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Investigating Factors Affecting Personal Bankruptcy in Malaysia Through Regression Analysis

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Abstract. Investigation on the factors of why people go bankrupt needs to be identified to reduce bankruptcy cases among Malaysians, as the number of bankruptcy cases has significantly increased in Malaysia. This study intended to know the relationship between the unemployment rate, lending rate, non-performing loan, GDP, and household debt toward personal bankruptcy and was investigated using multiple linear regression (MLR) analysis by utilizing the available data from 2005 to 2021 through Malaysia of Department of Insolvency (MDI). The findings suggest that two variables, i.e., the unemployment rate and lending rate, are statistically significant towards personal bankruptcy in Malaysia.

Keywords: Personal bankruptcy, multiple linear regression, financial literacy, information management.

1 Introduction

In Malaysia, personal bankruptcy is a type of bankruptcy in which an individual declares themselves insolvent and petitions the court to have their financial affairs placed under receivership. Personal bankruptcy is a debt solution for those who can't pay their debts for a considerable period (Tan, 2017). According to the official portal of Malaysian Department of Insolvency, if a person is unable to pay his debt of at least RM100,000.00, he will be declared bankrupt (Personal Bankruptcy, 2022). This means that the creditors are allowed to take over all the person's assets, so they can be repaid as quickly as possible. 274,628 people declared bankruptcy in Malaysia as of June 2022 (Bankruptcy Statistic 2022, 2022). Among the consequences of personal bankruptcy in Malaysia include the loss of assets, damaged credit rating, difficulties in borrowing, and a travel ban (Bankruptcy, 2022).

Personal bankruptcy will impact significantly the individual and their family. An individual who files for personal bankruptcy usually does so because they cannot pay back high-interest credit cards, loans, and other types of debts. Therefore, it is

important to keep good financial records, make wise financial decisions, and seek professional advice from Agensi Kaunseling dan Pengurusan Kredit (AKPK) if necessary. By taking these steps, the possibility of becoming the victim of personal bankruptcy can be minimized in your life and even your family. Investigation on the factors of why people go bankrupt needs to be identified to reduce bankruptcy cases among Malaysians. Hence, in this study, we focus on five main factors, i.e. unemployment rate, lending rate, non-performing loan, gross domestic product (GDP), and household debt to examine if they contribute to personal bankruptcy in Malaysia.

Unemployment Rate

Hilmy et al. (2013) suggested that the unemployment and bankruptcy are statistically significant. The model of this study has strong explanatory power, as it shows that a combination of non-performing loans, unemployment, and economic conditions explains many changes in bankruptcies (Hilmy et al, 2013). The unemployment rate among young people is statistically insignificant with personal bankruptcies. This means that when the unemployment rate rises, so do the personal bankruptcy rate (Hassan et al, 2021). The unemployment rate is not a particularly effective explanatory variable at all (Kubalek et al, 2017). The rate of unemployment has a significant and negative impact on personal bankruptcy cases (Tan, 2017).

According to the results of the study, there is a significant correlation between the rate of unemployment and consumer bankruptcies (Malarvizhi et al, 2021). In Malaysia, the unemployment rate was determined to be significant, which hurt personal bankruptcy. According to the rational expectations' theory, this finding can be explained as: when unemployment is high in a country, people are afraid of losing their jobs, so they spend less and save more. When people spend less, it means they are less likely to get a loan, which increases their debt load, and they save more of their income instead of spending it. As a result, personal bankruptcies decrease when unemployment rises (Choong et al, 2019).

In Malaysia, the unemployment rate adversely affects bankruptcy. In Singapore, it has negative effects. However, the unemployment rate was not a significant predictor of personal insolvency in both countries (Ahmad et al, 2022). The number of dismissal laws in labor legislation that existed in the two years before filing for bankruptcy had a positive and significant impact on bankruptcy (Stef, 2018). The rising unemployment rate has led to an increase in bankruptcy filings. When people lose their jobs, they are more likely to experience financial hardship, which can lead to bankruptcy (Baulkaran, 2022). In terms of control variable coefficients, higher unemployment rates relate to higher bankruptcy rates, implying that negative economic shocks exacerbate financial suffering (Kuroki, 2021).

