

Measuring Default Risk in Leveraged Buyouts

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Abstract

We investigate the measurement of default risk in Leveraged Buyout transactions (LBOs). Default risk is defined as the probability that the post LBO-firm will not be able to service its debt. After a review of research on LBOs and different methods of estimating default and distress risk, we develop a spreadsheet model predicting the annual cash flow coverage ratio for the proposed LBOs of two case firms, Kinetic Concepts Inc and Mediq Inc. Using Monte Carlo simulation software, we estimate the probability that the case firms will survive without recapitalization the first three years after the LBOs, and conclude that both companies stand a substantial risk of default on their respective debt service obligations. We find that the risk levels of the LBOs are highly dependent on the projections of management regarding sales and EBIT margins, and that the single most influential factor determining the survival of the LBOs is the companies' future EBIT margins. We also find that the risk of default can be reduced by altering the characteristics of some of the debt instruments used in the LBOs without changing the overall leverage of the case firms.

ABSTRACT	1
1. INTRODUCTION	4
1.1 OBJECTIVES OF OUR STUDY.....	5
1.2 LIMITATIONS	5
2. PRIOR RESEARCH ON LEVERAGED BUYOUTS	6
2.1 GENERAL DEFINITION OF A LEVERAGED BUYOUT	6
2.2 BENEFITS OF LBOs	7
2.3 THE LBO TRANSACTION – STEP BY STEP	9
2.4 SOURCES AND CHARACTERISTICS OF FUNDS USED IN LBOs.....	9
2.5 CAPITAL STRUCTURE CONSIDERATIONS OF LBOs.....	12
3. PRIOR RESEARCH ON MEASURING THE RISK OF FINANCIAL DISTRESS	14
3.1 MEASURING FINANCIAL DISTRESS RISK	14
3.2 UNIVARIATE APPROACHES – SINGLE RATIO ANALYSIS	14
3.3 MULTIVARIATE APPROACHES – ALTMAN’S Z, TRADITIONAL RATIO ANALYSIS.....	14
3.4 VALUE AT RISK – CREDITMETRICS	16
3.5 DEFAULT RISK IN LEVERAGED BUYOUTS – SIMULATION OF CASH FLOWS	17
3.6 DEALING WITH FINANCIAL EMERGENCIES	17
4. METHOD FOR OUR CASE STUDIES	18
4.1 SIMULATIONS FOR CASE COMPANIES.....	18
4.2 SIMULATION 1: BASE CASE	18
4.3 SIMULATION 2: MANAGEMENT’S PROJECTIONS ALTERED, FINANCING ACCORDING TO 13E-3	18
4.4 SIMULATION 3: MANAGEMENT’S PROJECTIONS ALTERED, FINANCING ALTERED	20
4.5 @RISK.....	21
5. CASE COMPANIES	21
5.1 KINETIC CONCEPTS INC.....	21
5.2 TRANSACTION DETAILS	21
5.3 MEDIQ INC	22
5.4 TRANSACTION DETAILS	22
6. DATA	23
6.1 SELECTION CRITERIA FOR CASE COMPANIES	23
6.2 DESCRIPTION OF THE DATA SELECTION PROCESS.....	23
7. OUTPUT, VARIABLES AND FIXED INPUTS OF THE MODEL	24
7.1 DEFINITION OF CF COVERAGE RATIO	24
7.2 PRINCIPAL REPAYMENTS AND PREFERRED DIVIDEND	25
7.3 FIXED DEBT.....	26
7.4 FLOATING DEBT	27
7.5 EBIT MARGIN, SALES.....	27
7.6 CAPITAL EXPENDITURE, DEPRECIATION	27
7.7 ASSET SALES	28
8. RESULTS	28
8.1 ESTIMATES OF THE BASE CASE PROBABILITIES OF SURVIVAL FOR CASE LBOs.....	28
8.2 IMPACT OF UNCERTAINTY IN MANAGEMENT’S PROJECTIONS.....	28
8.3 SENSITIVITIES OF THE LBOs TO DEVIATIONS IN INPUT VARIABLES	29
8.4 EFFECTS OF ALTERATIONS IN THE CAPITAL STRUCTURE OF THE LBOs	29

