

**AN EXAMINATION OF THE RELATIONSHIP BETWEEN CREDIT
DEFAULT SWAPS AND EQUITY PRICES.**

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DECLARATION:

I hereby certify that this material, which I submit for assessment of the programme of study leading to the award of a Masters in Finance is entirely my own work and has not been taken from the work of others, and to the extent that such work has been cited and acknowledged within the text of my work.

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ABSTRACT:

This paper analyses the empirical relationship between credit default swap spreads and equity prices at an individual firm level during the period Jan 2000 to Jun 2006. Using samples from a data set of 250 of the most liquid, publicly quoted names in the credit default swap market, I found there to be a statistically significant inverse relationship between these two financial instruments. Additionally, I found that this relationship changes when there is speculation that an individual firm may be purchased by means of a leveraged buyout. During this period of speculation, the relationship is positive until the company is taken private or until the speculation recedes. In the event of the speculation being eliminated, I found that the relationship reverts to being negative.

TABLE OF CONTENTS:

I. INTRODUCTION:	1
A) CREDIT DEFAULT SWAPS:	2
<i>What is a Credit Default Swap?</i>	2
<i>History of CDS</i>	2
<i>Main participants in the CDS Market</i>	3
<i>Why use a CDS?</i>	4
<i>What happens when there is a credit event?</i>	5
<i>Pricing CDS:</i>	6
B) EQUITIES	7
<i>History of Equities:</i>	7
<i>Why invest in Equities?</i>	7
B) LEVERAGED BUYOUTS	8
<i>What is a Leveraged Buyout?</i>	8
<i>History of LBOs:</i>	9
<i>Main Participants in the Private Equity Market:</i>	10
<i>Recent LBO Activity:</i>	10
II. HYPOTHESIS:	12
III. LITERATURE REVIEW:	12
<i>Equities and Bonds:</i>	12
<i>Equities and CDS:</i>	13
<i>Bonds and CDS:</i>	14
IV. RESEARCH METHODOLOGY:	16
<i>Collecting the Data:</i>	16
<i>Selecting Sample Companies:</i>	17
<i>Testing the Data:</i>	18
V. FINDINGS:	19
<i>What is relationship between equity prices and CDS spreads?</i>	19
<i>What happens the relationship in a LBO situation?</i>	20
VI. CONCLUSION:	24
VII. REFERENCES:	25
VIII. BIBLIOGRAPHY	28

APPENDIX A: COMPANIES FOR WHOM DATA WAS COLLECTED:	29
APPENDIX B: SAMPLE OF INPUT DATA	33
APPENDIX C: COMPANIES ELIMINATED FROM ORIGINAL DATA	34
APPENDIX D: REGRESSION ANALYSIS OUTPUTS	35
APPENDIX E: MARKS & SPENCER GROUP LBO SPECULATION HISTORY	50
APPENDIX F: MARKS & SPENCER REGRESSION ANALYSIS OUTPUT	51
APPENDIX G: CDS INDICES CONSTRUCTION INFORMATION	54
APPENDIX H: RATINGS DEFINITIONS	56

FIGURES/TABLES:

Figures:

FIGURE 1: HOW A CDS CONTRACT WORKS.....	2
FIGURE 2: PARTICIPANTS IN THE CDS MARKET AS OF DECEMBER 2005, IN BILLIONS OF US DOLLARS.	4
FIGURE 3: LBO ACTIVITY 1998 – PRESENT.....	11
FIGURE 4: PRIVATE EQUITY – NEW FUNDS 1998 -2005	11
FIGURE 5: M&S EQUITY PRICE V.'S CDS PRICE 2001 - PRESENT	50
FIGURE 6: MOODYS INVESTOR SERVICE CREDIT RATING SCALE	56
FIGURE 7: S&P RATINGS DEFINITIONS	57

Tables:

TABLE 1: BREAKDOWN OF COMPANIES IN CDS INDICES:	16
TABLE 2: BREAKDOWN OF COMPANIES SELECTED FOR TESTING:	17
TABLE 3: COMPANIES SELECTED AS SAMPLES FOR TESTING.	18
TABLE 4: REGRESSION ANALYSIS OUTPUTS:	19
TABLE 5: REGRESSION ANALYSIS RESULTS FOR LBO COMPANY (M&S).....	21

I. INTRODUCTION:

Empirical studies suggest that there is a close link between equity prices and debt prices as their value depends on the market value of the firm's assets and on the distribution of that market value. What is less obvious is the relationship between these instruments and other derivative products referencing the same company. In particular, the relationship between the heavily growing credit derivatives market and traditional equity markets has only been explored on a limited scale so far. For this reason, I propose to empirically analyse the movement of single name credit default swaps and the movement of equity prices at an individual firm level, thus investigating if and how these markets are connected.

After analysing this relationship, I propose to investigate its properties further under a leveraged buyout. In recent years, there has been an upsurge in private equity activity and leveraged buyout scenarios. This growth has been fuelled by, (a) historically low borrowing costs making purchases cheaper and (b) rising stock markets making it easier to sell assets at a profit thus giving returns to their investors. In total, there are 3,000 private equity firms world-wide all aiming to deliver superior returns as investors to take advantage of new and exotic financial instruments. These investors are typically looking for higher returns than usually available from the stock market.

In order to investigate this in a clear and comprehensive manner, it is necessary to structure the remainder of this paper in the following order:

- The remainder of chapter I introduces credit default swaps, equities and leveraged buyouts, each section explaining how they work and who the main participants are in each market.
- Chapter II states my hypothesis
- Chapter III reviews previous literature in the area.
- Chapter IV explains the methods used in gathering, selecting and testing the input data for my analysis.
- Chapter V details the findings of my research.
- Chapter VI outlines my conclusions.

A) CREDIT DEFAULT SWAPS:

What is a Credit Default Swap?

Credit Default Swaps (CDS) are a new form of credit derivative, which enables investors to transfer credit risk (the risk of a company defaulting on its debt obligations). A CDS is an insurance contract that provides insurance against default by a company or a sovereign entity. The company is known as the reference entity and the default by the company is known as a credit event. The CDS protects the buyer against losses from a credit event associated with an underlying reference entity. In exchange for credit protection, the buyer of a default swap pays a regular premium to the seller of protection (“investor”) for the duration of the contract. Figure 1 gives a graphical representation of how a CDS contract works.

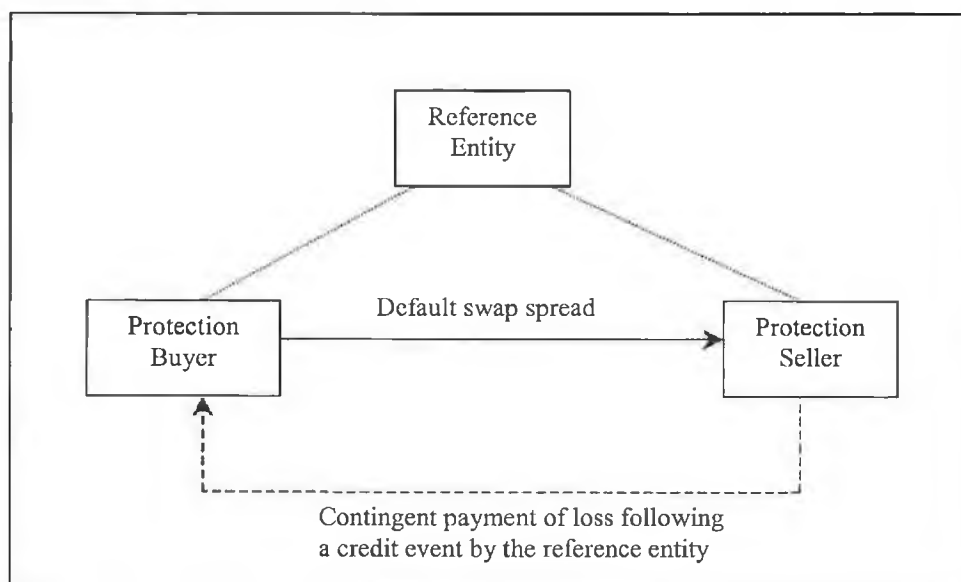


Figure 1: How a CDS Contract works.

History of CDS

CDSs were first developed for bonds, loans and similar instruments related to central bank transactions only. Corporate entities soon constituted an additional market and by the late 1990s, firms began to use CDS to buy protection for highly rated investment-grade¹

¹ Investment grade rating if held is a company or an issuance of debt is rated between Aaa and Baa by Moodys or between AAA and BBB by Standard & Poor's. Please refer to Appendix H for more detail.

borrowers. In doing so, these firms could choose to increase their exposure to a firm by selling CDS protection or choose to reduce their exposure to a firm by buying protection. The notional amount of outstanding CDS contracts² has grown exponentially since the inception of the product, more than doubling in 2005 alone. The notional amount of CDS contracts outstanding stands at \$14 trillion³ as of 30-Dec-2005, up from \$6.37 trillion at the end of 2004. (Most of the initial development in the CDS market was in single-name contracts. However, since late 2003 there has also been increasing activity in contracts related to CDS indices. The Bank of International Settlements (BIS) statistics indicates that the total notional amount outstanding of single- and multi-name default swaps was \$10.2 trillion and \$3.5 trillion respectively as of Dec 2005). Yet when compared to the combined notion amounts of interest rate, equity index and currency contracts outstanding of \$429 trillion⁴, the CDS market is still relatively small.

Main participants in the CDS Market

CDS contracts were thought to be most widely used in the banking system and the most recent release of CDS statistics from the BIS confirms this. These statistics also provide a finer breakdown of the counterparties than previously available. The data confirms the impression that the CDS market, like most other OTC markets, is largely an interbank market. As can be seen from figure 2, at the end of 2005, roughly two thirds of all outstanding positions were between reporting dealers and a further quarter were between reporting dealers and other banks or securities firms. The top three counterparties in 2004 were Deutsche Bank, Morgan Stanley and Goldman Sachs who accounted for 26% of all contracts, with the top 10 counterparties accounting for 70% of all contracts⁵

² In a standard contract, payments by the buyer are made quarterly or semi-annually in arrears on an actual/360day basis. If the reference entity defaults, there is a final accrual payment, payments then stop and the contract is settled.

³ The total notional amount outstanding is calculated as the sum of contracts bought and sold minus half of the sum of contracts bought and sold between reporting dealers. Source: BIS Quarterly Review of Derivatives Markets, June 2006, Chapter 4.

⁴ As of 31 March 2006. Source: BIS Quarterly Review of Derivatives Markets, June 2006.

⁵ Source: Fitch Ratings Presentation to Professional Risk Managers International Association, February 2006

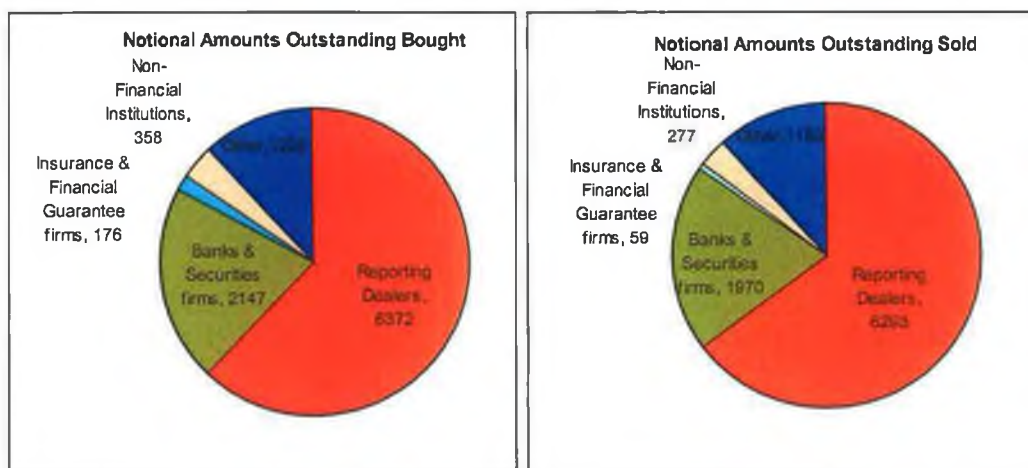


Figure 2: Participants in the CDS Market as of December 2005, in billions of US Dollars.

Source: Bank for International Settlements

Why use a CDS?

There are a variety of reasons why banks, other financial institutions and investors might use CDS. These reasons can be broken down into three main categories:

1. **Risk Management:** CDS can be used as a way of increasing or decreasing credit exposure to the reference entity⁶. For example, take a relationship bank that may have lent money to a corporate client with which it has a long-standing relationship. After lending this money, the bank takes a negative view on the future of that corporate. In this case, a CDS can be used to reduce the bank's exposure to that client by purchasing protection. In doing this, the bank eliminates the risk of losing money through any potential default by the corporate, yet it is able to maintain the long-standing relationship because the client may not be aware of this hedging. This also frees up regulatory capital, which gives the bank the ability to pursue other lines of business that may be more lucrative. The opposite is also true, the same bank can increase its exposure to an existing corporate or take on new exposure to corporate names that fit the banks risk appetite but with who they may not have a relationship.
2. **Trading Credit Risk:** An institution/investor can trade credit risk more efficiently using CDS. Commissions and other trading fees are less in the CDS market because of

⁶ Source: ECB Publishing: Credit Risk Transfer by EU Banks: Activities, Risks and Risk Management (May 2004).

increased liquidity. CDS also allow investors to take either a long or a short view on a credit. This is not possible in traditional debt markets.

