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Economic Factors Associated  
With Personal Bankruptcy  
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**ECONOMIC FACTORS ASSOCIATED  
WITH PERSONAL BANKRUPTCY  
A. Charlene Sullivan\***

**Abstract**

An understanding of factors related to trends in the incidence of personal nonbusiness bankruptcy is important to credit managers as well as to economists. This study updates and extends to 1982 an earlier study of economic factors associated with the incidence of bankruptcy from 1950 to 1970.

This study shows that the incidence of personal bankruptcy follows movements in a measure of the aggregate household debt burden (total consumer credit outstanding relative to disposable personal income). Unlike the earlier study, we found that independent measures of willingness to file bankruptcy were also significantly associated with the number of bankruptcies filed per 100,000 of population.

Our study also indicates that the enactment of the Bankruptcy Reform Act was followed by a significant increase in the incidence of personal bankruptcy. Holding other conditions constant, our model suggests that about 50 percent of such bankruptcies filed in 1982 were attributable to the new law.

**ECONOMIC FACTORS ASSOCIATED WITH PERSONAL BANKRUPTCY**

**A. Charlene Sullivan**

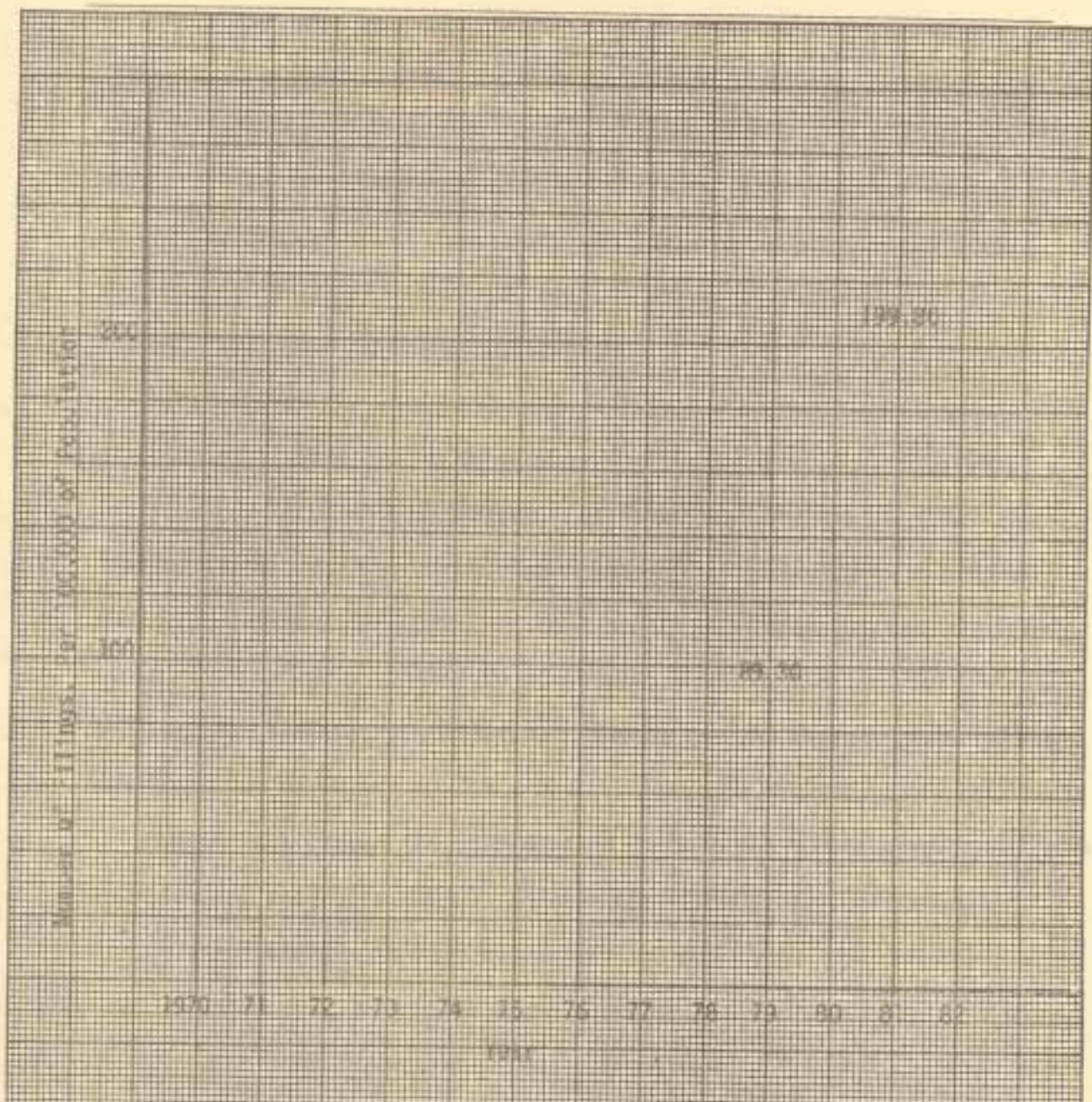
The growth in the number of personal bankruptcies has been well publicized, especially since the enactment of the Bankruptcy Reform Act of 1978. Since October 1979, when the law went into effect, the number of personal nonbusiness bankruptcies filed per year per 100,000 of population has more than doubled (Exhibit 1). An earlier study of trends in personal bankruptcies from 1950 to 1970 [11] showed that the incidence of personal bankruptcy was significantly and positively associated with a measure of aggregate consumer debt use. This study extends and expands that analysis of the relationship between the incidence of bankruptcy and household debt burden in light of changes that have occurred in the consumer credit market since 1970, including the new bankruptcy code.

