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Comparison of Car Loan Interest in Malaysia Using a Web-Based Calculator

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Abstract: In this paper, we analyse and compare the car loan interest rate by operating a web-based car loan calculator to help Malaysians to choose the bank which is the best to make a loan and avoid risk. XAMPP Control Panel and Microsoft Excel to handle the web-development tools and the calculating method. The results revealed that the mechanism of the car loan calculator is in two aspects, namely structure and the main function of the calculator and analysis of the different rates of interest. The primary aim is to make people understand the use of car loans and to make a comparison of the car loan interest given in Malaysia.

Keywords: Comparison, Car Loan Interest, Web-Based Calculator, Development Tools

1. Introduction

Car loans are a popular financing option for many Malaysians who wish to purchase a vehicle. However, the process of obtaining a car loan can be complex, with a range of interest rates and terms offered by different lenders [1]. To help the consumer, navigate this market and find the best deal, this study aims to conduct a comparison of car loan interest rates in Malaysia using a web-based calculator.

We examine the current state of the car loan market in Malaysia and the effect of interest rates on the overall cost of purchasing a car [2]. The study aims to provide insights into the current interest rates offered by various car loan providers in Malaysia, the influence of these rates on the total cost of the

car loan, and the important factors that consumers should consider when selecting a car loan provider [3]. We use a web-based car loan calculator to compare interest rates and analyze the impact of interest rates on the cost of a car loan [2]. The aim is to equip consumers with the necessary information to make informed decisions and options for their needs.

A lack of awareness and understanding of the car loan market in Malaysia and the impact of interest rates on the cost of a car has led to the need for this study. By providing a comparison of car loan interest rates, this study hopes to inform consumers and help them save money on their car purchases. The use of a web-based car loan calculator will enhance the understanding of the car loan market [1] in Malaysia among consumers and enable them to make well-informed decisions when choosing a car loan provider. This, in turn, will result in consumers finding the best car loan option for their needs and saving money on their car purchases.

2.0 Methodology

To create a car loan calculator, we are using web development tools such as XAMPP Control Panel and Microsoft Excel. Hence, there are steps to compare the car loan interest in Malaysia, which are as below:

- Register XAMPP Control Panel

- Create a localhost for the car loan calculator

- Construct the database in the phpMyAdmin

- Calculation in Microsoft Excel

The explanation and detail of each stated step above will be further discussed in Section 2.1 until 2.4 follow the sequence.

2.1 Register XAMPP Control Panel

The XAMPP Control Panel may be used to start/stop all servers as well as install/uninstall services. For this research, we use Apache server and MySQL [4]. The Apache HTTP Server is to link a server to a website user's browsers [5]. SQL Server functions are database objects that include a group of SQL statements to accomplish the database of the car loan calculator [6].

2.2 Create a Localhost for the Car Loan Calculator

Localhost is a hostname in computer networking that relates to the present device used to access it. It is used to connect to the host's network services through the loopback network interface [7]. A locally installed website for example, may be visited from a Web browser using the URL it is mostly used for web development purposes http://localhost to show its home page.

2.3 Construct the Database in the phpMy Admin

phpMyAdmin is a free and open-source tool written in PHP and designed to manage the administration of a MySQL database server [8]. It provides a user-friendly and intuitive web-based interface for performing various administrative tasks, such as:

- Establishing a database in phpMyAdmin allows users to create, alter and delete databases, as well as manage their tables and fields [9].

- Performing queries in phpMyAdmin provides a SQL editor that allows users to run queries, view and export the results, and even import data from various file formats [10].
- Adding user accounts in phpMyAdmin allows users to create, edit, and delete MySQL user accounts, as well as manage their privileges and permissions.

The ability to manage these tasks easily and efficiently through a web-based interface makes phpMyAdmin a valuable tool for web developers and database administrators, who often use it to manage their MySQL databases. [11].

2.4 Microsoft Excel

For further calculation was made in Microsoft Excel. Microsoft Excel can be used for a wide range of business operations such as statistics, finance, data management, forecasting, analysis, and business intelligence [12].

2.5 Calculate Car Loan Interest

The interest rate is determined by the bank base rate, which depends on the country's economy. To acquire a car with a car loan, we should completely grasp how the interest rate charges operate [1].

