Credit derivatives in Swedish banks
- Both sides of the coin

Kreditderivat i svenska banker
- Båda sidor av myntet

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ISRN: LIU-IEI-FIL-A--11/01086--SE
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Abstract

**Title:** Credit derivatives in Swedish banks – Both sides of the coin

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**Background:** The financial crisis of 2007-2010 had a massive impact on the financial markets worldwide. The crisis was partly blamed on the credit derivatives collateralized debt obligations and credit default swaps. These instruments were used to create leverage and speculation, which led to uncertainty in the financial system worldwide. There has been no recent documentation of how credit derivatives are used in Swedish banks, and what risks and opportunities they bring along.

**Purpose:** The purpose of this thesis is to describe the use of credit derivatives in Swedish banks, what benefits and risks they may generate and how the recent financial crisis has affected their use.

**Research Method:** This is a qualitative multiple case study which uses an inductive approach. The study covers four cases, three of the largest Swedish commercial banks, and a bank that specializes on international financing. Seven people working in different fields in these banks have been interviewed.

**Conclusions:** Credit derivatives are mostly used for hedging in Swedish banks, which mainly involves the use of credit default swaps, and sometimes iTraxx. Purely speculative trades are rare. The risks that arise are mainly due to lack of transparency in OTC trading, and abusive use of these instruments. Credit derivatives greatly facilitate risk management in banks. Regulations have increased since the financial crisis and the demand for more complex products greatly decreased.

**Keywords:** Credit derivatives, credit default swap, collateralized debt obligation, Swedish banks, risk management, hedging, central clearing, OTC
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<tr>
<td><strong>Asset-Backed Security</strong></td>
<td>A security whose value and income payments are derived and backed from a pool of underlying assets (Damodaran, 2002).</td>
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<tr>
<td><strong>CCP</strong></td>
<td>Central CounterParty, clearinghouse that acts as counterparty for derivatives contracts. It takes on the counterparty risk, and guarantees payment to both parties (Culp, 2004).</td>
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<tr>
<td><strong>CDO</strong></td>
<td>Collateralized Debt Obligation, a financial instrument issued from the performance of an underlying pool of assets, normally bonds and loans from a bank. In a synthetic CDO, the collateral consists of CDSs (Duffie &amp; Singleton, 2003). The CDOs are divided into different tranches, rated by credit agencies, indicating the order of payment to the investors (Anson et al., 2004).</td>
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<tr>
<td><strong>CDS</strong></td>
<td>Credit Default Swap, a credit derivative which is used to transfer credit risk. Protection is bought for an underlying asset. The protection buyer pays a current premium in exchange for a payment in the event of a credit downgrade or default of the underlying asset (Anson et al., 2004).</td>
</tr>
<tr>
<td><strong>Clearinghouse</strong></td>
<td>A firm that guarantees the payments of the parties in a derivative transaction (Hull, 2003).</td>
</tr>
<tr>
<td><strong>CLN</strong></td>
<td>Credit Linked Note, a credit derivative with an upfront payment, the protective payment is made at the beginning of the contract. This sum is paid back at the end of the contract, but will be reduced in the occurrence of credit events (Anson et al., 2004).</td>
</tr>
<tr>
<td><strong>Coupons</strong></td>
<td>The interest that the bond issuer pays to the bond holder (Hull, 2003).</td>
</tr>
<tr>
<td><strong>Countercyclicality</strong></td>
<td>Works against the cyclical tendencies of the economy. Mitigation of economic fluctuations (BIS, 2010).</td>
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<td>------------------------</td>
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<tr>
<td><strong>Counterparty</strong></td>
<td>The party with whom a financial transaction is made (Hull, 2003).</td>
</tr>
<tr>
<td><strong>Credit cycle</strong></td>
<td>A cycle involving availability of funds in the economy. The credit cycle is correlated to the economic cycle, but credit cycle focuses on credit availability, whereas economic cycle is about GDP (Jiménez &amp; Saurina, 2005).</td>
</tr>
<tr>
<td><strong>Credit rating</strong></td>
<td>A measure of creditworthiness of a bond (Hull, 2003).</td>
</tr>
<tr>
<td><strong>Hedge</strong></td>
<td>A trade designed to offset, reduce or balance risk from a financial position (Hull, 2003).</td>
</tr>
<tr>
<td><strong>iTraxx</strong></td>
<td>iTraxx are index portfolios of CDSs which together form a liquid product which may be used for diversifying and to hedge certain positions (Choudry, 2006).</td>
</tr>
<tr>
<td><strong>Naked position</strong></td>
<td>A short position in a call option or in a credit default swap that is not combined with a long position in the underlying asset (Hull, 2003).</td>
</tr>
<tr>
<td><strong>Netting</strong></td>
<td>The ability to offset contracts with positive and negative values in the event of a default (Hull, 2003)</td>
</tr>
<tr>
<td><strong>Off balance-sheet leverage</strong></td>
<td>Off-balance sheet instruments are derivatives that have no balance sheet impact (Ong, 2006). Since the exposures do not show up on the balance sheet, a company can achieve more leverage, by taking on more exposure and earn an enhanced return (Caouette, 2008).</td>
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**OTC**  Over The Counter, a bilateral, flexible agreement between two actors, on how to settle a contract. These trades imply counterparty risk since the other party in the contract might not be able to meet its payment obligations (Culp, 2004).

**Par value**  The principal value of a bond, also called stated value or face value (Hull, 2003).

**Procyclicality**  Magnification of economic fluctuations (BIS, 2010).

**Speculating**  Taking a market position and betting for the prices to go up or down (Hull, 2003).

**SPV**  Special Purpose Vehicle, a company set up to manage a Collateralized Debt Obligation (Duffie & Singleton, 2003).

**Systemic Risk**  Risk to the entire economy, or “system” (Kaufman, 2000).

**TRS**  Total Return Swap, a financial instrument that enables banks to fund the exposures of their customers. The customer obtains a synthetic exposure to the underlying asset, and the bank will be paid any negative price change at the end of the contract (Hull, 2003).
I. Introduction

In the first chapter the background of the thesis will be presented, followed by a problem disposition leading to the purpose. The limitations of the thesis will also be discussed as well as the target group.

1.1. Background

The financial crisis of 2007-2010 had a massive impact on the financial markets worldwide. Many financial institutions were brought to the brink of their survival and a few ceased to exist. This global event has led to a broader awareness of the need for greater stability in the financial sector and much attention has been given the financial instruments called credit derivatives (Aronson, 2010).

The issue of financial regulation and stability has been brought up before. In 1988 the Basel Committee released a regulatory framework for minimum capital requirements called Basel I, in order to increase the financial solidity in the financial institutions. This framework is constantly developed and the third edition is being discussed today, Basel III. The third edition of the Basel framework aims to increase the transparency of the financial markets and stricter capital requirements (BIS, 2010).

At the time of the crisis the Basel framework was not perfect. Starting in the 1990s, many new financial instruments were developed; enabling financial institutions and investors to shed their risk across different market participants, but also to circumvent the regulations and acquire more leverage (Aronson, 2010). Increased competition also forced banks to engage in new kinds of activities, including the use of newly developed instruments (Greuning & Bratanovic, 2009). In the USA where the prevailing politics in the housing markets encouraged people to own their own houses, banks and financial institutions approved loans to borrowers with low or no credit rating (Swan, 2009). These mortgage-backed securities, called subprime loans are considered by many to be the reason for the financial crisis that followed (Wallison, 2009).
The banks, in order to shed the material amount of risk taken upon them, hedged themselves by selling the risk with credit derivatives mainly in the form of Credit Default Swaps (CDS) and Collateralized Debt Obligations (CDO). The risk was passed on to numerous financial institutions worldwide, and many actors started to speculate in these derivatives or build up excessive off-balance sheet leverage. It was not uncommon that neither the buyer nor seller of the instrument actually possessed the underlying credit. Since CDOs in particular can be quite complex instruments, actors lost track of what debt they actually traded (Blundell-Wignal et al., 2008). When the economy turned and these subprime loans defaulted due to non-payments, the losses were spread over many actors in different countries. Some financial institutions that were speculating in CDOs were heavily affected and some even defaulted (Duyn & Bullock, 2010). The banks and financial institutions were closely interconnected which led to procyclicality and spread the risk throughout the world (BIS, 2010).

1.2. Problem Disposition
Credit derivatives have become very popular the last decades and their use has grown extensively (McIlroy, 2010). While some people blame these instruments for the financial crisis of 2007-2010 (Wallison, 2009), others believe these instruments can greatly reduce risks in the banking sector (Choudry, 2006). Previous research on the use of credit derivatives in Swedish banks is very limited, and not many studies have been carried out since the financial crisis. This thesis aims to examine how and to what extent credit derivatives are used in Swedish banks in order to understand and evaluate the risks and possibilities these instruments may carry.

- How are credit derivatives used in Swedish banks, and what purpose do they serve?

- What possibilities do credit derivatives bring to banking?

- What risks arise from the use of credit derivatives?

- What changes in the use of credit derivatives have been made since the financial crisis?
The banking environment is influenced by external and internal factors that might affect and broaden the discussion to the questions above. Some of these factors could be financial inventions, economic cycles and the competition on the financial markets. Other aspects are the prevailing regulations for financial institutions and the banks internal restrictions. This could have an impact on the use of credit derivatives in Swedish banks and will be considered and discussed throughout the thesis.

1.3. Purpose
The purpose of this thesis is to describe the use of credit derivatives in Swedish banks, what benefits and risks they may generate and how the recent financial crisis has affected their use.

1.4. Limitations
This study is limited to four cases; three of the four largest Swedish commercial banks, and one non-commercial bank with its expertise on international financing. Additional banks were not included due to limited time and accessibility. Since the purpose of the study is to examine how credit derivatives are used in the Swedish banking sector, only Swedish banks are interviewed. Hedge funds and other financial institutions are not part of the study, since the focus lies on banks whose main activity is lending.

Banks are dealing with a number of different risks that require a great deal of supervision (Bessis, 2002). Therefore the risks involved in the banking sector are explained briefly in order to give the reader a better understanding of the risk challenges in the business. However not all risks will be explained in detail, since this thesis focus on credit risk.

There are many different credit derivatives on the financial markets, and more are created every year (McIlroy, 2010). The ones relevant for this study are Credit Default Swaps (CDS), Collateralized Debt Obligations (CDO), Total Return Swaps (TRS), Credit Linked Notes (CLN) and iTraxx since others are less common.
The new Basel regulatory framework plays a role in the use of credit derivatives in banking. Therefore some parts of the Basel framework will be explained, however all the technicalities will not be discussed further, due to their limited relevance to this study.

1.5. Target group
The target group of this study is business administration students seeking to gain deeper knowledge of the use of credit derivatives in Swedish banks. The results of this thesis may support others in continued and future research within the same field. This study may also be of interest to banking managers, financial supervision institutions, and anyone else who wishes to obtain a broad description of how credit derivatives are used in Swedish banks, the possibilities they bring and how exposed these banks are to the dangers that these instruments promote.
II. Research Method

In this chapter the methodological reasoning used for this study will be explained. Here is also discussed the quality achieved in the study and the implications that arose due to the choice of method.

2.1. Research Approach

A research study can be quantitative or qualitative. The difference in these two approaches lies in the way the data is being collected and the number of observations made. A quantitative researcher often seeks to draw conclusions from a population using statistical methods. A qualitative research can often go deeper than a quantitative, however conclusions are not drawn from statistical evidence but rather from anecdotal evidence (Bryman, Futing & Lewis-Beck, 2004). This thesis is made with a qualitative research approach. A qualitative research is often characterized by a phenomena being described in detail with rich and relevant information (Bryman, Futing & Lewis-Beck, 2004). There are only a few observations in this study, and the conclusions are built on the describing answers of individuals working in Swedish banks. In compliance with the thesis purpose, which is of a descriptive nature; in-depth observations are more relevant than statistical research.

A Research design is the logical structure of empirical data being collected to a research study. The empirical data shall be collected in a way that conclusions can be drawn from it. One of the most common forms of research design is the case study, where a phenomenon is studied in depth. When the same phenomenon is studied in more than one case it is called a multiple case study. The purpose of this design is therefore to focus on a small number of cases to achieve in-depth observations (Bryman, Futing & Lewis-Beck, 2004). The multiple case study is appropriate for this thesis purpose which seeks to describe a phenomenon in a number of complex organizations. The use of credit derivatives is studied within four Swedish banks in order to create generalized theory.

In research, an inductive or deductive approach can be used. While using a deductive method of reasoning, the researcher will use theories that are tested in order to create results for the study. For example a deductive approach can be to derive a hypothesis
from a general theory that is then tested. An inductive approach on the other hand entails working from specific observations, detecting patterns and regularities and creating a general conclusion or theory (Trochim, 2006). This study uses an inductive approach that is based on interviews, and strives to generalize the findings and form some general conclusions of how credit derivatives are used in Swedish banks.

In order to accomplish this study, data has been collected. Researchers may gather the data themselves for example by carrying out surveys or experiments. Data collected for the specific study is called primary data. When data is used that has been collected for another purpose then the study, it is called secondary data. Secondary data could for example be data collected for a similar study (Bryman, Futing & Lewis-Beck, 2004).

2.2. Choice of cases and interviewees
The choice of cases was based upon the thesis purpose, to describe the use of credit derivatives in Swedish banks, giving an objective and representative picture. Interviews were made with three of the four largest commercial banks in Sweden. In Sweden the four largest commercial banks together account for 75 % of the public deposits (Sveriges Riksbank, 2010). One of these banks did however not want to participate in this study, since it is a significant user of credit derivatives. Including a bank that has been using credit derivatives for a long time and to a great extent, gave the study a broader approach. The data collected through the interviews of the banks will be compared in order to find similarities.

Bryman, Futing and Lewis-Beck (2004) are of the opinion that data sampling is an important part in the research process where the choice of the most suitable participant has to be made in order to meet the needs of the study. The people working in the banking sector have been very helpful and positive about this thesis, but the choice of interviewees demanded individuals with the right knowledge and the right experience of credit derivatives, people that sometimes have been hard to get in contact with. This was managed by several phone calls and emails, explaining the thesis purpose.
2.3. Interviews and data sampling

This study includes interviews with seven people working with credit risk in four different Swedish banks. All interviews are presented anonymously and in this study the banks will be referred to as A, B, C and D. In bank A the interview was carried out with a trading risk manager and two counterparty risk managers. A conference call was made with a trading risk manager in bank B. In bank C the interview was held with two responsible, one for risk transference and one for their risk division. The interview in bank D was made with a credit researcher.

