
APPLICATION OF CUSTOMER LAPTOP LOAN INSTALLMENTS BASED ON THE EFFECTIVE AND FIXED INTEREST RATE METHOD

by

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Abstract: *Financial institutions (finance) are currently growing rapidly by providing various kinds of attractive credit facility promotions to their customers. The public can take advantage of this financing service, if the administrative requirements are complete. Credit promotions are given to customers in the form of a list of installments with varying interest according to the desired amount of credit for each installment period. This study aims to determine the application of mathematical concepts by using the annuity interest rate system and sliding rate as well as flat interest rates. The data analysis model used in this study is an exploratory method and the data collection is secondary data by taking several price list brochures of six (6) brands of laptops from various types and three (3) financial institutions (finance). The data obtained are down payment (DP), interest rate (i), insurance costs, administrative costs and credit installment period. After the data is obtained, then the analysis and calculation is carried out with the following steps: (1) Performing the calculation of flat interest, annuity interest and sliding rate interest; (2) Calculation of monthly installments on annuity and sliding rate. Based on the results of data processing , it is found that the greater the loan value, the smaller the interest rate charged to consumers and the longer the payment period, the smaller the interest rate charged to consumers. The results of this study, concluded that The payment system that is more profitable for the finance party is the flat interest rate system, while the system that is best used for the customer is the effective interest rate system, namely the sliding rate system . This system, gives customer interest relief decreased. However, if the customer wants to pay off early, the sliding rate and flat interest rate system is more profitable for the customer. While the annuity interest rate uses declining interest, the amount of interest earned is greater than the sliding rate interest The principal installments are getting bigger and bigger*

INTRODUCTION

Changes in the order of new human life activities around the world began with the emergence of a corona virus called COVID-19. The impact of COVID-19 has affected all sectors and new challenges are felt when the government implements *work from home* (WFH), government employees, entrepreneurs, teachers/lecturers, students/students, employees, and so on are in dire need of information technology with an internet network. so that work can be completed even from home. Likewise , the implementation of the learning system of a teacher/lecturer can provide material to students only online (in the network) or *online* . This learning method is one way of face-to- face learning not directly between teachers and students but its implementation *online* using a personal computer (PC) or notebook/laptop connected to an internet network connection. So, the teacher can ensure that students take part in learning at the same time, even though in different places.

Along with the advancement of digitalization-based education , the use of information technology in accessing the internet is also very much needed by teachers/lecturers and students. So the community's need to have a computer/notebook/laptop device is a dilemma/problem because income/salary with the price of goods needs to be adjusted to the current conditions, which are still in a pandemic condition. However, more teachers/lecturers and students are more interested in choosing portable computers because they can be folded, have certain specifications according to the type desired by the customer, the functions and features that are connected to the internet are known as Notebooks or Laptops . The size of the laptop is small, light, and easy to carry anywhere that can be used anytime and anywhere . The diversity of types of laptop brands that are widely circulated in Indonesia such as Toshiba, Hp, Compaq, Lenovo, Sony, Apple and so on, makes it difficult for customers to decide to choose according to their needs [13].

The price of cash/cash for a Laptop in the current economic crisis is a dilemma/polemic experienced by the community, where incomes decrease, are laid off and layoffs (PHK). Financial problems like this are seen by financial institutions as one of the opportunities or solutions to overcome customer economic constraints by providing funding support for various types of needs or procurement of goods/assets/services involving three parties, namely the funding provider, the provider and the beneficiary party. Funding service companies in the OJK, legally the financial institutions are declared legal and legal so that people feel safe and comfortable. Through financial services, it is very helpful for the community to finance the ownership of a product that is offered in the form of an annuity list which varies according to the desired amount of credit for each installment period. Various kinds of attractive credit facility promotions are given to the public to be owned so that the purchase of an item/asset can be achieved.

In Philip Kotler [6]. Something the process of solving problems by analyzing or recognizing needs and wants, searching for data, evaluating selected sources for alternative purchases, purchasing decisions for a product are influenced by various aspects, as well as purchasing laptops. The price factor for buying a laptop is a significant part that influences consumer purchases . The purpose of consumers to buy an object is to satisfy their needs and desires in order to obtain quality at an affordable price in their purchase [10].

