

CHAPTER ONE

THE MARKET FOR CREDIT DERIVATIVES

The Phoenicians invented the money – But why so little of it? (Nestroy)

Credit Events That Have Led to the Birth of Credit Derivatives

The dramatic rise of credit derivatives (for the definition see Introduction) has its origin in several severe credit crises in the recent past. Some of them will be discussed in the following.

The Latin American debt crisis in the early 1980s. In August 1982, the debt situation in Latin America turned into a severe crisis when Mexico suspended coupon payments to its creditors. The crisis worsened over the next 7 years and spread to other Latin American countries as inflation grew and investors pulled capital out of the plagued debtor nations. Private lenders were unwilling to provide new money, but at the same time lending by official, taxpayer-supported institutions increased steadily.

In March 1989, the United States Treasury Department under then Treasury Secretary Nicholas F. Brady put together a new strategy for dealing with developing country debt. The strategy, better known as the “Brady Plan,” acknowledged that reversing the flight of capital from debtor nations was critical, and that global capital markets would direct resources to any country that had the will to implement genuine reforms based upon sound economic fundamentals.

As a result, the Brady Plan focused on debt service reduction for those debtors who agreed to implement substantial economic reform programs. The plan offered banks credit enhancements in exchange for their agreement to reduce claims. These credit enhancements were created by first converting commercial bank loans into bonds, and then collateralizing the notional amount with US Treasury zero-coupon bonds, purchased with the proceeds of IMF and World Bank loans. Thus, the Brady bonds represented a form of default insurance, similar to a default swap, the most popular credit derivative in today’s trading practice.

The junk bond crisis in the 1980s. In the early 1980s, the investment bank Drexel Burnham Lambert with its West-Coast chief, the self-made millionaire, Michael Milken, engaged in

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high volume trading of junk bonds. Junk bonds, or the more benign term, high yield bonds are bonds with a rating lower than BBB. The high yield of the junk bonds naturally reflects the high default probability of the junk bond issuer.

At first Milken's trading activities in junk bonds resulted in enormous profits. However, his trading success deteriorated and he was later charged with securities fraud and Drexel Burnham had to shut down its operation. In addition, many Savings & Loan (S&L) institutions had invested in high-yield bonds, which sparked the S&L crisis of the late 1980s, while simultaneously tainting the junk bond name.

The Savings and Loan (S&L) crisis in the late 1980s. Exploding interest rates during the early 1980s were one of the primary causes of the crisis. The S&L associations typically provided long-term mortgage loans, usually at a fixed interest rate, for a period up to thirty years. These long-term loans were usually financed with short-term depository funds. The huge difference between the long-term mortgage rates and short-term depository funds, coupled with highly speculative investments, partly in junk bonds, by some Savings and Loan institutions caused most of the industry to become insolvent. Losses kept compounding since the insolvent institutions were allowed to remain open, leading to accumulating losses. The US government finally had to step in and take over and bail out many S&L institutions. In 1990, the General Accounting Office estimated that the insurance losses would ultimately exceed \$325 billion, over \$1,000 for each resident of the United States.

The Asian financial crisis in 1997–1998. Falling interest rates in industrialized countries throughout the 1990s resulted in lower cost of capital for investing companies and nations. Coupled with overconfidence in the growth perspectives of South-East Asian nations, huge amounts of capital had poured into South-East Asia. Moreover, the financial flows were mostly “hot money” i.e. short-term with less than 1-year maturity. When growth rates declined in the mid 1990s, creditors did not renew their credits. Since most of the funds were invested long term (or unprofitable), these maturity mismatches led to the Asian financial crisis.

On July 2, 1997 the crisis broke out when the Thai government released the Thai baht from the US dollar peg. Aggravated by currency speculators, many South-East Asian currencies devalued sharply and the countries could not meet their financial obligations since most of them were in US dollars. The IMF and the World Bank stepped in and prevented bankruptcy by lending the hardest hit countries South Korea \$58.4 billion, Indonesia \$42.3 billion and Thailand \$17.2 billion.

The Russian debt crisis 1998. The origins of the Russian crisis in 1998 are to be found in the country's gradual transition process from totalitarianism towards democracy and economic liberalization.