Lending Rate

Lending rates have a significant positive impact on personal bankruptcy cases (Tan, 2017). In Malaysia, the lending rate is found to be significant and hurts personal bankruptcy. Borrowers with a reduced default risk can obtain a cheaper loan rate from credit card providers. Even while the lending rate is lower, smaller debts will lead to larger indebtedness, in the long run, increasing the likelihood of filing for personal bankruptcy

(Choong et al, 2019). In the United States, lending rates have a significant impact on consumer bankruptcies. Lending rates have a significant positive correlation with consumer bankruptcy rates. When lending rates rise, so do bankruptcies.

In a study that combined household delinquency panel data from 11 European countries with macroeconomic data, high consumer bankruptcies were associated with rising unemployment and interest rates (Ong et al, 2015). Interest rates, which are a major influence on both long-term and short-term bankruptcy in Malaysia, are insignificant in Singapore. When interest rates rise, borrowing rates rise as well, making it more difficult to accept loans for consumers with poorer credit ratings. As a result, bankruptcy cases tend to decrease since banks will only approve loans to borrowers with excellent credit (Ahamd et al, 2022). For the entire bankruptcy, the coefficients of interest are statistically significant and negative at the 1% level (Kuroki, 2021).

Non-Performing Loan

Non-performing loans are statistically associated with bankruptcy (Hilmy et al, 2013). When paired with personal bankruptcy, the non-performing loan produced positively significant results. This means that as the number of NPLs increases, so will the number of personal bankruptcies (Hassan et al, 2021). Personal bankruptcy and the acceptance of a non-performing loan have a positive link. The fundamental cause of rising bankruptcy cases is the failure to return borrowed funds. Personal bankruptcy will result from excessive borrowing (Selvanathan et al, 2016).

GDP (Gross Domestic Product)

The relationship with gross domestic product demonstrated a moderate reliance (Kubalek et al, 2017). In Malaysia and Singapore, GDP has no significant impact on bankruptcy. The negative association between bankruptcy and GDP is further corroborated by the impact of income and the economic scenario on debtors' ability to pay off their obligations (Ahmad et al, 2022). State GDP has no statistical relationship with total personal bankruptcy (Baulkaran, 2022).

Household Debt

For Malaysia and Singapore, household debt has a positive and significant impact on bankruptcy. This decrease verifies the expected negative relationship and demonstrates that CPI helps to lower bankruptcy in Malaysia. Such a link implies that the CPI influences purchasing power and, as a result, individual income. When adjusted for inflation, the increase in income may have been used by individuals to lower their obligations, keeping them from entering the bankruptcy category (Ahmad et al, 2022).

2 Methodology

Data Selection

This research uses the secondary data collection method, where the dataset is collected from various websites. The dataset collected is within the timeframe from 2005 to 2021. It is useful in determining the factors that affect the bankruptcy of Malaysia's residents. Table 1 shows the sources of the data.

Table 1 Sources of Data

Data	Source
Personal Bankruptcy (in cases)	Malaysia Department of Insolvency (MDI)
Unemployment rate (in percentage)	Malaysia Department of Insolvency (MDI)
Lending rate (in percentage)	World Bank Group
Non-performing loan (in percentage)	World Bank Group
GDP (in percentage)	World Bank Group
Household debt (in percentage)	CEIC Data

Variable Definitions

As part of this study, several factors that affect bankruptcy have been examined concerning personal bankruptcy cases in Malaysia from 2005 to 2021. Table 2 summarizes all the variables that affect the bankruptcy of Malaysia's residents and their abbreviations which will be used in this study.

Table 2 Summary of variables related to personal bankruptcy

Variables		Description	Abbreviation
Dependent	Personal Bankruptcy	Number of personal bankruptcy cases reported in Malaysia	PB
Independent	Unemployment Rate	The unemployment rate in Malaysia	Ue
	Lending Rate	The average lending rate each year offered by the commercial bank in Malaysia	L
	Non-Performing Loan	The loan interest rate for debtors who are unable to repay the contract within a predetermined period	NPL
	GDP	The percentage growth of the total market value of	GDP

	goods and services produced by a country during a given period.	
Household Debt	The household debt percentage of GDP Credit consumption is the same as household debt	HD

Data Checking and Cleaning

In this research, the data is entered in an Excel file before transferring to IBM SPSS Statistics 26. The descriptive statistics for all the variables are illustrated in the table below.