The better the laptop with a well-known brand, the price will be expensive because the

specifications, space, functions and features will be more and better, compared to standard ones. Opinion of Kotler and Armstrong (2012: 319). Price measures are listed prices, discounts, special discounts, payment periods, and credit application conditions [7]. Likewise, in Kotler and Keller (2016:198) stated that at the time of the purchase decision session, there are five (5) things that consumers need to consider when making decisions, including brand (brand), dealer (store), quantity, time (timing).), the method of payment (method of payment) [8]. The economy of a country can be said to be developing or advanced in terms of the state of its economy and financial business, one example is the development of financial institutions registered with the Financial Services Authority (OJK), stable financial turnover and many enthusiasts[5].

The credit purchasing system is a product purchase system where the customer is usually required to make a *down payment* , after which the rest of the product price is paid in installments over a certain period of time. This purchasing system is very helpful for customers who cannot make purchases in cash. But there is something that needs to be considered when buying a product with this system, namely the amount of interest rates offered by the store . [3] This type of credit system is an alternative that is widely chosen by *customers* and this is called *consumptive credit*, namely *finance* provides credit to parties. third parties/individuals (including employees themselves) for consumption needs such as goods or services by buying, renting, or crediting. Long-term loans have a payback period of 1 to 3 years. This credit is offered by *finance* for a maximum period (tenor) of 3 years. The tenor system contained in the ownership credit is a category of long-term credit, namely credit with the longest repayment period. *Finance* provides a promo offer for laptop ownership credit installments for *customers* in the form of *In Advance* , which is a calculation of laptop ownership installments with a total down payment which has been calculated for the first installment, administration, and insurance. This ownership submission, usually *finance* provides financing of 70 % - 80% of the laptop price, for the remaining 20% - 30% originally is customer money that has been paid as a down payment. The 70% - 80% financing credit is debt for customers whose installments are paid in installments along with the calculated interest rate. The customer installment payments are paid until the credit is paid off.

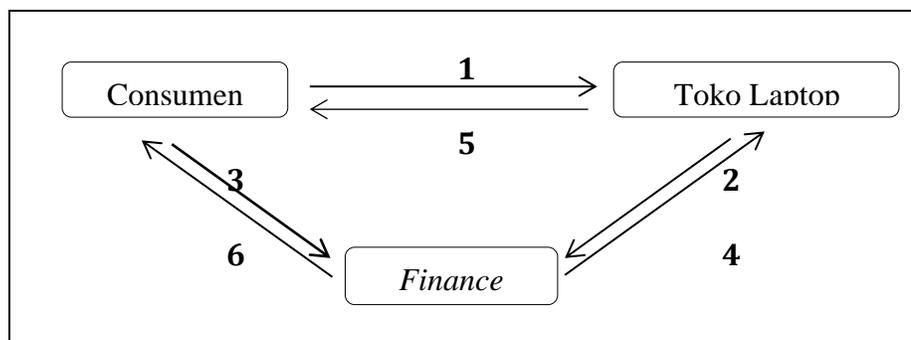


Figure 1. Credit Purchase Procedure

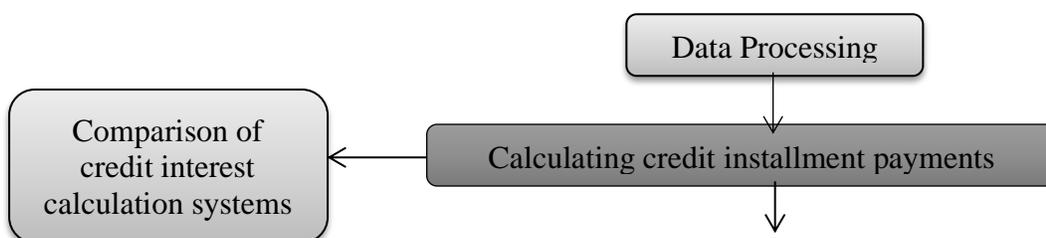
The financing credit determined by each *finance* has a different interest rate, for that it is suggested to the customer to understand the calculation mechanism as well as the ownership credit payment system that is considered quite safe and adjusted to the

