



UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

Incorporating Funding Value Adjustment in Valuation of Derivatives

- A case study

Bachelor Thesis in
Industrial and Financial Management
School of Business, Economics and Law
University of Gothenburg
Autumn 2013

Tutor:
Anders Axvörn

Authors:
Per Johansson
Simon Josefsson

Abstract

The derivatives market is a large, global market that fills an important function in the financial system (Eklund et al., 2012). Before the global financial crisis in 2008, factors such as capital cost, funding cost and counterparty risk were hardly considered when pricing derivatives. Instead, the primary focus was to accurately price for the market risk in accordance with the transaction (Dennehy et al., 2013).

After the global financial crisis, there was a change in how derivatives should be valued, partly on account of the risk-free rate. A new value adjustment, called Funding Value Adjustment, was introduced. Funding Value Adjustment takes its basis in estimating the underlying funding of the party providing the derivatives (Ernst & Young, 2012). Since the global financial crisis, Funding Value Adjustment has been an intensively debated subject in the derivatives market. At the moment there is a gap between the theoreticians and the practitioners. The general view of the theoreticians is that an incorporation of Funding Value Adjustment is not to be recommended, while the practitioner's mean that they are wrong, and that it should be incorporated (Kancharla, 2013). The thesis has mainly been based on interviews in co-operation with a chosen institution from the industry, and also with other impartial actors. The purpose of the thesis is to determine if an incorporation of Funding Value Adjustment in the valuation of derivatives shall be executed in the chosen institution.

When bringing all aspects together there seem to be little doubt that an incorporation should be executed. All financial instruments valued at fair value should incorporate all relevant aspects when determining a fair value, including the funding cost. However, there are several factors that need to be taken into consideration regarding when it should be conducted, i.e., when the timing is good. The uncertainties regarding what funding curve to use, and the discrepancy between the different departments (i.e., the Valuation department, Front Office and Treasury) needs to be further investigated. The chosen institution also needs to assure that there is a common understanding and collaboration with regards to Funding Value Adjustment in the different areas within the institution. Other factors, such as how the Nordic competitors act, and how the customers might react to an incorporation, needs to be assessed.

To cope with these factors, it is suggested that the institution should put together a project group from the departments for a pre study. This study should analyse the factors and come with a solution of how and when Funding Valuation Adjustment should be incorporated in the Fair Value.

Consequently, the conclusion from this case study is that the chosen institution should take immediate actions to start their incorporation. The institution need to understand and act on the factors mentioned above, and thus get ready, because now that their competitors have started to act, the institution need to be able to do the same.

Keywords

Funding Value Adjustment, Fair Value, Fair Value Adjustments, Exit Price, Valuation, Over-The-Counter, Derivatives, Funding Cost, Funding Curve.

Preface

We would like to thank our tutor, Senior Lecturer Anders Axvörn from the University of Gothenburg - School of Business, Economics and Law, who have helped us to navigate through the difficulties of writing this thesis.

Also, we would especially like to thank our advisor from the chosen institution for taking of his valuable time and for doing his utmost to ensure that this thesis would be as good as possible. His help has been invaluable, and his passionate interest in the subject has inspired us throughout the whole process of writing this thesis.

Our gratitude goes to all the opponent groups, dear friends and family who through the entire process have encouraged us with their full support.

Gothenburg, January 2014

Per Johansson

Simon Josefsson

Abbreviations

CVA – Credit Valuation Adjustment
CSA – Credit Support Annex
DVA – Debt Value Adjustment
FV – Fair Value
FVA – Funding Value Adjustment
GFC – Global Financial Crisis
IAS – International Accounting Standards
IASB – The International Accounting Standards Board
IFRS – International Financial Reporting Standards
ISDA – International Swaps and Derivatives Association
LIBOR – The London Interbank Offered Rate
LOP – The Law of One Price
NPV – Net Present Value
OIS – Over Night Index Swap
OTC– Over The Counter

Table of Contents

1. Introduction	1
1.1 Background	1
1.2 Problem Discussion	3
1.4 Limitations	4
1.5 Purpose	5
2. Methodology	6
2.1 Preamble	6
2.2 Case Study	6
2.3 Primary Data	7
2.4 Secondary Data	9
2.5 Method Discussion	10
3. Organisation Presentation	11
3.1 Organisational Overview	11
3.1.1 Treasury	11
3.1.2 Front Office	12
3.1.3 Valuation	13
3.1.4 Accounting	13
3.1.5 Risk	13
3.2 The Market	13
4. Theoretical Framework	14
4.1 IFRS 13	14
4.2 Value Adjustments in line with IFRS 13	14
4.2.1 Credit Value Adjustment	14
4.2.2 Debt Value Adjustment	15
4.2.3 Funding Value Adjustment	15
4.2.4 DVA, FVA and Double Counting	16
4.3 The Market	16
4.3.1 Collateralised Derivatives	16
4.3.2 Uncollateralised Derivatives	16
4.3.3 Collateralised vs. Uncollateralised Derivatives	16
4.3.4 CCP	17
4.3.5 CSA	18
4.3.6 OTC	18
4.4 The FVA-debate	18
4.4.1 The Theoreticians Perspective	18
4.4.2 The Practitioners Perspective	19
5. Empirics	21
5.1 The Treasury Perspective	21
5.2 The Front Office Perspective	20
5.3 The Valuation/Accounting Perspective	23
5.4 The Risk Perspective	24
5.5 The Market Perspective	25
6. Analysis	26
6.1 The Theoreticians View	26
6.2 The Practitioners View	27
6.3 The Valuation/Accountant View	28
6.4 Discussion	31
7. Conclusion	32
8. References	33



1. Introduction

In this section, a summary of derivatives as well as methods used to adjust their value will be presented. Also, an introduction of the method that is to be analysed will be presented. Problems regarding an incorporation of Funding Value Adjustment will also be presented.

1.1 Background

The derivatives market is a large, global market that fills an important function in the financial system (Eklund et al., 2012). The total value of the derivative's underlying assets is approximately 600 000 billion dollars, which correspond over 40 times the U.S. GDP (BIS, 2013). Derivatives create opportunities for market participants to manage their risks. Institutions may use derivatives, e.g., futures, to protect against unanticipated changes, either in foreign exchange rates, or in interest rates. The derivatives market thus reduces risk, but it also creates risks, such as liquidity risk, market risk and credit risk, including counterparty risks (Eklund et al., 2012).

Concerns about the various risks contributed to the uncertainty during the global financial crisis in 2008 (hereafter referred to as GFC). The Over-The-Counter market (hereafter referred to as OTC), where derivatives are traded outside the stock market, was especially problematic. The OTC market had low transparency and was not regulated to any extent, leading to great uncertainty about what might happen to the market if any actor suffered from serious problems. The crisis showed the need for action in the OTC market to strengthen financial stability (Eklund et al., 2012). Since the GFC, G20¹ leaders have agreed to implement a number of changes to reduce the risk of future crises. This includes measures to remedy the problems identified in the OTC market. G20 leaders' agreement has now resulted in new laws and regulations that, among other things, call for improved risk management and extensive reporting requirements that will lead to greater transparency. Therefore the OTC market faces major changes in the next few years, and both financial institutions and other actors in the derivatives market will need to adapt to these changes (ibid).

Before the GFC factors such as capital cost, funding cost and counterparty risk were hardly considered when pricing derivatives. Instead, the primary focus was to accurately price for the market risk in accordance with the transaction. Due to the fact that developed markets in general are more transparent, the market risk prices quoted to clients by different financial institutions operating within these markets were generally similar (Dennehy et al., 2013).

After the GFC, there was a change in how derivatives should be valued, partly on account of the risk-free rate. The value of derivatives was now to be adjusted using two types of adjustment methods, i.e., Credit Value Adjustment and Debt Value Adjustment (hereafter referred to as CVA and DVA). Derivatives were adjusted with these methods in order to reach a so-called fair value (hereafter referred to as FV), in line with the International Financial Reporting Standards 13 (hereafter referred to as IFRS 13). IFRS 13 states that a FV is "The price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date" (IFRS, 2012).

