

APPENDIX G-2.a

Consumer Bankruptcy: Causes and Implications (Prepared by Visa U.S.A. Inc. Consumer Bankruptcy Reports)



CONSUMER BANKRUPTCY: CAUSES AND IMPLICATIONS

VISA CONSUMER BANKRUPTCY REPORTS



JULY 1996
VISA U.S.A. INC.

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EXECUTIVE SUMMARY

This report reviews the results of a study Visa initiated to investigate the causes of personal bankruptcies at both the state and national levels. The study was undertaken in response to Member concerns that the historical relationships used to forecast bankruptcy filings have broken down. The research project developed a statistical model to measure the impact of economic and social factors on bankruptcy filing trends. The model can be used to forecast individual Issuer as well as systemwide losses.

A disturbing acceleration in chargeoff levels has been occurring in recent years. Further, net credit chargeoffs are projected to double over the next several years, reaching historical highs. Personal bankruptcy filings are a leading contributor to escalating losses. Such filings have almost tripled since 1981, with an acceleration seen between 1985 and 1992, and are expected to surpass one million filings in 1996.

Issuers typically invest minimal resources to recover the balances of cardholders who have filed for bankruptcy. This practice is rooted in both history and perception. In the mid-1980s, bankruptcy losses amounted to less than a third of total losses. Furthermore, these losses were perceived as a *fait accompli*. By the early 1990s, bankruptcy losses had grown in proportion to total losses, and Issuers began to dedicate more resources toward challenging bankruptcy losses.

The Visa 1996 Issuer Benchmark Study (reflecting 1995 calendar year data) shows that Issuers still invest relatively limited resources toward recovering the balances of cardholders filing for bankruptcy. On average, Issuer activities relating to bankruptcies represent a small fraction of total collections activities, accounting for about 3 percent of total collections-related expense. Low recovery rates associated with bankruptcy chargeoffs, particularly when compared to recoveries on contractual chargeoffs, i.e., nonbankruptcy chargeoffs, reinforce this finding. Based on the 1996 Issuer Benchmark Study, the average contractual chargeoff recovery rate of 18 percent is six times higher than the bankruptcy chargeoff recovery rate of 3 percent.

Analysis and Results

Over 65 macroeconomic and social variables with potential explanatory value were examined to explain trends in personal bankruptcy filings both at the state and national levels. After extensive econometric analysis spanning a 16 years, an equation was developed which, at the national level, explains more than 99 percent of the variation in bankruptcy filing trends.

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The equation incorporates a combination of seven economic and socioeconomic independent variables which proved to be the most powerful in terms of explaining changes in filing rates for personal bankruptcies (Chapters 7 and 13). The variables, in order of importance of their estimated coefficients, are:

- ▶ Growth in Total Employment
- ▶ Share of Population Aged 25–44
- ▶ Divorce Rate
- ▶ Median Existing Home Prices
- ▶ Social Factors Trend Variable (e.g., legal advertising)
- ▶ Number of Bank Credit Card Accounts per Adult
- ▶ Ratio of Consumer Installment Debt Service to Personal Disposable Income

Given the wide variation in personal bankruptcy filings at the state level, a further analysis was undertaken to see if the same set of core economic and socioeconomic factors that drive bankruptcy filing trends at the national level also influence changes in bankruptcies at the state level. With only a few exceptions, the analysis demonstrates that state trends behave in a manner similar to that of the national trends and reinforces the findings of the national model. A few exceptions were found, however:

- ▶ Differences in transfer payments (e.g., unemployment insurance, social security per adult) are significant at the state level, but not at the national level.
- ▶ Unemployment rates affect filing trends at the state level much more than growth in total employment.
- ▶ Housing starts per adult at the state level correlate negatively with personal bankruptcy filing trends, while changes in housing starts were less significant at the national level.
- ▶ Divorce rates are not significant at the state level mainly because of the anomalies in divorce laws which are offset when aggregated to the national level.

Conclusion

The four major findings of this research are:

- ▶ The same set of core economic, credit industry, and socioeconomic factors statistically explain recent and past bankruptcy behavior, and no fundamental shift in underlying factors can be identified.

-
- ▶ In addition to economic drivers, social factors play an important role in influencing personal bankruptcy rates.
 - ▶ States generally follow major national trends and, for the most part, the same set of core factors drive both state and national bankruptcy behavior.
 - ▶ The amount of resources Issuers dedicate to collections efforts on bankruptcy accounts differs quite significantly.

This report identifies the major determinants of bankruptcy filings. Given the robustness of these results, Issuers will be better able to forecast overall credit losses for the bankcard industry in general, as well as to establish appropriate reserve levels and to allocate resources to optimize recoveries, in particular. Forecasts of personal bankruptcies based on this model, however, will ultimately depend on the accuracy of the forecasts of independent variables.

In light of the continued upward trend in bankruptcy filings and, ultimately, in credit card losses related to personal bankruptcies, it may be prudent for Issuers to invest greater resources to predict and manage potential bankruptcies.

Questions concerning this analysis and the econometric model on which it is based should be directed to Bob Holden, Visa U.S.A. Business Research and Reporting Department, at (415) 432-2939.

INTRODUCTION

This report is the first in a continuing series of white papers intended to assist Visa Members in identifying and dealing with current issues related to credit and bankruptcy risk and their impact on the bankcard industry. Future bankruptcy studies will be released over the next several quarters and will report on the following studies currently underway:

- ▶ **Bankruptcy Debtor Survey:** Provides insights into the profile, motivations and, behavior of bankruptcy filers.
- ▶ **Bankruptcy Petition Study:** Provides insight into the financial condition of filers based on a survey of bankruptcy petitions.