allocation of needs taking into account that the current market interest rate is uncertain, so that future *customers* will not feel disadvantaged. *Customers* need to be critical in choosing the payment method and minimum interest so that *customers* don't have to be burdened with each payment. *Customers* need to know whether the interest rate determined by *finance* is flat or effective. It should be remembered that the community is a *customer* with a sensitive character regarding price, if there is a slight increase in price and interest it can affect the *customer's interest and ability* to make a purchase of a laptop product. *Customers* need to provide information that is in accordance with actual income data so that the selection of payment methods can be adjusted.

Based on the problems above, the researchers conducted a study on: (1) How to analyze the system for calculating the flat interest rate or the effective interest rate (*annuity* and *sliding rate*) , with the calculation application in *Microsoft Excel*; and (2) How is the comparison between the effective interest rate (*annuity* and *sliding rate*) with the flat interest rate applied by *finance* to *customers* .

METHODOLOGY

The data analysis model used in this study is an exploratory method. This research was conducted to determine the connection of mathematical concepts by using the effective interest rate method (*annuity* and). *sliding rate*) as well as the flat interest rate method. Data analysis is used to calculate the interest rate charged to customers based on the value of credit installment payments from variations in the number of loans made. Calculation of credit loan payments using the ownership credit payment method in obtaining interest payments and monthly installments to be used as a component in the mathematical model of the difference equation of the laptop credit payment system after payment of $t + 1$. The last stage is to substitute the mathematical model into the solution of the differential equation and analyze the results. Schematically, the research stages are presented in Figure 3.1. The data analysis taken is by the following stages: data collection, calculating the interest rate of the variable number of loans and the length of repayment, calculating the flat interest rate and effective interest rate, analyzing the interest rate obtained based on the difference in the number of loans and the length of repayment, and conclusion.



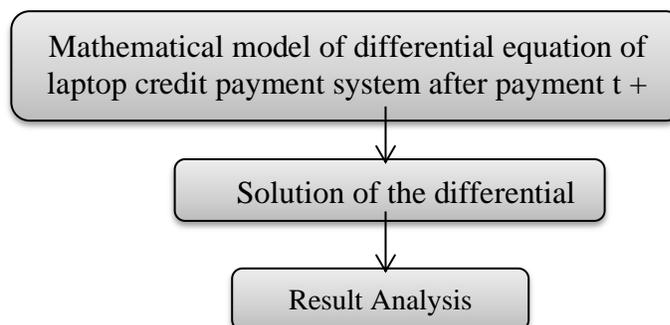


Figure 2. Schematic of determining the differential equation model credit payment system

RESULTS AND DISCUSSION

The data used is secondary data taken from several price list brochures for laptop brands of various types such as Asus, Acer, Hp, Apple Macbook Pro, Apple Macbook Air, Dell Gs, Dell Latitude, Lenovo, and so on. This data was obtained from several notebook/laptop sales points, namely HND Computer, Ariel Computer, Genius Computer Center, Elextra Computer, Proton Computer. While the data *finance* used is PT. Home Credit Indonesia (HCI), PT Adira Dinamika Multifinance, and PT . Mandala Multifinance. The data is taken from sales, down payment (DP), interest rate (*i*), insurance costs, administration fees, and the laptop credit installment period (tenor) for two (2) years.

Table 1. Interest rates and rates for laptop electronic financing for 2 years

Finance Name	Down Payment (DP %)	tenor		
		Interest Rate (%/pa)	Administration (Rp)	Insurance (%)
PT. Home Credit Indonesia (HCI)	2	4.79	205,000	5
PT Adira Dinamika Multifinance	3	11	150,000	5
PT. Mandala Multifinance	3	5.25	200,000	5

To take this credit, it is necessary to pay attention to the down payment (DP), tenor, interest rate, and finalty fees charged when paying off the loan before maturity after the customer enters into a credit agreement with *finance* . The amount of down payment (DP) or taking the credit period (tenor) of the customer needs to be adjusted to the ability of his income level. With the aim that the customer does not need to be burdened or there is no difficulty in returning his credit. The lower the customer's income, the longer the credit

period taken . *Finance* provides a time period for credit customers because it affects the interest rate.

