express

CHAPTER 3

METHODOLOGY

3.1 Introduction

Methodology is the explanation of the steps that we take during the experiment or case study is being conducted. The explanation of methodology are systematic and in the theoretical analysis. In this case study, the methodology will explain how the data is being key in, the owning cost and the operating cost of motorcycles in Malaysia. This part also explains what is the research is all about and clearly state the objectives stated early in chapter 1. At the beginning, all related article from previous journal were collected. This part is a bit crucial in order to investigate and know the total cost of owning and operating cost in the real life.

For the actual reason, the data for the brand of motorcycles are being collected to estimate the cost of purchasing motorcycles and make a comparison between local brand and imported brand of motorcycles. Besides that, the data that need to be collected is the years of manufacture and kilometre used. From the data collected, we can obtain the cost that has been spending per kilometre for owning motorcycles. For the cost of road tax, the data can be collected from JPJ website. From the data, we can calculate the cost of road tax per kilometre. Next is the cost of maintenance. Cost of maintenance can be getting by knowing the cost for maintenance per mileage.

Lastly, the result of analysis can obtain with the calculation for operating cost. The analysis can get with submission all the data collected which is the owning cost of motorcycles, cost of maintenance and the cost of fuel.

3.2 Case study

Motorcycle is one of the transports that are used in Malaysia. There are different sizes in motorcycle, depend on the capacity of each motorcycles. Motorcycles also can be categorised into different type of owner. The owner of motorcycle could be student, employee, and sometimes parents that used motorcycles just to buy groceries at nearby supermarket. Therefore, the study is used to know the exact cost of owning and operating cost of motorcycles.

In order to complete the research, there are several method used. The first one is the Interview. The interview was conducted to get the data from motorcycles users about the information of the motorcycles that have been used. As an example, interview is conducted to know the cost of buying of the motorcycles, how long the motorcycles has been used, how many time per year the user take their motorcycles for maintenance service and how much is the cost for the services. The second method is using a questionnaire. Questionnaire is used to create more samples to get the data.

3.3 Flowchart of research methodology

Flowchart of research methodology involves the process of interview. The data to calculate owning cost can be get using the formula stated in literature review, which is chapter 2. The combination of results from the interview and the formula can be the exact cost of owning and operating cost of motorcycles in Malaysia.

