# ACCOUNTS RECEIVABLE, TRADE DEBT AND REORGANIZATION

## James W. Tucker[*] and William T. Moore[**]

## Abstract

The optimal outcome of a firm in bankruptcy is to liquidate if its asset value is greater than its value as a going concern or, alternatively, to reorganize if it is worth more as a going concern. In this study, we identify firm asset and liability characteristics which may determine the likelihood of a firm successfully emerging from bankruptcy. We find two key factors influencing the success of a bankruptcy: the ratio of the firm's accounts receivable to its total debt, and the ratio of its accounts payable to total debt. Controlling for size, the probability of a firm successfully reorganizing is found to be positively related to the ratio of accounts receivable to total debt, and negatively related to the ratio of accounts payable to total debt. The evidence indicates that accounts receivable are a valuable source of cash to pay creditors in bankruptcy, and that trade creditors may be more supportive of liquidation than other creditors even though liquidation eliminates the opportunity to conduct future business with the firm.

## INTRODUCTION

What characteristics increase the likelihood of a firm successfully emerging, as opposed to liquidating, following formal bankruptcy proceedings? Previous research (Warner (1977), Guffey and Moore (1991)) has found that larger firms experience lower proportional direct bankruptcy costs, and Campbell (1996) finds that larger firms are more likely to file under Chapter 11 of the bankruptcy Code than under Chapter 7. It is argued that large firms are more successful at reorganizing due to their greater access to capital markets and their better access to legal and financial expertise. In addition to firm size, a key consideration to creditors, upon whose support a successful reorganization crucially depends, is the firm's future ability to make principal and interest payments to debtholders and other creditors.

In this study, we identify two factors in addition to firm size that aid in the prediction of whether a firm that has filed for bankruptcy protection will successfully emerge from bankruptcy. These factors are (1) the ratio of accounts receivable to the total indebtedness of the firm; and (2) the ratio of accounts payable to the total indebtedness of the firm.

Campbell (1996) and Tucker and Moore (1999) have developed predictive models which incorporate firm characteristics to determine whether or not a firm will file under Chapter 7 or under Chapter 11 of the Bankruptcy Reform Act of 1979 (hereafter, the Code). This study extends this work in that we examine firms which successfully reorganized or liquidated after having filed under Chapter 11 of the Code. This distinction is useful in that it includes firms that liquidate under Chapter 11 of the Code and those that convert from Chapter 11 to Chapter 7 after their initial filing.

## PREVIOUS RESEARCH AND TESTABLE IMPLICATIONS

Accounts receivable are current assets that have several characteristics that make them important to creditors. First, in the valuation of a firm the value of accounts receivable can be readily determined whereas other assets may have values that are much more difficult to measure. Second, accounts receivable are liquid assets which provide

cash to make payments to creditors. With regard to the latter characteristic, firms with larger proportions of accounts receivable relative to their levels of debt funding should be better able to make payments to creditors and therefore should have less difficulty in reorganizing.

The ease with which accounts receivable may be valued has less obvious implications in terms of the success of a debtor firm in reorganizing. The greater precision at which the value of accounts receivable can be determined for some firms would provide creditors with a more certain estimate of total asset value than they would obtain from an otherwise similar firm with a lower level of accounts receivable. More certain asset value may increase the probability of a firm receiving enough creditor support to emerge from bankruptcy.

On the other hand, the ease at which accounts receivable can be valued may increase the likelihood of a firm liquidating in that an asset with a readily determined value is also highly marketable. This is especially true with accounts receivable which are often sold to a "factor" who provides a ready market to purchase these receivables. Alderson and Betker (1995) define firms as having low liquidation costs "... if the value of their assets in liquidation is nearly as great as their value in current use." If firms with greater proportions of accounts receivable relative to total indebtedness are in industries with lower liquidation costs, then greater levels of accounts receivable should reduce the likelihood of reorganizing.