3. Arbitrage Opportunities: Institutions/Investors can use CDS in an effort to benefit from arbitrage opportunities in the market. These arbitrage opportunities may occur between differing lengths of CDS contracts or between a CDS contract on a particular reference entity and a bond that has been issued by that entity.

What happens when there is a credit event?

There are two types of settlement when credit default swaps are used: cash and physical.

1. Cash Settlement:

Under a cash settlement, there is no delivery of the reference obligation (the reference obligation is a debt instrument issued by the reference entity). A market auction of the reference obligation takes place after the credit event occurs, the benefits of which go to the protection buyer. The seller of protection then makes a cash payment to the buyer for the difference, if any, between the calculation amount and the recovery value of the reference obligation.

2. Physical Settlement:

Under a physical settlement, the buyer of protection delivers title to its claim against the reference entity (the reference obligation) to the seller of protection. The provider of protection then has a claim on the reference entity. The provider of protection then makes a cash payment to the buyer of protection for the calculation amount (i.e., nominal value of the bonds) less any accrued fee payable.

As a specific example⁷, suppose that on January 23, 2002, a protection buyer wishes to buy five years of protection against the default of the Worldcom 7.75 percent bond maturing April 1, 2007. The buyer owns 10,000 of these bonds, each having a face amount of \$1,000. Thus, the notional value of the buyer's position is \$10,000,000. The buyer contracts to buy full protection for the face amount of the debt via a single-name credit default swap with a 169 basis point premium. Thus, the buyer pays a premium of

⁷ Example taken from Longstaff, Mithal and Neis, 2003.

$A/360 \times 169$, or approximately 42.25 basis points per quarter for protection, where A denotes the actual number of days during a quarter. This translates into a quarterly payment of $A/360 \times \$10,000,000 \times .0169 = A/360 \times \$169,000$. So when Worldcom filed for bankruptcy, under a physical settlement, the buyer delivers the 10,000 Worldcom bonds to the protection seller and receives a payment of \$10,000,000. Credit events that typically trigger a credit-default swap include bankruptcy, failure to pay, default, acceleration, repudiation or moratorium, or a restructuring.

Pricing CDS:

The price of a CDS contract, or the cost to buy protection on a reference entity, is known as the CDS spread. In theory, the N -year CDS spread should be close to the excess of the yield on a N -year bond issued by the reference entity over the risk-free rate (Hull, Predescu & White, 2004). A number of other researchers have independently carried out related research. Longstaff, Mithal and Neis (2003) assume that the risk-free rate is the U.S. Treasury rate and find significant differences between CDS and bond yield spreads. Blanco, Brennan and Marsh (2003) use the swap rate (LIBOR⁸) as the risk-free rate and find credit default swap spreads to be quite close to bond yield spreads. Houweling and Vorst (2002) confirm that the credit default swap market appears to use the swap rate rather than the Treasury rate as the risk-free rate.

In practice, CDS spreads are then added to LIBOR to get the total cost of purchasing protection (or the total income from selling protection) through a CDS contract (i.e. EIRCOM 5yr CDS bid/ask of LIBOR +267/287bps).

⁸ LIBOR: London Interbank Offered Rate is published by the British Bankers Association (BBA) shortly after 11:00 each day, London time, and is a filtered average of inter-bank deposit rates offered by designated contributor banks, for maturities ranging from overnight to one year.

B) EQUITIES

History of Equities:

Unlike the recent developments in CDS, equities or stocks have existed in some form for hundreds of years. The first actively traded U.S. stocks, floated in 1791, were two banks: the Bank of New York and the Bank of the United States. The creation of equities as an investment allowed the public to own easily tradable shares of a company for the first time. Before 1801 there were over 300 corporations chartered in the U.S., yet fewer than 10 had securities that traded on a regular basis and two-thirds of those were connected with transportation. In the early nineteenth century, the most important stocks were financial institutions: banks and later, insurance companies. Throughout the 19th century, stocks were seen to be for speculators and insiders and it wasn't until the 20th century that people came to realise that stocks, as an asset class, might be suitable investments under certain economic conditions. Throughout the 21st century, investing in stocks has become ubiquitous as markets became more heavily regulated and transparent and the public became more familiar with how stocks functioned. As Roger Lowenstein commented about the American public in 1996, *"Investing in stocks has become a national hobby and a national obsession...To update Marx, it is the religion of the masses"*.

Why invest in Equities?

People invest in stocks for one of the following reasons or a combination of the following reasons. Firstly, capital appreciation. People invest in stocks with the belief that the stock price will increase over time as the company delivers profitable performance and reinvests its profits into growing the company. The more an investor expects a company to grow, the more they are willing to pay for the stock. Secondly, dividend yields. Investors are attracted by the income received from amount paid out in dividends each year. Whether a company has a high dividend depends on its industry and its stage in the growth cycle. It is more typical to see mature, non-cyclical companies with high dividends, as they will have more stable cashflows. Investors also look to stocks as being a hedge against inflation. Historical evidence suggests that the returns on stocks over long periods of time have kept pace with inflation. Since stocks are claims on the earnings of real assets (assets whose

value are intrinsically linked to labour and capital), it is reasonable to expect that their long-term returns would not be influenced by inflation. Finally, there are psychological reasons why some investors look to equities. This could be due to popularity of equities at a given time or pure speculation.

B) LEVERAGED BUYOUTS

What is a Leveraged Buyout?

Leveraged Buyouts (LBOs) are one area in the broader industry of Private Equity. Private equity also includes venture capital and can be described as medium to long-term finance provided in return for an equity stake in potentially high growth unquoted companies. A Leveraged Buyout (LBO) is a takeover of a company, using a combination of equity and borrowed funds. Generally, the target company's assets act as the collateral for the loans taken over by the acquiring group. The acquiring group then repays the loan from the cash flow of the acquired company. LBOs can generally be separated into two categories: (i) buying a private company or (ii) buying a public company and taking it private (sometimes known as “take public to private” or “take private” transactions). The latter type of transaction is becoming increasingly popular throughout Europe and the U.S. In most LBOs, public shareholders receive a premium to the market price of the shares. The acquiring groups objective is to exit the investment after three to five years realising, typically, an internal rate of return of greater than 20%⁹. Assumptions regarding business performance, the exit strategy, and the period between acquisition and exit are critical to determining an appropriate capital structure and potential returns to equity investors. The acquirer will generally look to create value through some/all of the following mechanisms:

- An increase in the underlying operating and financial performance of the assets acquired.
- Repayment of debt through cashflow generated while owning the asset.

⁹ Source: JP Morgan European Credit Research, LBO Structuring-Behind the Scenes, Jan 2006.

- Increased multiple on sale of the business (i.e. the acquiring group bought the company for a multiple of 8.0x EBITDA and sell for 10.0x EBITDA).

Many companies that become targets of LBOs have common characteristics. These include¹⁰:

- Steady and predictable cash flows.
- A clean balance sheet with little debt.
- A strong, defensible market position.
- Limited working capital requirements.
- Minimal future capital requirements.
- A heavy asset base for loan collateral.
- Assets that the company can divest of.
- A strong management team.
- A viable exit strategy.
- Synergy opportunities.
- Potential for cost reduction.

History of LBOs:

LBO's first came to prominence in the 1980's when LBO firms and their professionals were the focus of considerable attention, mostly negative. However, the first LBO is believed to have been carried out in the years following World War II. Before the 1980's, LBO's were commonly known as a "bootstrap acquisition" and were little more than obscure financing. After the end of World War II, the Great Depression was still relatively fresh in the minds of America's corporate leaders few companies relied on debt as a significant source of funding. At the same time, American business became caught up in a wave of conglomerate building that began in the early 1960's. Throughout this period, middle management in companies grew, and profitability declined. In the late 70's and early 80's, newly formed companies such as Kohlberg Kravis Roberts and Thomas H. Lee Company saw an opportunity to profit from this inefficiency and the modern LBO was

¹⁰ Source: Centre for Private Equity and Entrepreneurship, Tuck School of Business at Dartmouth College, Note on Leveraged Buyouts" Sept 2003.

born. Many early LBOs were motivated by profits available from buying entire companies, breaking them up and selling them in pieces, however, in recent years this is no longer the primary motivation. Nowadays, in many cases the motive is to buy the company, take it private and in doing so, reduce the amount of scrutiny the company is under from the market. The firm then goes about eliminating inefficiencies within the company with the intention of re-floating the company on the market and exiting with the funds raised from the floatation. The largest LBO in history was carried out in 1989 when Kohlberg Kravis and Roberts purchased RJR Nabisco for €25 billion. The deal was ultimately unsuccessful and in 1999, the tobacco company spun off the food and cracker company.

Main Participants in the Private Equity Market:

There are about 3,000 private equity firms world-wide. In the U.S. alone, there are an estimated 1,607 private equity firms, up from 773 in 1995, according to Thompson Financial. The top 5 market participants are Carlyle Group, Blackstone Group, Kohlberg Kravis Roberts, Texas Pacific Group & Thomas H. Lee which together raised \$123 billion, equivalent to 47% of all funds raised in 2005¹¹.

Recent LBO Activity:

LBO activity has been extremely strong over the past two years and 2006 is expected to be another record year with \$95 billion spent on LBOs up to the end of May (*See figure 3*). There are a number of reasons why this growth has occurred in the LBO market including; (i) historically low interest rates both in the U.S and in Europe, (ii) rising stock markets make it easier to profit from sales and (iii) increased appetite for this type of risk from investors who look for higher returns than those available from the stock market. In research carried out by Lehman Brothers¹², the amount of equity capital raised in the previous year was one of the leading factors in predicting the number of LBOs each year between 1990 and 2005. Using correlation, they found that the amount of equity raised explained 53% of the number of LBOs in the subsequent year. New funds raised by private

¹¹ Source: Wall Street Journal: "Is the Boom in Buyouts Good for Business?" June 2006

¹² Source: Lehman Brothers Quantitative Credit Strategy paper, May 2006.

equity firms (includes venture capital firms and buyout firms) have been growing strongly since 2003 (See figure 4), and that these firms raised a record \$261 billion in 2005. When we take this into account the expectation that 2006 will be a record year is reinforced.

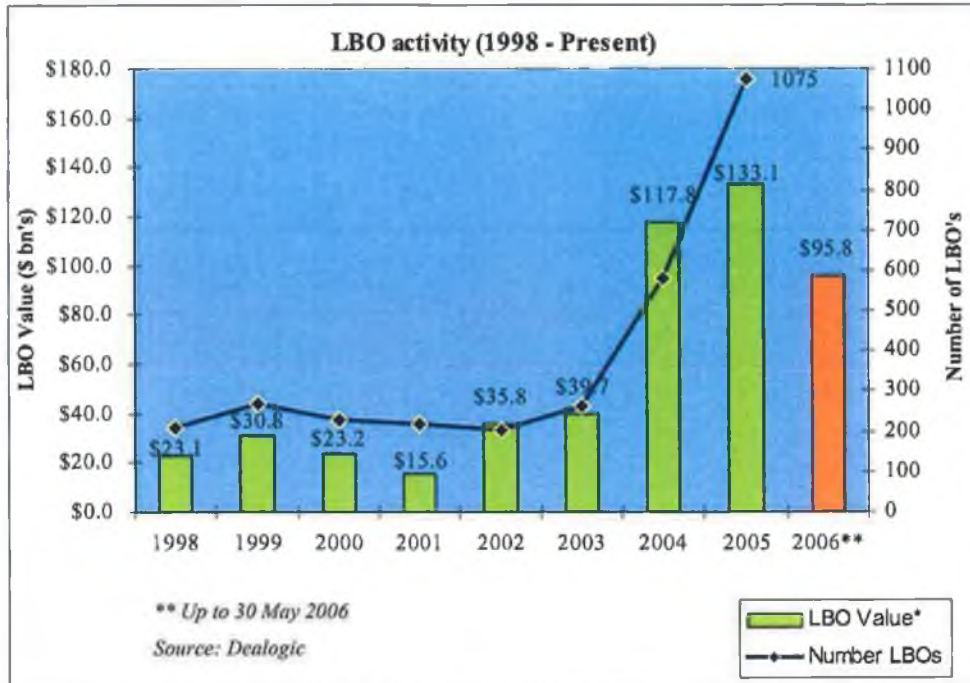


Figure 3: LBO Activity 1998 – Present

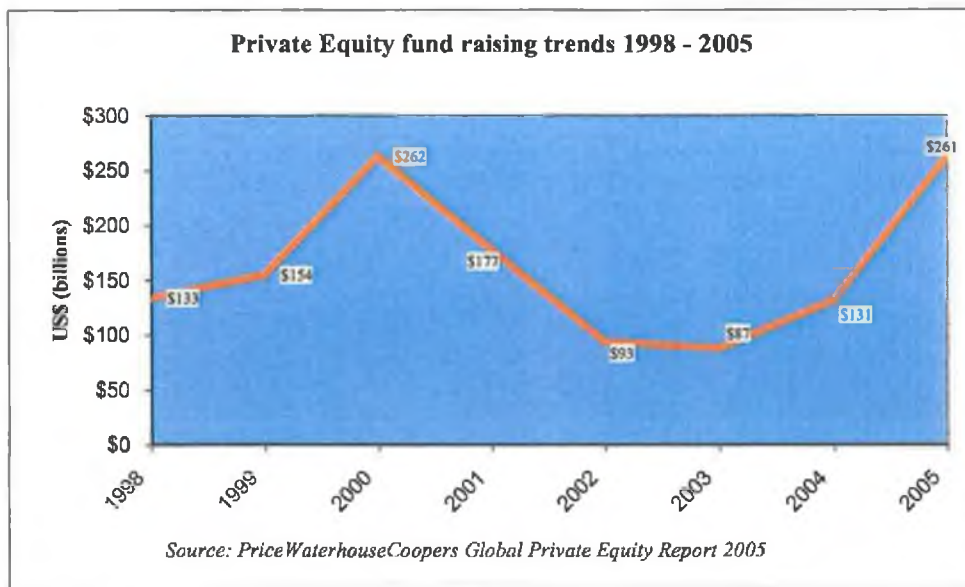


Figure 4: Private Equity – New Funds 1998 -2005

II. HYPOTHESIS:

I propose the following hypothesis:

H1: What is the relationship between equity prices and credit default swap spreads?