9. DISCUSSION.....29

9.1 POTENTIAL WEAKNESSES OF THE MODEL29

9.2 CONCLUSIONS30

9.3 SUGGESTIONS FOR FURTHER STUDIES.....32

10. REFERENCES33

ARTICLES.....33

LITERATURE.....35

OTHER SOURCES36

APPENDIX 1. SUMMARY OF PROJECTIONS IN CASE LBOS37

APPENDIX 2. SOURCES AND USES OF FUNDS IN CASE LBOS.....39

APPENDIX 3. SIMULATION RESULTS KINETIC CONCEPTS INC.40

APPENDIX 4. SIMULATION RESULTS MEDIQ INC.43

APPENDIX 5. THANKS TO46

1. Introduction

The financial structure of Leveraged Buyouts (LBOs) are by nature more risky than traditional capital structures since one of the key elements in the LBO-transaction is to drastically increase the financial leverage – and hence the debt service obligations – of the company. It is therefore of great importance to all stakeholders in an LBO to correctly assess the financial risk inherent in the transaction. The extreme capitalization of this type of highly levered transaction makes LBOs interesting objects of study with regard to the effects of aggressive debt financing since the high debt levels of an average LBO normally cannot be found in corporations that have not gone through a buyout. The objective of our study is to examine the relationship between the choice of financing package of an LBO, and the probability that the company that went through the LBO is able to service its debt.

Research has shown that many LBO-transactions undergone until today have been highly successful and created substantial wealth for investors. For example, De Angelo (1984) found that shareholder wealth increased by an average of 30.4% following the announcement of an LBO. However, a number of LBOs have failed to accomplish such returns¹. Companies have been forced into restructuring or bankruptcy as a consequence of insufficient cash flows to service the post LBO large debt obligations.

Substantial amounts of capital have been flowing into the buyout industry in recent years. LBO funds have raised more than \$70 billion in the past two years in the United States alone. To arrive at a rough estimate of the capital available for use in the US LBO-industry, applying a 5 to 1 leverage factor to the \$70 billion gives \$ 350 billion of potential buying power. Compared to the total of US LBOs done in 1997 which was \$29 billion, the numbers clearly illustrate how overheated the LBO industry is at present². An increasing number of participants in the market chase a limited number of investment opportunities, and the premiums paid in the transactions and leverage applied to companies are rising drastically as a consequence of the increasing competition. This calls for caution for investors and other participants in LBOs, and emphasizes the importance of using adequate risk measurement methods for evaluating this type of transactions.

Donaldson (1978) concludes that debt capacity must be determined by management in terms of individual corporate circumstances and on the basis of cash flows, that the usage of rules of thumb and accounting ratios in fact can be misleading and dangerous to corporate solvency. Bruner & Eades (1992) arrive at similar conclusions in their study of the crashed LBO of Revco Drug Stores. Revco filed for bankruptcy in July 1988, only 19 months after the company had been taken private. According to the authors, a Monte Carlo simulation analysis of the cash flows and debt service obligations based on information available at the time of the transaction revealed that the firm only had a 5 – 30% probability of surviving the first three years after the LBO.

One leveraged buyout is not like any one other. Two seemingly similar transactions in terms of traditional ratio values may exhibit very different financial risks due to what specific debt,

¹ Some of the more well know are Campeau, Integrated Resources, Ames Department Stores, Circle K, Hillsborough Holdings, Greyhound and Revco Drug Stores.

² Forbes, LBO Mania, page 131, March 9, 1998

equity or hybrid instruments are used in the transaction, and the specific characteristics of such instruments. The financial analysis underlying the valuations and risk assessments of the financial advisors' engaged in the cases we have studied included mainly ratio analysis of different cash flow coverage ratios and other operational and financial ratios based on projections and historical data for the companies. This type of measures - however illustrative as snapshots of different aspects of the financial condition of a company - fall short of providing a complete and comprehensive measure of the vulnerability or robustness of a proposed transaction. Answering the key question of whether a post LBO company is likely to be able to service its debt, requires a detailed study of how the debt obligations of a company matches its cash flows over time taking into account an inevitable uncertainty regarding the size and timing of future cash flows.

