

FACTORS OF CONSUMER BANKRUPTCY: A CASE
STUDY IN THE UNITED STATES

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DECLARATION

We hereby declare that:

- (1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references 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 learning.
- (3) Equal contribution has been made by each group member in completing the research project.
- (4) The word count of this research report is 11, 157 words.

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LIST OF ABBREVIATIONS

BANKRUPTCY	Consumer Bankruptcy Rate
BAPCPA	Bankruptcy Abuse Prevention and Consumer Protection Act
BLUE	Best Linear Unbiased Estimator
CDC	Communicable Disease Center
CLT	Central Limit Theorem
CREDIT	Credit Card Debt
DIVORCE	Divorce Rate
EU	European Union
IV	Instrumental Variable
LEND	Lending Rate
LOGCREDIT	Logarithm of Credit Card Debt
NCHS	National Center for Health Statistics
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PSID	Panel Study of Income Dynamics
SCF	Survey of Consumer Finances
VAR	Vector Autoregressions
VIF	Variance Inflation Factor

ABSTRACT

Consumer bankruptcy is one of the major issues in the United States but the determinants of consumer bankruptcy have rarely been explored. This paper presents an empirical study of the factors leading to consumer bankruptcy in the United States by utilizing the available data from 1980 to 2011. The determinants included in this research are credit card debt, lending rate and divorce rate. Ordinary Least Squares (OLS) multiple regression model was employed to study the relationship of credit card debt, lending rate and divorce rate towards consumer bankruptcy rate. The results suggest that there is a significantly positive relationship between credit card debt, lending rate and divorce rate towards consumer bankruptcy rate. This implies that the rising of credit card debt, lending rate and divorce rate will lead to the increasing of consumer bankruptcy in the United States. Based on this study, future researchers are recommended to use daily, quarterly or monthly data in order to obtain more accurate and reliable results. Besides, future researchers who intend to conduct study in developing countries are suggested to collect extra information on the determinants of consumer bankruptcy for the country. Moreover, future researchers are also recommended to have budget planning and search for sponsor funds to obtain the latest journals and data. Lastly, it is advisable to lengthen the study period of research so that future researchers could be more focused in studying more relevant topics.

CHAPTER 1: RESEARCH OVERVIEW

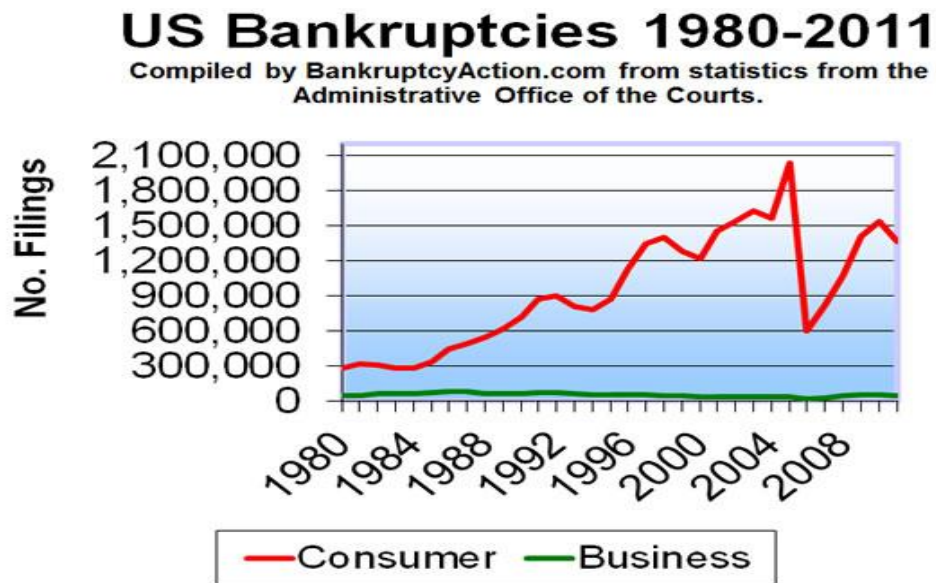
1.0 Introduction

Nowadays, there is a lot of bankruptcy cases happened in the world and they have become widespread. This research is designed to investigate the factors that lead to consumer bankruptcy in the United States. The idea of conducting this study is based on the research background and problem statement that had been identified, thus came out with research objectives and questions on the factors that cause consumer bankruptcy. This study developed the hypotheses of study to examine whether there is relationship between consumer bankruptcy rate and credit card debt, lending rate as well as divorce rate. Lastly, this study discussed about the significance of study, chapter layout and finally came out with a summary to conclude Chapter 1.

1.1 Research Background

Bankruptcy is currently a common issue held among countries. Consumers are forced to file for bankruptcy when they face financial hardship or cannot afford for unexpected major expenses. Claessens and Klapper (2002) tabulated the number of bankruptcy in different countries such as Australia, Hong Kong, Ireland and Russia. According to the statistic, the top five countries with high number of bankruptcy are the United States (U.S.), United Kingdom, France, Germany and Japan. Hence, this has driven the interest to study the determinants of consumer bankruptcy in U.S. which has the highest consumer bankruptcy rate among other countries from the period of 1980 to 2011.

Figure 1.1



Source: Administrative Office of the Courts.

Figure 1.1 shows the number of consumers and businesses filing for bankruptcy from year 1980 to 2011 in U.S.. Since the main concern of this study is on consumer bankruptcy, this study has only focused on studying the trend on consumer bankruptcy filing. Based on Figure 1.1, the number of consumers filing for bankruptcy shows an increasing trend from year 1980 to 2005. The highest number of consumers filing for bankruptcy is in year 2005 which is about 2,039,214 people. Garrett (2007) revealed that the rapidly increase in the number of consumer bankruptcy was generally caused by debt overload and impact of unexpected negative shock such as divorce, unemployment and medical expenses. The number of consumer bankruptcy rose in U.S. when there was a decline in consumer saving and rose in consumer debt including mortgage payment, personal debt and credit card debt. In addition, there was also evidence showing that casino gambling activity also contributed to the number of consumer bankruptcy. Barron, Staten and Wilshusen (2002) found that casino gambling had brought an impact to consumer bankruptcy for the period between 1993 and 1999.

As the number of bankruptcy filing increased and reached the peak in year 2005, U.S. government had took the remedial action to solve the problem. Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) was introduced by

U.S. Congress in 2005 (Dickerson, 2007). According to BAPCPA, it had increased the degree of difficulty to file for bankruptcy and gave incentives to consumers to avoid over-indebtedness. Before BAPCPA is introduced to U.S. consumers, they could freely decide whether to file for bankruptcy under the section of Chapter 7 or Chapter 13. According to Bankruptcy Reform Act of 1978, Chapter 7 of bankruptcy code providing for liquidation of debtors' assets while Chapter 13 providing for adjustments of debts. The implementation of BAPCPA has provided a comprehensive procedure in deciding whether consumer bankruptcy filing is classified under Chapter 7 or Chapter 13 and this has increased the cost of bankruptcy filing in the viewpoint of consumers (Garrett, 2007). Hence, this caused the number of bankruptcy filing to decline dramatically from year 2005 to 2008 as shown in Figure 1.1.

However, the number of consumer bankruptcy filing had increased after year 2008. This was due to the global financial crisis happening in year 2008. The financial crisis had brought a great impact on U.S. economic. A great depression on U.S. economic happened which was affected by the crisis. Bosworth (2012) stated that the crisis caused the nation's output fell and the unemployment rate rose over 9 percent. During that period, many large corporations and banks failed and filed for bankruptcy. Bear Stearns as an American investment bank which engaged heavily on mortgage-backed securities was severely damaged due to the stock price collapsed in March 2008 (Marshall, 2009). In addition, Marshall (2009) also revealed the bankruptcy of investment bank Lehman Brothers filed for Chapter 11 bankruptcy. The failure of Lehman Brothers had heavily affected the U.S. investors. Hence, the trend of consumer bankruptcy filing increased in year 2008 due to the crisis happened.

The high consumer bankruptcy filing rate had brought a great impact on consumers and financial institutions in U.S.. Consumers filed for bankruptcy when they faced financial difficulty or were unable to repay their debt. The default on debt repayments had brought negative impact to the banking industry. It was considered as non-performing loan and a cost to banks. Banks put the bankruptcy cost in their income statement as provision for loan losses. For example, during the late of 1980s, banks in U.S. had incurred high delinquency and losses on

commercial mortgage loans and loans on apartment buildings due to the low quality of lending and overbuild of shopping centres, apartments and office buildings. Therefore, this affected the quality of commercial lending and the profitability of financial institutions in U.S. (Fledstein, 1998).

In addition, the non-performing loan arisen from bankruptcy filing also affected the economy growth in U.S.. Hou (2007) stated that the non-performing loan caused the banking industry failure and negatively affected the economic growth and reduced economy efficiency. Hence, the high bankruptcy in U.S. reduced the flow of credit in the country and directly affected the efficiency of business units.

Furthermore, it also brought impact to the business creditors. The impact arose when businesses done with extended credit by creditors. In this situation, some borrowers might extend the credit without any collateral. Therefore, once they filed for bankruptcy, the debt was disposed due to the bankruptcy filing. Thus, the cost of bankruptcy was classified as expenses by creditors and reduced the profitability of the creditors (Fledstein, 1998).

In short, consumer bankruptcy is a serious issue in U.S. along the years. The number of bankruptcy filing had increased since 1980 and it had brought many negative impacts to U.S. especially the economy of the country.