¹ The G-20 is an international forum for discussing and coordinating economic policies among major advanced and emerging economies. The G-20 includes Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, United Kingdom, and the United States, as well as the European Union (EU) (Nelson, 2013).



There are three main types of derivatives: *options*, *futures* and *swaps*. An *option* is a contract in which one party commits to purchase or sell the underlying property, from or to, the other party, and this at a predetermined price. A *forward* is a mutually binding contract between two parties regarding the purchase and the sale of an underlying property, at a predetermined price, with delivery or other enforcement at a predetermined time. A *swap* is an agreement for continuous payments between two parties. The agreement could either be based on fixed or variable interest rate, e.g., an interest rate swap, or that the parties at some point exchange any kind of property between the parties, such as different types of currencies, e.g., currency swap. The different types of derivatives are traded on the derivatives market (Avanza Bank AB, 2013). The value of these derivatives is controlled by the market and hence will not be discussed in depth in this thesis. The purpose of presenting them was rather to give an insight into what a derivative can be. It is the uncollateralised OTC derivatives that are problematic, and it is on these derivatives that this thesis will focus.

The valuation of assets is controlled from The International Accounting Standards Board (hereafter referred to as IASB), which is an independent, private-sector body. Under the oversight of the IFRS Foundation Constitution, they develop and approve IFRS. The IASB was formed in 2001 to replace the International Accounting Standards Committee. The IASB is responsible for the technical matters of the IFRS Foundation and has full discretion when pursuing and developing its technical agenda, except some certain consultation requirements with the public and the trustees. They are also responsible for the preparation and issuing of IFRSs, following the due process that is specified by the constitution, and issuing of interpretations developed by the IFRS Interpretations Committee (Deloitte, 2013).

Furthermore, after the GFC financial markets in both US and Europe have witnessed a widening of credit spreads. As a cause of this, financial institutions have realized the importance of including funding costs, e.g., the costs of providing the derivatives, in the pricing and valuation of derivatives. Moreover, after the GFC the LIBOR rates could no longer be acknowledged as a solid base, since the longer term LIBOR started to command higher spreads. This has led the financial institutions to move away from LIBOR discounting concept to instead use Overnight Index Swaps-yield curves (hereafter referred to as OIS), since the OIS-yield is representing the risk-free rates better. OIS represents at which fixed rate trades are being exchanged during the night. The OIS-curve is a good indicant of the inter-bank credit markets. Accordingly this rate is considered less risky than traditional interest rate spreads (Kancharla, 2013).

Recently a new value adjustment, called Funding Value Adjustment (hereafter referred to as FVA), was introduced. FVA takes its basis in estimating the underlying funding of the party providing the derivatives (Ernst & Young, 2012). A majority of the practitioners, i.e., different financial institutions, believes that the funding of the party providing the derivatives must be included in the valuation of the derivatives.

The underlying reasons for, and regulation regarding the incorporation of FVA need to be explained and examined thoroughly. The subject has not been investigated broadly, and therefore there are no straightforward answers to the problem, which applies to all financial institutions in the industry. This thesis is a case study in co-operation with a chosen financial institution, which seeks answer to if an incorporation of FVA is to be recommended.

1.2 Problem Discussion

Since the GFC, FVA has been an intensively debated subject in the OTC market. Today's market participants continue to see a large disparity in market quotes, leading the debate into the FVA relationship as part of the funding process. At the moment there is a gap between the theoreticians and practitioners. The general view of the theoreticians is that incorporating FVA is not to be recommended, while the practitioner's mean that they are wrong, and that it should be incorporated (Kancharla, 2013).

Since it does not exist any clear rules or regulations regarding how one should calculate FVA it becomes hard to reach a FV, and it also results in institutions interpreting the FVA differently. "I'm not looking forward to the experience at all. There is no convergence how the FVAs should be calculated, and everyone is doing it differently, because at the moment there are no right or wrong answers. Quite frankly, it's a bit of a mess" argues Cameron (2013).

According to Hull and White (2013), there are theoretical arguments that the FVA adjustment is not accurate and therefore should not be included in the valuation of derivatives. One of the problems discussed is that various financial institutions use different risk-free interest rates affecting the FVA. Furthermore, Hull and White (2013) claims that including FVA in the valuation gives the end users arbitrage opportunities leading to conflicts between traders and accountants. This while other experts claim that FVA should be included in the valuation in order to reach a more accurate FV. In a theoretical perspective, the reason that arbitrage opportunities arise when adding FVA to the pricing valuation is due to the different funding interest rates between financial institutes. This is best illustrated with an example.

Consider two banks, Bank A and Bank B. Bank A funds itself at a risk-free rate of 5 % and Bank B funds itself at a risk-free rate at 2%. Since Bank B will have lower funding costs than Bank A the FVA adjustment will be lower for Bank B then Bank A. This will lead to that high credit quality end user can make an arbitrage by buying derivatives from Bank B and selling them back to Bank A (Hull & White, 2013). Hull and White (2013) also discussed that including FVA in the pricing model violates the law of one price, since adding the FVA to the valuation will lead to all prices being subjective. Due to that, everyone will have different funding spreads, hence different FVA. The question arises whether a derivate should either be valued as a market price or as a cost based price. Adding FVA to the valuation puts the price more to cost based valuation rather than a valuation according to the market price. The market value will be unfair if FVA are included in the valuation. The key point is that a dealer might have many private values of a derivative, but only one market value, which according to Hull and White (2013) also is the FV.

Moreover, according to Hull and White (2013) investments should not depend on how it is financed; it should depend on the risk in line with the classic corporate finance theory² (ibid). There will also be an interpretations problem of IFRS 13's FV guidelines. The practitioners argue that adding the FVA in the valuation is in line with IFRS 13, but the theoretic-

² The classic corporate finance theory states that the evaluation of an investment should depend on the risk of the investment, not how it is financed (Hull & White, 2013).

cians argues the other way. They claim that an incorporation of FVA is not in line with IFRS 13 (ibid).

Another problem discussed with incorporating FVA is the risk that it will be a difference between the adjustment made in the front office and the adjustment made in the valuation department. Valuation is making their adjustment for accounting purposes. The FVA in Market and Trading departments, e.g., the front office, reflects the financial institutions own funding rate. The valuation towards the accounting shall reflect an exit price of the derivate in line with IFRS 13. The FVA for accounting purposes should therefore reflect a more general average funding curve, e.g., an average funding curve reflecting a special industry or branch. The question arise how one could estimate such a curve properly.

The subject is relatively new and actual to the market, and there have not been many thorough studies yet. The subject is frequently debated in the market, and there are many written articles, especially in a financial magazine called Risk Magazine. John C Hull and Alan White is two of the authors that will be mentioned during the thesis. A part from their articles, many of the major actors in the branch, such as EY and KMPG, has released reports and analyses regarding the subject. These reports will also be an important basis in the thesis.

Clearly, an incorporation of FVA is aligned with a number of problems. The chosen institution appears on a relatively small market, and therefore they need to handle larger changes carefully. In order to solve the purpose of this thesis, three problems need to be examined in the case study.

- How the institution should reach a fair value in line with IFRS 13
- Problems regarding which funding rate the chosen institution should use
- The risk of discrepancy between the departments that could occur with an incorporation of FVA

1.4 Limitations

The core question in the thesis is how derivatives should be valued in order to reach a so-called fair value in line with the IFRS 13. The common way to value derivatives is by using different methods of value adjustments. Today there are several valuation adjustment methods performed on the market, where two methods are more commonly used than others, i.e., CVA and DVA. Therefore, this thesis will give an explanation of these two methods, but not any deeper analysis. Along with these methods, a new method has been introduced to the market, i.e., FVA. This new method takes its basis in estimating the underlying financing of the party providing the derivatives, and the effects of this method will be thoroughly analysed. Many of the larger international institutions have already incorporated this method, both in their pricing and in their balance sheets, and the Nordic actors are lagging behind.



