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A Due Diligence Process for Highly Leveraged Transactions

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I. Introduction

This article provides a due diligence process that may be followed as a general outline for the evaluation of highly leveraged transactions. The process involves an integrated combination of economic and financial analysis. The result of the process is a determination of the ability of the entity in question to pursue the transaction. The transactions that this due diligence process is appropriate for include major loans, leveraged buyouts, recapitalization plans as well as other transactions. The process can be used by the analyst to determine, for example whether the company is currently in sufficiently good financial condition to sustain the pressures of the additional debt. The process also combines the condition of the industry and the economy with the firm's own position to make an overall determination. The due diligence process that is put forward in this paper shows a framework of basic analytical steps that may be take by the analyst or participants in the transaction. It should be understood, however, that each transaction will present unique circumstances which may require additional analysis. Therefore, this process shows the minimum set of analytical steps that must be followed.

This analytical process starts with economic analysis and then narrows down to a more specific financial analysis of the company. Economic analysis can be used to establish the economic environment in which the firm operates. Factors such as the level of demand for the company's products or the competitive structure of the industry should become apparent following such an analysis. Financial analysis is used to analyze the firm-specific factors which measure the company's past, current and expected financial condition. Given the fact that economics and finance are two related, but somewhat separate disciplines, the remainder of this paper will discuss an integrated approach which combines both economic and financial analysis as part of a necessary due diligence analysis for highly leveraged transactions. Such an analysis should be performed in advance of the transaction, as part of the necessary due diligence process, by the various participants and other interested parties such as providers of financing.

II. Highly Leveraged Transactions of Fraudulent Conveyance Litigation

The issue of the proper due diligence process becomes quite relevant in the fraudulent conveyance litigation that has followed the failures of many highly leveraged deals and leveraged buyouts (LBOs). LBO are transactions financed primarily with debt in which a buyer purchases the equity in a tar-

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get. LBOs became increasing common in the 1980s merger wave. Unfortunately, some of the deals that were financed in the 1980s became the bankruptcies of the 1990s. In the litigation that often followed the bankruptcy filings, certain litigants claimed fraudulent conveyance of assets. The law, as it relates to such litigation, has been discussed at length elsewhere and, therefore, will not be elaborated upon here.[1] Courts have applied standards such as requiring the corporation to receive reasonably equivalent value for the increase in the obligations that follows the assumption of addition debt. In the landmark *United States v. Gleneagles Investment Company* (1983) decision, the court concluded that an LBO was fraudulent when sufficient consideration is lacking or where it is clear that creditors may not be paid. Other decisions come close to applying financial analysis through the determination of whether the LBO left the company in a weak financial position and with "unreasonably small capital".[2] A review of these decisions reveals that participants were not following any commonly accepted principles of due diligence when reviewing the transaction. It is also clear that the courts could be aided if they were presented with a concise framework that could be followed by the participants while deciding on the merits of the transaction as well as by court in reviewing the transaction after the fact. It is hoped that the basic framework of integrated economic and financial analysis may be of some assistance as a first step towards that end.

III. Economic Analysis

The economic analysis component of the due diligence process should begin from the broad macroeconomic perspective. It starts with an examination of the current levels and historical trends in various relevant macroeconomic aggregates, such as gross domestic product, national income, retail sales, consumption expenditures, etc. An examination of these aggregates provides an indication of the current economic condition of the national economy. Periods of economic growth, such as what occurred in the mid-1980s, should be sharply differentiated from recessionary economic climates such as in the early 1990s. Clearly, the vast majority of businesses thrive in a growing economy and suffer in a recessed economic environment. For highly cyclical industries, such as automotive and certain manufacturing industries, the macroeconomic environment can be a crucial variable in determining financial well being. A contracting economy is not a favorable economic environment for conducting an LBO which increases debt pressures for the LBO candidate. A cyclical company may have a limited ability to service the increased fixed obligations associated with additional leverage. On the other hand, companies such as pharmaceutical firms, can continue to exhibit growth in economic downturns. A comparison between industry sales and trends in the economy can reveal the extent to which the industry is vulnerable to macroeconomic fluctuations.

The national macroeconomic analysis should then be narrowed to the regional level for companies that service a more narrowly defined market.

[1]See Patrick A. Gaughan and Gregory Haworth, "Due Diligence Process for Highly Leveraged Transactions," paper presented at the Eastern Economics Association Annual Meetings, Washington DC, 1993.

[2]See e.g., In re *Ohio Corrugating Co* ; *Wieboldt Stores, Inc. v. Scholtstein*; *Jeannette Corp. v. Security Pacific Business Credit, Inc.*; *Murphy v. Meritor Savings Bank*.

For example, a company that derives most of its revenues from the Northeast United States is more concerned about the economic environment in this region of the country. This is important since economic fluctuations do not affect all areas of the nation evenly. For example, the early 1990s recession in the U.S. was initially more severe in the Northeast. However, this area started to experience some growth while the West Coast of the remained stagnant.

Regional economic aggregates, such as output and employment measures, can be used to establish the local economic environment. Such data are readily available from governmental entities, such as the U. S. Department of Commerce and the U. S. Department of Labor, as well as through private sources.[3] Together with the national data, they establish the relevant economic environment for the contemplated transaction. If the economy is not favorable, or if it appears that economic growth is slowing, the advisability of the transaction may be questioned.