1.1 Objectives of our Study

This thesis deals with the measurement of default risk in an LBO transaction, default risk defined as the probability that a firm is able to meet its debt service obligations. Our aim is to examine the relationship between the choice of financing package for a buyout, and the probability that the company will be able to service its debt. In the first part of the study, we provide an overview of prior research in the fields of leveraged buyouts, and measurement of the risk of financial distress. We then build on the methodology of Bruner and Eades (1992) in two case studies of the proposed leveraged buyouts of Mediq Inc (SEC filing as of January 14, 1998) and Kinetic Concepts Inc (SEC filing as of October 8, 1997). Specifically, we will do the following analyses:

1. Estimate the probability that our case firms will survive with the capitalization proposed in the Securities and Exchange Commission (SEC) 13E-3³ filings of the transactions given that management's projections regarding sales and EBIT⁴ margins prove to be correct.
2. Examine the impact of uncertainty in management's projections of future sales and EBIT margins on the risk of default.
3. Examine what type of deviations from projections (deviations in sales, EBIT margins or interest rates) that imply the greatest risk of putting the case companies in financial distress, and rank these potential deviations in order of importance.
4. Examine how the risk in the transaction can be managed by including a larger portion of interest deferred instruments in the financing of the LBOs.

1.2 Limitations

In the empirical part of the thesis, we study two companies. The method of close case studies of a few deals has its limitations regarding the extent to which conclusions can be generalized. An alternative approach to study the relationship between financing default risk of leveraged buyouts would be to draw on a greater sample of firms and look for patterns in the data to infer general conclusions about the population. An example of such a study in a related subject

³ Companies that go through an LBO are required by the SEC to file a 13E-3 document with the SEC. The 13E-3 of our case companies include detailed descriptions of the proposed transactions including historic profiles for the companies, strategic rationale behind the LBO, opinions of the financial advisors regarding the soundness and fairness of the LBO, descriptions of the debt and equity instruments used, historic and forecasted financial statements of the companies and other information concerning the LBO.

⁴ Earnings Before Interest and Taxes.

is Roden and Lewellen (1995) regarding the rationales behind capital structure decisions in LBOs.

Instead, we follow the recommendation by Bruner & Eades (1992), that a close study of a few LBO transactions is likely to provide richer insights into the area. It is our objective to be able to draw conclusions that would suggest hypotheses to be proven by further research.

2. Prior Research on Leveraged Buyouts

2.1 General Definition of a Leveraged Buyout

Palepu (1990) describes a leveraged buyout as a general form of corporate restructuring in which a small group of private investors uses mainly debt financing to purchase a corporation or a corporate division. The buying group often consists of buyout specialists, investment-and/or commercial banks and, usually, incumbent management⁵. The LBO is sometimes called Highly Leveraged Transaction (HLT), going private transaction or minority squeeze out. A MBO is a leveraged buyout where the buying group comprises the incumbent management. When the buying side initiates a management buyout it is called Buyer Initiated Management Buyout (BIMBO) and when the selling side takes the initiative to the deal it is called Vendor Initiated Management Buyout (VIMBO).

According to Jensen (1989) a significant increase in financial leverage is the most obvious characteristic of LBO, average long-term debt to assets in an average public company is about 20%, but 85% after a buyout. There are, however, several other important changes associated with these transactions. LBOs are often structured so that management's ownership interest in the firm increases substantially. LBOs also bring about significant corporate governance changes – large-block equity investors join the firm's board of directors and actively monitor management's strategy and performance. Another important characteristic of the post-LBOs firm is that the company loses direct access to public equity markets after buyout. The high leverage, large management ownership, active corporate governance, and loss of investors' access to liquid public equity markets fundamentally distinguish an LBO from a typical public corporation. Many LBOs are taken back to the public markets through what is sometimes called a "reversed LBO". The time period from the LBO until it is reversed by a public offering is normally between three to five years.

Opler and Titman (1993) find that firms that initiate LBOs are characterized by a combination of having unfavorable investment opportunities (low Tobin's q ⁶) and relatively high cash flows. They argue in another article (1990) that LBOs increase the firm's efficiency by increasing firm debt to better match the firm's underlying asset structure.

Because leveraged acquisitions increase financial risk by allocating a large portion of corporate cash flow to interest and principal payments that are fixed by contract, the creditors and investors demand higher returns than they would from a business with similar operating characteristics but which is capitalized substantially with equity. These higher returns result from changing the financial risk of the corporation by adding debt in place of equity. How

⁵ Takeovers, Restructuring and Corporate Governance, chapter 16, p. 316

⁶ Tobin's q is defined as the ratio of a firm's market value to the replacement value of its assets.

much the equity can be levered is determined by matching the cash flows from an operating plan to a capital structure, which normally is divided into several layers of risk. The result is that different debt and hybrid security holders take on different risk and - in theory - get compensated correspondingly.

2.2 *Benefits of LBOs*

Much research on LBOs have dealt with the potentially value creating effects of taking a company private. Weston et al. identifies five main types of potential gains from an LBO transaction⁷.