1.5 Purpose

The purpose of the thesis is to determine if incorporating FVA in the valuation of derivatives for valuation purposes, with today's perception and interpretation, is to be recommended for the chosen institution at the moment.



2. Methodology

This section will present methods used to help analyse the problem, the contribution to valuation of derivatives, and also the reliability and validity of the methods used.

2.1 Preamble

To fulfil the purpose of the thesis, a qualitative approach was selected, and this was motivated by the fact that the case study only examines one institution. In co-operation with one of the largest institutions in the Swedish banking industry, a case study has been conducted. As part of this case study, a number of interviews have also been conducted. The people that have been interviewed, as well as the chosen institution, have all asked to be anonymous, why all people will be called by a letter from A to L, and the institution by "the chosen institution".

One of the tasks to investigate is if the FVA should be included in the chosen institution. In what way the use of FVA will affect existing valuation is another important question to investigate. Furthermore, analysis of the effects on the price and value of the derivatives, which in turn will affect the trading of derivatives, e.g., arbitrage opportunities, will be made. The answer to these questions will all serve as a support to the purpose mentioned in the introduction. For this reason, contact with representatives from various functions in the chosen institution will be made, in order to learn about their perception and interpretation of the use of FVA.

The thesis will investigate the problems faced with incorporating this new method. Due to the limit of time, all articles written in the subject cannot be analysed, why focus have been on the ones written the past two years. The thesis will analyse the questions through three different perspectives: the theoreticians view, the practitioners view and the valuation/accounting view. The institution providing the assignment of writing the thesis claims that their main interest at the moment is to look at the valuation/accounting view, why the main focus for the thesis will be on this.

2.2 Case Study

The authors have chosen to use a case study as research approach, in order to research the answers to the problems mentioned in the introduction. Case Studies is suitable for essays whose ambition is to focus on five to ten different functions, i.e., departments (Jacobsen 2002). According to Jacobsen (2002) one gets the right tools in the quest to gain a deeper understanding for a particular event with this research approach. Jacobsen (2002) also identifies that it is important to elucidate the specificity of the investigating in the case study, i.e., the context. For the authors, this means that the possibility of a deeper understanding for their specific focus will be met and that it is especially important to target the case study so that it generates the material that best suits an extensive and directly relevant empirical data collection. The case study will be carried out with an ambition to investigate the chosen institutions specifically in order to get a deeper understanding about their situation and the problems faced with a possible incorporation of FVA.

To incorporate FVA in an institution is not a simple procedure. It takes both great understanding and a well-functioning interplay between all of the departments involved for a possible incorporation to work. The adding of FVA to institutions valuation process will af-

fect actors in the business differently, and therefor the thesis will analyse the questions through three different perspectives:

- The theoreticians view
- The practitioners view
- The valuation/accounting view

Together with the chosen institution it has been decided that the main focus of the thesis is the valuation/accounting view. In the chosen institution, the valuation adjustment of derivatives is made in the order as shown in *Figure 1.1*.

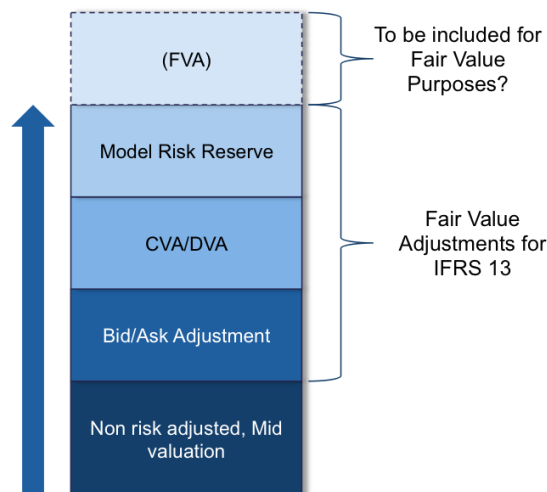


Figure 1.1 – Firstly, the mid price is bid/ask adjusted in accordance with IFRS 13. Secondly, it is CVA/DVA adjusted to reflect the credit risk and counterparty risk. Thirdly, a model risk reservation is made to reflect the uncertainty of the model. Lastly, the question arise whether FVA should be included or not (The chosen institution, 2013).

It is important to highlight that the figure above is only an illustrative example; there might be other valuation adjustments made in order to reach FV. In addition to these three adjustment steps, a fourth adjuster is now to be added, i.e., the FVA, to reflect the funding of the derivate.

2.3 Primary Data

According to Björklund and Paulsson (2012) the most suitable and commonly used qualitative method are interviews. Furthermore, the interviews create a deeper understanding of the topic, as they allow flexibility in terms of individual adjustment of the question (ibid). The interview result may be of higher quality when allowing a degree of adaption, according to Trost (2010). This thesis primary data consists of interviews. In total, twelve people have been interviewed. Nine of them were representatives from the chosen institution, and the remaining three were representatives from two of the world 's leading consulting/audit firms. As



for the representatives from the chosen institution they were all carefully selected according to their positions in the company. For a possible incorporation of FVA there need to be, as mentioned above, a complete understanding and interplay between the involved departments. For this reason, people from all departments involved in a possible incorporation have been selected, and they all have leading roles in their respective departments. As for the representatives from the audit firms, two internationally based individuals (hereafter referred to as Person A and Person I) and one nationally based person (hereafter referred to as Person K) were chosen. These individuals were selected to provide an understanding of how other institutions, partly the international ones, but also the domestic ones, have acted in regard to the subject. Since some of the international institutions already have incorporated FVA in their valuation, information on how they proceeded were sought. The general knowledge is that the domestic institutions have not done as much as the international institutions, but it was nonetheless important to gain some insight into how far the domestic institutions have come in regard to the subject. The interviews were formed as open discussions, but with questions serving as guidelines. This method was chosen in order to get the person's own reflection, rather than distorted answers due to restricted questions. The questions were sent to the persons that were to be interviewed in advance, with specifically designed question for the different persons and departments. The interviews with the correspondents from the chosen institution all took place at the institutions head quarter in the capital of Sweden. The same was for one of the interviews with the correspondents from a consulting firm, but this interview was conducted by telephone. The other interview with correspondents from a consulting firm was also conducted by telephone, but it took place at the consulting firms head quarter, also in the capital of Sweden.

Both of the authors were attending all of the interviews, along with a supervisor designated by the chosen institution. Each interview began with a presentation of the authors and an explanation of the purpose of the interviews, i.e., to get each person's perspective on a possible incorporation. Then the authors explained formalities concerning confidentiality for every person. The interview substratum consisted of both general questions and also questions specified to the different persons and departments. All questions were formed to be in line with the purpose of the thesis. None of the interviews were recorded, why the authors took notes during the interviews. All of the interviews were then transcribed immediately, and after transcribing the material it was sent to the interviewees for their approval.

2.3.1 Interview List

Company	Person	Title	Est. Time	Act. Time	Date
EY	A	Valuation expert	45 min	53 min	6/12
CI ¹	B	Trader, Front Office - Treasury	45 min	47 min	28/11
CI	C	Expert - Treasury	45 min	45 min	5/12
CI	D	Trader, Front Office - Markets	30 min	42 min	28/11
CI	E	Trader, Front Office - Markets	45 min	55 min	4/12
CI	F	Quant, Front Office - Markets	60 min	55 min	5/12
CI	G	Management, Front Office - Markets	45 min	43 min	27/11
CI	H	Valuation expert	45 min	45 min	29/11
KPMG	I	Valuation expert	45 min	46 min	5/12
CI	J	Accounting expert	45 min	52 min	4/12
EY	K	Valuation expert	45 min	52 min	6/12
CI	L	Quant – Risk Department	45 min	47 min	6/12

¹ = the chosen institution

Table 2.1 – A table presenting the interviewed people, what company they work for, by which name they will appear in the thesis, their title, the estimated time as well as the actual time of the interviews, and also the date and place of the interviews.

