

# “Fixed asset sales by financially distressed firms: bank pressure or bankruptcy avoidance”

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## Fixed asset sales by financially distressed firms: bank pressure or bankruptcy avoidance

### Abstract

Using a sample of 253 financially distressed Korean firms, this study examines the factors and motivations prompting asset sales by financially distressed firms. The authors examine with cross section analysis three hypotheses that explain the asset sales by financially distressed firms: (1) by bank pressure; (2) for bankruptcy avoidance; (3) as a viable debtor. For the sample, the authors find that banks appear to influence firms to sell fixed assets. The paper fails to find that bank pressure on the firms influences the use of sales proceeds to pay loans. Rather, firms in the sample appear to sell fixed assets to use the proceeds to reduce high leverage. It is concluded that this reduction in overall leverage could benefit both shareholders and banks in that the leverage reduction alleviates agency problems driven by information asymmetry and debt overhang faced by high leverage firms in financial distress, resulting in increased viability of such distressed firms.

**Keywords:** asset sales, divestitures, bank pressure, bankruptcy avoidance, profitability of asset sales.

**JEL Classification:** G30, G33, G34.

### Introduction

The factors and motivations prompting asset sales by financially distressed firms hold interest. Financially distressed firms may face constraints: imposed by existing covenants; freshly inflicted constraints and pressures by existing claimants seeking to maximize returns; firm-specific rejection by capital markets or “unacceptably” high costs of accessing capital markets; by “market wide” capital market conditions. Management and/or other agency forces may exist which cause agents to anticipate adverse effects on their position (e.g., dilution of position or claim) stemming from raising funds in capital markets. The sale of assets represents an alternative source of needed capital when in *extremis*.

This study reports on the effects of voluntary asset sales by financially distressed firms for sample of companies from the Korean market. Empirical studies on asset sales by distressed firms seemingly report conflicting market reaction to the announcement of asset sales. Denis and Denis (1995) and Brown et al. (1994) report negative abnormal returns for asset sales announced by distressed firms while Afshar et al. (1992) and Lasfer et al. (1996) find a positive market reaction on average. Our study sheds light on this seemingly conflicting evidence.

In explaining the motivation of asset sell-off, Brown et al. (1994) attribute bank pressure for their finding of negative market reaction, while Lasfer et al. (1996) point to avoidance of possible bankruptcy to justify positive price reaction for asset sales. Assuredly, these explanations of the motivation behind the asset disposition by distressed firms are not mu-

tually exclusive, even though the two papers above document the opposite market reactions. Thus, banks may force distressed firms to sell-off fixed assets to avoid the consequences and impact of bankruptcy on the claims of banks.

A well-managed bank, enjoying a position of power compared to a troubled firm, may exert its influence on a distressed firm’s asset sell-offs process as a result of its information dominance and its rent-seeking behavior. Theoretical models of financial intermediation<sup>1</sup> imply that banks enjoy a favored information position as a monitor. This position results from their comparative advantage in accessing information on a borrower, including access to non-public information. Banks may also benefit from information access or privilege from relationships with other parties including suppliers, customers, creditors, and providers of capital.

In credit markets, market participants may perceive information deficiencies for financially distressed firms for several reasons. Disruption in the information generation, flow, complexity, and/or perceived reliability may increase perceived opacity of information and adversely affect external funding possibilities. Accordingly, financial market participants may value the monitoring and “certification” role played by banks in both the asset divestiture process and in monitoring the use of the sales proceeds. Additionally, management behavior of the distressed firm may inject more uncertainty to the circumstance. In fact, Datta et al. (2003) report that managers tend to misuse the proceeds from the asset sell-offs absent monitoring by banks.

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<sup>1</sup> Refer to Diamond (1984) and Fama (1985) for a theoretical discussion of the uniqueness of the role of a bank as a monitor.

Agency problems driven by information asymmetry and debt overhang for distressed firms tend to be the greatest problems in the asset divestiture process. Monitoring banks might utilize their favorable information position to influence the asset sale process and the use of the sale proceeds. This informational advantage puts the banks in a better position to evaluate the going-concern value of a distressed firm. If banks believe they will ultimately recover more by letting a company survive, the banks could support the decision to lower leverage using the sales proceeds. This decision for the use of sales proceeds may signal the bank's belief in the viability of the distressed firm. The involvement of banks in the sales process that may signal viability of firms divesting assets is named the Viable Debtor Hypothesis.

In contrast, instead of signaling or giving an *impri-matur* of firm viability, a well-informed bank(s) may take advantage of its (their) position. Compared to creditors owing public debt (multiple in number and potentially having diverse interests), a bank as a single and/or a large credit holder is in a better position to access and to pressure management in a financially distressed firm. Thus, a separate and less gracious view might assert that a position of influence<sup>1</sup> as well as information advantage gives the banks a favored position. One would expect them to exploit this advantage(s) to the *disadvantage* of other claimants, especially net of the costs of non-bank claimants' efforts to protect claimant position. In this scenario, banks may pressure borrowers in distress to sell assets with the condition of paying down bank loans, resulting in the Bank Pressure Hypothesis.

Bankruptcy costs include "indirect" financial as well as non-financial costs. A bankrupt firm faces higher funding costs in addition to customary higher interest rates for lines of credits. The bankruptcy process may disrupt the firm's ordinary business relationship with various stakeholders: suppliers, employees, customers, and others. Bankruptcy also inhibits or even blocks the firm entering into long-term commitments of any kind. Consequently, the overall costs of bankruptcy are significant. A firm having high/increasing risk of bankruptcy, especially those with high indirect bankruptcy costs, may attempt to divest their assets to ameliorate the firm's increasing bankruptcy risk (bankruptcy avoidance hypothesis).

This study contributes to existing research on asset divestitures by financially distressed firms by (1) separating the decision for asset divestiture from the

use of sales proceeds and (2) avoiding the confounding effect of industry liquidity for asset sell-offs implied by Shleifer and Vishny's (1992).