Due to the monetary policy implemented in 1995, banks had limited funds to lend to enterprises. To compensate for the low availability of loans, enterprises were forced to use barter relationships with customers, suppliers and workforces. A barter relationship is one in which goods or services, rather than cash, are exchanged for debt. These kinds of relationships allow companies to balance their accounting books, thus overstating many companies' financial status. Additionally, Russia's administrative tax collection was little

developed leading to low government revenues from taxes, resulting in high government debt.

To attempt to increase government revenue, the state decided to issue short-term ruble-denominated bonds (called GKO's) at attractive interest rates. However, the state was unable to pay back these bonds and was thus forced to issue more GKO's at even higher rates.

Struggling to repay its debt, the central bank was forced to devalue the ruble. It did so by increasing the ruble's fluctuation band against the dollar by 50%. In addition, the central bank decided to print more rubles, which naturally led to higher inflation. Consequently, confidence dwindled and many investors converted their money into US dollars, aggravating the downfall of the ruble. Furthermore, oil prices fell sharply in 1998, reducing Russia's income further. In August 1998 the Russian government forced restructuring of the ruble-denominated internal debt and imposed a 90-day moratorium on repayments of foreign loans. Thus, Russia was officially in a state of bankruptcy.

Argentinean crisis 2001. One of the main factors for the demise of the Argentine economy in the late 1990s was the peg of the Argentine peso to the US dollar. With the dollar appreciating in the 1990s against nearly all currencies, Argentina's exports and foreign investment in Argentina had become increasingly less attractive. It was estimated that productivity had to increase by around 20% to make Argentine exports competitive. Together with poor political and economic leadership, Argentina experienced a severe recession in 2001.

In order to reduce capital outflow, the interest rate on 3-month treasury bills was raised from 9% to 14% in July 2001 despite an ongoing deflation, which increased the real burden of high interest payments.

In order to manage the crisis, a new currency, the "Argentino," was created, not tied to the dollar. Prices, rents, and interest payments were supposed to stay in dollars or pesos, whereas pensions and wages were to be paid in Argentinos, whose value was suspected to decrease relative to the dollar or the peso. The wide majority of the population anticipated the rise in cost and decrease in income, and President Rodriguez Saa had to resign.

In early December 2001, Argentina required investors to swap \$50 billion of 11% and 12% bonds into 7% yielding bonds. On December 23, 2001 Argentina's capital reserves were depleted and Argentina declared a moratorium, officially defaulting on their debt. For investors, who had bought credit protection maturing in mid December in the form of default swaps, it was crucial whether the forced yield swap constituted the event of default. The issue depends on the definition used in the specific contract and will be solved in court.

The Enron bankruptcy filing. On December 2, 2001, corporate America was shocked to hear the Chapter 11 filing of utility giant Enron. Enron's principal activity was the provision of products and services related to natural gas, electricity and communications to wholesale and retail customers. Reasons for Enron's bankruptcy filing, the biggest petition in US history, were over-expansion, mismanagement, and personal enrichment. Before the filing, Enron accountants had tried to hide financial problems with numerous special purpose entities (SPE), located in the Cayman Islands and other tax havens. Thousands of former Enron employees and shareholders are seeking financial retribution for the billions of dollars lost in the company collapse.

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Arthur Andersen, working for Enron as a consultant *and* auditor, was found guilty of obstruction of justice in June 2002 for destroying thousands of its Enron audit records after learning federal regulators were investigating. With its reputation badly damaged, Arthur Andersen did not see any prospects to survive, selling its tax and audit practices in ten cities to Ernst & Young LLP and its offices in five cities to KPMG LLP.

Market Size and Products

In 2003, credit derivatives comprised about 0.8% of the overall derivatives market, as seen in figure 1.1. However, credit derivatives have increased sharply in recent years and have grown from \$54 billion to \$840 billion from 1998 to 2003, as seen in figure 1.2.

Broadly, the credit derivatives market can be divided into four categories: default swaps (DS) also called credit default swaps (CDS), total rate of return swaps (TRORs), credit-spread products, and synthetic structures (for details see chapter 3). Over two-thirds of all traded credit derivatives in 2002 were default swaps and about 25% were synthetic structures. Total rate of return swaps, which had about the same trading volume as default swaps in 1998, only comprised about 1.3% of the credit derivatives market in 2002. One reason for the rise in default swaps is the provision of a standardized legal documentation by ISDA (International Swaps and Derivatives Association) in 1999, with an update in 2003.¹ Once standard legal documentation for TRORs is available, TRORs might regain their previous