The national and regional macroeconomic analysis should next be narrowed to the microeconomic level. This consists of an analysis of the industry in which the company operates. Industry data, which are available from government agencies as well as numerous private sources and trade associations, can be used to establish the historical growth of the industry. Variables such as industry sales and output are useful in establishing the growth of the industry.[4] A growing industry can provide increased revenues for some members of that industry which, theoretically, could be applied to obligations such as debt service. On the other hand, a declining industry may imply decreased revenues for a borrower which could make debt service more problematic. In addition, a declining industry may be associated with declining market shares and increased competitive pressures as member firms seek to offset the industry decline by expanding market shares. Clearly, a declining industry is a negative factor for candidates for highly leveraged transactions.

The greater the level of price and non-price competition, the lower the profit margins of industry participants.[5] Competition tends to reduce the gap between revenues and costs as prices decline while other forms of non-price competition, such as free services, tend to increase costs.[6] All other factors constant, competitive industries are less favorable for highly leveraged transactions compared to less competitive industries.[7]

The microeconomic analysis proceeds from the industry level to the firm level by considering the company's revenue and profit history. Trends in firm revenues are compared to various industry and macroeconomic time series in order to place the company's position in perspective. For example, such an analysis could show that while company revenues have grown at a ten percent average annual rate for the past five years, the industry showed a more modest four percent rate of nominal growth that only kept even with inflation. The company's growth rate must be considered in light of the

[3]For example see *Economic Indicators*, a monthly publication of the New Jersey Department of Labor or *Economic Trends*, a monthly publication of the Federal Reserve Bank of Cleveland.

[4]See the *U.S.Industrial Outlook*, a annual publication from the U.S. Department of Commerce or *Predicasts Basebook*, an annual published by Predicasts, Inc.

[5]See Miller (1986), pp 330-332

[6]Ibid., pp. 459-460.

[7]See Gaughan (1991).

firm's life cycle. A typical company life cycle might feature a period of more rapid growth following by a slowing in the rate of growth. The eventual maturity rate of growth might approach the industry after a certain number of years. The analyst needs to place the firm's historical rate of growth in perspective by considering the age of the firm. The age of the firm is important when using historical rates of revenue growth to project future revenues. For newer companies, the analyst may need to project a declining rate of growth that may start with the recent actual rate of growth but be brought down to a predetermined maturity level within a finite period of time.

IV. Financial Analysis

The microeconomic analysis should logically flow into the financial analysis which is directed at determining the financial well being of the transaction candidate. The financial analysis typically begins with a financial ratio analysis, a mainstay in most corporate finance textbooks.[8] The most commonly utilized financial ratios can be grouped into four categories: liquidity, leverage, activity and profitability ratios.[9] The next section will provide a brief review of the meaning of these ratios for those readers that may not be them familiar with them.

A. Liquidity Ratios

Liquidity ratios measure the firm's ability to satisfy its current obligations as they come due. The two principal liquidity ratios are the current ratio and the quick ratio:

Current Ratio =	Current Assets ÷ Current Liabilities
Quick Ratio =	(Current Assets – Inventories) ÷ Current Liabilities
Current Assets =	Cash plus all assets that can be converted into cash within a year. These include short term marketable securities, accounts receivable and inventories.
Current Liabilities =	All the financial obligations that are expected to be paid with a year. These include accounts payable, notes payable and the current part of the long term debt.
Working Capital =	Current Assets – Current Liabilities

The current ratio measures the firm's ability to meet its short term obligations using assets that are expected to be converted into cash within a year. The quick ratio removes inventories from current assets since they may not be as liquid as some of the other current assets.

[8]See Moyer, McGuigan and Kretlow (1990), Weston and Copeland (1989), Brigham and Gapinski (1987).

[9]The section on financial ratios is adapted from Gaughan (1991), pp. 515-524.

The more liquid a firm is, the higher the current and quick ratios. The greater the liquidity of a firm the lower the probability it can become *technically insolvent* which means that the firm cannot meet its current obligations as they come due.

Generally, the illiquid part of the current assets are the inventories. If the analyst would like to use a more stringent measure of liquidity, the quick ratio can be used. When there are questions about the liquidity of the company's inventories, the quick ratio is relied upon more often than the current ratio. The quick ratio, however, is less relevant for service companies than for firms that maintain large amounts of inventories such as retail companies.

As with most financial ratios, they have to be put in perspective by comparing the firm's ratios with the industry average. Certain firms, such as large pharmaceutical companies that have steady cash flows and good lines of credit, may be able to maintain a lower level of liquidity compared to manufacturing companies in cyclical industries. Industry averages will provide the analyst with an indication of the appropriateness of the firm's level of liquidity.

B. Activity Ratios

Activity ratios measure the speed with which various accounts are converted into cash. Activity ratios are normally an important supplement to liquidity ratios because liquidity ratios do not provide information on the composition of the various assets of the firm. They include total and fixed asset turnover as well as the average collection period.

Total Asset Turnover = Sales ÷ Total Assets

This ratio shows how effectively a firm uses its total resources. The higher the ratio, the better the firm's utilization of its assets.

Fixed Asset Turnover = Sales ÷ Total Assets

This ratio measures how effectively a firm uses its fixed assets. The higher the ratio, the better the firm's utilization of its fixed assets

Average Collection Period = Accounts Receivable ÷ Total Credit Sales ÷ 360

The average collection period shows the ability of the company to convert its accounts receivable into cash. It is a reflection of the effectiveness of the firm's collection efforts.

C. Financial Leverage Ratios

Financial leverage or debt ratios indicate the degree of financial leverage that the firm has or will assume. Financial leverage refers to the amount of debt the firm has used relative to the equity in its total capitalization. Three of the more often cited leverage indicators are the debt ratio, the debt to equity ratio and the interest coverage ratio.