Table 3 Descriptive Statistics for all variables

	N	Mean	Std. Deviation
PB	17	16099.29	4393.538
Ue	17	3.4206	.47658
L	17	4.9918	.81998
NPL	17	3.2447	2.56674
GDP	17	4.2071	3.15593
HD	17	78.42876	9.860582
Valid N (listwise)	17		

The N for all variables is 17, which indicates that there are no missing values or errors have been found in the dataset.

Method of Data Analysis

The data management and statistical results will be analyzed with IBM SPSS Statistics 26 in this study. Statistical analysis will be used to compile the predictions for each independent variable with the dependent variable. In this study, some models are selected to analyze the data to discover if there is an evident relationship between unemployment rate, lending rate, non-performing loan, GDP, household debt, and personal bankruptcy. Several models were selected to investigate the data to find the relationship between variables. These models are Pearson correlation, multiple linear regression, and multicollinearity test.

Phase 1 – to determine the contributing factors to personal bankcrupcy

As part of this step, Pearson correlation will be used to determine the contributing factors (unemployment rate, lending rate, non-performing loan, GDP, and household debt). To predict bankruptcy, the correlations of personal bankruptcy with each of the attributes will be analyzed. A correlation coefficient is a quantitative assessment that is used to measure the direction as well as the strength of this tendency to vary in tandem. The correlation coefficients are a single number where the range is between -1 to 1. Based on the Pearson correlation coefficient, the absolute value determines the strength

of the relationship between variables. A correlation coefficient whose absolute value is greater means the relationship is stronger. These relationships will be placed into three categories: strong, moderate, and weak. Correlation coefficients are interpreted based on the sign of the correlation coefficient, which is either positive (+) or negative (-). Positive coefficients indicate that the variable value increases along with the value of the other variable, while negative coefficients indicate that the variable value decreases along with the value of the other variable.

Generally, relational relationships that are strong and positive will correlate close to 1, whereas those that are weak and negative will typically correlate to zero. This method can be used to begin modeling a regression model.

Phase 2 – to examine the relationship between personal bankcrupcy and factors affecting Malaysia's residents

To investigate the relationship between bankruptcy and factors affecting Malaysia's residents, multiple linear regression (MLR) analysis is an effective way to predict the independent variables (unemployment rate, lending rate, non-performing loan, GDP, and household debt) through the dependent variable (personal bankruptcy). The regression model is a build-up to predict a reasonable effect on personal bankruptcy. The regression analysis approach assumes the straight-line relationship between the variables and identifies the hypothesis statement. As part of this study, five hypothesis statements are formed to predict whether personal bankruptcy is related to the factors.

In this research, the regression model is utilized in determining if there is a relationship between the factors and personal bankruptcy and how strong the relationship is. The regression model uses the enter and remove selection method to fit the best regression model. Based on the model summary in the regression analysis, the coefficient of determination (R-square) is showing the percentage of variation of the personal bankruptcy affected by the predictors (factors). This value is an overall measure of the strength of the association and does not reflect how closely any particular independent variable is related to the dependent variable. An adjusted R square is calculated when predictors (factors) are added to the model. Each predictor will explain some variances in the dependent variable simply by chance. The adjusted R-square aims to provide a more accurate estimation of the R-squared value.

Through the ANOVA, the F-statistics and significant value which is the p-value, determine whether the regression model is a good predictor variable. The overall significance test evaluates the ability of the independent variables, when used together, to predict the dependent variable and does not address the predictability of any individual independent variable.

In the Coefficients table, each independent variable is evaluated according to its ability to predict the dependent variable. A regression equation is constructed using unstandardized coefficients (B) to predict the dependent variable from the independent variables. The t-statistics and significant values are used to test the null hypothesis. When the coefficient has a p-value of less than or equal to 0.05, it would be considered statistically significant. The null hypothesis was rejected, and there is a relationship between the independent variable and dependent variable, or vice versa.