The paper is organized into three sections. In the first section, the literature concerning the economic and demographic factors associated with personal bankruptcy is reviewed. Several specifications of a model of personal bankruptcy are empirically tested in the second section. The final section contains a discussion of the results and conclusions.

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INCIDENCE OF PERSONAL BANKRUPTCY  
(Filings per 100,000 of population)\*



\* The number of filings were adjusted to reflect the fact that before 1970, a husband and wife had to file separately, and were counted as two filings; after 1970 a husband and wife could file jointly on one petition.

SOURCE: U. S. Bankruptcy Courts

## I. Background

The few studies related to personal bankruptcy either analyze determinants of the rate of personal bankruptcy using time series data [11] or characteristics of consumers taking bankruptcy using cross sectional data [7,8]. Yeager [11] developed a bankruptcy growth model that related the incidence of personal bankruptcy filings per 100,000 of population to the incidence of financial insolvency in the population and to the proportion of insolvents who chose bankruptcy. The latter variable was a reflection of consumers' attitudes toward the moral, social, and economic consequences of bankruptcy.

Yeager used the ratio of consumer installment credit outstanding to disposable personal income as a proxy for the incidence of insolvency and the tendency to choose bankruptcy. He found that the debt burden variable (lagged six months) explained 94 percent of the variation in the annual number of personal bankruptcy filings per 100,000 of population for the period 1950 to 1970.<sup>1</sup> The rate of unemployment, lagged for various time periods, was introduced but did not improve the explanatory power of the model.

Yeager noted that the upward trend in both the number of personal bankruptcies, and aggregate use of consumer credit relative to disposable income which started in 1950 was abated in 1965.

The saturation point was apparently reached in the mid-sixties, when the ratio of consumer credit outstandings to disposable personal income had grown to 19 percent. This ratio ceased to grow after calendar year 1965 and average growth in personal bankruptcies from fiscal year 1966 to fiscal year 1970 was virtually zero. . [11, p.96].

The increase in the incidence of personal bankruptcy from 1950 to 1965 was apparently a byproduct of a structural shift to a more credit oriented economy.