1.2 Problem Statement

Consumer bankruptcy is alarming in U.S.. The past few decades had shown a dramatic rise in the number of people who filed for bankruptcy. Statistically, according to the data obtained from American Bankruptcy Institute (2013), this study found that there was about 300,000 numbers of people going bankrupt in year 1980 and it was increased by around 1 million numbers of people in year 2011.

Figure 1.2

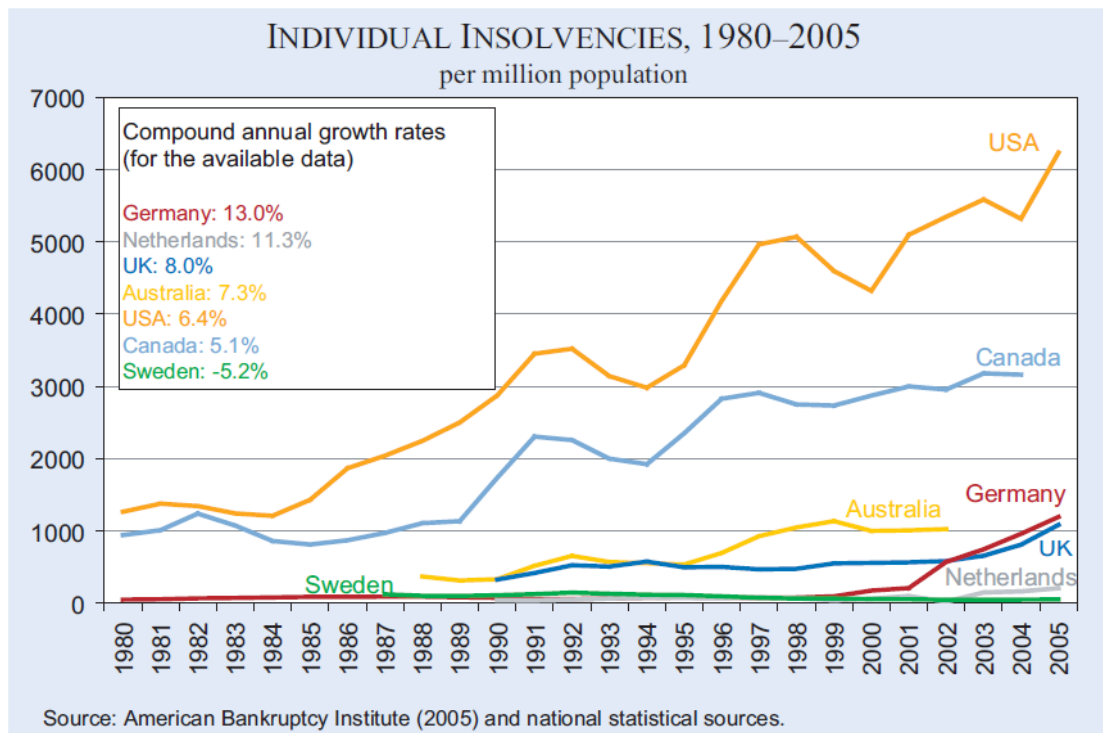


Figure 1.2 adapted from Osterkamp (2006) compared the consumer bankruptcy between the selected OECD and EU countries. As could be seen from Figure 1.2 above, the consumer bankruptcy in the United States, from 1980 to 2005, remained the highest number of people as compared to other countries.

According to Beraho (2008), consumer bankruptcy rate in the United States had increased more aggressive than other European countries. Until today, there are many researchers studying the factors that cause the rising of consumer bankruptcy in the United States. However, the factors still remain as a debatable subject and are preserved as an open question in the United States. Hence, it is an interesting topic to study the determinants that affect consumer bankruptcy in U.S..

1.3 Research Objectives

Research objectives are closely related to the problem statement and they summarize what to be achieved from the study. In the research, general objective

and specific objectives are prepared in order to identify the goals for this research project.

1.3.1 General Objective

General objective is the main objective of the research. The main objective of this research is to identify the factors that affect consumer bankruptcy in the United States.

1.3.2 Specific Objectives

Specific objectives are the objectives narrowed down from the general objective in order to provide a clearer objective for the research. There are four specific objectives in this research which are shown as below:

- a) To examine the relationship between consumer bankruptcy and credit card debt.
- b) To examine the relationship between consumer bankruptcy and lending rate.
- c) To examine the relationship between consumer bankruptcy and divorce rate.
- d) To examine the overall significant relationship between consumer bankruptcy, credit card debt, lending rate and divorce rate.

1.4 Research Questions

There are few research questions created to meet the objectives of the study. The research questions include:

- a) Is there any significant relationship between consumer bankruptcy and credit card debt?
- b) Is there any significant relationship between consumer bankruptcy and lending rate?
- c) Is there any significant relationship between consumer bankruptcy and divorce rate?
- d) Is there any overall significant relationship between consumer bankruptcy, credit card debt, lending rate and divorce rate?

1.5 Hypotheses of the Study

1.5.1 Credit Card Debt

According to Mathur (2012), credit card debt is the biggest contributor of individual bankruptcy. It becomes the major cause that leads to the increasing of consumer bankruptcy in the United States. Meanwhile, Agarwal and Liu (2003) provided the results that credit card debt and consumer bankruptcy have a positive relationship between each other. Hence, this study proposes that there is a significant relationship between consumer bankruptcy and credit card debt.

H₀: There is no relationship between consumer bankruptcy and credit card debt.

H₁: There is a relationship between consumer bankruptcy and credit card debt.

1.5.2 Lending rate

Jappelli, Pagano, and Maggio (2008) stated that increase in interest rate is associated with a higher insolvency rate. When consumers encounter a high level of debt because of the economic shock such as sharp rising in interest rate or economic recession, it will lead them to bankruptcy. Therefore, this study proposes that there is a significant relationship between consumer bankruptcy and lending rate.

H₀: There is no relationship between consumer bankruptcy and lending rate.

H₁: There is a relationship between consumer bankruptcy and lending rate.

1.5.3 Divorce rate

According to O'Steen Law Firm (n.d.), divorce creates a financial strain on both partners in a number of ways. Firstly, the cost after divorce such as child support payments, alimony, and the follow-up cost of keeping up two separate households will create a financial burden to one of the parties. Legal cost such as lawyer fees imposes a high cost to both partners and might lead them to bankruptcy. Thus, this study proposes that there is a significant relationship between consumer bankruptcy and divorce rate.

H₀: There is no significant relationship between consumer bankruptcy and divorce rate.

H₁: There is a significant relationship between consumer bankruptcy and divorce rate.

1.6 Significance of the Study

Ideally, bankruptcy can benefit the economy of a country. During the bankruptcy process, if the outstanding debts of debtors are discharged without any future obligation, they can rebuild their credit record. This, in turn, will encourage spending and borrowing which are beneficial for economy. However, bankruptcy can adversely affect the economy if more and more people file for bankruptcy at the same time (Dobbie and Song, 2013). Therefore, this paper studying factors that affect the consumer bankruptcy is mainly contributed to financial institutions, policy makers, investors, as well as consumers.

After the global financial crisis of 2009, stricter rules and regulations become the concern of financial institutions and policy makers in order to prevent another economic meltdown (Barth, Caprio, and Levine, 2013). By understanding the factors that lead to consumer bankruptcy may help financial institutions to reduce the credit default of consumers. Also, policy makers will have better decision in the implementation of appropriate country policy by analyzing the determinants of consumer bankruptcy which may have negative impacts on economy.

Besides, from the perspectives of investors, this research tends to provide useful information in their investment decision making. High rate of bankruptcy may always indicate poor economic condition in a country (Buehler, Kaiser, and Jaeger, 2012). Hence, investors can evaluate the economy performance of a country based on the bankruptcy rate before making investment decision to secure their returns.

Moreover, according to Agarwal and Liu (2003), those who file for bankruptcy might encounter difficulty in applying for new credits and even looking for new employments during a specific period of time. Therefore, if consumers possess the knowledge of bankruptcy, this might assist them in better evaluation of financial situation and more wisely financial planning to avoid bankruptcy.

1.7 Chapter Layout

This research project consists of five chapters and they are organized as follow:

Chapter 1: In Chapter 1, it gives an overall concept of the research project. It comprises of research background, problem statement, research objectives in general and specific, research questions, hypotheses and significance of the study. It provides a clear direction and guideline for the following chapter.

Chapter 2: In Chapter 2, this study discusses the literature review on consumer bankruptcy from the previous researchers. It covers the empirical testing procedures and proposed theoretical framework.

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

Chapter 4: In Chapter 4, the results corresponding to the research questions and hypotheses are discussed in detail. This study interprets and analyzes the data collected through the website of American Bankruptcy Institute, World Bank, U.S. Federal Reserve System and CDC/NCHS National Vital Statistics System.

Chapter 5: In Chapter 5, this study comes out with 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.

1.8 Conclusion

In conclusion, first chapter briefly explains the whole concept of the study towards consumer bankruptcy in the United States. This study is designed to investigate the significant relationship between the independent variables (credit card debt, lending rate and divorce rate) and the dependent variable (consumer bankruptcy rate). This research aims to investigate whether these independent variables would have positive or negative relationship with consumer bankruptcy rate. The previous researchers found that there are several factors will lead to consumer bankruptcy. However, this study choose this few independent variables to conduct the research as they have proved a stronger relationship with consumer bankruptcy. The evidence and justification will be further discussed in the literature review of next chapter.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

In chapter 2, this study aims to review the study of factors (credit card debt, lending rate and divorce rate) leading to consumer bankruptcy from different researchers. This research is keen to identify whether the factors stated have significantly effect on consumer bankruptcy and what is the relationship between the factors and consumer bankruptcy. Furthermore, this study would identify what are the techniques, equations, and models used by different researchers.