In response to Member concerns that the historical relationships used to forecast bankruptcy filings have broken down, Visa initiated a study to investigate the causes of personal bankruptcies at both the state and national levels. This report reviews the results of that analysis, which included the development of a statistical model to measure the impact of economic and social factors on bankruptcy filing trends. This model can be used to forecast individual Issuer as well as systemwide losses. With a better understanding of bankruptcy trends at the state and national level, Issuers will be better prepared to:

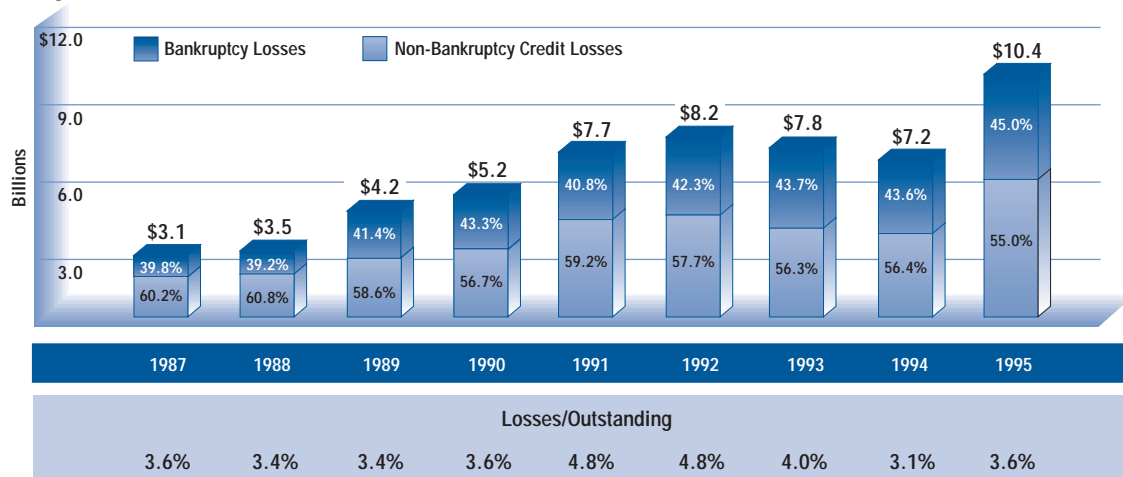
- ▶ Combat the rising tide of losses
- ▶ More precisely forecast overall losses with regard to establishing reserve levels
- ▶ Allocate adequate resources toward not only minimizing losses, but also toward optimizing recoveries

Recent Developments in Personal Bankruptcies

An acceleration in net credit card chargeoffs has occurred in recent years. Net credit chargeoffs, the second largest category of Issuer expense following funding costs, have more than tripled in the nine years between 1987 and 1995 (see Figure 1—Total Bankcard Net Credit Losses) and are projected to double over the next several years. The tremendous growth in credit card outstandings that has occurred in recent years has mitigated these losses to a certain extent. But, the growth in credit card receivables is likely to slow in the next few years, and net chargeoffs may reach historical highs.

Personal bankruptcy filings (Chapters 7 and 13) are a leading contributor to escalating losses. Such filings have almost tripled since 1981, with a significant increase between 1985 and 1992 (see Figure 2—Personal Bankruptcy Filings). During the first half of

Figure 1—Total Bankcard Net Credit Losses



Source: 1994 Visa Bankruptcy Survey, Visa/MasterCard Quarterly Statistical Reports

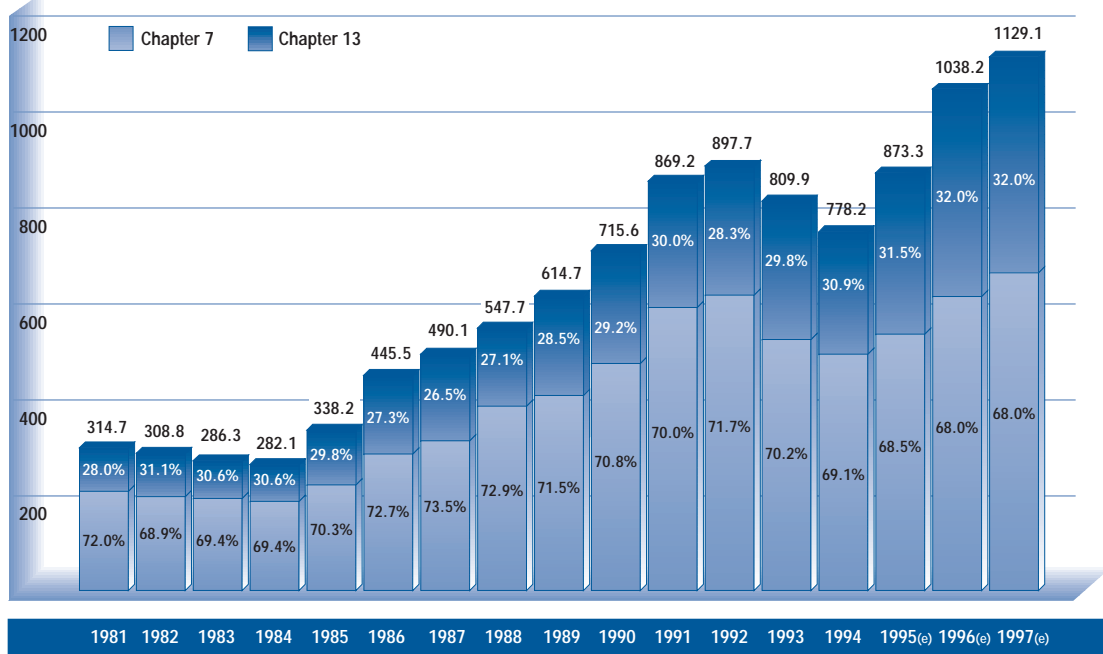
1996, filings continued to accelerate and are expected to top one million by year end. During 1995, bankcard industry losses increased to \$10.4 billion; bankruptcy chargeoffs accounted for almost half of these losses. At \$4.7 billion, bankruptcy chargeoffs soared more than 45 percent from 1994.

Based on the model on the following pages, Visa projects that by 1997 the number of total personal bankruptcies will exceed 1.1 million, resulting in potential credit card losses caused by bankruptcies of almost \$9 billion. While this forecast assumes the number of bankruptcies will level off, the dollar loss per account will continue to increase substantially to more than \$4,000, and the number of bankcard accounts per filing will increase to more than five.

About 30 percent of total personal bankruptcy filings in the U.S. are Chapter 13; the remainder are Chapter 7 (see Figure 2). Chapter 7 filings are characterized by permanent forgiveness of qualifying debt; Chapter 13 provides temporary protection while the debtor restructures his/her financial debt. Given the potential for some recovery of principal by Issuers in a Chapter 13 reorganization, shifting the mix toward a greater proportion of Chapter 13 is desirable.

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Figure 2—Total Personal Bankruptcy Filings
(Chapter 7 and 13)
(In 000s)



Source: Administrative Office of the Courts, U.S. Bankruptcy Courts

Historical Perspective

Personal bankruptcy in the U.S., defined as the voluntary legal action of filing a court petition, dates back to the Bankruptcy Act of 1898. The option to file is intended to serve as a social insurance policy to lessen the impact of unemployment, disability, or illness on the financial well being a household.

From 1898 to 1978, federal bankruptcy law allowed individual states to determine the dollar value and type of property protected by filing for bankruptcy. The 1978 Bankruptcy Reform Act (BRA), for the first time, imposed federal minimum protection levels. The act also allowed states to opt out of the federal minimum protection levels and set levels higher than those dictated by the original act.