As a result of this relationship and as a sub-hypothesis, I also propose to investigate the following hypothesis:

H2: If there is speculation that a company will be acquired through a leveraged buyout (LBO): does this relationship change?

III. LITERATURE REVIEW:

In comparison to other areas in finance and since CDSs are relatively new financial instruments, there is limited research to date covering this specific topic, although research is continuing in this area. When you narrow this research down to the specific area, which I propose to investigate throughout this paper, there is no one paper written to date which specifically addresses all the topics. However, upon researching the broader area of credit derivatives, equities and leveraged buyouts, I found there to be papers that address related topics. Some of these papers examined the relationships between equities and bonds, between bonds and CDS, and equities and CDS (although this research does not address the specific area being examined in this paper). Therefore, I will be reviewing these papers under the headings relating to the areas they cover.

After searching extensively, I can find no research in the area of how LBOs effect the relationship between CDS prices and equity prices. All the papers uncovered have been in relation to the valuation of a leveraged buyout. As this topic is not linked to my research, I have chosen to omit it.

Equities and Bonds:

There have been several studies that link the credit default swap market, the bond market and the equity market. Fama and French (1993) investigate which risk factors are able to explain monthly returns of stock and corporate bond portfolios in the period 1963 – 1991. They identify three stock market factors (overall excess market return, firm size and book-

to-market equity ratio) and two bond-market factors (term structure spread and default risk spread) whereas the two bond-market factors establish the link between both markets.

Alexander, Edwards and Ferri (2000) investigate the relationship between daily stock and high-yield bond returns at the individual firm level during the period 1994-1997. They find positive but economically weak correlation between daily high-yield bond returns and firms' stock excess returns.

Equities and CDS:

In the area of equities and CDS, Zhang, Zhou and Zhu (2005) analysed how a structural model with stochastic volatility and jumps implies particular relationships between observed equity returns and credit spreads. They found that volatility risk alone predicts 50% of CDS spread variation, while jump risk alone forecasts 19%. After controlling credit ratings, macroeconomic conditions, and firms' balance sheet information, they could explain 77% of the total variation. They also found that marginal impacts of volatility and jump measures increase dramatically from investment grade to high-yield entities.

Longstaff, Mithal, and Neis (2003) examine weekly lead-lag relationships between CDS spread changes, corporate bond spreads and stock returns of US firms. They fit a reduced-form model to corporate bond yields and solved for the credit default swap premiums they imply. They then compared the implied market premiums to actual market premiums. They find that both Stock and CDS markets lead the corporate bond market. However, they found no clear lead of the stock market with respect to the CDS market or vice versa.

Abid and Naifar (2005) studied the impact of stock returns volatility of reference entities on credit default swap rates using a data set from the Japanese market. Using a copula approach¹³, they model the different relationships that can exist in different ranges of behaviour. They found that the dependence structure between credit default swap rates and stock return volatility is asymmetric and positive and display right tail dependence. They also found that companies with higher credit ratings present a weaker dependence

¹³ A copula is a statistical measure that represents a multivariate uniform distribution, which examines the association or dependence between many variables. Source: www.investopedia.com

coefficient and the impact of stock return volatility on credit default swap rates is higher for the lowest credit rating class.

Bystrom (2005) provides evidence of a link between the Dow Jones ITraxx CDS index¹⁴ market and the stock market. This study took a market level perspective (vis-à-vis a individual firm level) and found that a correlation study reveals a tendency for ITraxx CDS spreads to narrow when stock prices rise and vice versa. Furthermore Bystrom found evidence that firm-specific information was embedded in stock prices before it was embedded into CDS prices. Stock price volatility is also found to be significantly correlated with CDS spreads. Bystrom found that as stock price volatility increases, credit spreads increase and vice versa.

Zhang (2004) documented the existence and heterogeneity of within-industry credit contagion for major credit events, including Chapter 11 bankruptcies, Chapter 7 bankruptcies and other significant jump events using a comprehensive data set of credit default swap spreads. Furthermore, Zhang uncovered evidence that the co-movement of credit risk within the same industry is attributable to both common industry risk and contagious spillovers. He also reported evidence that credit contagion is captured in the CDS market in an earlier, cleaner and stronger was than in the stock market.

Bonds and CDS:

Blanco, Brennan, and Marsh (2004) followed Collin-Dufresne, Goldstein, and Martin (2001) in analysing determinants of CDS spread changes and corporate bond spread changes. They found that the impact of firm-specific stock returns is stronger on CDS spread changes than on corporate bond spread changes.

Longstaff, Mithal, and Neis (2003) examined whether credit protection was priced consistently in the corporate bond and credit derivatives market. They found clear evidence that the implied cost of credit protection is significantly higher in the corporate bond market than in the credit derivatives market. They concluded that the potential explanation for the higher cost of credit protection implied by corporate bonds may be due

¹⁴ Dow Jones ITraxx is a CDS index comprised of the top 125 most liquid CDS names in Europe across six sectors. Please refer to Appendix VII for more information on its construction.

to significant tax-related and liquidity components built into the spreads of these corporate bonds.

Hull, Predescu, and White (2004) examined the relationship between CDS spreads, bond yields, and credit rating announcements.

The study by Bystrom (2005) is the most closely related paper to my proposed research where he assesses the relationship between the ITraxx CDS market. However, there are distinct differences between Bystrom's research and my proposed research. To start, I propose to examine the relationship at an individual firm level before further this research and assessing the relationship in an environment where there is LBO speculation surrounding a firm.

IV. RESEARCH METHODOLOGY:

Collecting the Data:

In order to carry out my research it was necessary to collect both historical CDS price data and historical equity price data for a pool of companies. In order to get reliable data it was necessary to choose companies that were publicly quoted and liquid in the CDS market. Consequently, the best course of action was to use the companies who make up the Dow Jones CDX Investment Grade Index (North America) and the Dow Jones ITraxx Investment Grade Index (Europe). In doing so, this ensures the liquidity and validity of the data. Each index comprises of the top 125 liquid names in the CDS market throughout North America and Europe (giving a total sample of 250 companies) and is re-balanced every six months. The companies that make up the index are from a variety of different business areas but they are placed into six broad sectors. These sectors are; (i) Auto; (ii) Consumer; (iii) Energy; (iv) Financial; (v) Industrial; (vi) Telecommunication, Media and Technology (TMT). (Please refer to Appendix G for more information on the construction of these indices). A breakdown of the companies by sector can be seen in table 1, note there are no auto companies in the American Index. This is because there are currently no American auto manufacturers with investment-grade credit ratings since both General Motors and Ford Motor Company were both downgraded to junk status in 2005. To compensate for this, the number of companies operating in the other sectors has increased, thus bringing the index back to equilibrium.

Table 1: Breakdown of Companies in CDS Indices:

	Auto	Consumer	Energy	Financial	Industrial	TMT	Total
European	10	30	20	20	20	25	125
North American	0	36	14	29	22	24	125
Total	10	66	34	49	42	49	250
<i>% of Total</i>	<i>4.0%</i>	<i>26.4%</i>	<i>13.6%</i>	<i>19.6%</i>	<i>16.8%</i>	<i>19.6%</i>	<i>100.0%</i>

Having selected the companies that would form the pool, it was necessary to determine the time frame for the analysis. For this, I have selected the starting point 1 January 2000. There are two reasons why this point was chosen. Firstly and most importantly, the CDS market was only developed in the late nineties and initially there was a lack of liquidity in

the market. Consequently, single name CDS pricing experienced large degrees of volatility, which may not have truly reflected the volatility in the credit risk of the underlying corporate. Secondly, what is now 5½ years worth of data (284 observations) will make my findings statistically significant.

The next step was to gather the raw data. To do this I used Bloomberg Professional Service (“Bloomberg”). This software allowed me to collect weekly equity price data and CDS price data for the pool of companies. When doing this, I chose to use the CDS mid-price for each company vis-à-vis the bid or offer, as this was the most conservative option. In choosing the mid-price, this eliminated any degree of illiquidity that existed for each company, as there is usually large differences between the bid and the offer price for illiquid names, thus increasing the validity of my findings. (For a full list of the companies that compose both indices, please refer to Appendix A).

After collecting this data, I was forced to eliminate 17 companies through lack of reliable data (e.g. unreliable CDS Price or the company was no longer a public quoted company but still had a CDS price because of debt outstanding). This left me with 233 companies from which to take samples and test.

Selecting Sample Companies:

Utilising prudence and efficiency, it was necessary to take a fair and representative sample of the different types of companies. To do this I broke the companies down by geography and by sector and used the process of random stratified sampling to select sample companies to test. A breakdown of the samples used by geography and by sector can be seen in table 2. The list of companies selected for testing can also be seen in table 3.

Table 2: Breakdown of Companies selected for testing:

	Auto	Consumer	Energy	Financial	Industrial	TMT	Total
European	2	1	1	1	1	1	7
North American	0	2	2	1	1	2	8
Total	2	3	3	2	2	3	15
<i>% of Total</i>	<i>13.3%</i>	<i>20.0%</i>	<i>20.0%</i>	<i>13.3%</i>	<i>13.3%</i>	<i>20.0%</i>	<i>100.0%</i>

Table 3: Companies selected as samples for testing.

	European	North American
Auto	Volvo AB Volkswagen AG	
Consumer	PPR	The Boeing Company The Kroger Company
Energy	National Grid Plc.	Transocean Inc. Valero Corp.
Financial	Unicredito Italiano SpA	American Express Company
Industrial	Seimens AG	Alcoa Inc.
TMT	Vivendi SA	Hewlett-Packard Co. The Walt Disney Company

The companies selected in table 3 were used to test the relationship between the equity price and the CDS price of the respective companies. However, as I mentioned before my sub-hypothesis was examine if and how this relationship changed as a result of LBO speculation surrounding the company and furthermore what happens if this speculation is eliminated. To assess this I searched through the list of companies in both CDS indices where there was speculation that a LBO would occur but where this speculation has since ceased. I found this particularly difficult, as there were many companies who are currently surrounded by LBO speculation, but where the outcome is unclear. As it is not possible to prolong the research in order to see whether each company will be (a) bought-out and taken private or (b) the LBO speculation receded it was necessary to choose a specific historic example. One company fitted this profile: Marks and Spencer Group Plc (M&S).

Testing the Data:

To test the relationship between the variables I used SPSS. By inputting the equity price data and the CDS price data from each of the selected companies in table 3, SPSS was able to run regression analysis on the information. In doing this, I assumed the independent variable to be the company's equity price and the dependent variable to be the company's CDS price. This program analysed the data on this basis and returned statistics values such as the R², the F-Test, the dependent variables coefficient and the t-statistic. Using this information, I was able to interpret my findings.

V. FINDINGS:

What is relationship between equity prices and CDS spreads?

Based on statistical analysis, upon examining the relationship between equity prices and CDS prices, I found there to be an inverse relationship. This means that for an increase in a company's equity price we can expect to see a decrease in that company's CDS price. A summary of the regression analysis results can be seen in table 4.

Table 4: Regression Analysis Outputs:

Geography	Sector	Company	R²	F - Statistic	Coefficient	t-statistic	Covariance	Correlation
North American	Industrial	Alcoa Inc.	0.542	246.900	-1.982	-15.713	-31.061	-0.676
North American	Financial	American Express	0.686	454.508	-2.137	-21.319	-51.006	-0.807
North American	TMT	Disney	0.747	730.810	-7.677	-27.033	-320.238	-0.803
North American	TMT	Hewlett Packard Inc.	0.440	164.422	-4.509	-12.823	-35.651	-0.567
North American	Consumer	Kroger	0.097	23.860	-3.897	-4.885	-17.164	-0.426
European	Energy	National Grid Plc.	0.491	196.724	-11.748	-14.026	-12.094	-0.753
European	Consumer	PPR	0.653	337.232	-5.492	-18.364	-666.135	-0.807
European	Industrial	Siemens AG	0.370	148.212	-1.016	-12.174	-103.463	-0.841
North American	Consumer	The Boeing Company	0.572	278.356	-1.561	-16.684	-220.352	-0.732
North American	Energy	Transocean	0.536	202.430	-0.526	-14.228	-2.260	-0.528
European	Financial	Unicredito Italiano SpA	0.233	67.582	-7.447	-8.221	-408.923	-0.579
North American	Energy	Valero	0.296	87.735	-1.976	-9.367	-465.452	-0.849
European	TMT	Vivendi SA	0.369	126.812	-30.446	-11.261	-82.323	-0.738
European	Auto	Volkswagen AG	0.698	572.687	-1.421	-23.931	-92.769	-0.883
European	Auto	Volvo AB	0.595	364.017	-2.350	-19.079	-68.742	-0.877

When we break this results down and examine them in more detail, we can see that all of the independent variable (equity price in this case) coefficients are both negative and are statistically significant. These two results are key in proving that both a negative relationship exists and that this relationship is statistically significant. In examining the R² output for each of the companies, we can see that in 14 out of the 15 samples taken the movement in equity price displays strong explanatory power in the movement in CDS

price. It is also important to note that these results were consistent throughout all the sectors.