Our study takes a direct approach to examine the decision of asset sales by distress firms by adopting a different experimental design. The Brown et al.'s (1994) examination assumes the sample firms divest their assets to pay down bank loans. Thus, they do not separate the divestiture activity from the decision of how to use sales proceeds. *We assert that the divestiture decision may not necessarily link to the decision about the use of sale proceeds.* In our investigation, we separate the sample firms' fixed asset sales (FAS) decision from the decision about the use of sales proceeds.

We take steps to lessen implications related to industry liquidity raised by the Shleifer and Vishny (1992) model. To examine the FAS decision, we selected a control sample of financially distressed firms that did not sell fixed assets. This selection and match control for both industry and size (by total assets). The sample considers sales of fixed assets excluding the divestiture of a division or a subsidiary. Excluding division and subsidiary sales stems from concerns that these sales potentially are sensitive to industry-wide asset liquidity.

Using a sample of 253 financially distressed firms that sold their fixed assets, we examine the motivation for asset sales by firms in financial distress. To scrutinize the decision for fixed assets sales (instead of other ways of increasing liquidity), we run a conditional logit model (CLM) on the sample of distressed firms and control firms that are in financial stress. The analysis has control firms matched by size measured by total assets and industry. This allows inspection and test of the distressed firms' asset divestiture decision. For examination of the decision for the use of sales proceeds, we run the logistic model on the sample (distressed) firms that sold their fixed asset during the sample periods. To confirm the findings for the determinants of fixed asset sales, we identify the profitability of the fixed asset sale transaction and run the logistic model to the transaction identifiable by profit-loss.

Our findings suggest that banks associated with the sample firms do appear to influence the sale of fixed assets, but the banks apparently do not mandate the use of sales proceeds to pay bank loans. Firms do appear to sell fixed assets to use the proceeds to reduce high leverage. Consistent with Lang et al. (1995) and Bates (2005), our findings suggest that firms in distress use the sales proceeds to reduce the agency costs of leverage. This reduction in overall leverage increases the viability of asset selling firms

<sup>1</sup> Brown et al. (1994) empirically show the existence of bank pressure in the use of proceeds following asset sales by distressed firms. Welch (1997) theoretically presents that bank loans' senior status enable banks to exert influence on the distressed firms' decision process.

as a result of the leverage reduction diminishing the bankruptcy risk, and assuages problems such as information asymmetry and debt overhang faced by highly leverage firms in financial distress. The involvement of banks in the sales process may eventually benefit shareholders as well as creditors, lending support to the viable debtor hypothesis.

This study proceeds as follows. Section 1 discusses characteristics of the Korean governance/bankruptcy procedure that might affect both asset sales and the use of proceeds decision by distressed firms. Section 2 explains the hypotheses tested. Section 3 offers details on the sample construction and the variables. Section 4 reports on empirical findings for the determinant of fixed asset divestitures of financially distressed firms. Section 5 presents the empirical findings for the use of sales proceeds. The final section presents conclusions and a summary.

### **1. Institutional/bankruptcy procedural characteristics of Korean system that could affect bank interests**

Different from the two reference papers, Brown et al. (1994) and Lasfer et al. (1996), which use the sample from market oriented system, the US and the UK, respectively, this study uses its sample from the Korean market, a bank-centered market. After the Financial Crisis in 1997, though the Korean market took measures to implement a swift change to the Anglo-American system from the traditional bank-centered system, which is regarded as one cause of the financial crisis, the Korean system is still colored as a bank-dominated relationship-based model. As in the Japanese market, which is also a bank-centered system, almost all Korean firms that have loan exposure to credit/capital market have main banks, which are simply the major creditors of the firm in the same spirit as in Campbell and Hamao (1994). Through various banking transactions with the client firm, the banks are in a position to accumulate a substantial base of information on the borrower's business and financial health. When dealing with a firm in financial distress, the banks play a critical role in supplying liquidity to the firm. To support a distressed firm, the banks must be willing to bear greater losses than other credit holders and even subordinate their claims to those of other creditors. Examining the link between distressed firms' asset sales decision and their relationship with banks under bank centered system may shed some light on what motivates a financially distressed firm to sell its fixed assets.

In Korea, default either on a trading promissory note or filing for protection according to the Korean version

of Chapter 11 triggers bankruptcy. Differences in bankruptcy between the Corporate Reorganization Act /Corporate Liquidation Act (Korean version of Chapters 7 and 11) and Chapters 7 and 11 in the US could affect our conclusion on a bank's involvement in handling a financially distressed borrower (in fact, differences could alter the behavior of managers dependent on the laws and bankruptcy schemes.) First, contrary to the absolute priority rule held by the US Chapters 7 and 11, Korean bankruptcy laws and judicial decisions maintain the relative priority rule among creditor groups. Thus, in the liquidation process, the holders of unsecured debt would get some payment even before full payment of the secured creditors. The percent of payments allocated between secured and unsecured debt holders depends on the bankruptcy court decision, though the majority of the payments should go to the secured debt holders. This relative priority rule in liquidation should lead a selfish bank to require the payment of bank loans using the sales proceeds.

Second, compare to the Chapter 11 in the US, Korean bankruptcy law usually involves a replacement of existing management. Additionally, shareholders rarely receive any payment in bankruptcy. Managers, aside from their jobs, also often are principal shareholders in the majority of Korean listed firms. Preserving their managerial positions with attendant benefits, personal wealth in terms of equity in the company, as well as the importance of "face" provides strong motivations to avoid bankruptcy. These strong incentives might prompt management to endure and respond to pressure from banks rather than "hand them the keys" and walk away.

### **2. Test hypotheses**

Creditors sometimes require that firms liquidate "bank-selected" assets as a condition for restructuring, possible debt concessions, and other "accommodations" to enhance the value of their claim. In fact, as Gilson (1990) and Gertner and Scharfstein (1991), and Gilson et al. (1990) have documented, banks require borrowing firms to divest assets before they grant debt forgiveness or additional funding to the distressed firms. Shleifer and Vishny (1992) assert that creditors apply pressure on firms in financial distress to force the divestiture of a substantial portion of their assets. The hand-picked asset dispositions naturally reduce the pool of remaining or residual assets. The bank's "choice of assets" for pressured sale may (likely) consider the bank's recovery factor, not the maximization of firm survival after the sale.