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Empirical research dating back to the early 1960s has identified a variety of economic and social factors that have affected trends in bankruptcy filings, including:

- ▶ Increases in unemployment
- ▶ Higher divorce rates
- ▶ An increase in the level of indebtedness relative to the flow of disposable income
- ▶ Increases in public assistance (e.g., unemployment insurance)

Several researchers have also quantified the increase in bankruptcy filings caused by legislative actions such as the 1978 BRA and later amendments.

Starting in the mid-1980s, many of the historical relationships appeared to be weakening. The growth in bankruptcy filings, which normally declines during periods of economic growth, grew 150 percent from 1983 through 1990, even though the U.S. economy experienced the longest peacetime expansion in its history. Furthermore, after a brief reduction in the number of filings in 1993 and 1994 (see Figure 2), the pace of filings accelerated, even though the underlying economy was expanding. Visa projections indicate that filings for 1996 and 1997 will easily surpass the previous peak reached in 1992.

Some states have higher rates of personal bankruptcy filing (e.g. California, Florida, Georgia, Tennessee and Texas). This may be because a variety of factors, including differences in the interpretation of federal statutes by district courts and differences in asset protection levels. However, since 1983, bankruptcy filings increased similarly in all areas of the country despite differences in economic performance during this period.

THE MODEL

Visa initiated a study to investigate the causes of personal bankruptcies at both the state and national levels in response to concerns that the historical relationships used to forecast bankruptcy filings may have broken down. The research project developed a statistical model to measure the impact of economic and social factors on bankruptcy filing trends. The model can be used to forecast individual Issuer as well as systemwide credit card losses. The goals were to:

- ▶ Identify historical drivers of bankruptcy filings
- ▶ Examine the effect of historical drivers on recent trends in bankruptcy filings
- ▶ Examine the ability of a national model to explain state level trends in bankruptcy filings
- ▶ Provide a forecasting tool for Visa Members

Methodology

The WEFA Group, an economic consulting firm, provided technical expertise and resource support. Econometric modeling and data pooling techniques were used to measure the effects of macroeconomic and social factors on personal bankruptcy filing rates.

The analysis attempts to explain changes in the number of personal bankruptcy filings per 1,000 adults, the dependent variable. While both Chapter 7 and 13 filings are considered, no attempt was made to distinguish between factors relating to the two types of filings. The scope of the study includes both national and state historical data dating from the first quarter of 1980 through the first quarter of 1996 on a quarterly basis. Three intervals within that period were examined:

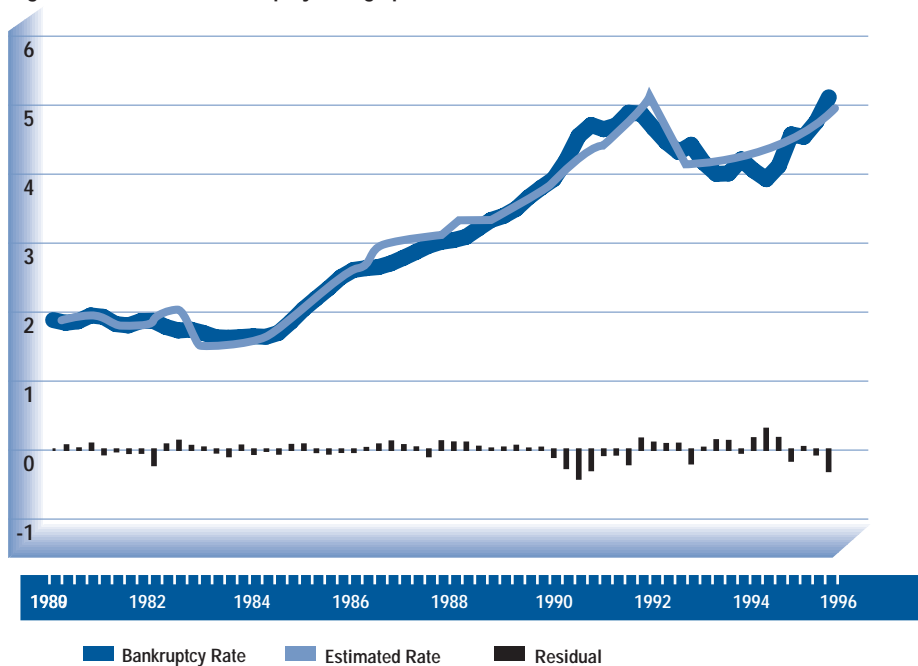
- ▶ First quarter 1981 to first quarter 1996
- ▶ First quarter 1990 to first quarter 1996
- ▶ First quarter 1994 to first quarter 1996

Historical National Analysis

Approximately 65 variables were examined to explain trends in personal bankruptcy filings. In many cases, variables were tested to determine whether there was a “lag” effect (i.e., whether a change in one quarter was not felt or not fully felt until one or more quarters later). This use of different lag structures inflated the number of variables tested to more than 100. Most were discarded because they either were not statistically significant, were redundant, or were implicit in other drivers that were more significant. (See Appendix B—Excluded Variables, for a list of factors tested but not used.)

After extensive econometric analysis over the 16-year interval, an equation was developed that explains more than 99 percent of the variation in personal bankruptcy filing trends. Figure 3—Personal Bankruptcy Filings per 1,000 Adults, illustrates this extraordinarily good fit. Bankruptcy Filings per 1,000 Adults was used as the dependent variable to eliminate as a factor, the growth of bankruptcy filings related solely to general population growth.

Figure 3—Personal Bankruptcy Filings per 1,000 Adults



Source: Visa Consumer Bankruptcy Report Regression Analysis

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The dark line represents actual historical filings and the lighter line represents bankruptcy filings estimated by the equation produced from the econometric analysis. The bars at the bottom of the chart show the residual, or error, between the estimated filings and actual filings for each quarter of the time series. Although the residuals appear to be growing over time, it is important to remember that the base from which the residuals are generated, actual filings, is also growing. When the residuals are stated as a percent of actual filings, the residuals are relatively stable over time. Furthermore, the first quarter 1996 residual, when stated as a percent of actual filings, is not the largest residual in the study period.