Upon reflection, this outcome makes sense. If we think of circumstances, where a company's equity price increases there is usually positive news behind the movement. This movement could be explained by an event in the company's microenvironment such as improved sales in the previous quarter or an approved patent for a new product which investors believe will lead to increased returns in future. The increase could also be caused by an event in the company's macro-environment such as a favourable ruling in the company's regulatory environment. In any event, if we think of how any such news would affect the company's credit standing, any improvement in the company's financial metrics will reduce the risk of the company defaulting on its debt obligations. Logically, if there were a reduced risk of the company defaulting, this would be reflected in the price for a purchaser of CDS protection.

What happens the relationship in a LBO situation?

As I described in my research methodology there was one company in my pool of data which fitted this specific profile. This company was Marks and Spencer Group Plc. (M&S). In May 2004, speculation mounted that billionaire Philip Green, owner of other UK retail stores, would purchase M&S via a leveraged buyout. This speculation receded in July 2004 when Green could not get co-operation from the company board. (For more information in relation to the specific details of this LBO bid, please refer to Appendix E). During the analysis of M&S's data, it was prudent to analyse the data before any approach from Green and after the approach became public knowledge. Therefore, the period from 01-Jan-2000 to 27-May-2004 became my first period to analyse. In examining this first period, I found that the equity price coefficient to be negative (consistent with broader analysis), although the t-statistic cannot be deemed statistically significant. Furthermore, the R^2 in that period is only 0.003, meaning that the movement in share price does not display good explanatory power in the movement in CDS price. Although this result does not show the same significance as the broader analysis my main research, I feel that the

breadth of that analysis proves that the inverse relationship exists. In this case M&S (in the period before any LBO speculation) is an outlier.

I proceeded to examine the relationship after the news of the Green approach became public and decided to break this period into two sub-periods also. I decided to test the data from 27-May-2004 (date of news breaking) + 1 month and found that the relationship had turned positive. I then tested the data from 27-May-2004 + 2 months and the relationship remained positive. I continued to test in this manner and found that after 3 months the relationship returned to being negative. This negative relationship is consistent with my findings in my main research

Therefore, for the period from Jan-2000 to 27-May-2004, I found that while the data returned a negative relationship the results are not statistically significant. For the period from 28-Aug-2004 to present, I found that the relationship is consistent with my main research. In this case, the coefficient of the independent variable (equity price) was – 24.391 and with a t-statistic of –41.103, this can be deemed statistically significant. The R^2 in this case was 0.866 demonstrating that the movement in equity price is a good predictor for the movement in CDS price.

For the period between 27th May 2004 and 27th August 2004 the analysis displayed a positive relationship, with a coefficient of 494.167 and a t-statistic of 6.152 making it statistically significant. With an R^2 value of 0.759, it showed that a movement in equity price during this period could predict the movement in CDS price also. A summary of the analysis can be seen in table 5.

Table 5: Regression Analysis Results for LBO Company (M&S)

	R²	F - Statistic	Coefficient	t-statistic	Covariance	Correlation
<i>Prior to any LBO speculation</i>	0.003	0.139	-3.454	-0.373	0.225	0.087
<i>During period of LBO speculation</i>	0.759	37.846	494.167	6.152	7.491	0.871
<i>Period after LBO speculation receded</i>	0.866	594.927	-24.601	-24.391	-41.103	-0.931

Having analysed this output, I began to investigate further why this may be the case. Why, if there is speculation of a company being purchased via a LBO, would the relationship

between the equity price turn from negative to positive? I found there to be a number of reasons why this would happen:

1. From a equity holders standpoint:

When a private-equity firm approaches a company, the firm will be forced to pay a premium over the current share price in order to gain the approval of the shareholders. Studies of Mergers & Acquisitions (M&A) which includes private equity acquisitions, have shown that the premiums¹⁵ paid for targets stood at c.25% in 2005. This figure is down from c.50% in 2000¹⁶. When we take this into account we can see why the share price would increase post-announcement of any buyout. Based on empirical research, investors buy the equity in the hope that they will make significant returns between the period of the transaction announcement and when the buyout transaction is completed.

2. From a CDS holders standpoint:

The prospect of a LBO from a CDS holder's standpoint is unfavourable. By its nature, a LBO will increase the amount of debt in the company; this will reduce the company's financial flexibility through increases in repayments. Above all, increased debt will increase the likelihood of a credit event occurring. However, after further examination, this is not the only reason that we could expect the CDS price to increase. The CDS price can increase due to technical reasons. The problem surrounds the reference obligation. The reference obligation determines the type and seniority of debt obligation issued by the reference entity that can be delivered to the seller of protection under a credit event. In a LBO situation, the debt that the private-equity firm raises may rank more senior than that of the reference obligation. This is often the case in an LBO situation because the debt raised to fund the buyout is secured on the assets of the company, whereas the reference obligation in a CDS contract ranks as senior unsecured debt in the majority of cases. Therefore, if a credit event occurs and the LBO debt ranks more senior than the reference obligation. This increases the risk that the

¹⁵ Premium is relative to the targets share price four weeks prior to announcement for deals over US\$250 million. Source: Goldman Sachs Global Strategy Research, April 2005.

¹⁶ Source: Goldman Sachs Global Strategy Research April 2005.

recovery value of the reference obligation is diminished as a result of the secured debt being repaid first.

While the findings from an equity standpoint are not surprising, the CDS-holder findings were unexpected at the outset of this research.

VI. CONCLUSION:

In this paper, I primarily investigated the empirical relationship between credit default swap prices and equity prices at an individual firm level for an international sample over the period 1 Jan 2000 to 16 June 2006. Secondary to this research, and because of the aforementioned relationship, I investigated if and how the relationship changes where there is speculation that an individual firm may be purchased through a leveraged buyout.

Throughout the course of my research, I found that over the period, in all samples across all industry sectors, there was a negative relationship between the company's equity price and CDS price. This means that if the company's equity price increases we can expect to see the company's CDS price declining. Averaging all the R^2 values from the data selected, I found that the movement in equities could explain 49% of the movement in CDS prices. Furthermore, it was found that should the market believe that an individual firm would be purchased via a LBO, this specific negative relationship, i.e. between CDS and Equity prices, behaves uncharacteristically. I found that, during the period of this speculation, the relationship is positive and both prices move in the same direction. However, when this speculation recedes, the relationship reverts to its original form: a negative relationship. In investigating this area, one unexpected outcome was uncovered. This is the impact of the reference obligation from the CDS-holders perspective in a LBO situation. There is a possibility that the reference obligation in the terms of the CDS contract could become subordinated to the debt used to finance the LBO. Because of increased debt a LBO would place on the target company's balance sheet, its financial flexibility is reduced and therefore increasing the possibility of a credit event. This technical situation is shown to have a major effect on the price of the CDS contract in a LBO environment.

This relationship between CDS prices and equity prices can be deemed conclusive. However, due to the lack of companies that currently fit the profile of my LBO situation, I feel that this area of my research could be examined in more detail in future. Activity in the LBO market is currently at historically high levels and with the certainty that not all of these LBO attempts will be successful, we are sure to see more companies that fit this profile in the future. Therefore, I firmly believe this paper provides a good foundation for more investigation in this area in the future.

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APPENDIX A: COMPANIES FOR WHOM DATA WAS COLLECTED:

EUROPEAN CDS INDEX - DOW JONES 5-YEAR ITRAXX INDEX (16-JUNE-2006)			
Sector	Company	Equity Ticker	5YR CDS Ticker
1	Auto	BAYERISCHE MOTOREN WERKE AG	BMW GR EQUITY
2	Auto	CIE FINANCIERE MICHELIN	MIC SW EQUITY
3	Auto	CONTINENTAL AG	CON GR EQUITY
4	Auto	DAIMLERCHRYSLER AG-REG	DCX GR EQUITY
5	Auto	GKN PLC	GKN LN EQUITY
6	Auto	PEUGEOT SA	UG FP EQUITY
7	Auto	RENAULT SA	RNO FP EQUITY
8	Auto	VALEO SA	FR FP EQUITY
9	Auto	VOLKSWAGEN AG	VOW GR EQUITY
10	Auto	VOLVO AB-B SHS	VOLVB SS EQUITY
11	Consumer	ACCOR SA	AC FP EQUITY
12	Consumer	ALTADIS SA	ALT SM EQUITY
13	Consumer	BOOTS GROUP PLC	BOOT LN EQUITY
14	Consumer	BRITISH AMERICAN TOBACCO PLC	BATS LN EQUITY
15	Consumer	CADBURY SCHWEPPEES PLC	CBRY LN EQUITY
16	Consumer	CARREFOUR SA	CA FP EQUITY
17	Consumer	COMPASS GROUP PLC	CPG LN EQUITY
18	Consumer	DEUTSCHE LUFTHANSA-REG	LHA GR EQUITY
19	Consumer	DIAGEO PLC	DGE LN EQUITY
20	Consumer	DSG INTERNATIONAL PLC	DSGI LN EQUITY
21	Consumer	ELECTROLUX AB-SER B	ELUXB SS EQUITY
22	Consumer	GALLAHER GROUP PLC	GLH LN EQUITY
23	Consumer	GROUPE AUCHAN	211642Z FP EQUITY
24	Consumer	GUS PLC	GUS LN EQUITY
25	Consumer	HENKEL KGAA-VORZUG	HEN3 GR EQUITY
26	Consumer	IMPERIAL TOBACCO GROUP PLC	IMT LN EQUITY
27	Consumer	KINGFISHER PLC	KGF LN EQUITY
28	Consumer	LVMH MOET HENNESSY LOUIS VUI	MC FP EQUITY
29	Consumer	MARKS & SPENCER GROUP PLC	MKS LN EQUITY
30	Consumer	METRO AG	MEO GR EQUITY
31	Consumer	NESTLE SA-REG	NESN VX EQUITY
32	Consumer	PHILIPS ELECTRONICS NV	PHIA NA EQUITY
33	Consumer	PPR	PP FP EQUITY
34	Consumer	SAFEWAY LTD	SFW LN EQUITY
35	Consumer	SODEXHO ALLIANCE SA	SW FP EQUITY
36	Consumer	SVENSKA CELLULOSA AB-B SHS	SCAB SS EQUITY
37	Consumer	TATE & LYLE PLC	TATE LN EQUITY
38	Consumer	TESCO PLC	TSCO LN EQUITY
39	Consumer	THOMSON (EX-TMM)	TMS FP EQUITY
40	Consumer	UNILEVER NV-CVA	UNA NA EQUITY
41	Energy	CENTRAL AFRICAN GOLD PLC	CAN LN EQUITY
42	Energy	E ON AG	EOA GR EQUITY
43	Energy	EDISON SPA	EDN IM EQUITY
44	Energy	ELECTRICITE DE FRANCE SA	EDF FP EQUITY
45	Energy	ENBW ENERGIE BADEN-WUERTTEMBERG	EBK GR EQUITY
46	Energy	ENDESA SA	ELE SM EQUITY
47	Energy	ENEL SPA	ENEL IM EQUITY
48	Energy	ENERGIAS DE PORTUGAL SA	EDP PL EQUITY
49	Energy	PORTUM OYJ	FUM1V FH EQUITY
50	Energy	GAS NATURAL SDG SA	GAS SM EQUITY
51	Energy	IBERDROLA SA	IBE SM EQUITY
52	Energy	NATIONAL GRID PLC	NG/ LN EQUITY
53	Energy	REPSOL YPF SA	REP SM EQUITY
54	Energy	RWE AG	RWE GR EQUITY
55	Energy	SUEZ SA	SZE FP EQUITY
56	Energy	TECHNIP SA	TEC FP EQUITY
57	Energy	UNION FENOSA SA	UNF SM EQUITY
58	Energy	UNITED UTILITIES PLC	UU/ LN EQUITY
59	Energy	VATTENFALL AB	VATT SS EQUITY
60	Energy	VEOLIA ENVIRONNEMENT	VIE FP EQUITY
61	Financial	AEN AMRO HOLDING NV	AABA NA EQUITY
62	Financial	AEGON NV	AGN NA EQUITY
63	Financial	ALLIANZ AG-REG	ALV GR EQUITY
			CBMW1ES CURNCY
			CCMICH1ES CURNCY
			CCONT1ES CURNCY
			CDCX1ES CURNCY
			CGKN1ES CURNCY
			CPEUG1ES CURNCY
			CREN1ES CURNCY
			CVLQF1ES CURNCY
			CVW1ES CURNCY
			CVLVY1ES CURNCY
			CACC1ES CURNCY
			CALT1ES CURNCY
			CBOTP1ES CURNCY
			CBAT1ES CURNCY
			CCBRY1ES CURNCY
			CCARR1ES CURNCY
			CCPG1ES CURNCY
			CLUFT1ES CURNCY
			CDIAG1ES CURNCY
			CDIX1ES CURNCY
			CELT1ES CURNCY
			CGG1ES CURNCY
			CAUCH1ES CURNCY
			CGUS1ES CURNCY
			CHENK1ES CURNCY
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			CNESN1ES CURNCY
			CPHG1ES CURNCY
			CPRTP1ES CURNCY
			CAYL1ES CURNCY
			CEXH1ES CURNCY
			CSCA1ES CURNCY
			CTATE1ES CURNCY
			CTSCO1ES CURNCY
			CTMMF1ES CURNCY
			CULVR1ES CURNCY
			CCAN1ES CURNCY
			CEON1ES CURNCY
			CEDN1ES CURNCY
			CEDF1ES CURNCY
			CENB1ES CURNCY
			CEND1ES CURNCY
			CENEL1ES CURNCY
			CEPOR1ES CURNCY
			CBIRK1ES CURNCY
			CGAS1ES CURNCY
			CIBER1ES CURNCY
			CNGG1ES CURNCY
			CREP1ES CURNCY
			CRWE1ES CURNCY
			CLYOE1ES CURNCY
			CTEC1ES CURNCY
			CUNFS1ES CURNCY
			CUU1ES CURNCY
			CVATT1ES CURNCY
			CVIVE1ES CURNCY
			CAAB1ES CURNCY
			CAEGO1ES CURNCY
			CALZ1ES CURNCY