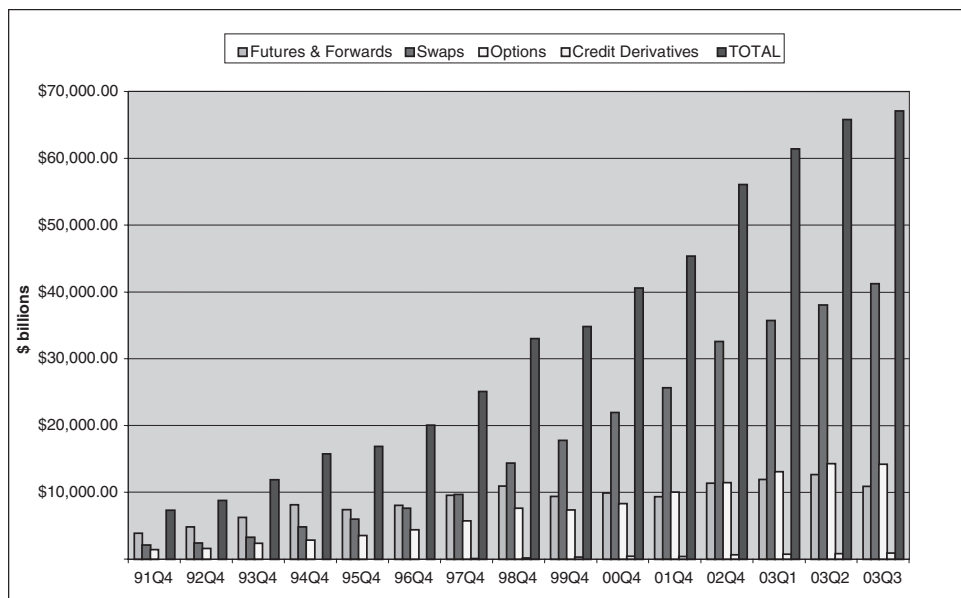


Figure 1.1: Total quarterly US derivative activity from 1998 to 2003 (notional amount)
 Source: Comptroller of the Currency Administrator of National Banks, OCC Bank Derivatives Report.

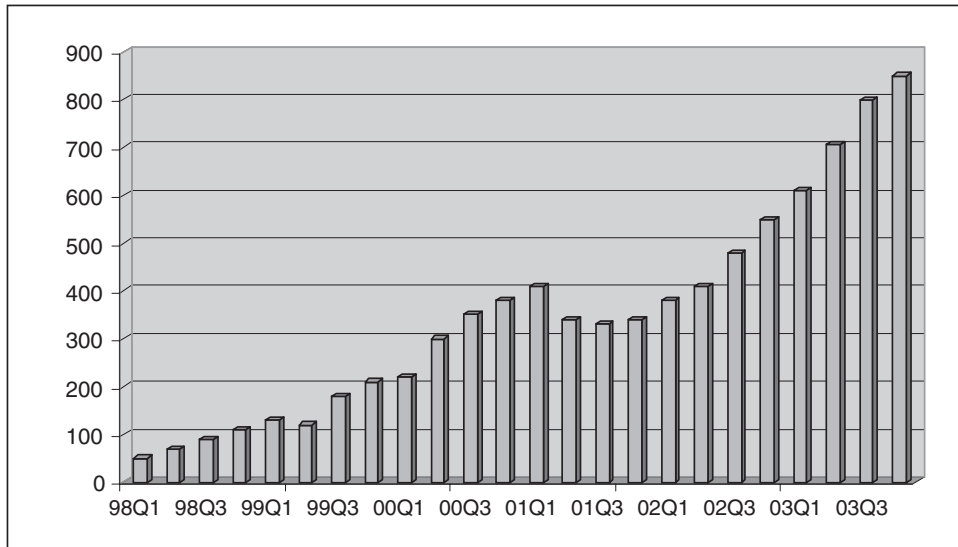


Figure 1.2: Credit derivatives quarterly growth in the US from 1998 to 2003 (notional amount in millions)

Source: Comptroller of the Currency Administrator of National Banks, OCC Bank Derivatives Report Fourth Quarter 2000 to 2003.