2.4 Secondary Data

In academic writing it is essential to base the study in previous study, literature and theory, i.e., secondary data. What distinguishes the secondary data is that it is produced for another purpose than the one at hand, and it is therefore important to have a critical approach when assuming the content (Björklund and Paulsson, 2012). As mentioned, the subject is relatively new and actual to the market, and there have not been many thorough studies yet. Therefore, the secondary data will mainly be based on written discussion articles and reports/analysis from financial, consultant and audit institutions. The articles provide the authors with a perspective from both the theoreticians and practitioners, helping analysing the results. The main



part of the articles that has been used was received from Risk Magazine, through Risk.net, which is a website with financial risk management news and analysis.

2.5 Method Discussion

Since the purpose of the thesis is to investigate whether the chosen institution is ready to incorporate FVA, and since it on behalf of them, there is, according to the authors, no reason to criticize the selection of representatives for interview. If the aim had been to examine what various financial institutions know about FVA, it could have been questioned why the chosen institution itself chose the representatives, but that is not the case. It is the chosen institution that has designed the assignment, and it is in their absolute interest to obtain a thorough and valuable result, why the persons who have been interviewed are considered to be reliable. The interview method has, as Bell (2000) describes, an advantage, and that is its flexibility. With the flexibility Bell (2000) is referring to that the interviewer has the opportunity to follow up ideas, explore motives and emotions and investigate the answers in a way that normally is not possible in for example a survey.

Bell (2000) also highlights the additional advantage of interviews, which is the ability to ask supplementary question, and that the interviewer can get answers both developed and deepened. Although interviews can be seen as quite time consuming, the authors sees this approach as most suitable for their data collection. A further advantage of interviews is that the interviewer can ask the respondent to develop their answers if they are not entirely sure how the answers are to be interpreted. However, it is important to have the knowledge that the risk of bias is high. Bias is primarily about the risk that the interviewer affect the respondent in different ways, which is something that Bell (2000) also highlights, for example, the respondent may want to make the interviewer pleased, or the interviewer could try to extract answers supports preconceptions.

However, what is questionable in the context of the interviews is the fact that none of the interviewees wanted to be recorded, and also that two of the interviews was conducted through a telephone. To conduct an interview while forced to write down the answers to the interview is a task that anybody would experience as difficult. There is a risk that important information is missed. For this reason, a sectioning at each interview was made so that one of the authors conducted the interview, while the other took notes. Also, there was always a representative from the chosen institution during the interviews and the briefing of the results. To further strengthen the information, the results were, as mentioned, sent as a copy back to the interviewees for their final approval.

The articles that have been used as secondary data is actual to the subject since they have been written the past two years. They can be considered as reliable and relevant since they reflect the chosen subject in the manner of which the authors sought. The articles debates both in favour and against a possible incorporation, and have acted as support for the writers in their comparison of the different perspectives. The different perspectives are, de facto, different people's opinions, and for that reason, the articles served as an excellent basis to improve the understanding of the debate.

3. Organisation Presentation

This section will present the organisation, which the case study is made with, and also the relevant functions in the organisation. The market in which the derivatives are traded will also be presented, together with an explanation of the specific derivatives.

3.1 Organisational Overview

To get a better understanding of how the chosen institution works in practice *Figure 4.1* is presented.

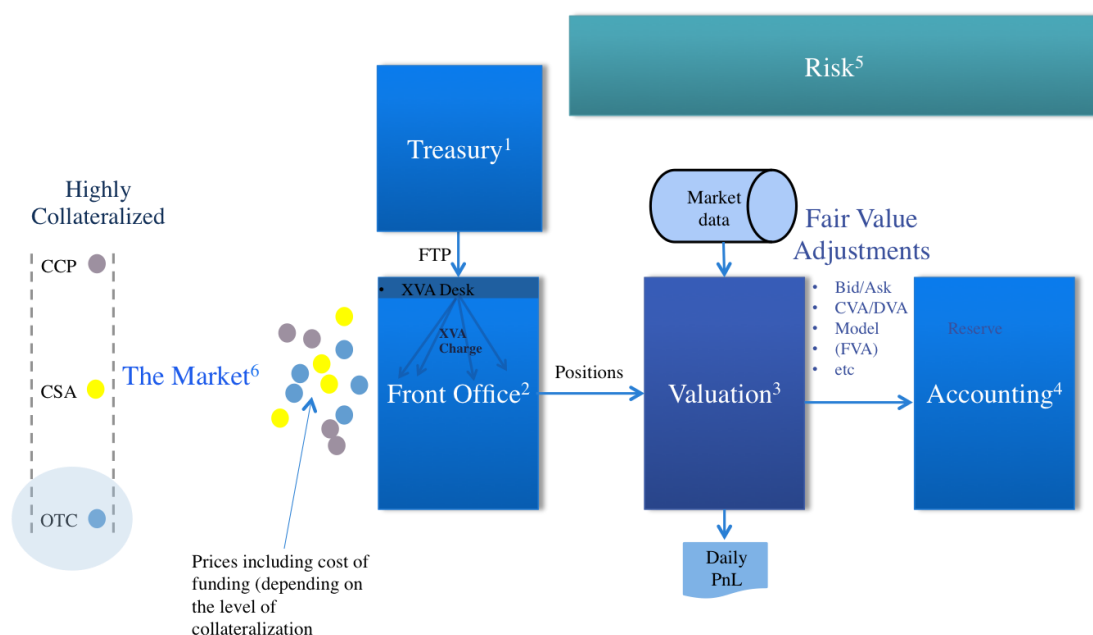


Figure 4.1 – The left side of the figure exemplifies a menial view of the derivatives market, where the derivatives all have different grade of collateralization. The five different boxes represent the different departments in the chosen institution, which all will be further described in the following section (The chosen institution, 2013).

3.1.1 Treasury

1. *Treasury* acts as the bank within a financial institution. Their primary task is to ensure that the institution has sufficient liquidity to meet all payment obligations. This is achieved by borrowing on the capital markets. Furthermore, Treasury manages and finances the institution's liquidity reserve, the institution's liquidity planning, assessing the institution's capital and prepares proposals for future capitalization structure. Another important task for Treasury is to decide the internal rates, which is based on the institutions funding costs. The internal rate, also called the funding transfer price (hereafter referred to as FTP), is the basis for the financial institutions business areas (Person B, 2013). The FTP will be described more in detail below. Person B and C represents this department.

3.1.1.1 FTP

The FTP is the financial institutions internal funding rate provided by Treasury. It is the rate of which the departments in the financial institution can borrow money from Treasury. The FTP can, according to Person B, be compared with the industries transfer pricing system since it almost works in the same way. The purpose of the FTP is to reflect the financial institutions funding cost that it carries at the moment, i.e., the funding costs that the financial institu-

tion holds. It should give a correct price of the liquidity and could be viewed as a mid price (Person B, 2013).

The pricing of the FTP might affect and control the behaviour of the trading in the front office. It gives the trading department an incitement for how they should do their trading on the trading floor. It is therefore important to create a behaviour that reflects the reality, i.e., an FTP-structure that reflects the current situation in the market that the financial institution poses. Since the FTP is a part of the financial institutions funding costs, it is partly on the FTP that the FVA in the front office should be based. The power in the FTP is that it determines the hole pricing system in the institution. The next session will explain more how the FTP is transformed in to an FVA for derivatives in the front office of the institution (Person C, 2013).

3.1.2 Front Office

2. *The front office* is trading with derivatives and is taking positions on the market. Moreover, transactions are closed in the front office. As part of the financial institution's currency management, the foreign exchange dealer closes, for instance FX spot transactions³. In connection with the execution of the cash management, the funding manager takes loans from, for instance, Treasury. As part of the interest risk management, interest rate swaps are closed. If a financial institution is involved in an issue, it will also be involved in the placement of the securities and thus closes securities transactions (van der Wielen, 2013).