Then, remove the effect variables that are not significant (criteria: remove the significant value of more than 0.05) and rebuild the model until all the variables are significant to the dependent variable and construct the best prediction in this research.

The equation of the regression model is created as below:

$$y_i = (\beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots + \beta_n x_{in}) + \epsilon_i$$

where y_i The predicted value of the dependent variable,
β_0 y-intercept,
$\beta_1 x_{i1}$ Regression coefficient (β_1) of the first independent variable (x_{i1}),
$\beta_2 x_{i2}$ Regression coefficient (β_2) of the second independent variable (x_{i2}),
$\beta_n x_{in}$ Regression coefficient (β_n) of the last independent variable (x_{in}),
ϵ_i Model error.

Then, the assumptions (the relationship between the dependent variable and independent variables is linear, the errors have the same variance, the errors are independent of each other, and the error is normally distributed) of multiple linear regression are checked to satisfy the accurate results from the statistical method.

Phase 3 – to determine the strength of factors affecting Malaysia's bankcrupcy

The strength of factors affecting Malaysia's bankruptcy is examined by the multicollinearity. To detect multicollinearity, a metric called variance inflation factors (VIF) is used. VIF is a tool that measures and quantifies the degree of variance inflation and the strength of correlation between the predictor variables in regression models. When $VIF = 1$, it indicates the predictors are not correlated; if $1 \leq VIF \leq 5$, it indicates the predictors have moderately correlated; $VIF > 5$ indicates the predictors are highly correlated.

3 Results and Discussion

Contribution Factors to the Personal Bankcrupcy

The contributing factor to personal bankruptcy is determined by the correlation. Direction and strength can determine how factors related to personal bankruptcy. The correlation of the contributing factors to personal bankruptcy is illustrated in the table below.

Table 4 The correlation of the contributing factors to the personal bankruptcy

	PB	Ue	L	NPL	GDP	HD
PB	1	-.816	.071	-.156	.490	.032
Ue	-.816	1	-.451	-.084	-.721	.303
L	.071	-.451	1	.846	.385	-.917
NPL	-.156	-.084	.846	1	.206	-.823

GDP	.490	-.721	.385	.206	1	-.357
HD	.032	.303	-.917	-.823	-.357	1

The factor unemployment rate shows a perfect and strong negative correlation with -0.816 which is close to -1. This indicates that with the decrease in the unemployment rate, personal bankruptcy cases also tend to decrease. Followed by the GDP which has a moderate positive correlation to personal bankruptcy with 0.490. Other factors (Lending rate, non-performing loan, and household debt) have a less or weak correlation to personal bankruptcy. The lending rate (0.071) and household debt (0.032) have a weak positive correlation while the non-performing loan (-0.156) has a weak negative correlation. All factors' variables have a relation to personal bankruptcy, whether it is weak, moderate, or strong. This correlation is providing the information to predict the regression lines.

The unemployment rate is likely to have a significant and negative impact on the personal bankruptcy case. The negative relationship in this study was caused by government policies implemented during the study sample period to promote economic growth and reduce the country's unemployment rate. Regardless of the significance of the unemployment rate in this study indicates, it will have an impact on personal bankruptcy cases in Malaysia. As a result, policymakers must make consistent efforts to keep the local unemployment rate at around 3%, which is considered low and good in a developing country (Tan, 2017).

Besides, GDP meets a moderate positive correlation to personal bankruptcy. But, from the theoretical standpoint, it should be negatively correlated. There is a possible explanation for why they have a positive correlation. When GDP rises, it encourages people to borrow more, which leads to an increase in debt and personal bankruptcy. According to the theory, higher GDP implies higher economic growth, which leads to higher income, which means they will feel more confident in taking on and issuing more debt, which will lead to personal bankruptcy. (Meniago et al, 2013) found that GDP has contributed significantly to changes in personal bankruptcy levels in South Africa.