In addition, a company having assets represents a call option with at least two components<sup>1</sup>. The sale of assets extinguishes for shareholders – and potentially other claimants ahead of shareholders – any call option value tied to the assets sold. The option on the assets expires with the sale of assets, with any option value lost if sale proceeds flow to retire debt. Denis and Denis (1995) and Brown et al. (1994)<sup>2</sup> present evidence that banks pressure distressed firms to sell assets and use the proceeds to repay debt, resulting in sale benefits only accrued to the creditors. We call this divestiture of assets driven by bank pressure as the “bank pressure hypothesis”<sup>3</sup>.

Forced asset sales to reduce bank loans potentially contaminate the residual assets, possibly limit opportunities for the firm, and result in negative effects to the shareholders. However, bank monitored divestitures and subsequent use of proceeds could be beneficial to shareholders *if the banks do not impose* the condition of paying down the bank loans.

In the asset disposition process, effective bank(s) monitoring may mitigate an alleged or actual information deficiency for financially distressed firms. The presence of bank debt certifies the decision of asset sales as a value-increasing action that benefits other stakeholders such as shareholders. In fact, empirical research supports the positive role of banks as monitors in the asset divestiture decision. For example, the contribution of Hirschey et al. (1990) reports a positive relationship between bank debt relative to total liabilities and abnormal stock price reactions for firms selling assets. Additionally, Lasfer et al. (1996) demonstrate that the valuation effects of asset divestiture announcements are positively related to the leverage of the selling firms that are financially distressed.

If banks believe they can preserve or enhance their interests with potentially less impairment of their claim value, banks may favor the going concern value of the distressed firm instead of confining themselves to garnering the value of assets securing credits. When banks expect a better outcome from the going-concern value of distressed firms, banks are motivated to lower the leverage of distressed firms (Gilson, 1990). Problems in internal cash generation force distressed firms to a greater depen-

dence on debt financing. High leverage that could result in bankruptcy and liquidation may cause an asymmetric payoff between shareholders and creditors. This asymmetry may exist since *ex ante* expected gains for creditors are limited, but unlimited for shareholders. For a highly leveraged financially distressed firm, incremental leverage may significantly increase the risk of bankruptcy for debt holders with attendant loss of capital, compared to the limited risk faced by shareholders for *incremental* losses of capital. In this scenario, share price is depressed or near zero. The added risk of incremental debt and the possible survival of the firm that results from taking greater risk offers only upside potential to the shareholders (they have already lost their money). In contrast, creditors might still lose more capital, yet face limits on upside benefits.

Additionally, highly leveraged distressed firms suffer from the debt related agency problems and the attendant debt overhanging problem. If survival has a greater expected payoff to banks, banks have incentive to soften “hard contracts” of distressed firms by lowering the leverage in an attempt to preserve going concern value. This action taken by banks for the use of the sale proceeds can signal the potential ongoing concern value of the distressed firms to other market participants. “Deleveraging” is also beneficial to the shareholders if lower leverage mitigates the debt related agency problems (Viable Debtor Hypothesis).

Asset sales that relieve immediate liquidity problems may be beneficial to financially distressed firms, regardless of the intended use of the sale proceeds. Contributions of researchers such as Asquith et al. (1994) and Lasfer et al. (1996) regarding significant positive market reaction to announcement of asset sales by distressed firms as evidence of asset divestitures to lessen bankruptcy risk. Avoidance of costly bankruptcy may explain the positive market reaction to the announcement of asset divestiture even with subsequent possible inefficient use of resources and/or with the possible wealth transfer from shareholders to creditors. Lasfer et al. (1996) divided a sample of UK firms into healthy and financially distressed categories. Their examination finds that abnormal returns are associated mainly with asset divestiture announcements by financially distressed firms, lending support to the bankruptcy avoidance hypothesis. These findings suggest that avoiding bankruptcy is beneficial to both the shareholders and the creditors. This notion makes sense since bankruptcy does squander economic resources. Researches term this argument of sale of assets to evade possible bankruptcy as the “bankruptcy avoidance hypothesis”.

<sup>1</sup> If assets have unique characteristics, or are none replaceable, owning assets might create other option possibilities.

<sup>2</sup> These negative wealth effects might stem from membership in a currently poorly performing industry (Denis and Denis (1995)) or from the use of the sales proceeds to repay debt (Brown et al., 1994).

<sup>3</sup> Absent “social context” or other extant pressures (e.g., political) that prompt decision makers to act for the greater or longer term good, rather than the bank’s interest.

### 3. Sample and variables used

**3.1. Sample construction.** Following the work of Brown et al. (1994), we limit our fixed asset sale (FAS) sample to those firms experiencing financial distress preceding *and* at the time of FAS. For reasons explained shortly, we truncated the sample.

Sample design seeks to avoid selection bias and proceeded as follows. We first identify listed Korean firms that divested their fixed assets during year 2000-2006 periods<sup>1</sup>. Next, we exclude (1) firms from regulated industries; (2) firms not financially distressed for year 1997-2006; (3) firms for which financial data are not available in the Korean Information Service, Inc.-Financial Analysis System (KIS-FAS) database. This process identifies 363 firms that sold fixed assets during our sample period.

Earlier studies on asset divestitures measure the signs of financial distress including: a period of poor market performance (Alexander et al., 1984; Jain, 1985); unusually high leverage (Afshar et al., 1992; Ofek, 1993); relatively poor performance by accounting measures compared to peers in the same industry (Montgomery and Thomas, 1988); news key words search (Brown et al., 1994); and Altman Z-score (Lasfer et al., 1996).

We classify a firm as financially distressed if it had an Emerging Market Altman Z-score lower than the 4.15 cut-off used in Altman (2005). For inclusion in the sample, we require that a firm exhibit signs of financial distress during the year and years prior to the announcement of FAS. Thus, if a firm is financially distressed three years prior to announcement of fixed asset sale and do not show any sign of distress since then, the firm is not included in our sample. These successive truncations resulted in 269 firms. Finally, we then drop firms that are under bankruptcy protection. The precipitate of this process resulted in 253 sample firms. Our sample includes twenty-nine firms under workout process and forty-nine firms delisted because of financial reasons.