Debt to Assets Ratio = Total Debt ÷ Total Assets

Debt to Equity Ratio = Long Term Debt ÷ Shareholder Equity

The debt to assets ratio compares the total debt of the company, both short and long term, to the book value of its total assets. The debt to equity ratio compares long term debt to the book value of shareholder equity. The higher these ratios the more risky the company. This risk often translates into a higher probability of becoming bankrupt.

Times Interest Earned or Interest Coverage = $\frac{\text{Earnings before Interest and Taxes (EBIT)}}{\text{Interest}}$

Interest coverage reflects the ability of the firm to cover its interest payments from its operating income (EBIT). Other variations of this ratio, such as the fixed charge coverage ratio which relates operating income, EBIT, to all fixed charges including lease payments can also be used. The higher these ratios, the less risky the firm.

D. Profitability Ratios

These ratios allow the company to judge how profitable it is in relation to its sales volume and asset size. They are used as a measure of company performance. Several alternative measures are used in this analysis. Four of the more often cited are highlighted below.

Before Tax Profit Margin = Net Income ÷ Total Revenues
This ratio, along with its post-tax counterpart, is a standard measure of profitability.

Basic Earning Power = EBIT ÷ Total Assets
This ratio relates the value of the company's operating income to the size of its total assets. It measures the ability of the company to generate operating income through the utilization of its assets.

Return on Assets = Earnings After Taxes ÷ Total Assets
The return on assets is sometimes also referred to as the return on investment. It shows how effectively management is able to generate after-tax profits from the use of the firm's available assets.

Return on Equity = Earnings After Taxes ÷ Shareholder Equity
This measure is a refection of the return that the owners of the company are earning on the value of stockholder's equity as it is reflected on the balance sheet.

Financial ratio analysis needs to be conducted from both a time series and cross sectional viewpoint. Time series financial ratio analysis considers the trend in each ratio over time. This trend analysis may reflect an improvement or deterioration in any particular ratio over time. A deterioration in liquidity and profitability, for example, should raise questions that need to be answered prior to contemplating a highly leveraged transaction such as a leveraged buyout. The time series financial ratio analysis is followed by a cross sectional analysis in which each ratio is compared to an industry average as of the date of analysis. The cross sectional analysis places the ratios in perspective by comparing them to similar companies. This is necessitated by the fact that there can be significant variability in ratios for firms in different industries. For example, inventory turnover in the range of

30 may be normal for a supermarket chain whereas an inventory turnover ratio equal to one may be acceptable for an airline manufacturer. Numerous sources of industry ratios, which break down the ratios by both industry and firm size, as reflected by value of assets or total revenues, are available.[10]

Of the four above sets of ratios, the liquidity and leverage ratios are particularly relevant for highly leveraged transactions. The transaction candidate needs to be sufficiently liquid to offset the additional current payments necessitated by the increased debt service associated with the deal. If pretransaction liquidity has been declining over time, and is below the industry average for firms of similar size, the advisability of a buyout, which would place even greater demands on the candidate's liquid assets, needs to be questioned. Similarly, a company that has increased the percent of debt in its capital structure, above both the industry average and its own historical levels, may also be a poor candidate for additional debt. Providers of debt capital should be hesitant to contribute financing to a company that has limited liquidity and is debt laden even before the transaction. Such companies walk a fine line between solvency and bankruptcy. Moreover, the fact that they have already assumed much debt means that their borrowing capacity will probably become exhausted by the buyout. Therefore, borrowing emergency funds may not be an option in the future.

Financial ratio analysis can be combined with multiple discriminant analysis to predict the likelihood of bankruptcy. This was first attempted by William Beaver (1966) who showed that some financial ratios were excellent predictors of failure. A later study by Edward Altman (1968) using multiple discriminant analysis showed that, in particular, five financial ratios could be used to predict bankruptcy one to five years prior to bankruptcy. While the predictive accuracy of these independent variables declines as an increasing function of the number of years prior to bankruptcy, the model predicted bankruptcy quite well two years in advance of failure.[11] The final discriminant model provides its results in terms of a Z score:

$$Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5$$

where:

X_1 = working capital ÷ total assets
X_2 = retained earnings ÷ total assets
X_3 = earnings before interest and taxes ÷ total assets
X_4 = market value equity ÷ book value of total liabilities
X_5 = sales ÷ total assets
Z = overall index

While other studies, using different data sets, failed to show as much predictive ability, they did confirm the usefulness of using financial ratios and discriminant analysis as predictors of bankruptcy.[12] Moreover, the authors of the original Z Score model (Altman, Haldeman and Narayanan, 1977) have refined their analysis through the inclusion of other relevant variables, such as the capitalization of leases. This model predicted failure five years in advance 96% of the time while one year in advance failure pre-

[10]See *Annual Statement Studies* (1991) and *Almanac of Business and Financial Ratios* (1989).
[11]See Altman (1983), p. 106.
[12]See Moyer (1977)

diction improved to 70%.[13] Given this established predictive ability of financial ratios, a thorough ratio analysis becomes an essential ingredient of the due diligence analysis for participants in the leveraged buyout process.

Research studies have showed that the ability of financial ratios to predict bankruptcy can be extended to small businesses in addition, to large, well followed corporations. Robert O. Edminster (1972), using multiple discriminant analysis, showed that financial ratios were accurate predictors of the failure of smaller businesses if the financial statements were averaged over a three year period. However, his study failed to show reliable accuracy using one year's financial statements.