The proportion of a firm's total debt composed of accounts payable or trade credit also has implications for the success or failure of the attempt to reorganize. For a reorganization plan to be accepted, the majority of creditors in each class representing two-thirds of the value in that class, must vote to accept the plan. According to Stulz and Lang (1994) trade creditors may exhibit a "contagion effect" in which a bankruptcy in a given industry reduces trade creditors' willingness to extend credit to other firms, thus putting these firms in distress as well. Opler and Titman (1997) note that retailers can experience sudden losses of credit in a similar manner to the "runs" experienced by banks in which depositors withdraw their funds at once. According to Opler and Titman, one bankruptcy in the retailing industry often causes creditors to tighten their credit policy toward all of their customers. To the extent that trade creditors desire to reduce credit when a firm files for bankruptcy protection, firms with greater proportions of accounts payable to total debt should be less likely to reorganize successfully. The short-term nature of accounts payable itself may add to the increased desire of trade creditors relative to bank lenders or bondholders to take a short- term view of a corporation's future potential.

However, the presence of trade credit may increase the likelihood of a given firm reorganizing if the creditors value future business dealings with the debtor firm. Eberhart and Sweeney (1992) have noted the existence of deviations from absolute priority, in which subordinate creditors are paid more than expected had the priority rules of bankruptcy been strictly followed. Franks and Torous (1989) note that "The Creditor must obtain at least that which would have accrued in liquidation (absolute priority rules)." Franks and Torous, (1994), Eberhart, Moore and Roenfeldt (1993) and Weiss (1992) argue that creditors may vote in favor of such a plan because of the debtor's ability to delay payment. The debtor in possession has the right to file the initial bankruptcy plan, and may seek extensions, thereby lengthening the time period until payment is made. Creditors therefore choose to vote for a plan that seems to offer them less than they would receive in liquidation in order to receive their payments quickly and to reduce further legal and administrative expenses associated with attempting to force the firm into liquidation.

An alternative explanation for the creditors' choice to vote in favor of a plan that seems to offer them less than they would receive in liquidation is that they value the future profits to be earned from continuing business with the reorganized debtor firm. The reorganization plan would be preferable to the creditor as long as the present value of profits from future business with the debtor firm exceeds the difference between the amount the creditor would receive in liquidation less the amount the creditor receives in reorganization. To the extent the trade creditor's products may be specific to the creditor's needs, the two firms are linked more strongly than would be the case if the creditor were simply a lender of funds. Creditors lending funds have a broad range of alternative borrowers. Trade creditors are more limited as to the location and type of customer to which they extend credit.

## EMPIRICAL MODEL

The following model is employed to predict whether a firm successfully reorganizes after filing for Chapter 11 bankruptcy protection:

Equation 1

$$REORG = á_0 + á_1 TA + á_2 TA^2 + á_3 AR/TD + á_4 AP/TD + å$$

where:

$$REORG = \begin{cases} 1 \text{ if firm emerged from bankruptcy} \\ 0 \text{ if firm liquidated} \end{cases}$$

$TA$ = total assets of the firm (in book value);

$TA^2$ = total assets squared;

$TD$ = total firm debt;

$AR/TD$ = accounts receivable divided by total debt; and

$AP/TD$ = accounts payable divided by total debt.

The dependent variable is 1 if the firm successfully reorganizes under Chapter 11. The variable is 0 if the firm liquidates under Chapter 11 or changes to Chapter 7. Discussions with bankruptcy attorneys indicated that larger firms tend to file under Chapter 11 rather than Chapter 7, therefore the variable $TA$ is expected to be positively related to the likelihood of a firm successfully reorganizing. Warner (1977) and Guffey and Moore (1991) find that direct bankruptcy costs[1] are proportionately smaller for large firms and that bankruptcy costs decrease as a percentage of firm value for larger firms, indicating the existence of substantial fixed costs associate with reorganizations.

The variable $AR/TD$ is predicted to increase the likelihood of a firm successfully reorganizing if creditors view this asset as providing the firm with the liquidity necessary to meet payments to creditors. If, however, the ratio serves as a proxy for the ease with which the firm may be liquidated, then the relationship between the ratio $AR/TD$ and the likelihood of reorganizing will be negative.

The coefficient for the variable $AP/TD$ will be negative if trade creditors become more hesitant to extend credit to firms that have filed for bankruptcy protection. Alternatively, the coefficient for this variable should be positive if trade creditors place value on the future profits they would expect to earn from transactions with the reorganized debtor firm.

The dichotomous dependent variable necessitates the use of logit and probit methods of estimation. The interpretation of the results will therefore indicate the influence of each of the independent variables on the likelihood of the firm successfully emerging from bankruptcy proceedings.