The attention is paid to the matched sample. Since interest centers on factors that influence the fixed assets divestitures by financially distressed firms, we select a matched sample of firms that are financially distressed *but do not* sell fixed assets. Again, and consistent with Altman (2005), we classify firms as financially distressed if the Emerging Market Altman Z-score is lower than 4.15. To find a match for an asset selling by distressed firm, the

process (1) take those firms that do not sell any fixed assets during our sample periods of 2000-2006; (2) use the Emerging Market Altman Z-score to create a pool of firms in distress; (3) pick control firms from this pool of distressed firms based on 2-digit KSIC industry codes and size as measured by total assets<sup>2</sup>; (4) for each sample firm we choose, with replacement, a size-matched firm from all listed firms with the same two-digit KSCI code in the year of sample firm's asset sale announcement. The selected control firms are the closest in total assets to the sample firms.

For four out of 237 firms, only one potential control firm existed with the same 2-digit KSIC code. We use this firm regardless of size. For sixteen firms, no control firm had the same 2-digit KSIC code. We then use the firms with the same 1-digit KSIC code having total assets closest to that of the sample firm. The matching algorithm yields 506 sample firms, which consist of 253 fixed asset sale firms and 253 matched *non-sale* firms. This detailed process resulted is a sample offering reasonable control for industry and size effects on the distressed firms' decision for FAS. The majority of firms in the final sample tend to be smaller and single division firms, a characteristic different from the sample firms of previous studies.

**3.2. Variables used.** Runs of conditional logistic regression models examine the determinants of fixed asset sales by financially distressed firms. For some distressed firms, asset sales are a critical form of financing as suggested by Lang et al. (1995) and Officer (2007). The proceeds from the sales remove financial constraints faced by the distressed firms.

The Emerging Market Altman Z-score (Altman, 2005) variable is *ALTMANZ*, calculated using financial data at the end of fiscal year. *ALTMANZ* characterizes the probability of bankruptcy. A decrease in the *ALTMANZ* signals an increase in probability of bankruptcy. As documented in Pindado and Rodrigues (2005), we assume that bankruptcy costs and the probability of bankruptcy have a positive relationship. Hence, one expects a negative sign on the variable if firms sell their fixed assets to reduce bankruptcy risk. To control for the effects of leverage the model includes a coverage ratio (*COVERAGE*), calculated as *EBITDA* divided by the interest expense, as well as a book leverage ratio (*BKLVG*) using the ratio of total liabilities to total assets.

Asset sales without debt reduction payments to the creditors reduce the remaining collateral to debt ratio and, potentially reduce the asset liquidation

<sup>1</sup> Our sample period is limited by the availability of fixed asset divestiture data filed on the DART (Data Analysis, Retrieval, and Transfer System), a disclosure system managed by the Korean Financial Supervisory Service Agency. The DART database only goes back to calendar year 2000.

<sup>2</sup> We recognize the debate on the correct variable to measure size. Given the study focuses on asset issues, we decided to use assets as the measure.

value of a firm's residual assets and potential recovery of principle. Consequently, banks would not allow asset sales by distressed firms without dedication of proceeds for the payment of the bank loans or, that banks view asset sales and their use of intended proceeds are beneficial to creditors. Banks may force the distressed firms to sell assets and use

proceeds to pay bank debt and/or decrease the overall debt costs. *LOANTB* is the ratio of bank loans to total borrowing<sup>1</sup>. *LOANTB* serves as a proxy for the strength of bank power and pressure to force sales by distressed firms. A greater pressure to force sales argues for a positive sign for *LOANTB*. Other variables in our specification appear in Table 1.

Table 1. Variable definitions

Variable name	Description	Definitions
<i>LOANTB</i>	Loans to borrowings ratio	Total bank loans/ (Total bonds + Total borrowings)
<i>ATMANZ</i>	Emerging Market Altman Z-score	EM Z-score = $6.56 X_1 + 3.26 X_2 + 6.72 X_3 + 1.05 X_4 + 3.25$ $X_1$ = working capital to total assets $X_2$ = retained earnings to total assets $X_3$ = operating income to total assets $X_4$ = book value equity to total liabilities
<i>FLOAN</i>	Loans in foreign currency	(Short-term borrowings in foreign currency + Long-term borrowings in foreign currency) / (Total bonds + Total borrowings)
<i>PAYOUT</i>	Pay off to the creditors	The dummy variable for the use of sales proceeds equals "1" if the selling firm indicates that it will retire debt with the sales proceeds, and "0" otherwise.
<i>SIZE</i>	Size of firm	The natural log of total assets deflated year 1995 Consumer Price Index
<i>MVBV</i>	Market-to-book ratio	[Ending price of common stock * Number of shares outstanding]/Stockholders' equity
<i>COVERAGE</i>	Coverage ratio	[Income from operations + Depreciation]/Interest expenses + Interest on bonds
<i>BKLVG</i>	Book leverage ratio	Total liabilities/Total assets
<i>OROA</i>	Operating profit margin	Operating profit/Total assets
<i>CFCL</i>	Operating cash flow ratio	Cash flow from operations/Current liabilities
<i>CASH</i>	Cash ratio	Cash and cash equivalents/Total assets
<i>BOND</i>	Public debt dummy	1 if the firm has public debt and 0 otherwise
<i>SPECIAL</i>	Specialty ratio	[Research + Development + Advertisement expenses]/Total sales
<i>SGROWTH</i>	Sales growth	Average of annual sales growth of firm's $((t_0 - t_1) / t_1)$ over last five years
<i>TOPFIVE</i>	Ownership concentration ratio	Sum of percent holding of top five shareholders to firm
<i>SALESTA</i>	Relative size of fixed asset sold	Sales proceeds / Total assets at the beginning of the year
<i>INDOROA</i>	Industry cash flow	<i>EBIT</i> /Assets for the median firm in the 2-digit KSIC industry codes
<i>CHABOL</i>	Chabol dummy	The dummy variable for <i>CHABOL</i> affiliation equals "1" if a firm is affiliated with a <i>CHABOL</i> , and "0" otherwise

**3.3. Test variables and expected sign.** Table 2 shows the expected sign by each hypothesis tested. The bank pressure hypothesis suggests that banks pressure distressed firms to sell assets provided that the firms use the proceeds to repay bank loans, presumably with such sales only benefiting creditors. The bank pressure hypothesis, therefore, predicts positive and significant *LOANTA* coefficient for both asset sales and payout decisions. Though distressed firms make the asset sale decision with influence from their banks, they may make a decision to sell assets independently from their decision about the use of sales proceeds.