For an analyst involved in highly leveraged transactions, the research in this area provides another set of tools, Zeta scores, which can be used to enhance the standard financial statement analysis. These Zeta scores can be purchased from commercial vendors.[14]

E. Cash Flow Analysis

A standard element in the analysis of highly leveraged transactions is the analysis of free cash flows. Cash flow is a more reliable measure of performance than net income since it reflects the ability of the company to generate cash which can be used to make payments such as debt obligations.[15] The relative of importance of cash flows compared to net income is underscored by various studies which show that the market values cash flows more than net income. McKinsey & Company showed that there is a low correlation between growth in earnings per share and the P/E ratios of the S&P 400 while there was a high correlation between the market value of equity and the discounted cash flows of these same companies.[16]

There are several definitions of free cash flow. In its simplest form, free cash flow can be defined as net income plus non-cash charges such as depreciation.[17] Bank analysts often add back depreciation to net income to gain a quick measure of a company's ability to service debt. Unfortunately, this "quick read" method may not be sufficient. A thorough cash flow analysis would warrant a projection of anticipated capital expenditures plus other expected changes in working capital. A definition of free cash flow is:[18]

Free Cash Flow = + Adjusted Net Income
+ Depreciation
– Planned Capital Expenditures
– Changes in Working Capital

The adjustments to net income involve the incorporation of a variety of assumptions that go into the forecast of future cash flows. These may involve restricted budgets and cost reductions through layoffs, administrative expense cutbacks etc. The adjusted net income may also incorporate as-

[13]See Van Horne (1989), p. 732.

[14]Zeta Services, Inc., Hoboken, NJ.

[15]See Stern (1989) and also Dorfman (1987).

[16]See Copeland, Killer and Murrin (1990), pp 73-94. See also the various event studies which show that changes in accounting income are not statistically significant determinants of stock prices (Brown and Ball, 1963).

[17]See Gitman (1988), p. 63.

[18]See Gaughan (1991), pp. 546-547.

sumptions of higher revenues to be derived from various anticipated gains to be derived from economies of scale or scope. It is here that the evaluator of the buyout needs to be most circumspect regarding the inherent optimism that promoters of deals tend to incorporate into their projections. This is most apparent in the legacy of some of the failed LBOs and acquisitions of the 1980s. The examiner's report in the bankruptcy proceeding of Revco, the large drug store chain that was the first major LBO to fail, clearly points out the unrealistic optimism that was incorporated in the pre-LBO projections that were presented to the funders of the deal (Zaretsky Examiners Report, Revco Bankruptcy Proceedings). The limitations of overly optimistic projections were equally apparent in the recapitalization of Interco in 1988 wherein overly optimistic sale prices of divisions, such as Ethan Allen and Central Hardware, were incorporated into the recommendation that Interco could finance a highly leveraged recapitalization in an effort to prevent a takeover by the Rales Brothers. While Ethan Allen was projected to sell for between $550-625 million, it brought only $388 million. The same was true of Central Hardware which was projected to command between $300-325 million but only brought in $245 million. These reduced sale prices of divisions, along with poorer than anticipated performance of other divisions, left this St. Louis based conglomerate unable to pay down its burdensome post-deal debt and its was forced to file for Chapter 11.[19] LBO or merger candidates may appear to be undervalued and a source of great benefits to buyers but the track record of such deals tends to be more modest than many dealmakers would have capital providers believe. For example, Ravenscraft and Scherer (1987) showed that targets in the 1960s and 1970s earned a return on assets that was not significantly different than non-targets.

Clearly, a detailed cash flow analysis, beyond just the perfunctory adding back of depreciation charges, is needed to determine the ability of the LBO candidate to service the post-buyout debt. However, such an analysis typically involves the incorporation of a variety of assumptions and projections. The "reasonableness" of each of these assumptions should be carefully scrutinized. The company's historical track record, as well as the results of the due diligence economic and financial analysis outlined above, must provide the basis for the cash flow projections. Overly optimistic scenarios put forward by interested parties and deal makers seeking larger fees, should be dismissed. A detailed analysis and careful examination of each crucial assumption is necessary in order to provide some degree of confidence that the buyout will succeed. Even with such an analysis, the inherent unpredictability of the economy and financial markets will provide an unavoidable degree or risk. It is, therefore, critical that the pre-transaction due diligence analysis go as far as possible to account for all relevant variables that can be analyzed and measured in advance of the funding of the transaction.

F. Scenario and Sensitivity Analysis

Assumptions regarding the levels of certain critical variables that may affect future income, such as the interest rates or labor and materials costs, can be incorporated into the pre-transaction analysis through the use of scenario analysis. Scenario analysis allows the analyst to consider the firm's

[19]See Anders and Schwadel (1990), p. A1.

financial conditions under varying sets of circumstances.[20] The analyst constructs various pro-forma income statements, each based upon different assumptions on levels of certain critical variables. When these assumptions are included in different scenarios, the analyst may be able to determine how sensitive the success of a project is to different values of key variables. Used in this manner, scenario analysis is often referred to as *Sensitivity Analysis*.[21]

G. Cash Flow Statistical Analysis

Cash flow analysis can be combined with some of the same statistical techniques that were used to relate financial ratio analysis to the probability of bankruptcy.[22] Aziz and Lawson (1989) used various determinants of cash flows, such as investing, operating and liquidity levels, as predictors of bankruptcy. The results of their analysis showed slightly greater predictive ability using cash flow variables as opposed to basic financial ratios (92% accuracy one year in advance of bankruptcy and 72% accuracy five years before).