The results reported in Table 4 show that the lending rate is weak to influence the personal bankruptcy case. As mentioned by (Tan, 2017), since the market interest rate rises, all banks and financial institutions must follow suit and raise the lending rate that is being offered to the public, whether for existing or new customers. In this case, a higher cost of debt will burden the consumer. This will reduce the amount of money circulating in the economy to achieve a specific economic goal set by the policymaker, such as lowering the inflation rate during periods of high economic growth. However, raising the market interest rates is not always a good idea because it is dependent on other economic indicators, such as a country's household debt level.

The same occurs for household debt with less or weak positive correlation to influence the personal bankruptcy case. According to the Theory of Household, there is a reason for a household to use a bank's credit which is household debt when the household income stream is inconsistent with its consumption pattern over time. During his early earning years, households tend to borrow against his future earnings to purchase and accumulate assets while repaying debts as his earnings increase. An increase in interest rates, combined with household consumption exceeding earnings and debt sustainability weaknesses such as failure to meet repayment obligations, leads to

insolvency and personal bankruptcy. Furthermore, the study's findings are consistent with (Alfaro and Gallardo, 2012) study on household debt in Chile, in which income and income-related variables are significant, and the likelihood of default and bankruptcy is increased.

Non-performing loans have less or weak negative correlation to influence the personal bankruptcy case. However, based on the theoretical point of view, it shows that when paired with personal bankruptcy, the non-performing loan produced positively significant results. There is a possible explanation for why they have a negative correlation. As the non-performing loans will obstruct the interest revenue, continuously reduce investment opportunities and cause liquidity crises in the financial system. This will be resulting in personal bankruptcy and performs a weak economic system.

Relationship between Personal Bankcrupcy and Factors Affecting Malaysia's Residents

Based on the analysis above, there is a strong correlation between the unemployment rate and personal bankruptcy while a moderate relationship between the GDP versus personal bankruptcy. Therefore, the first model created for the multiple regression model is the attributes *(personal bankruptcy ~ unemployment rate + GDP)*. The variables (Ue and GDP) are entered to determine the connection of personal bankruptcy.

By referring to the model summary illustrated in the table below, the regression model makes the adjusted R-square as 0.641 or 64.1%, which indicates that Malaysia has carried out 64.1% explaining how these predictors (Unemployment rate and GDP) affect personal bankruptcy.

Table 5 Model Summary of the unemployment rate and GDP

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.828[a]	.686	.641	2630.806

a. Predictors: (Constant), Ue, GDP

The analysis of the variance of the unemployment rate and GDP is shown in the table below. The F-statistics of the model is 15.312 with a sig-value of 0.000. This can conclude that the model is good, and the predictor variables are all significant in the overall measure.

Table 6 ANOVA[a] of unemployment rate and GDP

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	211954792.683	2	105977396.342	15.312	.000[b]
	Residual	96895984.846	14	6921141.775		
	Total	308850777.529	16			

a. Dependent Variable: PB

b. Predictors: (Constant), Ue, GDP

The coefficient for the predictors is shown in Table 7. The coefficients for the unemployment rate (-8888.071), GDP (-285.583), and constant (47703.192) can create an equation of the model for predicting personal bankruptcy as $PB = 47703.192 - 8888.071Ue - 285.583GDP + \varepsilon$.

Table 7 Coefficients[a] of unemployment rate and GDP

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	47703.192	7805.063		6.112	.000
	GDP	-285.583	300.918	-.205	-.949	.359
	Ue	-8888.071	1992.680	-.964	-4.460	.001

a. Dependent Variable: PB

Through the coefficients' table, the sig-value for the unemployment rate is 0.001, which is considered significant, and can conclude that the unemployment rate has a relation to personal bankruptcy. This is because people continue to lead ordinary lifestyles despite being unemployed, unemployment in Spain is associated with personal insolvency (Azmin et al, 2019). According to (Hilmy, 2013), payment defaults occur because people are out of work and find it difficult to continue making mortgage payments. The number of personal insolvency cases will increase if this problem persists. Low wages and a high unemployment rate imply that people will only be able to rely on their emergency savings (Khan et al, 2016).

On the other hand, the ability of the GDP is not significant in predicting personal bankruptcy because the sig-value of the GDP is more than 0.05 which is 0.359. The null hypothesis cannot be rejected. Therefore, there is no relationship between GDP and personal bankruptcy.