In order to collect the primary data, semi-structured interviews were made. This means that all respondents were asked a combination of structured questions, questions in the same form and order, enabling an aggregation of the data received; but also unstructured questions that left the respondent room to develop and elaborate the answers (Bryman & Bell, 2007). In order to avoid misunderstandings, a self-correcting interview strategy was used to a certain extent, which means that some questions asked were meant to confirm what the interviewee had said. Three of the interviews were carried out in Stockholm, in order to meet the interviewees in person, and one interview was a conference call due to practical reasons.

References to additional literature were found in articles and theses on the subject. There has been some information published about the use of credit derivatives in other markets, especially in the USA. In Sweden the latest published theses about credit derivatives are mainly about regulatory issues. Studies on the use of credit derivatives in the USA do however not seem to be very representative for how they are used in Sweden.

Most of the articles used were found in the databases Academic Source Premier, Business Source Premier, Scopus and Google Scholar. Literature was found at the library of Linköping University among other libraries and online e-book sources. Statistics used in the thesis are found on the websites of BIS (Bank of International Settlements). Information from the Basel Regulatory Framework released by the Basel Committee has also been used in the thesis. Secondary data was used in form of annual reports from the banks.
2.4. Data analysis
As mentioned earlier the empirical data in this study is collected from semi-structured qualitative interviews. All interviews were recorded and transcribed in order to secure and to simplify the work and analysis of the information. Thereafter the data were divided into four different parts concerning different subjects of interest to this thesis:

- The use and purpose of credit derivatives
- Positive aspects of credit derivatives
- Negative aspects of credit derivatives
- The regulations and the impact of the financial crisis of 2007-2010

The answers from the interviewees were categorized within the different subjects. When analysing the findings, not all data were processed the same. A researcher should use data that contributes important information and an explanation of the thesis’ findings, additional data that is contradictory to the findings should also be used. The researcher should also choose quotations that best emphasize the developing argument (Lewis et al, 2004). Since the interviews were carried out in a semi-structured manner, the interviewees answered the questions freely, which means that a lot of the information gathered in the interviews is not directly relevant to this study. Therefore some of the data gathered has not been used in this thesis. The credit researcher in bank D did not have complete information about the bank’s policies concerning credit derivatives, compared to the other banks. Instead supplementary information has been found in the banks’ annual report of 2010. Bank D is however not represented at all times during the analysis.
2.5. Quality

_In this section the quality of the thesis will be discussed and evaluated. Concepts that will be discussed in this chapter are validity, reliability and credibility, transferability and objectivity._

2.5.1. Internal validity

Validity can be defined as the conformity of the theoretically defined, and the empirically observed. It is also said that validity is absence of bias and that, what the study examines, is what it is said to examine. This is called internal validity, in contrast to external validity, which is how well the study can be generalized (Esaiasson et al., 2004).

Problems with validity are not as common and serious when it comes to relatively easy and uncomplicated theoretical concepts (Esaiasson et al., 2004). Since most of the theoretical framework consists of explaining the different credit derivatives and how those are used, not many complicated concepts are presented that require extensive previous knowledge. Therefore no significant internal validity problem is present.

Reliability is the absence of random and unsystematic errors. These errors can be bad recordings, mishearing, unreadable notes, or errors made because of tiredness or stress (Esaiasson et al., 2004). The semi structured, flexible interviews may decrease the reliability of a study (Silverman, 2004). In order to minimize the decrease in reliability, all interviews were recorded and transcribed.

To increase the credibility of the study the inquirer can share his empirical findings with the respondents, in order to confirm correct interpretation and representation of their realities (Mugenda, 2008). To further minimize errors and increase the credibility of the study, additional measures have been taken. The empirical data has been sent to the interviewees for them to confirm that there have been no misunderstandings.
2.5.2. External Validity
The external validity determines to what extent the study represents the reality intended to be represented, if the study can be used to form general theory or if the sample used for the study is not representative enough (Esaiasson et al., 2004). For this study, three of the four largest banks in Sweden have been investigated, as well as one bank whose specialization lies in international financing. Since the four largest banks in Sweden, as mentioned before, together stand for 75% of the public deposits in the country (Sveriges Riksbank, 2010), we believe the sample in this study should be representative enough to draw generalized conclusions, even if only three of those four banks are represented in the study.

2.5.3. Transferability
The transferability addresses the question of whether the findings of the thesis can be transferred and used in another similar project. The judgement about the usefulness is therefore in the hands of the ones reading the study and who wish to use the conclusions in their own work (Lewis, 2004). This thesis deals with a topic of current relevance, yet the matter is little mentioned in Swedish articles today. As stated above, the usefulness of this study is not for the researchers to judge, but the choice of subject has been met with positive responses from the interviewees in this study.

2.5.4. Objectivity
For a study to be objective, the data has to be independently obtained, and not contaminated by biases, motivations, interests or perspective of the inquirer or others (Mugenda, 2008). The data collected for this study might be somewhat contaminated by interests and perspectives from the interviewees, since they could be inclined to give a good impression of the bank they represent. In order to minimize this problem all interviewees appear anonymously in the study. We as inquirers have great interest in producing a study with high reliability and objectivity, and have therefore not consciously contaminated the data collected in any way. However, the purely theoretical knowledge regarding the subject studied, has probably led us to perceive things a certain way.
III. Theoretical Framework

In this chapter the framework used in the thesis will be explained to the reader. The chapter is divided into two parts, the first containing the challenges and risks in banking, the portfolio approach of credit risk management and the regulatory issues. In the second part credit derivatives will be explained and the benefits and dangers with their use will be discussed.

3.1. PART I – BANKING

This part begins by familiarizing the reader with the challenges and risks in the banking sector. It also explains the portfolio approach to credit risk management. In order to assure the balance and risk management, a bank spends a lot of time and money, measuring and valuating risk (Bessis, 2002). Therefore we will quickly introduce the reader to different kinds of risks in order to promote a better understanding for the banking sector.

3.1.1. Challenges in Banking

Customers come to banks with funds that are to be invested, contacting the bank with the task of investing capital, which also implies managing the challenges of credit valuation and administration. Included in these tasks are the evaluation of the future borrower and his or her ability to repay the loan. Since a borrower’s economic situation can change, continuous valuation of the risk and default probabilities of the loan during its lifetime is also crucial (Bessis, 2002).

Since the bank carries out a task from one client to another, the main concern of a traditional bank is to find as many clients that want to invest money, as clients that wants to borrow money (Saunders & Allen, 2010). The client that wants to invest money comes in the form of financial institutions or as clients that have private deposits in the bank. The borrowers are anyone who takes a loan from the bank, or issues a bond that the bank buys (Caouette, 2008). Banking is therefore about the balance between capital and credits and the interest rates applicable. A bank or financial institution must manage their balance sheet to maintain a balance between assets and liabilities, that is, mainly between financial assets, capital and other kinds of funding (Bessis, 2002).
In the 1980s the banking sector went through great changes. Internationalization, new technologies and deregulation created new opportunities but also increased the competition. New conditions were incentives for banks to come up with new ideas, while the margins from the old, traditional banking decreased. Financial innovation has created new markets for more complex instruments. This developed banking structure provoked the implementation of capital requirements, which in turn has lead to new “off-balance sheet” instruments. Not only has competition increased among banks, but also from nonbank financial intermediaries that offer substitutes to the banks’ products. This is an incentive for banks to adopt the trends and behaviour on the markets (Greuning & Bratanovic, 2009).

Off-balance sheet instruments are derivatives that have no balance sheet impact. Due to securitization, which entails selling loans in different forms to third party investors, these contracts do not have to appear on the balance sheet. Credit derivatives are such contracts, even though more and more documentation exists regarding how to treat such derivatives on balance sheets (Ong, 2006). The use of these instruments has caused an increased correlation between different risks in banking, within individual banks but also in the whole banking environment (Greuning & Bratanovic, 2009).

Proprietary trading is to conduct trading for your own accounts and taking own risks. This is common in Sweden and all the large commercial banks in Sweden are trading for their own accounts, but not to a particularly large extent. In Europe there is no ban against proprietary trading, but it is discussed in the USA. The topic in Europe is to make sure that the proprietary trading in banks does not jeopardize the clients’ deposited funds (Ring, 2010).

3.1.2. Credit risk
A credit is an expected payment within a limited time. The chance that this expectation does not occur can be defined as the credit risk.

“An element of credit risk exists whenever an individual takes a product or service without making immediate payment for it.”

(Caouette, 2008)
Even though banks are exposed to several different risks, credit risk is the oldest and most important in banking. In Sweden, public loans make up 60 per cent of a bank’s assets, which make credit risk the greatest risk on a bank’s asset side (Sveriges Riksbank, 2010). As with all other financial risks, the reason for why actors are willing to undertake credit risk is to receive a financial compensation, called a risk premium. The risk premium is the excess premium over the risk free interest rate required by the market for accepting additional risk exposure. The risk premium of a loan or a bond is referred to as the credit spread. The credit spread depends on the current credit worthiness of the credit, which is given by a rating agency. The credit spread is affected by fundamental factors, which can be both macro- and micro oriented (Anson et al, 2004).

The macro oriented fluctuations depend on the economic cycles. A company’s corporate cash flows are strongly correlated to the economic wealth, which means that in an economic downturn the company will have more difficulties in meeting its bond obligations. Investing in an economic recession therefore implies greater risk, hence a wider credit spread. Different industries can be more or less sensitive to economic cycles. The credit spread is affected by the anticipated economic future since the behaviour of investors often reflects their anticipations of the future (Anson et al, 2004).

The micro fundamentals are based on an individual corporation’s capacity to satisfy its bond obligations. This is closely linked to the credit downgrade risk, which is the risk that rating agencies, after evaluating the credit quality of a corporation, worsen the credit worthiness of the company that issued the bond. This will increase the credit spread, hence reducing the price of the bond (Anson et al, 2004).

One can organize the credit risk into three categories; credit default risk, credit spread risk and downgrade risk.

- **Credit default risk** occurs when the expected payment of the credit is not made within the given time. This often inflicts a total financial loss of the credit to the loan giver.
• **Credit spread risk** is the risk that the value of a credit will change due to fluctuations in the credit spread used in the marking-to-market of a product, which is valuing a product after its current market value. Whenever the credit spread of a credit in a bank’s portfolio increases, the market value of that credit will decrease and inflict a financial loss to the portfolio.

• **Downgrade risk** is the risk that the credit rating of a bond changes during its lifetime. It affects the credit in the same way as credit spread risk, changing the market value of the credit.

All these types of risks can induce value changes in a loan portfolio, and must therefore be measured and managed (Anson et al, 2004). Greuning and Bratanovic (2009) point out three important policies in credit risk management; a bank should limit the credit risks, classify the assets and anticipate loss. The first relates to concentration, overexposures and diversification. The second means a constant evaluation of the credits in the loan portfolio and the third points out the importance in the provision in future loss a bank has to take into account.

Duffie and Singleton (2003) mention the importance of risk measurement and there are several factors that should be included, such as the sources of risk, their probability distributions and methods to measure changes in the quality and default of the many counterparties.

Value at risk (VaR) is a widely used risk measure, which predicts a portfolio’s maximum amount of loss in market value, given a specific probability level and time horizon. The confidence level and time horizon vary depending on the user and the purpose. Banks often use a one-day horizon with a confidence level of 99 % for their internal calculations, which means that with a certainty of 99 % the bank will sustain a loss of the VaR value every hundred days (Duffie & Singleton, 2003).

### 3.1.3. Interest rate risk

If a bank has credits to different customers with floating interest rates, and has mainly fixed interest rates on its funding, it is exposed to interest rate risk. When there is a
decrease in the risk free rate, the cash flow from the assets will decrease while the cost of funding will remain the same, and the bank will suffer substantial losses. For this reason it is important to match the interest rates of the assets and liabilities, so that a change in the risk free rate affects both sides of the balance sheet similarly (Bessis, 2002).

3.1.4. Liquidity risk
The balance between the amount of assets and liabilities is crucial for a banks existence. A discrepancy between the two is called a liquidity gap. An excess of assets generates liquidity risk, which is the risk of not being able to raise funds without excess costs. An excess of liabilities in turn can generate interest rate risk, since that bank does not know in advance to what interest rate the bank will be lending or investing the excess funds available (Bessis, 2002).

3.1.5. Counterparty, concentration and systemic risk
Banks evaluate and supervise the creditworthiness of their customers, but also the counterparties with whom they are trading financial instruments (Greuning & Bratanovic, 2009). Counterparty risk is the risk that the counterparty involved in a transaction, in this case a derivative contract, is not able to meet its required payment obligations.

“Counterparty risk is the risk that the counterparty to a credit derivative contract will default and not pay what is owed under the contract.”

(He, 2010, page 12)

The use of credit derivatives involves counterparty risk. The risk of financial loss in a position hedged with a credit derivative is always lower than the credit risk of the underlying asset. The credit risk of the underlying asset is the probability that the underlying asset will default. For a swap to default, the underlying asset has to have decreased in value, if not defaulted, and the counterparty with whom the contract was entered, must be unable to fulfil his commitments (Caouette, 2008).

Counterpart risk is a very important element when dealing with derivatives that need to be managed (He, 2010). Using regulations that force the party who have obligations to
set aside a margin or collateral reduces the risk of sustaining severe losses (Saunders & Allen, 2010). Counterparty risk can be further reduced by choosing a counterparty that has a low default correlation to the reference asset, since the risk of a double default then is reduced (Choudry, 2006; Bomfim, 2005).

For a bank to limit the credit risks it should consider its exposures’ size and origin. Without this management, a possible outcome would be overconcentration, which is simply stated a lack of diversification. Overconcentration is a result of excessive exposure to a single borrower, product, geographic area, sector or counterparty. These concentrations of credit risk made banks experience big losses due to the similarity in credits. There are now regulations that must be followed by all financial institutions and banks that state a limit for the exposure the institution can have to a single obligor (Caouette, 2008).