APPENDIX A (cont'd): COMPANIES FOR WHOM DATA WAS COLLECTED:

EUROPEAN CDS INDEX - DOW JONES 5-YEAR ITRAXX INDEX (16-JUNE-2006)				
	Sector	Company	Equity Ticker	5YR CDS Ticker
64	Financial	ASSICURAZIONI GENERALI	G IM EQUITY	CASS1ES CURNCY
65	Financial	AVIVA PLC	AV LN EQUITY	CAVL1ES CURNCY
66	Financial	AXA	AXA LN EQUITY	CAXA1ES CURNCY
67	Financial	BANCA INTESA SPA	BIN IM EQUITY	CBCL1ES CURNCY
68	Financial	BANCA MONTE DEI PASCHI SIENA	BMPS IM EQUITY	CBMP1ES CURNCY
69	Financial	BANCA POPOLARE ITALIANA	BPI IM EQUITY	CBPL1ES CURNCY
70	Financial	BANCO BILBAO VIZCAYA ARGENTA	BBVA SM EQUITY	CBBVA1ESCURNCY
71	Financial	BANCO COMERCIAL PORTUGUES-R	BCP PL EQUITY	CBCP1ES CURNCY
72	Financial	BANCO ESPIRITO SANTO-REG	BESNN PL EQUITY	CESP1ES CURNCY
73	Financial	BANCO SANTANDER CENTRAL HISP	SAN SM EQUITY	CBSH1ES CURNCY
74	Financial	BARCLAYS PLC	BARC LN EQUITY	CBAR1ES CURNCY
75	Financial	BAYERISCHE HYPO- UND VEREINS	VHB GR EQUITY	CHVB1ES CURNCY
76	Financial	CAPITALIA SPA	CAP IM EQUITY	CROM1ES CURNCY
77	Financial	COMMERZBANK AG	CBK GR EQUITY	CCMZ1ES CURNCY
78	Financial	DEUTSCHE BANK AG-REGISTERED	DBK GR EQUITY	CDM1ES CURNCY
79	Financial	HANNOVER RUECKVERSICHERU-REG	HNRI GR EQUITY	CHAN1ES CURNCY
80	Financial	MUENCHENER RUECKVER AG-REG	MUV2 GR EQUITY	CMURE1ES CURNCY
81	Financial	ROYAL BANK OF SCOTLAND GROUP	RBS LN EQUITY	CRBS1ES CURNCY
82	Financial	SANPAOLO IMI SPA	SPI IM EQUITY	CSAN1ES CURNCY
83	Financial	SWISS RE-REG	RUKN VX EQUITY	CRUK1ES CURNCY
84	Financial	UNICREDITO ITALIANO SPA	UC IM EQUITY	CUNI1ES CURNCY
85	Financial	ZURICH VERSICHERUNGS-GESELLS	1010Q SW EQUITY	CZUR1ES CURNCY
86	Industrial	ADECCO SA-REG	ADEN VX EQUITY	CADO1ES CURNCY
87	Industrial	AKZO NOBEL	AKZA NA EQUITY	CAKZO1ES CURNCY
88	Industrial	ARCELOR	LOR FP EQUITY	CLOR1ES CURNCY
89	Industrial	BAA PLC	BAA LN EQUITY	CBAA1ES CURNCY
90	Industrial	BAE SYSTEMS PLC	BA/ LN EQUITY	CBAE1ES CURNCY
91	Industrial	BAYER AG	BAY GR EQUITY	CBAY1ES CURNCY
92	Industrial	CIBA SPECIALTY CHEMICALS-REG	CIBN VX EQUITY	CCIBA1ES CURNCY
93	Industrial	COMPAGNIE DE SAINT-GOBAIN	SGO FP EQUITY	CGOB1ES CURNCY
94	Industrial	DEGUSSA AG	DGX GR EQUITY	CDEG1ES CURNCY
95	Industrial	EUROPEAN AERONAUTIC DEFENCE	EAD FP EQUITY	CAER1ES CURNCY
96	Industrial	FINMECCANICA SPA	FNC IM EQUITY	CFMEC1ES CURNCY
97	Industrial	GLENORE INTERNATIONAL AG	1696Z SW EQUITY	CTE35596 CURNCY
98	Industrial	IMPERIAL CHEMICAL INDS PLC	ICI LN EQUITY	CICH1ES CURNCY
99	Industrial	LAFARGE SA	LG FP EQUITY	CLAF1ES CURNCY
100	Industrial	LINDE AG	LIN GR EQUITY	CLIND1ES CURNCY
101	Industrial	RENTOKIL INITIAL PLC	RTO LN EQUITY	CRENT1ES CURNCY
102	Industrial	SANOFI-AVENTIS	SAN FP EQUITY	CAVEN1ES CURNCY
103	Industrial	SIEMENS AG-REG	SIE GR EQUITY	CSIEM1ES CURNCY
104	Industrial	STORA ENSO OYJ-R SHS	STERV FH EQUITY	CSTOR1ES CURNCY
105	Industrial	UPM-KYMMENE OYJ	UPM1V FH EQUITY	CUPMK1ES CURNCY
106	TMT	BERTELSMANN AG	BTG GR EQUITY	CBTG1ES CURNCY
107	TMT	BT GROUP PLC	BT/A LN EQUITY	CBT1ES CURNCY
108	TMT	DEUTSCHE TELEKOM AG-REG	DTE GR EQUITY	CDT1ES CURNCY
109	TMT	FRANCE TELECOM SA	FTE FP EQUITY	CFTEL1ES CURNCY
110	TMT	HELLENIC TELECOMMUN ORGANIZA	HTO GA EQUITY	COTE1ES CURNCY
111	TMT	ITV PLC	ITV LN EQUITY	CCCM1ES CURNCY
112	TMT	KONINKLIJKE KPN NV	KPN NA EQUITY	CKPN1ES CURNCY
113	TMT	NOKIA OYJ	NOK1V FH EQUITY	CNOK1ES CURNCY
114	TMT	O2 PLC	OOM LN EQUITY	CMMO1ES CURNCY
115	TMT	PEARSON PLC	PSON LN EQUITY	CPSON1ES CURNCY
116	TMT	PORTUGAL TELECOM SGPS SA-REG	PTC PL EQUITY	CPORT1ES CURNCY
117	TMT	REED ELSEVIER PLC	REL LN EQUITY	CREED1ES CURNCY
118	TMT	REUTERS GROUP PLC	RTR LN EQUITY	CRTR1ES CURNCY
119	TMT	TELECOM ITALIA SPA	TIT IM EQUITY	CTIIM1ES CURNCY
120	TMT	TELEFONICA SA	TEF SM EQUITY	CTLFO1ES CURNCY
121	TMT	TELIASONERA AB	TLSN SS EQUITY	CTLIA1ES CURNCY
122	TMT	VIVENDI SA	VIV FP EQUITY	CVIVU1ES CURNCY
123	TMT	VODAFONE GROUP PLC	VOD LN EQUITY	CVOD1ES CURNCY
124	TMT	WOLTERS KLUWER	WLSNC NA EQUITY	CWOLK1ES CURNCY
125	TMT	WPP GROUP PLC	WPP LN EQUITY	CWPP1ES CURNCY

APPENDIX A (cont'd): COMPANIES FOR WHOM DATA WAS COLLECTED:

AMERICAN CDS INDEX - DOW JONES 5-YEAR CDX INDEX (16-JUNE-2006)				
	Sector	Company	Equity Ticker	5YR CDS Ticker
1	Financials	ACE LTD	ACE US EQUITY	CACE1US CURNCY
2	Financials	AETNA INC	AET US EQUITY	CAET1US CURNCY
3	Industrial	ALCAN INC	AL US EQUITY	CAL1US CURNCY
4	Industrial	ALCOA INC	AA US EQUITY	CAA1US CURNCY
5	Financial	ALLSTATE CORP	ALL US EQUITY	CALL1US CURNCY
6	TMT	ALLTEL CORP	AT US EQUITY	CAT1US CURNCY
7	Consumer	ALTRIA GROUP INC	MO US EQUITY	CMO1US CURNCY
8	Energy	AMERICAN ELECTRIC POWER	AEP US EQUITY	CAEP1US CURNCY
9	Financial	AMERICAN EXPRESS CO	AXP US EQUITY	CAXP1US CURNCY
10	Financial	AMERICAN INTERNATIONAL GROUP	AIG US EQUITY	CAIG1US CURNCY
11	Consumer	AMGEN INC	AMGN US EQUITY	CAMG1US CURNCY
12	Energy	ANADARKO PETROLEUM CORP	APC US EQUITY	CAPC1US CURNCY
13	TMT	ARROW ELECTRONICS INC	ARW US EQUITY	CARW1US CURNCY
14	TMT	AT&T INC	T US EQUITY	CATT1US CURNCY
15	Consumer	AUTOZONE INC	AZO US EQUITY	CAZO1US CURNCY
16	Consumer	BAXTER INTERNATIONAL INC	BAX US EQUITY	CBAX1US CURNCY
17	Industrial	BOEING CO	BA US EQUITY	CBAX1US CURNCY
18	Consumer	BRISTOL-MYERS SQUIBB CO	BMY US EQUITY	CBMY1US CURNCY
19	Industrial	BURLINGTON NORTHERN SANTA FE	BNI US EQUITY	CBNI1US CURNCY
20	Consumer	CAMPBELL SOUP CO	CPB US EQUITY	CCPB1US CURNCY
21	Financial	CAPITAL ONE FINANCIAL CORP	COF US EQUITY	CCOF1US CURNCY
22	Consumer	CARDINAL HEALTH INC	CAH US EQUITY	CCAH1US CURNCY
23	Consumer	CARNIVAL CORP.	CCL US EQUITY	CCCL1US CURNCY
24	Industrial	CATERPILLAR INC	CAT US EQUITY	CCAT1US CURNCY
25	TMT	CBS CORP-CLASS B	CBS US EQUITY	CVIA1US CURNCY
26	Consumer	CENDANT' CORP	CD US EQUITY	CCD1US CURNCY
27	Industrial	CENTEX CORP	CTX US EQUITY	CCTX1US CURNCY
28	TMT	CENTURYTEL INC	CTL US EQUITY	CCTL1US CURNCY
29	Financial	CHUBB CORP	CB US EQUITY	CCB1US CURNCY
30	Financial	CIGNA CORP	CI US EQUITY	CCII1US CURNCY
31	TMT	CINGULAR WIRELESS	CNG US EQUITY	CCNG1US CURNCY
32	Financial	CIT GROUP INC	CIT US EQUITY	CCIT1US CURNCY
33	TMT	CLEAR CHANNEL COMMUNICATIONS	CCU US EQUITY	CCCU1US CURNCY
34	TMT	COMCAST CABLE COMMUNICATIONS INC.	CMC US EQUITY	CCMC1US CURNCY
35	TMT	COMPUTER SCIENCES CORP	CSC US EQUITY	CCSC1US CURNCY
36	Consumer	CONAGRA FOODS INC	CAG US EQUITY	CCAG1US CURNCY
37	Energy	CONOCOPHILLIPS	COP US EQUITY	CCOC1US CURNCY
38	Energy	CONSTELLATION ENERGY GROUP	CEG US EQUITY	CCEG1US CURNCY
39	Financial	COUNTRYWIDE FINANCIAL CORP	CFC US EQUITY	CCFC1US CURNCY
40	TMT	COX COMMUNICATIONS INC-CL A	COX US EQUITY	CCOX1US CURNCY
41	Industrial	CSX CORP	CSX US EQUITY	CCSX1US CURNCY
42	Consumer	CVS CORP	CVS US EQUITY	CCVS1US CURNCY
43	Industrial	DEERE & CO	DE US EQUITY	CDE1US CURNCY
44	Energy	DEVON ENERGY CORPORATION	DVN US EQUITY	CDVN1US CURNCY
45	Energy	DOMINION RESOURCES INC/VA	D US EQUITY	CDRI1US CURNCY
46	Industrial	DOW CHEMICAL	DOW US EQUITY	CDOW1US CURNCY
47	Industrial	DU PONT (E.I.) DE NEMOURS	DD US EQUITY	CDD1US CURNCY
48	Energy	DUKE ENERGY CORP	DUK US EQUITY	CDUK1US CURNCY
49	Industrial	EASTMAN CHEMICAL COMPANY	EMN US EQUITY	CEMN1US CURNCY
50	Financial	EQUITY OFFICE PROPERTIES TR	EOP US EQUITY	CEOP1US CURNCY
51	Financial	FANNIE MAE	FNM US EQUITY	CFNMA1US CURNCY
52	Consumer	FEDERATED DEPARTMENT STORES	FD US EQUITY	CFD1US CURNCY
53	Energy	FIRSTENERGY CORP	FE US EQUITY	CFE1US CURNCY
54	Financial	FREDDIE MAC	FRE US EQUITY	CFHLM1US CURNCY
55	Consumer	GAP INC/THE	GPS US EQUITY	CGPS1US CURNCY
56	Financial	GENERAL ELECTRIC CO	GE US EQUITY	CGE1US CURNCY
57	Consumer	GENERAL MILLS INC	GIS US EQUITY	CGIS1US CURNCY
58	Industrial	GOODRICH CORP	GR US EQUITY	CGR1US CURNCY
59	Energy	HALLIBURTON CO	HAL US EQUITY	CHAL1US CURNCY
60	Consumer	HARRAH'S ENTERTAINMENT INC	HET US EQUITY	CHET1US CURNCY
61	Financial	HARTFORD FINANCIAL SVCS GRP	HIG US EQUITY	CHIG1US CURNCY
62	TMT	HEWLETT-PACKARD CO	HPQ US EQUITY	CHWP1US CURNCY
63	Industrial	HONEYWELL INTERNATIONAL INC	HON US EQUITY	CHON1US CURNCY
64	TMT	IAC/INTERACTIVE CORP.	IACI US EQUITY	CIACI1US CURNCY
65	Industrial	INGERSOLL-RAND CO LTD-CL A	IR US EQUITY	CIR1US CURNCY
66	Industrial	INTERNATIONAL PAPER CO	IP US EQUITY	CIPI1US CURNCY
67	TMT	INTL BUSINESS MACHINES CORP	IBM US EQUITY	CIBM1US CURNCY
68	Financial	INTL LEASE FINANCE CORP	ILFC US EQUITY	CAIG1US CURNCY
69	Consumer	JONES APPAREL GROUP INC	JNY US EQUITY	CJNY1US CURNCY
70	TMT	KNIGHT RIDDER INC	KRI US EQUITY	CKRI1US CURNCY
71	Consumer	KRAFT FOODS INC-A	KFT US EQUITY	CKFT1US CURNCY