Finance offers a kind of installment system that is In Advance for customers, based on the calculation of the purchase credit installments together with the total down payment by including the first and administrative installments, as well as insurance. Several components need to be calculated, namely the selling price, down payment, insurance costs, and administrative costs can be seen in the table below:

Table 2. Laptop Prices

Computer Store/ Laptop Brand	Type	Selling price
Asus	Vivobook 14 A412FA	7.150.000
Asus	Zenbook 134x325	16,000,000
Dell	GS 15 SE	10,000,000
Dell	XPS 132 in 1	19,000,000
Apple	Macbook Pro	27,000,000
Apple	Macbook Air	15,000,000
Mobile phone	Envy	14,000,000
Mobile phone	Pavilion	9,875,000
Acer	Nitro 5	8,895,000
Lenovo	Ideapad L340	6,580,000
Lenovo	Ideapad Yoga 500 7DID	10,000,000

The calculation can be seen as follows:

Purchase of one unit of Dell GS 15 SE Laptop through the sales store "Ariel Computer" and Home Credit Indonesia (HCI) *finance* on an advance installment system with a tenor of 24 months:

Selling Price	: IDR 10,000,000.00	
Down Payment	: IDR 200,000.00	– (a)
Principal Debt	: IDR 9,800,000.00	
Insurance (5%)/tenor (24 months)	: IDR 20,833.33	(b)
Administration	: IDR 205,000.00	+
Total paid (a+b+c)	: IDR 425,833.33	(c)

Credit Payment Calculation

For laptop electronic credit financing, each *finance* has a different method or calculation system. There are several types of interest payment calculation systems for laptop purchases, which can use effective interest rates (annuities and *sliding rates*) and flat interest rates. In general, in the end, the calculation of the purchase credit payment remains the same, namely in order to obtain a large interest payment in monthly installments. *Customer* payments are determined from the size of the interest rate payments such as time, loan amount, and applicable interest rates. However, what distinguishes the three

credit payment methods for the purchase of this laptop is the amount of interest rates on each *finance*. [15] The calculation for purchasing one unit of Laptop through the "Lenovo" brand at a computer shop and home credit (HCI) *finance using an advance* installment system is as follows:

a. Flat Interest Rate

With this flat interest rate calculation system, the amount of the interest rate is adjusted to the initial principal, so the interest and principal in monthly installment payments will remain the same. The calculation of the purchase credit payment is seen as follows:

$$\begin{aligned} \text{(A) Installment} &= \frac{p}{t} + \left(\frac{p \cdot i}{t} \right) = \frac{Rp\ 10,000,000}{24} + \left(\frac{Rp\ 10,000,000 \cdot 4,79\%}{24} \right) \\ &= \text{IDR } 416,666.67 + \text{Rp } 19,958.33 \\ &= \text{IDR } 436,625.00 \end{aligned}$$

The total down payment (TDP) on the purchase of a laptop unit with the *Lenovo Ideapad Yoga 500 7DID* brand through HND Computer and HCI *finance* using the flat method can be seen in the table below:

Table 3.3 Calculation of Advances with Flat Interest Rates

<i>advance</i>	
Down Payment (DP)	= IDR 200,000.00
Administration (Adm)	= IDR 205,000.00
Insurance (Ass) (5%/year)	= IDR 20,833.33
Installment-1	= <u>IDR 436.625,00 +</u>
Total paid	= IDR 862,458,33

From the table above, it shows that the 1st installment that has been paid together *down payment* (DP), then the calculation of the remaining credit and interest on the purchase of one laptop through a computer shop and HCI *finance and using a flat* interest rate is calculated as follows:

