FACTORS OF PERSONAL BANKRUPTCY: A CASE STUDY OF MALAYSIA

BY

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DECLARATION

We hereby declare that:

(1) This postgraduate research project is the end result of my own and that due acknowledgement has been given in the reference to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of leering.

(3) The word count of this research report is 20,122.

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LIST OF ABBREVIAITONS

GDP	Gross domestic product
MDI	Malaysia Department of Insolvency
DOSM	Department of Statistics Malaysia
BNM	Bank Negara Malaysia
AKPK	Agensi Kaunseling dan Pengurusan Kredit
U.S.	United States
U.K.	United Kingdom
FHA	Federal Housing Association
OLS	Ordinary Least Squares
DF	Dickey Fuller
ADF	Augmented Dickey Fuller Test
PP	Philips-Perron Test
VIF	Variance Inflation Factor
ARCH	Autoregressive Conditional Heteroscedasticity
RESET	Regression Equation Specification Error Test
BLUE	Best, Linear, Unbiased, Estimator
VAR	Vector Autoregressive
VECM	Vector Eror-Correction Model
IR	Impulse Response Function
SIC	Schwarz Info Criterion
AIC	Akaike Information Criterion
ECT	Error Correction Term

PREFACE

This research is submitted in as a fulfillment of the requirement for the pursuit of the Master Degree in Business Administration (Corporate Management). This research is focusing on the determinants of the personal bankruptcy case in Malaysia by using the independent variable of the unemployment rate, lending rate, and divorce case. The increasing trend of the personal bankruptcy case in Malaysia has raised the concern of the policy makers and the researchers as this will essentially become a stumbling block for Malaysia to become a high-income status nation by 2020. Even the past researchers have identifies the factors driven by the high personal bankruptcy case in Malaysia was due to the credit card debt, car loan, and insufficient knowledge in personal financial management. Based on all these identified factors, the policy maker has designed some policy in curbing this problem. However, the personal bankruptcy cases are kept touching record high level in every year. This has raised the question that whether there are other important potential variables being ignored by the researcher and the policy maker. The details of the research findings, policy implication, limitation of this research, and the recommendations for the future researcher will be discussed further in this research paper.

ABSTRACT

Personal bankruptcy is one of the main concerns by the policy maker in nowadays. The reason being is the increasing trend of the personal bankruptcy case in Malaysia will essentially become a stumbling block for Malaysia to become a "high-income status nation" by 2020. In Malaysia, in fact, the factors lead to the personal bankruptcy has been extensively and the policy maker also has introduced some policy in curbing this problem. However, the problem of the personal bankruptcy is still kept increasing from year to year and this has raised the interest to study what is some of the possible relevant factors lead to the personal bankruptcy has been ignored by the researchers and the policy makers. With the hope that the identification of these relevant factors can help the policy maker to come out some new policy which can be more effective to control the personal bankruptcy case in Malaysia. In this research, will study the factors lead to the personal bankruptcy case in Malaysia by incorporating the factors of the unemployment rate, lending rate, and divorce case. The study period starts from 1985 to 2015 with a total 31 observations. In this study i) Ordinary Least Square (OLS) multiple regression models has been employed to study the relationship of the unemployment rate, lending rate, and divorce case towards the personal bankruptcy case. The results show all these independent variables are significant. ii) Johansen cointegration test has been tested to investigate the existence of the long-run or short-run relationship in the model. Subsequently, VEC model is being employed to examine how the model coincided to the long-run relationships while also enabling the short-run adjustment dynamics. Lastly, the Granger causality has been tested to identify the causal relationship between the variables.

CHAPTER1: RESEARCH OVERVIEW

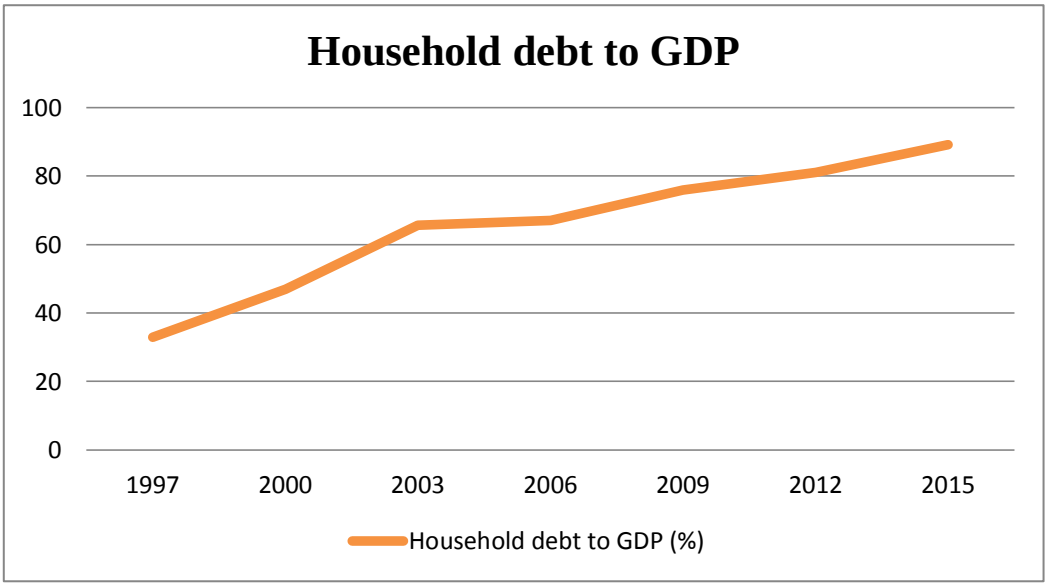
1.1 Introduction

The personal bankruptcy case in Malaysia are kept increasing ever since the 1980s until the mid of 2010s. This study is designed to study the factors to influence the personal bankruptcy case in Malaysia. The details about the idea to generate this research will be discussed further in this chapter. Hence, the research objectives and questions about the factors lead to the personal bankruptcy have been generated. This research will develop the hypothesis of study i) To identify the relationship between the personal bankruptcy case and the unemployment rate, lending rate, and divorce case in Malaysia. ii) To identify the existence of a cointegration relationship in the model. iii) To identify the causal relationship among the variables. Lastly, the significance of study will be included in this chapter.

1.2 Research Background

Malaysia, one of the fastest growing economies in Asian countries which aim to become a "high-income status" nation by 2020 has to deal with one of the primary obstacles to achieving this vision, which is the climbing of the personal bankruptcy rate. According to Cheng, Wei, Rajagopalan and Hamid (2014), Malaysia has the highest personal debt among 14 Asian economies. As shown in Figure 1.1, the household debt to GDP in Malaysia has jumping to 89 percent of gross domestic product (GDP) in 2015 from around 33 percent in 1997. Therewith, the climbing record high to 89 percent of GDP in 2015 has surpassed Thailand which boasted the highest household debt in Southeast Asia.

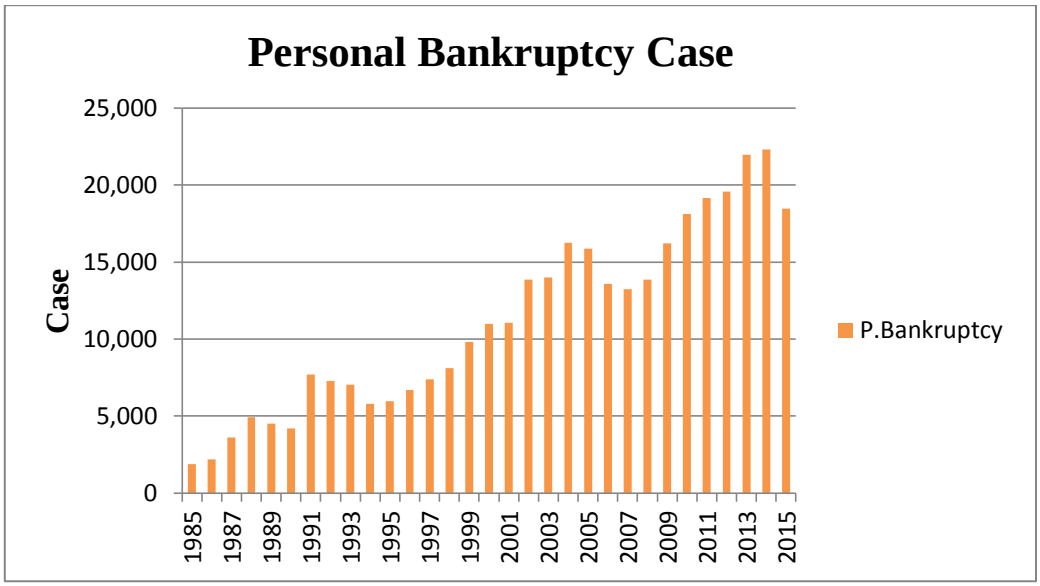
Figure 1.1: Household debt to GDP in Malaysia



Source: Bank Negara Malaysia (BNM, 2015)

Based on the information provided by Malaysia Department of Insolvency (MDI), the bankruptcy petition can be applied either by the debtors or the creditors as long as the outstanding debt amount is more than RM 30,000.

Figure 1.2: Personal Bankruptcy in Malaysia



Source: Department of Statistics Malaysia (DOSM, 2015)

Based on Figure 1.2 displays the evolution of the personal bankruptcy case in Malaysia from the year 1985 and 2015. In general, the personal bankruptcy has an upward trend from the 1980s to 2010s. There is a notable increase in a number of personal bankruptcies in the Post-Asian Financial Crisis of 1997 and the Post-Global Financial crisis of 2007-2008. Specifically, the bankruptcy cases have climbed by 114% from the year 1993 and 2005. Meanwhile, the personal bankruptcy cases have climbed by 68% from the year 2007 and 2014. An explanation given by Sutthirak and Gonjanar (2012) to explain the post-financial crisis effect is the individual was stuck in their liquidity problem due to a huge loss on their capital investment.

According to a research done by MDI, in 2007 there were around 0.049% of a population of 26.8 million declared bankruptcies. Specifically which is around 37 Malaysian going bankruptcies in every single day. Surprisingly, this figure was kept climbing until 2014, where there were around 0.075% of a population of 29.9 million declared bankruptcies. Specifically, which is around 62 Malaysian declaring bankruptcies in every single day. In other words, the personal bankruptcy reported in every single day has been increased by 68% in the past 7 years and yet this figure is still climbing until today (Carvalho and Hamdan, 2015).

With the increasing number of bankruptcy cases reported from year to year it is noticed that the young in nowadays are tend to over borrowing which has beyond their ability to handle the debts level. Based on the findings of D'Alessio and Iezzi (2013), the composition of the heavy household debt burdens is mainly contributed by housing loans, car loans, and others. Currently, the bad debts in local banks are still low, yet it is notable an increasing trend to declare bankruptcy for those under age of 35. To the extent that financial difficulties of an individual would reduce personal consumption. Besides that, another problem for Malaysia's economy on top of low commodity prices, a battered currency and a political crisis (Carvalho and Hamdan, 2015).

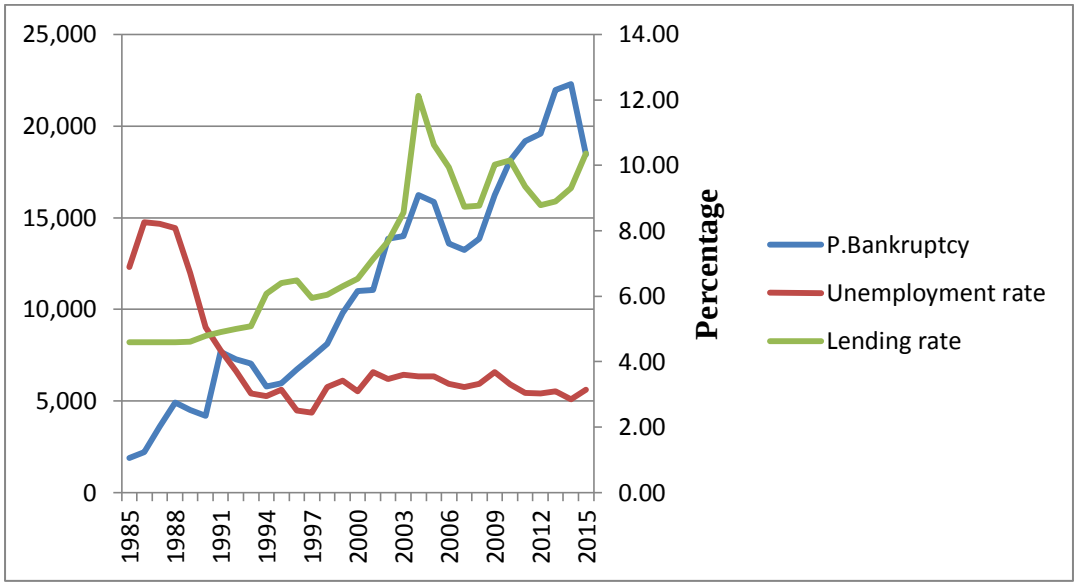
Furthermore, the economics of Malaysia is mainly supported by domestic (private) consumption, as the growth of private consumption has been slowing, and if that continues, Malaysia's growth rates could be hit. In fact, in Malaysia, the speed of debt accumulation by the households is much faster than the speed of their incomes growth. As a result, this will increase the likelihood of repayment difficulties when the credit cycle turns. The default on debt repayments had brought negative impact on the banking industry. It was considered as non-performing loan and a cost to the banks. Banks put the bankruptcy cost in their income statement as provision for loan losses (Chow, 2015).

1.3 Problem Statement

The increasing trend in the personal bankruptcy is always the major concern of the policy maker (Thomas and Michael, 2002). In Malaysia, the research about the factors lead to the personal bankruptcy has been extensively studied where the factors were mainly contributed by the non-performing loan from car loans, personal loans, credit card debt, and insufficient knowledge in personal financial management (Cheng et al., 2014; Selvanathan, Krusnan, and Wong, 2016; and Zamzamir, Jaini, and Zaib, 2013). Based on the identified factors, the policy maker has come out some measures to control the personal bankruptcies problem. For instance, there are two agencies being set up by the Bank Negara Malaysia (BNM) which are the Malaysia Department of Insolvency (MDI) and Agensi Kaunseling dan Pengurusan Kredit (AKPK). The mission of MDI is to facilitate and control the bankruptcy problem while the AKPK is acting like a financial consultant in providing financial information and debt rescheduling plan for those facing financial problems. Meanwhile, BNM has required all commercial banks to tighten their rules in borrowing loans and issuing credit cards ("New Measures on," 2006 and "Malaysia tightens household," 2013).

However, the increasing number of bankruptcies cases from the year 2007 and 2014 showing that the agencies are not effective in curbing the problem. This has come to the question that whether there is other major factors that may lead to the increasing trend in the personal bankruptcy. According to a research done by Garrett (2007) revealed that the rapidly increase in the number of consumer bankruptcy in the United States (US) was generally caused by debt overload and the impact of unexpected negative shocks such as divorce, unemployment, and medical expenses. Besides that, a research done by Jappelli, Pagano and Maggio (2008) by incorporating macroeconomic variables to study the relationship with personal insolvency. The authors conclude that the climbing of interest rate and the unemployment rate has resulted in climbing of personal insolvency.

Figure 1.3: A comparison of the unemployment rate and the lending rate with the personal bankruptcy



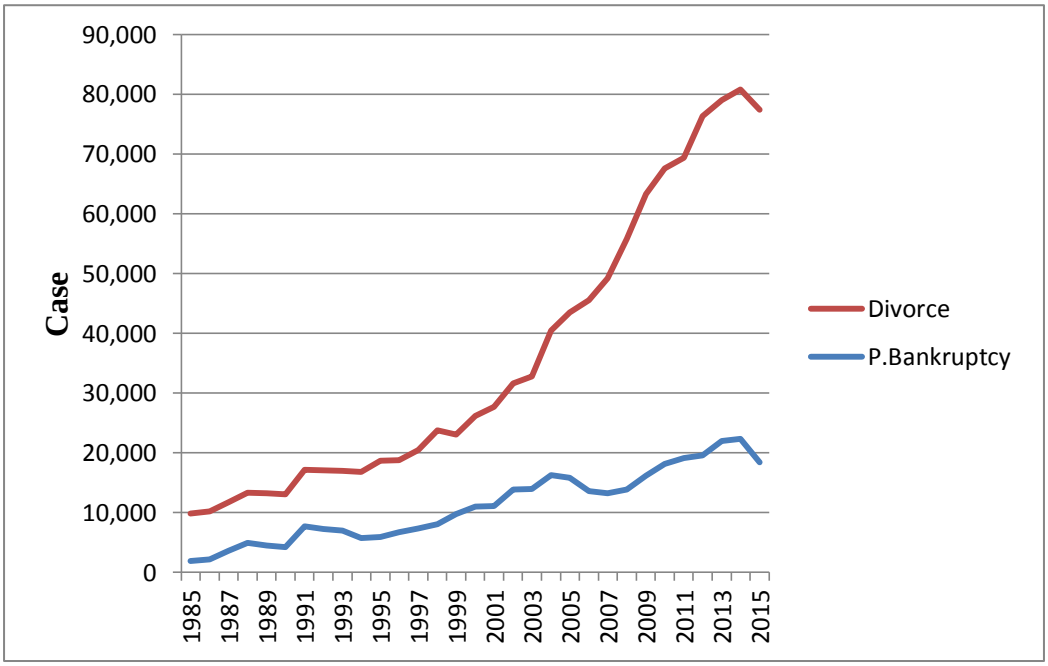
Source: Department of Statistics Malaysia (DOSM, 2015)

Based on the research findings of Garrett (2007) and Jappelli et al. (2008) have created an interest to investigate whether the unemployment rate, the lending rate, and divorce case are the factors to influence the climbing of the personal bankruptcy case in Malaysia. Figure 1.3 displays the trends between the unemployment rate, lending rate, and the personal bankruptcy case in Malaysia from the year 1985 and 2015. Based on the graphical approach shows there is a

negative relationship between the unemployment rate and the personal bankruptcy case. From the theoretical point of view, unemployment and the personal bankruptcy should be positively correlated. However, a possible reason can explain why the unemployment rate was dropping significantly in the mid-1980s was due to the rapid economy growth in that period. The rapid economic growth in Malaysia has demanded a lot of workers until the labour are being shortage in the market. This explains why the unemployment rate fell from about 8 percent in 1987 to 5 percent in 1990 (Felker and Jomo, 2013).

The lending rate, on the other hand, shows an upward trend from the year 1985 and 2015 and it has a positive relationship with the personal bankruptcy case. The lending rate was started to increase from about 4.5 percent in 1985 and reached about 12 percent in the mid-2000s. The reason for the steady climbing of the lending rate was due to the steady climbing of the market interest rate in order to stabilize the inflation rate in Malaysia during the rapid economic growth since the mid-1980s (Felker and Jomo, 2013). When there is a change in the lending rate will directly affect the cost of servicing the debt. Likewise, an increasing lending rate means an increasing cost of debt and therefore, a higher the personal bankruptcy case. Besides from the macroeconomic variables (unemployment rate and lending rate) has been discussed earlier, the divorce rate is suspected to be another important factor would influence the individual insolvency. In fact, the divorce rate in Malaysia has become one of the serious concerns as the divorce cases reported is keep climbing from year after year as shown in Figure 1.4.

Figure 1.4: Comparison of personal bankruptcy and divorce in Malaysia



Source: Department of Statistics Malaysia (DOSM, 2015)

Figure 1.4 displays the trends between the personal bankruptcy case and divorce case in Malaysia from the year 1985 and 2015. Based on the graphical approach shows there is a positive relationship between the personal bankruptcy case and divorce case. This has created a question whether the increasing of divorce case is one of the important factors resulted the increasing of the personal bankruptcy case in Malaysia. Based on a research revealed there were 56,760 divorces were recorded in 2012, which equivalent to a marriage is breaking down every 10 minutes. Divorce could bring more financial distress to one of the parties. This includes the cost of keeping up the 2 separate household such as alimony and child payment support (Boon, 2014). Up to date, as to author knowledge in Malaysia, there is no researcher incorporating the variables of the unemployment rate, lending rate, and divorce case into consideration to study the relationship with the personal bankruptcy. This has raised an interesting issue to study whether all these variables are an important factor leading to high personal bankruptcies in Malaysia.

1.4 Research Objective

In this research, general objective and specific objectives are stated in order to identify the goals for this research project.

1.4.1 General Objective

To investigate the factors of the personal bankruptcy case in Malaysia.

1.4.2 Specific Objectives

a) To identify the relationship between the personal bankruptcy case and its independent variables which are the unemployment rate, lending rate, and divorce case.
b) To identify the existence of a cointegration relationship in the model.
c) To identify the causal relationship among the variables.

1.5 Research Questions

a) What is the relationship between the personal bankruptcy case and its independent variables which are the unemployment rate, lending rate, and divorce case?
b) Is there any cointegration relationship in the model?
c) What is the causality pattern among all the variables?

1.6 Hypothesis of the Study

1.6.1.1 Unemployment Rate

H_{0a}: Unemployment rate does not have a significant relationship with the personal bankruptcy case.

H_{1a}: Unemployment rate have a significant relationship with the personal bankruptcy case.

Based on Warren (2003) proposed that the reasons of the climbing in the personal bankruptcy case of a country is due to the adverse events in the labour market. For instance, a job loss and salary reduction during a bad economic condition. This is because when there is a steady income is being earned, individuals would able to make their monthly debt repayment easily and on time. This could signify the use of credit cards or personal loans is not a necessity. However, during unemployment, income will stop, families are forced to quickly spend down their accrued saving balances on everyday living expenses. When savings are depleted, getting loans to fund their life has become a necessity to support the current living expenses. This can result in serious financial issues for those who do not have an income to make their debt repayment. The unemployment then leads to outstanding personal loan debts that end up in default, perpetuating financial concerns even further.

1.6.1.2 Lending Rate

H_{0b}: Lending rate does not have a significant relationship with the personal bankruptcy case.

H_{1b}: Lending rate have a significant relationship with the personal bankruptcy case.