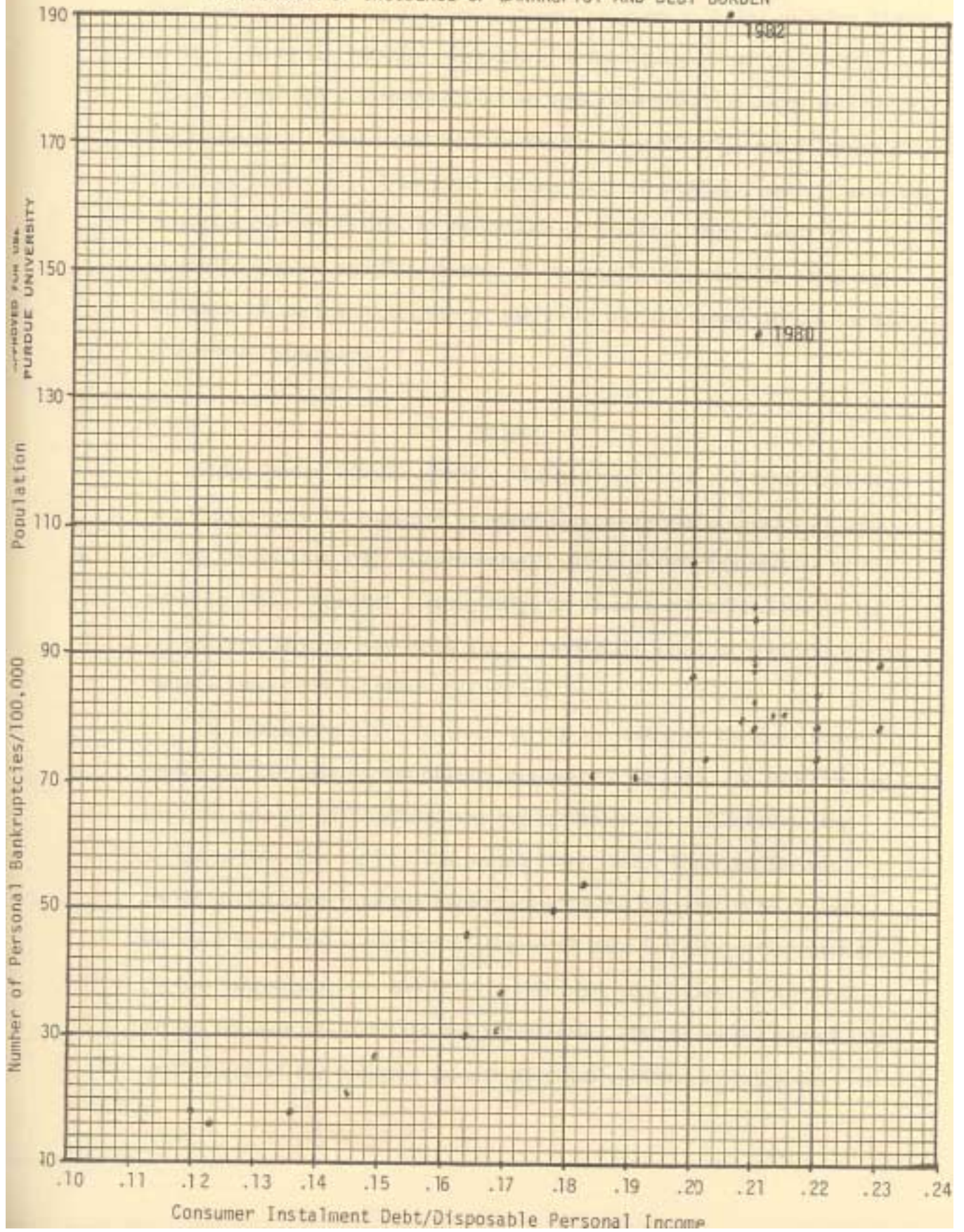
After 1970, until 1979, both the number of bankruptcies per 100,000 of population and the debt burden variable fluctuated randomly with little apparent relationship to each other. Between 1971 and 1979, the number of personal bankruptcies per 100,000 consumers fluctuated between 74.0 and 105.05. During the same period, the measure of debt burden ranged narrowly from 20.4 percent in 1975 to 23.4 percent in 1979. The break in the pre-1970 relationship of bankruptcy rate to debt burden is illustrated in Exhibit 2, which provides a scatter diagram of the yearly relationships. It is apparent that the positive correlation between the two variables disappears when the ratio of consumer installment debt to disposable personal income exceeds 20 percent. Above this point there appears to be no systematic relationship between the two variables. In October 1979, the Bankruptcy Reform Act of 1978 became effective and the sharp increase in the number of petitions filed after that date can perhaps be attributed to the law, which increased the benefits relative to the costs of filing personal bankruptcy.