Loan = IDR 10,000,000.00

Tenor = 24 months

Interest 4.79% = IDR 10,000,000.00 x (4,79% / 24) = IDR 19,958.33

1st installment = IDR 10,000,000 / 24 months = IDR 416,666.67

The remainder of the 2nd credit loan = Selling Price - Installment 1

= IDR 10,000,000.00 - IDR 416,666.67

= **IDR 9,583,333.33**

Thus the calculation of the remaining credit loans until the 24th, then in the 24th month the installment payment agreement ends. The results of installment payments that have been paid for 24 months can be concluded that:

- a) the total amount of *flate interest* earned is : IDR 479,000.00
- b) the total amount of insurance obtained is : IDR 500,000.00

c) the total amount of installments obtained is : IDR 10,979,000.00

b. Effective Interest Rate with *Upfront Annuity*

Annuity in advance (*annuity due*) is a payment at the beginning of each period. The beginning of the first period is the calculation of the first interest and the beginning of the second period and the calculation of the second interest and the beginning of the third period and so on. The amount of interest is calculated in accordance with the remaining credit loans. Then the amount of interest and principal for each month's installments will be different, even though the amount of installments per month remains the same. Finance provides a fixed interest rate with a flat condition, but the flat interest rate is still converted/converted previously into the form of an effective interest rate by using the annuity installment method, as follows :

$$Er = (2 * Fr) - 1$$

then the effective interest rate after being converted from a flat interest rate of 4.79% is 8.58%. Thus, the effective interest rate after being converted to a flat interest rate of 4.79% is 8.58%. Thus, the calculation of ownership credit payments is seen below:

$$\begin{aligned} \text{1st installment} &= \frac{p * i}{\left[1 - \left\{1 / \left[1 + \left(\frac{i}{1}\right)^n\right]\right\} \right] * (1+i)} \\ &= \frac{Rp\ 10,000,000.00 * \left\{\frac{8.58\%}{24}\right\}}{\left[1 - \left\{1 / \left[1 + \left(\frac{8.58\%}{24}\right)^{24}\right]\right\} \right] * \left[1 + \left\{\frac{8.58\%}{24}\right\}\right]} = \text{Rp } 435,541.14 \end{aligned}$$

Table 3.4 Calculation of down payment with *annuity system*

Advance	
Down Payment (DP)	= IDR 200,000.00
Administration (Adm)	= IDR 205,000.00
Insurance (Ass)	= IDR 35,750.00
Installment-1	= <u>IDR 435,541.14 +</u>
Total down payment	= IDR 876,291.14

From the table above, it shows that the 1st installment that has been paid together *down payment* (DP), then the calculation of the remaining credit and interest on the purchase of one laptop through a computer shop and HCI *finance* and using a declining interest rate (*annuity*) is calculated as follows:

Credit Loan	= IDR 10,000,000.00
Tenor	= 24 months
Interest 8.58% (interest decreased)	= IDR 10,000,000.00 x (8.58% / 24)
	= IDR 35,750,00
1st installment (decreased)	= Rp 10,000,000.00 - IDR 399,791.14
	= Rp 9,602,208 ,86
The remainder of the 2nd credit loan	= Selling Price - Installment 1
	= IDR 10,000,000.00 - IDR 399,719.14
	= IDR 9,602,208.86

Thus the calculation of the remaining credit loans until the 24th, then in the 24th month the installment payment agreement ends. The results of installment payments that have been paid for 24 months can be concluded that:

- a) the total amount of *annuity interest* earned is : IDR 452,987.38
 b) the total amount of insurance obtained is : IDR 500,000.00
 d) the total number of installments obtained is : IDR 10,952,987.38

c. Effective Interest Rate with *Sliding Rate*

Calculation of exercise interest at the end of each payment period. For the calculation, the amount of credit interest is calculated from the final balance or the remaining credit loans each month, the interest paid by the customer every month decreases. Thus, the number of installments paid by customers every month seems to be getting smaller. The calculation of financing credit payments is shown in table 3.5:

$$\begin{aligned} \text{1st installment} &= \frac{p * i}{\left[1 - \left(\frac{1}{1+i}\right)^n\right]} * (1+i) \\ &= \frac{Rp\ 10,000,000.00 * \left\{\frac{8.58\%}{24}\right\}}{\left[1 - \left\{1 / \left[1 + \left(\frac{8.58\%}{12}\right)^{24}\right]\right\}\right] * \left[1 + \left\{\frac{8.58\%}{24}\right\}\right]} \\ &= \mathbf{Rp\ 435,541.14} \end{aligned}$$