Based on Jappelli et al. (2008) proposed that the increase in interest rate is always associated with a higher personal bankruptcy rate. In a situation where consumers are having high debt level due to the financial crisis or economic recession followed by sharp rising interest rate adjustment will lead to more consumers to declare bankruptcy. This is because the rising interest rate will further increase the burden on them to make debt repayment and as a consequence higher bankruptcy reported. Therefore, this study proposes that there is a significant relationship between the personal bankruptcy and the lending rate.

1.6.1.3 Divorce case

H_{0c}: Divorce case does not have a significant relationship with the personal bankruptcy case.

H_{1c}: Divorce case have a significant relationship with the personal bankruptcy case.

Based on Poortman (2000), divorce can create financial distress on both partners in a number of ways. Firstly, the primary cost after divorce, for example, child support payments, education fees, and

alimony. All these costs can easily drive up the financial burden to one of the parties. As results, this study proposes that there is a significant relationship between the personal bankruptcy case and divorce case.

1.6.2 Long-run versus short-run relationship

H_0: There is no cointegration relationship in the model.

H_2: There is a cointegration relationship in the model.

Johansen Cointegration test will be used in order to identify existence of a cointegration relationship in the model. If the model does not have a cointegration relationship then this study will employ a short-run model (Vector autoregressive) model. Conversely, if there is a cointegration relationship in the model, a long-run model (Vector Error Correction) will be employed in this study (Gujarati and Porter, 2009).

1.6.3 Causal relationship

H_0: X_t does not Granger cause Y_t.

H_{3a}: X_t does Granger cause Y_t.

H_0: Y_t does not Granger cause X_t.

H_{3b}: Y_t does Granger cause X_t.

The lag length involved, distributed, and autoregressive models has raise the issue of causality in the economic variables. This is because the finding in the OLS only can tell the existence of the relationship between the variables where it does not prove any causality or the direction of influence towards the dependent variable. This is where the Granger causality test comes in to fill up this gap. For instance, a variable X_t is said to Granger cause Y_t, if Y_t can be predicted with greater accuracy by using past values of the X_t variable rather not using such past values. Ceteris paribus assumption (Gujarati and Porter, 2009).

1.7 Significance of the Study

Conceptually, when an individual is facing insolvency and turned out to declared bankruptcy, in fact, this can benefit the economy of a country. The logic behind is that, during the bankruptcy process, an individual can rebuild his/her credit record if the outstanding debts of the debtors are discharged without any future obligation. With this, can encourage an individual in spending and borrowing which is good for the economy. Nevertheless, if they are increasing number of people filing for bankruptcy at the same time can adversely affect the economy (Dobbie and Song, 2013). Thus, in this research will focusing on the factors that affect the personal bankruptcy is mainly contributed to the policy makers, investors, and consumers.

After the difficult periods of the Asian Financial Crisis in the 1997 and the global financial crisis in the 2009, the policy makers has introduced a number of rules and regulations to enhance the local banking structure as well as the financial market (Barth, Caprio, and Levine, 2013). By having a better understanding of the

factors that lead to personal bankruptcy may help the policy makers to develop a better policy to curb the increasing number of personal bankruptcy case. For instance, if the lending rate is one of the significant variables to influence personal insolvency, subsequently, the policy maker may control the lending rate of the banking and financial institutions to ensure it is at the optimum level which will not significantly increase the debt burden of the consumer. Similarly, the policy to stabilize the unemployment rate and divorce case is another concern by the policy maker which can allow to stabilize the personal bankruptcy of a country.

Besides that, this research tends to provide useful information for the investor to make their investment decision making. According to Buehler, Kaiser, and Jaeger (2012), a high personal bankruptcy rate of a country may always indicate a country is facing a poor economic condition. Thus, based on the personal bankruptcy rate of a country can actually signify to the investors about the actual economic performance of a country before they invest in the country. Moreover, for those bankruptcies personal might face difficulty in applying for new credit and even looking for new jobs. Thus, if consumers have the personal financial management knowledge can actually have a wise financial plan which can effectively in preventing them from filing bankruptcy. Additionally, the financial knowledge can allow the consumer to understand which type of lending rate (fixed and floating) is actually suited for them when they are about to borrow loans from the banking and financial institutions. With this can actually reduce the chances of an individual to file for bankruptcy.

1.8 Chapter Layout

This research project contains five chapters and they will be presented as follow:

Chapter 1: In Chapter 1, will provide an overall concept of the research project. It contains research background, problem statement, research objectives (general and specific), research questions, hypotheses as well as significant of the study.

Chapter 2: In Chapter 2, this chapter will discuss about the literature review on personal bankruptcy form the previous researchers. It covers the empirical testing procedures and proposed theoretical framework.

Chapter 3: In Chapter 3, this chapter determines the research methodology that used to carry out the research. It shows the ways to conduct the research which include data collection methods and data analysis.

Chapter 4: In Chapter 4, this chapter will interpret the research findings corresponding to the research questions and hypotheses are discussed in detail. This study interprets and analyses the data collected from the Department of Statistics Malaysia (DOSM).

Chapter 5: In Chapter 5, this chapter provides an overall conclusion based on the research project, including the summary of statistical analyses, discussion of major findings, implications and limitations of study as well as recommendations for future research.

1.9 Conclusion

In conclusion, in Chapter 1 will briefly explain the general concept of the study towards the personal bankruptcy in Malaysia. Firstly, this study is designed to investigate the significant relationship between the independent variables (unemployment rate, lending rate, and divorce case) and the dependent variable (personal bankruptcy case). This research aims to investigate whether these independent variables would have a positive or negative relationship with personal bankruptcy case. The previous researchers found that there are several factors will lead to personal bankruptcy by conducting primary data research. However, this study chooses this few independent variables to conduct the research as they have proved a stronger relationship with personal bankruptcy. Secondly, the existence of a cointegration relationship in the model will be examined followed by the examination of the causal relationship among the variables. The evidence and justification will be discussed in the following chapter.

CHAPTER 2:LITERATURE REVIEW

2.1 Introduction

In this chapter, a brief review of the factors (unemployment rate, lending rate, and divorce case) leading to the personal bankruptcy case from different researchers have been extensively studies. The research objective is to identify the factors of the personal bankruptcy in Malaysia. Additionally, the technique, equations, and models used by different researchers will be discussed in this chapter.

2.2 Review of Literature

2.2.1 Personal bankruptcy case

Personal bankruptcy is a type of debt solution for those people who is no longer has the ability to pay back their debts in a reasonable time. Basically, the personal bankruptcy can be divided into voluntary and involuntary. Voluntary bankruptcy also known as "petitioning for bankruptcy" is where an individual knowing he/she no longer has the ability to pay his/her debts and therefore, file for bankruptcy. Involuntary bankruptcy, on the other hand, is where the creditors taking a legal bankruptcy proceedings to sue an individual for bankruptcy (Irby, 2017). In Malaysia, any individual who is unable to pay a minimum debt amount of RM 30,000 will be suing by the creditor to file for bankruptcy.

2.2.2 Unemployment rate

The unemployment rate is one of the common macroeconomic variables where the researchers, for instance, Deng, Quigley, and Van Order (2000); also prefer to incorporate to study the relationship with personal bankruptcy. This is due to the fact that from the theoretical point of view unemployment should be statistically significant and positively influence the personal bankruptcy filing. This is because when an individual has loss of job, he/she can no longer meet its obligation to service their debts such as student loan, car loan, and houses loans. As a result, he/she has to file for bankruptcy and financial restructuring.

According to Hendershott and Schultz (1993); Deng, Quigley, and Van Order (2000) in the studies of bankruptcy decision by incorporating the macroeconomic factors, such as the unemployment rate. The findings have consistent results to shows that unemployment is significant and positively to influence the personal bankruptcy filing in their study. For instance, Hendershott and Schultz (1993) study the foreclosures on the federal housing association (FHA) single family mortgages insured from the year 1975 and 1987. They found that the unemployment rate and the book value of borrower equity are statistically significant to influence an individual insolvency. In their study mentioned that unemployment has forced the borrowers no longer has the ability to service its home loan obligation. In this case, they are actually forced to sell the house and move to another place. However, the moving decision actually increases the likelihood of default due to the fact that the moving cost is actually unable to deter from default. Furthermore, the decision to sell the house urgently can reduce the effective equity in the house.

Nevertheless, the studies of Fay, Hurst, and White (2002) have failed to show unemployment is a significant variable in the studies. Thus, the Congressional Budget Office has pointed out that the empirical studies do

not have a consistent result to prove that the macroeconomic variables (unemployment) are significant to affect the filing rate. However, by using the surveys of bankruptcy filers do have a consistent result to show that unemployment is a significant factor in the decision of personal bankruptcy.

According to a survey done by Sullivan, Warren, and Westbrook (2000) in analysing a survey study of 1,991 bankruptcy filings have found that the unexpected adverse events (such as unemployment, divorce, health problems, and medical debts) are the major causes lead to the climbing in bankruptcy filings in the United States. The findings from the survey show that there is 67.6 percent of the filers claim that loss of the job is the main reason for them to declare bankruptcy where these adverse events have eventually creates an income shock. The loss of income or high expenses would influence the debt repayment ability and thus, forcing them to declare bankruptcy. Similarly, this statement is also supported by Hetes-Gavra, Avram and Avram (2016) where they study among a sample size of 2,000 bankruptcy filers in Europe also found that there is 20 percent of the filers claims that there were filing for bankruptcy due to loss of job.

Meanwhile, other researchers have studies on the determinants of the personal bankruptcy by using time series data. Grieb, Hegji, and Jones (2001) study the macroeconomic factors and consumer behavior on the personal bankruptcy via credit card defaults in a sample period from the year 1981 and 1999. The finding show that the unemployment leads to the climbing of credit card default rates due to the card user is relying on the credit card to maintain the autonomous spending. As a result, the credit card default has become a trigger point for the card user to file for bankruptcy in the United States.

Agarwal, Liu and Mielnicki (2003) study the effect of unemployment on consumer bankruptcy by using the credit card data from the year 1995 and 2001 on 700,000 customers. The findings show that country unemployment is critical in determining the consumer bankruptcy. The study of Dick and Lehnert (2010) study the U.S. credit supply and rising bankruptcy rate in the U.S. covering the sample period from the year 1981 and 1999. The findings show that the unemployment rate is statistically and positively significant to affect personal bankruptcy. Specifically, a 1 standard deviation increase in the unemployment rate will increase the personal bankruptcy by 27 percent.

On the other hand, Gross and Souleles (2002) using the bank account level quarterly data from the year 1995 and 1997 to conduct an empirical study of the demand for unsecured credit and its impact on consumer bankruptcy. They adopt a duration model to estimate the importance of the different variables in predicting the default. Specifically, they estimate the risk effects on default, age, macroeconomic shock and changes in the costs of default. They draw a conclusion that risk effects, macroeconomic shock, and cost of default are statistically significant to influence the consumer default. Nonetheless, the macroeconomic variable (state unemployment) is failed to show significant impact on consumer bankruptcy. The authors explain that the unemployment is insignificant in their study could be due to their sample period does not have enough variation in unemployment.

Since, most of the researchers also found that the unemployment is a statistically and positively variable to influence the personal bankruptcy in their studies. Thus, in this research, it is expected the unemployment variable is statistically and positively to influence the personal bankruptcy case.

2.2.3 Lending rate

Nominal interest rate is part of the monetary policy where the central bank will revise the nominal interest rate on a quarterly basis. This would forms a reference rate to adjust the lending rate by all the banking and financial institutions. In other words, depending on the economic performance of a country, the central bank can adjust the nominal interest rate of a country to achieve a certain economic objective (Blanchard and Johnson, 2013). For instance, the interest rate will be adjusted downward to boost the economic growth via a lower real interest rate. A lower interest rate which means a lower lending rate which could make borrowing more attractive due to cheaper cost to serve the debts. Besides that, a lower interest rate means lower return from the savings in the bank which could reduce the incentive of saving yet increase the incentive of borrowing. This in turns will increase the money supply in the market to achieve the economic driven objective as well as to drives up the inflation (Blanchard and Johnson, 2013).

However, bear in mind that as the economy becomes over heated, a higher inflation rate will then followed by an increase of market interest rate. This might increase the burden of creditors who are holding a high level of floating loan debts. In this case, a higher cost of debt will increase the number of people to file for bankruptcy since they have no way to service the debt. This statement is supported by the study of Igor, MacGee, and Tertilt (2010). The authors study the personal bankruptcy in the United States from the year 1970 and 2004 by employing a heterogeneous agent life-cycle model to evaluate how the changes in uncertainty (income shocks, expense uncertainty) and credit market environment (lending rate, transaction cost, and credit rating) can affect the bankruptcy filing decision. The finding shows that the changes in uncertainty cannot account quantitatively for the rise in bankruptcies.

However, the changes in credit market environment are the main force driving the rise in filings for bankruptcy.

Meanwhile, this statement is also supported by Jappelli et al. (2008). The authors study the effect of macroeconomic variables (interest rate, lending to households, cyclical indicators, and institutional variables) on personal bankruptcy in 11 European countries by using Vector autoregressive (VA) model. The result shows that the increasing interest rate and the unemployment rate will lead to higher personal insolvency rate. Additionally, during economic shocks or sharply rising in interest rate also would significantly drive up the personal debt level. Moreover, other researchers also show that the lending rate has a significant relationship with consumer debt. When the lending rate increases, the cost of credit card debt payment, hire-purchase loan, and personal loan also will increase. This will become a significant financial burden for the borrowers.

Conversely, when the lending rate decreases, which means consumers are easier to settle their monthly debt obligations. This scenario was proven by the research conducted by Katz (1999) in the United States. The author studies the effect of the lending rate and consumer debt towards insolvency. The finding shows that the number of personal bankruptcy cases filling in 1993 and 1994 was declined followed by the dropping of lending rate. In contrast, the number of bankruptcy cases filling was increased in the late 1994 and 1995 due to the sharply increases of lending rate. Meanwhile, Durkin and Staten (2012) also have the same finding where the increasing nominal interest rate has resulted in climbing of bankruptcy case being reported.

However, based on the research done by White (2010) has a contrary point of view. The author studies the relationship between the macroeconomic factors and the personal insolvency case of United

Kingdom (UK) from the year 1975 and 2008. The finding shows that the climbing of insolvency rate in the early 1990s was associated with an increase in the unemployment rate. Nevertheless, the accumulation in household credit and insolvencies was associated with falling interest rates. The result shows that the real lending rate declined from 4.3% in 1997 to 1.8% in 2005. The low cost of borrowing in this period has lead to increasing number of borrowers borrowing the loan and therefore, increasing number of insolvency cases being reported from year to year. This statement is also supported by Zywicki (2005) and Dell'Ariccia, Igan, and Laeven, (2008) where they also find similar findings where the decreasing in nominal interest rate is one of the factors resulted in higher insolvency rate.

In conclusion, a majority of the researchers also found that the lending rate is statistically significant and positively to influence the personal bankruptcy case in their studies. However, a minority of the researchers found that the lending rate is statistically significant yet it will negatively to influence the personal bankruptcy. Thus, it is expected the lending rate variable also will be statistically significant in these research yet the relationship (positive or negative) towards the personal bankruptcy case is yet to explore in this research since a different researchers has a different findings in their research.

2.2.4 Divorce case

The climbing divorce case is becoming one of the primary concerns by the policy makers and researchers as the climbing divorce case has a notable effect on the climbing in the personal bankruptcy case of a country. The reason being for divorce can be related to personal insolvency is due to the fact that divorce does entail financial costs. After divorce, regardless is a man or a woman also would results in a

substantial decline in household income which would increase the likelihood of living on social welfare or falling into poverty (Jarvis and Jenkins, 1999; Duncan and Hoffman, 1985; Burkhauser and Duncan, 1989; Holden and Smock, 1991; Smock, 1994; Poortman, 2000).

According to Francis (2005), an economic report to investigate the impact of household income after a divorce of the United States has been studied. The report shows that the household income has fallen by 40% to 45% for children whose parents divorce and remain divorced for at least 6 years. Whereby, the food consumption for a divorced family also has reduced by 17% as compared to a non-divorce family. An explanation given by a divorced family is due to the absence of a second parent in a variety of ways that help mitigate some of the financial cost. Meanwhile, Edmiston (2006) study in analyzing the new perspective of bankruptcy filing rates in the United States from the year 1970 and 2000. The finding shows that divorce always causes a huge, immediate, and unexpected household income reduction which in turns drive up the chances of a bankruptcy filing in the United States. The findings further revealed that this is particularly true for women after divorce. The result predicts that the economic status for a divorce woman would drop by 30 percent after 1 year of divorce. The author further highlighted that when the divorce increases by 1 percentage point among the population, these would bring an additional 7.8 people to declare bankruptcy per 1,000 individual per year. Therefore, the author concluded that the share of population divorce in the United States is estimated to affect the bankruptcy rate.

Additionally, Hoffman and Duncan (1985); Aassve, Betti, Mazzuco, and Mencarini (2007) claimes that a substantial number of men wills experiences economic problems after divorce due to the costs of acquiring and equipping separate house, child support payments, and alimony. Researchers also found that the impact on men's income after a divorce has been found to be modest and more often positive than negative. This

can be explained by a male is stronger in labour market attachment and the tendency for children to stay with their mothers after divorce. Meanwhile, based on a research done by Fay, Hurst, and White (2002) found that an individual would have higher chances to declare bankruptcy in the following year after a divorce. Based on the statistical result shows there would be 86 percent increases in personal bankruptcy in the following year after a divorce. Divorce would reduce the socioeconomic status and might lead to personal bankruptcy.

Moreover, the authors added that the divorce lawyers will tend to promote cross-market products by persuading their customer to declare bankrupt before a divorce. Lawyers will keep discussing with their customer about the benefits of bankruptcy before divorce such as the court filing fee, a joint bankruptcy petition will only need to pay one attorney fee and these savings can be significant. All debts regardless in jointly or individually debt also will be discharged in the bankruptcy. This will be no lingering joint debt that the non-filing spouse will be responsible for. As a result, declare bankruptcy before a divorce can make the entire divorce settlement process becomes much cleaner and easier with no debt obligations to distribute. This can explain that why divorce and bankruptcies are positively correlated.

Additionally, the findings of Domowitz and Sartain (1999) also stated that an individual would have 200 percent higher chances to declare bankruptcy as compared a married individual. In addition, there is much-related research such as Zagorsky (2005); Del Boca and Rocia (2001); Lyons (2003); Edmiston (2006); Fisher and Lyonse (2005) also have consistent findings to shows that divorce is statistically and positively to influences towards the personal bankruptcy. Therefore, in this study it is expected the divorce variable is statistically and positively to influence the personal bankruptcy case.

2.3 Theoretical Model

2.3.1 Personal bankruptcy case

Bankruptcy growth model

Yeager (1974) has developed a bankruptcy growth model where the model development is based on the recognition of insolvency is a prerequisite to bankruptcy. This means that, in any given time period, the number of consumers who declare bankruptcy proceedings may never exceed the number of insolvent consumers in *t*. Therefore, it can say develop that:

$$B_t \leq I_t$$

Where:

B_t = The number of consumer units who declare bankruptcy in year *t*.

I_t = The number of insolvent consumer units in year t.

However, it can also be assumed that some consumers who are insolvent may not choose bankruptcy. Thus:

$$B_t = q_t I_t, \text{ and } q \leq 1$$

Where:

B_t = The number of consumer units who declare bankruptcy in year *t*.

I_t = The number of insolvent consumer units in year *t*.

q_t = proportion of insolvent consumer units choosing bankruptcy in year *t*.

It is immediately seen that the number of new consumer bankruptcies commenced may not change in the year subsequent to *t* unless a change occurs in *I* (the number of insolvent consumers), or in *q* (the proportion of insolvent consumers who choose bankruptcy).

2.3.2 The unemployment rate

Economic theory of poverty

In the different school of economic thought have a range of views on poverty. Since the 19th-century, the classical and neoclassical definition, through the Keynesian shift, which brought poverty to the forefront of the policy agenda, to the most recent theories. Firstly, the classical views of poverty assume a person is poor which is largely due to its own personality traits. This trait, for example, is laziness, and low educational levels which have to turn a person to fail. Secondly, from the neoclassical point of view, poverty is recognizing as beyond an individuals' control. For instance, lack of social as well as private assets, market failures that exclude the poor from credit markets, and cause certain adverse choices to be rational. The criticism of these two approaches does not take the linkage with the community into account (Agola and Awange, 2014).

Finally, the Keynesian theory of poverty developed by Keynes in 1936 proposed that a major cause of poverty is due to unemployment which is unlike from the classical approaches. The unemployment is viewed as involuntarily which government intervention is needed in order to combat this poverty issue in the developing country (Lerner, 1936). As mentioned in the study of Odekon (2015), poverty causes bankruptcy. The author explains that an individual becomes poverty after involuntarily unemployed. In this case, an individual has to borrow and go into debt. They also become more vulnerable to a sudden economic downturn and do

not easily absorb economic shocks. As a result, they cannot pay their debts and be forced to declare bankruptcy.

2.3.3 Lending rate

Liquidity preference theory

Liquidity preference theory was first created by Keynes in 1936 in his book The General Theory of Employment, Interest and Money. Basically, this theory explains the determination of the interest rate by the supply and demand for money. In accordance with this theory, keeping money in cash is much preferred due to its liquidity. In order to persuade an investor to invest in the financial tools such as fixed deposit investment with the bank, the rate of return must be sufficient enough to compensate for the foregone benefits of holding liquidity on hand. Similarly, the longer the maturity, the higher the rate of return will be requested by the investor due to a higher uncertainty in the long term.

However, the interest rate is adjustable by the central bank in order to achieve a certain economic objective. When the interest rate adjusted downwards, it will make the saving/fixed deposit investment with the bank become less attractive. This will rather increase the incentive to hold cash for consumption or investment in other financial tools. Similarly, a lower interest rate means a lower cost of borrowing, this can encourage more borrowing for investment and consumption as well. The ultimate objective of lower interest rate is to increase the money supply in the market, therefore, driven economic growth. However, as mentioned by White (2010), personal debt was started to pile up during the low-interest rate environment. In this favourable environment has made the loan to become very attractive until the borrowing has exceeded the capability to service

the debts. As a result, a high indebtedness has driven the number of people to file for bankruptcy.