The formula is:

monthly_payment = (interest_rate / (100 * 12)) * vehicle_value / (1 - pow(1 + interest_rate / 1200, -months))

Here's a breakdown of the formula:

- "interest_rate" is the interest rate on the loan, expressed as a decimal.
- "vehicle_value" is the total amount being borrowed.
- "months" is the number of months over which the loan will be repaid.

The formula calculates the monthly payment by dividing the interest rate by the number of payments in a year (100 * 12) and multiplying it by the total loan amount. The result is then divided by the result of a calculation based on the future value of an annuity formula, with the monthly interest rate and the number of payments.
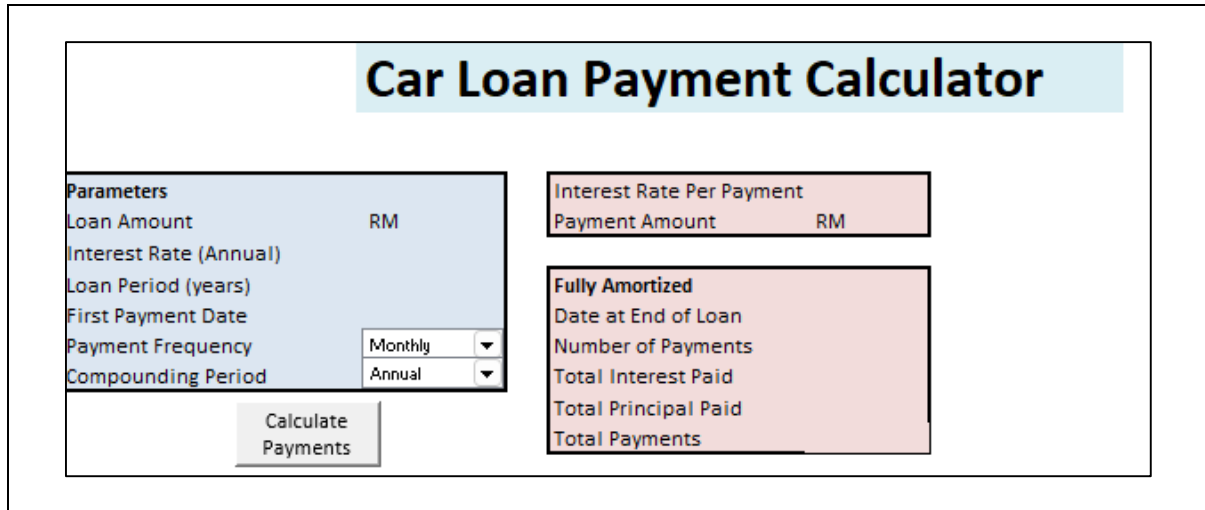
2.6 Flow chart of the study
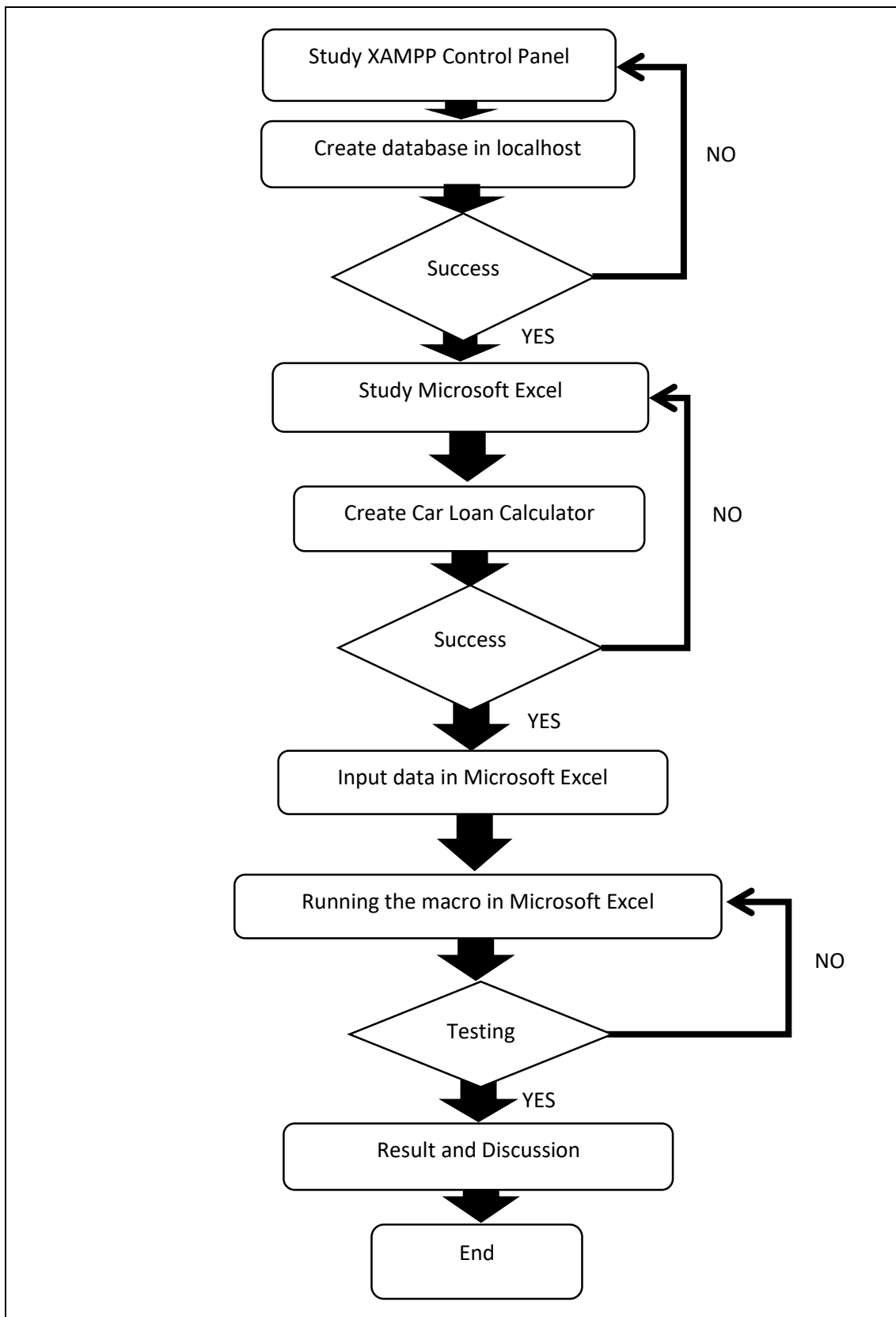
Figure 1 : Flowchart of the study