Traders at many financial institutions hold positions in a large range of instruments, although this is becoming less common. For this purpose, they enter into transactions at the expense and risk of their own financial institution. Front Office traders mostly trade in so called plain-vanilla instruments, which are instruments in their original form, without all the extra features that transform them into more structured products (ibid). Person D, E, F and G represents this department.

3.1.2.1 XVA-Desk

Since CVA, DVA and FVA overlap each other to some extent, a number of financial institutions are looking to bring together the management of these three adjustments under one centralised desk. The purpose is also to optimize the handling of the FV adjustments. CVA, DVA and FVA are collectively known as XVA; hence the desk is called XVA-desk. This will mean that the pricing and hedging will be executed from one single desk. In other words, it is in the XVA desk that the CVA, DVA and FVA will be estimated for the whole front office instead of separately in every desk (Carver a, 2013). The question when setting up the XVAs under the same roof and in the same desk is where in the institution it shall be implemented. If one set it up in Treasury, the traders might feel threatened of the reason that Treasury might put their interest first. If setting up the XVA desk in the front office, Treasury might be undermined. Implementing the desk somewhere in between may lead to a lack of power in decisions, and might also be an incentive for war between the two departments (Carver b, 2013).

³ An FX spot transaction is a binding obligation to buy or sell a certain amount of foreign currency at a price which is the "spot exchange rate" or the current exchange rate for settlement in two business days time (MFX, 2012).

The main task for the XVA desk will be to put the expertise in the area from the institution and to estimate valuation adjustments charges for the market and trading floor for the institution (ibid).

3.1.3 Valuation

3. *The valuation department* is provided with the positions that the front office has entered on the market. The valuation department are valuating the financial institution's positions for accounting purposes. The positions are valuated in regard to accounting regulations and guidelines, such as IFRS 13. The purpose for the valuation department is to value all positions into a fair value in line with IFRS 13. The valuation department receives the positions from the Front Office and is then making the value adjustments for the accounting purposes and the books (Person H, 2013). Person H represents this department.

4.1.4 Accounting

4. *The accounting department* receives the adjusted positions from the valuation department and then put the positions into the balance sheet (Person J, 2013). Person J represents this department.

3.1.5 Risk

5. *The risk department* takes in all the institution's positions and calculate the institution's total risk exposure (Person L, 2013). The risk department is a department that collects all the institutions' positions and puts the data together, and from the gathered data calculates a Value at Risk⁴ (hereafter referred to as VaR). The VaR tells whether the risk is priced in a conceptually correct manner, and if the implementations are stable and faultless (Hendricks, 1996). The department is also responsible for creating the models and the calibration that are to be used to measure the risk, and to frequently valuate the models. The model validation functions task is to contribute with constructive criticism and perspective on model risk and conceptual issues. Its whole functionality is a result of the GFC, since many of the value models used before the GFC could be questionable (Person L, 2013). The department tries to evaluate counterparty risk, operational risk and market risk were movement in the market, e.g., market risk, is the most one. Market movement affects the institution's positions. To measure this risk, the department looks at how to shift and change curves in an appropriate way. After the GFC the world have, in terms of risk, gone from being one-dimensional to now take more dimensions into consideration, and for example ask what would happen if the institution got a funding cost and a funding curve, and how this would affect the spread. They also need to know what would happen to the institutions different desks, and what would happen to the company as a whole (ibid). Person L represents this department.

3.2 The Market

6. *The derivatives market* is a complex market consisting of different collateralisation and different derivatives contract, which will be further explained in the theoretical framework.

⁴ A value-at-risk model measures market risk by determining how much the value of a portfolio could decline over a given period of time with a given probability as a result of changes in market prices or rates (Hendricks, 1996).

4. Theoretical Framework

This section will present the theories of which the thesis is based on, a critical discussion of the pros and cons of the theories, and a summary of the key theoretical points.

4.1 IFRS 13

One of the core standards when measuring a FV is IFRS 13, which is a standardized framework. The framework uses a FV hierarchy, which imply that market-based measurement is regarded higher than other extents. IFRS 13 states that “When measuring a FV, the objective is to estimate the price at which an orderly transaction to sell an asset or to transfer liability would take place between market participants at the measurement date under current market conditions, i.e., to estimate an exit price” (IFRS, 2012). When an investor decides the right price, she must consider the following, according to IFRS 13:

- Which valuation technique makes the least subjective adjustments to the inputs used (i.e., which technique maximizes the use of relevant observable inputs and minimizes the use of unobservable inputs)
- The ranges of values indicated by the techniques used and whether they overlap
- The reasons for the differences in value under different techniques.

If the investor chooses the right techniques and is taking these aspects into consideration while she is assessing the asset price, she would approach a so-called FV. Furthermore, paragraph 17 states that a FV is a market-based measurement (IFRS, 2012). It should reflect the market situations. Even though in some cases all market information is not available in the analysis, which could lead to difficulties when setting the FV in line with the market-based measurement (ibid).

In line with paragraph 17, paragraph 23 also express that the valuation technique should reflect current market conditions. This means that the market approach is the most correct approach when assessing the FV of an asset or liability in almost every case. The most important aspect of IFRS 13 is that it states that a derivate should be valued to an exit price. An exit price is what a third party buyer is willing to pay for the derivate (IFRS, 2012). The purpose with the FV is to reflect and reasonable price that reflects the market value. Credit value adjustment, Debt value adjustment and funding value adjustment are therefore the next step in order to make the FV even more correct in line with IFRS 13 standards.

4.2 Value Adjustments in line with IFRS 13

4.2.1 Credit Value Adjustment

CVA is the price of the default risk for a derivative, or portfolio of derivatives, with a particular counterparty considering the effect of offsetting collateral. More general, CVA can be described as the price one would pay to hedge the derivatives or portfolio of instruments' specific counterparty credit risk. When calculating CVA, one simply looks at the difference between the risk free value and the true risk-adjusted value. In general, the FV of an asset or

liability is reduced by the amount of CVA (FinCAD Corporation, 2011). To make it easier to understand the CVA in practice an examples will follow. Consider you are taking a loan. Then there is a chance that you will default and cannot pay back the loan to the financial institution. Therefore, the financial institution has to make a credit adjustment on the loan. Two adjustments has to be done, one expected loss adjustment, also called the economical CVA, which is the risk the financial institution takes when lending money, that the borrower cannot pay back the loan. Consider the risk free rate at 3% and that you estimate that 1/5 will default, then you have to add another 0.2% on the borrowing rate to give an example of how the economical CVA works in practice. The other CVA added to the valuation is the regulatory CVA, which is the measure of unexpected loss and has its basis in the capital adequacy the financial institution has to have according to legal framework, such as Basel III. It would mean from the institute's perspective that the loan taker has to take cost of the capital cover instead of the shareholders. The shareholders wealth should not be affected of the consequences of the legal framework.

4.2.2 Debt Value Adjustment

DVA can be defined as the value reflecting the risk of default possibility of the financial institution or the dealer of derivatives. Therefore a financial institution's own credit risk will affect the DVA, which in turn will affect the valuation of its derivatives. In short, increases the financial institutions credit risk the DVA will also increase. Furthermore, the DVA also depend on the interest used for discounting and other risk exposures for the derivate. Consequently, changes in creditworthiness is not the only aspect affecting the DVA's sensitivity, all factors that could affect the risk exposures of the own credit risk should also been accounted for in the DVA (Basel Committee on Banking Supervision, 2011). Briefly, if a person purchases a derivate it should be adjusted after the risk the person as a buyer hold.

4.2.3 Funding Value Adjustment

In addition to the CVA and DVA adjustments, FVA is an adjustment for the funding of the derivative that should reflect the average funding cost of the dealer. The cost of funding can approximately be estimated to the risk-free rate (OIS-rate) plus its own credit spread. Thus FVA become the adjustment for a derivative portfolio, or derivative reflecting how the dealer has funded the derivative or portfolio (Hull & White, 2013). When adding FVA to the already consisting methods, i.e., CVA and DVA, one should be able to approach a more FV in line with IFRS 13. The FVA takes its value from how the underlying asset can be funded and how the derivate position can be funded (ibid).