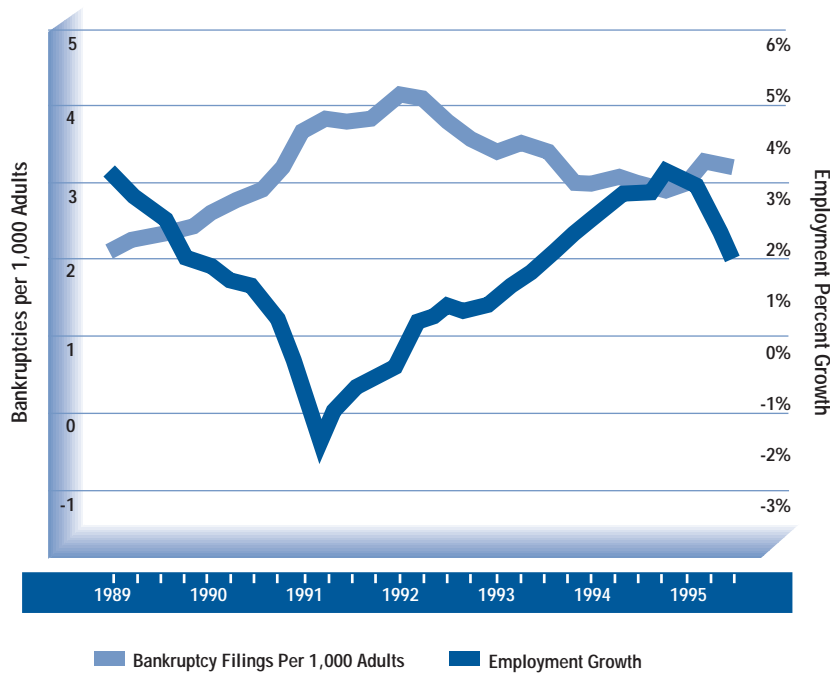
The estimated equation represents a combination of seven macroeconomic and socioeconomic terms. (Appendix D—Bankruptcy Equation, contains the coefficients for all factors, the intercept, and all descriptive statistics for each factor.) Any one of the seven variables alone may be an obvious contributing factor to bankruptcy but, more importantly, it is in combination that these specific variables provide the greatest explanatory power. The seven independent variables are discussed below.

Growth in Total Employment

Employment growth rates proved to have the single most powerful coefficient in explaining bankruptcy behavior. Interruptions in income have clearly been shown to correlate negatively with trends in bankruptcy filings, i.e., when employment growth declines, bankruptcy filings increase (see Figure 4—Bankruptcy Filings vs. Employment Growth). Changes in the employment growth rate appear to have the greatest impact on the rate of bankruptcy filings after “lags” of one and two quarters.

The unemployment rate, on the other hand, proved to have less predictive value. This may be caused primarily by the way unemployment is measured. Unemployed workers who become discouraged and no longer search for jobs are not counted among the ranks of unemployed. Consequently, as the ranks of the discouraged unemployed grow, the unemployment rate loses explanatory power. In addition, unemployment rates may vary widely among states during an economic cycle. These variations are often muted when aggregated at the national level.

Figure 4—Personal Bankruptcy Filings vs. Employment Growth



Source: Bureau of Labor Statistics, U.S. Bankruptcy Courts

Share of Population Aged 25–44

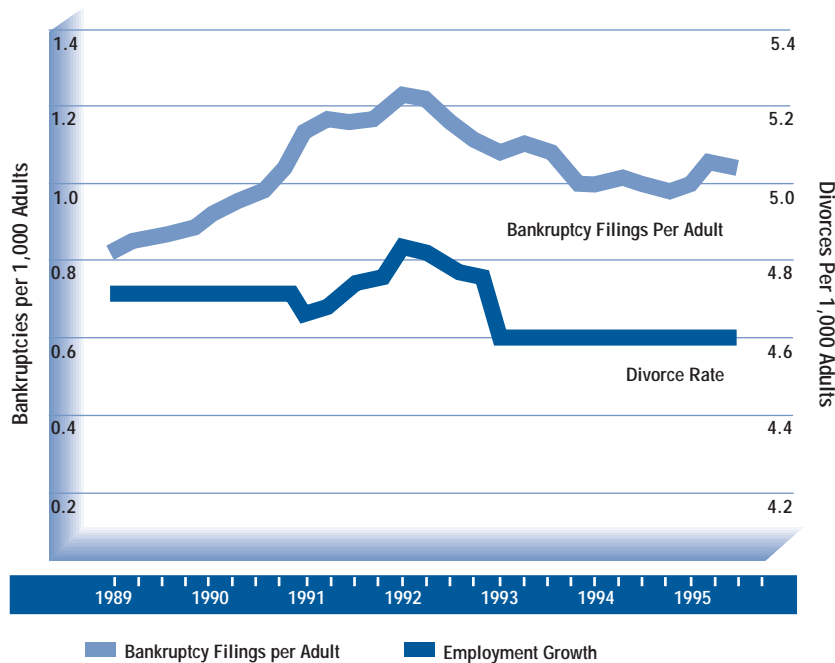
The second most powerful term in explaining bankruptcy filing trends is the share of population between the ages of 25 and 44. The analysis indicates that as the proportion of the population in this group increases, so does the number of bankruptcy filings. Adults in this age category are in their peak consumption years and typically consume and borrow more than individuals in other demographic age groups. As a result, they often have fewer reserves upon which to draw during periods of financial hardship. In addition, this age group may not view bankruptcy with the same stigma as previous generations and may be more inclined to file for bankruptcy.

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Divorce Rate

Divorce rates rank third in power to explain bankruptcy filing trends and correlate positively, i.e., as the divorce rate increases, the number of bankruptcy filings increases (see Figure 5—Bankruptcy Filings vs. Divorce Rates). This driver provides another measure designed to capture interruptions in income flows. Frequently, one or both spouses are financially disadvantaged as a result of the dissolution of a marriage.

Figure 5—Bankruptcy Filings vs. Divorce Rates



Source: Bureau of the Census, U.S. Bankruptcy Courts

Median Existing Home Prices

The median prices of existing homes serve as a proxy for equity (or accumulated wealth) in the equation. This variable was negatively correlated, reflecting two phenomena. First, a collapse in home prices means that individuals may owe more on their homes than they are worth, making bankruptcy a less onerous way to deal with debt problems. Secondly, equity can be a source of funds that may be tapped in an emergency. When values decline, this source of funds dries up, making bankruptcy more likely. This term was most significant when lagged two quarters.

Social Factors Trend Variable

Because of the acceleration in bankruptcy rates shown in Figure 3—Personal Bankruptcy Filings per 1,000 Adults, during a period defined by economic growth, noneconomic factors are likely to have played a more important role in determining changes in personal bankruptcy filings. Many social factors are not easily quantifiable, as consistent, historical data do not exist. Such factors include changes in the bankruptcy laws, the reduced stigma associated with filing for personal bankruptcy and broader advertising of legal assistance with bankruptcy filings. Consequently, a trend term was developed as a proxy for legal, social, and other noneconomic phenomena. This trend term has a high correlation with changes in bankruptcy rates, particularly from 1985 through the second quarter of 1992.