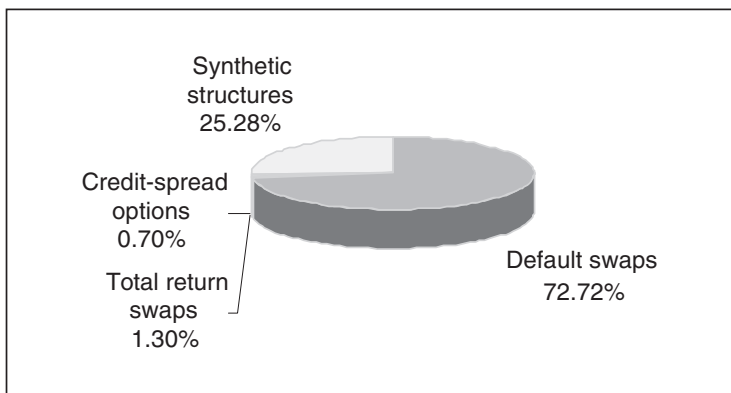


Figure 1.3: Credit derivatives in percent of trading volume in the US in 2002

Source: Risk Magazine, February 2003, pp. 20–3.

trading volume. Figure 1.3 shows the distribution of credit derivatives products in the US in 2002.

In terms of regional trading activity, the American market has a slightly higher trading volume than Europe, as seen in figure 1.4.

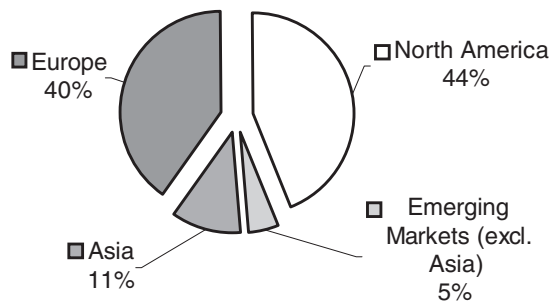
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Figure 1.4: Trading volume with respect to geographical regions in 2002 by origin of underlying credit

Source: *Risk Magazine*, February 2003, third survey of credit derivatives, pp. 20–3.

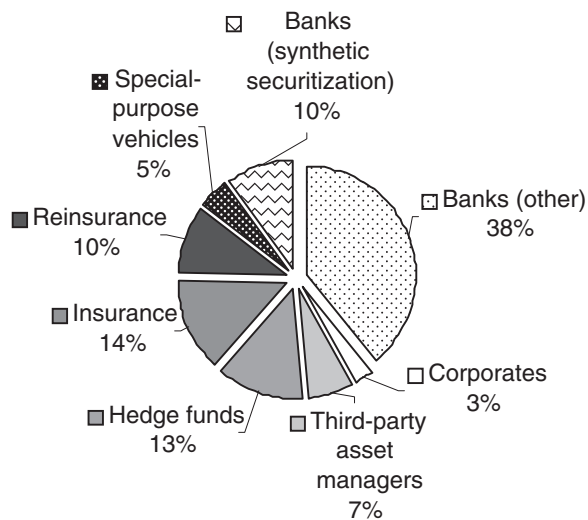


Figure 1.5: End-user breakdown

Source: *Risk Magazine*, February 2003, third survey of credit derivatives, pp. 20–3.

With respect to end users, we can see from figure 1.5 that banks, insurance companies, and hedge funds are the main buyers and sellers of credit derivatives.

Credit Derivatives Have Been Around in Different Forms

Credit derivatives started trading actively in the mid 1990s. However, they are not a recent invention. Other forms of credit protection such as letters of credit and bond guarantees such as the Brady bonds have been around for many years.

Letter of credit. A letter of credit is a document issued by a bank guaranteeing that the loan of a foreign investor will be repaid. Let's look at an example: a US company wants to build a power plant in Thailand. It needs 10,000,000 Thai baht from Thai Farmers Bank immediately. The US company asks its house bank, Bank of America, to send a letter of credit to Thai Farmers Bank, which guarantees the repayment of the loan. This way, the US company can receive the money immediately without lengthy and costly credit checks by Thai Farmers Bank. Thus a letter of credit is effectively an insurance against default of a third party (the US company), therefore quite similar to a standard default swap.

Brady bonds. Brady bonds, as already briefly discussed above, are US dollar denominated bonds issued mainly by Latin American countries, that were exchanged for Latin American commercial bank loans in default. US Treasury zero-coupon bonds guaranteed the notional amount of these bonds. Therefore, the US government acted de facto as a default swap seller. The fee in this "default swap" was however zero, since the US government guaranteed the notional amount for free, trying to re-establish investor confidence in the plagued Latin American countries.