Systemic risk is the risk of collapses or dysfunctionality in the financial markets through a chain reaction of defaults or through widespread disappearance of liquidity. The problem of procyclicality has to be addressed in order to avoid too much systemic risk. This risk is measured to reduce the chance of financial distress where a given firm’s negative effects affect the rest of the financial system. It can be financial guarantees provided by taxpayers or financial institutions. Risk-based minimum-capital requirements can mitigate systemic risk (Duffie & Singleton, 2003).

3.1.6. Portfolio approach in banking
In modern banking a portfolio approach is applied to deal with the many credits given to different customers. In the past, when banks mostly concentrated on analysing individual loans, it was not uncommon that the banks created excessive concentration of credit risk (Caouette, 2008).

The portfolio approach originates from the diversification theories of Harry Markowitz that affect the subject of correlated securities and the fact that having a portfolio of negatively correlated securities reduces the volatility of the portfolio returns (Markowitz, 1959). Diversification can be obtained by investing in, for example different market sectors, geographical areas or non-correlated assets (Hull, 2003) As an example, the manager of a credit portfolio with overconcentration to a single borrower would try
to get out of this exposure and instead enter into a new exposure with the same properties but one that does not correlate with the rest of the portfolio. This action would reduce the overall portfolio risk (Morgan, 1999). The Modern Portfolio Theory is sometimes used in loan portfolio management, which means that the loan portfolio of a bank would be optimized in quite the same way as a portfolio of other assets such as stocks. But since loans and bonds are traded over-the-counter with little or no information, it makes it difficult to collect historical data in order to calculate returns, variance, covariance and correlations (Saunders & Allen, 2010). A previous study has tried to prove the efficiency of portfolio optimization in credit management. The conclusion is that it requires extensive statistic information about the credits in order to be reliable (Gustafsson & Ingebrand, 2005).

The portfolio approach is not always an optimal strategy in the lending process. Banks often want to maintain their good relations with customers by granting those credits if their rating is satisfactory. This presents a problem since it can lead to large exposures to single companies and create concentration risk. One way to circumvent this dilemma is by using credit derivatives (Saunders & Allen, 2010).

3.1.7. The Basel III framework
In 1988 the Basel Committee released a regulatory framework for minimum capital requirements called Basel I, in order to increase the financial solidity in financial institutions. A few years later a new and revised version of the Basel framework was implemented. The new Basel II accord was meant to be a modern update of Basel I with more flexibility and transparency. Today a third version of the Basel framework is about to be released, with fundamental reforms built on lessons from the recent financial crisis of 2007-2010 (BIS, 2011).

The Basel III framework points out several changes in order to reinforce the resilience of banks and financial institutions, this implies both micro and macro reforms. The macro approach strives to obstruct the systemic risks that arise when banks and financial institutions become too interconnected and to prevent procyclicality. Procyclicality can arise in an economic downturn, when companies have more difficulties meeting their payment obligations, which increase the risk level of the firms. During the financial crisis of 2007-2010, many companies were highly leveraged and with their increased risk
profile, funding expenses went up. The market forced companies to diminish their leverage, which turned down the prices of assets. On top of that, margining and collateral practices increased, which had a further negative effect on the situation of the companies (BIS, 2010).

In the new framework BIS (2010) wants to create incentives for market participants to use central counterparties to increase the transparency and decrease counterparty credit risk. Examples of other improvements are increased capital requirements, new risk weights, restricted leverage ratios in banks, create countercyclical buffers and to form standards for the financial market infrastructure.

Sweden’s central bank asserts that the four largest banks in Sweden are well capitalized compared to international banks. They also imply that Swedish banks are well prepared to adapt the new regulatory capital requirements from the Basel committee. Banks’ lending to companies might be more limited though, with the new stricter rules (Sveriges Riksbank,, 2010).

According to the Swedish financial regulator in 2007, institutions should have guidelines for their use of credit derivatives, guidelines that connect to the overall strategy of their risk management. Further they acquire routines and systems to follow up and handle contingent concentrations of credit risk that arise from these instruments (Finansinspektionen, 2010).
3.2. PART II – CREDIT DERIVATIVES

This part begins by explaining what a derivative is, and what they may be used for. The different credit derivatives included in this study will be explained and defined. The issue of the benefits and the dangers associated with their use will also be discussed.

3.2.1. What are Derivatives?

New financial instruments with tailor-made characteristics are constantly developed to meet the requirements of different actors; while some seek protection others are looking for riskier exposures in order to generate higher portfolio returns. (Anson et al, 2004). The remarkable growth in the derivatives market the last two decades is due to the increased trading in swaps and options as well as the development of new financial products. These instruments create various possibilities, but the explosion on the market has made it difficult for regulatory instances to control and to supervise their utilization (McIlroy, 2010).

A derivative is used to transfer risk between two or more actors. The value of this financial instrument is derived from the price of an underlying asset. The underlying asset can be equity, a commodity, an interest rate, a currency or a credit. (Anson et al, 2004)

3.2.2. Credit derivatives and their main uses in banks

Credit derivatives allow banks to trade credit risk, without trading the entire credit. The credit risk from a loan is efficiently transferred to other market participants. This makes banks able to grant loans without exposing themselves to losses in the case of default of missed payments (Saunders & Allen, 2010). A bank’s credit portfolio might be very sensitive to credit spread changes. In order to tackle this exposure credit derivatives can be very practical (Anson et al, 2004). Before the introduction of credit derivatives on the financial markets, there was no way to efficiently trade credit risk (Bessis, 2002).
“Credit derivatives are instruments serving to trade credit risk by isolating the credit risk from the underlying transactions. The emergence of credit derivative instruments is a major innovation because, unlike other risks, such as market or interest rate risk, there was no way, until they appeared, to hedge credit risk.” (Bessis, 2002, page 722)

Credit derivatives hedge the credit risk in a loan or bond. Not only is this practical, but for some customer relations, crucial (Bessis, 2002). Credit derivatives can facilitate the management of these risks. For example, consider a bank that has a large exposure to a single client, which the bank’s management does not feel comfortable with. One option would be to sell the loan to another bank or financial institution in the secondary loan market, which would relieve the bank of its exposure to the client. However, in order to sell a loan in the secondary market, the bank generally needs to notify and sometimes even get consent from the borrower. This does not always constitute good customer relations, since it might be difficult to explain to a customer that the bank considers him too risky but still wants him as a customer for future deals. This option is therefore not always optimal (Bofim, 2005).

Another option is for the bank to purchase protection for its exposure in the credit derivatives market. By acquiring protection the bank will get compensation from a third party if the client defaults, and is able to synthetically form the same result as if it would sell the loan. However the difference is that this is made anonymously and the bank does not have to put its customer relations at risk (Bofim, 2005; Choudry, 2006). Credit derivatives protect the buyer from credit events which do not only involve credit default, but also events like downgrade in credit rating or a change in credit spread that reaches above a specified level (Choudry, 2006).

3.2.3. Credit derivatives in general
It is important to remember that credit derivatives can be used both for avoiding and taking on credit risk. If there is a buyer of protection there must obviously be a seller. The seller in the transaction takes on risk, while the buyer avoids risk (Bomfim, 2005). Let’s not forget that the risk does not disappear, but is transferred to another market participant (He, 2010).
“One fundamental reality of credit derivatives is that they do not eliminate credit risk. They merely shift it around. As a result, when the credit cycle turns and default rates rise, someone, somewhere, will lose money.”

(He, 2010, page 10)

There are many forms of credit derivatives with different structures and uses. Since anyone can trade these instruments, not everyone does it for the same purpose. The different objectives might be hedging strategies, funding alternatives, leverage, regulatory capital or speculative investments. Some of the main users are banks, insurance companies and investment funds, but there are also other users such as hedge funds and industrials (Schönbucher, 2003). Regulatory frameworks, both international and national, can limit the use of credit derivatives, but also organizational restrictions (Economist, 2011).

According to Nyberg (2007) credit derivatives can seem very complex, but the principles are simple, working as a kind of insurance. The instruments differ in their structure, returns, payment procedures and complexity. A Credit Default Swap (CDS) is a commonly used instrument that enables a simple transfer of credit risk (Anson et al, 2004), often used for hedging purposes in banks (Bofim, 2005). The Collateralized Debt Obligation (CDO) was very popular up until the financial crisis due to its attractive characteristics (The New York Times, 2010). A CDO does also transfer risk but with a more complex structure than a CDS (Greuning & Bratanovic, 2009; Anson et al, 2004). A Total Return Swap (TRS) enables banks to fund the exposures of their customers towards a specific position, which in turn gives the bank protection against credit events (Hull, 2003). In a Credit Linked Note (CLN) the protective payment is made up front, if there is no credit event during the life of the contract, the money is paid back to the investor (Anson et al, 2004). The iTraxx are an indexed CDS, which enables hedges towards a whole market sector or geographic area (Choudry, 2006).

Single-name credit derivatives are instruments that have one underlying asset, compared to for example index swaps and CDOs that have several (Lehman Brothers, 2001). The credit risk of the underlying bond can be sold and transferred by several derivatives contracts, for example it is possible to buy more than one CDS on the same
underlying asset (Nyberg, 2007). Further credit derivatives can be funded or unfunded instruments. The difference between an unfunded and a funded instrument is the payment made by the investor. With a funded instrument the protection seller, makes an up-front payment to the protection buyer when the note is bought. With an unfunded credit derivative, the investor does not make an upfront payment to the protection buyer, but has the obligation to compensate the protection buyer if a credit event occurs (Choudry, 2006).

“Credit derivative instruments enable participants in the financial market to trade in credit as an asset, as they isolate and transfer credit risk.”

(Choudry, 2006, page 5)

Image 1, Isolation of risk elements with credit derivatives.

Inspired by Choudry 2006.

The image above compares a bond or loan with a credit derivative. The value of the bond depends of the credit risk, the interest rate risk, and the investor’s funding costs. In a funded credit derivative like for example a CLN, the value is derived from the credit risk and the funding cost. However, with unfunded credit derivatives like CDSs, the funding aspect is removed, leaving only the credit element. This is because a CDS does not
require an up-front payment and there is no funding to be made by the investor (Choudry, 2006).

3.2.4. CDS – Credit Default Swap
One of the most important new instruments is the Credit Default Swap (CDS) that was created in 1995 by the American investment bank J. P. Morgan (McIlroy, 2010). Among all credit derivatives the CDS might be the simplest way of transferring credit risk. If a market participant is not willing to bear the risk for an exposure, he can buy protection from someone else who is more suitable or interested in having this risk, a credit protection seller. In that way the risk has been transferred from one participant to another (Anson et al, 2004).

A single-name CDS can either have an underlying reference entity or a reference bond. With a reference bond, protection is being bought for a specified bond. A reference entity is an issuer of debt and any of its bonds could be delivered given the constraints of the contract. If a CDS has more than one reference entity the contract is referred to as a basket default swap, which normally has three to five reference entities (Anson et al, 2004). However, in this chapter a single-name credit default swap is described.

If the reference cannot fulfill its obligations or defaults, it is called a credit event. The protection buyer has to pay a fee (premium) to the protection seller in exchange for a payment (protection) in the occurrence of a credit event (Anson et al, 2004). The payment from the protection seller can be either cash settled or physically settled, this is specified in the CDS contract. In a cash-settled CDS the underlying asset is valued at the time of the credit event. A bond for example can have some value, even though the company who emitted the bond has defaulted, since there can be money collected when the company is wound up. The protection seller then pays the difference in value between the par value of the bond, and its current value at the time of the credit event. In a physically settled contract the bond is physically delivered to the protection seller in exchange for the par value of the bond (Lehman Brothers, 2001).

The picture below demonstrates the use of a single-name CDS. There is a protection buyer with a reference entity or a reference bond. In order to get protection a premium
is paid to the protection seller in exchange for a contingent payment in the occurrence of a credit event, this is called a swap premium.

![Diagram of a single-name credit default swap](image)

*Image 2, Single-name credit default swap.*
*Inspired by Anson et al, 2004*

When the parties enter into a single-name CDS contract the scheduled length of the instrument is set up, which is normally five years. The instruments are mostly traded over-the-counter (OTC) and there are both standardized and customized contracts. If there is a credit event, the protection seller will make a payment and the contract comes to an end. A CDS does not work like an option where the premium is paid in advance (Hull, 2003). In a CDS the premium is normally paid quarterly and the price depends on the credit worthiness of the reference (Anson et al, 2004). As has been shown a CDS can transfer the credit risk from one party to another, but the risk that the counterparty in the CDS-contract will default still remains. The event that both the obligor and the protection seller default is called a “double default” and is the only way to suffer a loss if properly hedged with a CDS (Bessis, 2002).

Credit default swaps are also frequently used as indicators for economic health of nations, sectors and companies. The price of a CDS shows the premium that the protection buyer has to pay, also referred to as the CDS spread, which changes according to the supply and demand for this specific CDS. Like an insurance premium, the CDS
spread shows the risk anticipated by the actors on the market (Flannery, Houston & Partnoy, 2010). Similarly the credit spread of a CDS on a treasury bill issued by a nation, indicates the market’s thoughts of the risk of that nation not being able to pay the bond holder (Business Insider, Feb. 2010). CDSs are used as a benchmark for the value of a nation’s debt (McFarlin, 2011). The picture below from Bloomberg shows the spreads of CDSs on government bonds for five nations. As shown, the CDS spreads differ significantly between countries in different financial situations.

3.2.5. CDO – Collateralized Debt Obligation
In 1988 the first Collateralized Debt Obligation (CDO) was created. This instrument is classified as an asset-backed security, and was the fastest growing instrument within that market during the 1990s (Anson et al, 2004). The structure of a CDO is more complex than other credit derivatives and failures in accurate pricing of asset-backed securities still cause global concern (Greuning & Bratanovic, 2009). An asset-backed security is a bond structure, where credit risk can be transferred from the loan portfolio of a bank into the portfolio of an investor. The value depends on an underlying collateral of assets, (Anson et al, 2004).
A CDO requires a special purpose vehicle (SPV), which is a company that is set up to manage the instrument. The SPV has a pool of assets, made up of bonds and commercial bank loans. The performance of the issued notes is derived from the underlying pool of assets (Duffie & Singleton, 2003).