2.1 Review of Literature

2.1.1 Credit Card Debt

According to Domowitz and Sartain (1999), the largest contributor to consumer bankruptcy is credit card debt. When credit card debt increases from the average population level of typical bankruptcy household, it is expected to result a six-fold increase in the prerequisite probability of individual that applies for bankruptcy protection. The average growth in credit card debt under Chapter 7 bankruptcy is estimated to lead to an increase in the probability of individual filed for bankruptcy by 624 percent. For credit card debt under Chapter 13 filings, it is forecasted that there will be a minimum increase of 498 percent of consumer bankruptcy filings when credit card indebtedness increases. The consequence of the increase in credit card debt that leads one filing for bankruptcy might sometimes due to the excessive expansion of credit pre-approved by the bank (Bizer and DeMarzo, 1992).

Based on White (2007), there was evidence showing that revolving debt especially credit card debt serves as the main reason that leads to the increase of consumer bankruptcy rate in countries. Many of them filed for bankruptcy when they found that they encountered difficulties in repaying the large amount of credit card debt due to the increasing interest rate. As market interest rate goes up, credit card holder will therefore need to pay more interest according to the amount of credit card debt they owed. The more credit card debt they owe, the more money they need to pay back later as interest charged is based on the amount the holder swiped using credit card. Thus, the higher the credit card debt, the higher the principal plus interest they need to pay back to the particular credit card issuer.

Credit card delinquency had become an increasingly prominent attribute in the landscape of bankruptcy and it over 3.5 percent in 1996. Meanwhile, the number of consumer bankruptcy filings in U.S. had reached the highest record among the years which up to 290,111 individuals (Ausubel, 1997). This indicates that consumer bankruptcy rate has a relationship with credit card debt as changes in the rate of credit card delinquency will lead to the changes of bankruptcy rate about one quarter. Also, credit card debt as well as consumer bankruptcy seem rocketry increased even in a healthy economy. Ausubel (1997) stated that credit card debt was unsecured as it depended on the periodically state of the economy such as recession or unemployment. It definitely affected households' ability to repay their debt. Therefore, credit card debt would probably be the first credit that they could not repay and lastly would possibly lead to bankruptcy.

According to the Federal Reserve Bank of Cleveland (1998), the default rate of credit cards had risen rapidly which led to a 75 percent increase in the probability of consumer bankruptcy filings in U.S.. According to Gross and Souleles (2002), they made use of the new credit card account dataset to examine the relationship between credit card debt and consumer bankruptcy. They found that frequent credit card users are more likely to go into bankruptcy. In 1997, there was one percentage point of credit card holders declared bankruptcy and three percentage points of credit card

holders encountered the same risk which might face delinquency on credit card debt.

In accordance to Mathur (2012), credit card debt is one of the factors that cause consumer bankruptcy. From his survey, he found that there were 42 percent of respondents claimed that the primary reason they filed for bankruptcy was due to the large amount of credit card debt. However, there were only 9 percent of respondents stated that credit card debt was the secondary reason that led them into bankruptcy. Mathur (2012) also stated that credit card debt and consumer bankruptcy are positively correlated. The result showed that when household primary debts are credit card debt, it will lead to an increase of 36 percent in consumer bankruptcy filings on average age.

Furthermore, Agarwal and Liu (2003) also claimed that credit card debt and consumer bankruptcy have a positive relationship. It showed that as credit card delinquency increases sharply, the probability of consumer bankruptcy filings also rises. From the view of unemployment, many of those unemployed workers simply use the credit card to pay off their debts to compensate the loss of income. However, this leads them delinquent in settling the monthly payments after the use of credit card. Therefore, they would probably declare bankruptcy or default to payments when they are still unable to get a job months later. By using the credit card data from 1995 to 2001, there are 700 thousands of credit card holders filing for bankruptcy due to the reason of unemployment. As a result, this showed that credit card debt would cause consumer bankruptcy.

According to Zhu (2011), credit card debt to household annual income plays an important role in contributing to consumer bankruptcy filings. Credit card debt occupies almost one half of the household's annual income whereas occupies over the full annual income for households that file for bankruptcy. For those households with lower income, they will probably use the credit card frequently to cover their regular living costs. Therefore, consumption on credit card to household annual income

showed a big impact on consumer bankruptcy filings which would change the bankruptcy probability by 35.6 percent. For those who used over the household average debt would definitely face high probability to declare bankruptcy.

Moreover, in the research of Fay, Hurst and White (2002), they found that there is other reason that leads individuals filing for bankruptcy which is due to the household characteristics that hardly repay the credit card debt. They found that demographic vector like age, education or family size and other adverse events that household encountered would reduce their ability to repay the credit card debt which thereby caused an increase in the number of consumer bankruptcy. As a conclusion, individuals who declare bankruptcy usually bear a high level of credit card debt (Clements, Johnson, Michelich and Olinsky, 1999). Based on the survey among students, there were almost 80 percent of them believing that credit card debt is the major reason for individuals file for bankruptcy (Bland, DeMagalhaes and Stokes, 2007).

2.1.2 Lending Rate

Most of the empirical researches on consumer bankruptcy in the United States depend on the variation in exemption levels across different states. The researches found that household living in states with comparatively high exemptions are more likely to be turned down for credit, borrow lesser and pay higher lending interest rate (Gropp, Scholz and White, 1997). They interpreted this outcome by reflecting the negative effect of debtor-friendly regulation on the supply of loan. Debt forgiveness in bankruptcy harmed future borrowers by reducing credit availability and increasing interest rate (White, 2006).

Jappelli et al. (2008) merged panel data on household arrears for 11 European countries with macroeconomic data on lending to households,

interest rate, cyclical indicators and institutional variables to investigate the effect of those macroeconomic variables on consumer bankruptcy. The results showed that high consumer insolvency rate is associated with the increasing of unemployment and interest rate. Consumers are facing a higher level of debt because of the large economic shocks such as economic recession or sharp rising in interest rate.

Moreover, interest rate has significant relationship with consumer credit card debt. When interest rate increases, the cost of monthly credit card debt payments might increase for consumers. In contrast, consumers will get easier to make the payments when interest rate is low. This was proved by the history of Americans in 1993 and 1994, the bankruptcy rate declined after the significantly falling of interest rate and the rate increased when interest rate rose dramatically in later 1994 and 1995 (Katz, 1999).

The level of debt outstanding declines as lenders responded with higher interest rate for any given level of borrowing. Lower lending rate will offset this effect by making borrowing more attractive. This is due to the fact that when interest rate is lower, more people are willing to borrow money instead of saving in the bank. Meanwhile, consumers will have more money to spend and invest. It results in the economic growth and inflation might happen. When inflation happens, it might increase the burden of consumers who are holding many debts and might lead to the increase of bankruptcy which was supported by Igor, MacGee and Tertilt (2010).

However, there are some researchers arguing that interest rate would not cause dramatically increase of consumer bankruptcy (Ellis, 1998). Ausubel (1997) and Rougeau (1996) stated that interest rate might not cause consumer credit amount or debt to increase. Those researchers argued that the important of interest rate deregulation on credit card lender will expand more credit availability to consumers and lead to higher bankruptcy. Besides, Ellis (1998) stated that the impact of interest rate deregulation is based on the price and underwriting decision of lenders and the rational

thinking of borrowing decision of consumers. Therefore, changes in interest rate might irrelevant to cause consumer bankruptcy and those irrational consumer decisions to borrow large amount of debt will in other hand increase the cases of bankruptcy.

2.1.3 Divorce rate

Marital dissolutions create high level of financial burden to both husband and wife in a number of ways (O'Steen Law Firm, n.d.). Firstly, the costs after divorce such as child support payments, alimony, division of property, and the follow-up cost of keeping up two separate households will create a financial burden to one of the parties. For instance, partner who fails to make the child support payments or alimony stated in the agreement will usually leave the other partner completely insolvent. Next, legal costs such as lawyer fees impose a high cost to both partners and might cause some of them to be bankrupt.

Del Boca and Ribero (2001); Fisher and Lyons (2005) also studied the same types of expenses which are the child support payments, alimony and division of property in their researches. They stated that these could also be the supplemental income for one of the selected spouses and the income would help his or her to offset the financial burden of divorce. However, Caplovitz (1974); Sullivan, Warren, and Westbrook (1995) argued that an individual might still be incapable to recover financially from the divorce, even with the additional income. At the end, the individual might be default or become bankrupt.

According to Edmiston (2006), divorce always causes a huge, immediate, and unexpected reduction in income, which might lead to bankruptcy. The author claimed that the relationship is correct for women in particular and they were expected to suffer a 30 percent drop in economic status in the first year after divorce. Edmiston (2006) also provided the results that one

percentage point higher share of population being divorced would bring 7.8 extra bankruptcy per 1,000 individual every year. Thus, the share of population being divorced is estimated to affect the country bankruptcy rate in the United States.