The QBI Contract

Personal bankruptcy filings have increased dramatically in the US in recent years as seen in figure 1.6. To protect against these increasing bankruptcies or assume risk on it, the CME

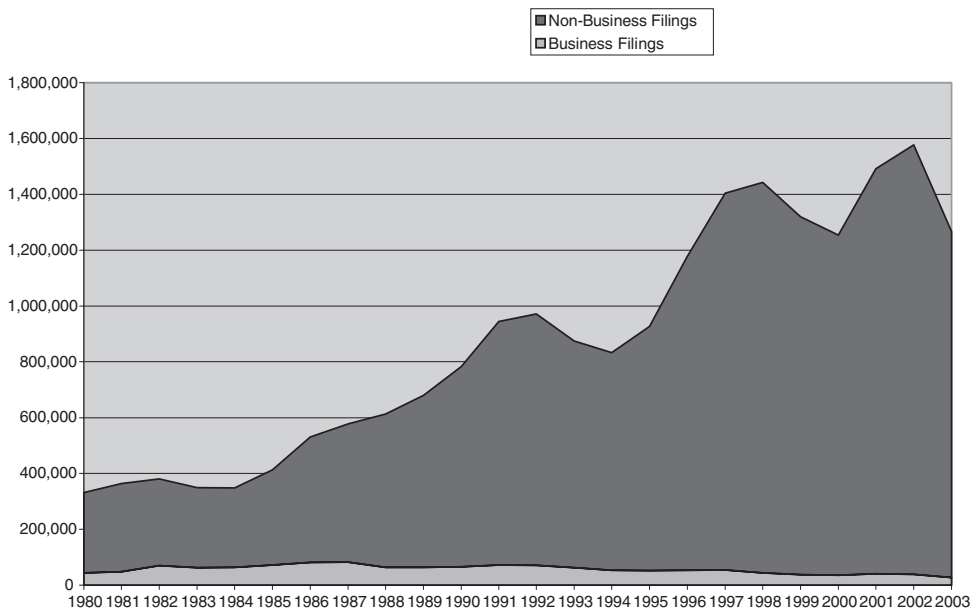


Figure 1.6: Business and non-business bankruptcy filings in the US from 1980 to 2003
 Source: American Bankruptcy Institute, <http://www.abiworld.org/stats/1980annual.html>.

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(Chicago Mercantile Exchange) launched derivatives contracts on the QBI (Quarterly Bankruptcy Index) in September 2000, the first ever exchange-traded credit derivative product. Investors who want to take a position in future bankruptcy filings can buy or sell the QBI Futures² (Ticker symbol QB) or the QBI Options³ on Futures contract (Ticker Symbol 8Q).

The QBI Futures contract. Due to the unusual underlying, which is personal bankruptcy filings during a specific quarter, the QBI Futures contract has some unique features. It principally trades on the March, June, September, December cycle (i.e. there are four Futures contracts per year). However, to accommodate for possible late bankruptcy reporting during a quarter, the QBI Futures contract is settled two business days before the fifteenth of April, July, October, and January. Conveniently, one bankruptcy filing increases the QBI index by \$1. The index is rounded to the nearest \$25 and expressed in units of 1,000.

Buying a QBI Futures contract means that the buyer believes the market underestimates future bankruptcy filings; selling a QBI Futures contract means that the seller believes the market overestimates future bankruptcy filings.

Example 1.1: An investor believes that the QBI Futures contract underestimates the personal bankruptcy filings during the quarter from January to March. In February, he buys one QBI Futures contract at the current QBI future price of 355. At future maturity on April 13, the QBI has a settlement price of 360,127, which is rounded to the nearest 25, so 360,125. Thus, the profit for the investor is $360,125 - 355,000 = \$5,125$. Naturally, if the settlement price had been below 355,000, the investor would have lost money.

It is also interesting to notice how the QBI Futures contract is traded. Traders are able to enter bids and offers at anytime during a “pre-opening” period each day from 7:30 a.m. until 1:30 p.m. Chicago Time. Orders become “firm” (i.e. they cannot be canceled or modified) between 1:20 p.m. and 1:30 p.m., when the orders are matched and executed.