To improve the regression model, the second model will include all the factors, which are the unemployment rate, lending rate, non-performing loan, GDP, and household debt. All factors are entered to determine their relationship with personal bankruptcy. The second model created for the multiple regression model is the attributes *(personal bankruptcy ~ unemployment rate + lending rate + non-performing loan + GDP + household debt).* The model summary is illustrated below. The new value of the adjusted R square is 0.781 or 78.10%, which is more than the previous model. This indicates that Malaysia has carried out 78.10% which explains how these predictors affected personal bankruptcy.

Table 8 Model Summary of all factors (PB~ Ue+L+NPL+GDP+HD)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.922[a]	.849	.781	2056.101

a. Predictors: (Constant), HD, Ue, GDP, NPL, L

The analysis of variance of all the variables is shown in the table below. The F-statistics (12.411) and the sig-value (0.000) indicate that the regression model is a good prediction model and overall is significant.

Table 9 ANOVA[a] of all factors (PB~ Ue+L+NPL+GDP+HD)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	262347702.897	5	52469540.579	12.411	.000[b]
	Residual	46503074.633	11	4227552.239		
	Total	308850777.529	16			

a. Dependent Variable: PB
b. Predictors: (Constant), HD, Ue, GDP, NPL, L

The coefficient for all the predictors is shown in Table 10. From the coefficient's analysis, the household debt, GDP, and non-performing loans are not significant because their sig-values are greater than 0.05, which are 0.50, 0.132, and 0.07 respectively.

Table 10 Coefficients[a] of all factors (PB~ Ue+L+NPL+GDP+HD)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	99423.325	26894.352		3.697	.004
	Ue	-13333.617	2264.722	-1.446	-5.888	.000
	L	-6276.783	2466.612	-1.171	-2.545	.027
	NPL	1010.985	504.360	.591	2.004	.070
	GDP	-422.789	259.848	-.304	-1.627	.132
	HD	-100.533	144.162	-.226	-.697	.500

a. Dependent Variable: PB

Therefore, the factors (household debt, GDP, and non-performing loan) attribute will be removed one by one from the model to reevaluate the model. The following tables are the analysis for the reevaluate model. There are three models, where the *Model 1 as (PB ~ Ue+ L+ NPL+ GDP)*, *Model 2* as *(PB ~ Ue+ L+ NPL)* and *Model 3* as *(PB ~ Ue+ L)*.

Table 11 Model Summary of 3 Model (excluded HD, GDP, NPL)

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.918[a]	.843	.790	2011.611	.843	16.081	4	12	.000
2	.901[b]	.813	.769	2110.077	-.030	2.304	1	12	.155
3	.882[c]	.777	.746	2215.773	-.035	2.438	1	13	.142

a. Predictors: (Constant), GDP, NPL, Ue, L
b. Predictors: (Constant), NPL, Ue, L

c. Predictors: (Constant), Ue, L

For *Model 1*, the predictors are the unemployment rate, lending rate, non-performing loan, and GDP, where household debt is excluded to rebuild the model. It can be inferred that Malaysia is influenced by these predictors by 79% based on the adjusted R square which is 0.790.

As compared to the previous model, household debt does not contribute to personal bankruptcy in Malaysia since the R-square change is $0.006\ (0.849 - 0.843)$, which is approximate to 0. It means that the household debt contributes 0.006% only as a factor to personal bankruptcy. As a result, household debt can be removed, and the null hypothesis for this variable cannot be rejected, showing enough evidence to conclude that household debt is not related to bankruptcy.

The following table is the analysis of variance for all the variables excluded household debt, GDP, and non-performing loans.

Table 12 ANOVA[a] of 3 Model (excluded HD, GDP, NPL)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	260291807.800	4	65072951.950	16.081	.000[b]
	Residual	48558969.730	12	4046580.811		
	Total	308850777.529	16			
2	Regression	250969247.223	3	83656415.741	18.789	.000[c]
	Residual	57881530.306	13	4452425.408		
	Total	308850777.529	16			
3	Regression	240115675.176	2	120057837.588	24.453	.000[d]
	Residual	68735102.353	14	4909650.168		
	Total	308850777.529	16			

a. Dependent Variable: PB
b. Predictors: (Constant), GDP, NPL, Ue, L
c. Predictors: (Constant), NPL, Ue, L
d. Predictors: (Constant), Ue, L

The table below shows the coefficients for 3 regression models.