APPENDIX A (cont'd): COMPANIES FOR WHOM DATA WAS COLLECTED:

AMERICAN CDS INDEX - DOW JONES 5-YEAR CDX INDEX (16-JUNE-2006)				
	Sector	Company	Equity Ticker	5YR CDS Ticker
64	TMT	IACINTERACTIVE CORP.	IACI US EQUITY	CIACI1US CURNCY
65	Industrial	INGERSOLL-RAND CO LTD-CL A	IR US EQUITY	CIRI1US CURNCY
66	Industrial	INTERNATIONAL PAPER CO	IP US EQUITY	CIPI1US CURNCY
67	TMT	INTL BUSINESS MACHINES CORP	IBM US EQUITY	CIEM1US CURNCY
68	Financial	INTL LEASE FINANCE CORP.	ILFC US EQUITY	CAIG1US CURNCY
69	Consumer	JONES APPAREL GROUP INC	JNY US EQUITY	CJNY1US CURNCY
70	TMT	KNIGHT RIDDER INC	KRI US EQUITY	CKRI1US CURNCY
71	Consumer	KRAFT FOODS INC-A	KFT US EQUITY	CKFT1US CURNCY
72	Consumer	KROGER CO	KR US EQUITY	CKRI1US CURNCY
73	Industrial	LENNAR CORP-CL A	LEN US EQUITY	CLEN1US CURNCY
74	Consumer	LIMITED BRANDS INC	LTD US EQUITY	CLTD1US CURNCY
75	Industrial	LOCKHEED MARTIN CORP	LMT US EQUITY	CLMT1US CURNCY
76	Financial	LOEWS CORP	LTR US EQUITY	CLTRI1US CURNCY
77	Consumer	MARRIOTT INTERNATIONAL-CL A	MAR US EQUITY	CMARI1US CURNCY
78	Financial	MARSH & MCLENNAN COS	MMC US EQUITY	CMMC1US CURNCY
79	Financial	MBIA INSURANCE CORP	MBI US EQUITY	CMBI1US CURNCY
80	Consumer	MCDONALD'S CORP	MCD US EQUITY	CMCD1US CURNCY
81	Consumer	MCKESSON CORP	MCK US EQUITY	CMCK1US CURNCY
82	Industrial	MEADWESTVACO CORP	MWV US EQUITY	CMWV1US CURNCY
83	Financial	METLIFE INC	MET US EQUITY	CMET1US CURNCY
84	TMT	MOTOROLA INC	MOT US EQUITY	CMOT1US CURNCY
85	Energy	NATIONAL RURAL UTILITIES COOP	2381A US EQUITY	CNRUC1US CURNCY
86	Consumer	NEWELL RUBBERMAID INC	NWL US EQUITY	CNWL1US CURNCY
87	TMT	NEWS CORP-CLASS B	NWS US EQUITY	CNCP1US CURNCY
88	Consumer	NORDSTROM INC	JWN US EQUITY	CJWN1US CURNCY
89	Industrial	NORFOLK SOUTHERN CORP	NSC US EQUITY	CNSCI1US CURNCY
90	Industrial	NORTHROP GRUMMAN CORP	NOC US EQUITY	CNOC1US CURNCY
91	tmr	OMNICOM GROUP	OMC US EQUITY	COMCI1US CURNCY
92	Energy	PROGRESS ENERGY INC	PGN US EQUITY	CPGN1US CURNCY
93	Industrial	PULTE HOMES INC	PHM US EQUITY	CPHM1US CURNCY
94	Consumer	RADIOSHACK CORP	RSH US EQUITY	CRSH1US CURNCY
95	Industrial	RAYTHEON COMPANY	RTN US EQUITY	CKTN1US CURNCY
96	Industrial	ROHM AND HAAS CO	ROH US EQUITY	CROH1US CURNCY
97	Consumer	SABRE HOLDINGS CORP-CL A	TSG US EQUITY	CTSG1US CURNCY
98	Consumer	SAFEWAY INC	SWY US EQUITY	CSWY1US CURNCY
99	Consumer	SARA LEE CORP	SLE US EQUITY	CSLE1US CURNCY
100	Energy	SEMPRA ENERGY	SRE US EQUITY	CSRE1US CURNCY
101	Industrial	SHERWIN-WILLIAMS CO/THE	SHW US EQUITY	CSHW1US CURNCY
102	Financial	SIMON PROPERTY GROUP INC	SPG US EQUITY	CSPGI1US CURNCY
103	Consumer	SOUTHWEST AIRLINES CO	LUV US EQUITY	CLUV1US CURNCY
104	TMT	SPRINT NEXTEL CORP	S US EQUITY	CFON1US CURNCY
105	Consumer	SUPERVALU INC	SVU US EQUITY	CSVU1US CURNCY
106	Consumer	TARGET CORP	TGT US EQUITY	CTGT1US CURNCY
107	Industrial	TEMPLE-INLAND INC	TIN US EQUITY	CTIN1US CURNCY
108	Industrial	TEXTRON INC	TXT US EQUITY	CTXT1US CURNCY
109	TMT	THE WALT DISNEY CO.	DIS US EQUITY	CDIS1US CURNCY
110	TMT	TIME WARNER INC	TWX US EQUITY	CAOL1US CURNCY
111	Industrial	TOLLS BROTHERS INC.	TOL US EQUITY	CTOL1US CURNCY
112	Energy	TRANSOCEAN INC	RIG US EQUITY	CRIG1US CURNCY
113	TMT	TRIBUNE CO	TRB US EQUITY	CTRB1US CURNCY
114	Consumer	TYSON FOODS INC-CL A	TSN US EQUITY	CTSN1US CURNCY
115	Industrial	UNION PACIFIC CORP	UNP US EQUITY	CUNPI1US CURNCY
116	Energy	VALERO ENERGY CORP	VLO US EQUITY	CVLO1US CURNCY
117	TMT	VERIZON COMMUNICATIONS INC	VZ US EQUITY	CVZGF1US CURNCY
118	Consumer	WAL-MART STORES INC	WMT US EQUITY	CWMT1US CURNCY
119	Financial	WASHINGTON MUTUAL INC	WM US EQUITY	CWMI1US CURNCY
120	Financial	WELLS FARGO & COMPANY	WFC US EQUITY	CWFC1US CURNCY
121	Consumer	WENDY'S INTERNATIONAL INC	WEN US EQUITY	CWEN1US CURNCY
122	Industrial	WEYERHAEUSER CO	WY US EQUITY	CWY1US CURNCY
123	Consumer	WHIRLPOOL CORP	WHR US EQUITY	CWHR1US CURNCY
124	Consumer	WYETH	WYE US EQUITY	CAHP1US CURNCY
125	Financial	XL CAPITAL LTD -CLASS A	XL US EQUITY	CXL1US CURNCY

APPENDIX B: SAMPLE OF INPUT DATA

Company: VOLKSWAGEN AG
 Sector: Autos
 Equity Ticker: VOW GR EQUITY
 5YR CDS TICKLR: CVM1E5 INDEX

Date	Equity Closing Price	CDS Mid Price
01/03/03	37.90	58.80
01/10/03	36.36	59.00
01/17/03	36.68	58.80
01/24/03	34.30	60.90
01/31/03	36.68	64.14
02/07/03	35.74	64.90
02/14/03	35.58	67.71
02/21/03	37.85	65.20
02/28/03	37.10	68.88
03/07/03	33.00	75.86
03/14/03	29.60	87.70
03/21/03	33.30	79.10
03/28/03	30.75	79.75
04/04/03	31.95	76.07
04/11/03	32.00	73.29
04/18/03	33.02	65.60
04/25/03	31.22	63.00
05/02/03	30.76	67.00
05/09/03	32.33	65.33
05/16/03	30.84	71.75
05/23/03	30.12	73.36
05/30/03	30.71	71.00
06/06/03	32.15	68.57
06/13/03	33.67	72.00
06/20/03	35.95	66.21
06/27/03	36.26	73.79
07/04/03	37.41	72.38
07/11/03	37.23	72.00
07/18/03	36.68	67.00
07/25/03	36.60	57.94
08/01/03	38.15	55.50
08/08/03	37.72	55.08
08/15/03	42.25	53.60
08/22/03	44.59	50.00
08/29/03	44.66	45.79
09/05/03	45.70	41.29
09/12/03	43.30	45.44
09/19/03	43.60	43.96
09/26/03	39.56	54.10
10/03/03	40.35	61.33
10/10/03	41.54	60.62
10/17/03	43.10	48.05
10/24/03	41.99	51.95
10/31/03	43.39	47.51
11/07/03	44.85	47.66
11/14/03	45.00	44.44
11/21/03	41.65	46.42
11/28/03	41.45	46.83
12/05/03	42.80	44.44
12/12/03	43.80	45.13
12/19/03	44.42	46.15
12/26/03	43.40	45.44
01/02/04	44.60	45.67
01/09/04	41.30	48.94
01/16/04	43.20	55.25
01/23/04	41.20	57.98
01/30/04	40.60	59.83
02/06/04	39.35	64.18
02/13/04	39.70	65.05
02/20/04	39.90	66.10
02/27/04	39.10	67.46
03/05/04	39.00	65.84
03/12/04	36.60	72.84
03/19/04	35.70	68.80
03/26/04	34.90	65.96
04/02/04	36.45	61.42
04/09/04	36.64	60.31
04/16/04	37.72	60.60
04/23/04	38.74	60.19
04/30/04	36.70	63.24
05/07/04	35.92	66.07
05/14/04	35.38	70.28
05/21/04	34.85	69.52
05/28/04	35.72	68.08
06/04/04	35.90	69.97
06/11/04	35.34	66.53
06/18/04	34.05	67.28
06/25/04	34.25	66.35
07/02/04	33.76	69.80
07/09/04	33.10	74.56
07/16/04	32.00	70.94
07/23/04	33.00	72.20
07/30/04	33.65	69.00
08/06/04	32.45	69.70
08/13/04	30.70	71.13
08/20/04	30.90	67.25
08/27/04	32.29	65.44
09/03/04	31.95	61.67
09/10/04	32.65	60.68
09/17/04	32.41	62.79
09/24/04	31.54	64.32