3.0 Results and Discussion

The results and discussion section presents data and analysis of the study. This section will discuss the result and discussion of the car loan calculator in two aspects below:

- Structure and the main function of the car loan calculator
- Analysis of the different rate

3.1 Results

Figure 2: Homepage of the Car Loan Payment Calculator

Figure 2 above shows the homepage of the spreadsheet car loan payment calculator in Microsoft Excel. The spreadsheet can be used to calculate the monthly payments, total interest, and total cost of a car loan. The calculator includes input fields for the loan amount, interest rate (Annual), loan period (years), first payment date, payment frequency, and compounding period.
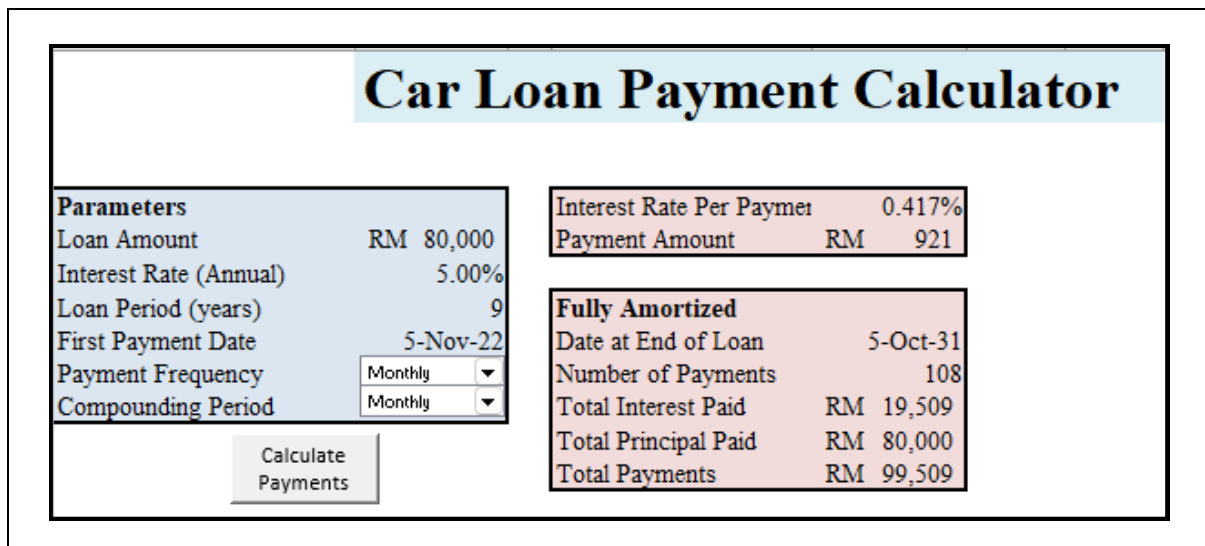
Figure 3: Car Loan Payment Calculator

