

Economic and Behavioral Influences on Small Businesses Bankruptcy

Doina G. Vlad
Seton Hill University

This paper focuses on small business activity in United States, and an analysis of the economic and behavioral influences on recent small business bankruptcy levels. The resulting conclusions might prove useful to academics, and to both private sector and government policy makers focused on promoting small business growth. The results show some of the causes of small business bankruptcy are related to one or more of the following: the form of proprietorship, borrowing costs, related industry factors (employment figures of major sectors), and to overall consumer sentiment.

INTRODUCTION AND LITERATURE REVIEW

This paper focuses on small business activity in United States and an analysis of the microeconomic and macroeconomic influences on recent small business bankruptcy levels. Because the small business sector of the economy provides economic growth perspective, through job creation and competitive environment, it is important to understand how changes in economic variables affect this sector. The data set includes periods of both economic growth and economic downturns on the following variables: business bankruptcy filings, employment by major sectors of the economy, interest rates, Optimism and Consumer Sentiment indexes, Producer Price Index, and variables for the small business formation legal framework.

This study adds to the existing research by focusing on both economics and behavioral factors for very recent periods (November 2003 to March 2009). The resulting conclusions might prove useful to academics and to both private sector and government policy makers focused on promoting small business growth. The results show some of the causes of the small business bankruptcy are related to one or more of the following: the form of proprietorship, borrowing costs, related industry factors (employment figures of major sectors), and the overall consumer sentiment.

Reviewing the available literature provides some insights from small businesses' reaction on bankruptcy legislation. White (2001) analyzed the connection between personal bankruptcy and small businesses that are unincorporated and therefore, personally liable for their business loss. She found that new legislation (Bankruptcy procedure, Chapter 13) would negatively affect incentives to start new businesses; debtors earning more than the median income level would not be given the chance of a "fresh start" because of previous legislation from "Bankruptcy procedure", chapter 7. On the other hand, Van Auken, Kaufmann, and Herrmann (2009) did not find a causality relation between entrepreneurs' knowledge of bankruptcy legislation and their decision to raise capital. They interpret the result as a less effective government intervention in achieving their desired outcome.

Van Praag (2003) found a correlation between poor start-up financial decisions and increased failure rates among small business firms. He also noted other factors associated with small business failures:

excessive use of debt, inadequate levels of short-term debt with relatively high cost of borrowing, and under capitalization for start-ups.

Craig, Jackson, and Thomson (2004) examined credit access within beginning small businesses, with very little or no credit history. They found that due to an adverse selection effect, the market had difficulties allocating credit on price, when the lower-risk borrowers were removed as the potential borrowers.

Baird and Morrison's research (2005) revealed one important reason in small businesses' failure occurs when there is a mismatch between owner's business knowledge and a particular business model skill requirement, in particular, a labor economics issue problem.

Klein (2005) expressed small business owners' concern over the state of the economy, with regards to rising inflation, increasing trade deficits, energy problems, and the collapse of the dollar factored against adverse international exchange rates.

Bradley and Cowdery (2005) pointed out "small business plays a critical role in the health of the U.S. economy" (p. 205). Their research revealed that poor planning, not enough finances, improper business experience, and lack of personal discipline, are some of the major causes of small business bankruptcies. Similarly, Carter and Van Auken (2006) identified three categories as the most important causes of bankrupt firms: lack of knowledge, debt inaccessibility, and economic conditions.

Based on the previous research findings on small business bankruptcy factors and based on current developments in the economy, this study examines correlation between the economic and behavioral factors and the small business bankruptcy levels.

The remainder of this paper is divided into three parts. Section two, outlines testable hypothesis. Section three, describes the testing methodology and empirical results. Section four, discusses the research and conclusions.

TESTABLE HYPOTHESES

The statistical analysis part of this paper uses monthly data provided by the US Small Business Administration (SBA) research center. The number of monthly small business bankruptcy filings in United States from November 2003 to March 2009 is used as a dependent variable. The following are independent variables: the prime bank loan rate, the Small Business Optimism Index, the next 3 months "good time to expand" Index, the number of firms self-employed incorporated, the number of self-employed unincorporated, the employment by major sectors, the seasonally adjusted unemployment rate for the economy, Producer Price Index, Consumer Sentiment Survey Index, the 3-months Treasury bills rates (as a proxy for the short term cost of borrowing), and the 10-year Treasury Note (as a proxy for the short term cost of borrowing).