H. Conclusion of Financial Analysis

Numerous research studies have chronicled the value of financial analysis as indicators of financial well being and predictors of financial failure. This analysis should include a thorough financial ratios analysis, from both a time series and cross sectional perspective, as well as a detailed cash flow analysis. The combined use of these financial tools is an essential component part of the due diligence process for participants and fiduciaries involved in highly leveraged transactions.

V. Case Study of Economic and Financial in the Context of a Leveraged Buyout

The case study that follows is instructive since it highlights the failures of a limited level of pre-buyout economic and financial analysis. It also shows how the necessary due diligence pre-buyout analysis should feature an integrated combination of both economic and financial analysis.

A. Background Facts

This case study considers the 1988 leveraged buyout of a Northeast trucking company (hereafter referred to as NTC) that was financed by a New England thrift institution (NET). NTC was bought by a Canadian trucking company (CTC) in a transaction that enabled the original owner of NTC to liquidate his equity in this company. CTC was able to convince the primary lender that the combined companies would be financially viable as a result of various economies of scale that would include the benefits of interlining the route structure of both companies. Theoretically interlining would increase load factors for the combined entity. The thrift institution was sufficiently impressed with the anticipated interlining and economies of scale, which were incorporated as assumptions in the projections of the charis-

[20]See Kolb (1988), pp. 485-486.
[21]See Levy and Sarnat (1986), pp. 258-262.
[22]See Van Horne (1992), p.742.

matic CEO of CTC, that they ignored certain obvious negative factors such as the limited profit history of CTC and the steadily declining profitability of NTC. The due diligence analysis of NET was highly questionable in light of the limited number of financial ratios that were computed along with the apparent lack of any economic analysis. A basic cash flow analysis, which featured the adding of historical depreciation to net income and comparing the resulting values to projected interest charges, was performed. The obvious limitations of such a cursory analysis was underscored by the fact that NTC defaulted on the first debt payment following the buyout! The sections below include some of the highlights of the microeconomic industry analysis and financial analysis. The macroeconomic environment is not discussed since it was not as relevant to this particular transaction.

1. Economic Analysis

The trucking industry underwent dramatic change in the 1980s due to deregulation that resulted from the enactment of the Motor Carriers Act of 1980. This Act allowed companies to engage in price competition and eliminated uniform rates. Prior to 1980, the trucking industry featured a more limited type of competition due to the inability of firms to aggressively engage in price competition and for new entrants to gain market share.

The trucking industry was tightly regulated in the years 1935-1980. The deregulation of the industry that followed passage of Motor Carriers Act of 1980 allowed trucking firms to determine their own pricing policies and geographic territories. Within the Less Than Truckload (LTL) sector, firms expanded into each other's territories seeking to win away business through offering better rates and service. Specialists in the Truck Load (TL) business also expanded and took away market share in this category from those LTL carriers who also provided TL service (such as Holmes Transportation, Inc.). The truck load sector, in particular, saw many new entrants.

2. Price Competition and Discounting

With the advent of deregulation, competition significantly increased in the industry. Much of this competition took the form of price competition. Trucking companies aggressively used discounting as the means of generating additional business. Competitors were also forced to offer discounted rates in an effort to prevent the volume of business from falling. A 1987 report by the General Accounting Office to Congress failed to conclude that there was evidence that predatory pricing was rampant in the industry. The report, however, did confirm that trucking companies sometimes offered rates below a break-even level as a temporary promotion designed to attract new customers. This type of aggressive price competition is indicative of the intensity of price competition in this industry.

3. Service Competition

Price competition was also combined with quality and service competition during the 1980s as companies sought to take business away from their rivals. Truckers offered customers better tracking which would enable companies to tell customers where their shipments were during transport. Other efforts were made to better ensure quicker and more dependable service. A higher quality of service became a necessary condition of just maintaining a company's position in the industry.

4. Labor Issues

The LTL sector, of which NTC was a member, has traditionally been the most unionized sector of the trucking industry. The Teamsters Union negotiated wage increases, such as in the National Master Freight Agreement, which was ratified in May, 1988, retroactive to April, 1988, equal to 7% for the three-year period covered by the contract and 10% for the complete benefit package. Unionized carriers attempted to pass along these increases in the form of higher rates. Such rate increases enhance the ability of non-unionized carriers to compete through more aggressive price competition. While truck load carriers benefited from lower labor costs, many of them had difficulty keeping drivers and had to respond by also raising driver compensation.

5. Truck Load vs. Less Than Truck Load Carriers

As noted above, TL carriers have traditionally been less unionized while LTL carriers tend to employ a unionized workforce. TL carriers also tend not to have a terminal network which is necessary for the LTL business. The delays and uncertainty which can occur in terminal operations allows TL carriers to offer their customers superior, "custom-tailored" service. The LTL carriers lost a significant portion of their TL business due to the aggressive competition by the TL specialists who, with their non-unionized workforce and superior service within their segment of the industry, took away an important part of the LTL's carriers' overall business.

LTL carriers were forced to respond to the aggressive competition from the TL carriers by increasing the quality of their service. Part of this effort to achieve quality enhancements was attempted through technological advancements.

6. Productivity Changes and Competition

The widespread price competition between the TL and LTL carriers, as well as the widespread price competition among LTL carriers, eroded profit margins. Firms were forced to try to lower costs in an attempt to maintain their revenue base. For example, carriers tried to run trucks at higher levels of capacity or load factors. Companies attempted to utilize more advanced technology which included computerization and better tracking of shipments. However, given the competitive nature of this industry, these productivity changes were being implemented by many of the firms in the industry. Therefore, such productivity enhancements became a necessary condition of remaining in the industry and did not necessarily mean that the company instituting such changes would realize a competitive advantage over its rivals. The proposed productivity enhancements that were presented to NET by the CEO of CTC would not be a source of increased profits but merely a minimal necessity of staying in this industry. However, since NET did not do an economic analysis, this was not known prior to the buyout.