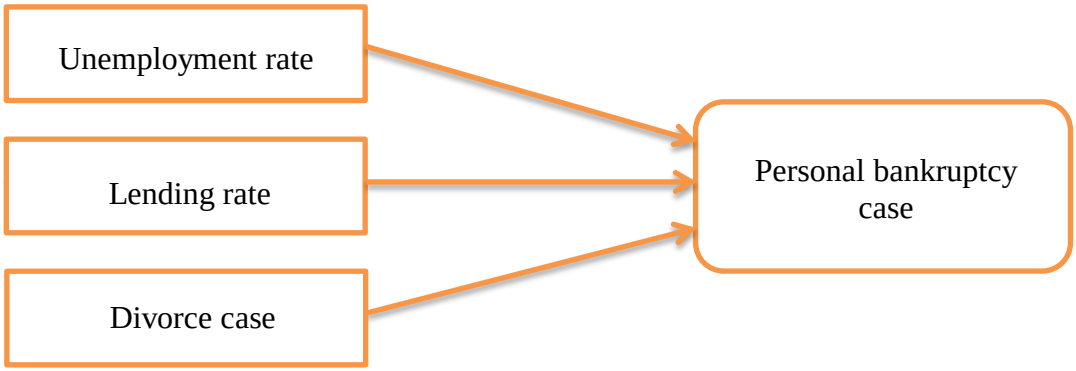
2.3.4 Divorce case

Economic theory of divorce

According to Carroll (1997) and Cocco (2005), from the traditional economic theory views divorce as a shock which would drive up the individual background risk. This background risk would raise the uncertainty about future income. As mentioned in the study of Schmidt and Sevak (2006), when two spouses have decided to divorce, the initial economic of scale (income sharing) associated with marriage are lost. Furthermore, the uncertainty about the future and the possibility of a second marriage are likely to affect the individual's financial risk taking and wealth accumulation. In addition, authors further mentioned that a divorce is costly due to the expensive lawyer payment and liquidation of real estate assets, which may then alter the composition of wealth. As mentioned in the study of Edmiston (2006), a divorce shock has lead to income reduction which has eventually driven the number of the bankruptcy filing of a country.

2.4 Proposed Theoretical Framework

Figured 2.1 Framework for the Factors of Personal Bankruptcy of Malaysia



The Figure 2.1 above displays there are three independent variables will influence the dependent variable. The three independent variables are Unemployment rate, Lending rate, and Divorce case which will influence the dependent variable (Personal bankruptcy case) in Malaysia.

2.5 Hypothesis Development

2.5.1 The unemployment rate and the personal bankruptcy case

According to Sullivan et al. (2000), loss of job has resulted an individual no longer has the ability to service the debt obligations (personal loan, home loan, and car loan) and eventually has to file for bankruptcy. This statement is supported by a number of researchers such as Dick and Lehnert (2010); Agarwal et al. (2003).

H_{1a}: The unemployment rate will positively influence the personal bankruptcy case.

2.5.2 The lending rate and the personal bankruptcy case

According to Jappelli et al. (2008), changes in the nominal interest rate will directly reflect on the lending rate offered by the banking and financial institutions. Increases in nominal interest rate can increase the cost of borrowers to service their debt level. As a result, for whose borrower who is no longer has the ability to service the debt has no choice but to file for bankruptcy. However, based on the finding of White (2010) states that the climbing of insolvency rate is due to lower nominal interest rate. This has increased the incentive of borrowing and resulted in higher insolvency rate.

H_{1b}: The lending rate will positively influence the personal bankruptcy case.

2.5.3 Divorce case and the personal bankruptcy case

According to Zagorsky (2005) and Del Boca and Rocia (2001), the research finding shows that divorce has lead to a reduction in household income, followed by the expenses of alimony, legal fees, and children support fees have eventually resulted in a bankruptcy filing. Besides, Fayet et al. (2002) state that before a divorce, bankruptcy decision is often suggested by the lawyers to discharge the debts owing by each other. This can ensure there will be no lingering joint debt that the non-filing spouse will be responsible for.

H_{1c}: The divorce case will positively influence the personal bankruptcy case

2.5.4 Long-run versus short-run

According to Hussain (2002), the author studies the macroeconomic determinants (unemployment, interest rate, disposable income, and household debt) of personal bankruptcy in the U.S. has found the existence of a cointegration relationship in the model. Thus, in this study it is expected the existence of a cointegration relationship in model.

H_2: There is a cointegration relationship in the model.

2.5.5 Causal relationship

Granger causality test is being important because it can fill in the gap as what the OLS cannot explain such as to explain the causal relationship. This causal relationship can tell how the past values of X_t or Y_t can use to predict the future value of Y_t or X_t respectively. The first objective of this test is to examine the causal relationship between the independent variables/X_t (unemployment rate, lending rate, and divorce case) towards the dependent variable/Y_t (Personal bankruptcy case). The second objective of this test is to examine the causal relationship of the dependent variable/Y_t towards the independent variables/X_t (unemployment rate, lending rate, and divorce case). The causal relationship can be categorized into a bidirectional, unidirectional, and independent relationship. According to Jappelli et al. (2008), the authors find a unidirectional relationship between the unemployment rate and insolvencies as well as find an independent relationship between interest rate and insolvencies both in the U.S and the U.K. Nevertheless, there is a limited researcher using Granger causality to investigate the causal relationship between all these variables. Therefore, the actual causal relationship among these variables in this study is yet to discover in Chapter 4 as the expected causal relationship among these variables is hard to justify based on one single researcher only.

H_{3a}: *X_t does Granger cause Y_t*

H_{3b}: *Y_t does Granger cause X_t*

2.6 Conclusion

Based on the literature review, it was found that the unemployment rate, the lending rate, and divorce case have a significant effect on the personal bankruptcy case. Based on the studies of different researchers, the unemployment rate and divorce case are positively correlated on the personal bankruptcy case. On the other hand, the lending rate has an ambiguous effect on the personal bankruptcy due to different researcher has a different point of view and obtained different findings. The methodology will be discussed further in the following chapter.

CHAPTER 3: METHODOLOGY

3.1 Introduction

The methodology of the study will be discussed further in this chapter. Firstly, discuss the data collection. Secondly, diagnostic checking will be carried out to ensure the data are free from econometric error. Thirdly, regression analysis by using OLS. Fourth, using Johansen cointegration test to examine the existence of a cointegration relationship the model. Lastly, using Granger causality to examine the causal relationship among the variables.

3.2 Data Collection Methods

Based on Sekaran (2005), data collection methods are a critical part of research design. Data collection is a technique of collecting information and the information collected can be applied for research purpose or in decision making purpose. Basically, data can be categorized into primary and secondary data. Primary data refers to the first hand data collected by the researcher to conduct exploratory research. Secondary data, on the other hand, data is made accessible to the public sources. In this research, secondary data has been collected from the Department of Statistics Malaysia (DOSM). The sample sizes consist of 31 years of annual data, covering from the year 1985 and 2015 both for dependent and independent variable. The table 3.1 shows the sources and data explanation.

Table 3.1: Sources and Data Explanation

Variables	Units	Explanation	Sources
Personal bankruptcy	Case reported	Number of personal bankruptcy case reported in Malaysia.	DOSM
Unemployment	Percentage	Unemployment rate in Malaysia	DOSM
Lending	Percentage	Average lending rate offers by the commercial bank in Malaysia.	DOSM
Divorce	Case reported	Number of divorce case reported in Malaysia.	DOSM

Notes: Department of Statistics of Malaysia (DOSM)

In this research, the software of E-Views 7 was used to analyze the data. Basically, E-Views is an interactive econometric software which allows to conduct data analysis, data estimation and, data forecasting. An empirical analysis of Ordinary Least Squares (OLS) will be carried out by using E-views. By using this method, econometric problems can be identified from the empirical model. Subsequently, the solution to resolve the econometric problems will be given in order regressed the model that is free from error.

3.3 Data Analysis

First of all, OLS test will be carried out to answer the Research Objective 1 to identify the relationship between the personal bankruptcy case and the unemployment rate, lending rate, and divorce case. Economic Model of the study is as shown in below:

BANKRUPTCY= f(UNEMPLOYMENT, LENDING, DIVORCE)

Thus, the Economic Model is constructed as:

$$LOGBANKRUPTCY_t = \beta_0 + \beta_1 UNEMPLOYMENT_t + \beta_2 LENDING_t + \beta_3 LOGDIVORCE_t + \varepsilon_t \text{ rj} \quad (3.1)$$

Where,

LOGBANKRUPTCY: Logarithms of personal bankruptcy case

UNEMPLOYMENT: Unemployment rate

LENDING: Lending rate

LOGDIVORCE: Logarithms of divorce case

3.3.1 Ordinary Least Squares (OLS)

Ordinary least squares (OLS) is one of the simplest of linear regression model. It used to estimate the unknown parameters in a linear regression model with a goal to minimizing the sum of squared errors from the data. Graphically, if draw a regression line along a given data set, the closer the distance of the corresponding points along the regression line, the better the model fits the data. Generally, the OLS estimators are said to be the best linear unbiased estimator only when the OLS has fulfilled all the seven assumptions. These assumptions includes: 1) The OLS estimator is a linear regression model, 2) Fixed X values, 3) there is a zero mean value of disturbance, 4) the sample size must greater than the number of parameters estimated, 5). There must be variation in the values of the X variables, 6) No heteroscedasticity problem, and 7) No autocorrelation problem (Gujarati and Porter, 2009).

In fact, the OLS is being a popular technique to use in the research field due to it is easy to implement. In this research, the first and foremost test to run is the unit root test to test for the stationary properties of the

variables. Followed by diagnostic checking (multicollinearity, heteroscedasticity, model specification, normality and, autocorrelation) needed to carry out to ensure the econometric model is error free. Lastly, Granger causality is applied to see whether the independent variables can used to forecast the future dependent variable in Malaysia.

3.4 Diagnostic Checking

3.4.1 Unit Root Test

The unit root test is used to examine whether the stationary properties exist in the time series variables. When the mean, variance, and covariance are constant over time, this means that the series is stationary. Oppositely, when the mean, variance, and covariance change over time period, then it is consider as a non-stationary time series. The data will tends to be forecasted with no biases if the data has stationary properties. Unit root test uses negative value in the test. The negative number meaning the possibility of rejecting the hypothesis where there is a unit root at some level of confidence is greater. Besides, it is crucial to identify the most appropriate form of trend in the data. Therefore, unit root test always used in determining the appropriate form of whether trending data should be first differenced or it should be regressed on deterministic functions of time to ensure the stationary of the data. If there are trending data in the model, then if should undergo detrending process which is first differencing and time-trend regression. The I(1) time series is more suitable for first differencing whereas the I(0) time series is more suitable for the time-trend regression.

Under the null hypothesis, the initial Dickey Fuller (DF) unit root test assumed that the differences in the series are serially uncorrelated.

However, when the time series undergoes first differences, this means that the time series will become serially correlated. In other words, this indicates the DF has been transformed into ADF test. The transformation of the model removes the serial correlation in the error term of the model.

3.4.1.1Augmented Dickey Fuller Test (ADF)

Augmented Dickey-Fuller (ADF) is a test which further developed by Dickey and Fuller (1981) due to autocorrelation problem exist in DF test. This is the first approach that used to test for the stationarity of time series data with the condition of large sample size. The equation is as shown in below:

$$\Delta Y_t = \alpha Y_{t-1} + \beta_1 \Delta Y_{t-1} + \beta_2 \Delta Y_{t-2} + \cdots + \beta_p \Delta Y_{t-p} + V_t \quad (3.2)$$

Assume that the dependent variable follows an AR(p) process, the number of the lagged differenced terms of dependent variable will be included in the equation. The changes of dependent variable which consisted of constant and total lagged of changes in dependent variables, and white noise change, V_t. The null and alternative hypothesis for unit root test is:

H_0: *The variables are non-stationary (unit root)*

H_1: *The variables are stationary (no unit root)*

The null hypothesis has a unit root, means non-stationary with integrated order I(1), while alternative hypothesis has no unit root, means stationary with integrate order I(0). In this paper, the results obtained will be considered as dynamic stationary at I(1). In order to obtain I(1) in the level form, the p-value must be larger than alpha at

1% and 5% such that do not reject null hypothesis. Subsequently, through the first difference form to become stationary where the p-value is smaller than alpha at 1%, 5% and 10%, such that reject null hypothesis (Gujarati and Porter, 2009).

3.4.1.2 Philips-Perron Test (PP)

Philips-Perron test (PP) is also one of the tests for unit root. According to Gujarti and Porter (2009), PP is using the non-parametric method to take on the serial correlation in the error terms that lacking addition of lagged difference terms. PP test is similar with the ADF test, the mainly difference between these two tests is the way they handle the serial correlation in the regression. For ADF test, its ARMA structure of the errors in the test regression used a parametric autoregression to estimate error term, but the PP tests just fail to consider any serial correlation in the test regression. The hypothesis of PP can be written as:

H_0: *The variables are non-stationary (unit root)*

H_1: *The variables are stationary (no unit root)*

The decision rule for PP test is identical as ADF test where the H_0 will be rejected only when the p-value is smaller than 1% or 5% significance level. Otherwise, do not reject H_0.

3.4.2 Normality Test

H_0: The sample data are normally distributed

H_1: The sample data are not normally distributed

Normality test for the sample data is playing a critical role in the OLS model (Gujarati and Porter, 2009). When the properties of the sample data are normally distributed, this signifies the estimated result is consistent, unbiased and efficient estimator, and otherwise the result is not reliable. In this research, Jarque-Bera test has been applied to test the normality properties of the sample data. In order to ensure the model is free from the econometric problems, thus, must ensure the p-value obtained is larger than 5% significance level. Otherwise, the model has normality problem.

3.4.3 Multicollinearity Test

Multicollinearity problem will only occur in multiple regression models in which the independent variables are highly correlated with one another. In this case, the regression model is difficult to explain which independent variables are actually affecting the dependent variable (Paul, 2006). There are some practical consequences of multicollinearity which are large variance and covariances of OLS estimators, "Insignificant" t ratio and, wider confidence intervals. In fact, there is no one unique method to detect multicollinearity or measuring it is strength, but there is some rule of thumb to detect it. Firstly, high R-squared but few significant t ratios can be detected from the OLS output generated by E-Views. Secondly, High pair-wise correlation coefficients can use to

detect multicollinearity when the coefficient is closed to 1 (specifically is more than 0.8).

Lastly, Variance Inflation Factor (VIF) also can be used to detect multicollinearity in a regression model. If the VIF is >10, this signifies that the independent variables are highly correlated in the model (Gujarati and Porter, 2009). There some remedial to counter the multicollinearity problem such as dropping a variable and increase the sample size.

3.4.4 Heteroscedasticity

H_0: Homoscedasticity among the error terms

H_1: Heteroscedasticity among the error terms

One of the assumptions of OLS estimator is the error terms must be in heteroscedasticity. This means the error terms must not correlate with each other as well as they have the same variance across the sample size. Otherwise, if heteroscedasticity occurs, the OLS estimators for the coefficients are still unbiased and consistent. However, the estimators of the OLS method will become inefficient due to the increasing in the variances of the distribution (Hayes and Cai, 2007). In short, this will lead to hypothesis testing invalid and make the wrong conclusion. There are a numbers of methods to detect heteroscedasticity problems such as Park test, Glesjer test, Breusch-Pagam-Godfrey test, Whites' test and Autoregressive Conditional Heteroscedasticity (ARCH) test.

In this research, ARCH test has been applied to detect heteroscedasticity problem in the model. ARCH test has been selected among other detection methods because ARCH test is the only test applicable for time series data. Based on the hypothesis testing, null hypothesis means homoscedasticity and other wise. Thus, must ensure the p-value is greater than the significance level of 5%, subsequently, there is insufficient evidence to reject null hypothesis given null hypothesis is true. This signifies the error term is homoscedasticity and with the same variance across the sample size. White's Heteroscedasticity-Corrected Variances and Standard Error method can be used to counter the heteroscedasticity problem if this problem is exists in the model.

3.4.5 Model Specification

H_0: There is correctly specified

H_1: There is not correctly specified

Model specification is another important diagnostic checking of data analysis. The model is said to have specification bias due to a few factors. Firstly, omitting a relevant independent variable which could play an important role to affect the dependent variable. Secondly, including an irrelevant independent variable in the model and lead to the estimated coefficient to become biased and inconsistent. Lastly, adopting the wrong functional form of dependent and independent variable (Gujarati, 2012). Model specification bias can be detected by using Ramsey Regression Equation Specification Error Test (RESET) test. The null hypothesis is there is no specification biasl. Therefore, must make sure the p-value is greater than the significant level of 5%. This signifies the model is free from specification bias and other wise.

3.4.6 Autocorrelation

H_0: The error terms are not correlated over time

H_1: The error terms are correlated over time

Autocorrelation problem is the error terms for any observation are related to the error terms of other observation. One of the reason lead to this problem can be due to the omission of relevant independent variable or misspecification of true error term (Babatunde, Ikughur, Ogunmola, Oguntunde, 2014). There are a number of consequences of autocorrelation on the OLS estimators. Firstly, the OLS estimators are still unbiased and consistent. This is because both unbiasedness and consistency have nothing to do on with the assumption of no autocorrelation of the error term.

Secondly, the OLS estimators is no longer efficient and thus, no longer the Best, Linear, Unbiased, Estimator (BLUE). This is because the serially correlated error term will lead to the dependent variable to fluctuate in a way that the OLS estimation procedure sometimes attributes to the independent variables. Consequently, the OLS has higher chance to overestimate or under estimate the true coefficient. Lastly, the estimated variances of the regression coefficients will be biased and inconsistent and, resulted hypothesis testing invalid. There are three methods to detect autocorrelation which are Durbin-Watson test, Durbin's h test, and Breusch-Godfrey LM test. In this research, Breusch-Godfrey LM test has been applied to detect the autocorrelation problem. This is because LM test is applicable to detect in time series data regardless the model has autoregressive or not. Since the null hypothesis is there is no autocorrelation problem and therefore, it is important to obtain a p-value that is greater than the significant level of

5%. This signifies the error terms are not correlated overtime. In other words, no autocorrelation in the model.

However, in the case of having autocorrelation problem in the mdoel, first is try to find out if the autocorrelation is pure autocorrelation and not due to mis-specification. If it is pure auto correlation, Cochrane - Orcutt procedures can be applied to counter the problem. In the case of large samples, on the other hand, Newey – West method can be applied to obtain standard errors of OLS estimators that are corrected for autocorrelation.

3.5 Inferential Statistics

3.5.1 R-Squared

R-Square statistics is often emphasizing in the regression analysis, it provides a single number in telling how well the regression model fits the data. If the R-Squared value equal to 1 means that 100 percent of the variation observed in the dependent variable is captured by the independent variables in the regression model. This means the regression model perfectly fits the data. On the contrary, if the R-Squared value is 0.01, this shows that the regression model only can capture percent of the observed variation in the data. In other words, there are 99 percent of the observed variation in the dependent variable is not explained by the model used in the regression. As mentioned in (Gujarati and Porter, 2009), the cross-sectional analysis will normally obtain a lower R-Squared whereby in time series analysis tends to obtain a higher R-Squared. However, the R-Square value how "high" only consider as high is still remain an argumentative topic for most of the researcher, yet a majority of the researcher agreed that as long as the

R-Squared value is above 50 percent can consider as high R-Squared (Gujarati and Porter, 2009; Reisinger, 1997). There is a major limitation of R-Squared that make it less preferable to be interpreted in the result. This is because the R-Squared value can be increased by adding the number of independent variables regardless of how well the independent variables are correlated with the dependent variable. As an alternative, adjusted R-Squared is used in explaining the fitness of the data on the regression model.

3.5.2 Adjusted R-Squared

The adjusted R-Squared is having the similar concept as the R-Squared but, is has been adjusted for the number of predictors in the model. This means that the adjusted R-Squared value will be increased only when the independent variable has a correlation with the dependent variable. Conversely, any independent variable without a strong correlation will result in a lower adjusted R-Squared value. The adjusted R-squared value and the R-squared value will be equal only when there is only one independent variable, however, by adding the number of independent variable the adjusted R-squared value will keep dropping (Gujarati and Porter, 2009).

3.5.3 F-test Statistic

H_0: There is no difference between the variances

H_1: There is at least 1 difference between the variances

F-test is a statistical test used to determine the overall significance of the regression model. It is commonly applied to test whether the model is best fits the population based on the sample data set. This means that F-test is to examine whether there is at least a minimum of 1 independent variable can significantly to explain the dependent variable. The null hypothesis is all the coefficients of the independent variables are equal to zero or there is no difference between the variances. The alternative hypothesis, on the other hand, is at least one difference between the variances. Reject the null hypothesis if the p-value is smaller than 5% significance level. This signifies there is at least one difference between the variances.

3.5.4 T-test Statistic

$$H_0 = \beta_1 = 0, \beta_2 = 0, \beta_3 = 0 \text{ (Insignificant)}$$

$$H_1 = \beta_1 \neq 0, \beta_2 \neq 0, \beta_3 \neq 0 \text{ (Significant)}$$

Where,

β_1 = Unemployment rate

β_2 = Lending rate

β_3 = Logarithms of divorce case

T- test statistics is used to determine the relationship as well as the significance level between an independent and dependent variable (Gujarati and Porter, 2009). Besides that, this test also allows to examine whether the means of the two samples are statistically different from each other. According to Park (2009), there is a key assumption of T-test where the samples are randomly chosen from normally distributed populations without any selection bias. The null hypothesis is the individual regression coefficients are equal to zero. The

alternative hypothesis, on the other hand, the coefficients are not equal to zero. Reject the null hypothesis of the p-value is smaller than 5% significance level. This signifies the independent variable and the dependent variable has a significant relationship.

3.6 Johansen Co-integration Test

Johansen cointegration test is employed to answer the Research Objective 2 by examining the existence of cointegration relationships in the model. The test often suggests that cointegrated time series variables cannot shift too far away from each other and the cointegrations of these variables are stationary although individually they aren't. Johansen's methodology takes vector autoregressive (VAR) models as its starting point and giving permission the testing of hypothesis as regards the equilibrium relationship between the variables (Gujarati, 2009). Besides, the spurious rejection rate can be minimized by using the cointegration test. Moreover, the stated frequency persists in being immense and seems to build up with the quantity of the selected variables in the system, despite applying a number of specification tests (Osterholm and Hjalmarsson, 2007).