In addition, Hoffman and Duncan (1985) claimed that men also will suffer a deduction in their net income instantly after divorce, most likely due to the child support payments, alimony and loss of the spouse's income. These losses are slightly offset by increases in income. Yet, the deduction in men's income is much more moderate than for women because men's income is average 8 percent higher by the third post-divorce year compared to the first year of divorce. Based on the results, divorce imposes higher economic costs to women than men.

Fay, Hurst and White (2002) provided the evidence that individuals would have higher possibility to become bankrupt in the following year after divorce. Statistically, Fay et al. (2002) expected that there would be 86 percent rising in individual's bankruptcy rate in the following year after divorce. Besides the factor that divorce would reduce the economic status and might lead to bankruptcy, authors claimed that the divorce lawyers also cross market products and counsel their customers to file for bankruptcy. The lawyers will inform their customers about the benefits of bankruptcy after divorce. Thus, these explain that divorce and bankruptcy is positive correlated.

Domowitz and Sartain (1999) stated that a single person is about double the chances to declare for bankruptcy as compared to married individual. Many bankruptcy's studies using data on individuals had supported the thought of a positive correlation between divorce and bankruptcy (Edmiston, 2006; Del Boca et al., 2001; Fisher et al., 2005; Lyons, 2003; Zagorsky, 2005). All these papers focus on the individuals to declare bankruptcy after divorce.

2.2 Empirical Testing Procedures

2.2.1 Ordinary Least Squares (OLS) Estimation

OLS estimation is famous among researchers to study the relationship between consumer bankruptcy and macroeconomic factors because it assumes that all variables included in the study are continuous and closely “fit” a function to the dataset by minimizing the sum of squared errors.

Based on Ekici and Dunn (2010), they used OLS regression to examine whether there is a relationship between credit card debt and consumer bankruptcy rate. It stated that credit card debt would be a main problem for household in the long run which might lead to an increasing trend of bankruptcy. Hilmy, Mohd Z and Fahami (2013) used the annual data covering period from 1999 to 2012 to conduct their study. They chose non-performing loans as one of the independent variables in their study. The non-performing loans had a wide coverage of car loans, credit card debt, housing loans and personal loans. Throughout the study, the author used OLS to test for the significant of the model (F-test) and the significant of independent variables (t-test).

Moreover, Grieb, Hegji and Jones (2001) employed OLS regression to examine the relationship between macroeconomic factors and credit card default which assumed that the variables were stationary in the study. Dobbie and Song (2013) also measured the impacts of consumer bankruptcy protection using OLS estimation.

2.2.2 Hausman-type Specification Test

Hausman-type specification test is an econometric test used to determine if a model is corresponded to the data. It is also similar to the over-

identification test used in instrumental variable (IV) estimates to examine for the endogeneity of variables. Gan, Sabarwal, and Zhang (2011) applied Hausman-type specification test to study the hypothesis of adverse events and strategic timing. They found that both Panel Study of Income Dynamics (PSID) as well as Survey of Consumer Finances (SCF) data is consistent with the adverse events theory. In their research, they also recognized financial benefit was a distinguished feature between adverse events and strategic timing theory. Using Hausman test, the result indicated that financial benefit was exogenous for adverse events theory and endogenous for strategic timing theory. Furthermore, Gan and Sabarwal (2005) also carried a similar study showing that unsecured debt such as credit card debts, non-exempt assets and financial benefit were endogenous for strategic timing hypothesis by applying Hausman test.

2.2.3 Other Tests

There were small amount of researchers using other tests to identify the determinants of consumer bankruptcy instead of OLS method. The other tests used are vector autoregressions (VAR), Stress-test, and Response Functions.

Jappelli et al. (2008) estimated simple VAR and through the impulse response functions to describe how consumer bankruptcy responds to macroeconomic shocks such as unemployment rate and interest rate. They estimated a VAR with four-variables which were the number of insolvency per capita, the unemployment rate, the real interest rate, the household debt-GDP ratio and a time trend which the model includes 2 lags to investigate the influence of households' indebtedness on bankruptcy.

Bank of Canada has developed a "stress-test" methodology to examine how alternative economic situations would affect the distribution of debt. Bank would examine how changes in interest rate and unemployment

affecting consumer credit and the distribution of debt-service ratios (Dey, Djoudad and Terajima, 2008).

Domowitz and Sartain (1999) obtained the data on population of bankruptcy from the United States General Accounting Office. Throughout the study, they used the Conditional Probability Model in determining the relationship between debt and consumer bankruptcy.

Response functions showed that an increase in household debt was followed by higher insolvency, with the effect becoming statistically significant two to four years later. Instead, the confidence bounds of the responses to the unemployment and interest rate are large, preventing reliable inference (Jappelli et al., 2008).

2.3 Proposed Theoretical Framework

Figure 2.1: Framework for the Factors of U.S. Consumer Bankruptcy.

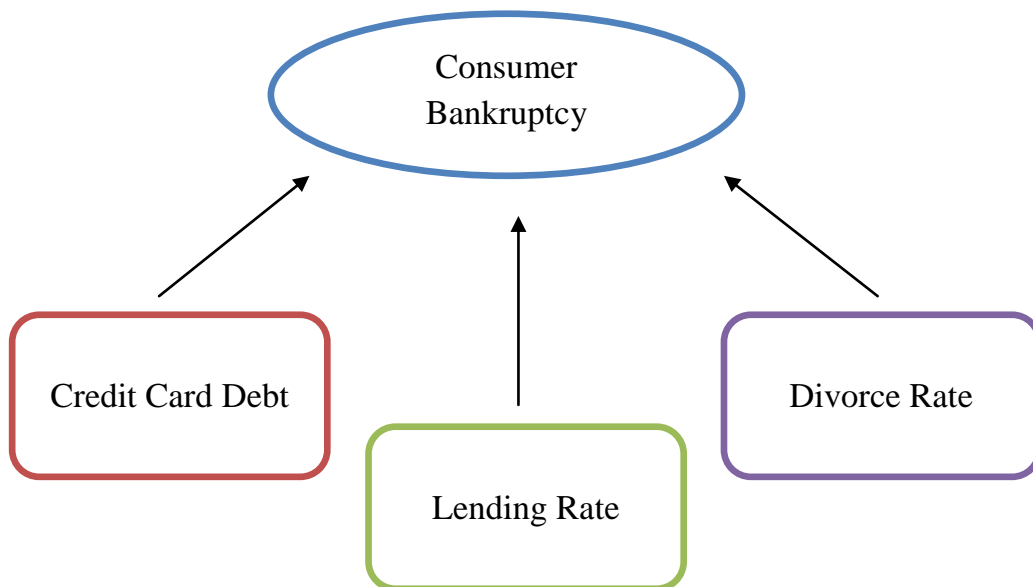


Figure 2.1 shows that there are three independent variables will affect the dependent variable. The three independent variables are Credit Card Debt, Lending Rate, and Divorce Rate which will affect the dependent variable (Consumer Bankruptcy) in the United Stated.

2.4 Conclusion

Throughout the research, it was found that credit card debt, lending rate and divorce rate have significant effect on consumer bankruptcy. Based on the studies of different researchers, the effect of credit card debt and divorce rate on consumer bankruptcy is positively correlated. On the other hand, the effect of lending rate on consumer bankruptcy is ambiguous because different researchers have stated different results. In the following chapter, this study will discuss the methodology of the study.

CHAPTER 3: METHODOLOGY

3.0 Introduction

In this chapter, this study will discuss about the methodology of the study. Methodology theory is important for research results as it is used to determine the relationship between independent variables (credit card debt, lending rate, and divorce rate) and dependent variable (consumer bankruptcy rate). In the following sections, this study will discuss the data collection, data analysis and provide a conclusion as well.

3.1 Data Collection Methods

According to Sekaran (2005), data collection methods are an essential part of research design. Data collection is a technique of collecting information and the information collected will be used in studies or decision making situations. Data can be obtained from two sources which are primary and secondary. Primary data is referring to the information collected first-hand by the researchers on the variables of interest for his or her specific intention of study. On the other hand, secondary data is the information obtained from published sources. For this paper, this study had used the secondary data since it is time saving and easy to obtain as compared to primary data.

The time-series data was collected from different sources such as U.S. Federal Reserve System, World Bank, American Bankruptcy Institute and CDC/NCHS National Vital Statistics System. The sample size consists of 32 years of annually data, covering from year 1980 to year 2011 for both independent variables as well as dependent variable. The Table 3.1 shows the sources and explanation of data.

Table 3.1: Sources and Explanation of Data.

Variables	Units	Explanation	Sources
Consumer bankruptcy rate	Percentage	Amount of individual bankruptcy in U.S.	American Bankruptcy Institute
Credit card debt	Millions of dollars	Personal credit card debt in U.S.	U.S. Federal Reserve System
Lending rate	Percentage	Lending rate that bank offers in U.S.	World Bank
Divorce rate	Percentage	The rate of marital dissolutions in U.S.	CDC/NCHS National Vital Statistics System

In this paper, E-views 6 will be adopted as a tool for analyzing the findings. E-views is a simple and interactive econometric software which provides data analysis, estimating and forecasting tools. Besides, E-views takes dominant position in Windows-based econometric software and it is the most frequently tool used in practical econometric.

Empirical analysis of Ordinary Least Squares (OLS) will be carried out by using E-views. Throughout this method, this study can easily identify the economic problems of the empirical model. After that, this paper would try to reduce the economic problems before proceeding to other tests.