Table 3.5 Calculation of down payment with *sliding rate system*

Advance	
Down Payment (DP)	= IDR 200,000.00
Administration (Adm)	= IDR 205,000.00
Insurance (Ass)	= IDR 20,833.33
Installment-1	= <u>IDR 452,416.67</u> +
Total DP	= IDR 878,250.00

From the table above, it shows that the 1st installment has been paid with a *down payment* (DP), then the calculation of the remaining credit and interest on the purchase of one laptop through a computer shop and HCI *finance* and using a *sliding interest rate* is calculated as follows :

$$\begin{aligned} \text{Credit Loan} &= \text{IDR } 10,000,000.00 \\ \text{Tenor} &= 24 \text{ months} \\ \text{Interest } 8.58\% \text{ (interest decreased)} &= \text{IDR } 10,000,000.00 * (8.58\% / 24) \\ &= \text{IDR } 35,750.00 \\ \text{1st installment (decreased)} &= \text{IDR } 10,000,000 - \text{IDR } 416,666.67 \\ &= \text{IDR } 9,583,333.33 \end{aligned}$$

$$\begin{aligned} \text{The remainder of the 2nd credit loan} &= \text{Selling Price} - \text{1st installment} \\ &= \text{IDR } 10,000,000.00 - \text{IDR } 416,666.67 \\ &= \mathbf{\text{IDR } 9,583,333.33} \end{aligned}$$

Thus the calculation of the remaining credit loans until the 24th, then in the 24th month the installment payment agreement ends. The results of installment payments that have been paid for 24 months can be concluded that:

- a) the total amount of *sliding rate interest* obtained is : IDR 446,875.00
- b) the total amount of insurance obtained is : IDR 500,000.00
- c) the total number of installments obtained is : IDR 10,946,875.00

Credit Payment Mathematical Model

financing credit payment model is useful for knowing the remaining credit $t + 1$ is the beginning of the sum of the remaining t credit loans with interest, after that it is also deducted the monthly installment fee where the payment is in the specified time period. At the initial stage, what must be done in modeling this credit payment is to determine the components of the Laptop credit payment with t payments, the amount of the loan after $t + 1$ payment is the same as the amount of the loan after t payments, plus the interest on the joint loan minus the amount of installments, then the part of credit payments can be modeled in the form of a first-order linear differential equation. Installment payments with interest per month can be seen through the financing credit calculation method, namely through a flat interest rate system, an *annuity* in advance, as well as a *sliding rate*.

The first order linear difference equation is obtained by $a = (1 + \frac{ar}{100})$ with $b = -A$, then it produces an equation, namely:

$$Pt = P_0(1 + \frac{ar}{100})^t + (-A) \frac{1 - (1 + \frac{ar}{100})^t}{1 - (1 + \frac{ar}{100})}$$

$$Pt = P_0(1 + \frac{ar}{100})^t + \left(P_0 - \frac{100A}{ar}\right) + \frac{100A}{ar}$$

a. Flat Interest Rate

The calculation of the remaining credit and interest on the purchase of a laptop through a computer shop and HCI *finance* and using a flat interest rate is calculated as follows using the first-order linear difference equation:

$$\begin{aligned} \text{Remaining credit to-1} &= \text{Selling Price} - \text{Total Initial Payment} \\ &= \text{IDR } 10,000,000,00 - (\text{IDR } 416,666.67 + \text{IDR } 19,958,33) \\ &= \text{IDR } 9,563,375.00 \end{aligned}$$

$$\text{Interest to - 1} = \frac{\text{Rp } 10,000,000.00 * 4.79\% *}{12 * 2} = \text{Rp } 19,958.33$$