In fact, under the comparison between the different types of cointegration test, Johansen's approaches are more sensible property than Engle and Granger. Researchers would prefer to apply the results of Johansen-Juselius on the asymptotic distribution of the likelihood ratio test as the asymptotic distribution of involves an integral of a multivariate Brownian motion with respect to itself. The Engle-Grangers Two Step Estimation method is easier to run but it can be only run on a maximum of two variables and as opposed to Johansen's method, it doesn't allow for hypothesis testing on cointegrating relationships (Gujarati, 2012). Furthermore, Gujarati (2012) concludes that Johansen's approach is far more superior compared to others even under circumstances where errors not being

normally distributed, or the dynamics of the vector error-correction model (VECM) are uncertain and an inclusion of additional lags in the VECM.

3.7 Vector Error Correction Model (VECM)

VECM is a multivariate generalization of error correction model derived from the VAR model to analyze non-stationary time series data. The specification of VECM comprises the cointegration relation and explains how the examined model coincides to the long-run relationships while also enabling the short-run adjustment dynamics.

The estimation accessible approaches can be different for the estimation of a model of type (1) based on the exact model specification. Providing that no zero restrictions on the matrices as well as lacking of exogenous variables, making it a reduced form model is specified without presence of exogenous variables and given that each equation has the identical right-hand side variables, then the Johansen reduced rank (RR) estimation procedure (Johansen, 1988) and simple two step (S2S) method was started by Lutkepohl and Kratzig (2005) can be applied.

The general form of vector error correction model (VECM) can be characterized as below:

$$\Delta Bank_t = \beta_0 + \sum_i^n \beta_1 \Delta Bank_{t-i} + \sum_i^n \beta_2 \Delta Unemp_{t-i} + \sum_i^n \beta_3 \Delta Lend_{t-i} + \sum_i^n \beta_4 \Delta Divo_{t-i} + \mu_i ECT_{t-1} + \varepsilon_{1,t} \quad (3.3)$$

$$\Delta Unemp_t = \beta_0 + \sum_i^n \beta_1 \Delta Unemp_{t-i} + \sum_i^n \beta_2 \Delta Bank_{t-i} + \sum_i^n \beta_3 \Delta Lend_{t-i} + \sum_i^n \beta_4 \Delta Divo_{t-i} + \mu_i ECT_{t-1} + \varepsilon_{2,t} \quad (3.4)$$

$$\Delta Lend_t = \beta_0 + \sum_i^n \beta_1 \Delta Lend_{t-i} + \sum_i^n \beta_2 \Delta Bank_{t-i} + \sum_i^n \beta_3 \Delta Unemp_{t-i} + \sum_i^n \beta_4 \Delta Divo_{t-i} + \mu_i ECT_{t-1} + \varepsilon_{3,t} \quad (3.5)$$

$$\Delta Divo_t = \beta_0 + \sum_i^n \beta_1 \Delta Divo_{t-i} + \sum_i^n \beta_2 \Delta Bank_{t-i} + \sum_i^n \beta_3 \Delta Unemp_{t-i} + \sum_i^n \beta_4 \Delta Lend_{t-i} + \mu_i ECT_{t-1} + \varepsilon_{4,t} \quad (3.6)$$

Where,

Bank = Logarithms of personal bankruptcy case

Unemp = Unemployment rate

Lend = Lending rate

Divo = Logarithms of divorce case

ECT_{t-1} = $Y_{t-1} - \beta_1 - \beta_2 X_{t-1}$

$\mathcal{E}_t$ = Residual

μ_i = Error correction coefficient

3.8 Granger Causality Test

Lastly, Granger causality is used to determine whether the time series variables are useful for the prediction of another time series variable. This test is use to answer the Research Objective 3. Granger (1969) stated that the Granger causality test is defined as the correlation between the present value of a variable and the past value of a different variable. This test defined as variable Y_t is said to Granger-cause X_t, if X_t can be better predicted using the histories of both variables X_t and Y_t rather than using past values of variable X_t alone, all of the other terms remain constant. Since, the future is unable to the predict past, when variable X_t

Granger causes variable Y_t, then changes in X_t should precede changes in Y_t. The concept of Granger causality test is analysed with predictability approaches and taking advantage of the direction of the time flow to attain a causal ordering of related variables. Considering it does not depend on the specification of an econometric model, it is acceptable for empirical model building strategies. There are three possible types of Granger causality.

$$H_0 = X_t \text{ does not Granger cause } Y_t$$

$$H_1 = X_t \text{ does Granger cause } Y_t$$

$$H_0 = Y_t \text{ does not Granger cause } X_t$$

$$H_1 = Y_t \text{ does Granger cause } X_t$$

The first type is both of the null hypotheses are not rejected, two series variable is independent. For the second type, the series will have bidirectional casual effect if both null hypotheses testing is rejected. Lastly, if there is only one of the null hypotheses testing rejected, there will be a unidirectional causal effect (Granger, 1969). Foresti (2006) stated that Granger causality test can be applied when there are three different situations. For the first one, there are two variables with their respective lags in the basic Granger causality test. Later on, there are not only two variables and their lags in the Granger causality test.

3.9 Impulse Response Function

The impulse response function (IRF) is a complimentary test use together with the granger causality test. This is because the Granger causality test has its own limitation in telling the Granger cause in the short run is positively cause or negatively cause, how long the effects will last for, as well as it does not provide evidence of this effect is direct or indirect cause. By using IRF, on the other hand,

all the limitations of the Granger causality test can be overcome and thus, IRF is also tested in this research.

According to Gujarati (2009), IRF can be used to identify the responsiveness of the dependent variables in both unrestricted VAR and VECM towards the macroeconomic shocks. The results of the IRF will be reliable only when the time series data achieved stationary after passing through the second difference form. Furthermore, it also performs like an economic function to identify what will be the likely impact caused on all the variables in the VECM when there is a shock occurs. Additionally, IRF also can detect the response of any variable towards the all other variables in the system (Gujarati, 2009). The ordering of the variables is playing an important role in the IRF this is because it can directly affect the result reported even though the same set of data is using.

3.10 Conclusion

In this research is using time series data where the investigation period is from the year 1985 and 2015 and the frequency is in annually. In the total of 31 sample size are taken from each independent variables (Unemployment rate, Lending rate, and Divorce case reported), and the dependent variable (Personal bankruptcy case reported) for this study. All the data is collected from DOSM and processed by using E-Views 7. In this research, diagnostic checking has been to ensure all the variables are free from econometric problem. Subsequently, Johansen cointegration is applied to test for the existence of the long-run relationship between the variables. The existence of the long run relationship allows to apply VEC model is applied to test for the speed of adjustment toward the long run equilibrium. Lastly, the empirical results will be discussed further in the next chapter.

CHAPTER 4: DATA ANALYSIS

4.1 Introduction

The data analysis in this chapter will present the interpretation as well as analyse the empirical findings from the methodology in order to answer the Research Objectives.

4.2 Diagnostic Checking

4.2.1 Unit root Test

The first and foremost test to begin with is the examination of the stationary properties of the variables, which are the personal bankruptcy case, the unemployment rate, lending rate, and divorce case by using unit root test. In this research, ADF and PP test were used to determine the stationary properties of the variables. The null hypothesis for both ADP and PP states that the variables have a unit root, means the variables is non-stationary.

Based on Table 4.1, the variables are tested both at the level form and first difference form with the inclusion of intercept without trend and intercept with a trend. The optimal number of lag length in ADF test is determined based on Schwarz Info Criterion (SIC), while the optimal lag length in PP test is determined based on Newey-West Bandwidth. The results of ADF show that the test statistics for the personal bankruptcy

case, the unemployment rate, lending rate, and divorce case are greater than the critical values at 1%. In other words, there is a statistically insignificant to reject null hypothesis at the level form. On the other hand, the results of PP test show that the test statistics for the four variables are also statistically insignificant to reject the null hypothesis at the level form as well. In short, ADF and PP tests have provided a conclusion for the personal bankruptcy case, unemployment rate, lending rate, and divorce case are non-stationary at the level form.

Next, the first difference in ADF is concluded for the four variables. The results show that the null hypothesis of non-stationary is being rejected at 1% significance level for all the four variables. Meanwhile, the result from PP test also reveals that the test statistics for the four variables are statistically significant to reject the null hypothesis at 1% significance level. Thus. This can conclude that the personal bankruptcy case, unemployment rate, lending rate, and divorce case are stationary at first difference.

Table 4.1: The results of unit root tests

	Level			
	Without Trend		With Trend	
Variables	ADF	PP	ADF	PP
BANKRUPTCY	0.0855	0.0316	0.0174	0.1271
UNEMPLOYMENT	0.4375	0.4255	0.0433	0.8567
LENDING	0.7439	0.8501	0.3496	0.3838
DIVORCE	0.9867	0.9823	0.1943	0.4703

	First Difference			
	Without Trend		With Trend	
Variables	ADF	PP	ADF	PP
BANKRUPTCY	0.0009***	0.0011***	0.0018***	0.0007***
UNEMPOYMENT	0.0030***	0.0021***	0.0031***	0.0031***
LENDING	0.0005***	0.0000***	0.0034***	0.0000***
DIVORCE	0.0001***	0.0001***	0.0004***	0.0004***

Notes: The asterisk of *, ** and *** indicate the rejection of the null hypothesis at 10%, 5% and 1% significance levels. Lag lengths for the ADF unit root test are based on Akaike's information criterion. For KPSS test, Barlett Kernel is used as the spectral estimation method.

4.2.2 Multicollinearity

Hypothesis:

H_0: The independent variables are not highly correlated in the model

H_1: The independent variables are highly correlated in the model

i. Reject H_0 if VIF is greater than 10, this signifies there is a serious multicollinearity problem.

ii. Do not reject H_0 if VIF is smaller than 10, this signifies there is no serious multicollinearity problem.

Table 4.2: Pair-wise Correlation Analysis

	LOGDIVORCE	LENDING	UNEMPLOYMENT
LOGDIVORCE	1.000000	0.875662	-0.557647
LENDING	0.875662	1.000000	-0.550533
UNEMPLOYMENT	-0.557647	-0.557647	1.000000

**Results obtained from Eviews7*

Based on the Table 4.2, there is a high correlation between the lending rate (LENDING) and divorce case (DIVORCE). This is proven by the high value of pair-wise correlation coefficient which is 0.875662. Based on Gujarati and Porter (2009), if the pair-wise correlation coefficient is greater than 0.8 that means there is a greater chance of the existing of multicollinearity problem. Therefore, the correlation results of 0.875662 which is greater than 0.8 shows there is a higher chance of the existing of the multicollinearity problem between the lending rate and divorce case.

In this case, may proceed to employ the Variance Inflation Factor (VIF) to detect the multicollinearity problem. This study estimated the R_2 by transforming the independent variable into dependent variable to compute the VIF, where $VIF = \frac{1}{(1-R2xi,xj)}$

Table 4.3: Correlation Analysis

Dependent variable	Independent variable	R-squared	VIF
LENDING	DIVORCE	0.766785	1.000000

Conclusion:

Based on Table 4.3, it shows that the VIF is falling between 1 and 10. Therefore, the decision making is do not reject H_0. This study can conclude that the model does not have a serious multicollinearity problem since the VIF of the independent variables are less than 10.

4.2.3 Heteroscedasticity

Hypothesis*:*

H_0: Homoscedasticity among the error terms

H_1: Heteroscedasticity among the error terms

Decision rules:

i. Reject H_0 if the p-value is smaller than significant level at 5%. This signifies there is a heteroscedasticity problem.

ii. Do not reject H_0 if the p-value is greater than significant level at 5%. This signifies homoscedasticity among the error term.

Table 4.4: Heteroscedasticity Test: ARCH

Obs*R-squared	2.931187	Prob. Chi-Square(1)	0.0869

Conclusion:

Do not reject H_0 since the p-value is 0.0869 which is greater than the significant level at 5%. Thus, this can conclude that the model is free from the heteroscedasticity problem.

4.2.4 Model Specification

Hypothesis:

H_0: The model is correctly specified

H_1: The model is not correctly specified

Decision rules:

i. Reject H_0 if the p-value is smaller than the significant level at 5%. This signifies the model is not correctly specified.

ii. Do not reject H_0 if the p-value is greater than the significant level at 5%. This signifies the model is correctly specified.

Table 4.5: Ramsey's RESET Test

	Value	df	Probability
t-statistic	1.856965	26	0.0747
F-statistic	3.448318	(1, 26)	0.0747

Conclusion

Do not reject H_0 since the p-value is 0.0747 which is greater than the significant level at 5%. Thus, there is sufficient evidence to conclude that the model is correctly specified.

4.2.5 Normality Test

Hypothesis:

H_0: The sample data is normally distributed

H_1: The sample data is not normally distributed

Decision rules:

i. Reject H_0 if the p-value is smaller than the significant level at 5%. This signifies the sample data is not normally distributed.

ii. Do not reject H_0 if the p-value is greater than the significant level at 5%. This signifies the sample data is normally distributed.

Table 4.6: Jarque-Bera Normality Test

Jarque-Bera	1.4354440	Probability	0.487863

Conclusion:

Do not reject H_0 since the p-value (JB statistics) is 0.487863 which is greater than the significant level at 5%. Thus, this can conclude that the sample data is normally distributed in the model.

4.2.6 Autocorrelation

Hypothesis:

H_0: The error terms are not correlated over time

H_1: The error terms are correlated over time

Decision rules:

i. Reject H_0 if the p-value is smaller than the significant level at 5%. This signifies the error terms are correlated over times or the model has autocorrelation problem.

ii. Do not reject H_0 if the p-value is greater than the significant level at 5%. This signifies the error terms are not correlated over time or the model is free from autocorrelation problem.

Table 4.7: Breusch-Godfrey Seial Correlation LM Test

Obs*R-squared	9.843314	Prob. Chi-Square(2)	0.0073

Conclusion:

Reject H_0 since the p-value (Chi-Square) is 0.0073 which is smaller than the significant level at 5%. Thus, there is sufficient evidence to conclude that there is autocorrelation problem in the model. In this case, Newey-West HAC Standard Errors will be used to overcome the autocorrelation problem.

4.3 Multiple Linear Regression Model

This study employed OLS method to form a Multiple Linear Regression Model in order to study the relationship of the personal bankruptcy (BANKRUPTCY) in Malaysia with the determinants of the unemployment (UNEMPLOYMENT RATE), lending (LENDING RATE) and, divorce case (DIVORCE). Below is the estimated Economic Model:

$$\widehat{\mathbf{LOGBANKRUPTCY}} = \widehat{\boldsymbol{\beta}}_0 + \widehat{\boldsymbol{\beta}}_1\mathbf{UNEMPLOYMENT} + \widehat{\boldsymbol{\beta}}_2\mathbf{LENDING} + \widehat{\boldsymbol{\beta}}_3\mathbf{LOGDIVORCE} \quad (4.1)$$

Therefore, the results were estimated as shown in Table 4.8.

Table 4.8: Regression Results for OLS model

Dependent variable: Bankruptcy				
Independent variables	Constant	Unemployment	Lending	Divorce
Coefficient	4.7159	-0.1219	0.0759	0.4422
t-Statistic	4.7423	-2.7343**	3.3212***	4.5102***
p-value	0.0001	0.0109	0.0026	0.0001
R^2	0.8750			
$\bar{R}^2$	0.8611			
F-statistic	63.0066			
Prob(F-statistic)	0.0000***			
Observation	31			

Notes: The reported results are adjusted for autocorrelation problem by using Newey-West method. :, ** and *** represent the null hypothesis will be rejected at 10%, 5% and 1% significance level respectively.*

4.3.1 Interpretation on Intercept Coefficient and Independent Variables

Based on the regression result, each of the independent variable is interpreted as below:

$\hat{\beta}_0$ = 4.7159. The coefficient of the intercept is 4.7159.The estimated personal bankruptcy case in Malaysia is 4.7159 percent that could not be explained by the independent variables of the unemployment rate, lending rate, and divorce case.

$\hat{\beta}_1$ = -0.1219. The t-statistics for the unemployment is -2.7344, which is significant at 5 percent significance level. The coefficient result of the unemployment rate is -0.1219, the negative sign indicates there is a

negative relationship between the unemployment rate and the personal bankruptcy case in Malaysia. The coefficient also means that holding other variables constant, if the unemployment rate increases by 1 percent, on average, the estimated personal bankruptcy case in Malaysia will decrease by 12.19 percentage point, ceteris paribus assumption.

$\hat{\beta}_2$ = 0.0759. The t-statistics for the lending rate is 3.3212, which is significant at 1 percent level. The coefficient result of the lending rate is 0.0759, the positive sign indicates there is a positive relationship between the lending rate and the personal bankruptcy case in Malaysia. The coefficient also means that holding other variables constant, if the lending rate increases by 1 percent, on average, the estimated personal bankruptcy case in Malaysia will increase by 7.5986 percent point, ceteris paribus assumption.

$\hat{\beta}_3$ = 0.4422. The t-statistics for divorce case is 4.5102, which is significant at 1 percent level. The coefficient is 0.4422, the positive sign indicates there is a positive relationship between the divorce case and the personal bankruptcy case in Malaysia. The coefficient also means that holding other variables constant, if the divorce case increases by 1 percentage point, on average, the estimated personal bankruptcy case in Malaysia will increase by 44.22 percentage point, ceteris paribus assumption.

4.4 Inferential Analyses

4.4.1 Interpretation on R^2 and $\bar{R}^2$

Based on the R^2, there is approximately 87.50% of the variation in the personal bankruptcy case could be explained by the variation in independent variables which are the unemployment rate, lending rate and, divorce case. Meanwhile, from the $\bar{R}^2$, there is approximately 86.11% of the variation in the personal bankruptcy case could be explained by the variation in independent variables which are the unemployment rate, lending rate and, divorce case after taking the degree of freedom into account.

4.4.2 F-test Statistic

F-test is employed to test the overall difference in the variances of the economic model.

Hypothesis:

H_0: There is no difference between the variances

H_1: There is at least 1 difference between the variances

Decision rules:

i. Reject H_0 if the p-value (F-Statistic) is smaller than the significant level at 1%. This signifies there is at least 1 difference between the variances or there is minimum of 1 independent variable

ii. Do not reject H_0 if the p-value (F-Statistic) is greater than the significant level at 5%. This signifies there is no difference between the variances or all the independent variable are significantly to explain the dependent variable.

Conclusion:

Based on Table 4.8: The result shows do not reject H_0 since the p-value is significant at 1% significance level. This can conclude that there is at least 1 difference between the variances.

4.4.3 T-test Statistic

In this study, T-test is employed to test the relationship between individual partial regression coefficient and dependent variable.

4.4.3.1 Unemployment rate

Hypothesis:

H_0: Unemployment rate does not have significant a relationship with personal bankruptcy case.

H_{1a}: Unemployment rate have a significant relationship with the personal bankruptcy case.

Decision Rules:

i. Reject H_0 if the p-value (t-statistic) is smaller than the significant level at 5%. This signifies there is significant relationship between the two variables.

ii. Do not reject H_0 if the p-value is greater than the significant level at 5%. This signifies there is no significant relationship between the two variables.

Conclusion:

By referring to Table 4.8: Regression results: reject H_0 since the p-value is 0.0109 which is significant at 5%.

4.4.3.2 Lending rate

Hypothesis:

H_0: Lending rate does not have a significant relationship with the personal bankruptcy case.

H_{1b}: Lending rate have a significant relationship with the personal bankruptcy case.

Decision Rules:

i. Reject H_0 if the p-value (t-statistic) is smaller than the significant level at 5%. This signifies there is significant relationship between the two variables.

ii. Do not reject H_0 if the p-value is greater than the significant level at 5%. This signifies there is no significant relationship between the two variables.

Conclusion:

By referring to Table 4.8: Regression results: reject H_0 since the p-value is 0.0026 which is significant at 1%.

4.4.3.3 Divorce case

Hypothesis:

H_0: The divorce case does not have a significant relationship with the personal bankruptcy.

H_{1c}: The divorce case have a significant relationship with the personal bankruptcy.

Decision Rules:

i. Reject H_0 if the p-value (t-statistic) is smaller than the significant level at 5%. This signifies there is significant relationship between the two variables.

ii. Do not reject H_0 if the p-value is greater than the significant level at 5%. This signifies there is no significant relationship between the two variables.

Conclusion:

By referring to Table 4.8: Regression results: reject H_0 since the p-value is 0.0001 which is significant at 1%.

4.5 Johansen Cointegration Test

Since the results from the unit root test shows that all the variables are stationary at first difference form. Subsequently, Johansen Co-integration test can be employed in order to test the presence and order cointegration for the variables over the sample period. First of all, VAR lag order selection criteria with first differenced variables in order to choose the optimum lag length based on the information criterion such as Akaike Information Criterion (AIC) and Schwartz Information Criterion (SIC). In this case, AIC was chosen because AIC is asymptotically optimal in choosing the least mean square error model from the assumption which "true" model is not within the candidate set while SIC is not asymptotically optimal under the assumption. AIC that is derived from principles of information meaning it has theoretical advantages over SIC too (Burnham and Anderson, 2003). In this research, the lag length suggested by AIC was 2 lag lengths.

The null hypothesis for this test is there is a cointegration relationship in the model. While the alternative hypothesis is there is no cointegration relationship in the model. Based on Table 4.9, the null hypothesis is rejected at 1% significance level when the co-integrating vector is 0 because of both the trace statistics and Max-Eigen statistics also with the p-value smaller than 1% significance level. Meanwhile, when the co-integrating vector is ≤ 1, both the trace statistics and Max-Eigen statistics also with the p-value smaller than 1% significance level. This suggests that 1 cointegrating equation emerge.

Table 4.9: Johansen Co-integration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Max-Eigen Statistic	5% Critical Value	
				Trace	Maximum Eigenvalue
Lag length selection = 2					
r = 0	0.7516	79.6884*** [0.0000]	39.9915*** [0.0019]	47.8561	27.5843
r ≤ 1	0.6637	40.6969*** [0.0011]	30.5121*** [0.0018]	29.7971	21.1316

Note: *The Johansen co-integration test's null hypothesis is there is no long run relationship between the variables or the variables are not co-integrated. MacKinnon-Haug-Michelis (1999) critical value help us to determine the rejection of null hypothesis in this study.*

"r" indicates the number of co-integrating vectors.