Tax Incentives

Lowenstein (1985) argues that most of the premium paid in an LBO is financed from tax savings and that the LBO company can expect to operate tax free for as long as five to six years. Lehn and Poulsen (1985) find strong evidence that tax benefits play a significant role in LBOs. In an empirical study, Kaplan (1989) finds that unused debt capacity, the result of buyout and the buyout structure, all account for parts of the tax benefits and that pre-buyout shareholders capture most of these benefits.

Management Incentives

Jensen argues in two articles (1986 and 1989) that what he calls the central problem of the public corporation, the agency problem, is reduced in the LBO governance structure. He means that the changes in governance that are caused by an LBO, eliminate much of the loss created by conflicts between owners and managers in a public firm, without impairing the vital functions of risk diversification and liquidity once performed exclusively by the public equity markets. Debt becomes a substitute for dividend, which forces managers to disgorge cash rather than reinvest it at returns below the cost of capital. Lehn and Poulsen (1985) give support for this standpoint in their study where they conclude that large undistributed cash flows often form the motivation for going private transactions, and that premiums paid to stockholders are related to these undistributed cash flows. Their theory - the so-called incentive-intensity hypothesis - can be explained by:

1. LBOs increase the proportion of equity held by managers. Performance related pay schemes align management's interests more closely with those of non-managerial shareholders.
2. LBOs concentrate the holdings of shareholders, which increases the owners' incentives to monitor management performance and intervene in corporate policy-making.
3. LBOs cut back free cash flow directly reducing the potential for the management to invest in capital destroying activities and instead compels them to squeeze out more cash for debt service. LBO associations have well-defined obligations to their creditors and residual claimants. The LBO-sponsors, who generally must get the permission of their investors to reinvest funds, cannot invest the funds in unproductive use.

Grossman and Hart (1986), and Heinkel and Zechner (1990) found similar results. Lehn and Poulsen (1985) find a significant relationship between undistributed cash flow and a firm's

⁷ Takeovers, Restructuring, and Corporate Governance, chapter 16, p. 326-332

decision to go private. Premiums paid to stockholders are significantly related to undistributed cash flow.

Easterbrook and Fischel (1982) argue that some profitable investment proposals call for disproportionate effort of managers so that they will be undertaken only if managers are given a correspondingly disproportionate share of the proposal's income, which generally is the case in an LBO.

Wealth Transfer Effects

Travlos and Cornett (1993) find that bondholders and preferred stockholders lose value when a company undergoes an LBO. Warga and Welch (1993) estimate average negative returns for this group to 7%, while Asquith and Wizman (1990) arrive at negative returns of 3,2%. Cook, Easterwood and Martin (1992) find that bondholders on average lose 3% of the market value of their bonds with a range of +13% to -19% after an LBO announcement, and that the magnitude of the losses depends on the existence of restrictive credit covenants. De Angelo & De Angelo (1984) find that pre-buyout shareholders of LBO target firms earn abnormal gains of 30-80% but that they nevertheless sometimes get deprived of value by management investors that have superior information and therefore underpay when they buy back stock in an LBO.

Kaplan and Stein (1990) estimate the systematic risk of the debt in public leveraged recapitalizations by calculating this risk as a function of the difference in systematic equity risk before and after the recapitalization. Under the assumption that asset beta is unchanged, they find that the implied beta of the post-recapitalization debt averages 0,65 (standard error of 0,06). Under the alternative assumption that the entire market-adjusted premium in the leveraged recapitalization represents a reduction in fixed costs, they find the implied beta of total debt to average 0,40 (standard error of 0,05). The authors conclude that the constant beta estimates arrived at in the study suggest that debt holders do not receive adequate compensation for the risk they bear.

Asymmetric Information and Underpricing

A theory that could help explain the large premiums often paid in LBOs is that management has access to non-public information regarding the condition and prospects of the firm. The buyout investors believe that the company is undervalued and carry through an LBO to buy the firm at a lower price than would have been possible from informed shareholders.

Research by Kaplan (1989), however, offers evidence against such arguments. He showed that managers and directors often do not participate in the buyout even though they normally have large equity stakes in the buyout.

Efficiency Considerations

The decision process can be more efficient under private ownership and action can be taken more speedily. According to Travlos and Cornett (1993) stockholder servicing costs and other related expenses do not appear to be a major motivational factor for LBOs, but they nevertheless represent factual costs that are avoided by a private firm.