Date	Equity Closing Price	CDS Mid Price
10/01/04	31.35	65.81
10/08/04	34.00	64.45
10/15/04	34.70	65.69
10/22/04	33.95	69.06
10/29/04	34.90	68.37
11/05/04	35.20	65.71
11/12/04	35.60	66.03
11/19/04	34.65	66.13
11/26/04	34.25	65.55
12/03/04	34.31	64.47
12/10/04	33.71	64.42
12/17/04	33.55	65.80
12/24/04	33.00	66.68
12/31/04	33.35	66.66
01/07/05	35.94	65.84
01/14/05	35.39	63.59
01/21/05	36.64	62.31
01/28/05	35.86	55.50
02/04/05	36.54	49.75
02/11/05	37.30	40.80
02/18/05	37.68	47.17
02/25/05	37.10	47.00
03/04/05	37.36	43.00
03/11/05	36.16	44.37
03/18/05	35.32	50.09
03/25/05	36.69	56.75
04/01/05	36.46	63.11
04/08/05	35.66	57.33
04/15/05	34.21	89.27
04/22/05	32.43	64.65
04/29/05	32.22	71.74
05/06/05	33.64	75.71
05/13/05	34.17	77.06
05/20/05	35.80	71.88
05/27/05	35.43	81.33
06/03/05	36.15	56.25
06/10/05	36.62	65.37
06/17/05	37.40	53.31
06/24/05	37.94	56.32
07/01/05	38.36	55.97
07/08/05	38.86	53.17
07/15/05	40.60	50.75
07/22/05	42.23	52.74
07/29/05	44.71	52.97
08/05/05	44.00	53.38
08/12/05	44.41	62.77
08/19/05	43.98	53.04
08/26/05	42.95	52.54
09/02/05	42.35	53.87
09/09/05	45.20	49.96
09/16/05	45.88	46.46
09/23/05	51.65	50.23
09/30/05	51.33	44.00
10/07/05	49.77	45.95
10/14/05	47.42	47.77
10/21/05	45.75	45.95
10/28/05	44.74	45.54
11/04/05	45.41	43.97
11/11/05	45.66	44.69
11/18/05	44.21	46.52
11/25/05	43.84	45.35
12/02/05	46.50	44.08
12/09/05	46.71	44.35
12/16/05	44.96	42.88
12/23/05	44.33	44.65
12/30/05	44.61	44.50
01/06/06	45.35	43.34
01/13/06	47.59	42.27
01/20/06	45.70	42.88
01/27/06	49.04	40.00
02/03/06	49.19	36.41
02/10/06	64.78	37.85
02/17/06	69.30	36.12
02/24/06	68.97	34.32
03/03/06	55.65	33.71
03/10/06	65.90	34.17
03/17/06	68.20	33.40
03/24/06	61.96	33.97
03/31/06	61.90	32.48
04/07/06	63.01	30.27
04/14/06	62.35	28.79
04/21/06	63.96	28.35
04/28/06	61.49	25.00
05/05/06	58.60	26.18
05/12/06	58.23	26.86
05/19/06	54.10	29.25
05/26/06	55.70	29.73
06/02/06	54.75	28.68
06/09/06	52.32	29.25
06/16/06	52.90	30.69

APPENDIX C: COMPANIES ELIMINATED FROM ORIGINAL DATA

The following companies were eliminated from the original pool of data through lack of data. This lack of data was a result of either (a) an unreliable CDS price input or (b) the company is no longer publicly quoted although it still has publicly quoted debt and hence still has a quoted CDS price:

European Companies:	US Companies:
1. Groupe Auchan	1. Carnival Corporation
2. Central African Gold Plc	2. Consolidated Natural Gas company
3. EDF SA	3. Commercial Metals Company
4. Vattanfall AB	4. Computer Sciences corp.
5. Glencore International	5. Knight Ridder Corp.
6. Bertelsmann AG	6. IAC/Interactive Corp
	7. Int'l Lease Finance Corp.
	8. MBIA Insurance Corp.
	9. National Rural Utility Coop
	10. Toll Brothers Inc
	11. Wendy's International Inc.

APPENDIX D: REGRESSION ANALYSIS OUTPUTS

Company: Alcoa Inc.

Sector: Industrial (Metal – Aluminium)

Company Description: Alcoa Inc. produces primary aluminium, fabricated aluminium, and alumina, and participates in mining, refining, smelting, fabricating and recycling. The company serves customers world-wide primarily in the transportation, packaging, building, and industrial markets with both fabricated and finished products.

Bloomberg Equity Ticker: AA US EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CAA1U5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.736(a)	.542	.539	8.14853

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16393.796	1	16393.796	246.900	.000(a)
	Residual	13877.300	209	66.399		
	Total	30271.096	210			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	90.992	3.671		24.790	.000
	Px Last	-1.982	.126	-.736	-15.713	.000

a Dependent Variable: Px Mid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: American Express

Sector: Financial (Finance – Credit Card)

Company Description: American Express company, through its subsidiaries, provides travel-related financial advisory, and international banking services around the world. The company's products include the American Express Card, the Optima Card and the American Express Travellers Cheque.

Bloomberg Equity Ticker: AXP US EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CAXPIU5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.828(a)	.686	.685	11.18564

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	56867.420	1	56867.420	454.508	.000(a)
	Residual	26024.677	208	125.119		
	Total	82892.097	209			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	125.334	4.342		28.865	.000
	Px Last	-2.137	.100	-.828	-21.319	.000

a Dependent Variable: Px Mid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: The Boeing Company

Sector: Consumer (Aerospace – Defence)

Company Description: The Boeing Company, together with its subsidiaries, develops, produces, and markets commercial jet aircraft, as well as provides related support services to the commercial airline industry world-wide. The company also researches, develops, produces, modifies, and supports information, space, and defence systems, including military aircraft, helicopters and space missile systems.

Bloomberg Equity Ticker: BA US EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CBA1U5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.757(a)	.572	.570	21.4402

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	127955.021	1	127955.021	278.356	.000(a)
	Residual	95613.543	208	459.680		
	Total	223568.565	209			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	122.076	4.873		25.053	.000
	Px Last	-1.561	.094	-.757	-16.684	.000

a Dependent Variable: Px Mid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: Hewlett Packard Company.

Sector: TMT (Computers and related hardware.)

Company Description: Hewlett-Packard Company provides imaging and printing systems, computing systems, and information technology services for business and home. The company's products include laser and inkjet printers, scanners, copiers and faxes, personal computers, workstations, storage solutions, and other computing and printing systems. Hewlett-Packard sells its products world-wide.

Bloomberg Equity Ticker: HPQ US EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CHWP1U5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.664(a)	.440	.438	27.0703

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	120489.273	1	120489.273	164.422	.000(a)
	Residual	153155.814	209	732.803		
	Total	273645.087	210			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	143.691	7.930		18.121	.000
	Px Last	-4.509	.352	-.664	-12.823	.000

a Dependent Variable: Px Mid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: The Kroger Company
Sector: Consumer (Food - Retail)
Company Description: The Kroger company operates supermarkets and convenience stores in the United States. The company also manufactures and processes food that its supermarkets sell. Kroger's stores operate under names such as Dillon Food Stores, City Market, Sav-Mor, Kwik Shop and Mini Mart.

Bloomberg Equity Ticker: KR US EQUITY (Independent Variable)
Bloomberg 5YR CDS Ticker: CKR1U5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.312(a)	.097	.093	26.77410

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17103.991	1	17103.991	23.860	.000(a)
	Residual	158424.345	221	716.852		
	Total	175528.337	222			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	140.891	14.259		9.881	.000
	Px Last	-3.897	.798	-.312	-4.885	.000

a Dependent Variable: Px Mid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: National Grid Plc.
Sector: Energy (Electric Distribution)
Company Description: National Grid Plc owns. Operates and develops electricity and gas networks. The group’s electricity transmission and gas distribution networks are located throughout the UK and in the northeastern section of the US. They also own liquefied natural gas storage facilities in Britain and provide infrastructure services to the mobile telecom industry.

Bloomberg Equity Ticker: LG/ LN EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CNGG1E5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.701(a)	.491	.488	11.407

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25599.362	1	25599.362	196.724	.000(a)
	Residual	26546.212	204	130.128		
	Total	52145.574	205			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	121.372	5.831		20.815	.000
	Px Last	-11.748	.838	-.701	-14.026	.000

a Dependent Variable: Px Mid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: PPR (Pinault-Printemps-Redoute)
Sector: Consumer (Retail – Major Department Store)
Company Description: PPR SA retails consumer and household products, sporting goods, personal computers, lingerie and other luxury goods by Gucci, Yves Saint-Laurent, Bottega Venata, Balenciaga, and Sergio Rossi.

Bloomberg Equity Ticker: PP FP EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CPRTP1E5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.808(a)	.653	.651	43.862

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	648793.964	1	648793.964	337.232	.000(a)
	Residual	344374.079	179	1923.878		
	Total	993168.043	180			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	563.004	24.243		23.223	.000
	Px Last	-5.492	.299	-.808	-18.364	.000

a Dependent Variable: Px Mid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: Siemens AG.

Sector: Industrial (Diversified Manufacturing Operations)

Company Description: Siemens AG manufactures a wide range of industrial and consumer products. The company builds locomotives, traffic control systems and automotive electronics, and engineers electrical power plants. Siemens also provides public and private communications networks, computers, building control systems, medical equipment, and electrical components. The company operates world-wide.

Bloomberg Equity Ticker: SIE GR EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CSIEM1E5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.609(a)	.370	.368	14.13565

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29615.175	1	29615.175	148.212	.000(a)
	Residual	50353.750	252	199.816		
	Total	79968.925	253			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	93.803	4.970		18.875	.000
	Px Last	-1.016	.083	-.609	-12.174	.000

a Dependent Variable: Px Mid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: Transocean Inc.

Sector: Energy (Oil & Gas Drilling)

Company Description: Transocean Inc is an offshore drilling contractor. The company owns or operates mobile offshore drilling units, inland drilling barges, and other assets utilised in the support of offshore drilling activities world-wide. Transocean specialises in technically demanding segments of the offshore drilling business, including deepwater and harsh environment drilling services.

Bloomberg Equity Ticker: RIG US EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CRIG1U5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.732(a)	.536	.534	10.070

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20529.068	1	20529.068	202.430	.000(a)
	Residual	17747.266	175	101.413		
	Total	38276.334	176			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	61.939	1.719		36.035	.000
	Px Last	-.526	.037	-.732	-14.228	.000

a Dependent Variable: Px Mid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: Unicredito Italiano SpA

Sector: Financial (Commerical Bank)

Company Description: Unicredito Italiano SpA, a bank, conducts operations in Italy. The group's three divisions include Unicredito Banca serving families and small businesses, Unicredito Banca d'Impresa for corporate segment and public organisations and Unicredito Private Banking for wealth management. Unicredito is also present in Central and Eastern Europe.

Bloomberg Equity Ticker: UC IM EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CUNI1E5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.483(a)	.233	.230	9.35247

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5911.286	1	5911.286	67.582	.000(a)
	Residual	19418.038	222	87.469		
	Total	25329.324	223			

a Predictors: (Constant), Px Last

b Dependent Variable: mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	52.956	4.027		13.151	.000
	Px Last	-7.447	.906	-.483	-8.221	.000

a Dependent Variable: mid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: Valero Energy Corp.
Sector: Energy (Oil Refining and Marketing)
Company Description: Valero Energy Corporation is an independent petroleum refining and marketing company that owns and operates refineries in the United States and Canada. The company also operates retail sites under the Valero, Diamond Shamrock, Ultramar, Total, and Beacon Brands. In addition, Valero owns a proprietary pipeline network.

Bloomberg Equity Ticker: VLO US EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CVLO1U5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.544(a)	.296	.292	56.60795

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	281143.054	1	281143.054	87.735	.000(a)
	Residual	669732.131	209	3204.460		
	Total	950875.185	210			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	135.740	6.557		20.701	.000
	Px Last	-1.976	.211	-.544	-9.367	.000

a Dependent Variable: Px Mid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: Vivendi SA.

Sector: Telecommunications, Media and Technology (Multimedia)

Company Description: Vivendi SA, through its subsidiaries, conducts operations ranging from music, games, and television services, sells music CDs, develops and distributes interactive entertainment, and operates mobile and fixed line telecommunications.

Bloomberg Equity Ticker: VIV FP EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CVIVU1E5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.607(a)	.369	.366	217.76052

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6013359.218	1	6013359.218	126.812	.000(a)
	Residual	10290062.839	217	47419.644		
	Total	16303422.057	218			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	874.890	59.639		14.670	.000
	Px Last	-30.446	2.704	-.607	-11.261	.000

a Dependent Variable: Px Mid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: Volkswagen AG.

Sector: Autos (Auto – Cars/Light Trucks)

Company Description: Volkswagen AG manufactures economy and luxury automobiles, sports cars, trucks, and commercial vehicles for sale world-wide. The company produces the Passat, Golf, Cabrio, Jetta, GTI, Beetle, AUDI, and other Models. Volkswagen also owns Seat and Skoda, which manufacture and sell cars in Spain and in Southern & Eastern Europe, and Lamborghini, which makes sports cars in Italy

Bloomberg Equity Ticker: VOW GR EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CVWIE5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.835(a)	.698	.697	7.84767

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35269.437	1	35269.437	572.687	.000(a)
	Residual	15273.295	248	61.586		
	Total	50542.732	249			

a Predictors: (Constant), Px Last

b Dependent Variable: nmid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	114.283	2.554		44.743	.000
	Px Last	-1.421	.059	-.835	-23.931	.000

a Dependent Variable: nmid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: Volvo AB.

Sector: Autos (Autos – Cars/Light Trucks, Machinery – General Industry)

Company Description: Volvo AB manufactures, trucks, buses and industrial engines, and aerospace equipment. The company also offers repair and maintenance, lease financing, insurance and financial products to its customers. Volvo manufactures and markets its products world-wide.