The notes issued are divided into different tranches and rated by at least one rating agency, giving the tranches different priorities. This means that an investor of the most senior tranche, the best rated, will receive his payment first. An investor of a subordinated tranche, or the most junior note, will not get paid until the investors of the superior tranches have received their payments and if the underlying pool of assets does not perform well enough the investor might not get paid at all. Since the junior note implies the highest risk, it has a higher expected return than the underlying pool of assets (Anson et al, 2004).

As mentioned above, the use of CDOs grew very fast during the 90s; the instrument seemed to offer several advantages to its users. In a bank’s perspective advantages were factors like regulatory reliefs, increased return on capital, to free up lending or a cheaper source of funding. There are different kinds of CDOs serving different purposes, for example a balance sheet CDO where the main point is to remove assets from a balance sheet, in order to decrease the regulatory capital requirements (Anson et al, 2004). The ownership of loans is being transferred to the SPV. This can be contrasted with a synthetic CDO where only the risk of default, in the form of CDSs, is transferred to the SPV. This means that in a synthetic CDO, the underlying pool of assets consists of CDSs (Duffie & Singleton, 2003). Synthetic CDOs accounted for over 10 percent of the total CDOs issued in 2007 (The New York Times, 2010). Another form of CDO is the arbitrage CDO, which is used in order to generate extra value and returns from an active management of the underlying pool of assets (Anson et al, 2004).
The picture above illustrates the features of a CDO. The originating bank holds a portfolio of loans, for which protection is being sought. The SPV gives default protection to the originating bank and retains the assets in a collateral pool. In a synthetic CDO, the pooled assets consist of CDSs. The notes issued by the SPV, depend on the performance of the underlying pool. The CDOs are divided into different tranches, dependent of their credit rating.

CDOs became very popular before the financial crisis of 2007-2010 and were traded in enormous volumes. Thomson Reuters estimates that the sales of CDOs peaked in 2006 to $534.2 billion, followed by $486.8 billion in 2007 (The New York Times, 2010).

### 3.2.6. TRS - Total Return Swaps

A Total Return Swap is, as the name suggests, an exchange of the total return on the underlying asset. TRSs are usually used as financing tools. For example, a financial institution (FI) has a bond on which it wishes to buy protection. A customer wants the exposure of the bond, but does not have the finance to buy the reference bond. By entering into a TRS contract the FI still owns the bond, but gives all revenues to the customer, for a compensation of STIBOR plus, for example 25 basis points. At the end of the contract the FI also has to pay any positive price changes in the asset that have
occurred. If the price of the asset has decreased, the customer has to reimburse the FI for the capital loss. Therefore the customer has the exposure in case of default (Hull, 2003).

To summarize, a TRS works as if the customer borrowed money from the FI in order to buy the reference bond, and therefore had to pay interest to the FI (STIBOR + X basis points). The additional basis points added reflects the risk that the FI is exposed to if the customer is to default, and therefore varies according to the credit rating of the customer (Hull, 2003).

The picture below illustrates a TRS contract. A TRS allows Bank B to take on a synthetic exposure to the reference asset and gives protection to Bank A in the occurrence of a credit event. If the reference entity has increased in value by the end of the contract, Bank A has to pay these positive price changes.

Image 5, Total Return Swap. Our interpretation.

The advantages of using TRSs are that it allows the customer to benefit from an asset without having the asset on its balance sheet. It also makes it possible for the FI to buy protection against a capital loss on the reference bond (Dufey, 2000). If the FI enters a
TRS without owning the reference bond, the TRS allows the bank to take a short position in the bond (Hull, 2003).

3.2.7. CLN – Credit Linked Notes

As mentioned earlier, credit derivatives can be funded or unfunded. A Credit Linked Note (CLN) is an example of a funded instrument, which means that the payment by the protection seller is made up front. If there is no credit event during the life of the contract, the protection buyer will have to pay the par value of the issue at maturity. If the opposite occurs the protection buyer will pay an amount less than the par value of the note (Anson et al, 2004).

The performance of the CLN is linked not only to the underlying asset but also to its issuing entity. The issuer of a CLN decreases the liabilities of its loans by transferring the credit risk to the investor, the protection seller. If there is a credit event, the amount to be repaid by the end of the contract will be reduced. The protection seller will obtain higher coupons than the underlying assets and higher returns than other investments on the market. Therefore, if there is a low incidence of credit events of the underlying assets the protection seller will earn an enhanced return. A CLN enables an investor to take on a synthetic exposure it might not have been able to have made another way, due to investment restrictions for certain instruments below a certain investment grade (Anson et al, 2004).

The picture below illustrates a CLN. Bank A seeks protection for the reference entity and receives an upfront payment from Bank B, the protection seller. Bank B will receive the coupons from the reference entity. If there are no credit events during the life of the contract, bank A will have to pay back the par value of the reference to Bank B. In the occurrence of credit events, the amount to pay back by Bank A will be reduced.
3.2.8. Credit default swap index (iTraxx)

iTraxx are index portfolios of CDSs which together form a liquid product which may be used for diversifying and to hedge certain positions. iTraxx are viewed as benchmarks due to their high liquidity. Their bid-offer spread is very low at 1-2 basis points, compared to about 10-30 basis points for a single-name CDS contract, therefore investors often view the iTraxx as a key indicator for the credit market (Choudry, 2006).

For example, the Dow Jones iTraxx Europe, which went live in March 2006, is made up of 125 investment grade, very liquid CDSs (Choudry, 2006). All CDSs in the indices are weighted the same, and the indices are renewed every six months. Using iTraxx to hedge risk sometimes reduces costs due to the indices high liquidity. They can also be used to hedge a position of a bond which may not have a CDS attached to it or gain exposure to diversified portfolio of credit (Wagner, 2008). Indexed CDSs are also used as components of synthetic CDOs (Saunders & Allen, 2010), also called index tranches (Wagner, 2008).

The Dow Jones CDX North American Investment Grade index was created in September 2003. Later in November 2004 the International Index Company iTraxx, which covers credits in the European Union, Japan and non-Japan Asia, was created. (Saunders & Allen, 2010)
There are also sub-indices to these indices that cover sectors, regions or sub-investment grade CDSs, an example is DJ iTraxx Europe energy, which covers the energy sector in Europe. This makes it easy to exploit market beliefs, by for example buying single-name CDS and selling an iTraxx for the same sector. (Wagner, 2008)

### 3.2.9. OTC and CCP clearing

The new Basel accord includes strengthened capital requirements for counterparty credit risk, arising through over-the-counter (OTC) derivative exposures (BIS, 2010). This might provoke a shift in the derivatives market, from trading OTC towards a central clearing partner, since the OTC-trading will become more expensive, relative to Central Counterparty (CCP) clearing (S&P, 2010).

An OTC contract is a bilateral agreement between two parties that agree on how a particular trade is to be settled. OTC trades enabled great flexibility in the contracts since the two parties can form the contract however they want. OTC trading implies counterparty risk to the other party in the contract. By using a central counterparty clearing house the counterparty risk is replaced by credit risk to the CCP. In a CCP trade, the two parties of the contract turn to the CCP. The CCP in turn, guarantees payment to both parties if applicable. This means that the identity of the counterparty with whom you initially entered the contract with, does not really matter. The positive aspects of using a CCP to clear the trades in the credit derivative markets are that the CCP logs and shares their information regarding exposures and therefore removes the lack of transparency that OTC trading implies (Culp, 2004).

"...because OTC contracts are on a bilateral basis rather than through central counterparties (CCPs or exchanges), there is little transparency about the nature and location of risks arising in these markets, making assessments of counterparty risk more difficult."

*(H.M. Treasury, 2009, page 80)*

The discussion today brings up regulatory issues such as limited OTC, standardized products, better transparency and higher collateral. One way to mitigate the systemic risk would be to initiate stricter limits for counterparty exposure (McIlroy, 2010). Today
the majority of trades on the CDS market are made OTC and the transparency in the CDS market is problematic (Bowman, 2008).

"The market is totally unregulated and those who hold the contracts do not know whether their counterparties have adequately protected themselves."

(George Soros, quoted in Bowman, 2008)

Since the financial crisis and the collapse of Lehman Brothers, the importance of transparency and safety have been brought up. The effort to put a CCP for credit derivatives in place has therefore increased. The aim of such a CCP would be to be able to reduce the impact of default by a big market participant and reduce systemic risk if enough market participants were to use it (Grant, 2008).

3.2.10. Dangers with credit derivatives

The last decade the use of credit derivatives has increased logarithmically. The most used instrument in the financial markets today is the CDS. The problem that arises with the increased use of CDS is the significant counterparty risk that follows. In the financial crisis of 2007-2010, not only did the concentration risk, generated by the use of CDS, affect the investment banks and other financial institutions, but also since the impact was so powerful on the US financial market the US government was greatly affected, having to intervene. Many of these dangers with credit derivatives can be traced to the way these instruments are traded. With the current over-the-counter trading it is difficult to monitor and measure how much risk there is, and where it is (McIlroy, 2010). Warren Buffet stated as early as 2002 that the use of credit derivatives was creating risk opacity in the financial institutions that posed grave danger to the financial markets.

“When Charlie and I finish reading the long footnotes detailing the derivatives activities of major banks, the only thing we understand is that we don’t understand how much risk the institution is running.”

(Buffet, 2002, page 16)
Even though credit derivatives have many positive aspects and can be used to greatly reduce the risk that a financial institution may carry (Morgan, 1999), the dangers must be taken seriously (Buffet, 2002).

“In my view, derivatives are financial weapons of mass destruction, carrying dangers that, while now latent, are potentially lethal.”

(Buffet, 2002, page 16)

As Buffet had predicted, these credit derivatives had a huge negative impact in financial institutions during the financial crisis. The American investment bank AIG had before and during the crisis accumulated $450 billion of credit default swaps. When AIGs credit rating was downgraded in September 2008, they were unable to post collateral for these positions and collapsed (McIlroy, 2010).

Another danger is “naked CDS” positions. A naked CDS position is when someone buys a CDS without owning the underlying asset. This means that that actor only benefits from a default event, and is not buying protection for his own assets. In an interview in January 2009, Eric Dinallo, the former superintendent of the New York State Insurance Department, estimated that as much as 80 percent of the credit-default swaps traded on the market was traded by firms, not owning the underlying asset (Kopecki & Harrington 2009). Some argue that since “naked” CDS positions are such a big part of the CDS market, banning them would result in even worse problems regarding the decreased liquidity of the market (Cotterill, 2008). Some countries have temporarily banned naked CDS positions of sovereign debt. The reason for this is that since CDSs are used as a benchmark for valuing a countries debt, speculation has an indirect effect on the cost of borrowing money in the country (McFaril, 2011). The problem with naked positions is further complicated by credit derivatives allowing actors to buy several contracts on the same underlying asset or entity. This can be problematic in the occurrence of a credit event, when the underlying might have to be delivered (Nyberg, 2007).

Liquidity is an import factor for credit derivatives to work. The financial actors are relying on the liquidity when trading these instruments. If there is an economic
downturn with many credit events, there might no longer be any buyers or sellers, which might greatly affect prices (Nyberg, 2007).

Even thought credit derivatives are a very practical way for banks and financial institutions to control the amount of exposure they have to a certain counterparty, these possibilities also loosen the incentives of a strict lending process (Saunders & Allen, 2010). The use of CDS can encourage a lending institution to force a borrower into solvency, if the sum collectable by the CDS hedging the loan, is greater than the value of the loan itself (Featherby, 2009). In this way some investors take a more predatory approach, simply because it could economically viable to do so (Young et al., 2009). In the financial crisis of 2007-2010, we witnessed how low incentives to careful lending due to the existence of derivatives could have a worldwide impact on the financial markets (Saunders & Allen, 2010).

He (2010) argues that the financial markets are not yet prepared enough to handle CDSs trade volumes traded today. Measuring the exposure taken on in a credit derivative contract can be very difficult and many market participants do not have the knowledge or resources to handle it adequately. Many investors rely on rating agencies to assess the risk of their derivative transactions, but it is argued that the fact that the same rating scale is used for credit derivatives as for corporate debt is misleading since some credit derivatives are much more sensitive to the credit cycle (He, 2010). S & P and Moody’s have been accused of knowingly assigning false credit ratings to complex instruments, which during that financial crisis had severe consequences. During the peak of the housing market in 2005-2007, many credit derivatives were given AAA-rating, and many of the investments defaulted soon thereafter. Most of the ratings have now been cut severely by Moody’s and S & P (Bernard, 2010).

“...credit derivatives are posing some significant risk management challenges. Many of these challenges reflect the immaturity of the credit derivatives market. For the credit derivatives market to develop and mature, market participants must address these risk management challenges”

(He, 2010, page 16)
The credit derivatives have become a common tool when dealing with credit risk and increased the financial markets efficiency and stability in the years before the financial crisis. This very stability may have increased risk taking and leverage in financial institutions, since it enabled them to lay off credit risk at will (Berner, 2007). Credit derivatives differ from traditional financial instruments in the sense that they are off-balance sheet (Caouette, 2008). The Basel II framework did not have sufficient regulations for off-balance sheet derivatives (BIS, 2010) which meant that a company could achieve more leverage, and more returns by taking on more exposure. Since the exposures did not show up on the balance sheet, it did not contribute to higher capital requirements (Caouette, 2008).

“...the greater the degree of leverage in any economy, the greater its vulnerability to unexpected shortfalls in demand and mistakes.”

(Alan Greenspan, Board of Governors of the Federal Reserve System, 2002)

One of the more complex credit derivatives is the CDO. The problem with the CDOs is that they are so complex that they have often been shown to be wrongly rated. Bankers issued CDOs that contained risky assets like subprime loans instead of corporate bonds, and created their own mortgage companies in order to relax the standards on what assets they would accept. Since the instruments were so complex, many investors were not aware of what their CDO actually contained. (The New York Times, 2010).

“As An ostensibly top-rated triple-A tranche might contain bottom-of-the-barrel subprime mortgage junk. That was supposed to make the tranche safer through diversification. In practice, however, it compounded the effect of a sharp, nationwide decline in home prices.”