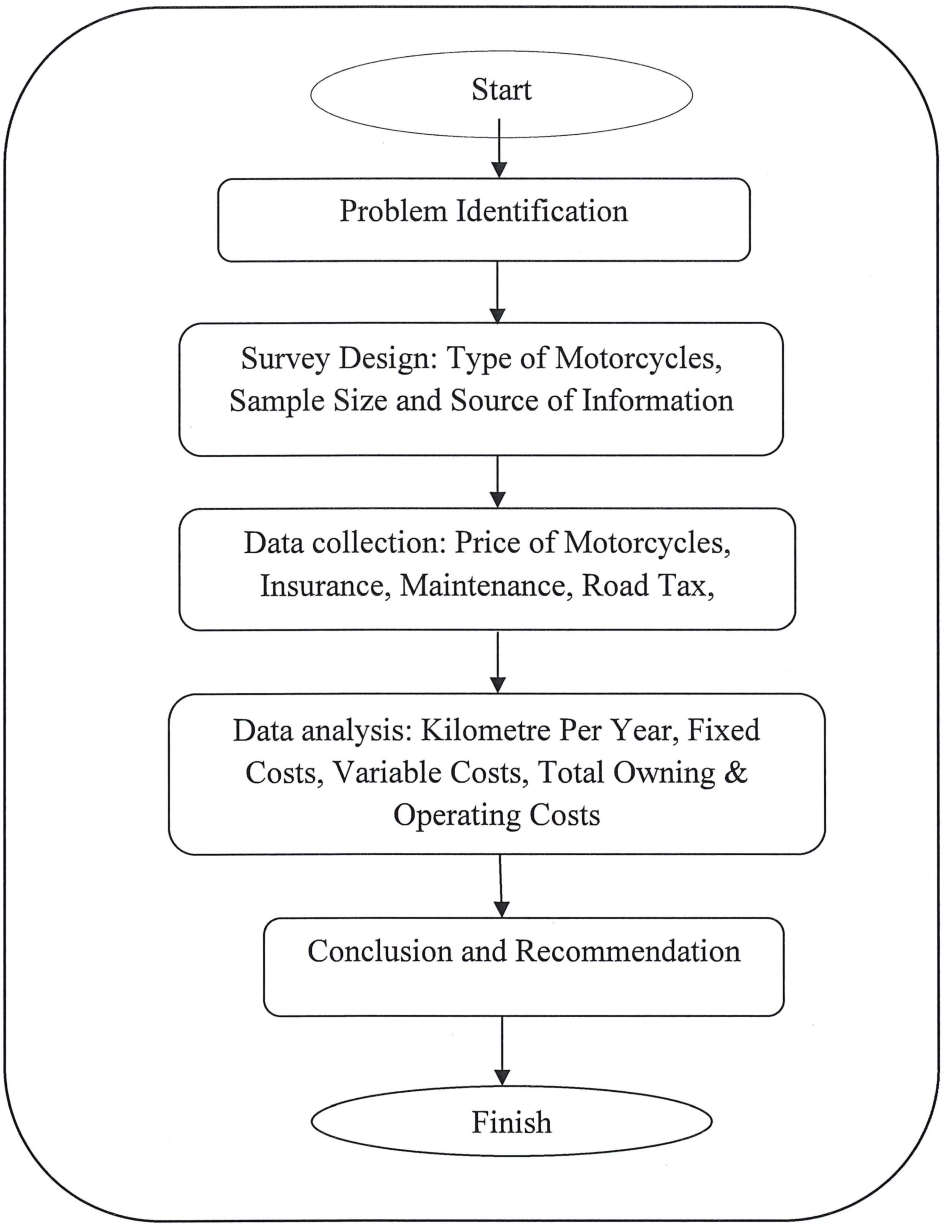

Figure 3.3 Flowchart of Research Methodology

3.4 Methodology and Data Resources

This method of this research is case study which involves interview session. Interview is a process to get the data needed and some solution to solve the problems. For this case study, the data needed were collected using following resources:

i. Internet
ii. Interview
iii. Journals

3.5 Survey Design

The data for this research can be categories into several types such as the gender of the user of motorcycles. Other than that, it can be the capacity of the motorcycles (engine size) and the brand of the motorcycles (local or import). The sample size for each type can be minimum 30. For the source of information, the data can be getting from the interview. For this research, the survey design only separated into two groups which is user that using a motorcycle with local brand and the second one is the user that using a motorcycle with imported brand. After that, the data can be a comparison between these two branded. Besides that, survey design also involves a public transport. The survey has been conducted to get the cost of using a public transport and make a comparison with the cost of using a motorcycle.

3.5 Data Collection

The data for the cost the road tax, maintenance, insurance and financing for the motorcycles can be collected based on two source of information which is:

i. Motorcycles dealer (the price of motorcycles, road tax, insurance and maintenance costs)
ii. Motorcycles owner (the type of the motorcycles, the capacity of the engine, the year of manufacture and total kilometre used.

For the data collection, data was collected using a google forms and interview from people that using a motorcycles and motorcycles shops. The data that is collected from google form is distribute to the user that using a motorcycles in Malaysia. An interview with the user of motorcycles is the collection data for the road tax, and insurance. At the motorcycles shop, the data collected is the price of the motorcycles.

3.4 Data Analysis

After collecting the data, the data need to be analysis based on the kilometre per year. With the sample size of 30, take the average of kilometre used per year of motorcycles. Besides, analysis can be based on the fixed and variable cost. The fixed cost is the cost of maintenance, road tax, insurance and the price of motorcycles. For the variable cost, it is the cost of the petrol fuel. The cost of petrol fuel fluctuated almost every month. Next is the total owning and operating costs. This cost is combination of fixed and variable cost. Lastly, the data from the analysis need to be compared to the public transportation.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

Result and discussion is the chapter where all the data has been mentioned in chapter 3 is combined and collected. The data for the owning and operating cost of motorcycles can be divided into two categories which is fixed cost and variable cost. Fixed cost refers to the cost of buying a motorcycle, the cost of road tax (RM/year) and the cost of insurance (RM/year). For variable cost, it is included the price of the fuel (km/l), the price of oil lubricant.

Brand of motorcycles can be grouped into two which is local brand and imported brand. The engine capacity of motorcycles also can be divided into two which is the engine capacity under 150cc (<150cc) and engine capacity above 150cc (≥152cc). In this research, the calculation can be divided into two groups. The first one is the local brand and the second one is the imported brand.