3.2 Data Analysis

Ordinary Least Squares test will be carried out in this research which is used to investigate the relationship between independent variables and dependent variable. The Economic Function of the study is shown as below:

$$BANKRUPTCY = f(CREDIT, LEND, DIVORCE)$$

Hence, the Economic Model is constructed as:

$$BANKRUPTCY_t = \beta_1 + \beta_2 LOGCREDIT_t + \beta_3 LEND_t + \beta_4 DIVORCE_t + \epsilon_t$$

where,

BANKRUPTCY:	Consumer bankruptcy rate
LOGCREDIT	: Logarithm of credit card debt
LEND	: Lending rate
DIVORCE	: Divorce rate

3.2.1 Ordinary Least Squares

According to Gujarati and Porter (2009), Ordinary Least Squares is a statistical technique that uses sample data to describe the relationship between two variables. The OLS method is a popular technique as it is easy to implement in order to examine the model assumptions such as linearity, constant variances and normality of error terms. There are some practices will be used to test for the model assumptions such as multicollinearity, heteroscedasticity, autocorrelation, model specification and normality tests.

3.2.2 Diagnostic Checking

3.2.2.1 Multicollinearity

Multicollinearity is an occurrence of multiple regression models in which the independent variables are highly correlated with one another. When multicollinearity arises, it is difficult to explain which independent variables are actually affecting the dependent variable (Paul, 2006). It will also increase the standard errors of estimators and thus provide misleading results as well as influence the accuracy of the model. In actual, there is no specific test or method to detect the multicollinearity problem but there are some general guidelines. Multicollinearity can be detected through the examination of pair-wise correlation coefficient and variance inflation factor (VIF). According to Gujarati and Porter (2009), when pair-wise correlation coefficient is near to 1 which is more than 0.8, this study may suspect multicollinearity to happen. Besides, VIF is used to detect the severity of multicollinearity in a regression model. When VIF is more than 10, it indicates that the independent variables are highly collinear in the model (Gujarati and Porter, 2009).

3.2.2.2 Autocorrelation

Autocorrelation problem arises when the error term for any observation is correlated to the error term of other observation (Rubaszek, n.d.). The autocorrelation problem may occur due to some factors such as omission of explanatory variables or misspecification of true error term (Babatunde, Ikughur, Ogunmola and Oguntunde, 2014). The autocorrelation problem may cause few consequences on OLS estimator in the model which lead the

estimator to be inefficient and no longer be the best linear unbiased estimator (BLUE). The model cannot obtain the minimum variance of estimator and hence leads to the estimated variances of the regression coefficients to become biased. As a result, the hypothesis testing tends to provide a misleading result and no longer valid. There are few ways in detecting the autocorrelation problem in OLS estimator such as Durbin-Watson test, Durbin's h test and Breusch-Godfrey LM test. In the model of this study, Breusch-Godfrey LM test was chosen to detect the autocorrelation problem. This is because LM test is more general and allows for non-stochastic regressors, higher-order autoregressive schemes and higher-order of series correlation which cannot be performed by Durbin Watson test and Durbin's h test (Thomas, 2009).

3.2.2.3 Heteroscedasticity

One of the basic assumptions of OLS regression is the variance of error term is constant across the sample size. If the variance of error term is not constant, the model is said to have heteroscedasticity problem. When heteroscedasticity occurs, the estimator of OLS will become inefficient as it ignores the minimum variance property of OLS. Furthermore, the covariance matrix of the parameter estimates would be inconsistent and biased. The presence of heteroscedasticity will not only affect the distribution of coefficients, it also causes the OLS method to underestimate the variances (Hayes and Cai, 2007). Due to the underestimated variances, it will lead to the higher than expected value of F-statistics or t-statistics. Hence, it will cause the hypothesis tests for F-statistics or t-statistics to become unreliable. The most popular test used to detect heteroscedasticity problem is the Autoregressive Conditional Heteroscedasticity (ARCH) test.

3.2.2.4 Model Specification

According to Gujarati and Porter (2009), Ramsey's RESET test is able to examine model specification. The purpose of using this test is to detect inappropriate functional form and capture omitted variables in the model. Ramsey's RESET test is carried out by using the F test formula or the critical values of F-distribution to compute the statistical results by estimating restricted and unrestricted model. It tests the null hypothesis against the alternative hypothesis to examine whether the model used is specified correctly in OLS method. F-value is said to be significant when the probability is greater than the significant percentage level of 1%, 5% or 10%. Theoretically, when the model is misspecification, it would cause the problem of non-normality or autocorrelation of error terms.

3.2.2.5 Normality Test

According to Gujarati and Porter (2009), normality test of error terms plays a vital role in OLS model. If the error term is normally distributed, the provided result is unbiased, consistent, and efficient. Otherwise, the result cannot be trusted. Hence, Jarque-Bera test was conducted to test the normality of error terms. Normality of error terms is determined based on the Skewness and Kurtosis in Jarque-Bera test. By referring to the p-value of Jarque-Bera test, if the p-value is greater than the significant level of 1%, 5% or 10%, the error terms are normally distributed. Otherwise, error terms are not normally distributed if the p-value is less than the significant level. Based on the Central Limit Theorem (CLT), the larger sample size provides the higher chance to the model to be normally distributed (Gujarati and Porter, 2009).

3.2.3 Inferential Analyses

3.2.3.1 F-test Statistic

F-test is a statistical test used to determine the overall significance of the regression model (Spanos, 1986). It is most often employed to identify the model that best fits the population based on the sample data set. In other word, F-test statistic is used to examine whether at least one of the explanatory variables is crucial in explaining the explained variable. The null hypothesis of F-test is all the coefficients of independent variables are equal to zero, whereas the alternative hypothesis is at least one of the coefficients is unequal to zero. Using the significant level of 1%, 5% or 10% as a benchmark, if p-value is less than the significant level, the null hypothesis will be rejected. Therefore, this study can conclude that at least one of the explanatory variables is important in explaining the explained variable and the model is significant, *ceteris paribus*.

3.2.3.2 T-test Statistic

According to Gujarati and Porter (2009), T-test statistic is used to determine the relationship and the significance between a specific independent variable and the dependent variable. It is also used to examine whether the means of two samples are statistically different from each other. The key assumption of T-test is the samples are randomly chosen from normally distributed populations without any selection bias (Park, 2009). The null hypothesis for T-test is the individual regression coefficients are equal to zero while the alternative hypothesis is the coefficients are not equal to zero. As similar to F-test statistic, the significant level is set at 1%, 5% or 10% as a benchmark. If p-value is less than the significant level, the null hypothesis will be rejected. This indicates

that there is a significant relationship between the independent variables and the dependent variable, *ceteris paribus*.

3.3 Conclusion

This chapter discusses about the data collection methods and data analysis of the research. Besides, this study also describes the methodology of how this study was being conducted and provides justification on it. The empirical results of this research will be discussed in the next chapter.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

This chapter will interpret and analyze the empirical results from the methodology of previous chapter. In this chapter, it includes three empirical results which are Ordinary Least Squares (OLS) analysis, diagnostic checking and inferential analyses.

4.1 Multiple Linear Regression Model

This research employed Ordinary Least Squares (OLS) method to form a Multiple Linear Regression Model in order to study the relationship of consumer bankruptcy rate (BANKRUPTCY) in the United States with the determinants of credit card debt (LOGCREDIT), lending rate (LEND) and divorce rate (DIVORCE). Below is the estimated Economic Model:

$$\widehat{\text{BANKRUPTCY}} = \hat{\beta}_1 + \hat{\beta}_2 \text{LOGCREDIT} + \hat{\beta}_3 \text{LEND} + \hat{\beta}_4 \text{DIVORCE}$$

Hence, the results were estimated as shown in Table 4.1.

Table 4.1: Regression Results

$\widehat{\text{BANKRUPTCY}} =$	$\hat{\beta}_1$	+	$\hat{\beta}_2 \text{LOGCREDIT}$	+	$\hat{\beta}_3 \text{LEND}$	+	$\hat{\beta}_4 \text{DIVORCE}$
$\widehat{\text{BANKRUPTCY}} =$	-33.39162	+	19.28752LOGCREDIT	+	1.438171LEND	+	4.412648DIVORCE
Standard Error =	(18.54649)		(2.172411)		(0.345011)		(1.553254)
t-Statistic =	(-1.800428)		(8.878392)		(4.168473)		(2.840906)
p-value =	(0.0826)		(0.0000)		(0.0003)		(0.0083)
$R^2 = 0.928170$							
$\overline{R}^2 = 0.920474$							
F-statistic = 120.6029							
Prob (F-statistic) = 0.000000							
Number of observations = 32							

4.1.1 Interpretation on R^2 and $\overline{R^2}$

From the R^2 , there is approximately 92.82% of the variation in the consumer bankruptcy rate could be explained by the variation in independent variables which are credit card debt, lending rate and divorce rate. Meanwhile, from the $\overline{R^2}$, there is approximately 92.05% of the variation in the consumer bankruptcy rate could be explained by the variation in independent variables which are credit card debt, lending rate and divorce rate after taking into account the degree of freedom.