Banks may allow distressed firms to preserve their going concern value if they believe they will ultimately recover more of their problem loans. This viable debtor hypothesis suggests a positive and significant *LOANTA* coefficient for asset sales decision but no implication on the coefficient for payout decision. If distressed firms sell fixed assets to avoid imminent bankruptcy or to reduce bankruptcy risk, then we anticipate a negative and significant *ALTMANZ* coefficient for asset sales decision, but a positive and significant *ALTMANZ* coefficient for payout decision.

Table 2. Testing variables and their expected sign

Hypotheses	Bank pressure	Bankruptcy avoidance	Viable debtor
Decisions			
Fixed asset sales	<i>LOANTB</i> (+)	<i>ALTMANZ</i> (-)	<i>LOANTB</i> (+)
Payout to banks	<i>LOANTB</i> (+)	<i>ALTMANZ</i> (+)	

#### 4. Determinants of fixed asset sales by financially distressed firms

**4.1. Examination for determinant of the asset sales decision using the conditional logit run.** Table 3 shows the results of conditional logistic regression estimated for distressed firms' fixed assets divestitures. We examine the attributes of distressed firms that lead to the asset sell-off decision by testing our hypotheses. The dependent variable is a dummy variable that equals 1 if the distressed firm sells fixed assets and 0 otherwise. Each column includes the specifications using different independent variables.

<sup>1</sup> Brown et al. (1994) used the ratio of bank debt to total liabilities. The correlation between our *LOANTB* and ratio of bank debt to total liabilities is 0.91. Either variable results in almost identical results with our models. We choose to use *LOANTB* because it is a more narrowly defined variable.

The results summarized in Table 3 provide evidence of bank pressure/viable debtor hypothesis for fixed asset sales. Across models, the estimated coefficient for *LOANTB* is positive and significant while *ATMANZ* is non-significant. This suggests that funding dependence on banks motivates the distressed firms in our sample to divest their fixed assets.

The coefficient of *SIZE* in Table 3 is consistently positive and statistically significant. Given they have more assets available for divestiture, larger firms are more likely to sell their fixed assets. In addition, compared to larger firms, small firms encounter relatively higher bankruptcy costs. Administrative costs of bankruptcy for small firms are likely larger in terms of percentage of assets. On the other hand, with diversified earnings and better access to the capital market, large firms likely have more options to avoid bankruptcy compared to small firms. This view weakens the motive of asset sales to avoid possible bankruptcy.

Table 3. Test for fixed asset divestiture

	Conditional logit model: Dependent = Fixed asset sale				
	Model 1	Model 2	Model 3	Model 4	Model 5
<i>LOANTB</i>	1.7882 (2.02)**	1.8585 (2.09)**	1.7821 (2.01)**	2.0029 (2.08)**	1.7234 (1.92)*
<i>ALTMANZ</i>	-.0933 (-1.34)	-.0992 (-1.24)	-.0888 (-1.28)	-.0800 (-1.14)	-.0903 (-1.31)
<i>SIZE</i>	1.0356 (2.04)**	.9470 (1.86)*	1.0190 (2.02)**	1.1167 (2.15)**	1.0421 (2.04)**
<i>MVBV</i>	.0964 (1.35)	.1153 (1.54)	.0962 (1.30)	.1231 (1.57)	.0987 (1.36)
<i>COVERAGE</i>	-.0000 (-.01)	.0097 (0.79)	-.0004 (-0.05)	-.0011 (-0.15)	-.0005 (-0.07)
<i>BKLVG</i>	-2.6599 (-1.56)	-2.3754 (-1.32)	-2.4695 (-1.47)	-2.4373 (-1.44)	-2.3744 (-1.42)
<i>OROA</i>	-3.2880 (-1.35)	-2.8136 (-1.12)	-3.4236 (-1.39)	-3.0040 (-1.17)	-3.4914 (-1.43)
<i>CHABOL</i>	-.7053 (-0.92)				
<i>CFCL</i>		-1.1164 (-1.86)*			
<i>CASH</i>		.5744 (0.13)			
<i>BOND</i>			.06144 (0.14)		
<i>SPECIAL</i>				-.1620 (-0.03)	
<i>SGROWTH</i>				-.3844 (-1.09)	
<i>TOPFIVE</i>					.3796 (0.39)
Chi-square	17.11**	20.42**	16.24**	18.14**	16.37**
Pseudo $R^2$	0.1387	0.1655	0.1316	.1504	.1327
Number of group	178	178	178	174	178

Notes: The sample includes 506 firms with 253 fixed asset sale firms and 253 matched non-sale firms. Table 3 reports the results of conditional logistic regressions for distressed firms' fixed asset divestitures. The dependent dummy variable is 1 if the firm sells assets, 0 otherwise. Significance is indicated by \*, \*\*, and \*\*\* for the 10%, 5%, and 1% level, respectively.

Model 1 summarizes the results of specifications similar but not identical to those used in Brown et al. (1994). Model 1 differs in that it excludes industry cash flows (however, we matched control firms by the two-digit KSIC code) and Model 1 includes the Emerging Market Altman Z-score and a dummy variables for Korean business groups, *CHABOL*. We include this dummy variable to control *CHABOL*'s role and influence on lending practices in Korea and how this idiosyncratic characteristic of Korean business environment influences asset sales. The variable *CHABOL* is not significant.

Companies in risk of bankruptcy face the short-term demands of current liabilities and separately, the demands of other creditors. Covering current liabilities may keep suppliers and lessors content and allow continued operation and the generation of cash. On the other hand, the company may delay complying with desires/demands for cash from other creditors that cannot immediately interrupt operations. Model 2 examines how the level of existing financial stock (*CASH*) and internally generated liquidity (*CFCL*) determine the divestitures of fixed assets by distressed firms. The results indicate that firms with the ability to generate enough internal liquidity to cover current liabilities may choose to avoid the sale of fixed assets as a source of liquidity. The finding of a negative and significant coefficient on *CFCL* supports the relevance of bank pressure/viable debtor to sell fixed assets. If firms want to sell assets to avoid bankruptcy, they would divest the assets regardless of the relative amount of internally generated liquidity. In addition, firms that generate enough cash to cover current liabilities and sustain current operations can fend off bank pressure to sell fixed assets.