Average funding costs are primarily based on at which interest rate financial institutions funds themselves. This could lead to valuation problems since different financial institutions funds themselves at different funding rates. Similar derivatives could therefore be valued differently because of the diversity of the financial institutions funding rates (KPMG, 2012).

4.2.4 DVA, FVA and Double Counting

There is a relationship between DVA and FVA that one has to take into consideration when adding these as adjusters to the valuation. DVA determines the own credit risk and FVA is focused on the funding. The credit risk should not be concerned in the FVA since it already has been taken into consideration in the DVA (Lu & Juan, 2011). Since the creditworthiness affects the funding it becomes easy to double count the own credit risk in both the DVA and the FVA (Cameron, 2013).

4.3 The Market

The derivatives market is a complex market consisting of different collateralisation and different derivatives contracts (Person G, 2013). These relationships will be described below.

4.3.1 Collateralised Derivatives

There is a consensus for valuation of collateralised derivatives, which is agreed by a majority of derivatives market participants. To get a FV, the estimated cash flows must be discounted at the same rate agreed for cash collateral, and this under the respective derivative's Credit Support Annex (hereafter referred to as CSA). This could for example take form in an overnight benchmark rate in respective currency (KPMG, 2012).

Complexities in the valuation may arise when thresholds for posting collateral are included in the contract, i.e., when the posted collateral is less than the full market value of the derivative. To manage such complexities, more advanced techniques are used to determine relevant discount rates (ibid). Although the practice used in the market continues to develop, and also varies for different cases, one trend can be observed. The impact of differences between the derivatives' cash flows and the collateral currency when calculating discount factors are taken into consideration by a majority of the market participants. The practice in this area is still in a developing phase, and therefore, especially financial institutions should observe the development in techniques in order to make sure that their market valuation model reflects the type of inputs that the market participants consider, in a proper way (ibid).

4.3.2 Uncollateralised Derivatives

There is no clear market consensus for uncollateralised transactions regarding the most appropriate discount rate to apply in a valuation model. One suggestion is to discount estimated cash flows using an institution's own cost of funding. Though, here it is unclear how these costs should be determined and included in a derivative valuation model. When pricing an derivative, financial institutions would need to ensure that any funding cost risk adjustment used in measuring FV is consistent with the cost that market participants would take into account when pricing an derivative rather than being only an entity-specific estimate (KPMG, 2012).

4.3.3 Collateralised vs. Uncollateralised Derivatives

Since the placement of collateral mitigates risks associated with credit and funding costs, the FV of a collateralised derivative differs from the FV of uncollateralised, but otherwise identi-

cal derivative. During times of market stress, this difference tends to be particularly pronounced (KPMG, 2012).

Before the GFC, unsecured interbank borrowing rates, e.g., LIBOR, were used commonly in order to discount cash flows. This of both collateralised and uncollateralised derivatives. Derivative valuation theory recognised conceptual differences between the two types of transactions. Despite this, the very small basis spreads that previously existed between the interest rate curves used for discounting collateralised and uncollateralised trades meant that the impact on valuations was rarely significant. For example overnight rates for the collateralised trades or three-month LIBOR rates for uncollateralised trades (ibid).

Though, as a result of changes in financial institutions' funding costs, the widening of spreads, and the increased use of collateral in OTC derivative trading. Since the GFC, market participants have moved towards using multiple curves for collateralised and uncollateralised trades when valuing derivatives (ibid).

3.3.4 CCP

In the financial market of derivatives, the Central Counterparties (hereafter referred to as CCPs) place themselves between the buyer and seller of an original trade, leading to a less complex network of exposures, as shown in *Figure 3*. CCPs effectively guarantee the obligations under the contract agreed between the two counterparties, both of which would be participants of the CCP. If one counterparty fails, the other is protected via the default management procedures and resources of the CCP (Rehlon & Nixon, 2013).

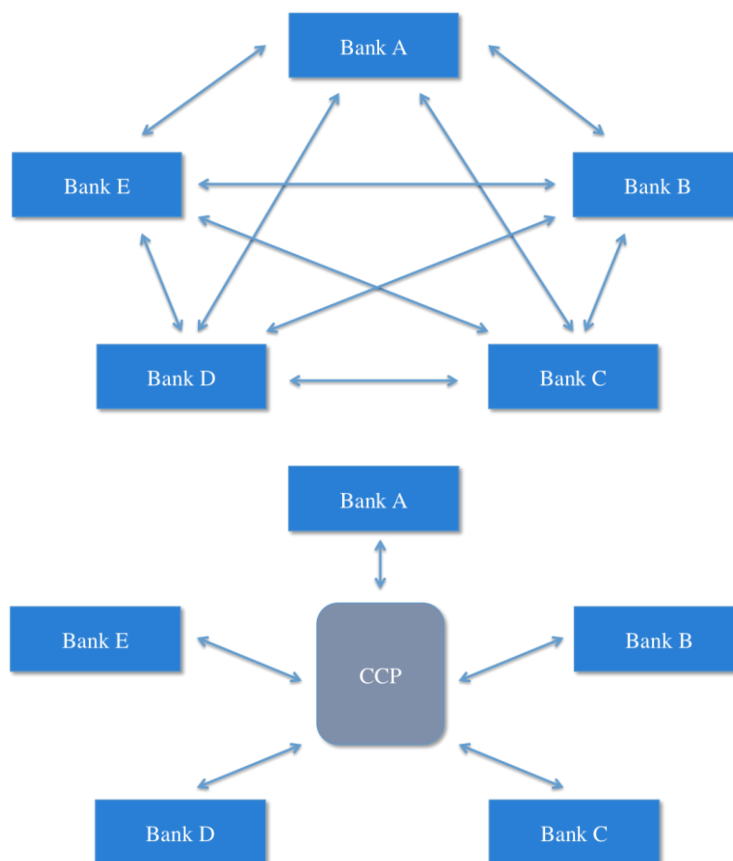


Figure 3.3 – CCPs impact on the complex network of exposures (Rehlon & Nixon, 2013).

4.3.5 CSA

The Credit Support Annex seeks to standardize market practices in collateral management for OTC derivatives. It removes embedded optionality in the existing CSA, promotes the adoption of OIS discounting, and aligns the mechanics and economics of collateralization between the bilateral and cleared OTC derivative markets. In addition, the CSA seeks to create a homogeneous valuation framework, reducing current barriers to resolving novations and valuation disputes (ISDA, 2013).

4.3.6 OTC

Over the counter derivatives are derivatives traded with non-exchange, and are transacted directly between market counterparties (which include trades carried through central clearing entities). The terms of the contracts are often tailored to the parties' specific requirements. These trades are usually governed by general terms published by the International Swaps and Derivatives Association (hereafter referred to as ISDA), and may also be accompanied by a CSA. Typical OTC derivatives include swaps, forward rate agreements and plain-vanilla options, which will not be further explained in this thesis. The main difference between the OTC, CCP and CSA derivatives is their grade of uncertainty. OTC derivatives are uncollateralized and thus uncertain to deal with. CSA is collateralized and therefore more certain to deal with. CCP is highly collateralized and thus the most certain to deal with (KPMG, 2012).

4.4 The FVA-debate

4.4.1 The Theoreticians Perspective

According to Hull and White (2013) a FV is the market value. When adding an FVA adjustment to the price, it will derive from the market value and then also derive from being a FV. The market price is the weighted average between supply and demand. It is the price for which the number of market participants wants to sell equals the number that the market participants are willing to buy. Therefore, the FVA should not be included and all derivatives' FV should be the market price (ibid).