The remainder of the 2nd credit loan :

$$\begin{aligned} P_{t+1} = P_2 &= \left[\left(\frac{4.79\%}{24} + 1 \right) x \text{Rp } 9.563.375,00 \right] - \text{Rp } 416.666,67 \\ &= \text{IDR } 9,165,795.23 \end{aligned}$$

Interest - 2 = IDR 19,958.33, and so on until the 24th installment.

a. Effective Interest Rate with *Upfront Annuity*

The calculation of the remaining credit loan with interest for the purchase of one laptop

from the "Ariel Computer" store with HCI *finance* and using annuity interest is calculated as follows:

$$\begin{aligned} \text{Remaining credit to } -1 &= \text{Selling Price} - \text{Initial Payment Sign} \\ &= \text{IDR } 10,000,000.00 - \text{IDR } 399,791.14 \\ &= \text{IDR } 9,600,208.86 \end{aligned}$$

$$\text{Interest} - 1 = \text{IDR } 10,000,000.00 * \frac{8.58\%}{24} = \text{IDR } 35,750.00$$

The remainder of the 2nd credit loan :

$$\begin{aligned} P_{t+1} = P_2 &= \left[\left(\frac{8.58\%}{24} + 1 \right) x Rp \ 9,600,208.86 \right] - (\text{Rp } 401,220.39) \\ &= \text{IDR } 9,197,559.21 \end{aligned}$$

Interest - 2 = **IDR 9,600,208.86** * $\frac{8.58\%}{24}$ = **IDR 34,320,75** and so on until the 24th installment

b. Effective Interest Rate with *Sliding Rate*

The calculation of the remaining credit loan with interest for the purchase of one "Lenovo" brand laptop at the "Ariel computer" store at HCI *finance* using the *sliding rate system* is calculated as follows:

$$\begin{aligned} \text{Remaining credit} &= \text{Selling Price} - \text{Early Payment Sign} \\ &= \text{IDR } 10,000,000 - \text{IDR } 416,666.67 \\ &= \text{IDR } 9,583,333.33 \end{aligned}$$

$$\text{Interest} - 1 = \text{IDR } 10,000,000 * \frac{8.58\%}{24} = \text{IDR } 35,750,00$$

$$\begin{aligned} \text{The remainder of the 1st credit loan} &= \text{Rp } 9,583,333.33 - \text{IDR } 416,666.67 \\ &= \text{IDR } 9,166,666,67 \end{aligned}$$

Interest - 2 = $\text{IDR } 9,166,666.67 * \frac{8.58\%}{12*2}$ = **IDR 34,260,42** and so on until the 24th installment.

The system for calculating interest rates and the amount of financing installment payments as above is the same as Adira *Finance* and Mandala *Finance* for other laptop brands. The remaining loan on each of the payments for the 1st year to the 2nd year, is calculated according to the above.

Looking at the results of the calculation analysis, it can be concluded that:

a. Comparison of Financing Credit Payment Systems

The calculation of financing credit payments can use a flat interest rate or an effective interest rate with *annuity* and *sliding rate*, it can also be seen the difference in the amount of interest income from the results of the acquisition of the finance party against the three interest rates. HCI *finance*, Adira *finance*, and Mandala *finance*. The policy of financial institutions to use flat interest rates because it provides large profits. The decision of the

finance party to use a flat interest rate because the calculation is easy and its daily practice can be understood by the computer shop and *customers*, as well as to optimize the company's profits. So, the decision making from the *finance side* by using effective interest with *annuities* is not without reason, but is caused by the level of competition in the business as well as the higher interest rate with various finances.