Number of Bank Credit Card Accounts per Adult

This core industry driver serves as a proxy for the availability of credit and is positively correlated with bankruptcy behavior (i.e., as the number of accounts per adult increases, so do bankruptcy filings). This variable has the most significant impact two and three quarters after the change. This may reflect the time it takes credit accounts to mature to the point cardholders become overextended and file for bankruptcy. Revolving credit as a percent of consumer installment credit proved to be almost as significant as accounts per adult, but created a redundancy issue when included with accounts per adult.

Ratio of Consumer Installment Debt Service to Personal Disposable Income

Intuitively, increases in a cardholder's debt service burden, defined as the contractual minimum principal and interest payment, could be positively correlated with bankruptcy filings. However, the debt service burden alone is less important than debt service burden relative to personal disposable income. This driver was found to be positively correlated with bankruptcy filings and was most significant when it was lagged two, three, and four quarters.

Personal disposable income proved to be more significant than other income measurements (e.g., total income, wages and salaries only, non-interest income). Interest rate increases, which are commonly believed to contribute to increases in bankruptcy filings, are implicit in both the debt service ratio and/or income. Therefore, the inclusion of an interest factor would have been redundant.

Value of Model in Explaining Recent Trends

Analysis of two additional, and more recent, time intervals, 1990 through the first quarter of 1996 and 1994 through the first quarter of 1996, produced results consistent with those of the historical 16-year model. The average absolute error between the actual and estimated values for these two intervals increased, but only slightly, implying that no fundamental shift in the explanatory power of the equation has occurred over the near term. Other factors, such as reduced social stigma or increased ease of reestablishing credit, are continuing to influence the propensity of individuals to file for personal bankruptcy.

Value of National Model in Explaining State Trends

The same set of core economic, industry, and socioeconomic factors drive both state and national levels of bankruptcy. Most of the major findings in the national model are confirmed by the state level analysis. Cross-sectional, pooled data for all 50 states and the District of Columbia were used in the analysis.

The three most important variables explaining changes in personal bankruptcy rates at the state level are:

- ▶ Accounts per adult
- ▶ Consumer installment debt service burden as a percent of personal disposable income
- ▶ Share of population aged 25–44
- ▶ The unemployment rate

Over time, these four factors can behave differently from state to state. Differences in state characteristics, e.g., divorce rates, average home prices, and the significance of the government sector on the local economy, may also contribute to these variations.

As with the national level analysis, the factors that explain filing trends in the longer term perform almost as well in near-term time periods. The few differences between the state and national models are discussed below.

Transfer Payments

Increases in transfer payments (e.g., unemployment insurance, social security per adult) are significant at the state level, but not at the national level. Transfer payments or a broader social safety net can act as insurance against risky behavior. The explanatory power of transfer payments at the national level becomes unclear most likely because of the variations in social and welfare policies from state to state.

Unemployment Rate

Contrary to the findings at the national level, changes in unemployment rates are significant in explaining filing trends at the state level. Trends become muddled when state data is aggregated but, at the state level, unemployment rates retain significant explanatory power relative to the national model.

To further test the explanatory power of unemployment rates, employment growth rates for significant regional industrial sectors were tested against state filing trends. This exercise, however, failed to provide significant results.

Housing Starts

Symptomatic of a strong economy, changes in housing starts per adult at the state level correlate negatively with filing trends. Here again, local or regional trends become less pronounced at the national level, but at the state level, housing starts are an important factor.

Divorce Rates

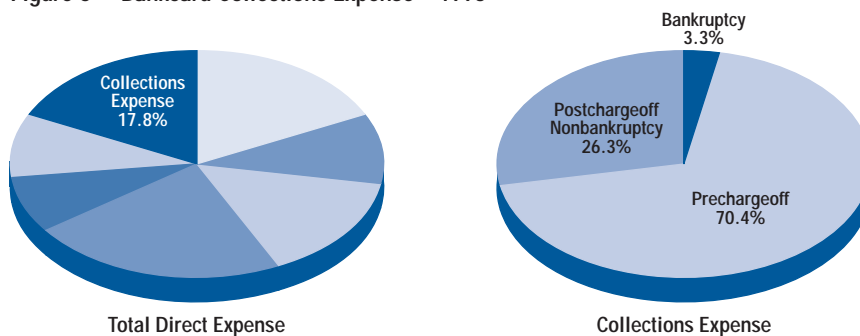
Divorce rates are not significant at the state level, occasionally even generating a counter-intuitive correlation (i.e., negative). Divorce laws and definitions for counting divorces, e.g., divorces for out-of-state residents and legal separation, differ widely from state to state. From the national perspective, however, state-by-state differences even out and divorce rates become very significant.

BANKRUPTCY COLLECTION EXPENSES

Issuers typically invest relatively minimal resources to recover balances of cardholders filing for bankruptcy. This practice is rooted in both history and perception. In the mid-1980s, bankruptcy losses amounted to less than a third of total losses. Furthermore, these losses were perceived as a *fait accompli*. Not until the early 1990s, as bankruptcy losses grew in proportion to total losses, did Issuers begin to dedicate more resources toward challenging bankruptcy losses.

The Visa 1996 Credit Card Issuer Benchmark Study (reflecting 1995 calendar year data) shows that Issuer activities related to bankruptcy collections represent a small fraction of total collections activities, only about 3 percent (see Figure 6—Bankcard Collections Expense). Recovery rates associated with bankruptcy chargeoffs are very low, particularly when compared to recoveries on contractual chargeoffs.

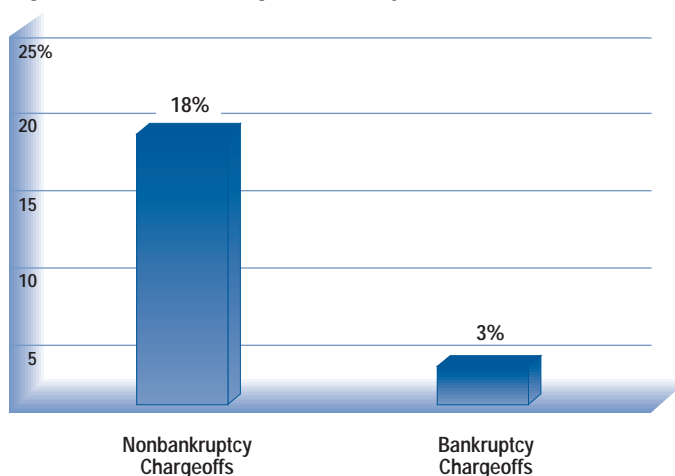
Figure 6— Bankcard Collections Expense – 1995



Source: Visa 1996 Credit Card Issuer Benchmark Study

The average contractual chargeoff recovery rate of 18 percent is six times higher than that of the bankruptcy chargeoff recovery rate of 3 percent (see Figure 7— Bankcard Chargeoff Recovery Rates).