7. Technological Changes

The competitive pressures generated by the TL carriers, along with the competition among the LTL carriers, forced the LTL carriers to look to technological advancements to allow them to offer better quality service. These technological advancements, however, failed to provide carriers with a sustained competitive edge since that were being implemented throughout the industry. The computerization of operations and the installation of two-way

radios in all trucks, like other productivity enhancements that NET was impressed by, were merely a necessary condition of staying in the industry and not a source of gains.

8. Price – Cost Squeeze

The increased price competition in the industry made it more difficult for firms to maintain the same levels of total revenues. In addition, costs factors, such as rising labor costs, also made it more difficult for companies to respond to lower prices by lowering costs. The combination of higher costs in some areas and more competitive prices "squeezed" profit margins.

The deterioration in profit margins is shown on Table 5. The data reflect a lower ratio of net income to number of firms in the industry. The declining ratio in the 1980s occurred in spite of the fact that industry revenues, as shown on Table 1, increased reflecting an increasing overall demand for trucking services. However, deregulation created conditions which brought about an increase in the number of companies in the industry as shown on Table 3. The declining profit margin caused net income for the industry as a whole to decline significantly in certain years, such as in 1987 and 1989. Industry net income rebounded somewhat in 1988 but failed to come close to the 1986 levels in the remainder of the 1980s.

9. Business Failures

An industry that is experiencing declining profit margins often features the failure of the less efficient firms. This pattern of business failures is reflected in Table 2. Unfortunately for the remaining firms in the industry, there was little relief caused by the failure of some of the companies since the number of new companies entering the industry continued at a rapid pace.

Table 1
Trucking Industry Revenues

Year	Revenue ($ Billions)	% Change	Cargo (Billion ton-miles)	% Change	Employment (000)	% Change
1984	195.4	—	606	—	1,071	—
1985	205.2	5.3	610	0.6	1,106	2.5
1986	213.1	3.8	627	2.8	1,118	1.1
1987	224.5	4.4	661	5.4	1,360	4.6
1988	239.5	6.7	704	6.5	1,455	6.9
1989	257.0	7.3	716	1.7	1,481	1.8
1990	273.0	6.2	730	2.0	1,516	2.4

Source: *U.S. Industrial Outlook 1992*, U.S. Department of Commerce.

Table 2
Trucking Industry Business Failures

Year	Business Failures
1985	716
1986	759
1987	621
1988	578
1989	501
1990	683

Source: Dun & Bradstreet Corporation, Economic Analysis Department.

Table 3 — Trucking Industry Net Income

Year	Number of Carriers	Net Income (Millions $)	Ratio of Net Income to Number of Carriers
1976	16,470	350	21,251
1977	16,610	450	27,092
1978	16,870	490	29,046
1979	17,080	310	18,150
1980	18,040	300	16,630
1981	22,270	290	13,022
1982	25,720	600	23,328
1983	25,520	350	13,715
1984	30,480	410	10,817
1985	33,280	360	14,885
1986	36,950	550	7,825
1987	38,340	300	11,613
1988	39,610	460	—
1989	—	360	9,609
1990	45,790	440	11,613
1991	47,890	310	647

Source: Net income data from *Predicasts' Basebook: 1992*, Predicasts, Inc., Cleveland, OH.

Table 4
NTI, Inc. Ratio Analysis

	12/85	12/86	12/87	4/88*	Before LBO*	After LBO*	12/88
Liquidity							
Current Ratio	1.38	1.54	1.01	0.94	0 73	0.63	0.45
Quick Ratio	1.30	1.49	0.96	0.89	0.70	0.60	0.43
Asset Management							
Avg Collection Period	34.01	34.79	43.99	41.48	42.03	42.03	46.87
Fixed Asset Turnover	4.92	5.78	6.59	5.71	6.19	6.19	3.01
Total Asset Turnover	2.52	2.32	2.84	2.72	2.97	3.46	2.26
Debt Management							
Debt to Total Assets (%)	42	38	36	49	58	108	93
Time Interest Earned	15.28	12.58	0.28	-13.77	-19 52	-19.52	-12.98
Profitability (%)							
Profit Margin (B-Tax)	2.37	4.18	-0.33	-8.59	-8 50	-8.50	-15.49
Basic Earnings Power	6.39	10.55	0.36	-21.76	-24.04	-17 03	-32.46
Return on Assets (B-Tax)	5.97	9.72	-0.92	-23.34	-25.28	-29.38	-34.96
Return on Equity (B-Tax)	10.30	15.71	-1.61	-46.18	-60.76	-66.53	-469.45

*Annualized
Note: Asset based ratios reflect book values rather than the market value of assets.