Model 3 documents how distressed firms' access to the public debt market affects the decision to divest fixed assets. The dummy variable for public debt access equals 1 if the firm has public debt (including convertible debt) in its capital structure and 0 otherwise<sup>1</sup>. Firms with alternative sources of funding, or the capacity (and freedom in terms of covenants) to issue bonds, would resist the banks' interference in the asset sale decision. Banks could be more reluctant to supply additional funding to a distressed firm with public debt access because of possible "hold out problem." As a senior claim holder often with collateralized debt (especially compared to the bondholders), banks may have less motivation to supply additional funds to a distressed firms that have bonds. Therefore, distressed firms with bonds tend to sell assets to avoid possible bankruptcy. We, however, fail to find any significance on the *BOND* variable.

<sup>1</sup> We defer to another paper' discussion of the behavior of debt and convertible debt holders of firms in financial distress.

The value of intangible assets (Research + Development + Advertisement expenses captured in *SPECIAL*) or the loss of investment opportunities to high growth firms (*SGROWTH*) potentially constitutes a large portion of bankruptcy costs. Model 4 summarize the results of firm exposure to higher bankruptcy costs measured by *SPECIAL* and, past sale growth (*SGROWTH*), and the decision to divest fixed assets. Destruction of going-concern value by bankruptcy is of greater concern to high bankruptcy cost firms having high indirect compared to direct bankruptcy costs. Higher indirect bankruptcy costs might provide greater motivation to avoid bankruptcy. In addition, firms with growth potential (measured by market-to-book ratio, *MVBV*) have a greater difference between going concern and liquidation value. Thus, high *MVBV* firms have greater motivation to avoid bankruptcy. The results: none of the coefficients (*SPECIAL*, *SGROWTH*, and *MVBV*) are statistically significant, weakening the argument of bankruptcy avoidance for asset divestitures. The bankruptcy avoidance hypothesis suggests that firms with higher bankruptcy costs would seek to divest their fixed assets to generate cash in attempts to avoid bankruptcy.

Model 5 tests the link between the level of share concentration of controlling shareholders and the asset sale decision. Controlling shareholders having concentrated ownership rights have a great interest at stake in the event of bankruptcy. These shareholders may incur losses due to the decline in the value of their shares, and suffer the loss of control rights. Since controlling shareholders have incentives to avoid bankruptcy, one expects a positive sign for *TOPFIVE* (the percent holdings of the top five shareholders) if bankruptcy avoidance is a reason to sell fixed assets. The *TOPFIVE* coefficient is positive but not significant.

### 5. Examination for determinants of use of sales proceeds using the logit run

Positive and significant *LOANTB* coefficient in Table 3 supports both bank pressure/viable debtor hypothesis for fixed asset sales. Thus, the results in the table indicate that banks at least pressure the financially distressed borrower to sell its assets, but whether banks require the use of the sales proceeds for loan reduction is not clear. The previous empirical studies on asset sales also seemingly report conflicting market reaction to the use of the proceeds from asset sales. Some studies of shareholder returns from asset divestitures by healthy firms detect positive and significant market reaction to the use of proceeds for debt reduction. This positive market reaction could be counted as supportive of Viable Debtor Hypothesis. These researchers attribute the decision to pay down debts to (1) agency costs of

managerial discretion (Lang et al., 1995) and (2) a reduction in the agency costs of leverage (Bates, 2004). In contrast, examining financially distressed firms Brown et al. (1994) find that the market reacts negatively to the use of the proceeds to repay debt. They argue this finding supports their hypothesis of bank pressure in asset divestitures.

Table 4 examines the determinants of announced use of sales proceeds. The dummy variable for the use of proceeds (dependent variable) equals ("1") for indicated debt reduction and, "0" otherwise<sup>1</sup>. The table reports the results of logistic regression that relates use of proceeds for debt reduction to the characteristics of distressed firms after controlling for industry performance. Model 1 shows the results of the specification used in Brown et al. (1994). As in Brown et al. (1994), *INDOROA* serves as a measure of median industry cash flow. We run the additional specification *SALESTA* as a measure for relative size of fixed asset sale to total assets.

The results differ from those of Brown et al. (1994). We fail to find significant influence of the creditors on the firms' decisions to use sales proceeds to reduce debt. The dependence to bank loans (*LOANTB*) variable is not statistically significant for any of the various specifications. Distressed firms in our sample also do not appear to repay debt to avoid possible bankruptcy either, given insignificance in the *ALTMANZ* variable. The *CHOBOL* affiliation (model 2), relative size of fixed asset sold (model 3)<sup>2</sup>, internal liquidity (model 4), and specialty of firms' assets (model 5) suggest no influence on the distressed firms' decisions on the use of sales proceeds.

Table 4. Test for use of the sales proceeds

	Logit model: Dependent = Payout to creditors				
	Model 1	Model 2	Model 3	Model 4	Model 5
<i>LOANTB</i>	-0.2629 (-0.30)	-0.2711 (-0.30)	-0.3422 (-0.38)	-0.2086 (-0.22)	.1687 (0.17)
<i>ALTMANZ</i>		-0.0257 (-0.41)	-0.0250 (-0.40)	-0.0339 (-0.50)	-0.0453 (-0.68)
<i>SIZE</i>		-0.1743 (-0.95)	-0.0527 (-0.36)	-0.1395 (-1.00)	-0.1630 (-1.11)
<i>MVBV</i>	.1281 (0.77)	.0950 (0.56)	.1102 (0.65)	.1902 (0.99)	.0771 (0.43)
<i>COVERAGE</i>	.0246 (0.98)	.0215 (0.85)	.0203 (0.82)	.0294 (0.98)	.0270 (0.86)
<i>BKLVG</i>	4.5099 (3.55)***	4.5837 (2.83)***	4.3945 (2.86)***	3.8646 (2.43)**	4.4582 (2.78)***

<sup>1</sup> If a firm indicates that it intends to use the sales proceeds for "financial restructuring" or "capital structure change," then we interpret this as indication of paying down principal.