4.2 Owning cost of motorcycles (Fixed cost)

Fixed cost is the combination of the cost of buying the motorcycles, the cost of road tax and the cost of insurance. To get owning cost of motorcycles, some data needed such as the cost of buying a motorcycle. Besides that, the data for year of manufacture and total kilometre used of the motorcycle also needed. The table below shows the sample calculation owning a motorcycle per kilometre that Malaysian used of buying motorcycles:

Sample calculation of owning:

Price	= RM 7167.12
10% of purchase price	=RM645.04
How long it has been used	= 6 years
Total kilometre used	= 56 678 km
Rate of use	$= \frac{56\,678\ km}{6\ years}$
	= 9 446.33 km/year
Cost of purchasing	$= \frac{645.04\ (\frac{RM}{year})}{9446.33\ (\frac{KM}{year})}$
	= RM0.07/Kilometre
Cost of road tax and insurance	= RM300/year
Cost of road tax and insurance per km	$= \frac{300\ (\frac{RM}{year})}{9446.33\ (\frac{KM}{year})}$
	=RM 0.03/Kilometre
Total cost of owning a motorcycles	= RM0.07/km + RM0.03/Km
	= RM0.10/km

4.3 Operating cost of motorcycles (Variable cost)

Variable costs are the cost that can change in time. Variable cost consists of the cost of petrol and the cost of lubricant oil (cost of service). Cost of fuel and services of lubricant oil is also known as operating costs. Operating cost is the submission of the cost of road tax, insurance, cost of services, and cost of fuel per litre. In Malaysia, the cost of road tax and insurance of motorcycles depend on the capacity size of the engine. The cost of road tax for motorcycles is much more cheaply compared to the cost of road tax of cars.

There is no different between the price of road tax for local brand and imported brand. Most of the brand have same price of road tax and insurance. Usually for cost of road tax, it is included with the cost of insurance. Most of the motorcycles, the cost of road tax and insurance per year is RM300. The cost included RM2 for road tax and the rest is about RM298 is for the cost of insurance. Table below shows the latest petrol price in Malaysia that has been updated in 25th May 2017:

Table 4.1 Latest petrol price in Malaysia

Ron95(RM/Litre)	Ron97(RM/Litre)	Diesel(RM/Litre)
2.12	2.40	2.03

Source: Petrol price Malaysia website

Sample calculation of fuel per kilometre:

Price of fuel per kilometre = RM2.12/Litre

Fuel consumption = 42Km/Litre

Operating cost $= \frac{2.12\ (\frac{RM}{Litre})}{42\ (\frac{KM}{Litre})}$

= RM0.05/km

Sample calculation of maintenance:

For every 5000 mileage	=RM100
Maintenance cost/year	= (9446.33/5000) x100
	=RM188.9266
Maintenance cost/km	=RM188.9266/9446.33
	= RM0.02/km
Total cost of operating	= Cost of fuel + cost of maintenance
	= RM0.05/km + RM0.02
	= RM0.07/km

4.4 Total owning and operating cost of motorcycles

Total cost= Cost of owning + Cost of fuel + Cost of maintenance

Total cost of owning and operating cost is the combination of the cost of owning and the cost of operating of motorcycles. The cost of owning need to be added with the cost of maintenance and the cost of operating to get the total cost of owning and operating per kilometre.

Sample calculation of total owning and operating cost:

Cost of owning =RM0.10/km

Cost of operating =RM0.07/km

Owning and operating cost of motorcycle per kilometre =RM0.17km

Therefore, based on the interview and questionnaire that has been distributed, the data is substituted into Microsoft Excel and the calculation for each type of motorcycles has been calculated. Based on the data that have been analyse using Microsoft excel, the result of owning and operating cost of motorcycles with different type of brand which is local brand and imported brand has been calculated. The table below shows the result for local and imported brand of motorcycles:

For local brand:

Table 4.2: Total cost of owning and operating a motorcycles for local brand

Type	Cost
Cost of owning	RM0.03406/km
Cost of maintenance	RM0.0074/km
Cost of operating	RM0.0381/km
Total cost of owning and operating	RM0.07956/km

For imported brand:

Table 4.3: Total cost of owning and operating a motorcycles for imported brand

Type	Cost
Cost of owning	RM0.0799/km
Cost of maintenance	RM0.0104/km
Cost of operating	RM0.0493/km
Total cost of owning and operating	RM0.1396/km

4.5 Cost of public transport (Bus)

To make a comparison between costs of motorcycle with the cost of using a public transport, the data for using a public transport also have been calculated. In this case study, the type of public transport that has been chosen is a bus. There are two types of buses that have been chosen, the first one is for short distance and the second one is for long distance.