Five testable hypotheses were developed and proposed. They are:

H1: The self-employed unincorporated firms are more likely to fail than the self-employed incorporated firms, due to more exposure to risk.

H2: Firms in manufacturing, retail trade, and related industries are more likely to fail than firms in other industries, due to increased sensitivity to geographic location and to industry's specific strategy.

H3: The bankruptcy rates are sensitive to and positively correlated with the cost of borrowing.

H4: The bankruptcy rates are sensitive to and positively correlated with the cost of production for small business firms.

H5: Optimism is inversely related with the increase in the number of bankruptcies when the economy is on the rise and positively related with the increase in the number of bankruptcies, when the economy is on downturn.

The variables used to statistically test the *H1* hypothesis are the number of incorporated small

business firms and the number of unincorporated small business firms. Previous research by Carter and Van Auken (2006) found bankrupt firms were more likely to be either proprietorship or partnership forms of organization than non-bankrupt firms. Hobbs (1997) and Jones (1997) also determined that the form of business was an important element for the small business owners' decision making process.

Based on the current reality of negative chain reactions from firms in manufacturing, retail trade, hospitality, and tourism areas (as a response to the economic downturn), this paper also looks into industry specific behavior. Specialized skills are required for people working in the above-mentioned industries and there is increased sensitivity to geographic location and industry specific strategies. Manufacturing and retail industries provide more growth opportunities, and absorb more of the local labor force; thus, those industries are highly sensitive to the overall economic conditions. During the economic downturns, the negative effect might accelerate, creating a domino effect with high rates of job loss and increased bankruptcy rates. Some of the previous research on small business bankruptcy factors indicates education, experience, type of the firm (Bruderl, Preisendorfer, and Ziegler, 1992), industry, location, strategy (Carter et al., 1997), market conditions, supplier relations, and strategy (Zacharakis, Meyer, and DeCastro, 1999) were associated with bankruptcy rates. Consequently, variables used to statistically test the *H2* hypothesis are the employment figures of major sectors of the economy.

To test the *H3* hypothesis, the prime bank loan rate was used to measure the overall cost of borrowing for the economy and two additional measures for the short term and long term costs of borrowing: the 3-months Treasury bills rates and the 10-year Treasury Note, respectively. Previous studies found the financing issues were relevant to the quality of small business activity: Malach, Robinson, and Radcliffe (2006); Brown, Colborne, and McMullan (1988), Mellor and Lee (2001), Hobbs (1997).

For *H4* hypothesis, the Production Price Index was used to measure the cost of production.

The three sentiment measures for *H5* testing hypothesis are: the Small Business Optimism Index, the next 3 months "good time to expand" Index, and Consumer Sentiment Survey Index. The hypothesis is that optimism is inversely related to the increase in the number of bankruptcies when the economy is on the rise. That is because business owners usually properly hedge for risk during good economic episodes. Based on previous findings on overreactions (Fama and French, 1996; Daniel, Hirshleifer, and Subrahmanyam, 1998; Vlad, 2008), the last hypothesis tests the idea that optimism is positively related with the increase in the number of bankruptcies due to over-optimism (overreaction) and less ability to hedge against risk (when the economy faces downturn).

TESTING METHODOLOGY AND EMPIRICAL RESULTS

The testing methodology is the Least Squares Method, with the number of business bankruptcy filings as the dependent variable and the following independent variables: prime bank loan rate, next 3 month "good time to expand" Index, Optimism and Consumer Sentiment Indexes, number of self-employed incorporated and number of self-employed unincorporated business firms, employment by major sectors of the economy data, Producer Price Index, 3-month treasury bills data, and 10-year treasury notes data.

The monthly data set covers the period starting November 2003 until March 2009 and Table 1 presented below shows the statistical results of the regression. Before analyzing the significance of each of the individual parameters of the variables in the model, the F-statistic in Table 1 below shows the multiple regressions relationship is significant. The F-test reveals that all of the variables in the model are jointly statistically significant at 1% level and that reliable t-tests can be conducted.