Theoreticians argue that estimates of funding costs should not influence the market value, but according to Laughton (2012), the true market value will be the FVA value. According to him, the law of one price no longer holds. Financial institutions with higher funding rate are less competitive than institutions with lower funding rate on trades that requires funding. "This is full consistent with the current situation in the markets – as theory aims to be" (Laughton & Vaisbrot, 2012). The FVA adjusted price will be the market value since some institutions will always be more competitive than other, means Laughton (2012).

Mr Brigo, professor of financial mathematics at Imperial College London, claims that the law of one price is gone due to the financial crisis. He argues that it all depends on the financial institutions funding level, which will give different prices (Carver, 2012b).

Moreover, theoreticians argue that an investment should not depend on how it is financed; it should depend on the risk in line with the classic corporate finance theory (ibid).

The corporate finance theory states that the evaluation of an investment should depend on the risk of the investment, not how it is financed. “Finance theory shows that it is the risk of a project that should determine the discount rate used by a company for the project’s cash flows” (Hull & White, 2013). The discount rate should not be the funding rate. Today, many companies are using their weighted average cost of capital to estimate when valuing investments/projects. According to finance theory this makes risky projects look more attractive and less risky projects would look less attractive. If one should use the average funding rate when valuating a low risk bond, for example a treasury bond, no one would buy it (ibid). Therefore, the classic corporate finance theory is also in danger when adding FVA to the valuation and pricing. Suppose the risk-free rate is 2% and that a financial institution is funding itself at an interest rate of 4%. Should the financial institution accept a risk-free investment earning 3%? The investment should definitely be undertaken, since the investment is risk-free and since the investment gives a positive cash flow, according to Hull and White (2013).

Theoreticians also argues that taking the funding cost into account would result in every price being unique due to different funding costs between the institutions, violating the law of one price (Hereafter referred to as LOP) (Sawyer, 2012). The LOP states that a commodity, asset or security will have the same price in every market. The LOP takes its basis from the concept of purchasing power parity (Berk & DeMarzo, 2013). Different prices are eliminated due to arbitrage opportunities. A commodity is bought in a cheaper market and sold in another market where the price is higher. The market price is the price that balances supply and demand (Hull & White, 2013). This means that prices will eventually be equalized where the supply will go down in one market and up in another (ibid).

In a post-crisis market the risk-free rate can no longer be seen as risk free rate, because longer term LIBOR started to command higher spreads. The underlying cause takes it basis in two ways. Firstly, as a liquidity preference, but more fundamentally, it only reflects the credit worthiness of the institutions that determine the LIBOR rate. The result of this is that practitioners on the market no longer can rely on a single curve for estimating future LIBOR fixings and discounting future cash flows. Financial professionals had to rethink how derivatives were priced, since the inability of using a single curve to both discount (calculate the present value) and project (estimate future values). The consensus that emerged was that the rate that should be used to discount future cash flows was the overnight index swap (OIS), the shortest tenor rate. The OIS-rate can be explained as the average overnight rates being exchanged during the night. For example the fed fund overnight rate in the United States or the Euro overnight in the European union. The OIS-discounting has become the new standard for discounting, since The Financial Accounting Board (FASB) have decided to adopt the over index swap rate as the hedge benchmark (Kancharla, 2013).

4.4.2 The Practitioners Perspective

Since the valuation is regulated in accordance with IFRS 13 it is important to interpret and take the regulations into consideration when incorporating a new value adjustment. Interpreting this abstract from the IFRS 13:

“In a fair value measurement, the non-performance risk related to a liability is the same before and after its transfer”. The non-performance risk can hardly be connected to the funding cost of derivate, which would mean that a higher non-performance risk leads to a higher funding cost. The argument that IFRS 13 states that a funding cost should reflect the fair value is also strengthened by this extract from IFRS 13 BC 94: “Without specifying the credit standing of the entity taking on the obligation, there could be fundamentally different fair values for a liability depending on an entity’s assumptions about the characteristics of the market participant transferee”. With other words, this would mean that not taking the credit standing into consideration when valuing derivatives is not in line with IFRS 13.

Practitioner argues that if the funding costs are ignored it might lead to that business will run with a loss, and the price will clearly be. In the car industry, every construction cost is included in the price. Therefore the funding cost should be included in the pricing and valuation of derivatives (Carver a, 2012).

Another interpretation of the fair accounting standards, the exit price and the FV accounting, can also be interpreted as the value that a free market is willing to pay in an ordinary transaction for a derivate today, according to Numerix (Kancharla, 2013). Numerix also state that the FV can be estimated using different funding rates depending on the characteristics of the trade in the following three ways:

- Unwinding - which will incur a cost of executing the opposite trades. The funding rate should be the cost that will be charged to one by ones counterparty to unwind.
- Novation - having a similar counterparty take over the trade. The funding rate should be an average of funding rates.
- Holding the trade to maturity – The funding should be ones own institutions funding rate.

Depending on what type of trade and between which parties it has been done in the front office, the FVA should be estimated differently in the valuation for accounting purposes.

Furthermore, one practitioner are against the other practitioner and claims that the funding should not be concerned when entering a position. “When you’re deciding whether to enter a position, it’s about the positive net present value to the firm. And has nothing to do with the funding” (Carver a, 2012).

Lastly, a survey on the market was done by Risk Magazine whether an FVA should be incorporated or not in the valuation. The result was positive to an incorporation of FVA. 64% was positive. This survey is talking against the theoreticians (Sawyer, 2012).

5. Empirics

In this section, a list of the interviews will be presented. Also, adequate parts of correspondence will be presented together with an explanation, which links the arguments, provided in the regulation and frame of reference section with the empirics.

5.1 The Treasury Perspective

Person B, who is a trader from the treasury department, is positive to include FVA in the valuation since it will capture, what he refers to as, a more real value. However, he also says that it looks preferable in theory, but that it in practice would be hard to collect all the data that are required, and to determine the quality of the data, to make a proper FVA.

Moreover, he argues that a possible incorporation of FVA would be very complex, why it seems reasonable to set up an XVA desk. It is hard to estimate how the collaterals should be priced internally, and the XVA desk would work as a speaking partner for the treasury department in order to cope with the problems faced. The desk would work as a counterparty to the treasury department within the institution, that would understand the matter that treasury provides. Until now collaterals has not really been concerned by traders, but due to the latest market developments, restructuring is required, according to Person B. Depending on how the desk is to be implemented its effects will turn out differently. There is a fine line regarding the responsibility the new desk would get and where the treasury department takes over. If the desk is to be implemented with the same work instructions as the treasury department, it will lead to overlaps in the organisation. According to Person B, the main problem is how the pricing is to be made, and how to create a system that gives incentives to all parties involved.

5.2 The Front Office Perspective

5.2.1 The Trading/Market Perspective

According to Person E, who is a trader from the front office, the trading floor will be highly affected by an incorporation of FVA, and therefore the pricing in the XVA desk has to work properly. Derivative transactions in general has fallen significantly over the last years, from being one of the largest transactions in terms of dealing with risk, to become considerably less intensive (ibid). An explanation for this might be the fact that customers are unsecure on how the derivatives should be valued, which might be a result of different financial institutions using different calculations methods. The downslope in the derivative market may also be due to falling interest rates, leading to customers locking up their assets in loans (ibid). Nowadays, various financial institutions have different ratings, which means that the customers cannot deal with them in the same manner as before. Some financial institutions with low credit ratings can price more aggressively in order to keep the customers deal with them, while financial institutions with a higher rating may price higher since the customers prefer to deal with them (ibid). Financial institutions must ask themselves how much capital they should hold. Otherwise, the price structure easily becomes distorted. Actors want to get paid more for doing different types of businesses (ibid). They want to know the rules before going into an agreement. To ensure this, financial institutions often take height in their trades, and different financial

institutions takes different heights, which also leads to uncertainty for customers. In other words, financial institutions might enter less profitable trades if they see the opportunity of possible greater profitability in another trade with the same customer. More general, it is the uncertainty that makes the topic difficult to discuss (ibid).