For short distance, Rapid Kuantan bus has been selected as an example. Rapid Kuantan is a corporate brand owned by Prasarana Malaysia Berhad (Prasarana) to operate stage bus services in Kuantan, Pahang in Malaysia. And for long distance, Cepat Express has been selected as an example.

Table 4.4 Calculation for short distance of public transport

Type	Cost
Distance (Gambang to Kuantan)	30 km
Ticket price	RM4.00
Cost per kilometre	RM0.13/km

Table 4.5 Calculation for long distance of public transport

Type	Cost
Distance (Kuantan to Kuala Lumpur)	225 km
Ticket price	RM24.20
Cost per kilometre	RM0.10/km

CHAPTER 5

CONCLUSION

5.1 Introduction

Conclusion and recommendation is the last chapter for the research. In this chapter, the result that has been calculated in chapter 4 which is result and discussion is concluding. Based on the result in chapter 4, it is shows that the cost of owning and operating of motorcycles per kilometre is relatively high compared to use a public transport. This chapter is focus to discuss about discoveries and results from the data analysis in chapter 4 to accomplish the goal of this study. This chapter also briefly discuss about the whole discoveries and result tending to exploration objectives that clarify in chapter 1.

5.2 Conclusion

This project is a researched about Owning and Operating Cost of Motorcycles in Malaysia. In this case study, a method of study has been done, which is to key-in the data collected from questionnaire that has been distributed to get the kilometre used per year for every motorcycles. The data collection consists of various type of motorcycles, capacity engine of motorcycles and kilometre used for motorcycles. So, from the data collected, the results and analysis were obtained which are the total cost of owning and operating cost of motorcycles.

Based on the objectives stated in chapter 1, this case study has been done to make a comparison between the cost of using a motorcycle and the cost of using a public transport. Based on the results shows in chapter 4, it is clearly stated that cost of using a public transport is much cheaper compared to the cost of using a motorcycles. Based on the results of the analysis, the comparison also can be made for the cost of owning and operating a motorcycle of local brand with the imported brand.

Refer to the results shows in the previous chapter, local brand has lower cost compared to the imported brand. The cost per kilometre for local brand is RM0.07956/km compared to the cost of imported brand which is RM0.1396/km. Factor that affect the cost of imported brand that makes it more costly compared to the local brand is because of the cost of buying. Basically the cost of buying an imported brand of motorcycles is higher than local brand. This is because of the quality of the materials and the cost of exportation.

Besides that, the second objective is about the comparison between the cost of using a motorcycles and the cost of using a public transport. In chapter 4, the analysis shows that the public transport have a lower cost compared to the use of motorcycles. Using a public transport such as bus shows a lower cost compared to using a motorcycle. Public transport cost for short and long distant only cost about RM0.13/km and RM0.10/km compared to the cost of using a motorcycle of local and imported brand with the cost of RM0.07956/km and RM0.1396/km.

Therefore, from the analysis stated, it can be conclude that motorcycles is more preferable compared to the motorcycles if the distant is short. But if the trip is used to go to travel with a long distance, public transport is more preferable. This is because, motorcycles is not only lower in cost using, but also can reduce the traffic congestion because of the small in term of the size.

5.3 Recommendation

Recommendation that can be made from this case study is that, if the user used to go to the travel, for a long travel distance, user is preferable to use a public transport. To attract users to use a public transport, government can improve the facilities of the public transport area so that the user can be more attractive to use the public transport rather than using a motorcycle as their choices. Other than that, the facilities inside the public transport also need to be improved. As an example, always keep the users comfortable while using a public transport. Make sure that the cleanliness inside the bus can be well maintained. Government also can build a bus stop near the residential area. Users do not have to walk with a long distance.

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APPENDIX A
SAMPLE APPENDIX 1