4.1.2 Interpretation on Intercept Coefficient and Independent Variables

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

- $\widehat{\beta}_1 = -33.39162$. The estimated consumer bankruptcy rate in the United States is -33.39% that could not be explained by the independent variables of credit card debt, lending rate and divorce rate.
- $\widehat{\beta}_2 = 19.28752$. If the credit card debt increases by one percentage point, the estimated consumer bankruptcy rate in the United States will increase by 19.29 percentage point, holding all other independent variables constant (ceteris paribus).
- $\widehat{\beta}_3 = 1.438171$. If the lending rate increases by one percentage point, the estimated consumer bankruptcy rate in the United States will increase by 1.44 percentage point, holding all other independent variables constant (ceteris paribus).
- $\widehat{\beta}_4 = 4.412648$. If the divorce rate increases by one percentage point, the estimated consumer bankruptcy rate in the United States will increase by 4.41 percentage point, holding all other independent variables constant (ceteris paribus).

4.2 Diagnostic Checking

4.2.1 Multicollinearity

Hypothesis:

H_0 : There is no multicollinearity problem.

H_1 : There is a multicollinearity problem.

Decision rules:

- (i) Reject H_0 if $VIF > 10$, which means that there is a serious multicollinearity problem.
- (ii) Do not reject H_0 if $VIF < 10$, which means that there is no serious multicollinearity problem (Gujarati and Porter, 2009).

Table 4.2: Pair-wise Correlation Analysis

	BANKRUPTCY	LOGCREDIT	LEND	DIVORCE
BANKRUPTCY	1.000000	0.930691	-0.032812	-0.838444
LOGCREDIT	0.930691	1.000000	-0.246809	-0.946594
LEND	-0.032812	-0.246809	1.000000	0.215623
DIVORCE	-0.838444	-0.946594	0.215623	1.000000

**Results obtained from Eviews6*

Based on the table above, there is a high correlation between credit card debt (LOGCREDIT) and divorce rate (DIVORCE). This is proven by the high value of pair-wise correlation coefficient which is 0.946594. According to Gujarati and Porter (2009), when the pair-wise correlation

coefficient is more than 0.8, there is a high chance of the existing of multicollinearity problem. Thus, the correlation result of 0.946594 which is more than 0.8 shows that there is a high chance of the existing of multicollinearity problem between credit card debt and divorce rate.

Therefore, this research used 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 Variance Inflation Factor, $VIF = \frac{1}{(1-R^2_{xi,xj})}$.

Table 4.3: Correlation Analysis

Dependent Variable	Independent Variable	R-squared	$VIF = \frac{1}{(1-R^2_{xi,xj})}$
LOGCREDIT	DIVORCE	0.896040	5.073250

Conclusion:

From table 4.3, it shows that the Variance Inflation Factor (VIF) falls between 1 and 10. Thus, do not reject H_0 . This study can conclude that there is no serious multicollinearity problem in the model since the VIF between the independent variables is less than 10 as according to Gujarati and Porter (2009).

4.2.2 Autocorrelation

Hypothesis:

H₀ : There is no autocorrelation problem.

H₁ : There is an autocorrelation problem.

Decision rules:

- (i) Reject H_0 if P-value of the Chi-squared $< \alpha$ (10%), which means that there is an autocorrelation problem.
- (ii) Do not reject H_0 if P-value of the Chi-squared $> \alpha$ (10%), which means that there is no autocorrelation problem (Thomas, 2009).

Table 4.4: Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.427192	Prob. F(2,26)	0.2582
Obs*R-squared	3.165561	Prob. Chi-Square(2)	0.2054

Conclusion:

Do not reject H_0 since the P-value of Chi-squared is $0.2054 > \alpha$ (10%). Therefore, this study has sufficient evidence to conclude that there is no autocorrelation problem in the model.

4.2.3 Heteroscedasticity

Hypothesis:

H₀ : There is no heteroscedasticity problem.

H₁ : There is a heteroscedasticity problem.

Decision rules:

- (i) Reject H_0 if P-value of F-statistic $< \alpha$ (10%), which means that there is a heteroscedasticity problem.

- (ii) Do not reject H_0 if P-value of F-statistic $> \alpha$ (10%), which means that there is no heteroscedasticity problem (Spanos, 1986).

Table 4.5: Heteroskedasticity Test: ARCH

F-statistic	1.580422	Prob. F(1,29)	0.2187
Obs*R-squared	1.602106	Prob. Chi-Square(1)	0.2056

Conclusion:

Do not reject H_0 since the P-value of F-statistic is $0.2187 > \alpha$ (10%). Therefore, this study has sufficient evidence to conclude that there is no heteroscedasticity problem in the model.

4.2.4 Model Specification

Hypothesis:

H₀ : The model is correctly specified.

H₁ : The model is not correctly specified.

Decision rules:

- (i) Reject H_0 if P-value of F-statistic $< \alpha$ (10%), which means that the model is not correctly specified.
- (ii) Do not reject H_0 if P-value of F-statistic $> \alpha$ (10%), which means that the model is correctly specified (Gujarati and Porter, 2009).

Table 4.6: Ramsey's RESET Test

F-statistic	1.51E-05	Prob. F(1,27)	0.9969
Log likelihood ratio	1.79E-05	Prob. Chi-Square(1)	0.9966

Conclusion:

Do not reject H_0 since the P-value of F-statistic is $0.9969 > \alpha$ (10%). Therefore, this study has sufficient evidence to conclude that the model is correctly specified.

4.2.5 Normality Test

Hypothesis:

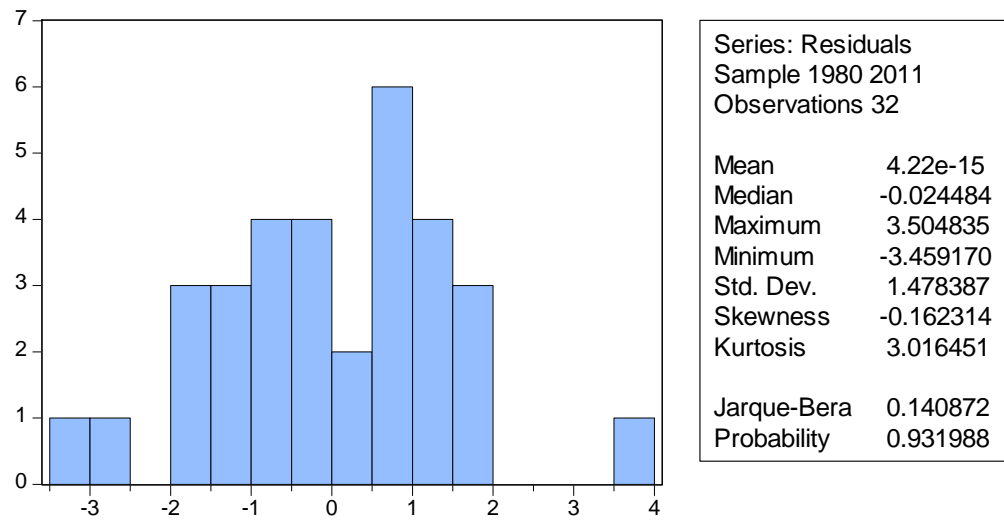
H₀: Error term is normally distributed.

H₁: Error term is not normally distributed.

Decision rules:

- (i) Reject H_0 if P-value for JB-statistic $< \alpha$ (10%), which means that the error term is not normally distributed.
- (ii) Do not reject H_0 if P-value for JB-statistic $> \alpha$ (10%), which means that the error term is normally distributed (Gujarati and Porter, 2009).

Table 4.7: Jarque-Bera Normality Test



Conclusion:

Do not reject H_0 since the P-value of JB-statistic is $0.931988 > \alpha$ (10%). Therefore, this study has sufficient evidence to conclude that the error term is normally distributed in the model.

4.3 Inferential Analyses

4.3.1 F-test Statistic

F-test is used in this study in order to determine the overall significance of the economic model (Spanos, 1986).

Hypothesis:

$$H_0: \beta_2 = \beta_3 = \beta_4 = 0$$

H_1 : At least one of $\beta_i \neq 0, i=2,3,4$.

Decision rules:

- (i) Reject H_0 if P-value of F-statistic $< \alpha$ (10%), which means that there is at least one independent variable is significant in explaining the dependent variable.
- (ii) Do not reject H_0 if P-value of F-statistic $> \alpha$ (10%), which means that all the independent variables are insignificant in explaining the dependent variable (Gujarati and Porter, 2009).

Conclusion:

By referring Table 4.1: Regression Results, reject H_0 since the P-value of F-statistic (0.000000) $< \alpha$ (10%). Therefore, this study has sufficient evidence to conclude that there is at least one independent variable is significant in explaining the dependent variable.

4.3.2 T-test Statistic

In the study, t-test is used to analyze the relationship between individual partial regression coefficient and dependent variable.

4.3.2.1 Credit Card Debt

Hypothesis:

H₀: Credit card debt does not have significant relationship with consumer bankruptcy.

H₁: Credit card debt has significant relationship with consumer bankruptcy.

Decision rules:

- (i) Reject H_0 if P-value of t-statistic $< \alpha$ (10%), which means that there is a significant relationship with consumer bankruptcy.
- (ii) Do not reject H_0 if P-value of t-statistic $> \alpha$ (10%), which means that there is insignificant relationship with consumer bankruptcy (Gujarati and Porter, 2009).

Conclusion:

By referring Table 4.1: Regression Results, reject H_0 since the P-value of t-statistic (0.0000) $< \alpha$ (10%). Moreover, based on (Domowitz and Sartain, 1999; White, 2007; Mathur, 2012; Agarwal and Liu, 2003) studies, they claimed that credit card debt and consumer bankruptcy have a positive relationship. Therefore, this study has sufficient evidence to conclude that there is a significant and positive relationship between credit card debt and consumer bankruptcy.