The reason for the popularity of CDOs before the crisis is that the instrument is divided up into tranches with different credit ratings and the less risky tranches sometimes got investment grade ratings. This enabled institutions whose internal restrictions and policies normally prevented them from trading in credit derivatives or complex instruments that had relatively high payoffs. Rating agencies submitted ratings that were very misleading and investors did not realize how much risk they were taking on (Bernard, 2010).
IV. Empirical findings

In this chapter the empirical findings will be presented. This consists of the information gathered during the interviews with the Swedish banks. The chapter has been divided into five parts, the first presenting short information about the cases and the interviewees, the second explains to what purpose credit derivatives are used in Swedish banks, the third describes the practical sides of the use of these instruments and the fourth part will present the positive and negative aspects of credit derivatives. Finally the fifth part will explain the recent changes in the credit derivatives market.

4.1. Cases and interviewees

**Bank A**, one of the four largest commercial banks in Sweden. Three employees working in the bank were interviewed. One was a trading risk manager, and the other two counterparty risk managers. The trading risk manager had extensive knowledge of how credit derivatives were used in the bank. The counterparty managers’ tasks are to measure and manage counterparty risk, which is very important when dealing with credit derivatives.

**Bank B**, one of the four largest commercial banks in Sweden. The employee interviewed was a trading risk manager who had been working for the bank for many years. He was responsible for the trading risk division in the bank and was very knowledgeable. The bank has a quite restrictive policy concerning credit derivatives, which confirms the banks values.

**Bank C**, is a large bank specializing in international financing. This bank is a big user of credit derivatives and has been so for a long time. The responsible person for risk transfer who has been in charge of hedging their exposures since they first started to use credit derivatives was interviewed as well as the responsible person for the risk division who does risk measurements and evaluations.

**Bank D**, one of the four largest commercial banks in Sweden. In this bank a credit researcher was interviewed. The tasks of the credit researcher are different from the
other interviewees and he does not have the same information about the bank’s policies concerning credit derivatives, therefore bank D is not always represented. However, the credit researcher contributes to additional information of how credit derivatives can be used and supplementary information was gathered from the bank’s annual report of 2010.

The interviews were started with a short presentation of the interviewees, describing their responsibilities and tasks within the bank. The first part of the interviews brought up the purpose and uses of credit derivatives; what instruments are used and why. In the second part questions about practicalities, risk control and directions were asked. Thereafter the possibilities and dangers of credit derivatives were discussed, as well as the changes in regulations and trends, in connection to the recent financial crisis of 2007-2010.

4.2. The purpose

Here are described to what purpose credit derivatives are used within the four Swedish banks. The section is divided into different uses of the instruments where information from the interviewees is gathered.

4.2.1. Hedging

Bank A, B and C mention that they use credit derivatives in order to hedge or secure an existing exposure that the bank for some reason does not wish to have.

The trading risk manager in bank A explains that they use credit derivatives partly to hedge existing exposures and gives an example:

“It can be the classical case where one has client exposures from before, which are maybe not the exposure one wants anymore. Then we can still help the customer and at the same time be protected if they were to default.”

(Trading risk manager, Bank A)
This is made with CDS contracts, an anonymous action that helps the bank maintain their good customer relations and to fulfil their commitments, says the trading risk manager in bank A.

Within bank B credit derivatives are used almost exclusively as an instrument for risk management. Their trading risk manager says that if there is a large exposure somewhere, they can choose to go to the market and buy protection on the underlying credit. Bank B use CDS contracts to hedge their exposures.

Bank C says that they use credit derivatives to reduce corporate risk which they transfer to bank risk. This is the main reason for which they started to use credit derivatives. In the beginning it was about capital requirements. The amount of capital needed when entering a position with a corporate counterparty was 8 percent, compared to 1.6 percent when having a bank as counterparty. Therefore, having a bank as counterparty was, economically and capital-requirements-wise, very profitable. That is how it began. Then they started to use it in order manage large exposures. The responsible person of risk transfer explains that Sweden has extremely large corporations relative to the size of the nation. Many of these are part of their customers and since they are a relatively small company, with relatively little capital, the only solution for them to be able to keep lending was to find other parties with whom they could share the exposure. CDSs were one of the solutions for bank C.

“Credit derivatives are exclusively used to remove other types of risk. Other types of risk are in this case corporate risk that is transferred into bank risk.”

(Responsible for risk transfer, Bank C)

The credit researcher in bank D says that credit derivatives are used to hedge existing positions, by entering into CDS contracts.

Furthermore, the trading risk manager in bank A explains that iTraxx are used to hedge their portfolio against wider credit spreads. If the bank has a diversified portfolio that they wish to keep, but they anticipate a temporary increase in the credit spread on the
market, they may use iTraxx to hedge their portfolio. Since it is hard to take a short position on bonds, iTraxx enables the bank to take the position synthetically.

“This is a way to actually take a short position synthetically”
(Trading risk manager, Bank A)

Bank B does not have internal product approval for the use of iTraxx, and bank C explains that they use exclusively single-name CDS, since they typically have large exposures to hedge. However, the trading risk manager in bank B has another opinion about indexed CDSs. He considers this instrument to be a part of an established trading strategy, and finds it very useful.

“Indexed CDS is such an established product on the market that one could expect that an organization like us would use it, but that is unfortunately not the case.”
(Trading risk manager, Bank D)

4.2.2. Diversifying and portfolio approach

The trading risk manager in bank A explains that the bank might have a well diversified portfolio they believe is a lasting investment, which means that they have invested in different market sectors. The bank wants to hold these exposures in the long term, but is concerned about a certain sector in a short time perspective. In order to circumvent this problem Bank A sometimes use iTraxx, to protect that specific sector, which enables them to keep their portfolio without losing money due to exposure in that sector.

When asked about whether the bank uses a portfolio approach, bank A answered both yes and no. First of all they look at separate big names to avoid concentration risk. The trading risk manager says that the portfolio perspective arises when the bank investigates the total credit risk of the portfolio in order to look at its sensitivity to credit spread changes. If for example, the credit spreads move one basis point, they calculate the impact this has on the value of the portfolio. These scenarios enable Bank A to track possible losses and what counterparty exposure causes them. Individual names have specified credit limits that are allocated with a portfolio perspective, in respect to the ratings of their counterparties. Most of their exposures are investment grade. A CDS can
then be used to bring down the exposure within the given limit, but also as one of the
counterparty risk manager expressed it:

“...to maximize the percentage of concentration risk towards different
counterparties and similar actors.”

(Counterparty manager, Bank A)

The diversification in Bank B is being set up by the individual credit limits for the
different issuers. The purpose of the credit limits is that the bank should not be able to
take on too much exposure on a specific counterparty. Bank B wants a constant
diversification that is driven by their credit limits and entails that many different
counterparties are used.

The trading risk manager in bank B explained his thoughts about the bank's portfolio
approach. The bank examines the risk of individual names and has the option to hedge
some of that risk, which the trading risk manager says is not in line with a portfolio
approach. During the credit crisis bank B had difficulties finding protection in the
derivatives market. Instead the bank bought protection for similar exposures, for
example the same sector, the same credit rating or the same issuer.

Bank C uses credit derivatives in order to obtain a more diversified portfolio. If for
example, they have an A rated bond from a Swedish company, they could enter into a
CDS contract with an English AA-rated bank, to obtain geographical diversification. As
mentioned above bank C does not use iTraxx, since they don’t find any use for them.

Bank C had not deliberately been using a portfolio perspective but it is something that
they wish to develop.

When discussing a portfolio approach in Bank D the credit researcher mentioned the
importance of limits and the possibilities of hedging the exposures with financial
instruments such as a CDS to stay within the given limits and directives.
4.2.3. Speculating

According to the trading risk manager in bank A, the bank sometimes uses iTraxx to speculate in different sectors, nations and markets. It can also be the case that a client takes an opposite position that the bank chooses not to hedge, since they do not share the clients’ beliefs, and in that way are indirectly speculating in the outcome of the clients’ position. Bank A has a CDO portfolio that is under liquidation. The trading risk manager explains that the purpose of the CDO portfolio was to produce extra returns. Only AAA rated CDO were traded. The bank no longer wishes to take any positions in CDOs.

“We had a CDO portfolio, that we thought that, more or less like most other banks, was a good extra return to get some extra basis points”

(Trading risk manager, Bank A)

Bank C has two CDO portfolios and they are also under liquidation since the financial crisis. The economic outcome is not yet clear but they have made certain reservations against them. The credit researcher in bank D was not sure if the bank has a CDO portfolio or not, but the 2010 annual report states that they are holding a CDO portfolio, that has diminished greatly since 2009.

“That was, we can admit, a less successful investment, and that is that.”

(Responsible of risk transference, Bank C)

The trading manager for bank B believes that credit derivatives might be instruments well suited for speculating, but the bank does not speculate in these instruments. Bank C does not use credit derivatives to gain any exposures, but only to get rid of their own exposures, this means that they are not speculating using credit derivatives, says the responsible person for risk transfer.

Bank A, B and C do not use credit derivatives in order to obtain leverage. The credit researcher in Bank D was not sure. In bank A they say that they have no need for leverage and it is not something that they wish to pursue in their activities. However
Bank A might help their customers that wish to obtain leverage by taking an exposure without an upfront payment.

4.2.4. TRSs and CLNs

Bank A has previously traded in TRS, but has none left. The purpose with the TRS was to help customers to take on exposures, without the obligation to buy the asset themselves. The bank had the opportunity to finance the investment and give them the exposure synthetically. The trading risk manager in Bank A says that the customers no longer have the need for this kind of exposure. They still sometimes use CLNs but only on customer demand. For example, a large investor might request that the bank emit a CLN in order for the investor to hedge its portfolio. On its initiative Bank A would never package a CLN and then wait to see if anyone is interested. There are mostly large companies that are interested in CLNs. However, since the financial crisis the demand for more complex products almost disappeared, says the trading risk manager for Bank A. The counterparty managers in Bank A however point out that what is trendy or not changes fast. They believe that the market will develop less complex products for a while. When asked if he thought there still would be a demand for more complex credit derivatives after the financial crisis, a counterparty risk manager says;

“At least not the next few years, but then everybody tends to forget what has happened.”

(Counterparty manager, Bank A)

The trading risk manager for bank B reports that the bank does not use TRSs or CLNs. He says that there are sometimes exceptions for making CLNs, tailor-made instruments for certain investors, but that happens rarely and with small nominal values. This has not changed because of the financial crisis and the bank has never used these instruments to a bigger extent. The trading risk manager says that is in line with the quite conservative ideology that the bank has, that these more complex products are not used.

Bank C has many large exposures to its clients, who are mainly large corporations. Credit derivatives are therefore very important tools in order to provide the capital that
the clients need, explains the responsible person for risk transfer in Bank C. When asked what opportunities the credit derivatives bring them, the answer is:

"It's the opportunity to serve our clients in an efficient way."

(Responsible for risk transfer, Bank C)

Bank C does not use CLNs or TRSs today; they have not yet found a good market opportunity. They are considering CLNs for future use, since they believe the instrument to be quite efficient.

The credit researcher for bank D explains that the bank sometimes get customers who request them to deliver CLNs. He explains that CLNs are very practical instruments since they are funded, but agrees that the demand for these products have decreased since the crisis.

"I think that the more complex products are less traded now after the crisis, and that the old motto, don’t buy what you don’t understand, is back"

(Credit analyst, Bank D)

4.2.5. Use as indicator
The credit researcher in Bank D says that as an analyst, he is able to use the CDS market as a good indicator of some financial events. The CDS market is very liquid and volatile, which enables analysts to perceive indications quite early compared to the corporate bond market, which is relatively illiquid in Sweden. This enables analysts to use the fluctuations in the CDS market to gather information about the underlying assets financial state, before the official ratings and bond spreads are changed. The credit researcher in Bank D says that the CDS market is also a very good indicator to evaluate a financial health of countries, since the CDS on government bonds give a good indication of the risk the bond holder is exposed to.

According to the credit researcher in Bank D, a problem with the CDS market is that even though the value of a CDS theoretically is only derived from the credit spread of the underlying credit, and the risk free rate of interest, the market is influenced by supply and demand fluctuations. These fluctuations are due to a lot of speculating in the CDS by
investors that do not hold the underlying credit. This makes the swings in the market sometimes bigger than they theoretically should be, and creates additional volatility to the market, says the credit analyst.

“A CDS is meant to be used for hedging an underlying bond, like insurance. If people who do not hold the bond, in a purely speculative purpose use CDSs, it obviously affects the price. Maybe even more than the fundamental credit rating and credit risk”

(Credit researcher, Bank D)

4.3. Risk management

The trading risk manager in bank A believes there are about ten people working with the monitoring and adjustments of the credit portfolio, including the counterparty risk managers. The board of directors sets mandates that are communicated to those responsible for the different divisions. Each unit has to make sure they stay within their given limits. This enables communication back to the board of directors, who believe it is important to inform about the general situation and the risks. Therefore reports are sent to the board of directors on a daily basis.

In order to measure risk, Bank A uses VaR and credit sensitivity. Generally Bank A does not want to have big exposures to a bond with a low credit rating. When it comes to credit products their counterparties should have investment grade rating and very few are non-investment grade. If the customer has a low credit rating, he will not be able to trade these products at all or he will obtain a very low limit. Bank A has a credit organisation that sets the limits for their customers. One of the counterparty managers in bank A believes that generally, all large banks in Sweden as well as the large international banks have their own internal risk categories and their own analyses of their customers. External rating agencies such as Moody’s and S&P are good indicators to see if the bank’s analyses are in line with those of the rating agencies’.

“…the external rating is used as a benchmark.”

(Counterparty risk manager, Bank A)
The trading risk manager in bank B explains that he is part of a group of 13 people working with credit risk, which also implies working with credit derivatives, analyses and customer relations. Five people have been delegated the responsibility of different parts of the market, for example Swedish SEK or EURO. The trading risk manager is responsible for the trading in EURO and is using CDSs to regulate the risk level in his books. Furthermore, the trading risk manager in Bank B says that there is no specific method that is being used in order to decide whether or not a credit derivative should be used. Rather, the risk of individual credit exposures are examined and evaluated. As mentioned earlier, they have credit limits that are quantified and to some extent affected by rating categories. For example there are limits on how much risk Bank B can have towards triple B rated issuers. The use of CDS does however not affect their credit limits.