Table 5
Trucking Industry Ratio Analysis

	Historical Industry Ratios								
	1981	1982	1983	1984	1985	1986	1987	1988	1989
Liquidity									
Current Ratio	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Quick Ratio	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.8
Asset Management									
Avg Collection Period	29.3	27.7	2.7	31.0	28.6	30.8	30.8	32.1	31.9
Fixed Asset Turnover	4.3	4.6	4.9	4.9	4.9	5.1	4.9	4.6	4.6
Total Asset Turnover	2.4	2.3	2.5	2.4	2.5	2.5	2.5	2.5	2.4
Debt Management									
Debt to Total Assets (%)	66.3	63.9	63.8	65.3	65.8	66.2	66.4	66.0	65.7
Time Interest Earned	2.2	2.2	1.8	2.4	2.6	2.0	2.5	2.4	2.3
Profitability (%)									
Profit Margin (B-Tax)	2.6	3.3	1.8	2.6	3.7	2.7	3.4	2.9	2.9
Return on Assets (B-Tax)	6.0	6.1	4.4	6.0	7.5	4.9	7.2	5.7	5.7
Return on Equity (B-Tax)	18.8	18.2	12.6	20.4	24.1	18.8	22.3	19.9	19.2

Source: *Annual Statement Studies,* Robert Morris Associates

B. Interpretation of Financial Ratio Results

1. Liquidity

The liquidity ratios for NTC, Inc. are low. This is clear from a comparison with the industry ratios. An examination of the current ratios of NTC, Inc. also reveals that the liquidity position of the company deteriorated significantly prior to and after the leveraged buyout. The deterioration in liquidity, as reflected in a current ratio of 0.73 before the LBO, should have

raised serious questions regarding the ability of the company to meet its current obligations. It confirms the fact that the company had negative working capital prior to the leveraged buyout. The fact that the company had poor liquidity prior to the buyout made it a poor candidate for a leveraged buyout. The limited liquidity, combined with other limitations, such as declining revenues and no additional borrowing capacity, should have raised serious questions regarding the ability of the company to meet its obligations as they would come due. It also indicates that this company should not have incurred additional debt obligations which would place further pressures on the company's liquidity.

2. Asset Management

The average collection period for NTC, Inc. was almost in line with industry averages up to 1986. The average collection period for the company was 34.79 days in 1986 while the industry average for that year was 30.08 days. However, the average collection period increased to 44 in 1987 while the industry average remained the same. The average collection period continued to rise after the buyout. The inability to receive timely payment, as reflected by the higher average collection period, further exacerbated the poor liquidity position of the company.

Both the fixed asset turnover and the total asset turnover are not dramatically different from the industry averages. This just means, however, that NTC is able to generate similar levels of sales with its assets. Given the deterioration in profitability of the industry, however, the sales to assets ratios fail to fully reflect the problems of the industry.

3. Leverage

The leverage ratios indicate that the total level of debt relative to the total assets of the company was below the industry average until after the transaction when they increased significantly. Interest coverage, however, was already at a dangerously low level prior to the transaction. This implies that the company was not in a position to be able to service additional debt. Therefore, it should not have been a surprise (as it was to the lenders) that the company would quickly default on the LBO debt payments.

4. Profitability

The profitability position of the company also deteriorated markedly just prior to the transaction. The fact that all the profitability ratios were negative after the transaction would not have come as a surprise if a proper scenario analysis, based upon reasonable assumptions, had been attempted prior to the LBO.

C. Scenario Analysis

This part of the report addresses the projections and expectations put forward by the buyer in the business plan that was presented to the lenders. In this plan, the CEO of CTC states that he sought to lower costs and increase revenues. He expected to realize the cost decreases through a combination of reducing the handling of shipments by 6%, improving load haul factors and increasing pick-up and delivery productivity. He expected to realize a savings of $3 million in operating expenses from these costs reductions. In addition, the plan refers to an expected increase of 6% in revenues.

These revenue increases were expected to come as the result of a direct line service between Canada and the United States (interlining – 4%) and increases in freight rates (2%).

Unfortunately, prior to the LBO, NTC was already actively attempting to lower costs through the various means suggested by the buyer. Therefore, the expectation that there would be further opportunities to lower costs in the manner suggested in the business plan, beyond that which was already being pursued by NTC, Inc., was not reasonable. In addition, interviews with the management of NTC indicated that NTC was already pursuing interlining opportunities with CTC prior to the completion of the leveraged buyout. They state that whatever interlining opportunities were available in Canada were already being pursued. In addition, the fact that CTC itself went bankrupt prior to the buyout, (a fact that NET was not told about until after it occurred) renders the interlining gains in revenues implausible.

The intense degree of competition in the industry makes rate increases very difficult. The fact that there was large scale discounting and lowering of rates, makes it more difficult to accept the proposition that a company such as NTC could seek to increase prices in such an environment and hope to realize an increase in revenues.

The above discussion highlights the fact that both the expected cost decreases and the revenue increases seem to be unreasonable. Given the competitive environment, it would be an effort for NTC to significantly increase its revenues beyond the pre-buyout level without a commensurate increase in costs. Moreover, it would not be reasonable for such dramatic changes to be achievable in the immediate time period following the buyout as was suggested in the business plan that was presented to the lenders.

The trend in the company's operating expenses had been rising. For example, operating expenses had steadily rose from $58,010,800 in 1985 to $60,208,500 in 1986 and $62,194,300 in 1987. This is an average annual rate of 3.5%. For NTC to lower costs it would have to reverse this trend. In addition, revenues fell from $61,282,600 in 1986 to $57,564,000 in 1987. This is a 6% decrease using the 1986 revenue level as a base. NTC would have to reverse this recent trend and add a six percent increase. Given the condition of the industry, there does not seem to be a reasonable basis for such an assumption.

The scenario analysis that follows puts forward more reasonable assumptions. The first scenario assumes that the company would experience a 2% increase in both revenues and costs. The second scenario assumes that revenues and costs would be held constant at their 1987 levels. Given the fact that the company had been experiencing a decline in revenues and annual increases in costs prior to the buyout combined with the condition of the industry, more pessimistic scenarios than these two might also have been expected. These two scenarios are put forward in the pages that follow after a consideration of truck purchases.