Figure 7—Bankcard Chargeoff Recovery Rates – 1995*

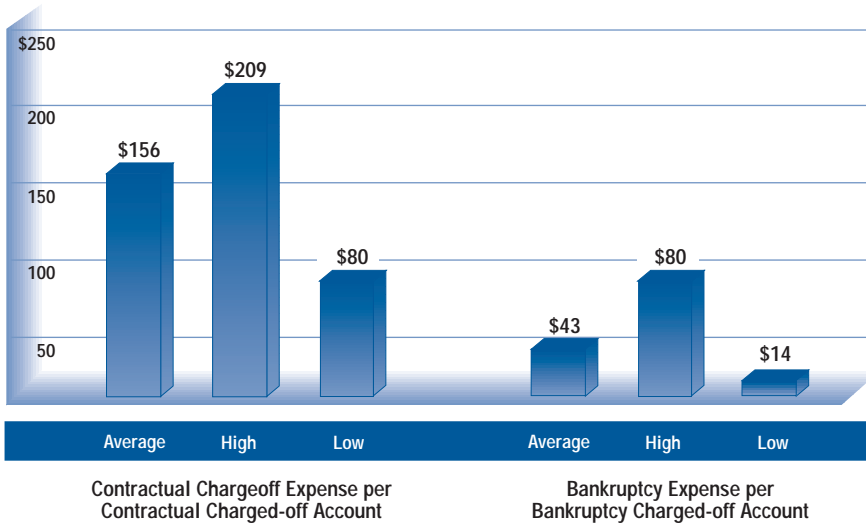


Source: Visa 1996 Credit Card Issuer Benchmark Study
*Dollars received per dollar charged-off

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In 1995 Issuers spent, on average, \$43 per bankruptcy account charged off to recover bankruptcy balances. This compares to \$157 per account charged off for contractual defaults (see Figure 8—Bankcard Recovery Unit Costs). Further, while the amount of resources Issuers devote to collection of contractual chargeoffs differs, the variation in expenditures devoted to working bankruptcy accounts is extraordinarily large.

Figure 8—Recovery Unit Costs – 1995



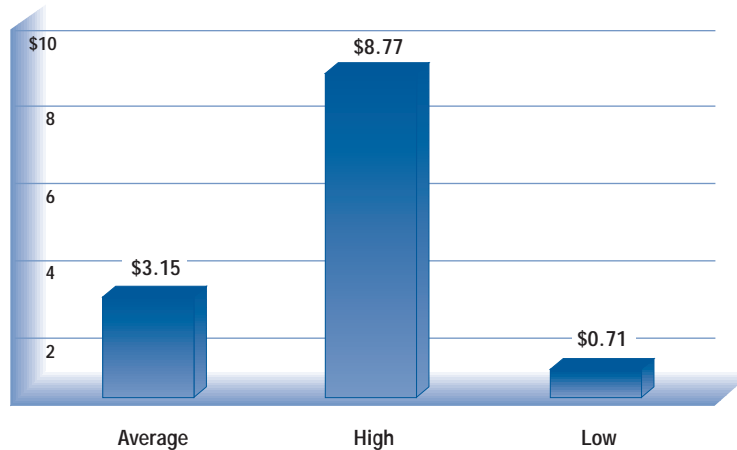
Source: Visa 1996 Credit Card Issuer Benchmark Study

The wide variation seen in the bankruptcy expense per charged-off account reflects differences in Issuer strategies regarding aggressiveness in contesting bankruptcy filings as well as the effect of bankruptcy laws applying to cardholders filing for protection.

The Visa 1996 Credit Card Issuer Benchmark Study indicates a strong correlation between the level of resources devoted to collecting on bankrupt accounts and bankruptcy recoveries. On average in 1995, more than \$3 of bankruptcy recoveries resulted from each dollar of bankruptcy collection expense (see Figure 9—Bankruptcy Recoveries per Dollar of Bankruptcy Collections Expense).

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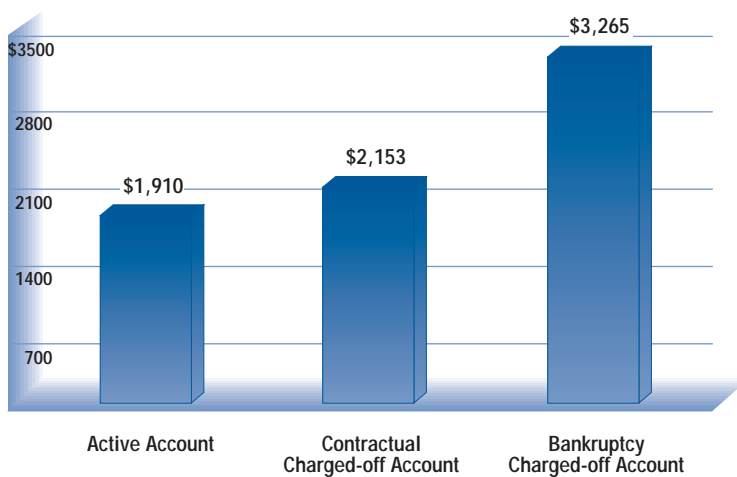
Figure 9—Bankruptcy Recoveries per Dollar of Bankruptcy Collections Expense – 1995



Source: Visa 1996 Credit Card Issuer Benchmark Study

This may be especially relevant given that the average bankruptcy chargeoff for the participants of the 1996 Credit Card Issuer Benchmark Study was \$3,265—52 percent higher than the average contractual chargeoff and 71 percent higher than the average balance of an active credit card account (see Figure 10—Average Account Balance). All of this suggests that spending additional funds to combat bankruptcies may be prudent for many Issuers.

Figure 10—Average Credit Card Account Balance – 1995



Source: Visa 1996 Credit Card Issuer Benchmark Study

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CONCLUSION

The four major findings of this research are:

- ▶ The same set of core economic, credit industry, and socioeconomic factors statistically explain recent and past bankruptcy behavior, and no fundamental shift in underlying factors can be identified.
- ▶ In addition to economic drivers, social factors play an important role in influencing personal bankruptcy rates. These may include an erosion of the social stigma against filing for bankruptcy, increased legal advertising, and the increased availability of credit to individuals who have declared bankruptcy in the recent past.
- ▶ Filings at the state level generally follow major national trends and, for the most part, the same set of core factors drive both state and national bankruptcy behavior.
- ▶ The level of resources Issuers dedicate to collections efforts on bankruptcy accounts varies widely.