Table 13 Coefficients[a] of 3 Model (excluded HD, GDP, NPL)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	83263.422	13354.446		6.235	.000
	Ue	-12755.096	2061.710	-1.384	-6.187	.000
	L	-5050.088	1691.713	-.943	-2.985	.011
	NPL	992.496	492.764	.580	2.014	.067
	GDP	-367.408	242.061	-.264	-1.518	.155
2	(Constant)	72198.802	11737.012		6.151	.000
	Ue	-10635.044	1590.704	-1.154	-6.686	.000
	L	-4451.765	1725.673	-.831	-2.580	.023
	NPL	770.721	493.639	.450	1.561	.142
3	(Constant)	57162.354	7044.799		8.114	.000

Ue	-9080.351	1302.619	-.985	-6.971	.000
L	-2003.884	757.099	-.374	-2.647	.019

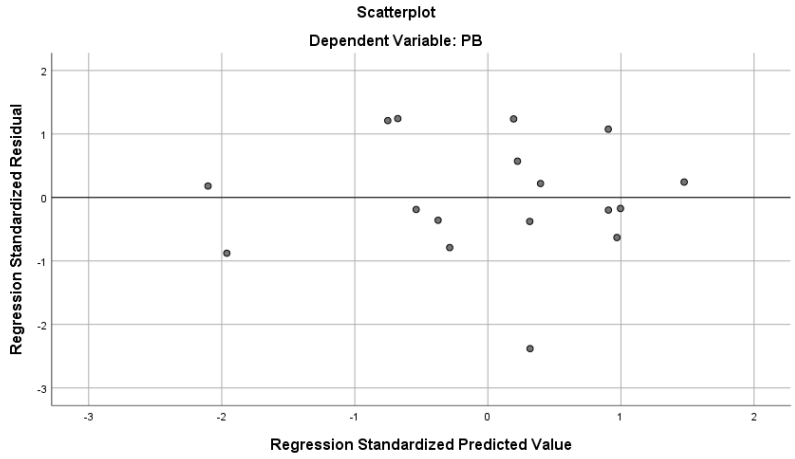
a. Dependent Variable: PB

From Table 13 (coefficients) in *Model 1*, p values for GDP and non-performing loans are 0.155 and 0.067 respectively. This indicates that the variables are not significant. Therefore, GDP and non-performing loans should also be removed from the bankruptcy model in determining the contribution.

By looking at the model summary in Table 11, we can see that GDP contributed approximately 0.03 or 3%, which is close to zero for the R square from *Model 1* to *Model 2*. It indicates that GDP is less and not associated with personal bankruptcy. For the non-performing loan, the contribution of these predictors is 0.035 or 3.5% from *Model 2* to *Model 3*, indicating that the predictor is less or not associated with personal bankruptcy. Thus, it can be argued that GDP and non-performing loans have no connection to personal bankruptcy.

Based on the results in this study, *Model 3* with the predictors (unemployment rate and lending rate) gives the best prediction. Once the best model has been found, examine the assumptions of the multiple linear regression on *Model 3*. Figure 1 shows the scatter plot of standardized predicted value versus residual.

Figure 1 Scatter plot of standardized predicted value versus residual



By referring to the scatter plot, the plot shows that both positive and negative residuals are centered around 0. Therefore, a linear relationship exists between the response variable (personal bankruptcy) and the predictors (unemployment rate and lending rate). Additionally, the scatter plot is more difficult to see as there are fewer data points in this study, but it is still more random than a funnel. This assumption has been met.

The table below shows the Durbin-Watson for *Model 1*.