The QBI Options on Futures contract. Investors can also hedge or assume risk on personal bankruptcy filings using the QBI Options on Futures contract. A QBI call option gives the call buyer the right, but not the obligation, to buy one QBI Futures contract at the strike price, which is determined at the purchase date. A QBI put option gives the put buyer the right, but not the obligation, to sell one QBI Futures contract at the strike price. The QBI option contract is American style, thus an option buyer can exercise his option anytime before or at option maturity.

Trading of the QBI Options contract takes place in the same form as the QBI Futures contract. That is, traders are able to enter bids and offers at anytime during a “pre-opening” period each day from 7:30 a.m. until 1:30 p.m. Chicago Time, and orders become “firm” (i.e. cannot be canceled or modified) between 1:20 p.m. and 1:30 p.m., when the orders are matched and executed.

An investor should buy the QBI Futures contract rather than the QBI call option, if he is very certain that the market underestimates future bankruptcy filings, because a future

contract does not require paying a premium, and thus has higher leverage. If an investor believes the market consensus about future bankruptcies is too low but he is not very certain, he should buy the call option rather than the Futures contract, because the downside of the call option is just the call premium. However, the downside of the future contract can be significant (the maximum loss of selling a future is unlimited; the maximum loss when buying a future is the future price, in case the future price goes to zero).

Example 1.2: A credit card company wants to protect against rising bankruptcy filings but at the same time wants to maintain the advantage of decreasing bankruptcy filings. The company buys 10 call options on the March QBI Futures contract with a strike of 350, with a call premium of \$0.50 for one option. Since the option contract is quoted in thousands, he pays $10 \times \$0.50 \times 1,000 = \$5,000$. At option maturity the QBI Futures contract is at 365,146, thus rounded to the next 25, it is 365,150. Thus the overall payoff for the company is $10 \times (365,150 - 350,000) - 5,000 = \$146,500$ (ignoring the interest rate effects of having paid the \$5,000 at an earlier point in time).

Creditex and CreditTrade

Creditex and CreditTrade, both founded in 1999, are Internet-based electronic platforms for trading and obtaining information on credit derivatives.

Creditex, headquartered in New York, is a broker/dealer approved by the NASD (National Association of Securities Dealers) and is officially supported by the major derivatives players such as JP Morgan Chase, Deutsche Bank, UBS, CSFB, etc. On average, 40 institutions place about 4,000 bids and offers per month on the platform mainly in default swaps. However, in 2002, a wide range of other credit derivatives such as total rate of return swaps and synthetic structures were also executed. Creditex also offers two data management services. The first is *Data Download*, where subscribers receive a comprehensive download of all transactions posted (or traded) to date on the Creditex trading platform. In addition, Creditex provides daily, weekly or monthly updates to the data. Data Download is delivered as an attachment to an automated email. The second service is *PriceTracker*, a desktop application, allows subscribers to view all current prices posted on the Creditex trading platform. Subscribers can search on a single name, as well as search for an entire portfolio at once.

CreditTrade, the London-based European competitor, is different to Creditex in that it offers a combined traditional voice and electronic brokerage service. In February 2000, CreditTrade acquired the credit derivative team of the broker Prebon Yamane and has today an exclusive correspondent relationship with Prebon. JP Morgan Chase and ICG are major shareholders of CreditTrade. Besides its brokerage service, CreditTrade offers, like Creditex, a historical data subscription service (CreditTrade Benchmarks) and an intra-day price tracing service (CreditTrade Market Prices). In January 2000, CreditTrade set up a struc-

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tured products desk to diversify their product range away from standard single name default swaps.

Trac-x and Iboxx

Trac-x (pronounced “tracks”) is a family of credit derivatives indexes launched by JP Morgan and Morgan Stanley in April 2003. Just as other indexes, for example the Dow Jones Industrial Index, the Trac-x consists of a basket of underlying financial instruments, whose price is expressed as a single number. The underlying for the Trac-x are prices of 50 or 100 default swaps (discussed in chapter 2). At the beginning of 2004, several Trac-x indexes existed: TRAC-X Europe, TRAC-X NA (North America), TRAC-X NA High Yield, TRAC-X Japan, TRAC-X Australia, and TRAC-X EM (Emerging Markets).

In November 2003, JP Morgan and Morgan Stanley handed over the management and marketing of the Trac-x to Dow Jones and Company (see www.dowjones.com). The indexes were renamed as “Dow Jones TRAC-X Indexes.” However, ownership of the Trac-x will remain with JP Morgan and Morgan Stanley.