4.3.2.2 Lending Rate

Hypothesis:

H₀: Lending rate does not have significant relationship with consumer bankruptcy.

H₁: Lending rate has significant relationship with consumer bankruptcy.

Decision rules:

- (i) Reject H_0 if P-value of t-statistic $< \alpha$ (10%), which means that there is a significant relationship with consumer bankruptcy.
- (ii) Do not reject H_0 if P-value of t-statistic $> \alpha$ (10%), which means that there is insignificant relationship with consumer bankruptcy.

Conclusion:

By referring Table 4.1: Regression Results, reject H_0 since the P-value of t-statistic (0.0003) $< \alpha$ (10%). In addition, (Jappelli et al., 2008; Igor et al., 2010) stated that lending rate and consumer bankruptcy have a positive relationship. Therefore, this study has sufficient evidence to conclude that there is a significant relationship between lending rate and consumer bankruptcy.

4.3.2.3 Divorce Rate

Hypothesis:

H₀: Divorce rate does not have significant relationship with consumer bankruptcy.

H₁: Divorce rate has significant relationship with consumer bankruptcy.

Decision rules:

- (i) Reject H_0 if P-value of t-statistic $< \alpha$ (10%), which means that there is a significant relationship with consumer bankruptcy.

- (ii) Do not reject H_0 if P-value of t-statistic $> \alpha$ (10%), which means that there is insignificant relationship with consumer bankruptcy.

Conclusion:

By referring Table 4.1: Regression Results, reject H_0 since the P-value of t-statistic ($0.0083 < \alpha$ (10%)). (Edmiston, 2006; Hoffman and Duncan, 1985; Domowitz and Sartain, 1999; Fay et al., 2002) supported the idea of a strong positive relationship between divorce and bankruptcy. Therefore, this study has sufficient evidence to conclude that there is a significant relationship between divorce rate and consumer bankruptcy.

4.4 Conclusion

In this chapter, this study had concluded the empirical results in table and figure form. Based on the diagnostic checking, there is no multicollinearity, heteroscedasticity, autocorrelation as well as model specification bias problem, and the error terms are normally distributed. From the t-test and F-test, the results show an individual and overall significant relationship between independent variables and dependent variable respectively. The summary of the whole research will be presented in the following chapter.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

Chapter 5 provides a summary of statistical analyses which was presented and discussed in the previous chapter. It is followed by the discussion of major findings to validate the research objectives and hypotheses as well as the implications of study. Furthermore, the limitations when carrying out this research are determined and the recommendations for future research are discussed in a flow manner. In the last section of this chapter, a conclusion for the overall research is presented.

5.1 Summary of Statistical Analyses

In this research, this study aims to examine the relationship between the independent variables of credit card debt, lending rate and divorce rate with consumer bankruptcy in the United States. This study use 10% of significant level to conduct diagnostic checking and study the individual as well as overall relationship between the independent variables and consumer bankruptcy.

Based on the results summarized, this study found that credit card debt, lending rate and divorce rate are significantly affecting consumer bankruptcy according to t-test statistic at 10% level of significance. Besides, based on F-test statistic, the overall relationship between the independent variables and dependent variable is significant.

For the diagnostic checking results, the model did not have serious multicollinearity problem within independent variables. Besides, heteroscedasticity did not exist in the model, meaning that the variance of error term was constant. The error term of model was also not correlated which was

proven by the absent of autocorrelation problem. Furthermore, the error term in the regression model was normally distributed according to Jacque-Bera Test. Lastly, the model did not have model specification bias as shown in Ramsey's RESET Test.

5.2 Discussion of Major Findings

5.2.1 Credit Card Debt

The credit card debt used in this study is the level of consumer credit outstanding issued by board of governors of the Federal Reserve System. Based on the statistical result in Chapter 4, it shows that the relationship between credit card debt and consumer bankruptcy rate in U.S. is significantly positive. This result is consistent with many findings such as Zhu (2008) and Agarwal and Liu (2003). Mathur (2012) found that credit card debt is the largest contributor among other unsecured debts that causes consumer bankruptcy by using the Cox's Proportional Hazard Model. The number of consumer bankruptcy in U.S. had reached the highest record due to the increasing number of credit card delinquency and they had a significantly positive relationship between each other (Ausubel, 1997). Gross and Souleles (2002) discovered that those frequently credit card users yet smaller payments are more likely to go into bankruptcy based on new credit card account dataset. It showed that credit card debt and consumer bankruptcy are positively correlated as default rate of credit cards increased it would lead to 75 percent of U.S. citizen filing for bankruptcy. The result was also supported by Fay, Hurst and White (2002) as they found that the increase in the number of consumer bankruptcy is due to demographic vector which has poor ability to repay credit card debt.

5.2.2 Lending Rate

According to this research, it is concluded that lending rate is significant in affecting consumer bankruptcy in the United States. Based on the empirical results in chapter 4, lending rate and consumer bankruptcy rate have a significantly positive correlation between each other. This positive result is consistent with Katz (1999) who found that the bankruptcy rate increases when lending rate rises. According to Jappelli et al. (2008) that merged panel data on household arrears for 11 European countries with macroeconomic data, high consumer insolvency rate was associated with the increasing of unemployment and interest rate.

5.2.3 Divorce Rate

From the previous chapter, the result is consistent with the hypotheses where there is a significant relationship between divorce rate and consumer bankruptcy rate. This study found that divorce rate is positively affecting consumer bankruptcy rate. This result was also supported by most of the previous researchers. For instance, Edmiston (2006) claimed that divorce always cause a large, immediate, and unexpected reduction in income, which might lead to bankruptcy. Besides, Fay, Hurst and White (2002) provided the evidence that individuals would have higher possibility to become bankrupt in the following year after divorce. Statistically, Fay et al. (2002) expected that there will be 86 percent rising in individual's bankruptcy rate in the following year after divorce. Besides, based on (Edmiston, 2006; Del Boca et al., 2001; Fisher et al., 2005; Lyons, 2003; Zagorsky, 2005) studies, they used the data on individual and supported the idea of a positive correlation between divorce rate and bankruptcy rate. Therefore, this study concluded that divorce rate and consumer bankruptcy rate are positively correlated.

5.3 Implications of the Study

The results of this research provide useful information to the parties such as government or policy maker, financial institutions, investors, as well as consumers. Based on the findings, there is a significant positive relationship between credit card debt and consumer bankruptcy. According to White (2007), credit card debt per household in the United States had increased from 3.2 to 12.5 percent of median family income from 1980 to 2004, which was almost fivefold in real terms. In order to reduce consumers' credit card debt, government could organize financial education programs or seminars to increase the awareness of consumers in debt management. As a result, consumers would have better knowledge of financial evaluation and financial planning to avoid over-indebtedness. Besides, this study found that lending rate does positively affect consumer bankruptcy. When lending rate rises, it will cause inflation to happen in which consumers have to pay more for goods and services, and finally lead to the increased of debt. Therefore, government plays an important role in maintaining an optimum lending rate. Government should be more alert and sensitive towards the lending rate movement and adjust the rate to an optimum level. However, government needs to bear in mind that increase or decrease in lending rate will always bring out another issue which is inflation or deflation.

In addition, this study also brings the implication to financial institutions as they could use the result of the study as a reference to predict individual bankruptcy rate. This research shows that credit card debt and consumer bankruptcy rate have a significant positive relationship, thus, it allows financial institutions to realize that credit card debt is actually occupied a great percentage for individual bankruptcy. In order to reduce the rate of consumer bankruptcy, financial institutions should take every credit card application into consideration before approving the credit. As studied, bankruptcy rate in U.S. is the highest among other countries. Due to the large quantity of credit card users, it is important for financial institutions to realize that credit card delinquent debt might become bad debt and bring possibility for them to go bankrupt. In year 2005, U.S. had implemented Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) to reduce the bankruptcy rate in U.S.. This had controlled the

percentage of citizen filing for bankruptcy but it again rose when U.S. economy experienced its worst crisis since the great depression in year 2007. In order to control the increasing rate of bankruptcy, financial institutions could enhance the terms and conditions for credit card application. Also, they could limit the amount of credit card for certain bad performance borrowers.

In light of the rising trend in bankruptcy rate, investors would pay attention to those factors that lead to bankruptcy. Based on the research results, the rising in lending rate might cause bankruptcy. Hence, the results could be used as guidance for investors to have better understanding and be aware for any investment plan. The changes of lending rate could be increased or decreased sharply affected by external or internal factors. Therefore, investors should read more materials or news to increase their investment knowledge. This would in turn enhance the profit opportunity and reduce the losses. Besides, investors also have to understand their capability for repayment before borrowing loan for investment. Investors have to do more research and understand the factors which might affect the return on their investment, especially the factor of lending rate.

Moreover, throughout this study, consumers would have better understanding about the bankruptcy factors and try to prevent declaring bankrupt. Consumer bankruptcy might bring the financial consequences to consumers instantly and into the future. For example, there is difficulty when consumer obtains a loan associated with a considerable time, limit the job options in future, and loss of assets or property. As mentioned, credit card debt is one of the major factors that cause a consumer declares bankrupt. Therefore, consumer needs to control credit card spending and make some real sacrifices. For instance, consumer needs to think before purchasing and distinguish between wants and needs. It might be sound old-fashioned but it really helps the one who are always over swiping their credit card without thinking about the debts. Based on the study, the consumer bankruptcy rate and divorce rate are positively correlated. As what the study found, divorce is expensive because the individual needs to pay for the costs after divorce, division of property, loss of spouse's income and legal fees. Consequently, it brings to financial strain and might lead to bankruptcy. Although the individual declares bankrupt after divorce, he or she still needs to pay for the

child support payments, alimony, and any legal costs. Thus, individual or married household needs to think properly before went for a marriage or separation.