In this research, we use Microsoft Excel to make a car loan calculator to make a comparison of the interest. The car loan calculator shown above in Figure 3 contains the main component and function as below:

1. Loan Amount
   The loan amount input field on a car loan payment calculator allows the user to enter the total cost of the car, including taxes and fees, in Ringgit Malaysia. This input is important because it determines the total amount of money the user will be borrowing from the lender [13].

2. Interest Rate (Annual)
   The interest rate input field on a car loan payment calculator allows the user to enter the annual percentage rate of the loan in percent (%). The interest rate is the compensation given by the borrower to the lender for the use of the borrowed money.

3. Loan Period (years)
   The loan period input field on a car loan payment calculator allows the user to enter the length of the loan in years. The loan period is the period that the user has to pay off the loan.

4. First Payment Date
   The first payment date input field on a car loan payment calculator allows the user to enter the date on which the first loan payment is due. The first payment date is important for the user to know when they will start making payments on the loan and to plan their finances accordingly [14].

5. Payments Frequency
   The payment frequency input field on a car loan payment calculator allows the user to select the frequency at which they want to make their loan payments. The options may include quarterly, bi-monthly, monthly, semi-monthly, bi-weekly, and weekly.

6. Compounding Period
   The compounding period input field on a car loan payment calculator allows the user to select the frequency at which the interest is calculated on a loan. The options may include semi-annual, monthly, quarterly, and annual.

A loan balance graph as Figure 3 below shows is a visual representation of the outstanding balance of a loan over time. In the case of the loan balance graph described, the graph would likely show the loan balance decreasing from 80,000 on November 1, 2022, to a specified amount on June 1, 2031.

The graph would typically be a line graph, with the loan balance on the y-axis and the date on the x-axis. The line would start at 80,000 on November 1, 2022 and decrease over time as the user makes payments on the loan. The exact shape of the line would depend on the loan terms, including the interest rate, the loan period, the payment frequency, and the compounding period.