Main users of the Trac-x are financial institutions, which can buy one of the Trac-x indexes to perform a broad hedge against credit risk (see chapter 2 and 4 on hedging). Investors can also sell one of the Trac-x indexes to assume credit risk. Hedging and assuming credit risk can be done conveniently, since the Trac-x, as any index, is expressed as a single number. The trading volume of the Trac-x has been very satisfactory, with over \$100 billion of Trac-x traded in the first nine months after the launch.

In October 2003, 11 credit dealers launched a rival index to the Trac-x, termed Iboxx. The dealers cited discontent with the licensing and reconstitution of the Trac-x. It is to be expected that the Trac-x and Iboxx will merge in the future to ensure high liquidity in a single index.

SUMMARY OF CHAPTER 1

The credit derivatives market has increased dramatically since its inception in the mid 1990s. The reasons for the increase are the general desire of the financial system to decrease credit risk, and thus increase stability. Furthermore, several severe debt crises of sovereigns and corporates have led to an increased awareness of credit risk. Among them are the Asian financial crisis in 1997–8, the Russian debt crisis 1998, the Argentinean crisis 2001, and corporate bankruptcy filings such as Enron or WorldCom in 2001 and 2002.

Credit protection is, however, not a new phenomenon, but has been around in forms such as letters of credit or Brady bonds. Brady bonds are effectively a default insurance, similar to a default swap.

The QBI Futures and the QBI Options on Future contract are the first two credit-related contracts to be traded on exchanges. The underlying of the QBI is the number of personal bankruptcy filings in a certain quarter, whereby one bankruptcy filing increases the QBI value by \$1. A credit card issuer, who wants to protect against personal bankruptcy filings, can either buy a QBI Futures

contract or a call option of the futures contract. The QBI Futures contract should be bought if the hedger is very sure that bankruptcy filings will increase. If the investor is not so sure, a call option should be bought, which protects against rising bankruptcy filings but at the same time maintains the advantage of decreasing bankruptcy filings.

Currently, two Internet-based credit derivatives trading platforms exist, the New York based Creditex and the London based CreditTrade. Both platforms provide an electronic brokerage system; CreditTrade also provides a traditional voice brokering. Both electronic trading systems also offer a historical and intra-day data subscription service.

The Trac-x index, launched in April 2003, is an index based on default swap prices. In October 2003, 11 credit dealers launched a rival index to the Trac-x, termed Iboxx. The Trac-x and the Iboxx allow investors to conveniently hedge or assume credit risk, since both indexes are expressed as a single number.

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QUESTIONS AND PROBLEMS

Answers, available for instructors, are on the Internet. Please email gmeissne@aol.com for the site.

- 1.1 Define credit derivatives! What are the reasons for the strong growth of credit derivatives since the mid 1990s?
- 1.2 What are the main applications of credit derivatives?
- 1.3 Define credit risk! Do you believe is it reasonable to differentiate default risk and credit deterioration risk?
- 1.4 Name several credit crises in the past years that have highlighted the need to reduce credit risk!
- 1.5 Why have default swaps dominated the credit derivatives market in the recent past? Why has the trading volume of TRORs diminished?
- 1.6 Discuss the underlying of the QBI Futures and the QBI Options on Futures contract. Describe the unusual trade execution of the QBI contract.
- 1.7 How do the dominant electronic trading platforms for credit derivatives Creditex and CreditTrade differ?
- 1.8 What is the main objective of the Trac-x and Iboxx indexes?

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NOTES

- 1 ISDA, www.ISDA.org, "ISDA Credit Derivatives Definitions"; ISDA, www.ISDA.org, "2003 Definitions."
- 2 A futures contract is the agreement to trade an underlying asset in the future at a price, which is determined at the start of the futures contract. The buyer of a futures contract has the obligation to buy the underlying asset at the maturity date of the future contract; the seller of a futures contract has the obligation to sell the underlying asset at the maturity date of the future contract. For more on futures see Hull (2003) or Meissner (1998).
- 3 In an option, the buyer has the right to buy (in case of a call) or sell (in case of a put) the underlying asset at a price, which is agreed at the start of the option contract. The seller of an option has to sell (in case of a call) or buy (in case of a put) the underlying asset, if the option buyer exercises her option. For more on futures see Hull (2003) or Meissner (1998).