Bloomberg Equity Ticker: VOLVB SS EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CVLVY1E5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.771(a)	.595	.593	16.02262

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	93452.021	1	93452.021	364.017	.000(a)
	Residual	63667.603	248	256.724		
	Total	157119.625	249			

a Predictors: (Constant), Px Last

b Dependent Variable: npxmid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	110.206	3.267		33.736	.000
	Px Last	-2.350	.123	-.771	-19.079	.000

a Dependent Variable: npxmid

APPENDIX D (cont'd): REGRESSION ANALYSIS OUTPUTS

Company: The Walt Disney Company
Sector: TMT (Multimedia)
Company Description: The Kroger company operates supermarkets and convenience stores in the United States. The company also manufactures and processes food that its supermarkets sell. Kroger's stores operate under names such as Dillon Food Stores, City Market, Sav-Mor, Kwik Shop and Mini Mart.

Bloomberg Equity Ticker: KR US EQUITY (Independent Variable)
Bloomberg 5YR CDS Ticker: CKR1U5 CURRENCY (Dependent Variable)

Regression Outputs:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.865(a)	.747	.746	17.20888

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	216426.046	1	216426.046	730.810	.000(a)
	Residual	73147.958	247	296.146		
	Total	289574.004	248			

a Predictors: (Constant), Px Last

b Dependent Variable: mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	237.726	6.631		35.851	.000
	Px Last	-7.677	.284	-.865	-27.033	.000

a Dependent Variable: mid

APPENDIX E: MARKS & SPENCER GROUP LBO SPECULATION HISTORY

Figure 5 shows the graphical relationship between Marks & Spencer Group Plc's (M&S) equity price and CDS price:

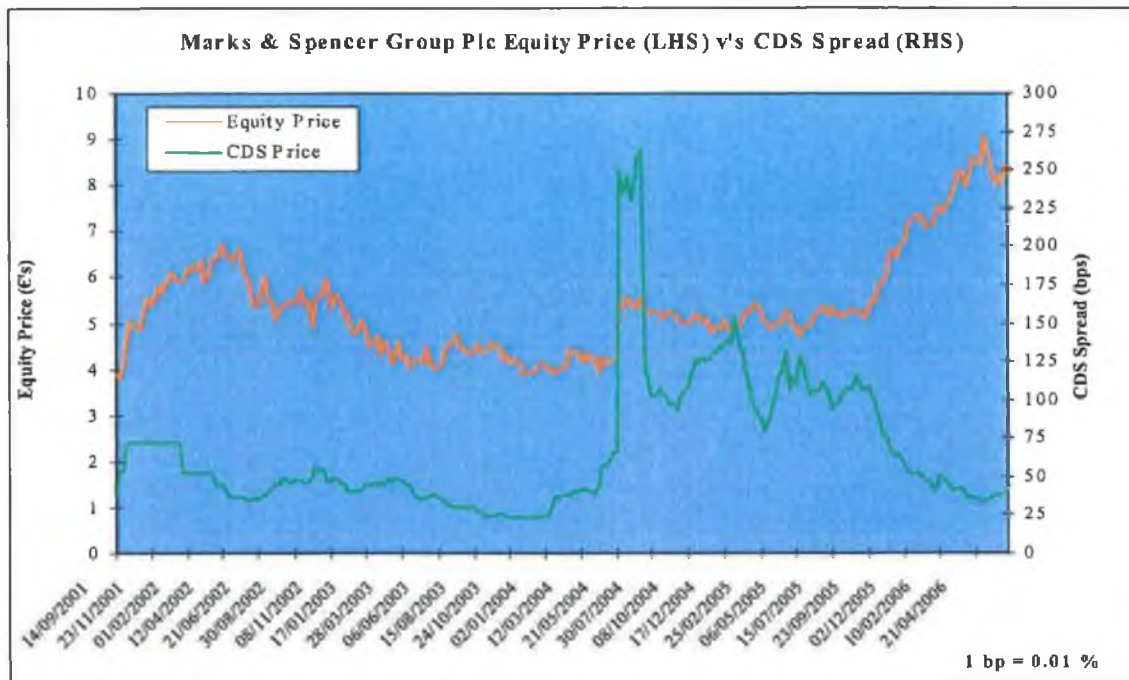


Figure 5: M&S Equity Price v. 's CDS Price 2001 - Present

Timeline:

- 27-May-2004: News breaks that billionaire Philip Green is considering making a bid for M&S. Green owns UK fashion chains including Dorothy Perkins, Top Shop and BHS Ltd. M&S's share price rose €0.81 to €5.16 (+19%). M&S's CDS price doubled from 65bps to 130bps and continued to increase strongly in the subsequent days.
- 14-Jul-2004: Philip Green withdrew his €13.18 billion offer to buy M&S after the company rejected his advances three times in seven weeks. Philip concluded that he would not gain the co-operation of the board at M&S. Investors sided with M&S, then newly appointed CEO, Stuart Rose siding with his plan to return €3.33 billion to them. M&S's share price declined €0.28 to €5.17 (-5%) while it's CDS price tumbled from 198bps to 128bps and continued to fall in the days after.

APPENDIX F: MARKS & SPENCER REGRESSION ANALYSIS OUTPUT

Company: Marks & Spencer Group plc.

Sector: Consumer (Retail – Major Department Store)

Company Description: Marks & Spencer Group plc operates retail stores in the UK, which sell consumer goods under the name St. Michael. The group also provides a range of financial services, including trust units, account cards, personal loans, pension and life assurance. They also operate Kings super markets in the US in addition to retail stores in the Middle East.

Bloomberg Equity Ticker: MKS LN EQUITY (Independent Variable)

Bloomberg 5YR CDS Ticker: CMKS1E5 CURRENCY (Dependent Variable)

Regression Outputs:

SUB PERIOD 1: Before LBO NEWS BREAKING:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.057(a)	.003	-.020	12.084

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.337	1	20.337	.139	.711(a)
	Residual	6278.957	43	146.022		
	Total	6299.294	44			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	48.004	38.963		1.232	.225
	Px Last	-3.454	9.254	-.057	-.373	.711

a Dependent Variable: Px Mid

APPENDIX F (cont'd): MARKS & SPENCER REGRESSION ANALYSIS OUTPUT

SUB PERIOD 2: DURING PERIOD OF LBO SPECULATION:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.871(a)	.759	.739	37.004

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	51823.045	1	51823.045	37.846	.000(a)
	Residual	16431.919	12	1369.327		
	Total	68254.965	13			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2449.278	426.933		-5.737	.000
	Px Last	494.167	80.328	.871	6.152	.000

a Dependent Variable: Px Mid

SUB PERIOD 3: PERIOD AFTER LBO SPECULATION RECEDED:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.931(a)	.866	.865	12.640

a Predictors: (Constant), Px Last

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	95050.980	1	95050.980	594.927	.000(a)
	Residual	14698.754	92	159.769		
	Total	109749.734	93			

a Predictors: (Constant), Px Last

b Dependent Variable: Px Mid

APPENDIX F (cont'd): MARKS & SPENCER REGRESSION ANALYSIS OUTPUT

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	235.863	6.220		37.917	.000
	Px Last	-24.601	1.009	-.931	-24.391	.000

a. Dependent Variable: Px Mid

APPENDIX G: CDS INDICES CONSTRUCTION INFORMATION

Construction Rules of Dow Jones CDX¹⁷ and ITraxx¹⁸ Indices

- Construction via dealer liquidity poll, administered by International Index Corporation (IIC).
- Each market maker submits to IIC a long list of names based on the following criteria:
 1. Incorporated in USA for CDX Index and Europe for the ITraxx Index.
 2. Those names with the highest CDS trading volume, as measured over the previous 6 months.
 3. Volumes for financial names are derived from Subordinated (Lower Tier 2) transactions.
 4. Exclude all internal transactions from the volume statistics, e.g. those with an internal proprietary desk.
- Volumes for names that fall under the same ticker, but trade separately in the CDS market, are summed to arrive at an overall volume for each issuer.
- The list is ranked according to trading volumes, (i.e. the issuer with the highest trading volume first), and submitted in the form of Bloomberg corporate ticker.
- IIC collates all submitted lists and removes any names rated Baa3/BBB and on negative outlook.
- Each issuer is assigned to its appropriate Dow Jones sector.
- Each Dow Jones sector is mapped to a CDX/ITraxx sector and each issuer ranked within its sector by averaging the liquidity ranking of the market makers.
- The final portfolio comprises 125 issuers, and is constructed by selecting the highest ranking issuers in each sector below:
 - For the CDX Index:

¹⁷ Source: Dow Jones Indexes Guide to Dow Jones CDX Indexes, Sept 2005.

¹⁸ Source: International Index Corporation, Dow Jones ITraxx – Portfolio Rules of Construction. July 2004.

APPENDIX G (cont'd): CDS INDICES CONSTRUCTION INFORMATION

36 Consumers

14 Energy

29 Industrials

22 TMT

24 Financials

- And for the ITraxx Index:

10 Autos.

30 Consumers (15 cyclicals & 15 non-cyclicals).

20 Energy.

20 Industrials.

20 TMT.

25 Financials (separate Senior & Subordinated indices).

Non-Financials (100 names excl. Financials).

(E.g. the 20 highest ranking Energy issuers, and the 25 highest-ranking Financials are included).

- Each name is weighted equally in the overall and sub-indices. For indices that cannot be divided equally to two decimal places, weighting adjustments (in the magnitude of +/- 0.01%) will be made in alphabetical order.
- For each issuer (Bloomberg corporate ticker) the most liquid CDS reference entity is assigned.

APPENDIX H: RATINGS DEFINITIONS

Moodys Rating Service:

Moody's Long-Term Rating Definitions:

Aaa	Obligations rated Aaa are judged to be of the highest quality, with minimal credit risk.
Aa	Obligations rated Aa are judged to be of high quality and are subject to very low credit risk.
A	Obligations rated A are considered upper-medium grade and are subject to low credit risk.
Baa	Obligations rated Baa are subject to moderate credit risk. They are considered medium-grade and as such may possess certain speculative characteristics.
Ba	Obligations rated Ba are judged to have speculative elements and are subject to substantial credit risk.
B	Obligations rated B are considered speculative and are subject to high credit risk.
Caa	Obligations rated Caa are judged to be of poor standing and are subject to very high credit risk.
Ca	Obligations rated Ca are highly speculative and are likely in, or very near, default, with some prospect of recovery of principal and interest.
C	Obligations rated C are the lowest rated class of bonds and are typically in default, with little prospect for recovery of principal or interest.




Figure 6: Moodys Investor Service Credit Rating Scale

Source: Moodys Investor Service Rating Symbols and Definitions, (August 2004)

As can be seen from figure 6 above, Moodys Rating Service definitions range from Aaa (the highest quality credit rating) to C (the lowest rating, typically in default). If a company or particular debt issuing is rated between Aaa and Baa, it is considered Investment Grade. If a company of debt issue is rated Ba or below is classified as sub-investment grade (a.k.a. speculative or junk).

APPENDIX H: RATINGS DEFINITIONS

Standard & Poor's (S&P) Rating Service

Long-Term Issue Credit Ratings	
AAA	An obligation rated 'AAA' has the highest rating assigned by Standard & Poor's. The obligor's capacity to meet its financial commitment on the obligation is extremely strong.
AA	An obligation rated 'AA' differs from the highest-rated obligations only to a small degree. The obligor's capacity to meet its financial commitment on the obligation is very strong.
A	An obligation rated 'A' is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligations in higher-rated categories. However, the obligor's capacity to meet its financial commitment on the obligation is still strong.
BBB	An obligation rated 'BBB' exhibits adequate protection parameters. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitment on the obligation.
BB	An obligation rated 'BB' is less vulnerable to nonpayment than other speculative issues. However, it faces major ongoing uncertainties or exposure to adverse business, financial, or economic conditions which could lead to the obligor's inadequate capacity to meet its financial commitment on the obligation.
B	An obligation rated 'B' is more vulnerable to nonpayment than obligations rated 'BB', but the obligor currently has the capacity to meet its financial commitment on the obligation. Adverse business, financial, or economic conditions will likely impair the obligor's capacity or willingness to meet its financial commitment on the obligation.
CCC	An obligation rated 'CCC' is currently vulnerable to nonpayment, and is dependent upon favorable business, financial, and economic conditions for the obligor to meet its financial commitment on the obligation. In the event of adverse business, financial, or economic conditions, the obligor is not likely to have the capacity to meet its financial commitment on the obligation.
CC	An obligation rated 'CC' is currently highly vulnerable to nonpayment.
C	A subordinated debt or preferred stock obligation rated 'C' is currently highly vulnerable to nonpayment. The 'C' rating may be used to cover a situation where a bankruptcy petition has been filed or similar action taken, but payments on this obligation are being continued. A 'C' also will be assigned to a preferred stock issue in arrears on dividends or sinking fund payments, but that is currently paying.
D	An obligation rated 'D' is in payment default. The 'D' rating category is used when payments on an obligation are not made on the date due even if the applicable grace period has not expired, unless Standard & Poor's believes that such payments will be made during such grace period. The 'D' rating also will be used upon the filing of a bankruptcy petition or the taking of a similar action if payments on an obligation are jeopardized.

Figure 7: S&P Ratings Definitions

Source: Standard & Poor's website (www.ratingsdirect.com), 14 June 2006

Similar to Moodys, S&P have a rating scale as shown in figure 7, which is broken down into investment grade and sub-investment grade. If a company/debt issue is rated between AAA and BBB, it is considered investment grade. If a company/debt issue is rated BB or below it is then classified as sub-investment grade.