Such a graph could be useful for the user to understand how their loan balance changes over time, and how their payments affect the outstanding balance. It can also help them to plan their finances and budget accordingly to make sure they can pay off the loan on time.
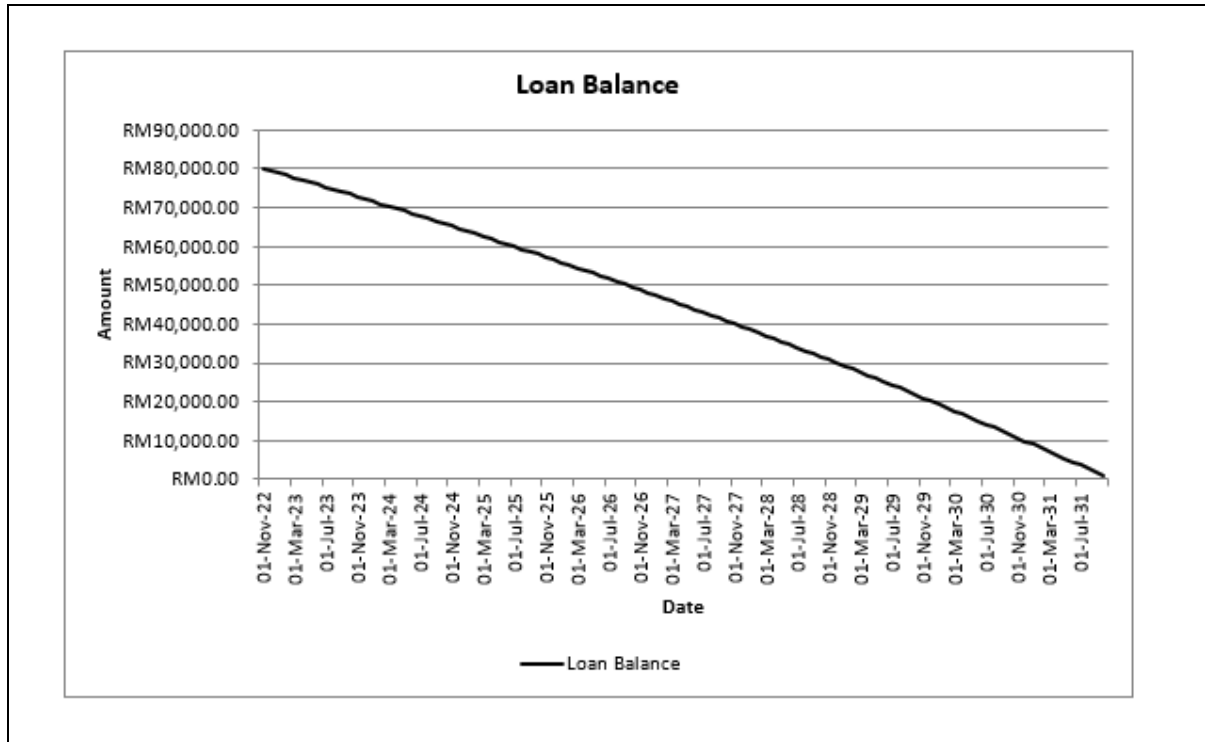
Figure 4: Loan Balance in the Format of Graph

Payment Number	Date	Amount	Interest	Principal	Balance
					RM80,000.00
1	05-Nov-22	RM848.52	RM333.33	RM515.19	RM79,484.81
2	05-Dec-22	RM848.52	RM331.19	RM517.33	RM78,967.48
3	05-Jan-23	RM848.52	RM329.03	RM519.49	RM78,447.99
4	05-Feb-23	RM848.52	RM326.87	RM521.65	RM77,926.34
5	05-Mar-23	RM848.52	RM324.69	RM523.83	RM77,402.51
6	05-Apr-23	RM848.52	RM322.51	RM526.01	RM76,876.50
7	05-May-23	RM848.52	RM320.32	RM528.20	RM76,348.30
8	05-Jun-23	RM848.52	RM318.12	RM530.40	RM75,817.90
9	05-Jul-23	RM848.52	RM315.91	RM532.61	RM75,285.29
10	05-Aug-23	RM848.52	RM313.69	RM534.83	RM74,750.46
11	05-Sep-23	RM848.52	RM311.46	RM537.06	RM74,213.40
12	05-Oct-23	RM848.52	RM309.22	RM539.30	RM73,674.10
13	05-Nov-23	RM848.52	RM306.98	RM541.54	RM73,132.56
14	05-Dec-23	RM848.52	RM304.72	RM543.80	RM72,588.76
15	05-Jan-24	RM848.52	RM302.45	RM546.07	RM72,042.69
16	05-Feb-24	RM848.52	RM300.18	RM548.34	RM71,494.35
17	05-Mar-24	RM848.52	RM297.89	RM550.63	RM70,943.72
18	05-Apr-24	RM848.52	RM295.60	RM552.92	RM70,390.80
19	05-May-24	RM848.52	RM293.29	RM555.23	RM69,835.57
20	05-Jun-24	RM848.52	RM290.98	RM557.54	RM69,278.03

Figure 5: Payment Schedule

When the user finished calculating their car loan, the payment schedule as Figure 5 shows above provides a clear understanding of the loan terms and helps them to plan their finances and budget accordingly. It will also help the borrower to keep track of the payments made and the remaining balance.