1. Truck Purchases

In the recent years leading up to the leveraged buyout, NTC had not been investing in new trucks (including tractors, trailers and "straight jobs") such as it had in prior years. This trend is reflected in the tables that follow. NTC had an aging rolling stock and investments in new trucks would have had to be made after the buyout. The scenario analysis includes a truck purchase schedule based upon the average level of purchases for the

company in prior years. This is based upon truck purchase prices that prevailed following the buyout. The scenario analysis only includes purchases of tractors and trailers and does not include the purchase of "straight jobs" which are used in the pick up and delivery process. However, there is evidence that NTC also needed to make investments in these types of trucks as well.

The historical levels of purchases of trucks are shown in the tables below. It can be seen that, except for the purchase of 50 trailers in 1986, the company stopped purchasing trailers in 1981. It is noteworthy to point out that this time period marks the onset of the increased post-deregulation competition. In the 1970s, the company purchased an average of 85 trailers per year. This amount fell to 21.4 in the years 1980-1986. This fall-off is also apparent in tractor purchases which averaged 34.7 per year in the 1970s and then fell to 21.7 in the period 1980-1986.

Table 6
Historical Truck Purchases

Year	Tractors	Trailers	Straight Jobs	Year	Tractors	Trailers	Straight Jobs
1971	35	50	—	1981	20	50	27
1972	25	100	—	1982	2	0	0
1973	40	175	—	1983	12	0	0
1974	25	100	—	1984	12	0	0
1975	5	0	—	1985	36	0	0
1976	37	50	—	1986	30	50	40
1977	29	100	—	1987	0	0	0
1978	66	150	—	1988	0	0	0
1979	50	40	—	1989	0	0	0
1980	40	50	5				

Table 7
Tractor Purchase Schedule

	Schedule 1		Schedule 2		Schedule 3	
Year	Tractors	Trailers	Tractors	Trailers	Tractors	Trailers
1987	$1,553,238	$1,253,750	$1,298,095	$843,700	$ 971,333	$315,650
1988	1,630,900	1,253,750	1,363,000	843,700	1,019,900	315,650
1989	1,665,600	1,253,750	1,392,000	843,700	1,041,600	315,650
1990	1,769,700	1,253,750	1,479,000	843,700	1,106,700	315,650

Schedule 1 is based on average tractors purchased in period 1971-79
Schedule 2 is based on average tractors purchased in period 1971-86
Schedule 3 is based on average tractors purchased in period 1981-86

Period	Average Tractors Purchased	Average Trailers Purchased
1971-1979	34.7	85.0
1971-1986	29.7	57.2
1980-1986	21.7	21.4

2. Incorporating Truck Purchases into the Scenario Analysis

A tractor and trailer purchase schedule is developed based upon the historical level of purchases. The costs of such purchases are then factored into the scenario analysis. The scenarios are shown below.

Scenario I — Most Optimistic Scenario
Revenues and costs are increased 2% above 1987 levels. Truck purchases are also added.

Scenario II — Optimistic Scenario
Revenues and costs are held constant at 1987 levels. Truck purchases are also added.

	Scenario I Two Percent Increase in Revenues and Costs		Scenario II No Increase in Revenues and Costs	
	Pro-Forma 1988	Pro-Forma 1989	Pro-Forma 1988	Pro-Forma 1989
Revenues	58,715,280	59,889,586	57,564,000	57,564,000
Operating Expenses				
Operating & Maintenance	62,006,106	63,246,228	60,790,300	60,790,300
Depreciation	1,401,500	1,401,500	1,401,500	1,401,500
Depreciation Adjustment	2,500	2,500	2,500	2,500
Total Operating Expenses	63,410,106	64,650,228	62,194,300	62,194,300
Operating Income (Loss)	(4,694,826)	(4,760,642)	(4,630,300)	(4,630,300)
Interest Expenses	325,000	1,950,000	325,000	1,950,000
Income After Interest	(5,019,826)	(6,710,642)	(4,955,300)	(6,580,300)
Tractors Purchased	(1,019,900)	(1,041,600)	(1,019,900)	(1,041,600)
Trailers Purchased	(315,650)	(315,650)	(315,650)	(315,650)
Income After Truck Purchases	(6,355,376)	(8,067,892)	(6,290,850)	(7,937,550)

D. Conclusion of Scenario Analysis

It is clear that using more realistic assumptions than those put forward in the buyer's business plan leads to adjusted net income levels that are negative. Even after making a further adjustment that would add back the depreciation expense, the company clearly would not have had the ability to meet its obligations as they came due. Therefore, there was no reasonable basis for the belief that the company could have been able to service its debt obligations. This example underscores the limitations of simple cash flow analysis which compares the sum of net income plus depreciation to interest payments. The proper measure is the sum of *adjusted* net income and de-

preciation. In this case, the adjusted net income should have at least included projected capital expenditures.

VI. Conclusion

The feverish pace of highly leveraged transactions that prevailed in the 1980s often featured deals which were put through without the necessary due diligence analysis. If such analysis had been performed, some of the deals that have turned into bankruptcies would not have been consummated. The due diligence analysis would have revealed that the post-transaction entities would have been left with unreasonably small capital or the inability to pay their debt as they came due. The case law in this area is vague and fails to indicate what is meant by unreasonable small capital or what the necessary due diligence should be. It is hoped that this paper will provide a framework for the pre-transaction due diligence process. Following such a process should enable the transaction participants to anticipate some of the limitations of transaction proposals.

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