Studies of personal bankruptcy that use cross-sectional data to identify the characteristics of petitioners for bankruptcy and the problems that lead to bankruptcy provide some insight into other factors that may have a causal relationship with the incidence of bankruptcy. A recent study of a sample of petitioners for bankruptcy under chapter 7 of the code [8] showed that the "typical" petitioner was less than 44 years of age with a family, and employed in a blue-collar position. Debt use is high during the family formation years relative to other stages of the life cycle. However, consumers in the family formation stage (25-44 years) had a disproportionately high representation among petitioners for bankruptcy. When asked to cite the most important causes of bankruptcy, petitioners were most likely to indicate marital problems, medical problems, increased cost of

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<sup>1</sup> The bankruptcy statistics are based on the fiscal year while the outstanding credit and disposable income numbers are based on calendar year. Consequently, there is a six-month lag of the outstandings figure relative to the bankruptcy figure.

SCATTERGRAM OF INCIDENCE OF BANKRUPTCY AND DEBT BURDEN



living, or excess use of credit. Thus, trends in variables such as age distribution of the population, divorce rate, and inflation of medical costs may be useful to explain trends in the incidence of personal bankruptcy.

## II. Analysis

Since Yeager's model showed a highly significant positive relationship between the incidence of personal bankruptcy and a measure of debt burden, an initial step in our analysis was to extend application of his model to 1982. Somewhat surprisingly, we found a marked decline in the explanatory power of the model and a significant level of positive serial correlation in the residuals (Exhibit 3).

The consistent positive trend in the incidence of personal bankruptcy and the debt burden measure disappeared in 1965. We hypothesized that the relationship between the two variables was different in the period before 1965 than in the period after 1965. When the 33--year period was divided into two subperiods with the division made at 1965, the results of the estimation of the model were markedly different for the two subperiods. In the first period, the coefficient of the debt burden variable was positive and significant. In the second period, the coefficient of the consumer debt-to-disposable-income variable was significant but negative. An F-test of the stability of the model over the entire period confirmed that the relationship between the incidence of personal bankruptcy and debt burden was not stable.<sup>2</sup>

The significant change in the relationship between debt burden and the incidence of consumer bankruptcy over the two test periods may be attributed to federal regulations of consumer credit that have been enacted since 1965. The Consumer Credit Protection Act, which became effective on July 1, 1969, was the first federal law regulating consumer credit and served to override many state laws which may have been less liberal relative to the federal law with regard to garnishment.<sup>3</sup> Other federal regulations of consumer credit which have been enacted since 1970 are the Equal Credit Opportunity Act, Fair Credit Billing Act and the Fair Credit Reporting Act. These regulations have generally reduced creditors' rights relative to those of consumers and thus may have increased the length of time between the incurrence of excess debt and the exhaustion of self-help tactics other than voluntary bankruptcy.

We tested this hypothesis by evaluating several specifications of the bivariate relationship between debt burden and personal bankruptcy with the independent variable lagged one and two years.<sup>4</sup> The results of the tests with the debt burden variable lagged one year (CID<sub>-1</sub>) were inconclusive (Exhibit 3). When the equation was estimated over the 2 entire period, the model had no explanatory power ( $R^2 = 0$ ). The estimate for the first subperiod showed that the incidence of personal bankruptcy was significantly positively associated with debt burden whether lagged one period (CID<sub>-1</sub>) or with no lag (CID). This insensitivity of the results is probably attributable to the consistent positive trend in both the independent and dependent variables during this time

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<sup>2</sup> To test for structural change of a model over time series data, one may construct the test statistic:

$$\frac{(RRSS-URSS)/K}{URSS/(n_1+n_2-2K)} \sim F_{K, n_1+n_2-2K}$$

where the restricted residual sum of squares (RRSS) result from the estimation of the model over  $n_1+n_2$  data points, constraining the K parameters to be equal; the unrestricted residual sum of squares (URSS) is calculated by estimating the model over the first  $n_1$  and the second  $n_2$  data points separately, and then summing the residuals resulting from each estimation.

<sup>3</sup> Cross-state analysis of the incidence of bankruptcy [1] found the rate of bankruptcy significantly higher in states with liberal garnishment laws, that is, laws that permitted creditors to gain a large proportion of consumers' income when the consumer defaulted on a contract.