## SAMPLE AND ESTIMATION RESULTS

Firms that filed for bankruptcy protection were identified using two methods. The *Wall Street Journal Index* provides announcements of the filing of bankruptcy petitions by firms or their creditors as well as announcements of the liquidation or the emergence of each firm from bankruptcy proceedings. *Moody's Industrial, Over-The-Counter, Transportation* and *Utility Manuals* were also used to identify firms that were no longer listed due to their filing for bankruptcy or their liquidation. The total asset and accounts payable data were also taken from *Moody's Manuals* for the most recent complete year of financial data for the year prior to the firm filing for Chapter 11 bankruptcy protection. For most firms the accounting information was for the last fiscal year prior to the bankruptcy filing. For some firms, however, the most recent available data were for two to three years prior to the bankruptcy filing. Note that the sample includes firms that filed for bankruptcy and either emerged successfully or liquidated. If the firm emerged from bankruptcy and later liquidated or filed for bankruptcy protection again, it would be included in the sample as a successful emergence from bankruptcy.

Table 1 shows the data characteristics. The sample contains 49 firms, 13 of which liquidated and 36 of which successfully emerged from bankruptcy. On average, firms that successfully emerge from bankruptcy are larger, with a mean asset size of \$1,0333 billion, than firms that liquidate, with a mean asset size of \$146.743 million. Firms that successfully emerge from bankruptcy have a lower mean ratio of accounts receivable to total debt, although the difference is not significant ($t = 0.30$). The medians are also insignificantly different ($Z = 0.623$). Finally, firms that liquidate have a higher mean ratio of accounts payable to total debt than firms that successfully emerge, and the difference is significant ($t = 2.34$). The sample medians are not significantly different ($Z = 0.96$).

---

[1]Direct bankruptcy costs include trustee's fees, appraisal fees, paralegal fees, court costs, filing fees and storage fees.

**TABLE 1**
**Reorganization Success, Asset Size and Accounts**
**Payable Percentages for 49 Corporate Bankruptcy Filings**

|                                    | Mean             | Minimum       | Maximum         |
|------------------------------------|------------------|---------------|-----------------|
| **A. Full Sample (n=49)**          |                  |               |                 |
| Book Value of Assets (*TA*)        | $798,098,163     | $3,819,000    | $8,577,212,000  |
| Accounts Receivable/Total Debt     | 0.193543         | 0.004651      | 0.653925        |
| Accounts Payable/Total Debt        | 0.163498         | 0.000675      | 0.857804        |
| **B. Successfully Emerged (n=36)** |                  |               |                 |
| Book Value of Assets (*TA*)        | $1,033,309,833   | $26,779,000   | $8,577,212,000  |
| Accounts Receivable/Total Debt     | 0.18549          | 0.009092      | 0.653925        |
| Accounts Payable/Total Debt        | 0.13120101       | 0.008377      | 0.422627        |
| **C. Liquidated (n=13)**           |                  |               |                 |
| Book Value of Assets (*TA*)        | $146,742,769     | $3,819,000    | $544,735,000    |
| Accounts Receivable/Total Debt     | 0.21584          | 0.004651      | 0.476378        |
| Accounts Payable/Total Debt        | 0.25294          | 0.000675      | 0.857804        |

**TABLE 2**
**Estimation Results For The Model:**

$$REORG = á_0 + á_1 TA + á_2 TA^2 + á_3 AR/TD + á_4 AP/TD + å$$

where $TA$ = $REORG$ = 1 if reorganized successfully, 0 otherwise; $TA$ = total assets; $TA^2$ = total assets squared; $AR/TD$ = accounts receivable/total debt; and $AP/TD$ = accounts payable/total debt.

|                         | Coefficient Estimate | t-statistics | p-value | $R^2$ |
|-------------------------|----------------------|--------------|---------|-------|
| **A. Logit Estimation** |                      |              |         |       |
| Intercept               | -0.605               | -0.64        | 0.522   | 0.316 |
| *TA*                    | $4.77 \times 10^{-9}$ | 2.07        | 0.038   |       |
| *TA$^2$*                | $-4.52 \times 10^{-19}$ | -1.23     | 0.217   |       |
| *AR/TD*                 | 4.913                | 1.84         | 0.066   |       |
| *AP/TD*                 | -4.526               | -1.66        | 0.096   |       |
| **B. Probit Estimation**|                      |              |         |       |
| Intercept               | -0.354               | -0.52        | 0.602   | 0.315 |
| *TA*                    | $0.268 \times 10^{-8}$ | 0.99       | 0.322   |       |
| *TA$^2$*                | $-0.229 \times 10^{-18}$ | -0.09    | 0.930   |       |
| *AR/TD*                 | 2.980                | 1.81         | 0.071   |       |
| *AP/TD*                 | -2.726               | -1.66        | 0.096   |       |