TABLE 4.6 OWNING COST OF MOTORCYCLES FOR LOCAL BRANDS

BRAND	YEAR USED	KM USED (KM)	PRICE	10% PRICE	RATE OF USE	COST OF PURCHASE	ROAD TAX	ROAD TAX/KM	COST OF OWNING
Demak DVS110	2	95000	4815	433.35	47500	0.009123158	300	0.003157895	0.012281053
modenas	9	100000	5000	450	11111.11111	0.0405	300	0.003	0.0435
Demak	2	82000	4959	446.31	41000	0.01088561	300	0.003658537	0.014544146
SYM	2	46000	5435	489.15	23000	0.021267391	300	0.006521739	0.02778913
Modenas	3	145000	5200	468	48333.33333	0.009682759	300	0.002068966	0.011751724
SYM	3	120000	5430	488.7	40000	0.0122175	300	0.0025	0.0147175
Modenas	10	689968	3500	315	68996.8	0.004565429	300	0.000434803	0.005000232
Modenas	1	40000	5132	461.88	40000	0.011547	300	0.0075	0.019047
SYM	4	180000	4000	360	45000	0.008	300	0.001666667	0.009666667
Demak	2	95000	5435	489.15	47500	0.010297895	300	0.003157895	0.013455789
SYM	2	20000	5334	480.06	10000	0.048006	300	0.015	0.063006
Modenas	2	70400	5694	512.46	35200	0.014558523	300	0.004261364	0.018819886
Modenas	2	100000	7352	661.68	50000	0.0132336	300	0.003	0.0162336
SYM	4	175000	4700	423	43750	0.009668571	300	0.001714286	0.011382857
Modenas	2	98000	4800	432	49000	0.008816327	300	0.003061224	0.011877551
Modenas	2	70000	7352	661.68	35000	0.018905143	300	0.004285714	0.023190857
Modenas	3	154000	4950	445.5	51333.33333	0.008678571	300	0.001948052	0.010626623
SYM	5	209968	4000	360	41993.6	0.008572735	300	0.001428789	0.010001524
Demak	1	40000	5435	489.15	40000	0.01222875	300	0.0075	0.01972875
SYM	4	180500	4900	441	45125	0.009772853	300	0.00166205	0.011434903
SYM	2	90000	5540	498.6	45000	0.01108	300	0.003333333	0.014413333
SYM	2	20000	5132	461.88	10000	0.046188	300	0.015	0.061188
Modenas	2	13450	4800	432	6725	0.064237918	300	0.022304833	0.086542751
Modenas	9	100000	3500	315	11111.11111	0.02835	300	0.003	0.03135
Demak	2	20000	5132	461.88	10000	0.046188	300	0.015	0.061188
Demak	2	29162	4500	405	14581	0.027775873	300	0.01028736	0.038063233
Demak	4	7000	4000	360	1750	0.205714286	300	0.042857143	0.248571429
SYM	2	28774	5435	489.15	14387	0.033999444	300	0.010426079	0.044425523
									0.953798063

TABLE 4.7 OPERATING COST OF LOCAL BRANDS

BRAND	YEAR	KM	RATE OF USE	RON95	FUEL CONSUMPTION	OPERATING	MAINTENANCE/YEAR	MAINTENANCE PER KM	
Demak DVS110	2	95000	47500	2.12	56	0.037857143	10.52631579	0.000221607	
Demak	9	100000	11111.11111	2.12	56	0.037857143	45	0.00405	
Demak	2	82000	41000	2.12	56	0.037857143	12.19512195	0.000297442	
SYM	2	46000	23000	2.12	56	0.037857143	21.73913043	0.00094518	
Modenas	3	145000	48333.33333	2.12	48	0.044166667	10.34482759	0.000214031	
SYM	3	120000	40000	2.12	56	0.037857143	12.5	0.0003125	
Demak	10	689968	68996.8	2.12	56	0.037857143	7.246712891	0.00010503	
Modenas	1	40000	40000	2.12	56	0.037857143	12.5	0.0003125	
SYM	4	180000	45000	2.12	56	0.037857143	11.11111111	0.000246914	
Demak	2	95000	47500	2.12	56	0.037857143	10.52631579	0.000221607	
SYM	2	20000	10000	2.12	56	0.037857143	50	0.005	
Modenas	2	70400	35200	2.12	56	0.037857143	14.20454545	0.000403538	
Modenas	2	100000	50000	2.12	56	0.037857143	10	0.0002	
SYM	4	175000	43750	2.12	56	0.037857143	11.42857143	0.000261224	
Modenas	2	70000	35000	2.12	56	0.037857143	14.28571429	0.000408163	
Modenas	2	98000	49000	2.12	56	0.037857143	10.20408163	0.000208247	
Modenas	3	154000	51333.33333	2.12	56	0.037857143	9.74025974	0.000189745	
SYM	5	209968	41993.6	2.12	56	0.037857143	11.90657624	0.000283533	
Demak	1	40000	40000	2.12	56	0.037857143	12.5	0.0003125	
SYM	4	180500	45125	2.12	56	0.037857143	11.08033241	0.000245548	
SYM	2	90000	45000	2.12	56	0.037857143	11.11111111	0.000246914	
SYM	2	20000	10000	2.12	56	0.037857143	50	0.005	
Modenas	2	13450	6725	2.12	56	0.037857143	74.34944238	0.011055679	
Modenas	9	100000	11111.11111	2.12	56	0.037857143	45	0.00405	
Demak	2	20000	10000	2.12	56	0.037857143	50	0.005	
Demak	2	29162	14581	2.12	56	0.037857143	34.29120088	0.002351773	
Demak	4	7000	1750	2.12	56	0.037857143	285.7142857	0.163265306	
SYM	2	28774	14387	2.12	56	0.037857143	34.753597	0.002415625	
						1.066309524		0.207824604	