<sup>4</sup> Actually, the lags tested were 1-112 and 2-112 years given the way the data series are created.

period (1950 - 1965). Consequently, it is conceivable that there was no change in the relationship between the measure of debt burden and the incidence of bankruptcy over the entire study period. Rather, Yeager's results may be attributable to a spurious correlation between the two variables as they were specified in his model.

We reestimated the equation with the debt burden variable lagged two years with more satisfactory results. For the entire period and the two subperiods, the coefficients of the debt burden variable were positive and significant. The test of stability showed that the model was stable over the entire test period. However, the explanatory power of the model was lower than that achieved by Yeager, and the Durbin Watson statistic supported the hypothesis that the residuals were significantly positively correlated. In time series data, if the successive residuals are serially correlated the results may be capturing the effect of omitted explanatory variables.<sup>5</sup>

### Exhibit 3

Time Period	Constant	CID	CID .1	CID .2	R <sup>2</sup>	F	DW	Test of Stability of Relationship
1950-1982	-100.74 (-2.7)*	918.66 (4.8)*			.41	23.0	.40	
1950-1965	-86.84 (7.2)*	796.44 (11.0)*			.89	120.97	1.04	F=14.88*
1966-1982	580.01 (3.2)*	-2234.71 (-2.6)*			.27	6.97	.29	
1950-1982	61.05 (1.90)		87.31 (.52)		.00	.27	.15	
1950-1965	-92.02 (-7.37)		842.31 (11.32)*		.90	128.1	.93	F=34.68*
1966-1982	189.91 (6.01)*		-427.57 (-2.83)*		.30	7.98	1.03	
1950-1982	-123.00 (-4.29)*			1057.68 (7.14)*	.62	50.92	.34	
1950-1965	-94.75 (-7.54)*			888.10 (11.61)*	.91	134.76	.77	F=2.83
1966-1982	-476.42 (-2.34)*			2701.95 (2.86)	.35	8.16	.59	

\*Significant at the 99 percent confidence level.

CID = Ratio of outstanding consumer installment and noninstallment credit to annual disposable personal income.

Whereas Yeager empirically tested only the relationship of debt burden to the incidence of bankruptcy, an additional independent factor associated with the level of bankruptcies i.e., willingness of consumers to file for bankruptcy was also hypothesized. Legally, a consumer does not have to be financially overburdened to file bankruptcy. Rather, a consumer may simply be unwilling or uncertain about his or her ability to repay existing debts and file for bankruptcy. The only restriction on the voluntary use of bankruptcy is that an individual may file only once within a six-year period. Consequently, the measures of debt burden may not be correlated with consumers' evaluation of the costs and benefits of bankruptcy and willingness to file bankruptcy as Yeager assumed in the empirical testing of his model. We tested the explanatory value of two variables as independent proxies for willingness to file bankruptcy.

<sup>5</sup> Actually, the lags tested were 1-112 and 2-112 years given the way the data series are created.

A household with a heavy debt burden, but an optimistic outlook about the future, would perhaps be less likely to file bankruptcy than otherwise similar households with a pessimistic view of the future.<sup>6</sup> Thus, we expected to find a negative relationship between household economic expectations and the incidence of personal bankruptcy. An index of household expectations--the Consumer Sentiment Index (CSI)--was included in the model as one proxy for willingness to repay debts or, inversely, to file bankruptcy.<sup>7</sup>

The index is measured quarterly and is a weighted average (equal weights) of responses of a random sample of households to the following set of questions:<sup>8</sup>

1. We are interested in how people are getting along financially these days. Would you say that you and your family are better off or worse off financially than you were a year ago?
2. Now, looking ahead, do you think that a year from now you people will be better off financially, or worse off, or just about the same as now?
3. Now turning to business conditions in the country as a whole--do you think that during the next twelve months we will have good times financially, or bad time, or what?
4. Looking ahead, which would you say is more likely--that in the country as a whole we will have continuous good times during the next five years or so, or that we will have periods of widespread unemployment or depression or what?
5. About the big things people buy for their homes--such as furniture, house furnishings, refrigerator, stove, television, and things like that. For people in general, do you think now is a good time to buy major household items?