The [] indicates p-value

**, ** and * ** represent the null hypothesis will be rejected at 10%, 5% and 1% significance level respectively.*

4.6 Vector Error Correction Model (VECM)

Error Correction Term (ECT) is a co-integration term where the process of short-run adjustments will be corrected until its deviation in the long-run equilibrium is fully adjusted.

$$Bank_t = 0.0634 + 0.0311ECT_{t-1} + 0.0075Bank_{t-1} - 0.2329Bank_{t-2} - 0.0237Unemp_{t-1} + 0.0169\ Unemp_{t-2} + 0.0292Lend_{t-1} - 0.0237Lend_{t-2} - 0.0139Divo_{t-1} + 0.1741Divo_{t-2} + \mathcal{E}_t \quad (4.2)$$

$$Unemp_t = 0.6292 - 0.2881ECT_{t-1} - 0.4735Bank_{t-1} - 1.1949Bank_{t-2} + 0.6875Unemp_{t-1} - 0.0234Unemp_{t-2} - 0.1979Lend_{t-1} - 0.0464Lend_{t-2} - 2.1342Divo_{t-1} - 4.9051Divo_{t-2} + \mathcal{E}_t \quad (4.3)$$

$$Lend_t = 0.6433 + 0.4584ECT_{t-1} - 1.4268Bank_{t-1} - 0.2851Bank_{t-2} + 0.6391Unemp_{t-1} - 0.1316Unemp_{t-2} + 0.2895Lend_{t-1} + 0.1691Lend_{t-2} - 2.0169Divo_{t-1} - 1.7105Divo_{t-2} + \mathcal{E}_t \quad (4.4)$$

$$Divo_{t-1} = 0.1874 - 0.1068ECT_{t-1} - 0.0263Bank_{t-1} + 0.0061\ Bank_{t-2} + 0.0485Unemp_{t-1} - 0.0542Unem_{t-2} - 0.0380Lend_{t-1} - 0.0250\ Lend_{t-2} - 0.8859\ Divo_{t-1} - 0.5673Divo_{t-2} + \mathcal{E}_t \quad (4.5)$$

Where,

Bank = Logarithms of personal bankruptcy case

Unemp = Unemployment rate

Lend = Lending rate

Divo = Logarithms of divorce case

ECT = Error correction term

Ɛ = Error term

Table 4.10: Long run estimates

Variables	ECT_{t-1}
Bankruptcy	0.0311 [0.4549]
Unemployment	-0.2881 [-1.9799]***
Lending	0.4584 [1.3068]
Divorce	-0.1068 [-4.5561]***

Notes: The numbers in parentheses refer to the coefficients*. The numbers in [] indicate* p-*values following the chi-squared distribution.*

**, ** and * ** represent the null hypothesis will be rejected at 10%, 5% and 1% significance level respectively.*

ECT is the main concern in VECM because it is a co-integration term that used to captures the variables' speed of short-run adjustment or dynamic adjustment towards the long-run equilibrium. Based on Table 4.10, only the unemployment rate and divorce are significant at 1% significance level. This means that in the short run, the unemployment rate and divorce case are taking the burden to bring the personal bankruptcy case back to the long-run equilibrium level. The unemployment rate shows an adjustment coefficient of 28.81%, this means it would take 3.5 years (100% / 28.81% = 3.47 years) of the adjustment towards the long run equilibrium level. The divorce case, on the other hand, shows an adjustment coefficient of 10.68%, this means it would take 9.4 years (100% / 10.68% = 9.36 years) of the adjustment towards the long-run equilibrium level.

4.7 Granger Causality Test

Diagnostic checking for the VEC model has been employed to ensure the model fulfils the BLUE (Best Linear Unbiased Estimator) assumptions. The diagnostic checking includes heteroscedasticity, autocorrelation, and normality tests. The results report that the model has no heteroscedasticity and autocorrelation problems. However, the model has the normality problem, according to Joyeux (2001) stated that the normality problem in VEC model can be solved by adding the dummies but, the author added that the dummies are not always can solved the normality problem in the model. Additionally, the author mentioned that the normality problem is not the crucial problem in the estimation of VAR and VECM. Therefore, in this research can directly proceed to Granger causality test.

Based on Table 4.11, the independent variables in this research (unemployment rate, lending rate, and divorce case) is found do not has a short-run causal relationship with the dependent variable (personal bankruptcy case). This means that all these independent variables have an independent relationship with the dependent variable. This means that, by using the past value (lagged 2) of the unemployment rate, the lending rate, and divorce case cannot be used for the prediction of the future personal bankruptcy case in Malaysia. This is because all these independent variables also obtained a p-value greater than 5% significance level. This indicates do not reject the null hypothesis given the null hypothesis is true. Next, the result shows that there is a unidirectional short run effect from the personal bankruptcy case to the unemployment rate. This is because the p-value is 0.0402 which is significant at 5% significance level. This indicates do not reject the null hypothesis given the null hypothesis is true. Meanwhile, the result also shows that there is a unidirectional short run effect from divorce case to the unemployment rate. This is because the p-value is 0.0011 which is significant at 1% significance level.

Table 4.11 VEC Granger causality /Wald Test

Independent Variables:	Dependent Variables:			
	Bankruptcy	Unemployment	Lending	Divorce
Bankruptcy	---	6.4279 (0.0402)**	1.4288 (0.4895)	0.1239 (0.9399)
Unemployment	0.0750 (0.9632)	---	1.8665 (0.3933)	4.4877 (0.1060)
Lending	0.7407 (0.6905)	3.3915 (0.1835)	---	5.6642 (0.0589)
Divorce	0.1103 (0.9463)	13.5970 (0.0011)*	0.3989 (0.8192)	---

Note: *The null hypothesis for this test is the independent variable does not granger causes the dependent variable.*

The number in the parenthesis refers to chi-sq.

Figures in parentheses ( ) refer to the p-value for each variable. .

, ** and * represent the null hypothesis will be rejected at 10%, 5% and 1% significance level respectively.*

Direction of causality :

Personal bankruptcy case ⟶ Unemployment rate

Divorce case ⟶ Unemployment rate

4.8 Impulse Response Function

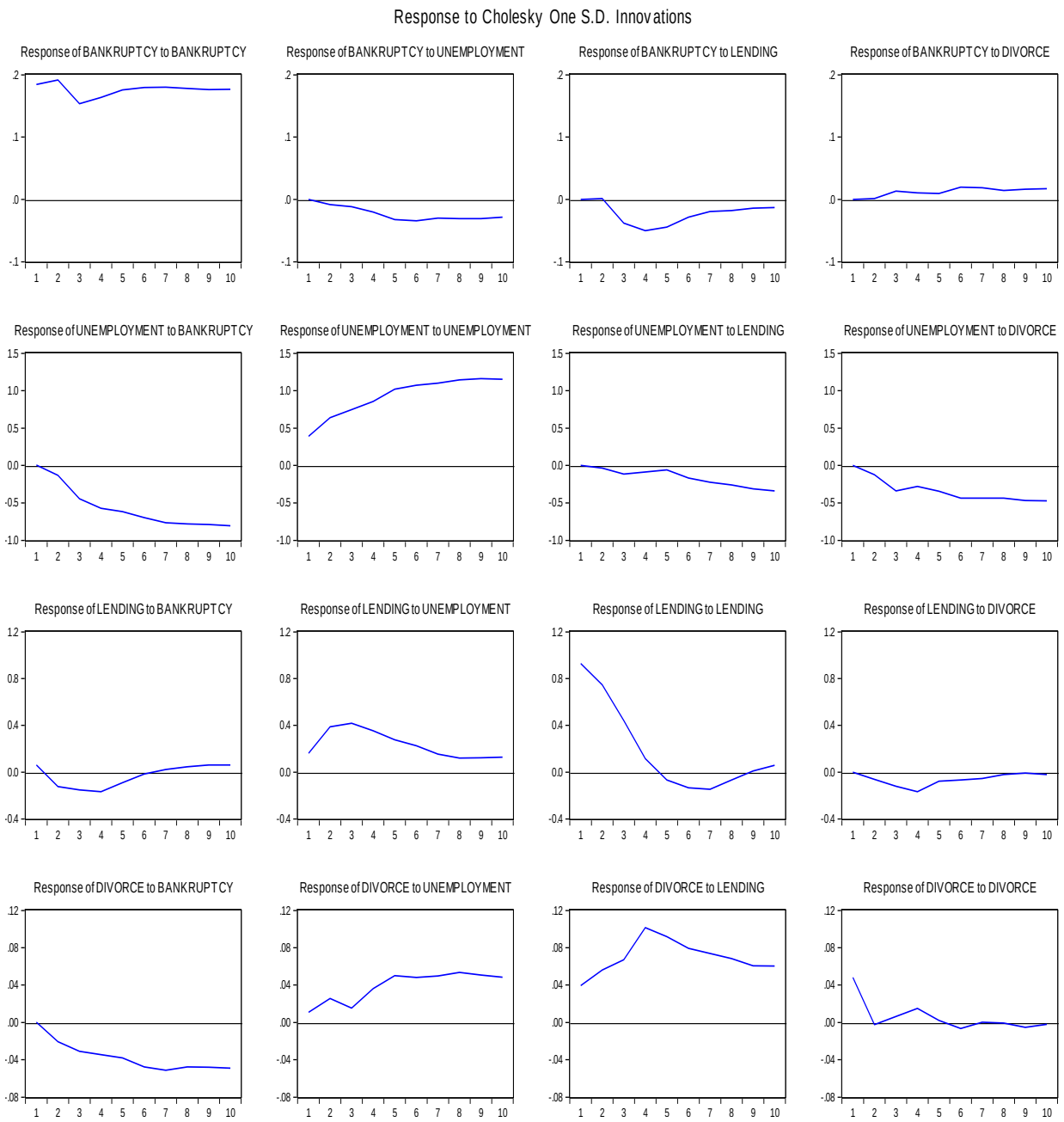
Figure 4.1 shows the results reported from shock by one standard deviation to individually of the three independent variables (unemployment rate, lending rate, and divorce case) are traced out. The results will be presented in three categories, the first category is how the variables (personal bankruptcy case, lending rate, unemployment rate, and divorce case) of this research will response by its own shock. The second category is how the dependent variable in this research (personal bankruptcy case) will be response towards the shock of the independent variables (unemployment rate, lending rate, and divorce case). The last category is

how the independent variables in this research (unemployment rate, lending rate, and divorce case) will respond to the shock of the dependent variable (personal bankruptcy case).

Firstly, when there is one standard deviation increase in personal bankruptcy, the personal bankruptcy will respond positively in the first 1.5 years, followed by negative response until 3.5 years. Subsequently, it will back to positive response again and lastly, become stagnant from 5.5 years until 10 years. When there is one standard deviation increase in the unemployment rate, the unemployment rate will responds positively in the first 10 years. When there is one standard deviation increase in the lending rate, the lending rate will respond negatively first 7.5 years and subsequently, become positively impact. When there is one standard deviation increase in the divorce case, the divorce case will respond negatively in the overall.

Secondly, when there is one standard deviation increase in the unemployment rate, the personal bankruptcy case will respond negatively in an overall in the next 10 years. Besides that, when there is one standard deviation increase in the lending rate, the personal bankruptcy case will have no effect in the first 1.5 years, and subsequent respond negatively thereafter. Lastly, when there is one standard deviation increase in the divorce case, the personal bankruptcy case will has no effect in the first 1.5 years, and subsequently has a weak positive impact thereafter. Lastly, when there is one standard deviation increase the personal bankruptcy case, the unemployment rate will have a negative response in the first 7.5 years, and become stagnant thereafter. Moreover, one standard deviation increase in the personal bankruptcy case, the lending rate will has a negative response in the first 3.5 years, and become positively response thereafter. Lastly, when there is one standard deviation increase in the personal bankruptcy case, the divorce case will have a negative response.

Figure 4.1: Impulse reponse functions for 10 periods



4.9 Conclusion

In this chapter, diagnostic checking has been done before proceeding to estimate the equation by using OLS. Firstly, the unit root test was tested and found that the variables are stationary at first difference form. Based on the diagnostic checking, there is no multicollinearity, no heteroscedasticity, no model specification bias, and the error term is normally distributed. However, there is autocorrelation problem in the model. Therefore, Newey-West HAC Standard Errors has been applied to solve the autocorrelation problem. OLS has been regressed to identify the relationship of the independent variables against the dependent variables. Next, Johansen cointegration test has been applied to test existence of a cointegration relationship in the model. The result shows there is a cointegration relationship in the model which allows to employ VEC model to test the speed of adjustment of the independent variables against the dependent variable. Granger causality test was applied to test the causality relationship among the variables. Lastly, Impulse response functions were applied to test how the shocks will affect the variables. The major findings and policy implication will discuss further in the following chapter.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.1 Introduction

In this chapter will provide a summary of the statistical analyses which have been discussed in Chapter 4. Subsequently, the major findings in this research will be discussed followed by the limitations of the study. Lastly, recommendations for future research are discussed in a flowing manner.

5.2 Summary of Statistical Analyses

In this research has three research objectives, the first objective is to identify the relationship between the personal bankruptcy case and its independent variables which are unemployment rate, lending rate, and divorce case. The second objective is to examine the existence of a cointegration relationship in the model. The last objective is to identify the causal relationship between the personal bankruptcy case and its independent variables which are unemployment rate, lending rate, and divorce case. In this research is using 1% and 5% of significant level to conduct the all the diagnostic checking and the test statistics.

Firstly, based on the result reports in the OLS (adjusted for autocorrelation problem), the t-statistic shows that the unemployment rate is significant at 5% significance level. The lending rate and divorce case, on the other hand, are significant at 1% significance level respectively. Besides, based on the F-test statistic, the overall relationship between the independent variables and the dependent variable is significant at 1% significance level. Based on the diagnostic

checking, the unit root test of ADF and PP test also consistently reports the properties of the variables are non-stationary in level form and achieved stationary in first difference form. In overall, the model is free from econometric problems (multicollinearity, heteroscedasticity, model specification bias, and normality problem) except the model is having the autocorrelation problem which has been resolved by using the Newey-West method.

Secondly, Johansen cointegration test has been employed to examine the existence of a cointegration relationship in the model. The result shows that the model has a cointegration relationship since the trace statistic and the Eigenvalue also consistently reports have a minimum of one cointegrating model at 1% significance level. Subsequently, the existences of a cointegration relationship allow employing the VEC model to examine how the examined model coincides to the long-run relationships while also enabling the short-run adjustment dynamics. The results of VEC model reports that only the unemployment rate and divorce are significant at 1% significance level. This means that in the short run, the unemployment rate and divorce case are taking the burden to bring the bankruptcy case back to the equilibrium level in the long-run. Based on the diagnostic checking on the VEC model, the result shows that the model is free from econometric problem except the model is having the normality problem. However, Joyeux (2001) mentioned having normality problem in the VEC model is not the crucial problem.

Lastly, Granger causality test and impulse response function have been tested. The result of Granger causality shows the personal bankruptcy case will Granger cause the unemployment rate and divorce case will Granger cause the unemployment rate. The results of the impulse response function can refer back to subchapter 4.8 in Chapter 4.

5.3 Discussion of the Major Findings

5.3.1 Unemployment rate

Based on the result reported in Table 4.8, the unemployment rate is significantly and negatively to influence the personal bankruptcy case. This is inconsistent with the economic theory of poverty (Keynesian theory of poverty) proposed by Keynes in 1936. Keynes proposes that a major cause of poverty is due to the involuntary unemployment where an individual has to borrow debt in order to survive. Since they are more vulnerable to a sudden economic downturn and thus, they are easier to fail to service the debts and forced to declare bankruptcy. The direction of the unemployment rate to influence the personal bankruptcy case is totally reverse and is totally inconsistent with the previous findings.

Based on Figure 1.3, in the mid-1980s, the unemployment rate has dropped significantly from as high as 8.26% in the year 1986 to as low as 2.95% in the year 1994. A given explanation by Felker and Jomo (2013) is due to prosper Malaysian economic growth during that period of time where the labour market almost near to full employment. Specifically, there were a number of policies being implemented by the Malaysian government in order to promote the economic growth. For instance, the New Economic Policy was implemented from the year of 1971 and 1990 with the objective of poverty eradication, social economic restructuring, and to achieve national unity, harmony, and integrity. Followed by the implementation of the National Development Policy from the year of 1991 and 2000 to enhance the welfare of the Malaysia. The successful implementation of these two policies has created employment opportunities for those in the rural areas (Hashim, 1998).

Besides, the Industrial Development Policy such as the export-oriented industrialization strategy implemented in the 1970s followed by the import substitution strategy implemented in the 1980s also has created a vast number of employment opportunities in the manufacturing and industrial sectors. For instance, the Heavy Industries Corporation of Malaysia (HICOM) which is fully backed by the government as a means to develop the heavy industries such as the locally manufactured car, cement, and steel industries (Yusoff, Hasan, and Jalil, 2000). This explains that why the unemployment rate decreases sharply in the mid-1980s. Meanwhile, the personal bankruptcy case between this time period was kept climbing from 2,200 cases reported in the year 1986 to 5,700 cases reported in the year 1994. In short, perhaps due to the aforementioned policies implemented by the government has resulted a negative relationship between the unemployment rate and the personal bankruptcy case.

The Johansen Cointegration test has been tested in order to answer the Research Objective 2. Based on the result reported in Table 4.9 shows there is a cointegration relationship in the model. This is consistent with the finding of Hussain (2002) where the author studies the macroeconomic determinants of personal bankruptcy in the U.S. The finding shows that the changes in the unemployment rate is sensitive to the individual bankruptcies. However, since there is a higher likelihood where the unemployment is a stationary series where this cannot account for the secular rise in the bankruptcies ratio. Nevertheless, the authors says the unemployment do has powerful short-run effects on bankruptcies around the long-term trend. Subsequently, VEC model is being employed and the result shows that the unemployment rate is significant at 1% level. This can conclude that in the short-run, the unemployment rate is playing a significant role to adjust the personal bankruptcy case back to the long-run equilibrium. Specifically, the rate of adjustment is 3.4 years towards the long-run equilibrium level. Next, the Granger causality test has been tested in order to answer the Research Objective 3. Based on the result reported in Table 4.11 shows that the unemployment rate has an independent relationship with the personal

bankruptcy case. This means that in the short-run, the unemployment rate will not Granger cause the personal bankruptcy case. This is inconsistent with the finding of Jappelli et al. (2008) where the authors find a unidirectional relationship between unemployment and insolvencies in the U.S. as well as in the U.K. Thus, this can conclude that in Malaysia, the unemployment rate cannot use to forecast the personal bankruptcy case in the future.

5.3.2 Lending rate

Based on the result reported in Table 4.8, the lending rate is significantly and positively to influence the personal bankruptcy case. This is inconsistent with the liquidity preference theory proposed by Keynes in 1936. Keynes proposes that a higher interest rate environment can motivate the consumer and investor for saving and investment. Conversely, a lower interest rate environment is rather encouraging for spending and borrowing for consumption and investment. As mentioned by White (2010), during a lower interest rate environment is where the personal debt started to pile up. A favorable borrowing environment has eventually created a high indebtedness and driven the number of people to file for bankruptcy.

Based on the finding, obviously, the high personal bankruptcy case in Malaysia is not driven by a lower interest rate environment. Instead, it is driven by a higher interest rate environment. This positive result is consistent with the finding of Katz (1999). Meanwhile, based on the research of Jappelli et al. (2008) also supported that a higher consumer insolvency rate was associated with the climbing of market interest rate. This can conclude that if the policy maker increases the nominal interest rate, a higher lending rate will lead to a higher number of the personal bankruptcy case filing in Malaysia. Next, the Johansen Cointegration test has been tested in order to answer the Research Objective 2. Based on the result reported in

Table 4.9 shows there is a cointegration relationship in the model. This is consistent with the finding of Hussain (2002) where the author studies the macroeconomic determinants of personal bankruptcy in the U.S. The author claims that an increase in the interest rate can lead to a greater indebtedness and resulted a higher bankruptcy cases. The reasons explained by the author is that a higher indebtedness will lead to higher gearing, reduce capacity to borrow further and increase individuals' vulnerability to adverse shocks. Subsequently, VEC model is being employed and the result shows that the lending rate is insignificant at 1% level. This can conclude that in the short-run, the lending rate will not adjust the personal bankruptcy case back to the long-run equilibrium level.

Next, the Granger causality test has been tested in order to answer the Research Objective 3. Based on the result reported in Table 4.11 shows that the lending rate has an independent relationship with the personal bankruptcy case. This means that in the short-run the lending rate will not Granger cause the personal bankruptcy case. This is consistent with the findings of Jappelli et al. (2008) where the authors find an independent relationship between interest rate and insolvencies in the U.S. as well as in the U.K. Thus, this can conclude that in Malaysia, the lending rate cannot use to forecast the personal bankruptcy case in the future.

5.3.3 Divorce case

Based on the results reported in Table 4.8, the divorce case is significantly and positively to influence the personal bankruptcy case. This is consistent with the economic theory of divorce as mentioned in the study of Carroll (1997) and Cocco (2005). They proposed that a divorce will create a shock to drive up the individual background risk. This risk in turns will increase the uncertainty about the future income where an income reduction will eventually driven the number of the personal bankruptcy case filing of a

country. Meanwhile, this positive result is consistent with the finding of Edmiston (2006); Del Boca et al. (2001); Fisher and Lyons (2005); Lyons (2003); Zagorsky (2005). This can conclude that the increasing trend of the personal bankruptcy case is correlated to the increasing trend of the divorce case in Malaysia.