Based on the statistical results presented in Table 1, the *H1* hypothesis is supported: the coefficient for the number of unincorporated business firms is significant at 5% level. Alternatively, the coefficient for the number of the incorporated business firms is not significant. Thus, the data provide statistical evidence showing that the self-employed unincorporated firms are more likely to fail than self-employed incorporated firms, due to more exposure to risk.

Testing *H2* hypothesis used employment figures from thirteen major sectors of the economy, including the government. The coefficients for seven of the industries are statistically significant. Based

on the coefficient's sign, the changes in the number of employed in three of the industries are negatively correlated with the changes in the number of business bankruptcy filings. The three industries are: Manufacturing, Retail Trade, and Leisure and Hospitality. Moreover, the coefficients for the industries show the highest statistical significance: at 1% level.

TABLE 1
SMALL BUSINESS BANKRUPTCY FACTORS

The dependent variable is the business bankruptcy filings (in thousands) in United States and the independent variables are presented in the table's specification.

Specification	Coefficient	t-Statistic	Other statistics
Constant term	75.24*	1.94	
Prime bank loan rate	0.82**	2.62	
3-Month Treasury Bills	-0.36	-1.27	
10-Year Treasury Note	0.53*	1.91	
Optimism Index	-0.01	-0.04	
Next 3 Months "good time to expand"	-0.04	-1.49	
Consumer Sentiment Survey	0.03**	2.69	
Unemployment Rate	0.09	0.18	
Producer Price Index	0.03	1.06	
Self-employed Incorporated	0.11	0.21	
Self-employed Unincorporated	-0.71**	-2.44	
Construction	-2.39	-1.14	
Manufacturing	-9.75***	-6.58	
Retail Trade	-13.03***	-2.79	
Leisure and Hospitality	-8.26***	-4.49	
Financial Services	7.68**	2.54	
Natural Resources and Mining	-5.15	-0.45	
Trade, Transportation and Utilities	12.52**	2.48	
Wholesale Trade	-8.33	-1.05	
Information	6.74*	1.97	
Professional and Business Services	-0.96	-0.72	
Educational and Health Services	-0.75	-0.38	
Other Services	9.81**	2.16	
Government	-0.01	-1.27	
R-squared			0.94
Adjusted R-squared			0.88
Durbin-Watson			2.10
F-statistic			16.47***

*Significance at 10% level; ** Significance at 5% level; *** Significance at 1% level.

The results lead credibility to the interpretation that as more people find jobs in manufacturing, retail trade, leisure, and hospitality industries (during good economic conditions), the number of bankruptcy filings goes down, showing that the industries are self-sustainable and contribute to economic growth. On

the other hand, as more people lose their jobs in manufacturing, retail trade, leisure, and hospitality industries (during bad economic conditions), the number of bankruptcy filings goes up, showing that these industries are sensitive to the overall changes or downturns in the economy. The finding is consistent with the hypothesis that due to more specialized skills required and increased sensitivity to geographic location, the manufacturing and retail industries are more likely to fail during times of economic hardships.

For the remaining industries, the changes in the number of employed in the following four industries are positively correlated with the changes in the number of business bankruptcy filings: Financial Services, Trade, Transportation and Utilities, Information, and Other Services. As more people find jobs in those four industries, the number of bankruptcy filings goes up, which shows that the industries are less stable over time and more exposed to market risk factors. These industries are less dependent on a specific geographic area and more exposed to the general market forces of supply and demand.

H3 hypothesis states bankruptcy rates are sensitive to and positively correlated with the cost of borrowing. The prime bank loan rate measures the overall cost of borrowing and the coefficient for the prime rate is positive and statistically significant at 5% level. Consequently, for the overall economy, the higher the prime rate, the higher the cost of borrowing for the small business firms, and the higher the number of business bankruptcy filings. Again, the data set supports the H3 hypothesis. However, when looking at the coefficients for the 3-months Treasury bills rates and for the 10-year Treasury Note rates, only the coefficient for the long term borrowing (10-year Treasury Note) is positive and statistically significant at 10% level. The result supports the interpretation that in the short run, due to swings in the market conditions and changes in the interest rates from monetary policy, there is no clear evidence of short-term interest rates as factor determining the bankruptcy rates. But in the long run, once the trend for interest rates “stabilizes”, statistical evidence suggests a positive correlation between the increase in the long-term cost of borrowing and an increase in the number of bankruptcy filings.