We tested several lag formulations of the CSI variable and found that the two-year lag specification made the greatest contribution to the explanatory power of the model. The sentiment variable and the debt burden variable were slightly negatively correlated with a simple correlation coefficient of -.07.

During recessionary periods personal knowledge of the consequences of bankruptcy is gained from the experiences of family, friends, and coworkers, and from news stories about bankruptcy.<sup>9</sup> This knowledge might lead to a reassessment of the personal consequences of bankruptcy. In other words, during recessionary periods the number of people filing bankruptcy would increase because uncertainty regarding the consequences would be reduced. An alternative measure of willingness to file bankruptcy which was tested was a dummy variable that took the value of one during the years since 1950 which have been officially designated as recessionary (RECES) and zero otherwise. Tests of various specifications of the relationship showed that the RECES variable made the maximum contribution to the explanatory power of the model when it was specified with a two-year lag.

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<sup>6</sup> See Katona [4] for a discussion of psychometrics which is the study of the relationship between economic expectations and economic decision-making.

<sup>7</sup> See Richard T. Curtin, "Index Construction: An Appraisal of the Index of Consumer Sentiment," Survey of Consumers 1971-1972, (Ann Arbor: Institute for Social Research, 1973).

<sup>8</sup> The annual index was created from an equally weighted average of the quarterly indexes.

<sup>9</sup> In [8], the sources of information most frequently specified by petitioners for chapter 7 bankruptcy was friends, relatives and coworkers.

The final variable included in the model which is ultimately related to willingness to file bankruptcy was a dummy variable (DUM) which represented the years since the enactment of the Bankruptcy Reform Act (1979-1982). The specific provisions of the law for personal bankruptcy which reduced the costs relative to the benefits of bankruptcy were: (1) a federal override of state asset exemption provisions which was more, generous than many state laws; (2) a requirement that once a bankruptcy petition is filed, all collection activity must cease; and (3) a relaxation of restrictions on the availability of chapter 13 relief. The optimal specification of that variable was with a one-year lag.<sup>10</sup> In other words, although the law became effective in October 1979, the impact on the number of petitions filed was not observable until 1980. The estimates of the model with the variables reflecting willingness to file bankruptcy included are shown in Exhibit 4.

The explanatory power of the model with the additional variables included improved dramatically over that of the bivariate model. The coefficients of the sentiment variable whether specified as an index of sentiment or as a dummy variable representing periods of recession, was significant with the expected sign. The overall results of the two models with the alternative attitude variables were almost identical. The R<sup>2</sup> for both models was .93 and the Durbin Watson statistic, although improved from that for the bivariate model, was in the indeterminate range at the five percent level of significance.

The coefficient of the variable representing the enactment of the change in the bankruptcy law (DUM) was significant and positive. Estimates using equation B in Exhibit 4 show that about half of the bankruptcies per 100,000 of population filed in 1982 could be attributed to the change in the bankruptcy law. (Exhibit 5).<sup>11</sup> The estimates in Exhibit 5 also show that in the three years since the law was enacted the percent of total filings that could be attributed to the change in the bankruptcy code has increased from 21.6 percent to 50.2 percent.

Alternative models that included measures of the divorce rate, trends in medical costs and housing expenses, the unemployment rate (lagged) and age shifts in the population were estimated. Since all the coefficients for these variables were not significantly different from zero, those results are not shown.

**Exhibit 4: Estimates of Determinants of Personal Nonbusiness Bankruptcy  
(Dependent variable = nonbusiness personal bankruptcies per 100,000 population)**

Time Period	Estimated Coefficient						R <sup>2</sup>	DW	F
	Constant	CID <sub>.2</sub>	ICS <sub>.2</sub>	Reces <sub>.2</sub>	Dum <sub>.1</sub>				
A. 1950-1982	-84.08 (-6.07)*	880.74 (9.82)*	-.16 (-1.79)**		71.59 (8.09)*	.93	1.40	125.29	
B. 1950-1982	-74.44 (-5.81)*	748.64 (10.95)*		12.24 (2.57)*	75.88 (10.48)*	.93	1.54	140.59	

\*Significant at one percent confidence level.

\*\*Significant at five percent confidence level.

CID Ratio of outstanding consumer installment and noninstallment credit to annual disposable personal income.