This report identifies the major determinants of bankruptcy filings. Given the robustness of these results, Issuers will be better able to forecast overall credit losses for the bankcard industry, in general, as well as to establish appropriate reserve levels and allocate resources to optimize recoveries, in particular. Forecasts of personal bankruptcies based on this model, however, will ultimately depend on the accuracy of the forecasts of the independent variables in the equation.

Recommendations

In light of the continued upward trend in bankruptcy filings, and ultimately, in credit card losses due to personal bankruptcies, it may be prudent for Issuers to invest greater resources to predict and manage potential bankruptcies.

Members need better tools to predict cardholders likely to file for bankruptcy. These include a better understanding of specific economic or “life events” that influence individuals to seek bankruptcy protection.

To reduce losses, better education and awareness about alternatives to bankruptcy are needed. In line with this, Visa has initiated a number of programs to sponsor better use of consumer credit counselling services and improvements in the accuracy of credit bureau reporting.

Although 30 percent of personal bankruptcy filings at the national level are Chapter 13, there are wide differences among states. Further research needs to be done to determine the reasons for these differences, which may have to do with such factors as differences in interpretation of the federal statutes, history, and culture. Increasing the relative proportion of Chapter 13 filings will result in higher recovery rates for all creditors.

Considerations for Issuers

Unfortunately, recent bankruptcy legislation has resulted in some unintended side-effects on the behavior of some of those the BRA was intended to help. Therefore, Issuers may wish to implement programs to:

- ▶ Screen for cardholder abuses of bankruptcy protection by cardholders. As a result of the Visa Bankruptcy Recovery Program, Issuers may be better able to identify fraudulent use of Chapter 7 to avoid paying debts
- ▶ Consider initiating reaffirmation programs for potential Chapter 7 filers, whereby the cardholder agrees to reaffirm their obligation to continue paying down their account balance in return for reinstatement of credit privileges
- ▶ Review Chapter 13 plans to assure that the payoffs accurately reflect the application of the debtor's disposable income, with the goal of increasing the percentage payout to all unsecured creditors
- ▶ File for proof of claim in all Chapter 13 cases

APPENDIX A

Visa Bankruptcy Reference Material and Programs

Visa Consumer Bankruptcy Reports

- ▶ *Consumer Bankruptcy: Causes and Implications (July 1996)*
- ▶ Bankruptcy Debtor Survey (August 1996)
- ▶ Bankruptcy Petition Survey (Quarter 4: 1996)

Visa Bankcard Bankruptcy Survey Findings (Annual)

Bankruptcy Recovery Seminars (Annual/Topical)

Visa Bankruptcy Recovery Program (ongoing)

- ▶ Desktop Reference
- ▶ Bulletin Board
- ▶ Backgrounder
- ▶ Criminal Pursuit Program

Visa Bankruptcy Conference (Annual)

Bankruptcy Highlights Newsletter (Bimonthly)

Issuer Risk Key Indicator Bulletin (Monthly)

1995 Credit Card Functional Cost Study

1996 Credit Card Issuer Benchmark Study (October 1996)

For information covering the above reference materials and programs (except as noted below), please contact Melyssa Barrett , Issuer Risk Management, 415-432-2980

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APPENDIX B

Excluded Variables

Explanatory, but not included	Not Explanatory	Borderline
Short term interest rates	Long term interest rates	Intermediate term interest rates
Money supply		
Average weekly hours of work - pvt	Share of population with high income	Share of population with low income
Average weekly hours of work - mfg	Male share of unemployed	Female share of unemployed
Personal income	Share of unemployed by age group	Blue collar share of employment
Disposable income	White collar share of employment	
Wage & salary income		Consumer spending
Property & interest income	Bankcard outstandings	Retail sales
Transfer payments	Bankcard outstandings per account	Consumer installment credit per adult
Industrial production	Bankcard outstandings per adult	Employment cost index
Consumer sentiment	Bankcard volume	Unit labor cost
Labor productivity	Bankcard volume per account	Imports
Inflation	Bankcard volume per adult	
Housing starts	Bankcard sales	
Labor force participation rate	Bankcard sales per account	
Labor force participation rate - females	Bankcard sales per adult	
Unemployment rate	Labor force participation rate - males	
Military employment	Federal govt employment	
Exports	Personal savings rate	
Gross Domestic Product (real & nominal)	Net exports/imports	
Compensation per hour	Federal govt grants in aid to state & local govt	
Inventories	Household head rate in ages 25 - 34	
New car sales	Tax deductibility of consumer debt interest	
Unit auto production		
Mortgage service payment as share of disposable income		
Total debt service payments as share of disposable income	Minimum wage rate	
Bankcard outanding share of revolving credit		
Revolving credit share of consumer installment debt		
Consumer installment debt service payments		

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APPENDIX C

Modeling Process

The national model was built to best take advantage of the correlations between the economic and other potential explanatory variables and bankruptcy rates. The economic drivers for the forecast were based upon WEFA's highly regarded model of the U.S. economy. The model was built using a logarithmic specification. This means that the logarithm of unit volume was regressed on the logarithm of the economic variables. This specification has a number of advantages. First, it allows the coefficients to be interpreted as elasticities. A one percent change in an explanatory variable (other variables held constant) results in a coefficient percent change in the bankruptcy rate (about .05 bankruptcies per thousand adults). Second, the logarithmic specification has proven superior when modeling rapidly growing series. Third, this specification has a smoothing influence reducing the importance of occasional unusual observations that occur in any data series of this type.

Variables in the model are not limited to economic factors, however. There is a pattern in the data that was caused by noneconomic (social and legislative) factors. A variable is included in the model to capture the effects of these noneconomic factors as distinct from economic factors. An additional set of variables is sometimes included to capture distinct seasonal patterns. However, these were not found to be significant in the national bankruptcy data.

The modeling process consisted of estimating an equation using the most highly correlated economic variables and the necessary noneconomic variable. Because to the interactions between the variables within the model, even some of the highly correlated variables proved to be insignificant in explaining the variation in bankruptcies per adult. The movements they tracked well were even better captured by other variables within the model. Other variables were then added and deleted in an iterative process designed to obtain the best model of the historic relationship.