<sup>2</sup> A number of studies find a positive relationship between assets sold/total assets and the wealth effects on the announcement of the sales (e.g., Krishnaswami and Subramaniam, 1999).

Table 4 (cont.). Test for use of the sales proceeds

	Logit model: Dependent = Payout to creditors				
	Model 1	Model 2	Model 3	Model 4	Model 5
<i>OROA</i>	-3.8932 (-1.59)	-2.6448 (-0.89)	-2.5187 (-0.87)	-3.4965 (-1.02)	-2.0761 (-0.65)
<i>INDOROA</i>	-6.1950 (-0.64)	-6.8964 (-0.70)	-6.7392 (-0.70)	-4.426 (-0.46)	-6.1267 (-0.61)
<i>CHABOL</i>		.4022 (0.56)			
<i>SALESTA</i>			1.2587 (1.04)		
<i>CFCL</i>				-.0610 (-0.11)	
<i>CASH</i>				-5.6996 (-1.14)	
<i>SPECIAL</i>					-2.9565 (-0.34)
<i>SGROWTH</i>					.0034 (0.74)
Chi-square	22.56***	23.69***	24.52***	26.25***	21.86**
Pseudo <i>R</i> <sup>2</sup>	0.1209	0.1270	0.1315	0.1443	0.1227
Number of obs.	148	148	148	146	138

Notes: The sample includes 253 sample firms of fixed asset sale firms. The table reports the results of logistic regression that relates the use of sales proceeds to pay down debt to the characteristics of distressed firms that sell their fixed assets. The dependent variable is the dummy variable for the use of sales proceeds equals "1" if the selling firm indicates that it will retire debt with the sales proceeds, and "0" otherwise. Each column includes the specifications using different independent variables. Statistical significance is indicated by \*, \*\*, and \*\*\* for the 10%, 5%, and 1% level, respectively.

These distressed firms do appear to use proceeds to reduce overall leverage as reflected in the positive and significant (0.01) *BKLVG* after controlling for *LOANTB* and *ALTMANZ*. This finding, after controlling for probability of bankruptcy, suggests that during periods of financial distress firms reduce leverage with sale proceeds. Thus, banks pressure the financially distressed borrowers to increase liquidity – as reported in the previous section – but do not require the use of the sales proceeds for debt reduction. Instead, distressed firms recognize the need to reduce debt. Managers of distressed firms want to escape distress status. They seek accommodations in the "hard contract" by paying down existing debt.

Our finding of the use of the proceeds to lower leverage is consistent with previous research on asset divestitures. Lang et al. (1995) present evidence that higher leveraged distressed firms are more likely to divest assets. Consistent with this, Lasfer et al. (1996) report a positive relationship between the wealth effects of asset divestiture announcements by distressed firms and leverage level. Ofek (1993) argues that the likelihood of asset divestiture increases with leverage.

The firms in our sample may want to reduce overhanging debt having various contractual obligations

that limit or even prohibit actions by management. Firms in financial distress often face demands for cash to meet current obligations such as accounts payable, and separately to service formal debt. Asset sales increase cash liquidity. Then the firms decide on the tradeoff between preserving the cash to meet current liabilities or to decrease leverage. Lowering the negative effects of financial distress to a manageable level requires balancing cash use for current obligations vs. reducing leverage. If reducing leverage lowers the negative effects of financial distress, lowering leverage is beneficial to creditors. Creditors recognize that lowering the leverage might preserve a firm's ability to operate, increase the chance of returning to normal operations, and have a higher expected payoff to creditors. In fact, unusually highly leveraged firms suffer the most during a cyclical industry downturn. Opler and Titman (1994) report that during industry downturns, higher leveraged firms tend to lose more market share and resort more to selling assets.

Bates (2004) provides another example of the costs related to the leverage, finding that distressed firms with high leverage suffer higher agency costs related to debt. Without identifying financial health status, he documents the positive relationship between the likelihood of a pay down of debt and industry adjusted leverage ratio. Bates attributes this finding to an adjustment to suboptimal debt levels in the firms' capital structure.

According to viable debtor hypothesis, firms with high potential going concern value (lower bankruptcy risk) tend to reduce overall corporate leverage. To investigate further the link between the use of sale proceeds, the leverage of firms in distress, and the potential bankruptcy risk faced, we added a regression interaction term between the leverage (*BKLVG*) and the variables for bank pressure (*LOANTB*) and for bankruptcy risk (*ALTMANZ*), respectively. The dependent variable stays the same: dummy variable for the use of proceeds (dependent variable) equals "1" for indicated debt reduction and, "0" otherwise. We do not include a table due to space limitations. A summary of the results: the inclusion of the interaction between *BKLVG* and *LOANTB* results in *BKLVG* remaining positive, non-significant (*P*-value is 0.32); *LOANTB* stays negative, non-significant (*P*-value is 0.13); the interaction-term between *LOANTB* and *BKLVG* is positive, non-significant (*P*-value is 0.13). For inclusion of the interaction between *BKLVG* and *ALTMANZ*, *BKLVG* is positive, and significant (*P*-value is 0.01); both *ALTMANZ* and the interaction-term between *ALTMANZ* and *BKLVG* stay non-significant (*ALTMANZ* is positive, *P*-value is 0.24) and the interaction term is positive (*P*-value is 0.13). The

positive but marginally significant interaction-term between *LOANTB* and *BKLVG* weakly support the argument that high leverage firms with more funding exposure to banks are inclined to pay down the debt. The positive but marginally significant interaction-term between *ALTMANZ* and *BKLVG* only weakly support that distress firms having high leverage but less bankruptcy risk are more likely to pay off the debt. Thus, firms that use the sales proceeds to pay down debt are leveraged with a greater percentage of debt in the form of bank loans, but have relatively less exposure to bankruptcy risk, marginally supporting the implication by viable debtor hypothesis.