ICS Measure of consumer sentiment series created by the Survey Research Center at the University of Michigan.

RECES Dummy variable taking on the value of one in years officially designated as being periods of recession and zero otherwise.

DUM Dummy variable taking the value of one for years since the Bankruptcy Reform Act of 1978 has been in effect, i.e. 1979-1982.

<sup>10</sup> Pfeilsticker [6] noted that "there was a sigh of relief when the raw figures for personal bankruptcy filings for the last quarter of 1979 were released for those figures appeared to indicate a decrease from the previous quarter in the number of filings. The new year, however, brought definite indications that the previous quarter's apparent decline was not a sign of things to come."

<sup>11</sup> Carter [2] estimated that about 72 percent of the increased cases filed nationally in the four-quarter period ending June 30, 1981 were attributable to the change in the bankruptcy law.

**Exhibit 5**  
**Estimates of the Effect of the Bankruptcy Reform Act**  
 Number of Bankruptcies per 100,000 of population

	1979	1980	1981	1982
Actual	89.30	141.32	199.80	193.90
Estimated if no new law	89.30	110.74	112.98	96.51
▲ Attributable to new law		30.58	86.82	97.39
▲ as percent of total filings		21.6%	43.5%	50.2%

### III. Summary

The model of the incidence of personal nonbusiness bankruptcy developed and tested by Yeager [11] related the annual rate of bankruptcy to the yearly ratio of the aggregate level of consumer credit outstanding to disposable personal income for the period 1950-1970. Since 1970, the measure of debt' burden has fluctuated randomly with no trend, while the incidence of personal bankruptcy has increased, quite dramatically in recent years. This research found that the ability of Yeager's model to explain bankruptcy trends had declined dramatically. Confronted with the failure of the Yeager's model in the post-1965 period, we tested variants of Yeager's model which reflect various lags between the points in time when high levels of debt are incurred and a bankruptcy petition is filed and additional measures of household economic attitudes and a variable representing the change in the federal bankruptcy law.

Our analysis show that the major explanatory variables for the incidence of personal bankruptcies per 100,000 people are debt burden and short-term economic outlook or attitudes. The optimal specification of both factors reflected a two and one-half year lag of changes in the rate of personal bankruptcies following changes in the economic variables. Holding those factors constant, our analysis shows that the enactment of the 1978 Bankruptcy Reform Act was followed by a significant increase in the number of personal nonbusiness bankruptcies filed per year per 100,000 people. About half of the personal bankruptcies filed in 1982 were attributed to the Reform Act.

These results suggest that the incidence of personal bankruptcy will not change dramatically in the next couple of years. The debt burden measure has declined since 1980 but the effects of the recession of 1979-81 on the incidence of bankruptcy will not subside quickly even though we are experiencing an upturn in the level of economic activity. In addition, the provisions of the new bankruptcy law will keep the incidence of bankruptcy at a high level until other adjustments made by creditors in light of the legislation, such as the substitution of secured claim for the unsecured claims, change the economics of the decision to file for personal bankruptcy.

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## APPENDIX A

### Time Series of Bankruptcy and Debt Burden Ratios

<u>Year</u>	Personal Bankruptcies Per 100,000 Population	Consumer Debt To Disposable Personal Income
1950	16.44%	12.4%
1951	17.95	12.0
1952	17.98	13.7
1953	20.80	14.5
1954	27.14	14.8
1955	30.26	16.4
1956	31.15	16.7
1957	36.99	16.8
1958	45.90	16.4
1959	50.02	17.8
1960	54.10	18.4
1961	71.53	18.4
1962	70.83	18.9
1963	73.55	20.3
1964	80.88	20.9
1965	84.10	21.6
1966	89.50	21.2
1967	96.49	20.9
1968	90.31	21.2
1969	83.63	21.4
1970	86.98	20.3
1971	88.02	21.0
1972	78.88	21.9
1973	74.00	22.2
1974	79.64	21.4
1975	105.05	20.4
1976	98.23	20.8
1977	84.01	22.0
1978	78.83	23.1
1979	89.30	23.4
1980	141.32	21.2
1981	199.80	20.6
1982	193.90	19.6

\*Includes installment and noninstallment credit.