"...it would not decrease our exposure within our credit limit and there is no straight netting between CDSs and the underlying instrument, even though the economic consequence would be another if you have protected a risk from an issuer with a CDS."

(Trading risk manager, Bank B)

The trading risk manager in bank B means that the credit spread of the underlying asset and the CDS spread do not move parallel to each other, the credit risk of the underlying asset is not completely offset by entering into a CDS contract. The trading risk manager in bank B explains that this is why the banks have to evaluate the underlying bonds and the CDS separately to estimate the market-to-market value. Bank B explains that there have been quite big differences in the spreads the last few years. The trading risk manager in Bank B believes that one of the reasons why the spreads differ is due to the payment; the underlying bonds are funded, while the CDSs do not require an initial investment.

In bank C there are five people working with the risk control, measuring limits and monitoring credits. Bank C has ten people analysing the banking counterparties and ten people analysing the company counterparties. Together they build up a customer relation where they have to follow up and understand the different counterparties. The
pure risk control division in bank C is made up of 4-5 people with the task of calculating the economic capital and monitoring and reporting the capital adequacy. The monitoring is continuously being controlled. There is a credit committee that sets the credit limits based upon an internal rating of their counterparties. These limits imply both the amount of the credit and its duration, says the responsible person for the risk division in bank C.

In order to calculate their capital requirements bank C uses a VaR measure, on a credit basis. Another method they use is a rating matrix that shows how the exposures will move, for example what a triple-A rated exposure will be in a year. Bank C has also developed an economic capital model, using risk weights based on the ratings of the different companies and banks.

“...this implies that the actual capital requirement, as we calculate it, is almost negligible.”

(Responsible of risk transfer, Bank C)

The purpose is to avoid double default, and since capital requirements are calculated on the probability of economic losses, the capital requirements are very low.

The credit researcher in bank D was not informed about the overall risk management, but it is stated in bank’s annual report of 2010 that internal ratings are made. Bank D measures their counterparty risk in OTC derivatives based on exposures, both current and future estimated exposures as well as the anticipated hedging costs.
4.4. Positive and negative aspects with credit derivatives

This chapter is divided in two parts. The first part will present what the interviewees see as the positive aspects of credit derivatives. The second part will discuss what the interviewees perceived as dangers and negative aspects associated with credit derivatives.

4.4.1. Positive aspects of credit derivatives

The trade risk manager for bank A says it is a good way to manage a credit portfolio and it is an easy way for banks to quickly change the exposures in the portfolio, due to the high liquidity in the CDSs relatively to the illiquid corporate bonds. It is also more difficult to sell bonds, than to take a corresponding position in a CDS. The counterparty risk manager adds that the iTraxx enables the bank to quickly hedge entire sectors if needed. A big advantage of credit derivatives is that it makes it possible to reduce the exposure to a client anonymously, says the trading risk manager.

In bank B, the trading risk manager explains that CDS contracts that mostly are standardized still can be modified or tailor-made to the customers’ needs. He also points out the advantage of being able to maintain customer relations anonymously and being able to take on larger exposures. It is also possible to go short in the credit market using CDS, which can be difficult otherwise.

“...I think it is mostly positive that products like credit derivatives exist, and it is very difficult to point out the negative sides.”

(Trading risk manager, Bank B)

The responsible person for risk transfer in Bank C says that the advantages of credit derivatives are that it enables them to serve their customers in an effective way. He points out that another advantage is that all these instruments look the same. It is very easy to trade them, everyone knows how it is done and it is anonymous and effective.

The responsible person for risk transfer in bank C explains that the derivative contracts are carried out in a way that if the value of the derivative changes the counterparty has to post more collateral immediately. In a successive downturn more money is brought in
successively. According to the responsible person for risk transfer the risk of is at a minimum level when this method is used.

### 4.4.2. Negative aspects of credit derivatives

The trading risk manager for bank A explains that one of the negative aspects of credit derivatives is that without being aware of it, dependencies can arise when hedging large exposures. Though it seems to him, that institutions nowadays have better control over their counterparty risks. Bank A makes sure it trades with several different banks; the trade risk manager thinks that most banks now are careful not to have only a few counterparties. The trade risk manager also mentions that the large banks dealing with credit derivatives pose a threat if they were to default, since then all hedges made with this bank would disappear, and many other banks would have to get new hedges, if possible. The problem with CDSs is that it is difficult to know what exposures the counterparties have.

> “The danger is that no one knows what the others are holding. That is the big disadvantage of the CDSs”

*(Trade risk manager, Bank A)*

Another danger is that the contracts are not perfectly matched and they are traded in models that do not move perfectly together. So the trading risk manager in Bank A argues that there is still a mark-to-market risk. The credit spread of the underlying bond does not move at the same pace as the basis of the CDS, which is partly due to the difference in liquidity between the underlying asset and the CDS, says the credit risk manger in Bank A.

A disadvantage of credit derivatives is that they will not fit in the investment philosophy of many institutions, regarding limits and restrictions. However, this is not an economical phenomenon, but an organizational problem that the institution has to tackle, says the risk manager for bank B. Another problem is the lack of transparency in the CDS market. During the financial crisis it was noticeable that no one knew how big exposures the counterparties, with whom one was involved with, actually had. However, this should not be considered a disadvantage, since it is a problem with OTC and CCP clearing, not with the CDSs themselves, says the risk manager for bank B.
The responsible person for risk transfer in bank C does not recognize any disadvantages with the use of credit derivatives. The credit researcher in bank D mentions that the CDS market can push stock prices and credit spread levels in a way that is not always fundamentally underpinned.

4.5. Recent changes

*In this section the interviewees’ perceptions about the changes on the financial markets are presented. The first part is about new regulations that have taken place, and the second part about the financial crisis 2007-2010 and the changes it provoked.*

4.5.1 Regulations

The regulations that affect the use of credit derivatives in banks are the new capital requirements in banks for counterparty risk exposures. These new regulations will acquire more capital for counterparty risk exposures and therefore it will be cheaper to use CCPs than OTC trading, says the risk manager for bank A. He thinks it is a good idea to use central clearing for credit derivatives since the counterparty risk will be reduced. However it will be important to closely monitor the central clearing houses.

> "...then it is important to have very good control over the central clearing houses, because if one of those defaults, then it is a meltdown!"

*(Risk manager, Bank A)*

He continues by explaining that this is why CCPs have been introduced for credit derivatives, and their use will increase. Right now the amount of the CDS market that is centrally cleared is minimal, but it will change. The reason that the market participants will use the CCPs is that with the new Basel regulations, it will become too expensive to have these exposures OTC, says the trade risk manager for bank A.

> "A CDS implies a double counterparty risk... If the company you bought protection for defaults and the one you bought the protection from cannot fulfil his obligations, then the protection was worth nothing."

*(Trading risk manager, Bank A)*
The fact that we are moving towards a centrally cleared market place is good, since it reduces counterparty risk, but someone will be there to collect margins, which is not positive, says the risk analyst for bank D. The responsible person for the risk division in bank C explains that Basel III is tightening the banking regulations. One of the problems that BIS wanted to address was the OTC trading. This was done by punishing OTC trade by making it more expensive in terms of capital requirements for counterparty risk exposures. Central counterparty clearing will be relatively cheaper than OTC, and in that way force market participants to centrally clear most of their derivatives trades. He says that although this is mostly positive, the flexibility that it is possible to achieve with OTC trades, will be very difficult to centrally clear, since CCP trades have to be standardized in order to assure high liquidity.

In bank B they still have exclusively OTC contracts, but they are going to switch completely to CCP trades for standardized contracts, while tailor-made ones might still be traded OTC, says the risk manager. He is very positive to the transition to centrally clear the credit derivatives transactions since this would remove the problem with measuring counterparty risk and the need to investigate the correlations between the underlying asset and the counterparty.

“...the only acceptable way to trade credit derivatives in the future, is to centrally clear them since then the underlying counterparty risk problems would be decoupled from the credit derivative.”

(Trading manager, bank B)

They have not yet begun to centrally clear their credit derivatives, and they will probably not be the first, since they are not a big user of credit derivatives and these instruments are not considered a trading product in their bank, but a hedging product. He explains that since their bank is one of the highest-rated banks in Europe, credit rating wise, they usually have counterparties with lower credit rating than themselves. Therefore the counterparty risk is often bigger for them than for the counterparty. A centrally cleared derivatives market would therefore be a very positive development, says the trading manager in bank B.
4.5.2 The financial crisis 2007-2010

The financial crisis of 2007-2010 affected the four banks in different ways. The trading risk manager in Bank B claimed that credit derivatives are of much interest today and explained that this subject has been very central in connection with the recent financial crisis. He also mentioned that quite a lot of people have different opinions about the subject and that the media has not always helped to clarify this to the public.

The trading risk manager in bank A explains that the bank experienced that the CDO market turned illiquid since no one wished to take on exposures to other banks anymore. During the worst part of the crisis, all limits were so low and everybody was so careful with whom they were doing business with, that practically no-one was trading these instruments anymore. This also influenced the CDS market but the CDS did anyhow stay more liquid than the CDO market, according to the trading risk manager. The CDSs did actually help to reduce losses during the crisis.

In Bank C the responsible person of risk transfer says that the financial crisis had little impact on their bank, except for the losses related to the CDO portfolio. There was a shock on the market after the default of Lehman Brothers, but the credit derivatives in which they were active did much better than the financial market. The demand for CDSs has not really decreased, but the liquidity has decreased a little. Before the crisis it was possible to do very big trades with a single counterparty, whereas now the limit of exposure allowed on a single counterparty is more tightly restricted. There are fewer financial institutions that emit CDS now after the crisis. He explains that the CDS market was pretty well functioning during the crisis, because of the need for protection.

Bank B did manage well through the financial crisis thanks to the credit derivatives market. The bank had bought protection for a great deal of their assets using credit derivatives. Without that protection the bank would not have been so fortunate, risks would have had to be cut down in some way. Bank B did experience a decrease in market participants; many of the counterparties that normally were active on a daily basis were gone or more or less closed from the market. The trading risk manager refers to the large banks in Europe that had big problems. So the number of counterparties was much more limited and the market was very illiquid.
In this chapter the empirical findings will be discussed and related to the theories presented earlier. The results will be analysed and possible explanations for the underlying factors that may affect them will be discussed. The chapter is divided into four parts, each answering one of the questions in our problem disposition.

5.1. How are credit derivatives used in Swedish banks, and what purpose do they serve?

Here the main use and the risk management of credit derivatives in Swedish banks according to the empirical findings are presented. They will be discussed contrasted with the theories described in the theoretical framework.

5.1.1. Risk management

The four banks in this study are closely monitoring their credit risks, which is very important according to Anson (2004). There are many risks related to credits, for example default risk or value changes due to fluctuations in the credit spreads or ratings. The banks report that they have people working with credit risk control but also with the evaluation of their counterparties, creating their internal credit ratings. Based on analyses and approval from the board of directors, credit limits are set for the different customers and counterparties. In this way the banks’ profile and internal restrictions are communicated to the people responsible for the banks’ different activities. The credit limits permit the traders to act within a given framework where they have to respect and obey the banks’ restrictions. This means that even though there might be efficient and tempting instruments available for traders, their use is not possible without internal approval.

Greuning and Bratanovic (2009) explain that the competition between banks worldwide is increasing, which fuels the innovation and the development of the financial markets. Nonbank financial intermediaries that might offer services similar to the banks further increase the competition on the market. To remain competitive we believe that banks have to be innovative but still respect the confidence and responsibilities towards their customers as well as the whole banking environment. This is also why regulatory frameworks like the Basel III that aims to increase the resilience of the financial sector
are developed (BIS, 2011). As mentioned earlier, the four banks have their own restrictions when it comes to the use of credit derivatives, but they are also affected by these external regulations (Caouette, 2008).

Bank C and A reports that they use a VaR measure to estimate risks and capital requirements, a widely used risk measure according to Duffie and Singleton (2003). This implies that the banks also use well-known measures that are applicable and understandable everywhere.

The banks are examining credit exposures separately and if the risks are too large or unwanted they might use CDS contracts to hedge the exposure. Bank A states that this enables them to bring down the exposure in a given limit and to maximize the concentration to that specific customer. However Bank B claims that CDSs contracts do not affect their credit limits; they cannot take on more exposures by using CDSs, since the contracts will never be perfectly matched. Obviously, the credit risk from an underlying asset cannot be completely netted with a CDS contract, since credit derivatives are much more sensitive to credit cycles than bonds (He, 2010). We believe it is important to monitor these two spreads in order to better control the risk, especially for banks that are maximizing the exposures in their credit limits. The banks report that they valuate the underlying bond and the CDS separately, since they witness that the spreads and liquidity of the two are different.

Greuning & Bratanovic point out the importance of risk measurements, for both borrowers and counterparties in a derivative contract. An economic loss occurs even if an exposure is hedged if there is a double default. A double default occurs if both the underlying asset and the counterparty in the derivative contract defaults. In bank A the credit products are mainly of investment grade rating and very few are non-investment grade. When transferring large credit risk exposures to another market participant, we believe that it is important to be selective in order to avoid the risk of double default. Economic cycles are constantly changing, which implies the need for durable and trustworthy counterparties. Since Bank C explains that the way their CDS contracts are created, by posting collateral and thanks to their own economic capital model, the risks in entering a CDS contract are very low, which also make their capital requirements very
low. This is consistent with the theories of Saunders and Allen (2010), which assert that the obligation to set aside collateral reduces the risk of large losses.

5.1.2. Main uses
The different credit derivatives all transfer credit risk but can be used for different purposes (Schönbucher, 2003; Saunders & Allen, 2010). During the interviews we learned that many of these instruments are not mentioned or used to a greater extent. Credit default swaps seem to be the only credit derivative that is widely used in the Swedish banks; others are hardly used at all for the banks’ own account. CDSs seem to be popular in the risk management of the Swedish banks, a management that requires much attention in terms of measurements, restrictions and analyses. All banks are users of credit derivatives but not to the same extent and not always with the same purpose. The banks have different profiles that might have been set in order to attract different customers with specific needs or preferences.