Next, the Cointegration test has been tested in order to answer the Research Objective 2. Based on the result reported in Table 4.9 shows there is a cointegration relationship in the model. In other words, the divorce case will influence the personal bankruptcy case of Malaysia in the long-run. This finding is contradict with the previous researcher as they are using other method to study the correlation and the relationship between these two variables. For instance Fisher and Lyonse (2005) employed a probability model whereby Edmiston (2006) employed a two stage models in their research. One of the reasons why there is no researcher looks into the existence of a cointegration relationship between the divorce case and the personal bankruptcy case can be due to the assumption of a short-run effect by the researcher. For instance, in the finding of Fay et al. (2002) shows that an individual would have higher chances to declare bankruptcy in the following year after a divorce. The reason being is due to the high expenses to live two separate family and etc. Besides, the authors also mentioned that a married couple will tend to declare bankruptcy before a divorce. This is to ensure that there will be no lingering joint debt that the non-filling spouse will be responsible for. Based on this point of view can explains why the researcher did not investigate the existence of a cointegration relationship as they assume this is a short-run effect instead.

Next, VEC model is being employed and the result shows that divorce case is significant at 1% level. This can conclude that in the short-run, the divorce case is playing a significant role to adjust the personal bankruptcy case back to the long-run equilibrium level. Specifically, the rate of adjustment is 9.3 years towards the long-run equilibrium level. Lastly, the Granger causality

test has been tested in order to answer the Research Objective 3. Based on the result reported in Table 4.11 shows that divorce case has an independent relationship with the personal bankruptcy case. This means that in the short-run divorce case will not Granger cause the personal bankruptcy case. Thus, this can conclude that in Malaysia, the divorce case cannot use to forecast the personal bankruptcy case in the future. However, the result shows that in the short-run, divorce case will Granger cause the unemployment rate. This means that by using the past data of divorce case can be used to predict the future unemployment rate in Malaysia. Meyer (n.d.) explains about how a divorce can affect the unemployment rate is due to the emotional imbalances after a divorce can affect the working productivity. The low working productivity (divorce employees) alone has on average cost an organization $ 83,171 per year. In this case, perhaps the consistent low productivity of a worker has no choice forcing the employer to lay them off. Perhaps from this point of view can explain why a divorce case can Granger cause the unemployment rate.

5.4 Implication of the Study

5.4.1 Unemployment rate

Based on the findings, the unemployment rate is significantly and negatively to influence the personal bankruptcy case in Malaysia. Even the negative relationship is inconsistent with the previous finding but this is nothing unusual. The negative relationship in this study was due to the policies implemented by the government to promote economic growth and to reduce the unemployment rate of the country during the study sample period. No matter how the significant relationship of the unemployment rate in this study shows it will influence the personal bankruptcy case in Malaysia. Thus, it is crucial for the policy maker to consistently putting effort to maintain the local

unemployment rate at around 3% level which is considered low and good in a developing country (Blanchard and Johnson, 2013).

5.4.2 Lending rate

Based on the findings, there is a significant positive relationship between the lending rate and the personal bankruptcy case. When the market interest rate increase, all the banking, and financial institutions have to follow to increase their lending rate offers to the public regardless is for the existing customer or for the new customer. In this case, a higher cost of debt signifies a higher burden being passed to the consumer. This will reduce the quantity of money circulating in the economy in order to achieve a certain economic objective set by the policy maker, for instance, is to lower down the inflation rate during high economic growth. However, a decision to increase the market interest rate may not always be a good move which may depend on other economic indicators, for instance, the household debt level of a country.

Currently, the household debt per GDP in Malaysia is close to 90% in 2016. At this high level of household debt amount, if the market interest rate increases will increase the likelihood of the consumers to fail to service their debt. As a result, this will not only increase the number of personal bankruptcy filing but, the significant bad debts can affect the entire banking system of a country. Since the interest rate adjustment can bring a different impact to the economy of a country thus, from time to time, the policy maker has to decide what is the optimal level of interest rate should be set to avoid any negative impact on the country.

In light of the upward trend in the personal bankruptcy case, the investor and the consumer would be aware and pay attention to those factors that lead to the climbing of personal bankruptcy filings. Since the research finding of this

study shows the lending rate is significant to influence the personal bankruptcy case. Hence, this finding could be guidance for the investor and consumer to plan carefully before borrowing loan for any investment and purchasing. This is because the adjustment of the market interest rate is unpredictable, any changes in the market interest rate can directly affect the cost of servicing the debt. Therefore, the investor and the consumer have to understand their capability for debt repayment before borrowing any loan for investment and purchasing. Also, before applying for a loan they can consult the loan specialist in which type of loan (fixed rate or flexible rate) is more suitable for them and what is the cost and benefits of a different type of loan.

5.4.3 Divorce case

Based on the finding in this study, the divorce case is significantly and positively to influence the personal bankruptcy case. This is a new finding in Malaysia as there was no previous researchers look into this issue. This provides a new understanding and discovery for the policy maker that in fact, the climbing in the divorce case is one of the factors lead to the climbing of the personal bankruptcy case in Malaysia. This means that in order to curb the problem of climbing in the personal bankruptcy case the policy maker not just needs to focus on how to educate the consumer in financial planning but, how to reduce the climbing of divorce problem as well.

In this case, it is suggested that before the marriage couple applies for divorce in the National Registration Department of Malaysia, it is required for the couple to seek professional advice from the family consultancy service. This is free of charge consultancy service provided by the government with the hope of an effort provided by the consultant can increase the understanding and resolve the conflict between the married couple. By using this policy it is expected can reduce the number of divorce case but, if the divorce decision is unavoidable the government has to design another new policy to provide a

reasonable amount of subsidy for the divorced family. It is expected that with the subsidy given by the government can reduce the living expenses after a divorce which in turn can prevent the climbing of personal bankruptcy case in Malaysia.

5.5 Limitation of the Study

There are some limitations encountered in this study, the first limitation is the data collection problem. In fact, this study was intended to form a larger sample size in order to include other interested independent variables such as the credit card debt, the medical expenses as well as the personal income. This can increase the accuracy of the empirical results in this study. However, the availability of the data is incomplete for some of the independent variables such as the lending rate. The maximum historical data provided by the DOSM is only started from 1985. This explains that why the sample period of this study can only include from the year 1985 to 2015 consisting of 31 observations. This has limited the ability of this study to include and to investigate other interested independent variables. Besides that, a smaller sample size will create a smaller degree of freedom when include lagged term in this study to run the Johansen Cointegration test as well as the VEC model. Even though, these two tests also allow for a small sample size of studies but, the small degree of freedom might affect the ability to generate desirable estimation results.

The second limitation of this study only focuses on the factors of the personal bankruptcy case in Malaysia. Since Malaysia is a developing country, therefore, the findings of this study could only be useful for the policy makers, investors, and consumers who conduct research in a developing country. However, for the users of developed country, they are not encouraged to refer to the findings of this study as a reference to implement their countries' policy or for their research purposes because they could obtain a biased result. Lastly, the limitation of time constraint has restricted the ability to conduct a panel data analysis. The duration

given to accomplish this research is only four months, therefore, this study is only allowed to investigate the factors lead to the personal bankruptcy case in one country instead of making a comparison between a few developing country in Southeast Asia.

5.6 Recommendations for Future Research

According to Liu (2009), by using high-frequency data in the research would improve the reliability of the results as well as would improve the portfolio optimization decision in the research. Thus, it is highly suggested by the researchers to increase the frequency of the data by using daily, monthly, or quarterly data. A larger sample size can increase the accuracy and increase the likelihood to obtain desirable results. Also, the personal bankruptcy data of a country seem to be a confidential data where it is not openly accessible to all the public. This data is not even publishing on the paid data source such as Bloomberg. It is only accessible unless a request from the respective department of a country where this application process, in fact, is really time-consuming. Thus, in order to increase the exploration of the research in this area, it is highly recommended for other countries to practice the same way as what the U.S. is doing where it disclosure their country's data (personal bankruptcy rate/case) to the public.

Besides that, since this research is only focused in Malaysia which is a developing country and it is only can be a useful reference for the policy makers in the developing country. Thus, in order to enhance the understanding of the factors of the personal bankruptcy in the developing country, it is highly suggested for the future researchers to incorporate the similar and additional interested independent variables to enhance the study in this area. Furthermore, it is suggested for the future researchers to explore this area in the developed country where the findings could be differing from the developing country. In addition, the future researchers must understand the economic condition and policy implemented in the country.

Lastly, if the future researcher has a more flexible research time frame it is highly advised the researchers to expand the research by doing a penal data analysis to compare the results between a few countries instead of only focusing on one country.

5.7 Conclusion

The increasing trend of the personal bankruptcy case in Malaysia has become one of the concerns by the policy maker as this will become a stumbling block for Malaysia to become a "high-income status nation" by 2020. The research purpose of this study is to identify what are the factors that will influence the personal bankruptcy case in Malaysia. The determinants include the unemployment rate, lending rate, and divorce case. All data collected are from the year 1985 to 2015 in Malaysia and various empirical analyses have been carried out based on the research objectives.

Based on the findings, this study shows that the unemployment rate, lending rate, and divorce case are significant to influence the personal bankruptcy case. The unemployment rate shows a negative relationship whereby lending rate and divorce case shows a positive relationship to influence the personal bankruptcy case. Diagnostic checking has been examined, generally the model is free from the econometric problems except the model is having the autocorrelation problem. However, this problem has been solved by using the Newey-West. Subsequently, OLS has been employed to answer the research objective 1.

Johansen cointegration test has been employed in order to answer the research objective 2. The result shows an existence of a cointegration relationship in the model. This allows employing the VEC model to examine how the model coincides to the long-run relationships while also enabling the short-run adjustment dynamics. The result shows that only the unemployment rate and

divorce case are significant to adjust the personal bankruptcy case back to the long-run equilibrium level. Lastly, the Granger causality test has been tested to answer the research objective 3. The result shows that all the independent variables (unemployment rate, lending rate, and divorce case) have an independent relationship with the dependent variables.

In addition, the limitations encountered in this research have been extensively discussed while the recommendations for future researchers have been provided as well. In conclusion, the research objective and the research questions in this study has been met and answered. The findings can provide some guidance for the policy maker, investor, and the consumer to increase their awareness towards the factors lead to personal bankruptcy in Malaysia.

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LIST OF APPENDICES

Appendices 4.1 ADF (With trend) (Level form)

Bankruptcy

Null Hypothesis: BANKRUPTCY has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.701938	0.0855
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BANKRUPTCY)
Method: Least Squares
Date: 06/30/17 Time: 13:23
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BANKRUPTCY(-1)	-0.120515	0.044603	-2.701938	0.0116
C	1.174745	0.407677	2.881554	0.0075

R-squared	0.206809	Mean dependent var	0.075998
Adjusted R-squared	0.178481	S.D. dependent var	0.174665
S.E. of regression	0.158313	Akaike info criterion	-0.784149
Sum squared resid	0.701761	Schwarz criterion	-0.690736
Log likelihood	13.76224	Hannan-Quinn criter.	-0.754266
F-statistic	7.300468	Durbin-Watson stat	1.998906
Prob(F-statistic)	0.011575		

Unemployment

Null Hypothesis: UNEMPLOYMENT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.666219	0.4375
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UNEMPLOYMENT)

Method: Least Squares
Date: 06/30/17 Time: 13:23
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UNEMPLOYMENT(-1)	-0.100338	0.060219	-1.666219	0.1068
C	0.283039	0.264984	1.068136	0.2946

R-squared	0.090209	Mean dependent var	-0.124667
Adjusted R-squared	0.057716	S.D. dependent var	0.573866
S.E. of regression	0.557059	Akaike info criterion	1.732050
Sum squared resid	8.688823	Schwarz criterion	1.825464
Log likelihood	-23.98076	Hannan-Quinn criter.	1.761934
F-statistic	2.776287	Durbin-Watson stat	1.029698
Prob(F-statistic)	0.106820		

Lending

Null Hypothesis: LENDING has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.989770	0.7439
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LENDING)
Method: Least Squares
Date: 06/30/17 Time: 13:24
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LENDING(-1)	-0.073477	0.074236	-0.989770	0.3308
C	0.722935	0.559970	1.291024	0.2073

R-squared	0.033805	Mean dependent var	0.192333
Adjusted R-squared	-0.000702	S.D. dependent var	0.885888
S.E. of regression	0.886199	Akaike info criterion	2.660591
Sum squared resid	21.98977	Schwarz criterion	2.754004
Log likelihood	-37.90886	Hannan-Quinn criter.	2.690474
F-statistic	0.979644	Durbin-Watson stat	1.803062
Prob(F-statistic)	0.330763		

Divorce

Null Hypothesis: DIVORCE has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.579063	0.9867
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIVORCE)
Method: Least Squares
Date: 06/30/17 Time: 13:24
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIVORCE(-1)	0.012213	0.021091	0.579063	0.5672
C	-0.053258	0.207624	-0.256512	0.7994

R-squared	0.011834	Mean dependent var	0.066674
Adjusted R-squared	-0.023458	S.D. dependent var	0.078720
S.E. of regression	0.079638	Akaike info criterion	-2.158306
Sum squared resid	0.177583	Schwarz criterion	-2.064893
Log likelihood	34.37459	Hannan-Quinn criter.	-2.128423
F-statistic	0.335314	Durbin-Watson stat	2.155983
Prob(F-statistic)	0.567177		

Appendices 4.2 ADF (With trend) (Level form)

Bankruptcy

Null Hypothesis: BANKRUPTCY has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.067160	0.0174
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BANKRUPTCY)
Method: Least Squares
Date: 06/30/17 Time: 13:28
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BANKRUPTCY(-1)	-0.609268	0.149802	-4.067160	0.0004
D(BANKRUPTCY(-1))	0.169310	0.164504	1.029216	0.3132
C	5.082344	1.207606	4.208610	0.0003
@TREND(1985)	0.035276	0.010738	3.285343	0.0030

R-squared	0.455276	Mean dependent var	0.073344
Adjusted R-squared	0.389910	S.D. dependent var	0.177141
S.E. of regression	0.138362	Akaike info criterion	-0.990450
Sum squared resid	0.478598	Schwarz criterion	-0.801858
Log likelihood	18.36153	Hannan-Quinn criter.	-0.931385
F-statistic	6.964945	Durbin-Watson stat	1.828890
Prob(F-statistic)	0.001456		

Unemployment

Null Hypothesis: UNEMPLOYMENT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 7 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.695748	0.0433
Test critical values:	1% level	-4.416345	
	5% level	-3.622033	
	10% level	-3.248592	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UNEMPLOYMENT)
Method: Least Squares
Date: 06/30/17 Time: 13:28
Sample (adjusted): 1993 2015
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UNEMPLOYMENT(-1)	-1.029465	0.278554	-3.695748	0.0027
D(UNEMPLOYMENT(-1))	0.281032	0.209527	1.341269	0.2028
D(UNEMPLOYMENT(-2))	0.053165	0.196491	0.270570	0.7910
D(UNEMPLOYMENT(-3))	0.118048	0.134579	0.877164	0.3963
D(UNEMPLOYMENT(-4))	0.283220	0.137131	2.065317	0.0594
D(UNEMPLOYMENT(-5))	-0.029286	0.139210	-0.210369	0.8366
D(UNEMPLOYMENT(-6))	0.294746	0.140815	2.093142	0.0565
D(UNEMPLOYMENT(-7))	0.214585	0.149679	1.433635	0.1753
C	3.978532	1.060909	3.750117	0.0024
@TREND(1985)	-0.025630	0.011271	-2.273974	0.0406

R-squared	0.748944	Mean dependent var	-0.024783
Adjusted R-squared	0.575136	S.D. dependent var	0.343774
S.E. of regression	0.224077	Akaike info criterion	0.145369
Sum squared resid	0.652738	Schwarz criterion	0.639062
Log likelihood	8.328255	Hannan-Quinn criter.	0.269532
F-statistic	4.309037	Durbin-Watson stat	2.434509
Prob(F-statistic)	0.008918		

Lending

Null Hypothesis: LENDING has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.447847	0.3496
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LENDING)
Method: Least Squares
Date: 06/30/17 Time: 13:29
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LENDING(-1)	-0.358715	0.146543	-2.447847	0.0212
C	1.517877	0.636024	2.386510	0.0243
@TREND(1985)	0.081604	0.036900	2.211469	0.0357

R-squared	0.181976	Mean dependent var	0.192333
Adjusted R-squared	0.121381	S.D. dependent var	0.885888
S.E. of regression	0.830384	Akaike info criterion	2.560783
Sum squared resid	18.61752	Schwarz criterion	2.700903
Log likelihood	-35.41174	Hannan-Quinn criter.	2.605608
F-statistic	3.003180	Durbin-Watson stat	1.631513
Prob(F-statistic)	0.066427		

Divorce

Null Hypothesis: DIVORCE has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 4 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.847865	0.1943
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIVORCE)
Method: Least Squares
Date: 06/30/17 Time: 13:29
Sample (adjusted): 1990 2015
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIVORCE(-1)	-0.319971	0.112355	-2.847865	0.0103
D(DIVORCE(-1))	-0.167058	0.188264	-0.887363	0.3860
D(DIVORCE(-2))	0.193995	0.181420	1.069317	0.2983
D(DIVORCE(-3))	0.609373	0.192118	3.171864	0.0050
D(DIVORCE(-4))	0.484859	0.206774	2.344870	0.0300
C	2.754467	0.947012	2.908588	0.0090
@TREND(1985)	0.023946	0.009523	2.514488	0.0211

R-squared	0.487905	Mean dependent var	0.073624
Adjusted R-squared	0.326190	S.D. dependent var	0.082371
S.E. of regression	0.067615	Akaike info criterion	-2.325166
Sum squared resid	0.086864	Schwarz criterion	-1.986447
Log likelihood	37.22715	Hannan-Quinn criter.	-2.227627
F-statistic	3.017077	Durbin-Watson stat	1.891217
Prob(F-statistic)	0.030344		

Appendices 4.3 PP (Without trend) (Level form)

Bankruptcy

Null Hypothesis: BANKRUPTCY has a unit root
Exogenous: Constant
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.175524	0.0316
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.023392
HAC corrected variance (Bartlett kernel)	0.013765

Phillips-Perron Test Equation
Dependent Variable: D(BANKRUPTCY)
Method: Least Squares
Date: 06/30/17 Time: 13:32
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BANKRUPTCY(-1)	-0.120515	0.044603	-2.701938	0.0116
C	1.174745	0.407677	2.881554	0.0075

R-squared	0.206809	Mean dependent var	0.075998
Adjusted R-squared	0.178481	S.D. dependent var	0.174665
S.E. of regression	0.158313	Akaike info criterion	-0.784149
Sum squared resid	0.701761	Schwarz criterion	-0.690736
Log likelihood	13.76224	Hannan-Quinn criter.	-0.754266
F-statistic	7.300468	Durbin-Watson stat	1.998906
Prob(F-statistic)	0.011575		

Unemployment

Null Hypothesis: UNEMPLOYMENT has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.690740	0.4255
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.289627
HAC corrected variance (Bartlett kernel)	0.375906

Phillips-Perron Test Equation
Dependent Variable: D(UNEMPLOYMENT)
Method: Least Squares
Date: 06/30/17 Time: 13:34
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UNEMPLOYMENT(-1)	-0.100338	0.060219	-1.666219	0.1068
C	0.283039	0.264984	1.068136	0.2946

R-squared	0.090209	Mean dependent var	-0.124667
Adjusted R-squared	0.057716	S.D. dependent var	0.573866
S.E. of regression	0.557059	Akaike info criterion	1.732050
Sum squared resid	8.688823	Schwarz criterion	1.825464
Log likelihood	-23.98076	Hannan-Quinn criter.	1.761934
F-statistic	2.776287	Durbin-Watson stat	1.029698
Prob(F-statistic)	0.106820		

Lending

Null Hypothesis: LENDING has a unit root
Exogenous: Constant
Bandwidth: 12 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.626119	0.8501
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.732992
HAC corrected variance (Bartlett kernel)	0.355856

Phillips-Perron Test Equation
Dependent Variable: D(LENDING)
Method: Least Squares
Date: 06/30/17 Time: 13:39
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LENDING(-1)	-0.073477	0.074236	-0.989770	0.3308
C	0.722935	0.559970	1.291024	0.2073

R-squared	0.033805	Mean dependent var	0.192333
Adjusted R-squared	-0.000702	S.D. dependent var	0.885888
S.E. of regression	0.886199	Akaike info criterion	2.660591
Sum squared resid	21.98977	Schwarz criterion	2.754004
Log likelihood	-37.90886	Hannan-Quinn criter.	2.690474
F-statistic	0.979644	Durbin-Watson stat	1.803062
Prob(F-statistic)	0.330763		

Divorce

Null Hypothesis: DIVORCE has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		0.461402	0.9823
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.005919
HAC corrected variance (Bartlett kernel)	0.007247

Phillips-Perron Test Equation
Dependent Variable: D(DIVORCE)
Method: Least Squares
Date: 06/30/17 Time: 13:41
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIVORCE(-1)	0.012213	0.021091	0.579063	0.5672
C	-0.053258	0.207624	-0.256512	0.7994

R-squared	0.011834	Mean dependent var	0.066674
Adjusted R-squared	-0.023458	S.D. dependent var	0.078720
S.E. of regression	0.079638	Akaike info criterion	-2.158306
Sum squared resid	0.177583	Schwarz criterion	-2.064893
Log likelihood	34.37459	Hannan-Quinn criter.	-2.128423
F-statistic	0.335314	Durbin-Watson stat	2.155983
Prob(F-statistic)	0.567177		

Appendices 4.4 PP (With trend)

Bankruptcy

Null Hypothesis: BANKRUPTCY has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.088369	0.1271
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.019547
HAC corrected variance (Bartlett kernel)	0.008901

Phillips-Perron Test Equation
Dependent Variable: D(BANKRUPTCY)
Method: Least Squares
Date: 06/30/17 Time: 13:33
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BANKRUPTCY(-1)	-0.408020	0.131487	-3.103117	0.0045
C	3.444333	1.055449	3.263381	0.0030
@TREND(1985)	0.022686	0.009844	2.304483	0.0291

R-squared	0.337180	Mean dependent var	0.075998
Adjusted R-squared	0.288082	S.D. dependent var	0.174665
S.E. of regression	0.147374	Akaike info criterion	-0.897042
Sum squared resid	0.586418	Schwarz criterion	-0.756923
Log likelihood	16.45564	Hannan-Quinn criter.	-0.852217
F-statistic	6.867513	Durbin-Watson stat	1.864173
Prob(F-statistic)	0.003880		