In some cases, the impact of changes in economic variables on the bankruptcy rate is not immediate. It may also occur over several quarters. For this reason, lagged economic variables are included in the model. Further, these effects may follow a distinct (frequently declining) pattern. To smoothly capture this pattern, and use fewer degrees of freedom, the coefficients on lagged variables may be constrained to follow a linear or quadratic pattern. When this pattern is imposed it is said that a **polynomial distributed lag** has been used on the variable. This technique proved beneficial in explaining bankruptcy rates.

The regional model is similar in nature to the national model except most of the explanatory variables are regional rather than national. The model is built with pooled time series cross-sectional equations. This means one equation was estimated to explain bankruptcy rates with the data for 51 states and 15 years combined or pooled. This approach has advantages in evaluating economic impacts across all states since equations run for single states (particularly smaller ones) can be distorted by volatility and inaccuracies in the data. Despite the pooling, it is possible for elasticities to vary for each state or for groups of states. In this particular application, however, there is little theoretical justification for any particular grouping of states and allowing many elasticities to vary across all states eliminates the benefits of pooling.

It is important to note that the intercept is allowed to vary by state, reflecting differences between states that persist over time, and are not captured by differences in the explanatory variables. Thus, even though the elasticities may be the same, there actually is a distinct equation for each state. In this application, the intercept term is likely to primarily capture the differences in the regulatory environment across states. It should also be noted that states still have unique forecasts despite identical elasticities because each state is driven by its own economic outlook.

APPENDIX D

Bankruptcy Equation

Ordinary Least Squares

QUARTERLY data for 62 periods from fourth quarter 1980 to first quarter 1996

log (bankrpcus)

$$\begin{aligned} = & + 0.45308 * \log (\text{ustrend}) & - 0.69044 * \log (\text{puvholdmed_sf} [-2]) \\ & (10.6698) & (2.03468) \\ & + 1.90663 * \log (\text{pop2534us+pop3544us)/adultpop}) \\ & (5.23780) \\ & + 0.17178 * \log (\text{qf2900}) [-2] & + 0.11452 * \log (\text{qf2900}) [-3] \\ & (3.16372) & (3.16372) \\ & + 0.05726 * \log (\text{qf2900}) [-4] & + 0.25055 * \log (\text{unacct/adultpop}) [-2] \\ & (3.16372) & (6.74354) \\ & - 3.49219 * \log (\text{eme/ (eme.1+eme.2+eme.3+eme.4) /4}) [-1] \\ & (9.5006) \\ & - 1.74609 * \log (\text{eme/ (eme.1+eme.2+eme.3+eme.4) /4}) [-2] \\ & (9.5006) \\ & + 0.12528 * \log (\text{unacct/adultpop}) [-3] & + 1.58467 * \log (\text{divorcus} [-1]) - 17.0684 \\ & (6.74354) & (5.66798) & (7.84000) \end{aligned}$$

Polynomial lags:

log (qf2900) log (unacct/adultpop)
from 2 to 4 degree 1 far

log (eme/ (eme.1+eme.2+eme.3+eme.4) /4)
from 1 to 2 degree 1 far

log (bcs bare)
from 3 to 5 degree 1 far

Sum Sq	0.0604	Std Err	0.0334	LHS Mean	-0.3190
R Sq	0.9936	R Bar Sq	0.9928	F 7, 54	1197.11
D.W. (1)	0.8283	D.W. (4)	2.0562		

Mnemonic key:

bankruspc	Bankruptcies per adult
ustrend	Social factors trend proxy
puvholdmed_sf [-2]	Median existing home price two quarter lag
(pop2534us+pop3544us)/adult pop	Share of adult population aged 25 to 44
eme/((eme.1+eme.2+eme.3+eme.4)/4)	Total employment growth term
qf2900	Consumer installment debt/disposable income
unacct/adultpop	Number of bank card accounts per adult
bcshare	Bank card share of revolving credit
divorcus.1	Divorce rate lagged one quarter
[-x]	Quarter lags
Parenthetical numbers below coefficients	T-statistic

The above econometric model for national analysis and all 50 states is available on diskette. Please contact Bob Holden, Visa U.S.A., Business Research and Reporting Department, at 415-432-2939

APPENDIX E

Regression Interpretation

T-statistics—The t-statistic tests the hypothesis that the particular coefficient is statistically different from zero. While it varies with sample size, generally t-statistics greater than 1.8 indicate significant coefficients.

Sum of Squared Errors—The statistic minimized by Ordinary Least Squares (OLS). The sum of squared residuals is a measure of the historic error of the equation that highly weighs larger errors (by squaring).

Standard Error—Frequently called the root mean squared error. Calculated by taking the sum of squared errors, dividing by the degrees of freedom (observations minus coefficients) and taking the square root. The mean squared error measures the spread of estimates around the true values.

LHS Mean—Mean value of the dependent (left-hand side) variable. OLS minimizes squared deviations from this mean. It is more informative for level equations than log specifications.

R-Squared—Variation in Y (the variable being modeled) = explained variation + residual variation. $R\text{-Squared} = \text{explained variation} / \text{total variation}$. Hence, it is a measure of the amount of variation in Y (around its mean) that is explained by the model. It ranges from 0 (no explanation) to 1 (perfect fit).

R Bar Squared—The R-squared corrected for the degrees of freedom in the model. This is frequently done because adding variables to the model will always increase the R-squared (statistical fact) but may not improve the model in any meaningful sense. R bar squared adjusts for the increase in R-squared simply from adding a variable to the model. It ranges up to 1 and can be negative.

F-Statistic—The f-statistic tests the hypothesis that none of the explanatory variables helps explain the variation in Y (i.e., that all the coefficients are equal to zero). If none of the coefficients is different from zero, the f-statistic will be close to zero. F-statistics vary fairly widely depending on sample size and number of explanatory variables, but values greater than 10 usually imply significance (as can values as low as 2 or 3).

Durbin Watson—Test for first-order autocorrelation. This tests for whether the error term can be predicted based on its previous value. Values near 2 indicate there is no autocorrelation. Values near 0 indicate positive autocorrelation (each error term is likely to have the same sign as the previous). Values near 4 indicate negative autocorrelation. The test has a large indeterminate zone where neither the conclusion that autocorrelation is present or absent can be made definitively (particularly when the number of observations is low). All of the results are technically within the indeterminate range, although most would be judged as indicating no problem.

Durbin Watson (4)—Test for autocorrelation among errors four quarters apart. This tests for whether the error term can be predicted based on its four quarters ago value. Positive autocorrelation would be an indication of seasonality not adequately captured by the model. Values near 2 indicate there is no autocorrelation. Values near 0 indicate positive autocorrelation (each error term is likely to have the same sign as the 4 period earlier). Values near 4 indicate negative autocorrelation.

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