Table 14 The Model Summary[b] for Durbin-Watson

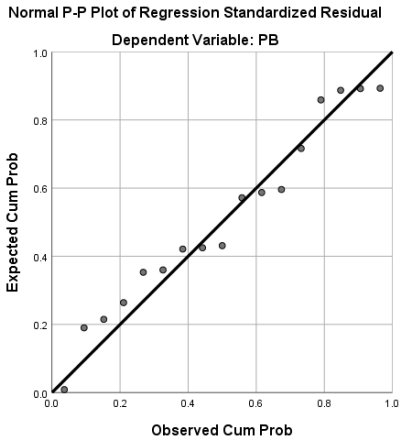
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.882[a]	.777	.746	2215.773	1.845

a. Predictors: (Constant), L, Ue
b. Dependent Variable: PB

As for the Durbin-Watson test, the value obtained is 1.845, which is close to 2. Hence, the assumption that the errors are independent of each other is met.

Figure 2 shows the normal P-P plot of regression standardized residual.

Figure 2 Normal P-P Plot of Regression Standardized Residual



The errors are normally distributed when looking at the normal P-P plot. The graph suggests that the relationship is not exactly deterministic, as the points barely touch the line, but a linear relationship is still evident. Since none of the points on these plots deviates significantly from the linear relationship defined by the residuals, it is reasonable to conclude that none of these datasets contains outliers. Therefore, the errors are normally distributed. As a result, the predictors (unemployment rate and lending rate) give the best prediction.

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Table 15 shows the variance inflation factor for *Model 1*.

Table 15 The Coefficients[a] for Statistics VIF

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	Collinearity Statistics

		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	57162.354	7044.799		8.114	.000		
	Ue	-9080.351	1302.619	-.985	-6.971	.000	.796	1.256
	L	-2003.884	757.099	-.374	-2.647	.019	.796	1.256

a. Dependent Variable: PB

Based on the table above, the VIF for the unemployment rate and lending rate has the same value of 1.256 which is more than 1 and less than 5, this means that the predictors have moderately correlated to personal bankruptcy. Also, this can conclude that each variable has a strength that is correlated with personal bankruptcy.

4 Results and Discussions

In Malaysia, the number of personal bankruptcies keeps increasing has become one of the problems for Malaysia to become a high-income in the future. The goal of this research proposal is to investigate the factors that influence personal bankruptcy cases in Malaysia. The unemployment rate, lending rate, non-performing loans, gross domestic product (GDP), and household debt are all determinants. All data were collected in Malaysia between 2005 and 2021, and numerous analyses were performed following the research objectives.

According to the findings, there is a link between the unemployment rate, lending rates, non-performing loans, GDP, household debt, and personal bankruptcies. Personal bankruptcies have a perfect and strong negative association with the unemployment rate. The second indicator is GDP, which has a moderately positive relationship with personal bankruptcies. Non-performing loans have a weak negative link with personal bankruptcies, but lending rates and household debt have a weak positive correlation. Research objective 1, which is about the factors that contribute to personal bankruptcy, has been addressed by Pearson correlation.

Multiple linear regression (MLR) analysis was used to answer research objective 2, which is about the relationship between personal bankruptcy and factors affecting Malaysia's residents. Personal bankruptcy is not related to household debt. GDP and non-performing loans are both lower and unrelated to personal bankruptcy. Personal bankruptcy has a statistically significant impact on both unemployment and lending rates. We find that there is a linear link between personal bankruptcy and the unemployment rate and lending rate based on the scatter plot of standardized predicted value versus residual. The graph is less structured than a funnel. When the errors are met, the Durbin-Watson test demonstrates that they are independent of one another. When looking at the normal P-P plot, the errors are normally distributed.

Finally, the multicollinearity test was used to determine the strength of factors affecting Malaysia's bankruptcy, which is research objective 3. The findings demonstrate that the unemployment rate and lending rate both have a strength that is associated with personal bankruptcy.

In conclusion, there are five factors that influence personal bankruptcy cases in Malaysia were identified. The factors are unemployment rate, lending rate, non-performing loans, gross domestic product (GDP), and household debt. All the factors have either positive or negative with personal bankruptcies. The findings of this research hopefully can help the policymakers, investors, and consumers to have better understand on the causes that contribute to personal bankruptcy in Malaysia. The responsible parties should be aware of these five factors when investigating about bankruptcies. Suitable approach needs to be taken to increase awareness among Malaysian regarding personal bankruptcies.

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