Unemployment

Null Hypothesis: UNEMPLOYMENT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.343889	0.8567
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.289616
HAC corrected variance (Bartlett kernel)	0.375459

Phillips-Perron Test Equation
Dependent Variable: D(UNEMPLOYMENT)
Method: Least Squares
Date: 06/30/17 Time: 13:35
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UNEMPLOYMENT(-1)	-0.098476	0.083642	-1.177356	0.2493
C	0.267196	0.554228	0.482105	0.6336
@TREND(1985)	0.000534	0.016321	0.032726	0.9741

R-squared	0.090245	Mean dependent var	-0.124667
Adjusted R-squared	0.022855	S.D. dependent var	0.573866
S.E. of regression	0.567270	Akaike info criterion	1.798677
Sum squared resid	8.688478	Schwarz criterion	1.938797
Log likelihood	-23.98016	Hannan-Quinn criter.	1.843503
F-statistic	1.339156	Durbin-Watson stat	1.032030
Prob(F-statistic)	0.278921		

Lending

Null Hypothesis: LENDING has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.375723	0.3838
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.620584
HAC corrected variance (Bartlett kernel)	0.569246

Phillips-Perron Test Equation
Dependent Variable: D(LENDING)
Method: Least Squares
Date: 06/30/17 Time: 13:40
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LENDING(-1)	-0.358715	0.146543	-2.447847	0.0212
C	1.517877	0.636024	2.386510	0.0243
@TREND(1985)	0.081604	0.036900	2.211469	0.0357

R-squared	0.181976	Mean dependent var	0.192333
Adjusted R-squared	0.121381	S.D. dependent var	0.885888
S.E. of regression	0.830384	Akaike info criterion	2.560783
Sum squared resid	18.61752	Schwarz criterion	2.700903
Log likelihood	-35.41174	Hannan-Quinn criter.	2.605608
F-statistic	3.003180	Durbin-Watson stat	1.631513
Prob(F-statistic)	0.066427		

Divorce

Null Hypothesis: DIVORCE has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.204199	0.4703
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.004909
HAC corrected variance (Bartlett kernel)	0.005931

Phillips-Perron Test Equation
Dependent Variable: D(DIVORCE)
Method: Least Squares
Date: 06/30/17 Time: 13:42
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIVORCE(-1)	-0.190950	0.088361	-2.161038	0.0397
C	1.684592	0.761814	2.211291	0.0357
@TREND(1985)	0.016593	0.007038	2.357746	0.0259

R-squared	0.180549	Mean dependent var	0.066674
Adjusted R-squared	0.119849	S.D. dependent var	0.078720
S.E. of regression	0.073852	Akaike info criterion	-2.278856
Sum squared resid	0.147263	Schwarz criterion	-2.138736
Log likelihood	37.18283	Hannan-Quinn criter.	-2.234030
F-statistic	2.974438	Durbin-Watson stat	2.122812
Prob(F-statistic)	0.068008		

Appendices 4.5 ADF (without trend) (First difference)

Bankruptcy

Null Hypothesis: D(BANKRUPTCY) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.642881	0.0009
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BANKRUPTCY,2)
Method: Least Squares
Date: 06/30/17 Time: 13:23
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BANKRUPTCY(-1))	-0.927237	0.199712	-4.642881	0.0001
C	0.067149	0.037494	1.790929	0.0845

R-squared	0.443945	Mean dependent var	-0.011804
Adjusted R-squared	0.423350	S.D. dependent var	0.236971
S.E. of regression	0.179950	Akaike info criterion	-0.525809
Sum squared resid	0.874309	Schwarz criterion	-0.431513
Log likelihood	9.624229	Hannan-Quinn criter.	-0.496276
F-statistic	21.55635	Durbin-Watson stat	1.773733
Prob(F-statistic)	0.000080		

Unemployment

Null Hypothesis: D(UNEMPLOYMENT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.175002	0.0030
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UNEMPLOYMENT,2)
Method: Least Squares
Date: 06/30/17 Time: 13:23
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEMPLOYMENT(-1))	-0.647063	0.154985	-4.175002	0.0003
C	-0.127039	0.090676	-1.401026	0.1726

R-squared	0.392311	Mean dependent var	-0.036897
Adjusted R-squared	0.369804	S.D. dependent var	0.597418
S.E. of regression	0.474259	Akaike info criterion	1.412347
Sum squared resid	6.072889	Schwarz criterion	1.506643
Log likelihood	-18.47903	Hannan-Quinn criter.	1.441879
F-statistic	17.43064	Durbin-Watson stat	1.727296
Prob(F-statistic)	0.000278		

Lending

Null Hypothesis: D(LENDING) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.864413	0.0005
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LENDING,2)
Method: Least Squares
Date: 06/30/17 Time: 13:24
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LENDING(-1))	-0.950675	0.195435	-4.864413	0.0000
C	0.190955	0.173081	1.103269	0.2796

R-squared	0.467062	Mean dependent var	0.036552
Adjusted R-squared	0.447323	S.D. dependent var	1.232490
S.E. of regression	0.916260	Akaike info criterion	2.729440
Sum squared resid	22.66739	Schwarz criterion	2.823736
Log likelihood	-37.57688	Hannan-Quinn criter.	2.758972
F-statistic	23.66251	Durbin-Watson stat	1.956477
Prob(F-statistic)	0.000044		

Divorce

Null Hypothesis: D(DIVORCE) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.610312	0.0001
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIVORCE,2)
Method: Least Squares
Date: 06/30/17 Time: 13:25
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DIVORCE(-1))	-1.074843	0.191584	-5.610312	0.0000
C	0.073984	0.019904	3.717124	0.0009

R-squared	0.538269	Mean dependent var	0.000164
Adjusted R-squared	0.521168	S.D. dependent var	0.116220
S.E. of regression	0.080422	Akaike info criterion	-2.136594
Sum squared resid	0.174626	Schwarz criterion	-2.042298
Log likelihood	32.98062	Hannan-Quinn criter.	-2.107062
F-statistic	31.47560	Durbin-Watson stat	1.991547
Prob(F-statistic)	0.000006		

Appendices 4.6 ADF (With trend) (First difference)

Bankruptcy

Null Hypothesis: D(BANKRUPTCY) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.027546	0.0018
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BANKRUPTCY,2)
Method: Least Squares
Date: 06/30/17 Time: 13:28
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BANKRUPTCY(-1))	-1.008026	0.200501	-5.027546	0.0000
C	0.177156	0.077532	2.284927	0.0307
@TREND(1985)	-0.006445	0.004010	-1.607462	0.1200

R-squared	0.494211	Mean dependent var	-0.011804
Adjusted R-squared	0.455304	S.D. dependent var	0.236971
S.E. of regression	0.174893	Akaike info criterion	-0.551592
Sum squared resid	0.795273	Schwarz criterion	-0.410147
Log likelihood	10.99808	Hannan-Quinn criter.	-0.507293
F-statistic	12.70243	Durbin-Watson stat	1.816430
Prob(F-statistic)	0.000142		

Unemployment

Null Hypothesis: D(UNEMPLOYMENT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.813219	0.0031
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UNEMPLOYMENT,2)
Method: Least Squares
Date: 06/30/17 Time: 13:28
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEMPLOYMENT(-1))	-0.705451	0.146565	-4.813219	0.0001
C	-0.496646	0.183432	-2.707525	0.0118
@TREND(1985)	0.022592	0.009954	2.269589	0.0318

R-squared	0.492797	Mean dependent var	-0.036897
Adjusted R-squared	0.453781	S.D. dependent var	0.597418
S.E. of regression	0.441531	Akaike info criterion	1.300561
Sum squared resid	5.068695	Schwarz criterion	1.442006
Log likelihood	-15.85814	Hannan-Quinn criter.	1.344860
F-statistic	12.63075	Durbin-Watson stat	1.951212
Prob(F-statistic)	0.000147		

Lending

Null Hypothesis: D(LENDING) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.767967	0.0034
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LENDING,2)
Method: Least Squares
Date: 06/30/17 Time: 13:29
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LENDING(-1))	-0.950257	0.199300	-4.767967	0.0001
C	0.173134	0.376898	0.459366	0.6498
@TREND(1985)	0.001110	0.020738	0.053502	0.9577

R-squared	0.467120	Mean dependent var	0.036552
Adjusted R-squared	0.426129	S.D. dependent var	1.232490
S.E. of regression	0.933663	Akaike info criterion	2.798295
Sum squared resid	22.66490	Schwarz criterion	2.939740
Log likelihood	-37.57528	Hannan-Quinn criter.	2.842594
F-statistic	11.39575	Durbin-Watson stat	1.957295
Prob(F-statistic)	0.000279		

Divorce

Null Hypothesis: D(DIVORCE) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.662717	0.0004
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIVORCE,2)
Method: Least Squares
Date: 06/30/17 Time: 13:30
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DIVORCE(-1))	-1.123644	0.198428	-5.662717	0.0000
C	0.048860	0.032838	1.487917	0.1488
@TREND(1985)	0.001780	0.001849	0.962678	0.3446

R-squared	0.554161	Mean dependent var	0.000164
Adjusted R-squared	0.519865	S.D. dependent var	0.116220
S.E. of regression	0.080531	Akaike info criterion	-2.102652
Sum squared resid	0.168616	Schwarz criterion	-1.961208
Log likelihood	33.48846	Hannan-Quinn criter.	-2.058354
F-statistic	16.15848	Durbin-Watson stat	1.959598
Prob(F-statistic)	0.000027		

Appendices 4.7 PP (Without trend) (First difference)

Bankruptcy

Null Hypothesis: D(BANKRUPTCY) has a unit root
Exogenous: Constant
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.549401	0.0011
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.030149
HAC corrected variance (Bartlett kernel)	0.018379

Phillips-Perron Test Equation
Dependent Variable: D(BANKRUPTCY,2)
Method: Least Squares
Date: 06/30/17 Time: 13:32
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BANKRUPTCY(-1))	-0.927237	0.199712	-4.642881	0.0001
C	0.067149	0.037494	1.790929	0.0845

R-squared	0.443945	Mean dependent var	-0.011804
Adjusted R-squared	0.423350	S.D. dependent var	0.236971
S.E. of regression	0.179950	Akaike info criterion	-0.525809
Sum squared resid	0.874309	Schwarz criterion	-0.431513
Log likelihood	9.624229	Hannan-Quinn criter.	-0.496276
F-statistic	21.55635	Durbin-Watson stat	1.773733
Prob(F-statistic)	0.000080		

Unemployment

Null Hypothesis: D(UNEMPLOYMENT) has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.305127	0.0021
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.209410
HAC corrected variance (Bartlett kernel)	0.320832

Phillips-Perron Test Equation
Dependent Variable: D(UNEMPLOYMENT,2)
Method: Least Squares
Date: 06/30/17 Time: 13:34
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEMPLOYMENT(-1))	-0.647063	0.154985	-4.175002	0.0003
C	-0.127039	0.090676	-1.401026	0.1726

R-squared	0.392311	Mean dependent var	-0.036897
Adjusted R-squared	0.369804	S.D. dependent var	0.597418
S.E. of regression	0.474259	Akaike info criterion	1.412347
Sum squared resid	6.072889	Schwarz criterion	1.506643
Log likelihood	-18.47903	Hannan-Quinn criter.	1.441879
F-statistic	17.43064	Durbin-Watson stat	1.727296
Prob(F-statistic)	0.000278		

Lending

Null Hypothesis: D(LENDING) has a unit root
Exogenous: Constant
Bandwidth: 22 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.257031	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.781634
HAC corrected variance (Bartlett kernel)	0.088283

Phillips-Perron Test Equation
Dependent Variable: D(LENDING,2)
Method: Least Squares
Date: 06/30/17 Time: 13:39
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LENDING(-1))	-0.950675	0.195435	-4.864413	0.0000
C	0.190955	0.173081	1.103269	0.2796

R-squared	0.467062	Mean dependent var	0.036552
Adjusted R-squared	0.447323	S.D. dependent var	1.232490
S.E. of regression	0.916260	Akaike info criterion	2.729440
Sum squared resid	22.66739	Schwarz criterion	2.823736
Log likelihood	-37.57688	Hannan-Quinn criter.	2.758972
F-statistic	23.66251	Durbin-Watson stat	1.956477
Prob(F-statistic)	0.000044		

Divorce

Null Hypothesis: D(DIVORCE) has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.655741	0.0001
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.006022
HAC corrected variance (Bartlett kernel)	0.008618

Phillips-Perron Test Equation
Dependent Variable: D(DIVORCE,2)
Method: Least Squares
Date: 06/30/17 Time: 13:42
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DIVORCE(-1))	-1.074843	0.191584	-5.610312	0.0000
C	0.073984	0.019904	3.717124	0.0009

R-squared	0.538269	Mean dependent var	0.000164
Adjusted R-squared	0.521168	S.D. dependent var	0.116220
S.E. of regression	0.080422	Akaike info criterion	-2.136594
Sum squared resid	0.174626	Schwarz criterion	-2.042298
Log likelihood	32.98062	Hannan-Quinn criter.	-2.107062
F-statistic	31.47560	Durbin-Watson stat	1.991547
Prob(F-statistic)	0.000006		

Appendices 4.8 PP (With trend)

Bankruptcy

Null Hypothesis: D(BANKRUPTCY) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 9 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.413289	0.0007
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.027423
HAC corrected variance (Bartlett kernel)	0.010155

Phillips-Perron Test Equation
Dependent Variable: D(BANKRUPTCY,2)
Method: Least Squares
Date: 06/30/17 Time: 13:33
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BANKRUPTCY(-1))	-1.008026	0.200501	-5.027546	0.0000
C	0.177156	0.077532	2.284927	0.0307
@TREND(1985)	-0.006445	0.004010	-1.607462	0.1200

R-squared	0.494211	Mean dependent var	-0.011804
Adjusted R-squared	0.455304	S.D. dependent var	0.236971
S.E. of regression	0.174893	Akaike info criterion	-0.551592
Sum squared resid	0.795273	Schwarz criterion	-0.410147
Log likelihood	10.99808	Hannan-Quinn criter.	-0.507293
F-statistic	12.70243	Durbin-Watson stat	1.816430
Prob(F-statistic)	0.000142		

Unemployment

Null Hypothesis: D(UNEMPLOYMENT) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.801628	0.0031
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.174783
HAC corrected variance (Bartlett kernel)	0.180258

Phillips-Perron Test Equation
Dependent Variable: D(UNEMPLOYMENT,2)
Method: Least Squares
Date: 06/30/17 Time: 13:35
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEMPLOYMENT(-1))	-0.705451	0.146565	-4.813219	0.0001
C	-0.496646	0.183432	-2.707525	0.0118
@TREND(1985)	0.022592	0.009954	2.269589	0.0318

R-squared	0.492797	Mean dependent var	-0.036897
Adjusted R-squared	0.453781	S.D. dependent var	0.597418
S.E. of regression	0.441531	Akaike info criterion	1.300561
Sum squared resid	5.068695	Schwarz criterion	1.442006
Log likelihood	-15.85814	Hannan-Quinn criter.	1.344860
F-statistic	12.63075	Durbin-Watson stat	1.951212
Prob(F-statistic)	0.000147		

Lending

Null Hypothesis: D(LENDING) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 21 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.790847	0.0000
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.781548
HAC corrected variance (Bartlett kernel)	0.094630

Phillips-Perron Test Equation
Dependent Variable: D(LENDING,2)
Method: Least Squares
Date: 06/30/17 Time: 13:40
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LENDING(-1))	-0.950257	0.199300	-4.767967	0.0001
C	0.173134	0.376898	0.459366	0.6498
@TREND(1985)	0.001110	0.020738	0.053502	0.9577

R-squared	0.467120	Mean dependent var	0.036552
Adjusted R-squared	0.426129	S.D. dependent var	1.232490
S.E. of regression	0.933663	Akaike info criterion	2.798295
Sum squared resid	22.66490	Schwarz criterion	2.939740
Log likelihood	-37.57528	Hannan-Quinn criter.	2.842594
F-statistic	11.39575	Durbin-Watson stat	1.957295
Prob(F-statistic)	0.000279		

Divorce

Null Hypothesis: D(DIVORCE) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.699697	0.0004
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.005814
HAC corrected variance (Bartlett kernel)	0.007978

Phillips-Perron Test Equation
Dependent Variable: D(DIVORCE,2)
Method: Least Squares
Date: 06/30/17 Time: 13:43
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DIVORCE(-1))	-1.123644	0.198428	-5.662717	0.0000
C	0.048860	0.032838	1.487917	0.1488
@TREND(1985)	0.001780	0.001849	0.962678	0.3446

R-squared	0.554161	Mean dependent var	0.000164
Adjusted R-squared	0.519865	S.D. dependent var	0.116220
S.E. of regression	0.080531	Akaike info criterion	-2.102652
Sum squared resid	0.168616	Schwarz criterion	-1.961208
Log likelihood	33.48846	Hannan-Quinn criter.	-2.058354
F-statistic	16.15848	Durbin-Watson stat	1.959598
Prob(F-statistic)	0.000027		

Appendices 4.9 Multicollinearity

	Divorce	Lending	Unemployment
Divorce	1.000000	0.875662	-0.557647
Lending	0.875662	1.000000	-0.550533
Unemployment	-0.557647	-0.557647	1.000000

Correlation analysis

Dependent variable	Independent variable	R-Squared	VIF=
Lending	Divorce	0.766785	1.000000

Dependent variable	Independent variable	R-squared	VIF
Divorce	Lending	0.766785	1.000000

Dependent Variable: LENDING
Method: Least Squares
Date: 05/06/17 Time: 22:03
Sample: 1985 2015
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIVORCE	2.736190	0.280214	9.764657	0.0000
C	-19.64931	2.769326	-7.095341	0.0000

R-squared	0.766785	Mean dependent var	7.322581
Adjusted R-squared	0.758743	S.D. dependent var	2.251206
S.E. of regression	1.105746	Akaike info criterion	3.101259
Sum squared resid	35.45757	Schwarz criterion	3.193774
Log likelihood	-46.06951	Hannan-Quinn criter.	3.131416
F-statistic	95.34852	Durbin-Watson stat	0.612587
Prob(F-statistic)	0.000000		

Variance Inflation Factors
Date: 05/06/17 Time: 21:42
Sample: 1985 2015
Included observations: 31

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
DIVORCE	0.078520	194.4459	1.000000
C	7.669164	194.4459	NA

Conclusion: Multi happen but not a serious multi problem

Appendices 4.10 Heteroscedasticity

Heteroskedasticity Test: ARCH

F-statistic	3.032021	Prob. F(1,28)	0.0926
Obs*R-squared	2.931187	Prob. Chi-Square(1)	0.0869

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/06/17 Time: 21:44
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.031314	0.009316	3.361440	0.0023
RESID^2(-1)	0.165420	0.095000	1.741270	0.0926

R-squared	0.097706	Mean dependent var	0.040198
Adjusted R-squared	0.065481	S.D. dependent var	0.044162
S.E. of regression	0.042692	Akaike info criterion	-3.405290
Sum squared resid	0.051032	Schwarz criterion	-3.311877
Log likelihood	53.07935	Hannan-Quinn criter.	-3.375406
F-statistic	3.032021	Durbin-Watson stat	2.120376
Prob(F-statistic)	0.092615		

Appendices 4.11 Specification bias

Ramsey RESET Test
Equation: UNTITLED
Specification: BANKRUPTCY DIVORCE LENDING UNEMPLOYMENT C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.856965	26	0.0747
F-statistic	3.448318	(1, 26)	0.0747
Likelihood ratio	3.860748	1	0.0494

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.191444	1	0.191444
Restricted SSR	1.634911	27	0.060552
Unrestricted SSR	1.443468	26	0.055518
Unrestricted SSR	1.443468	26	0.055518

LR test summary:

	Value	df
Restricted LogL	1.620086	27
Unrestricted LogL	3.550459	26

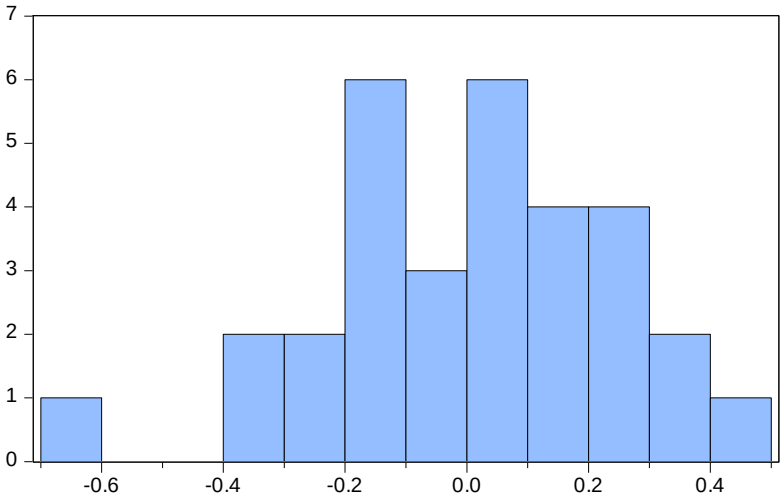
Unrestricted Test Equation:
Dependent Variable: BANKRUPTCY
Method: Least Squares
Date: 05/06/17 Time: 21:44
Sample: 1985 2015
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIVORCE	6.227524	3.117993	1.997286	0.0564
LENDING	0.993736	0.495841	2.004143	0.0556
UNEMPLOYMENT	-1.476638	0.730185	-2.022279	0.0535
C	3.640609	1.204311	3.022980	0.0056
FITTED^2	-0.681807	0.367162	-1.856965	0.0747

R-squared	0.889647	Mean dependent var	9.139907
Adjusted R-squared	0.872670	S.D. dependent var	0.660315
S.E. of regression	0.235623	Akaike info criterion	0.093519
Sum squared resid	1.443468	Schwarz criterion	0.324807
Log likelihood	3.550459	Hannan-Quinn criter.	0.168913
F-statistic	52.40202	Durbin-Watson stat	0.858828
Prob(F-statistic)	0.000000		

Conclusion: No specification bias

Appendices 4.12 Normality test



Series: Residuals
Sample 1985 2015
Observations 31

Mean	-3.94e-15
Median	0.026544
Maximum	0.422477
Minimum	-0.654949
Std. Dev.	0.233446
Skewness	-0.496802
Kurtosis	3.352222
Jarque-Bera	1.435440
Probability	0.487863