For this reason, one of the reasons for the *finance party* to be critical in making decisions and determining the system for calculating the interest on financing loans. For this reason, *finance* should not focus more on large profits, but how to get lots of *customers* with not so high interest income levels. Looking at the facts on the ground, there are several *finance companies* that apply flat interest rates rather than the effective interest rate. In order to be able to deal with *customers* where the flat interest rate seems lower than the effective interest rate. In accordance with the opinion of Bumulo and Mursanto, stating that in practice credit is used in installments and the interest expense is flat, the interest rate is lower than the effective interest rate, [2]. After being calculated using the mathematical method of financing credit payments, the results of the calculation of interest payments and installments for flat interest rates are higher than using the effective interest rate with *annuities* and *sliding rates*. Based on the remaining larger credit loans with longer tenors, the difference in the calculation of the payment system for the financing credit installments is also getting higher.

b. The advantages and disadvantages of the Financing Credit calculation method

Flat Interest Rate

Pros: For companies, this flat interest rate gives benefits because *finance* earns maximum profit.

Lack:

- i) In the event of settlement, the *customer* can pay the remaining debt without paying interest for the remaining term of the debt. As a result, the company suffers losses from early repayment of the credit granting period;
- ii) In this flat method, when there is an increase in interest rates in the current period, the interest rate is not passed on to the *customer* because the interest rate offered is fixed, so the finance profit can be reduced. However, there is an exception if the contract agreement contains a statement that when there is an increase in interest rates, the interest rate will be adjusted to the *customer*'s installment payments in the current period.

2) Effective Interest Rate with Annuity

Pros: While the remaining debt is still large at the beginning of the sales period, *finance* has already made a huge profit.

Lack:

- a) If there is a settlement, the *customer* only pays the remaining debt without paying interest for the remaining term of the debt, then the company gets a loss.
- b) If there is an increase in interest rates in the current period, the customer will not bear the increase in interest rates.

3) Effective Interest Rate with Sliding Rate

Excess:

- a) If the remaining debt is still large at the beginning of the sales period, *finance* has earned a very large profit;
- b) then the installments will be paid by the *customer* the longer it decreases.

Lack:

- a) If there is a settlement, the *customer* only pays the remaining debt without paying interest for the remaining term of the debt, then the company will get a loss;
- b) If there is an increase in interest rates in the current period, the *customer* will not bear the increase in interest rates .[3]

CONCLUSION

Based on the calculation results of Financing Credit payments, it can be concluded that:

1. using a flat interest rate, in this case *finance* earns interest income on a fixed basis (*fixed*) for each period of payment of Financing Credit from the *customer* , the company (*finance*) gets the maximum profit.
2. Comparison of the Flate interest rate with the effective interest rate (*annuity* and *sliding rate*) it can be seen that the interest income received by the *finance party* is *different* in each credit payment period from the *customer* , so that when the remaining debt is still large at the beginning of the sales period, the *finance party* has earned big advantage.
3. The interest rate system that provides benefits for the *finance party* is the flat and *annuity* interest rate compared to the *sliding rate interest rate* .
4. *sliding rate* interest rate can help ease the customer's burden during the credit repayment process. If, the *customer* wants to make an early payment , then the sliding rate method and the flat method provide benefits for the *customer* .
5. *Customer* decision making with the time period taken provides benefits for the company (*finance*) but this is adjusted to the needs of the *customer*.
6. The selected period of 3, 6 months taken by the *customer* with a large *down payment (DP)* from the selling price will affect the installments and interest, so the company (*finance*) does not get a large profit (profit), compared to the *down payment (DP)* is small with a period of 1 year and 2 years, then the installments and interest are divided from the selling price with a period according to the *customer 's request* . So the company (*finance*) benefits greatly in this case because the *customer* can only make repayments from the specified time period, so the company will also provide a penalty (administrative additional fees) as well as late payments will be subject to fines from the date of payment and daily interest rates .
7. Late payments from the specified date are usually given relief for three (days) to make payments, but if the three (days) period is not made, the penalty and interest rate will automatically apply. In addition, 1-3 consecutive months of not making payments will be withdrawn by the company (*finance*).
8. Preferably before the *customer* signs a statement of credit agreement then the *customer* needs to read carefully the contents of the credit sale and purchase agreement and if you do not understand, ask so that later the *customer* does not feel aggrieved.

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