APPENDIX B
SAMPLE APPENDIX 2

SYM	2	46000	5435	489.15	23000				
Modenas	3	145000	5200	468	48333.33333	0.009682759	300	0.002068966	0.011751724
SYM	3	120000	5430	488.7	40000	0.0122175	300	0.0025	0.0147175
			2500	315	68996.8	0.004565429	300	0.000434803	0.005000232

TABLE 4.9 OPERATING COST OF IMPORTED BRANDS

BRAND	YEAR USED	KM USED (KM)	PRICE	10% PRICE	RATE OF USE	COST OF PURCHASE	ROAD TAX	ROAD TAX/KM	COST OF OWNING
Honda RS150	5	56678	4500	405	11335.6	0.035728148	300	0.026465295	0.062193444
Honda RS150	3	67809	6550	589.5	22603	0.026080609	300	0.013272574	0.039353183
Yamaha Ego S	1	5543	6825	614.25	5543	0.110815443	300	0.054122316	0.164937759
Yamaha 125z	3	165000	10050	904.5	55000	0.016445455	300	0.005454545	0.0219
Yamaha 125Z	4	10936	8500	765	2734	0.279809802	300	0.109729334	0.389539137
Yamaha LC 135	5	30000	5860	527.4	6000	0.0879	300	0.05	0.1379
yamaha 150 fz	2	12000	6825	614.25	6000	0.102375	300	0.05	0.152375
yamaha lagenda	2	8000	7000	630	4000	0.1575	300	0.075	0.2325
Yamaha LC 135	2	20000	8000	720	10000	0.072	300	0.03	0.102
Yamaha Nmax 155	5	200000	7900	711	40000	0.017775	300	0.0075	0.025275
yamaha lagenda 115	6	162000	4670	420.3	27000	0.015566667	300	0.011111111	0.026677778
yamaha nouvo	4	15687	3500	315	3921.75	0.080321285	300	0.076496462	0.156817747
Yamaha rxz	18	900000	3000	270	50000	0.0054	300	0.006	0.0114
Honda wave 125 FI	5	563467	6890	620.1	112693.4	0.005502541	300	0.00266209	0.008164631
Yamaha Ego S	7	379304	4300	387	54186.28571	0.007142029	300	0.005536456	0.012678485
yamaha 135 Lc	3	43111	7000	630	14370.33333	0.043840319	300	0.020876342	0.064716662
yamaha	6	120000	4400	396	20000	0.0198	300	0.015	0.0348
Yamaha 125Z	2	12786	10000	900	6393	0.140778977	300	0.046926326	0.187705303
Yamaha 125	1	50000	10500	945	50000	0.0189	300	0.006	0.0249
Yamaha LC 135	2	10300	8000	720	5150	0.139805825	300	0.058252427	0.198058252
yamaha125zr	5	120000	8000	720	24000	0.03	300	0.0125	0.0425
yamaha lagenda115	5	135000	6000	540	27000	0.02	300	0.011111111	0.031111111
yamaha avantiz	2	98000	4200	378	49000	0.007714286	300	0.006122449	0.013836735
Yamaha 125	1	45000	10500	945	45000	0.021	300	0.006666667	0.027666667
yamaha 150fz	1	45000	6825	614.25	45000	0.01365	300	0.006666667	0.020316667
Yamaha 125	3	90000	9000	810	30000	0.027	300	0.01	0.037
yamaha 150 fz	2	80000	8500	765	40000	0.019125	300	0.0075	0.026625
yamaha 150fz	3	100000	7500	675	33333.33333	0.02025	300	0.009	0.02925
Yamaha 125	5	135000	8000	720	27000	0.026666667	300	0.011111111	0.037777778
									2.319976337