Conclusion: Error term is normally distribute

Appendices 4.13Autocorrelation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	5.815723	Prob. F(2,25)	0.0084
Obs*R-squared	9.843314	Prob. Chi-Square(2)	0.0073

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/06/17 Time: 21:52
Sample: 1985 2015
Included observations: 31
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIVORCE	0.006409	0.120315	0.053267	0.9579
LENDING	-0.001684	0.038288	-0.043980	0.9653
UNEMPLOYMENT	0.005010	0.028510	0.175737	0.8619
C	-0.073578	1.006231	-0.073123	0.9423
RESID(-1)	0.655753	0.192288	3.410271	0.0022
RESID(-2)	-0.320812	0.206370	-1.554550	0.1326

R-squared	0.317526	Mean dependent var	-3.94E-15
Adjusted R-squared	0.181032	S.D. dependent var	0.233446
S.E. of regression	0.211261	Akaike info criterion	-0.099456
Sum squared resid	1.115784	Schwarz criterion	0.178090
Log likelihood	7.541570	Hannan-Quinn criter.	-0.008983
F-statistic	2.326289	Durbin-Watson stat	1.597173
Prob(F-statistic)	0.072642		

Conclusion: Autocorrelation problem, proceed to apply Newey west

Newey west

Dependent Variable: BANKRUPTCY
Method: Least Squares
Date: 05/07/17 Time: 20:59
Sample: 1985 2015
Included observations: 31
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIVORCE	0.442241	0.098053	4.510228	0.0001
LENDING	0.075986	0.022879	3.321195	0.0026
UNEMPLOYMENT	-0.121926	0.044590	-2.734383	0.0109
C	4.715952	0.994437	4.742331	0.0001

R-squared	0.875011	Mean dependent var	9.139907
Adjusted R-squared	0.861124	S.D. dependent var	0.660315
S.E. of regression	0.246074	Akaike info criterion	0.153543
Sum squared resid	1.634911	Schwarz criterion	0.338573
Log likelihood	1.620086	Hannan-Quinn criter.	0.213858
F-statistic	63.00659	Durbin-Watson stat	0.760269
Prob(F-statistic)	0.000000		

Appendices 4.14VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: BANKRUPTCY UNEMPLOYMENT LENDING DIVORCE
Exogenous variables: C
Date: 07/06/17 Time: 15:29
Sample: 1985 2015
Included observations: 29

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-111.5861	NA	0.034049	7.971452	8.160045	8.030517
1	8.770430	199.2107*	2.59e-05*	0.774453	1.717416*	1.069777*
2	25.61924	23.23974	2.62e-05	0.715914*	2.413247	1.247498

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Appendices 4.15 Johansen Cointegration Test

Date: 07/03/17 Time: 20:30
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments
Trend assumption: Linear deterministic trend
Series: BANKRUPTCY UNEMPLOYMENT LENDING DIVORCE
Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.751560	79.68842	47.85613	0.0000
At most 1 *	0.663688	40.69688	29.79707	0.0019
At most 2	0.302494	10.18481	15.49471	0.2668
At most 3	0.003492	0.097959	3.841466	0.7543

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.751560	38.99154	27.58434	0.0011
At most 1 *	0.663688	30.51207	21.13162	0.0018
At most 2	0.302494	10.08685	14.26460	0.2063
At most 3	0.003492	0.097959	3.841466	0.7543

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

BANKRUPTCY	UNEMPLOYMENT	LENDING	DIVORCE
1.962585	0.143401	-1.847505	2.974486
-0.113787	1.015276	0.413888	-0.908062
-7.598632	-0.843871	0.449641	3.589783
-1.422300	0.394179	0.035537	2.830094

Unrestricted Adjustment Coefficients (alpha):

D(BANKRUPTCY)	0.015853	0.045362	0.047878	-0.006226
D(UNEMPLOYMENT)	-0.146783	-0.215778	0.003071	-0.008690
D(LENDING)	0.233562	0.051024	-0.308662	-0.028835
D(DIVORCE)	-0.054406	0.009239	-0.017005	-0.001326

1 Cointegrating Equation(s):	Log likelihood	26.41475

Normalized cointegrating coefficients (standard error in parentheses)

BANKRUPTCY	UNEMPLOYMENT	LENDING	DIVORCE
1.000000	0.073067	-0.941363	1.515596
	(0.08022)	(0.11933)	(0.31232)

Adjustment coefficients (standard error in parentheses)

D(BANKRUPTCY)	0.031113
	(0.06840)
D(UNEMPLOYMENT)	-0.288075
	(0.14550)
D(LENDING)	0.458386
	(0.35077)
D(DIVORCE)	-0.106776
	(0.02344)

2 Cointegrating Equation(s): Log likelihood 41.67079

Normalized cointegrating coefficients (standard error in parentheses)

BANKRUPTCY	UNEMPLOYMENT	LENDING	DIVORCE
1.000000	0.000000	-0.963261	1.568106
		(0.11689)	(0.31449)
0.000000	1.000000	0.299703	-0.718653
		(0.27588)	(0.74224)

Adjustment coefficients (standard error in parentheses)

D(BANKRUPTCY)	0.025952	0.048328
	(0.06521)	(0.03401)
D(UNEMPLOYMENT)	-0.263522	-0.240123
	(0.10604)	(0.05531)
D(LENDING)	0.452580	0.085296
	(0.35056)	(0.18284)
D(DIVORCE)	-0.107827	0.001578
	(0.02308)	(0.01204)

3 Cointegrating Equation(s): Log likelihood 46.71421

Normalized cointegrating coefficients (standard error in parentheses)

BANKRUPTCY	UNEMPLOYMENT	LENDING	DIVORCE
1.000000	0.000000	0.000000	-0.600794
			(0.09907)
0.000000	1.000000	0.000000	-0.043836
			(0.30031)
0.000000	0.000000	1.000000	-2.251621
			(0.17072)

Adjustment coefficients (standard error in parentheses)

D(BANKRUPTCY)	-0.337854	0.007926	0.011014
	(0.24481)	(0.04142)	(0.06069)
D(UNEMPLOYMENT)	-0.286860	-0.242715	0.183256
	(0.42332)	(0.07162)	(0.10495)
D(LENDING)	2.797990	0.345767	-0.549176
	(1.27784)	(0.21620)	(0.31681)
D(DIVORCE)	0.021386	0.015928	0.096693

(0.08662)	(0.01466)	(0.02148)

Appendices 4.16 VECM

Vector Error Correction Estimates
Date: 07/03/17 Time: 20:32
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
BANKRUPTCY(-1)	1.000000
UNEMPLOYMENT(-1)	0.073067 (0.08022) [0.91082]
LENDING(-1)	-0.941363 (0.11933) [-7.88849]
DIVORCE(-1)	1.515596 (0.31232) [4.85264]
C	-17.50095

Error Correction:	D(BANKRUPTCY)	D(UNEMPLOYMENT)	D(LENDING)	D(DIVORCE)
CointEq1	0.031113 (0.06840) [0.45490]	-0.288075 (0.14550) [-1.97994]	0.458386 (0.35077) [1.30681]	-0.106776 (0.02344) [-4.55610]
D(BANKRUPTCY(-1))	0.007503 (0.23328) [0.03216]	-0.473538 (0.49625) [-0.95423]	-1.426839 (1.19637) [-1.19264]	-0.026323 (0.07993) [-0.32931]
D(BANKRUPTCY(-2))	-0.232918 (0.22856) [-1.01908]	-1.194955 (0.48620) [-2.45772]	-0.285089 (1.17216) [-0.24322]	0.006103 (0.07832) [0.07793]
D(UNEMPLOYMENT(-1))	-0.023675 (0.09433) [-0.25098]	0.687456 (0.20067) [3.42577]	0.639131 (0.48379) [1.32110]	0.048487 (0.03232) [1.50007]
D(UNEMPLOYMENT(-2))	0.016892 (0.07789) [0.21687]	-0.023443 (0.16569) [-0.14149]	-0.131594 (0.39946) [-0.32943]	-0.054247 (0.02669) [-2.03259]
D(LENDING(-1))	0.029201 (0.05051) [0.57808]	-0.197853 (0.10746) [-1.84125]	0.289493 (0.25906) [1.11748]	-0.038014 (0.01731) [-2.19628]

D(LENDING(-2))	-0.023671	-0.046404	0.169101	-0.024956
	(0.05040)	(0.10721)	(0.25847)	(0.01727)
	[-0.46968]	[-0.43283]	[0.65424]	[-1.44511]
D(DIVORCE(-1))	-0.013861	-2.134220	-2.016886	-0.885870
	(0.69609)	(1.48079)	(3.56993)	(0.23852)
	[-0.01991]	[-1.44127]	[-0.56496]	[-3.71406]
D(DIVORCE(-2))	0.174089	-4.905097	-1.710504	-0.567346
	(0.63047)	(1.34120)	(3.23341)	(0.21603)
	[0.27612]	[-3.65724]	[-0.52901]	[-2.62619]
C	0.063382	0.629195	0.643337	0.187367
	(0.10694)	(0.22749)	(0.54844)	(0.03664)
	[0.59269]	[2.76580]	[1.17303]	[5.11329]
R-squared	0.121371	0.616491	0.290139	0.583868
Adj. R-squared	-0.317944	0.424737	-0.064791	0.375802
Sum sq. resids	0.612107	2.770003	16.09954	0.071868
S.E. equation	0.184407	0.392287	0.945737	0.063188
F-statistic	0.276273	3.215002	0.817455	2.806164
Log likelihood	13.79245	-7.343294	-31.98249	43.78154
Akaike AIC	-0.270889	1.238807	2.998749	-2.412967
Schwarz SC	0.204898	1.714594	3.474537	-1.937180
Mean dependent	0.058375	-0.180714	0.206071	0.070737
S.D. dependent	0.160631	0.517214	0.916512	0.079978

Determinant resid covariance (dof adj.)	1.04E-05
Determinant resid covariance	1.78E-06
Log likelihood	26.41475
Akaike information criterion	1.256089
Schwarz criterion	3.349553

Diagnostic checking for VECM

Appendices 4.17 Autocorrelation

VEC Residual Portmanteau Tests for Autocorrelations
Null Hypothesis: no residual autocorrelations up to lag h
Date: 07/05/17 Time: 19:44
Sample: 1985 2015
Included observations: 28

Lags	Q-Stat	Prob.	Adj Q-Stat	Prob.	df
1	6.470236	NA*	6.709875	NA*	NA*
2	14.39627	NA*	15.24561	NA*	NA*
3	24.50845	0.6544	26.57124	0.5417	28
4	32.89024	0.8905	36.35000	0.7870	44
5	50.38473	0.8073	57.64764	0.5622	60
6	69.20769	0.6963	81.60413	0.3094	76
7	79.08842	0.8291	94.77844	0.4006	92
8	97.65776	0.7523	120.7755	0.1889	108
9	107.4960	0.8544	135.2740	0.2305	124
10	117.2118	0.9197	150.3874	0.2593	140

11	130.9038	0.9288	172.9390	0.1676	156
12	137.2091	0.9763	183.9733	0.2524	172

*The test is valid only for lags larger than the VAR lag order.
df is degrees of freedom for (approximate) chi-square distribution

Appendices 4.18 Normality test

VEC Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: residuals are multivariate normal
Date: 07/05/17 Time: 19:50
Sample: 1985 2015
Included observations: 28

Component	Skewness	Chi-sq	df	Prob.
1	0.864046	3.484019	1	0.0620
2	-0.723035	2.439637	1	0.1183
3	2.650268	32.77830	1	0.0000
4	-0.749190	2.619333	1	0.1056
Joint		41.32129	4	0.0000

Component	Kurtosis	Chi-sq	df	Prob.
1	5.443109	6.963576	1	0.0083
2	3.612633	0.437872	1	0.5082
3	11.74260	89.17188	1	0.0000
4	3.279199	0.090944	1	0.7630
Joint		96.66428	4	0.0000

Component	Jarque-Bera	df	Prob.
1	10.44760	2	0.0054
2	2.877509	2	0.2372
3	121.9502	2	0.0000
4	2.710277	2	0.2579
Joint	137.9856	8	0.0000

Appendices 4.19 Heteroscedasticity

VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)
Date: 07/05/17 Time: 19:59
Sample: 1985 2015
Included observations: 28

Joint test:

Chi-sq	df	Prob.
180.5474	180	0.4745

Individual components:

Dependent	R-squared	F(18,9)	Prob.	Chi-sq(18)	Prob.
res1*res1	0.892078	4.132974	0.0174	24.97818	0.1255
res2*res2	0.845717	2.740797	0.0626	23.68008	0.1658
res3*res3	0.400139	0.333526	0.9773	11.20388	0.8855
res4*res4	0.651893	0.936338	0.5702	18.25299	0.4391
res2*res1	0.623167	0.826847	0.6521	17.44867	0.4925
res3*res1	0.431557	0.379595	0.9617	12.08359	0.8429
res3*res2	0.637487	0.879262	0.6121	17.84964	0.4656
res4*res1	0.543640	0.595627	0.8330	15.22193	0.6467
res4*res2	0.625626	0.835564	0.6454	17.51754	0.4878
res4*res3	0.400863	0.334533	0.9770	11.22416	0.8846

Appendices 4.20 Granger Causality Test

VEC Granger Causality/Block Exogeneity Wald Tests
Date: 07/06/17 Time: 11:36
Sample: 1985 2015
Included observations: 28

Dependent variable: D(BANKRUPTCY)

Excluded	Chi-sq	df	Prob.
D(UNEMPLOYMENT)	0.075043	2	0.9632
D(LENDING)	0.740733	2	0.6905
D(DIVORCE)	0.110360	2	0.9463
All	0.817751	6	0.9916

Dependent variable: D(UNEMPLOYMENT)

Excluded	Chi-sq	df	Prob.
D(BANKRUPTCY)	6.427948	2	0.0402
D(LENDING)	3.391535	2	0.1835
D(DIVORCE)	13.59701	2	0.0011
All	19.45593	6	0.0035

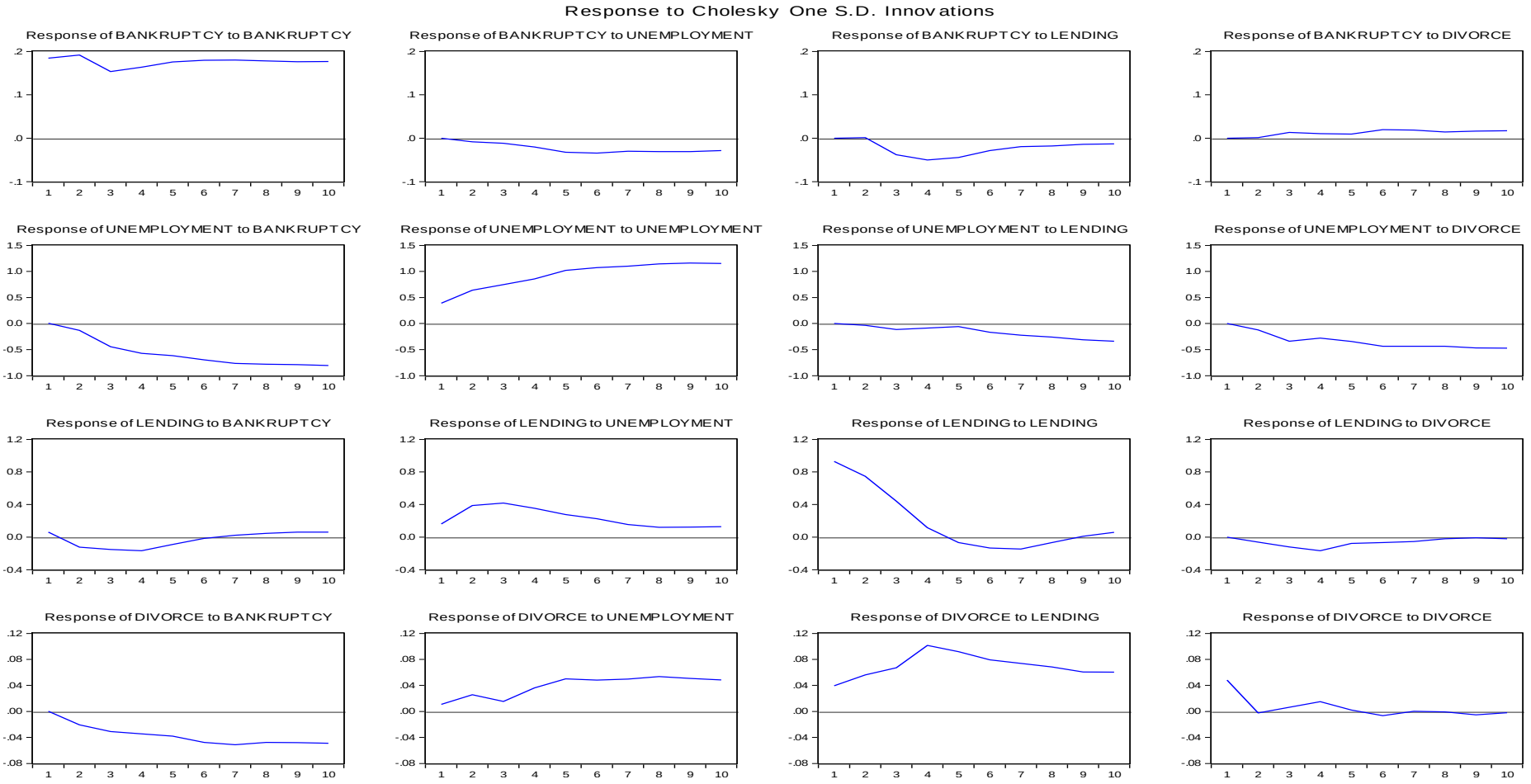
Dependent variable: D(LENDING)

Excluded	Chi-sq	df	Prob.
D(BANKRUPTCY)	1.428804	2	0.4895
D(UNEMPLOYMENT)	1.866506	2	0.3933
D(DIVORCE)	0.398863	2	0.8192
All	2.900230	6	0.8213

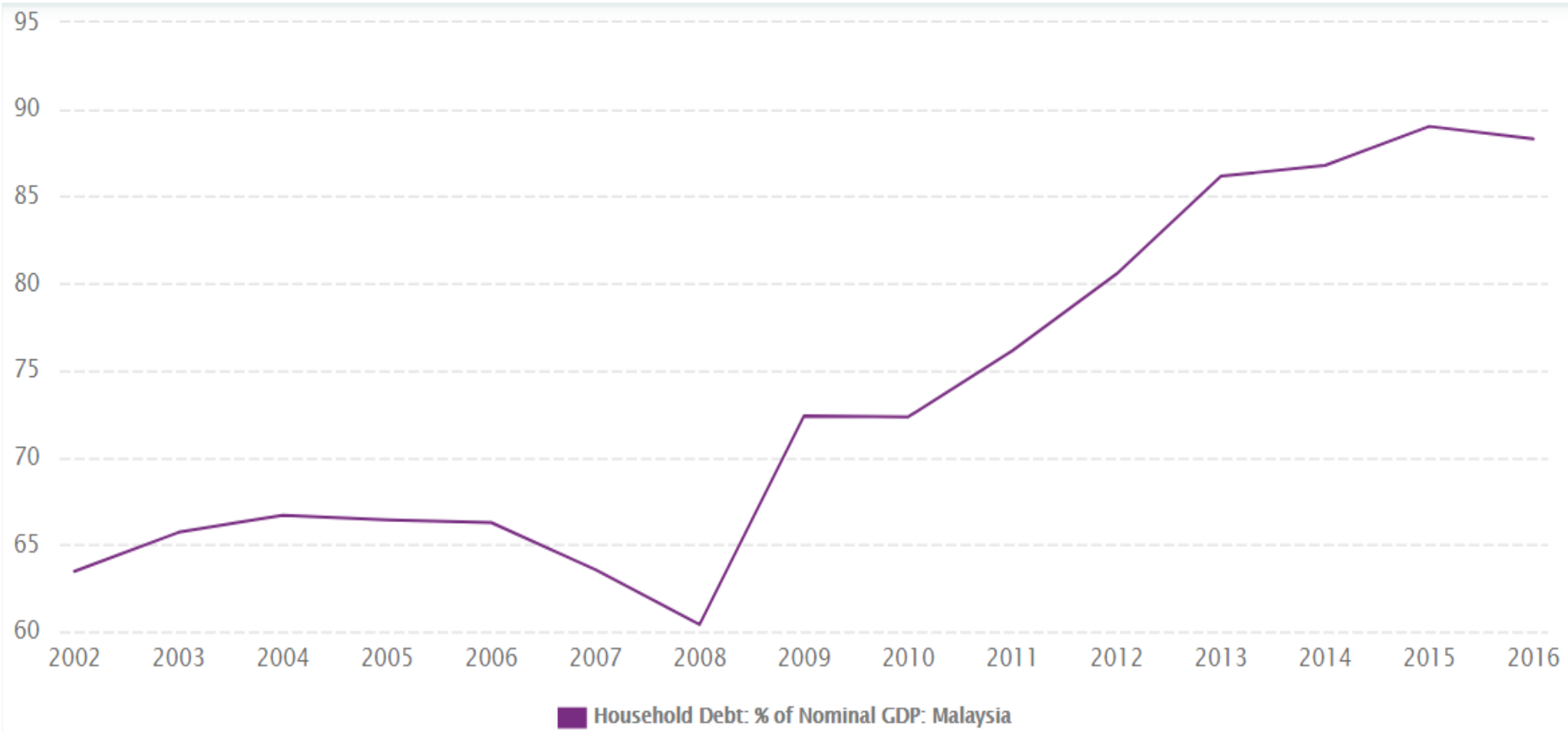
Dependent variable: D(DIVORCE)

Excluded	Chi-sq	df	Prob.
D(BANKRUPTCY)	0.123906	2	0.9399
D(UNEMPLOYMENT)	4.487689	2	0.1060
D(LENDING)	5.664226	2	0.0589
All	10.48103	6	0.1058

Appendices 4.21 Impulse Response Function



Appendices 5.1



Source: Bank Negara Malaysia (BNM)