5.4 Limitations of the Study

One of the limitations encountered in this study is the data collection problem. At first, this study intended to select a larger sample size and include other significant independent variables such as medical expenses and personal income in order to increase the accuracy of empirical results. However, the data available is incomplete in which there is some missing of data for some independent variables to be investigated. At the end, this study is only able to obtain a complete data set from year 1980 to 2011 consisting of 32 observations and include the independent variables of credit card debt, lending rate and divorce rate.

Besides, another limitation is this study only focuses on the determinants of consumer bankruptcy in the United States. Since the United States is a developed country, the result obtained from the research could only be useful for the researchers, policy makers and economists who conduct research in developed country. However, for users of developing country, they are not encouraged to take this result as reference in implementing their countries' policy or for their research purposes because they would probably obtain a biased result.

Furthermore, this study also encountered the budgetary constraint. Since most of the latest journals need to be subscribed, this study faced the problem of obtaining the latest journals to support for the findings. Also, due to the budgetary restriction, this study could only acquire the data up to the year of 2011 as most of the latest data is required to subscribe from different data source.

Last but not least, another limitation that this study was confronting is the time constraint. The duration given in accomplishing this research is only one year. Therefore, this study is only allowed to investigate the factors of consumer

bankruptcy in one country which is United States instead of making a comparison between two countries due to the limitation of time.

5.5 Recommendations for Future Research

According to Liu (2009), using high-frequency data would improve the portfolio optimization decision as well as improve the accuracy and reliability of the results. Therefore, researchers are suggested to use daily, monthly or quarterly data in their future researches in order to increase the sample size. Also, other countries are recommended to disclose their country's data such as consumer bankruptcy rate and other independent variables to public so that researchers could study the relevant topic based on other country data.

Besides, since this study just focuses on the United States which is a developed country and it is useful for researchers and policy makers in developed country. Hence, future researchers who intend to conduct study in developing countries are suggested to collect extra information on the determinants of consumer bankruptcy for the country. In addition, they also need to understand the economic condition and policy implemented in the country.

Furthermore, future researchers are recommended to have budget planning as data collection can be very costly. Many researchers might lack of funds to subscribe for the latest data or journals to conduct or support their study due to the budgetary problem. Thus, they are suggested to look for sponsor funds from third parties such as public, university and government when carrying out the research.

Lastly, it is advisable to lengthen the study period of this research due to the limitation of time constraint. With more supply of time, future researchers could be more focused in studying more relevant topics. In addition, researchers could also expand the research by doing a comparison between two countries instead of focusing on one country only. It is believed that researchers may obtain more accurate results if sufficient time is provided.

5.6 Conclusion

Consumer bankruptcy is a serious issue and negatively impacting the country of the United States. The purpose of this study is to investigate the factors that lead to consumer bankruptcy in the United States. The determinants included are credit card debt, lending rate and divorce rate. All data collected are from year 1980 to 2011 in the United States and various empirical analyses are carried out to ensure the prediction matches the theories that had been reviewed. Besides, Ordinary Least Squares (OLS) method was implemented in the research.

Based on the findings, this study found that credit card debt, lending rate and divorce rate are significant determinants to affect consumer bankruptcy. Both of the variables show a positive relationship with consumer bankruptcy. Furthermore, from the diagnosis checking, it shows that the model is normally distributed and correctly specified, and does not contain multicollinearity, heteroscedasticity as well as autocorrelation problem.

In addition, this research has also discussed the limitations encountered when conducting the study and some recommendations are provided for future researchers. In a nutshell, the objective to identify the factors that lead to consumer bankruptcy had been met. This research has provided useful information to the relevant parties such as policy makers, financial institutions, investors as well as consumers to increase their awareness towards the determinants leading to bankruptcy.

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APPENDICES

Appendix 1: Regression Results

Dependent Variable: BANKRUPTCY
 Method: Least Squares
 Date: 03/18/15 Time: 05:23
 Sample: 1980 2011
 Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-33.39162	18.54649	-1.800428	0.0826
LOGCREDIT	19.28752	2.172411	8.878392	0.0000
LEND	1.438171	0.345011	4.168473	0.0003
DIVORCE	4.412648	1.553254	2.840906	0.0083
R-squared	0.928170	Mean dependent var		92.51877
Adjusted R-squared	0.920474	S.D. dependent var		5.516137
S.E. of regression	1.555572	Akaike info criterion		3.838032
Sum squared resid	67.75450	Schwarz criterion		4.021249
Log likelihood	-57.40851	Hannan-Quinn criter.		3.898763
F-statistic	120.6029	Durbin-Watson stat		1.266079
Prob(F-statistic)	0.000000			

Appendix 2: Pair-wise Correlation Analysis

	BANKRUPTCY	LOGCREDIT	LEND	DIVORCE
BANKRUPTCY	1.000000	0.930691	-0.032812	-0.838444
LOGCREDIT	0.930691	1.000000	-0.246809	-0.946594
LEND	-0.032812	-0.246809	1.000000	0.215623
DIVORCE	-0.838444	-0.946594	0.215623	1.000000

Appendix 3: Correlation Analysis

Dependent Variable: LOGCREDIT
 Method: Least Squares
 Date: 03/18/15 Time: 06:52
 Sample: 1980 2011
 Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.506419	0.185958	45.74379	0.0000
DIVORCE	-0.681983	0.042411	-16.08023	0.0000
R-squared	0.896040	Mean dependent var		5.539792
Adjusted R-squared	0.892575	S.D. dependent var		0.402593
S.E. of regression	0.131953	Akaike info criterion		-1.152281
Sum squared resid	0.522347	Schwarz criterion		-1.060673
Log likelihood	20.43650	Hannan-Quinn criter.		-1.121916
F-statistic	258.5738	Durbin-Watson stat		0.336904
Prob(F-statistic)	0.000000			

Appendix 4: Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.427192	Prob. F(2,26)	0.2582
Obs*R-squared	3.165561	Prob. Chi-Square(2)	0.2054

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 03/18/15 Time: 06:54

Sample: 1980 2011

Included observations: 32

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.223227	18.37034	0.175458	0.8621
LOGCREDIT	-0.426966	2.154992	-0.198129	0.8445
LEND	-0.306174	0.385641	-0.793935	0.4344
DIVORCE	-0.204231	1.534968	-0.133052	0.8952
RESID(-1)	0.349007	0.218419	1.597879	0.1222
RESID(-2)	0.025375	0.193819	0.130923	0.8968
R-squared	0.098924	Mean dependent var		4.22E-15
Adjusted R-squared	-0.074360	S.D. dependent var		1.478387
S.E. of regression	1.532368	Akaike info criterion		3.858867
Sum squared resid	61.05197	Schwarz criterion		4.133692
Log likelihood	-55.74187	Hannan-Quinn criter.		3.949964
F-statistic	0.570877	Durbin-Watson stat		1.649950
Prob(F-statistic)	0.721578			

Appendix 5: Heteroskedasticity Test: ARCH

Heteroskedasticity Test: ARCH

F-statistic	1.580422	Prob. F(1,29)	0.2187
Obs*R-squared	1.602106	Prob. Chi-Square(1)	0.2056

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 03/18/15 Time: 06:56

Sample (adjusted): 1981 2011

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.391721	0.540977	2.572607	0.0155
RESID^2(-1)	0.182027	0.144793	1.257148	0.2187
R-squared	0.051681	Mean dependent var		1.789375
Adjusted R-squared	0.018980	S.D. dependent var		2.467012
S.E. of regression	2.443487	Akaike info criterion		4.687070
Sum squared resid	173.1483	Schwarz criterion		4.779586
Log likelihood	-70.64959	Hannan-Quinn criter.		4.717228
F-statistic	1.580422	Durbin-Watson stat		1.570577

Prob(F-statistic) 0.218731

Appendix 6: Ramsey's RESET Test

Ramsey RESET Test:

F-statistic	1.51E-05	Prob. F(1,27)	0.9969
Log likelihood ratio	1.79E-05	Prob. Chi-Square(1)	0.9966

Test Equation:

Dependent Variable: BANKRUPTCY

Method: Least Squares

Date: 03/18/15 Time: 06:57

Sample: 1980 2011

Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-34.15929	198.6192	-0.171984	0.8647
LOGCREDIT	19.48233	50.22447	0.387905	0.7011
LEND	1.452902	3.810369	0.381302	0.7060
DIVORCE	4.454385	10.86537	0.409962	0.6851
FITTED^2	-5.73E-05	0.014749	-0.003883	0.9969
R-squared	0.928170	Mean dependent var	92.51877	
Adjusted R-squared	0.917528	S.D. dependent var	5.516137	
S.E. of regression	1.584116	Akaike info criterion	3.900532	
Sum squared resid	67.75447	Schwarz criterion	4.129553	
Log likelihood	-57.40850	Hannan-Quinn criter.	3.976446	
F-statistic	87.22181	Durbin-Watson stat	1.265951	
Prob(F-statistic)	0.000000			

Appendix 7: Jarque-Bera Normality Test