For the H4 hypothesis, the data set shows that there is no statistical evidence for bankruptcy rates being positively correlated with the cost of production for small business firms, as measured by the Consumer Price Index.

The last hypothesis testing looks into the sentiment measures (next 3 month “good time to expand” Index, Optimism Index, and Consumer Sentiment Index) influence on the bankruptcy rates. Of the three sentiment measures, only the coefficient for the Consumer Sentiment Index was statistically significant, at 5% level. The positive sign of the coefficient suggests a positive change in Consumer Sentiment is associated with an increase in bankruptcy rates for small business firms. Given that the data sample covers periods of both positive economic outlook and downturn in the economy, the positive association suggests overconfidence from small business firms, leading to improper hedging against unexpected downward changes in the economic conditions.

Consequently, the H5 hypothesis is partially valid, since there is statistical evidence only for the overreaction or overconfidence behavior and only present in one of the three sentiment data sets.

To interpret the statistical analysis in more depth, further examination of how well the estimated equation fits the data sample would be a good follow up. The coefficient of determination (R-squared from Table 1) is 0.94, so 94% of the variability in the number of bankruptcy business firms is explained by the independent variables chosen in the linear regression model. One problem with R-squared as a measure of goodness of fit is that the R-squared will not decrease as more regressors are added to the model. To avoid overestimating the results by adding more independent variables to the model on the variability explained by the regression, the adjusted R-squared statistic provides a better measure for the goodness of fit. The adjusted R-squared (from Table 1 above) is 0.88, so 88% of the variability in the number of bankruptcy business firms is explained by the independent variables chosen in the linear regression model, after adjusting the R-squared for the addition of regressors. Thus, the model chosen in this paper and the data sample fit each other well.

The Durbin-Watson statistic measuring the serial correlation in the residuals has a value greater than 2 (from Table 1 above), showing no evidence of linear association between residuals from the regression model, which is a satisfying result as well.

CONCLUSION

This paper focused on the small business sector in United States and researched the effects some economic and behavioral factors have had on small businesses bankruptcy levels in United States, for the most recent years (between November 2003 and March 2009).

Statistical results sustained the majority of the testable hypothesis:

- The self-employed unincorporated firms are more likely to fail than the self-employed incorporated firms, due to more exposure to risk.
- Firms in the manufacturing, retail trade, and other related industries are more likely to fail than firms in other industries, during bad economic times.
- Bankruptcy rates are sensitive to and positively correlated with the cost of borrowing, as measured by the prime bank loan rate.
- The positive association between the Consumer Sentiment and bankruptcy levels suggests overconfidence from small business firms, which makes them to improperly hedge against the unexpected downward changes in the economic conditions.

The data set did not support the testable hypothesis in the following areas:

- There was no statistical evidence of a positive association between the short-term borrowing (as measured by the 3-months Treasury bills rates) and the bankruptcy levels.
- The data sample showed no statistical support for the hypothesis that the bankruptcy rates are positively correlated with the cost of production for small business firms, as measured by the Consumer Price Index.
- Two of the three sentiment measures (next 3 month “good time to expand” Index and the Optimism Index) were not significant factors to explain the fluctuations in the US bankruptcy levels.

In conclusion, the research provided statistical evidence that economic and behavioral factors play an important role on the bankruptcy level of the small business sector of the economy. The results can be used by the representative institutions and by policy makers focused on promoting small business growth and reducing small business bankruptcy levels.

Based on the paper’s findings, these recommendations for the small business sector should be considered:

- Increase the awareness to risk exposure for self-employed unincorporated firms. New starters have to know the advantages and disadvantages of each form of proprietorship before they incorporate, so they can make an informed decision for the type of organization they want to operate under.
- There should be additional effort in sustaining the more stable industries, such as manufacturing, retail trade, and other related industries in our economy. Both the government and the business sector should give incentives beyond the current levels for new entrants in such industries, which can include tax incentives and/or friendlier fiscal policy regulation.
- New entrants in the small business sector should be aware of the bankruptcy levels, including potential risks and what could be done about them. They should be informed about the consequences of engaging in too much leverage, when the economy goes through tough times.

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