Table 2 (Equation A) shows the results of the estimation of the model in Equation (1). The coefficient for the variable TA is significant ($t = 2.070$) with p-value of 0.038. This result is expected given larger firms' superior access to capital markets and legal expertise. The variable $TA^2$ has a negative coefficient estimate, though not significant ($t = -1.23$). This appears to be due to high collinearity (correlation .95) with $TA$. The variable $AR/TD$ is positively related to the dependent variable with a p-value of 0.066 ($t = 1.840$). Thus firms with larger proportions of accounts receivable relative to total debt are more likely to emerge from bankruptcy, and this supports the argument that liquidity provided by accounts receivable is positively viewed by creditors.

The coefficient estimate for the variable $AP/TD$ is negative with a p-value of 0.096 ($t = -1.664$) indicating that firms with larger proportions of trade debt relative to total debt are less likely to reorganize successfully. The result supports the convention that trade creditors reduce the amount of credit they extend when faced with the bankruptcy of a customer (Opler and Titman (1997)). Based on this finding, it is evident that the value placed by trade creditors on continued business with particular firms is overshadowed by arguments such as those by Stulz and Lang (1994) and Opler and Titman (1997). The $R^2$ coefficient is 0.316 which indicates that a substantial portion of the variation in the dependent variable is explained by the model. Table 2 (Equation B) contains the results for the model when estimated using the probit technique. The results are similar to those reported using logit. Using logit, the model correctly classifies 80 percent of the successful reorganizations. Probit results in 78 percent correct classification.

We modify the size control by using log of total assets instead of $TA$ and $TA^2$. The logit model re-estimated results in a positive coefficient for $AR/TD$ ($t = 2.10$) and a negative but marginally significant coefficient estimate for $AP/TD$ ($t = -1.44$). Thus the findings are generally robust to the method of controlling for size.

## SUMMARY

Firm size is a determinant of whether or not a firm entering bankruptcy will successfully emerge as a continuing entity. Firms with greater amounts of accounts receivable relative to total debt are more likely to emerge successfully from bankruptcy. The presence of this highly liquid source of cash is evidently positively viewed by creditors who must support the bankruptcy plan in order for the plan to be accepted. Firms whose liabilities are composed of larger proportions of accounts payable are less likely to reorganize. Trade creditors may benefit more by liquidation than other lenders because of the high priority of post-filing business expenses under the absolute priority rule. In other words, the portion of credit extended post-filing is paid before unsecured loans in general. This may entice trade creditors to push for liquidation and suggests an avenue of further research.

## REFERENCES

1. Campbell, S.V., "Predicting Bankruptcy Reorganization for Closely Held Firms," *Accounting Horizons* 10, 1996, pp. 12-25.

2. Eberhart, A., Moore, W. and Roenfeldt, R., "Security Pricing and Deviations from the Absolute Priority Rule in Bankruptcy Proceedings," *Journal of Finance* 45, 1990, pp. 1457-1469.

3. Franks, J. and Torous, W., "An Empirical Investigation of U.S. Firms in Reorganization," *Journal of Finance* 44, 1989, pp. 747-769.

4. Guffey, D. and Moore, W., "Direct Bankruptcy Costs: Evidence from the Trucking Industry," *The Financial Review* 26, 1991, pp. 223-225.

5. Lang, L.H.P. and Stulz, R., "Effects of Bankruptcy Announcements on Competitors," *Journal of Financial Economics* 32, 1992, pp. 45-60.

6. Tucker, J.W. and W.T. Moore, "Reorganization versus Liquidation Decisions for Small Firms," *Financial Practice and Education*, 1999.

7. Opler, T., Saron, M., and Titman, Sheridan, "Designing Capital Structure to Create Shareholder Value," *Journal of Applied Corporate Finance* 7, 1997, pp. 21-32.

8. Warner, J., "Bankruptcy Costs: Some Evidence," *Journal of Finance* 32, 1977, pp. 337-348.

9. Weiss, L., "Bankruptcy Resolution: Direct Costs and Violation of Priority Claims," *Journal of Financial Economics* 27, 1990, pp. 285-314.