## Conclusions

Asset sales are a known source of liquidity for firms in financial distress. Thus, financially constrained firms that are subject to high costs in accessing capital market may attempt to raise needed capital by selling their assets. This study examines the factors and motivations prompting asset sales by financially distressed firms. Noticing contradictory results of market reactions documented by the previous studies on asset sales by distressed firms, we employed an analysis to examine three hypotheses that explain the asset sales by financially distressed firms. We assume that the distressed firms may choose to sell their fixed assets (1) as a result of bank pressure; (2) for bankruptcy avoidance; (3) as a viable debtor.

Our study contributes to existing research on asset divestitures by financially distressed firms by: (1) se-

parating the decision for asset divestiture from the use of sales proceeds; and (2) avoiding the confounding effect of industry liquidity for asset sell-offs implied by Shleifer and Vishny' (1992).

Our results are supportive of some of the important findings of existing literature. We find that banks appear to influence sample firms' decisions to sell fixed assets, confirming the influence of banks in fixed asset sales. However, we fail to find evidence of banks' influence on the use of sales proceeds to repay loans: banks apparently do not mandate the use of sales proceeds to pay bank loans. Rather, firms appear to sell fixed assets to use the proceeds to reduce high leverage, supporting the viable debtor hypothesis. These findings indicate that distressed firms may make a decision to sell assets independently from their decision about the use of sales proceeds. Banks seem to allow distressed firms to continue as going concerns if they believe they ultimately will recover more of their problem loans. This conclusion is consistent with results found by previous studies of asset divestitures by healthy firms, which attribute the decision to pay down debts to reduction of agency costs of leverage (Bates, 2004). Thus, our results support the finding that reduction in overall leverage could benefit both shareholders and banks in that leverage reduction alleviates agency problems driven by information asymmetry and debt overhang, resulting in increased viability of such distressed firms.

## References

1. Afshar, K. Taffler, R. & Sudarsanam, P. (1992). The effect of corporate divestments on shareholder wealth: The UK experience, *Journal of Banking and Finance*, 16, pp. 115-135.
2. Altman, E. (2005). An emerging market credit scoring system for corporate bonds, *Emerging Market Review*, 6, pp. 311-323.
3. Asquith, P., Gertner, R. & Scharfstein, D. (1994). Anatomy of financial distress: An examination of junk bond issuers, *Quarterly Journal of Economics*, 109, pp. 625-634.
4. Bates, T. (2005). Asset Sales, Investment Opportunities, and the Use of Proceeds, *Journal of Finance*, 60, pp. 105-135.
5. Brown, D., James, C. & Mooradian, R. (1994). Asset sales by financially distressed firms, *Journal of Corporate Finance*, 1, pp. 233-257.
6. Campbell, J. & Hamao, Y. (1994). The Japanese main bank system: An introductory overview. In Aoki, M., Patrick, H. (Eds.), *Changing Patterns of Corporate Financing and the Main Bank System in Japan*, Oxford University Press, New York, pp. 324-349.
7. Datta, S., Iskandar-Datta, M. & Raman, K. (2003). Value creation in corporate asset sales: The role of managerial performance and lender monitoring, *Journal of Banking and Finance*, 27, pp. 351-375.
8. Denis, D. & Denis, D. (1995). Causes of financial distress following leveraged recapitalizations, *Journal of Financial Economics*, 37, pp. 129-157.
9. Diamond, D. (1984). Financial intermediation and delegated monitoring, *Review of Economics Studies*, 51, pp. 393-414.
10. Diamond, D.W. (1993). Bank loan maturity and priority when borrowers can refinance. In C. Mayer & X. Vives (Eds.), *Capital Markets and Financial Intermediation*, Cambridge, MA: Cambridge Univ. Press, pp. 46-68.
11. Eckbo, M. & Thorburn, K. (2008). Automatic bankruptcy auctions and fire-sales, *Journal of Financial Economics*, 89, pp. 404-422.
12. Fama, E. (1985). What is different about banks? *Journal of Monetary Economics*, 15, pp. 29-37.
13. Gilson, S. (1990). Bankruptcy, boards, banks, and blockholders, *Journal of Financial Economics*, 27, pp. 355-388.
14. Hirschey, M., Slovin, M. & Zaima, J. (1990). Bank debt, insider trading and the return to corporate selloffs, *Journal of Banking and Finance*, 14, pp. 85-98.

15. Jain, P. (1985). The effect of voluntary sell-off announcements on shareholder wealth, *Journal of Finance*, 40, pp. 209-224.
16. Krishnaswami, S. & Subramaniam, V. (1999). Information asymmetry, valuation and the corporate spin-off decision, *Journal of Financial Economics*, 53, pp. 73-112.
17. Lang, L., Poulsen, A. & Stulz, R. (1995). Asset Sales, Firm Performance, and the Agency Costs of Managerial Discretion, *Journal of Financial Economics*, 37, pp. 3-27.
18. Lasfer, A., Sudarsanam, P. & Taffler, R. (1996). Financial distress, asset sales, and lender monitoring, *Financial Management*, 25, pp. 57-66.
19. Montgomery, C. & Thomas, A. (1988). Divestment: motives and gains, *Strategic Management Journal*, 9, pp. 93-97.
20. Ofek, E. (1993). Capital Structure and Firm Response to Poor Performance: An Empirical Analysis, *Journal of Financial Economics*, 34, pp. 3-30.
21. Officer, M.S. (2007). The price of corporate liquidity: acquisition discounts for unlisted targets, *Journal of Financial Economics*, 83, pp. 571-598.
22. Opler, T. & Titman, S. (1994). Financial distress and corporate performance, *Journal of Finance*, 49, pp. 1015-1040.
23. Pindado, J. & Rodrigues, L. (2005). Determinants of financial distress costs, *Journal of Market and Portfolio Management*, 19, pp. 343-359
24. Shleifer A. & Vishny, R. (1992). Liquidation Values and Debt Capacity: A Market Equilibrium Approach, *Journal of Finance*, 47, pp. 1343-1366.
25. Welch, I. (1997). Why is Bank Debt Senior? A Theory of Asymmetry and Claim Priority Based on Influence Costs, *Review of Financial Studies*, 10, pp. 1203-1236.