According to Bessis (2002) the economic situation of a bank’s customers can change, which is why he points out the importance of continuous monitoring of the loans. Another vital aspect of banking is customer service, say Saunders and Allen (2010). This ongoing balance between the control of credits and customer service is a challenge for all four Swedish banks. Since the competition among banks is increasing, customer relations might be even more important today. The use of CDSs enables the banks to circumvent or at least mitigate the problem of exposures getting too large or unwanted. The main purpose of CDSs in the four Swedish banks is to hedge or secure existing exposures that the bank for some reason does not wish to have. All our interviewees agree that this is mainly what they use credit derivatives for. The bank managers explain that credit derivatives are very practical if one wishes to reduce the exposure to a customer anonymously for some reason, which can in some cases be crucial according to Bessis (2002), Bofim (2005) and Choudry (2006).

The modern portfolio theory, with diversification through uncorrelated securities in order to gain higher portfolio returns given a certain level of risk, can be applied in risk management. The banks’ thoughts about diversification strategies and portfolio approach differed and did not always cohere with the theories of Markowitz. All banks do have certain credit limits to their counterparty exposures and in bank A, B and D they
explained that the setting of these limits was to some extent driven by a portfolio and diversification perspective. The limits are set to avoid being exposed to overconcentration and bad credit ratings. This shows that the banks use an overall diversification approach, and not as Caouette (2008) states, create overconcentration to certain borrowers or sectors which banks often did in the past. Bank A mentions their general view of the portfolio where they look at the total risk and the portfolio’s credit sensitivity. However, the theories of Markowitz do not yet seem to be applied in the risk management of the banks’ credit portfolios, in the sense where the loan portfolio is optimized according to the modern portfolio theory. One reason might be that this kind of management is very time-consuming, due to the fact that information about returns, variance, covariance and correlations is limited for loans and bonds (Saunders & Allen, 2010). On the other hand, if sufficient information is available, optimizing the loan portfolio might be very efficient for risk management, as shown in a previous study by Gustavsson and Ingebrand (2005). Maybe the portfolio approach will be developed in banks’ risk management, if higher transparency is achieved in the future.

Risk assessments of the entire portfolio are often made in order to make sure risk levels are within the acceptable limits. However, all of the four banks ultimately look at single large exposures or large market exposures when deciding whether or not to use credit derivatives. We believe this is partly because the most used instrument in banks today is the CDS. CDSs are made to hedge a single position that is unwanted. Even though a modern portfolio theory approach would enable CDSs to be used for optimization purposes, iTraxx are probably more suited for these strategies, since they can provide hedges on whole geographical areas or sectors. According to Saunders and Allen (2010) iTraxx is a liquid product that can be used both for hedging purposes and diversifying. Bank A uses iTraxx for hedging purposes but also as a mean for diversifying their portfolio. The highly experienced trading risk manager in bank B, did not really agree with its own bank’s internal restrictions on not to use iTraxx, believing this instrument would facilitate the risk management. But the organizational limits prevent the manager from doing so, since the bank does not have internal approval for the use of iTraxx.

We were given an example of diversification in bank C, where corporate Swedish debt is turned into a high rated English bank debt using a CDS. Not only have they obtained a
bank with a higher credit rating as counterparty, but also switched their exposure to a bank in another geographical area, which is less correlated with the underlying asset than a bank on the Swedish market. Choudry (2006) and Bofim (2005) state that counterparties with a low default correlation to the reference asset reduce the risk of double default. This is why diversification is important when choosing counterparties. The transference of corporate risk into bank risk also loosens capital requirements since the counterparty risk is reduced.

We find it important for commercial banks today to be able to supply and to serve their customers in the best way possible, using different solutions such as credit derivatives. Credit derivatives seem to facilitate the risk management and enable the banks to expand their client base. However we believe it to be positive that the banks have strict policies in order to control and to supervise the use of credit derivatives. Abusive use of these instruments can have negative effects, as witnessed during the financial crisis of 2007-2010 (McIlroy, 2010).

5.1.3. Other uses
Speculating in credit derivatives can be dangerous and does not seem to attract the banks, maybe because of their restrictive risk profiles. One way to speculate in CDSs is to take a naked CDS position, buying protection without owning the underlying asset (Kopecki & Harrington 2009). This means that the speculative actors make a “bet” that the underlying asset will default, and they will earn money from the CDS. These positions represent the majority of trades on the CDS market (Kopecki & Harrington 2009). Although important for the liquidity on the market, these positions add volatility to the market that is not always fundamentally underpinned. None of the banks we interviewed reported taking naked CDS positions. We believe however, that the banks are indirectly affected by these positions, since they are all actors in the financial sector. The increased liquidity might be positive and facilitates the banks own trading, while unstable markets and price fluctuations are less desirable. The work of analyzing risk, credit exposures and counterparties is probably obstructed by increased volatility. In general, speculation did not seem to fit in very well in the banks activities. However proprietary trading is allowed in Sweden and all four large commercial banks are taking part of it (Ring, 2010). This means that the banks sell or buy securities for their own account, with the purpose of earning extra returns. But in bank B and C they claim that
speculating in credit derivatives is not allowed, they use credit derivatives exclusively for hedging purposes. Bank D could not give us information whether speculation in credit derivatives occurs or not. This leaves bank A as the only bank to use credit derivatives for speculative purposes. Bank A sometimes speculates in iTraxx, which means that they can take a speculative position in a market sector or geographical area. They also sometimes choose not to hedge a customer’s exposure, which makes the bank speculate indirectly in an opposite outcome to the client’s.

Three of the banks did however have CDO portfolios before the financial crisis of 2007-2010. In our opinion trading in CDOs may very well imply speculation, which also bank A confirms by saying that the purpose was to gain some extra basis points return. Maybe the internal regulations have changed since the crisis, regarding speculation. All banks seemed to make losses on these portfolios during the crisis and today two of the banks’ CDO portfolios are reported to be under liquidation, the third one probably is too. The banks did not have much to say about the CDOs, except that they have realized afterwards that this is not an instrument they want to use any more. The banks seem to follow the investment trends on the market, according to The New York Times (2010) the CDOs were very popular before the crisis of 2007-2010 and were traded in enormous volumes. In this case the popular “market trend” led to undesired outcomes during the recent crisis and like the general opinion on the market, the banks no longer want to trade complex products like CDOs. Some of the banks have more restrictions for credit derivatives than others, and might not be able to follow the trends and invest in new developed instruments, but on the other hand they managed the crisis well, according to a trading risk manager in bank B. We believe that the restrictive banks might miss out on some possibilities that new derivative instruments can give. However in a time of crisis, the more restrictive banks have fewer problems with illiquidity since they are mostly trading very liquid instruments.

Anson et al (2004) explain, that banks often used balance sheet CDOs with the purpose of removing assets from a bank’s balance sheet in order to reduce their capital requirements. The four banks in this study do not emit CDOs; neither do they use this kind of CDOs to lower their capital requirements or to create off-balance-sheet leverage.
This was not so surprising since the Swedish central bank (2010) report that the four largest commercial banks in Sweden are already well capitalized.

The four Swedish banks use credit derivatives for their own credit portfolio, but when talking about CLNs and TRS, we found out that these instruments are only issued at the customers’ request. Bank A, B and D explained that the use of this product is customer driven. Anson et al (2004) explain that a CLN is a funded instrument, which means that the payment in case of credit event is made up front and most of the counterparty risk is removed. The banks are only issuing CLNs in order to meet the needs of their clients. Bank C says that they are considering the use of this instrument in the future, maybe because the upfront payment of this funded instrument reduces counterparty risks. Bank A used to issue TRSs on demand to their customers, but since the recent financial crisis the demand for this product has almost disappeared. The banks seem follow the demands of their clients and the trends on the market given their own specified limits and policies.

The credit researcher in bank D pointed out another use regarding CDSs. In his work he can use the CDS market as an indicator for financial events but also, as stated in The Business Insider (2010), the credit spread of a CDS on a treasury bill can reflect the market’s thoughts about a nation’s health in terms of risk. According to the credit researcher in Bank D this is due to the high liquidity on the CDS market. The problem is that the many people speculating in these products amplify these credit spread fluctuations.

**To summarize:**
The table below summarizes the banks’ use of credit derivatives and the purposes for which they are used. Although two of the banks do not mention that they use the CDS market as an indicator, it is likely that they do, since it is a very widely used tool for analysts.
Table 1, Each banks use of the different credit derivative for different purposes.

As the table shows, all banks are using credit derivatives for hedging and diversification purposes, and the majority of them are not using them for speculative purposes except for the CDO portfolios that may be questioned whether they were for speculation or not. We believe they were. The majority of the banks emit CLNs on customer demand.

5.2. What possibilities do credit derivatives bring to banking?

According to Anson et al (2004) a CDS is a simple way of transferring credit risk. The interviewees in the four Swedish banks, all confirmed this theory. With a CDS the banks can reduce their credit exposures anonymously, which means that they can sell some of the risk without putting their customer relations at stake, which is crucial according to Bessis (2002). It also enables the banks to take on large exposures but also to make easy changes in the credit positions in their portfolios. Some contracts are standardized but they can still be tailor-made and modified according to the needs of the banks and their clients. In these days when banks are subject to tough competition on the markets from many new actors and institutions that can replicate some of the banks services, it is very important to maintain a good relationship with the customers.

Bessis (2002) states that before the credit derivatives were introduced on the financial markets there was no efficient way to transfer credit risk. This is probably the reason why credit derivatives are so widely used for risk management in banking today. These instruments enable bank managers to effectively transfer risk from specific customers to financial institutions. Some on the banks interviewed combine this with a diversification strategy by choosing a financial institution in another geographic area as counterparty,
preferably one with a very low correlation with the underlying asset. Credit derivatives also enable banks and other market participants to go short in the credit market, which can be of use for hedging and diversification strategies. These possibilities facilitate quick and effective management of credit risks.

When it comes to other credit derivatives such as CLNs, it enables the banks to meet the needs of their clients by bypassing the administration of granting a credit. Saunders and Allen say that iTraxx can be used for diversification and hedging. This facilitates credit management and reduces the work efforts needed. Other bank managers expressed their wish to use iTraxx, but due to limitations in the internal policies in the banks they are unable to. Many banks have very restrictive policies regarding the use of credit derivatives and some of the managers believe that the organizational limits are what keep the advantages and the possibilities of credit derivatives back.

The interviewees argue that there are almost only positive aspects when it comes to credit derivatives. This was quite surprising, as articles about credit derivatives often mention the negative aspects of credit derivatives. But obviously, people working with credit risk are mostly positive about their use. We believe that there is a difference between Swedish banks with restrictive policies and other actors with mainly speculative purposes. These instruments can be good tools when properly used, which seems to be the case within the four Swedish banks. However, most managers refer to CDSs when talking about credit derivatives and other instruments are rarely mentioned. This is probably because the other instruments are hardly used at all by the Swedish banks. This leads us to suspect that there might be dangers associated with the other instruments that are not mentioned in this thesis. The banks believe that when the credit derivatives eventually will be centrally cleared with a CCP, the problems with transparency and regulations will diminish.

To summarize:
Credit derivatives give the banks the possibilities to effectively and anonymously transfer credit risk. It facilitates for quick and effective diversification and portfolio management, as well as to enable banks to meet their customers’ needs. The banks are mostly positive about credit derivatives and the possibilities that they bring.
5.3. What risks Arise from the use of credit derivatives?

Warren Buffet (2002), McLlroy (2010) and H.M. Treasury (2009) all express their concerns regarding the lack of transparency that exists when credit derivatives are used. This can lead to concentration risk and difficulties when measuring counterparty risk. These concerns are shared with the trade risk manager for bank A, who thinks this is the biggest disadvantage of using credit derivatives. The representatives from the other three banks did not mention this problem as much. However, the trade risk manager for bank B says that CCP clearing will be the only acceptable way to trade credit derivatives in the future, which implies that there are problems with OTC trading. All banks still do the majority of their trades OTC. The recent crisis has probably contributed to the dislike of the lack of transparency in OTC trading. Suddenly everyone could see the risks that credit derivatives could bring to an institution if transparency was bad. We believe that this is only a temporary problem on the credit derivative markets and that soon, the majority of trades will be centrally cleared and market participants will be able to see how much risk their counterparties are holding. Since all banks we interviewed were positive to CCP clearing, we believe that the Swedish banks will be quick with the implementation of central clearing. According to the Swedish central bank, Sveriges Riksbank (2010), the largest banks in Sweden are already prepared for the new regulations, which may include the change towards central clearing.

Eric Dinallo (2009) says in an interview with Bloomberg that as much as 80 percent of the CDSs traded on the market are naked positions (Kopecki & Harrington 2009). According to the risk analyst in bank D this is problematic in the sense that the naked speculative positions create volatility on the CDS markets that affects the stock prices. Since CDSs are created for the purpose of “insurance”, the prices should reflect the credit risk of the underlying asset. However, since so many naked positions are taken, the prices are affected by supply and demand of the instruments in speculative purposes. Nyberg (2007) mentions that it can be problematic when several credit derivatives are bought on the same underlying asset. The credit researcher in bank D confirms this by explaining that if many protection buyers initially speculated in naked positions and in case of a credit event; they will have to purchase the underlying asset for delivery. This
might provoke a great shift in demand for the underlying asset, which could involve price fluctuations and volatility on the markets. The banks we interviewed did not seem to contribute to this problem, since only one reported that they speculate at all, and in that case speculation was done in iTraxx index products, not in naked CDS positions. Since anyone can buy credit derivatives, the problem with naked positions is not easy to solve. According to McFarlin (2011) some countries have temporarily banned naked positions, especially when the economy is in distress. However, since the majority of CDS transactions are naked positions, a ban on those would heavily damage the liquidity of the market. The liquidity is important for the banks to be able to hedge their exposures. The high volatility in the CDS market makes it attractive, and without it many of the advantages of using CDSs would be reduced. The reason for the bans is that the speculation in the CDS market causes volatility that in turn affects other variables that uses the CDSs spreads for their valuation, for example national interest rates. Without the naked positions the CDS market would be more stable and maybe reflect the underlying fundamental factors in a better way. It is not possible in this case to have a very liquid CDS market and at the same time ban the transactions that create extra volatility, a choice has to be made.