3.2 Discussion

| Row Labels	The sum of the Interest Rate	The sum of the Monthly Payment
50,000	0.03	898.43
60,000	0.04	1104.99
70,000	0.04	1289.16
80,000	0.05	1509.70
90,000	0.05	1698.41
100,000	0.06	1933.28
Grand Total	**0.27**	**8433.97**

Figure 6: Pivot Table

Figure 6 above is a summary of car loan interest rates at different loan amounts. It shows how much total interest we would pay for a loan amount of RM50,000, RM60,000, RM70,000, RM80,000, RM90,000, and RM100,000 at different interest rates (3%, 4%, 5%, and 6%). The monthly payment for each scenario will be displayed in the "Monthly Payment" column and can be used to compare the different loan options. Some general observations that can be made based on the results are:

- The higher loan amounts typically result in higher monthly payments, regardless of the interest rate [15].
- The higher interest rates result in higher monthly payments for the same loan amount [16].
- The monthly payment for a given loan amount can vary greatly based on the interest rate, with a difference of just a few percentage points potentially leading to a significant increase in the monthly payment [17].

For Figure 7 below, it can be seen that for a loan amount of RM50,000, the monthly payment for a 3% interest rate is RM898.48, while the monthly payment for a 4% interest rate is RM1104.99. This can be shown, that a difference of a few percent can lead to a significant increase in the monthly payment.
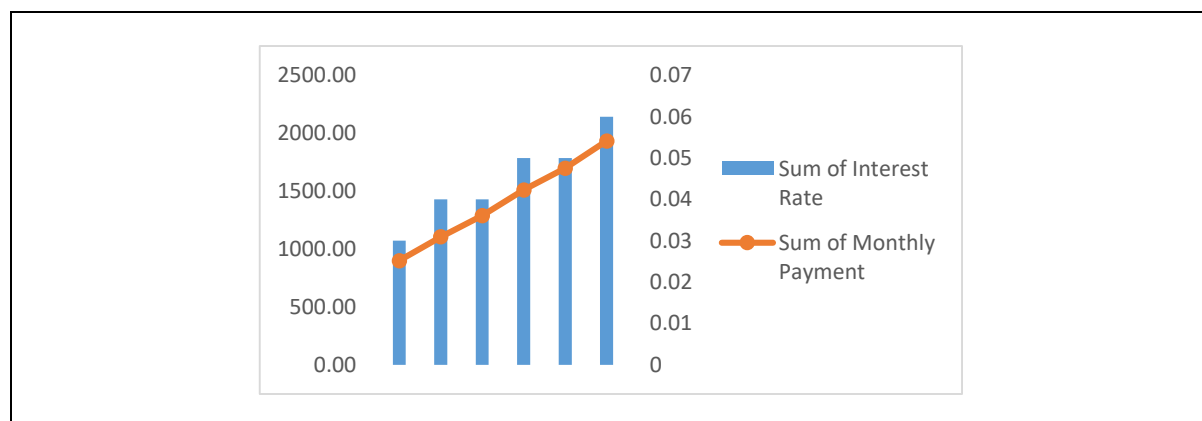
Figure 7: Pivot Graph

4.0 Conclusion

In light of the findings of this study, it is recommended that Malaysian consumers become more informed about car loan options and interest rates before making a decision. A comprehensive understanding of the car loan market, combined with the use of a web-based calculator, can help consumers make well-informed decisions about which loan provider and interest rate best fit their needs. Consumers should also be mindful of the factors that affect the cost of a car loan, such as loan amount, down payment, and loan period, in addition to the interest rate.

Furthermore, it is recommended that car loan providers in Malaysia work to increase transparency and accessibility for consumers by providing clear and concise information about the terms and conditions of their loans. This will help to build trust and confidence in the car loan market and improve the overall buying experience for Malaysian consumers.

In conclusion, the importance of car loan awareness among Malaysians cannot be overstated. By taking the time to research and compare car loan options, consumers can save money, reduce their financial burden, and choose the best car loan option for their needs.

Acknowledgment

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