Featherby et al (2009) and Young et al (2009) write about the incentives that CDSs can give a financial institution. Since protection can be bought against unwanted credits, the incentive to help the clients to not default is greatly reduced. CDSs can even encourage banks to take a more predatory approach, since it can be economically viable if the client defaults and the bank earns more money on the CDS than on the client himself. Being able to hedge exposures might make the banks more motivated to take on exposure they otherwise would not. Nothing during the interviews suggests though, that bad incentives have affected the banks’ way of treating their customers. If such incentives do exist, we cannot expect banks to talk about them openly in interviews. All four banks do however seem to have clear guidelines and routines on how to handle clients.

The trading risk manager in bank A, explains that the use of credit derivatives enables them to handle larger credit exposures, which can create enormous dependencies if there is only one counterparty, when hedging the exposures. Therefore it can be important to choose several reliable counterparties.
He (2010) discusses the issue of rating credit derivatives and says that since credit derivatives are much more sensitive to the credit cycle than bonds. The trading risk manager in bank B mentions that since the CDSs and the underlying assets are not affected the same by fluctuations in the markets, they should be valued separately. We believe that because of the higher sensibility of credit derivatives to the credit cycles, it is important to be vigilant in times of changes in the credit cycle. This is also problematic for credit ratings, since credit institutions has been said to use the same rating scale when valuating these instruments. The fact that most banks seem to use their own rating or models in order to evaluate and measure the risk on counterparties indicates that the trust for the rating agencies is low, which is understandable since they incorrectly rated so many instruments during the crisis. It is positive that banks not only use the ratings from agencies but also develop their own, which seems to be part of a banks’ risk management. However, we doubt that all banks and financial institutions have the resources required to create accurate ratings of all their counterparties. Increased transparency in the rating process of the agencies could be the best solution.

Up until the recent crisis CDOs had become a very popular instrument (The New York Times, 2010). During the crisis however, issuing banks in the US defaulted and the demand for CDOs almost disappeared. When there are almost only sellers on the market the prices plummet (Nyberg, 2007) and the banks that were holding CDOs suffered great losses due to the illiquidity. When asked about dangers and negative aspects of credit derivatives however, none of the banks mentioned the dangers of trading CDOs. Maybe this is because these CDO portfolios were not that big in contrast to other instruments that are traded in the banks, or maybe because the dangers of CDOs are a sensitive matter, since they obviously were not aware of the risks before the crisis.

**To summarize:**
The biggest risk that arises from the use of credit derivatives is due to the lack of transparency in the derivative market. Because of this the market participants do not know where the risks are and how much risks their counterparties are taking on, and concentration risk can arise. Other risks are the increased volatility in the CDS markets due to naked CDS positions that can affect other economical factors such as interest
rates. Large risks arise with complex instruments like CDOs, and the majority of the banks in the study have suffered losses on their CDO portfolios. Although credit derivatives are very practical and the banks are very positive towards them, they can build up dependencies to counterparties that can be dangerous.

5.4. What changes in the use of credit derivatives have been made since the financial crisis?

Since the financial crisis of 2007-2010 credit derivatives have been blamed for many of the problems that occurred during the crisis (Wallison, 2009). The New York Times (2010) writes that the main trends seen in credit derivatives are that the financial crisis of 2007-2010 substantially reduced the demand for more complex instruments. The four Swedish banks have all witnessed this downward trend. Three of the banks were holding CDO portfolios and suffered some losses due to illiquidity on the markets. However, since these positions were small, it did not do any substantial damage. The event did however make the banks stop using CDOs. The subject of CDOs seems to be something no-one really wants to talk about, something that the banks are trying to forget. The CDOs have got a lot of negative attention in the media after the crisis, which might have had an effect on the of the shareholders view of the banks using such instruments. All banks mentioned that the demand for CDOs is completely dead today, and they do not believe that CDOs will come back any time soon.

Other instruments also suffered a loss in demand during the crisis. The banks report that the demand for credit derivatives from their customers has changed a bit. The demand for products like TRS and CLN has decreased and generally it seems like market participants have once again remembered the old saying “don’t buy what you don’t understand”. The counterparty managers in bank A say that trends do however change fast, but they do think that the demand for complex credit derivatives will remain very low, at least for a few years. We believe this to be true, at least for these Swedish banks where the use of credit derivatives is quite restricted. The question is whether speculative investors and people with limited knowledge of these risks will prioritize higher returns before a global responsibility and a financial stability. Maybe the new regulatory framework, Basel III, will increase the transparency and the stability on the markets and indirectly force people to take more responsibility.
According to the four Swedish banks the CDS market remained functional throughout the financial crisis and was not affected nearly as much as the CDO market. The banks explained that the CDS market is only subject to some minor changes since the financial crisis so far. The liquidity has decreased a little, but the demand for CDSs is still high. New regulations force actors to decrease the size of their positions with a single counterparty, to increase diversification of exposures. Several banks had protected many of their assets using credit derivatives during the crisis, which helped them avoid credit losses. Without that protection the banks would not have been so fortunate, says the trade risk manager in bank B. Again we see a clear distinction between CDSs and other more complex instruments. During the crisis the liquidity of the more complex instruments suffered heavily, but the CDS markets kept functioning. Credit derivatives have been given bad reputation for what happened in the US with CDOs and CDSs used for the wrong reasons.

What the crisis did affect was the regulations of capital requirements for counterparty risk. New Basel III regulations dictate that more capital will be needed when entering credit derivative contracts OTC, since this entails counterparty risk (BIS, 2011). This will make it relatively cheaper to centrally clear credit derivatives in CCPs. The banks are all positive towards a centrally cleared marketplace where the CCP is responsible for measuring and recording the counterparty exposures the market participants are involved in. The trading risk manager in bank A says that it is good to start using CCP clearing houses since the counterparty risk will be reduced, however the credit researcher in bank D is worried about the CCPs stealing margins. The new regulations will probably make it more expensive to trade in credit derivatives since both alternatives of clearing the instruments means more costs. If the instruments are to be cleared centrally the CCP will of course need margins in order to be administered and managed. If credit derivatives are continued to be traded OTC, higher capital requirements will increase the cost of using the instruments. However, the increased transparency will probably reduce the need for counterparty risk departments and managers and will reduce the workload of credit risk management in banks. It is important that the CCPs are closely supervised and managed, since they will carry all counterparty risks. If a CCP defaults, we believe that it will have serious repercussions.
As stated above, external regulations and internal limits have increased since the recent crisis, which affect the banks and their use of credit derivatives. One outcome is the limited exposures the banks are allowed to have towards counterparties, but also that the number of financial institutions that emit credit derivatives has diminished, which was mentioned in one of the banks. This means that large exposures can no longer be hedged with a single counterparty, but several have to be used. We believe this could make the risk management more complicated but it is positive since it reduces concentration risk, dividing the risk between several counterparties. Another bank mentioned the importance to choose several and qualified counterparties, something proven from the recent crisis. We think the crisis has increased awareness and will probably make people more cautious in the near future.

Even though the new regulatory changes are mostly positive, the flexibility that can be achieved with OTC trades, will be very difficult to keep if trades are cleared in CCP clearinghouses, since instruments have to be standardized in order to be centrally cleared due to liquidity issues. The trade risk manager for bank B agrees but says that even though they, in the future, will clear most of their trades CCP, the tailor-made contracts might still be traded OTC. This seems to be the biggest problem with CCP clearing. In order to have a central clearing party the liquidity needs to be high in order to avoid too much risk for the CCP. This means that instruments that are tailor-made, and therefore less liquid, cannot always be cleared. Those instruments will probably have to continue to be cleared OTC.

**To summarize:**
Since the financial crisis of 2007-2010, the demand for complex products has fallen. There are now fewer banks that emit credit derivatives, but the exposures allowed to take against a single counterparty have been reduced and more counterparties have to be used for each trade. The markets are moving towards central clearing in order to increase transparency and reduce the exposures to counterparty risk. The banks are all following the market trends and are very positive towards a centrally cleared marketplace for credit derivatives.
VI. Conclusions

In this final chapter the questions asked in the introduction will be answered in order to fulfill the thesis' purpose. Each question will be answered separately with conclusions, in order of appearance.

The purpose of this thesis is to describe the use of credit derivatives in Swedish banks, what benefits and risks they may generate and how the recent financial crisis has affected their use.

In order to fulfill the purpose the questions below were put together. The questions are answered in the conclusion that follows.

- How are credit derivatives used in Swedish banks, and what purpose do they serve?
- What possibilities do credit derivatives bring to banking?
- What risks arise from the use of credit derivatives?
- What changes in the use of credit derivatives have been made since the financial crisis?

From the interviews in the four Swedish banks we have learned that credit derivatives are used in the risk management of the banks’ credit portfolio. These instruments are mainly used for hedging purposes and to facilitate the monitoring of credit limits. Increasing competition and market trends are incentives for the banks to use credit derivatives that offer efficient and fast solutions. However, the different uses of credit derivatives differ between the banks. Internal regulations restrict which instruments that are allowed. The banks have different risk profiles and policies, which are reflected in the trade limits.

The picture below illustrates our view of how credit derivatives are used in Swedish banks, and which instruments are used for the specific purposes. The size of the arrows illustrates how commonly credit derivatives are used for the different purposes.
• **Hedging:** The banks use credit derivatives in order to hedge or secure unwanted exposures. They all use CDSs, which enable them to transfer credit risk anonymously, without harming customer relations. iTraxx can be used in order to hedge entire sectors or markets. Due to internal restrictions only one bank uses iTraxx.

• **Diversifying, portfolio approach:** A portfolio approach is used to various extents in the four banks’ risk management. Credit derivatives facilitate the risk management of the credit limits set for maximum exposure. The making of these limits seems to be motivated by diversification and a portfolio perspective in order to avoid overconcentration and bad credit ratings.

• **Speculating:** In general credit derivatives seem to rarely be used for purely speculative purposes in the banks. Only one bank reported that they were speculating using iTraxx to take on exposures to certain markets or sectors.
- **Customer driven:** CLNs are instruments that the banks can supply when their customers demand them, but are not for the banks’ own use.

The use of credit derivatives in Swedish banks is affected by economic cycles and the prevailing situation on the financial market. Since the financial crisis both market trends and regulations have changed. The demand for more complex products is gone, the banks internal limits have tightened and new global regulations are being developed. We believe that Swedish banks are acting responsibly when trading in credit derivatives and the main risks arise from other actors with abusive use of these instruments. The risks that affect the banks are mainly lack of transparency in the derivative markets. This can make market participants unaware of how much risk their counterparties are taking on, creating concentration risk and impeding counterparty risk assessment. Exposures allowed to a single counterparty are nowadays limited and the number of actors has diminished. We believe this to be positive since it forces banks and other actors to spread risks by using several counterparties.

Today there is much discussion about the dangers that arise from the many speculative actors. The banks in Sweden are allowed to engage in proprietary trading, which could leave room for speculation. Among the four banks, today most of them seem to have internal restrictions against speculation in credit derivatives. However, three of the four banks were trading in CDOs, which we believe were in speculative purposes. Internal restrictions seem to have changed since the financial crisis and the banks do no longer trade in CDOs. The external regulations have also changed. The new Basel regulations are increasing the capital requirements for counterparty risk exposures, which forces market participants towards a centrally cleared marketplace. This will be relatively cheaper than OTC clearing. Tightened regulations and increased transparency might have some positive effects on a more developed portfolio approach, since we believe that with more information about credits and their characteristics, portfolio optimization can eventually be used according to the modern portfolio theory.

We believe that the positive aspects of using credit derivatives outweigh the negative aspects by far. Credit derivatives make risk management quicker, more effective and safer, when used responsibly.
VII. Future research

The current development in the credit derivatives markets is the implementation of clearing through CCPs (Central Counterparties). This will reduce the necessity for counterparty risk measurements but will require great control and insight in the CCPs. New regulations will force market participants to augment the capital requirements when taking on counterparty risk. This will make CCP clearing relatively cheaper than OTC, but on the other hand, the CCPs have to take commissions for the trades that they clear. For future research we recommend studying how the CCPs will be able to handle these enormous trading volumes that will be cleared through them and how this will affect the markets, the costs related to the use of credit derivatives and the flexibility of the instruments.

Another interesting area for future research is how naked CDSs affect the CDS market. Since the majority of CDS trades are naked positions, the liquidity on the market is greatly affected by them. On the other hand these naked positions create a lot of volatility that is not fundamentally underpinned. CDS spreads can affect stock prices, interest rates and other factors, since they affect and are used as a benchmark in the valuation of several different products.
References

Books


**Articles**


Webpages


Appendix

Interview questions

Purpose

1. How would you describe your use of credit derivatives? For what purpose are they used?

2. Do you use a portfolio approach while managing credits? Are credit derivatives a mean for avoiding concentration risk and to achieve diversification?

3. Are credit derivatives used in order to take on specific exposures?

4. Do you have a CDO portfolio? For what purpose?

5. Do you use other credit derivatives? For example credit options, CLN, TRS, indexed CDS, CDO?

Risk measurement and management

6. How many people are involved with the measurement and management of credit risk and credit exposures in your credit/bond portfolio?

7. What does their work entail? What methods are used to measure risk and decide if credit derivative are to be used?

8. How is your credit limits set? What restrictions are used? For example portfolio duration, maximum loss, VaR, diversification and credit rating?

9. How do you handle the changes in credit spreads, since this is affecting the value of the credits?

Positive and negative aspects

10. What possibilities can credit derivatives give you? What do you think are the positive and negative aspects with credit derivatives?

11. How do you manage the risks and dangers that follow the use of credit derivatives? For example counterparty risk?

12. Are your trades mostly OTC or CCP? Have there been changes in how to clear these instruments in recent years? What is your opinion about switching to CCP clearing?

13. Are credit derivatives used in order to achieve leverage?

14. How did the turbulence on the credit derivative markets affect your bank during the financial crisis?

15. Generally, what role do you think Swedish banks had in the financial crisis?

16. Have changes been made to your use of credit derivatives since the financial crisis? Have you had the need to customize your exposures and capital requirements according to the new Basel III regulations?