The persons interviewed from the front office say that a positive aspect with the FVA is that it reflects their real exposures and actual costs. Hence, the trading desk will have more accurate tools to price different deals with regards to all relevant factors by incorporating the FVA. If the desk does not include an accurate funding cost it might look like the earnings are greater than the actual case, which would be misleading. According to Person F, who is a quantitative analyst in the front office, in a trading perspective where one might enter business deals that look profitable before the FVA, and through a concern profit perspective, every reduction of this misleading would be to prefer. Previously, financial institutions based their price from a risk-free rate and just added a margin to cover up the risk (ibid). Furthermore, he argues that by incorporating the FVA in the valuation the financial institutions will know what costs are linked with what underlying trade, which is another positive aspect. His department is positive to include FVA in their valuation as soon as possible, and an argument to this is the fact that many of the financial institutions based in London already is doing it (ibid).

Negative aspects with the incorporation of FVA, agreed by all the interviewed persons from the front office, are firstly the complexity and the additional work that the calculations will lead to. Secondly the incorporation might lead to iteration in the pricing, which is not optimal for anyone. Furthermore, Person F means that including FVA in an early stage with no regulatory frameworks or branch praxis will also be problematic. This might lead to that everyone will do the FVA calculations differently, which will lead to different value of derivatives, and for this reason some prices will be more competitive than other (ibid). At present there are no right or wrong answers for how to calculate the funding cost, resulting in a risk that one will lose customers because someone else has a cheaper funding charge on their deal. This is likely to change, as institutions understand more about the FVA and as consultants help increase the understanding, claims Person E.

Hull and White's theory (2013), that arbitrage possibilities can occur when incorporating FVA in the valuation, is something that Person E does not agree with. It might be possible in theory, but not in practice. For instance, when doing arbitrages from a financial institution with a lower funding cost and selling to a financial institution with higher funding cost, there are other factors that are important as well. For example transaction costs. Another important aspect is the credit risk against the counterparty. According to Person G, who is a manager from the front office, it is not an arbitrage when trading against counterparties with a lower funding cost. The credit counterparty risk is also an important aspect when doing it, why it would rather be a business transaction than an arbitrage.

5.2.2. Setting up an XVA-Desk

The institution has decided to look into the possibility to set up an XVA-desk to handle the issues with the different fair value adjustments. The idea is that the desk will be set up in their front office and work as a speaking partner with Treasury of the institution. The desk will in

one way be an extension of the treasury and support the front office in their trading according to Person D, who is a trader from the front office. Person C, who is an expert from the treasury department, argues that it is important to avoid the risk that the XVA desk turns into some kind of black box, where the pricing methodology is unclear and where someone makes own adjustments that no one else understand. The FVA will be estimated from the FTP-curve. The FTP-curve will then be divided into several of funding curves to match the product that are being traded. The funding curve will be divided from three perspectives: product, term to maturity and incitement (ibid).

5.3 The Valuation/Accounting Perspective

According to Person H, who is a valuation expert from the valuation department, the incorporating of FVA in the valuation department is probably different from the process made in the XVA-desk. This because the FVA adjustment made in the front office is based on the FTP given by Treasury. The adjustment made in the valuation towards the accounting should, according to IFRS 13, reflect an exit price, i.e., what a third party is willing to pay for the derivative. Therefore, in theory FVA should be based on an average funding curve, reflecting for example an industry or branch average. This would mean that FVA would differ between the front office and the valuation department.

Since the FVA might differ between the two departments there is a risk that value differences will be created in the accounting. Some derivatives might be overvalued and market values may be inflated, argues Person H, which can be very negative and misleading. A positive aspect is that the balance sheet will be easy to compare when using an industry-average funding curve, but in reality there will be a mismatch between the front office and the valuation department. It will also be misleading to have an industry-average funding curve when the purpose with IFRS is to reflect businesses real value. IFRS are to entangle in the exit price, means Person H. But he still remains positive to include FVA in the valuation, since it seems legit. Another problem, mentioned by Person F regarding two different values between the front office and the valuation department, is that the discrepancy between the two departments will be measured in the valuation department. Even though the front office does not look at this valuation on a daily basis it is nonetheless the official valuation of the derivatives so it has to be followed. If the discrepancy is too significant, the front office will start to price after the FVA developed by the valuation department instead of pricing after what happens on the markets. The conclusion of this is that front office and the valuation department work from different theoretical and practical aspects. Moreover, Person J, who is an accounting expert, argues that including FVA in the valuation of derivatives will lead to a fair value according to IFRS 13. Since the fair value should reflect all possible factors that affect the value of the derivative and what happens on the markets. Regarding the exit price criteria Person J is doubtful, because it will not reflect what happens on the markets, and the pricing in the front office, and will therefore not reflect the reality. It will instead be valued to a more general market price and not the price the institution are trading to and will in one sense not reflect a fair value argues Person J. Further on Person J also argues that exit price is vague since

the exit price differ fundamentally between which counterpart one is exiting the price against. An exit price that is right for one counterparty could be totally different for another counterparty.

The question still remains if the exit price in line with IFRS 13 should be reflected by the FVA. As mentioned, practitioners are positive, but theoreticians are negative to that the FVA should be reflected in the valuation for accounting purposes. Thus, there are some guidelines in the IFRS 13 stating that a concern for the funding should be implemented in the valuation. Person K, who is an external valuation expert, argues that the exit price should be based on the same funding costs as one have as a firm, which could be one perception of IFRS 13 after interpreting IFRS 13 BC 94: “In a fair value measurement, the non performance risk related to a liability is the same before and after its transfer”. The non-performance risk can hardly be connected to the funding cost of derivate, which would mean that a higher non-performance risk leads to a higher funding cost. And the argument that IFRS 13 states that a funding cost should reflect the fair value is also strengthen by this extract from IFRS 13 BC 94: “Without specifying the credit standing of the entity taking on the obligation, there could be fundamentally different fair values for a liability depending on an entity’s assumptions about the characteristics of the market participant transferee”. With other words this would mean that not taking the credit standing into consideration when valuing derivatives, is not in line with IFRS 13.

Another significant aspect when considering if an FVA should be incorporated in the valuation is to consider how the other actor reacts in the area means Person E. They do not want to be first out; there will be question of timing, to incorporate it together. Because in a small market like the Nordic where the institution operates, to be first out in an environment with few large actors can make big difference. Furthermore, if an incorporation of FVA in the chosen institution is executed, it is of outmost importance that the whole organisation is familiar with the concept, and is aware of the consequences. If an FVA adjustment is done in the front office, the consequences through the rest of the organisation has to be known states Person A, who is an external valuation expert.

5.4 The Risk Perspective

An incorporation of FVA would have a large impact on the risk desk, according to Person L, who is a quantitative analyst from the risk department. Since the current risk models do not take the funding issue into consideration. Hence, a re-build of a major part of the risk models would be necessary. The current models are based on market data, and in addition to their current data, a huge amount of new, relevant, data would need to be taken into consideration. This would be an expensive process, but to not do it could over time be even more expensive, why Person L is positive to the incorporation. Furthermore, they would need to analyse new curves that considers the overlap between CVA, DVA and FVA when calculating the risk, in contrast to before the GFC when everyone used the same curve (ibid).

Another important task to investigate is, according to Person L, on which granularity level, i.e., where and in what way, the FVA should be included. The question whether it

should be included for every deal, every portfolio, every desk or on a more general level for the institution as whole, is important to answer (ibid). If choosing to concentrate this question to an XVA-desk, a suggestion is to also include an internal-audit function to make sure that there won't be any distorted incitements for the desk. Otherwise it would be a risky thing to do (ibid). It won't be enough to only look at the FVA, according to Person L. Instead, a preferred scenario is one were both CVA, DVA and FVA are counted for. Without an overall understanding, there is a risk that the organisation will work in different directions (ibid).

When the market practitioners are introduced to new adjustment methods, or new methods in general, there is often a debate between them and the theoreticians. Despite what the theoreticians argue for it is always the practitioners that decide the outcome of the discussion, since what they choose to do is by definition the answer to the discussion (ibid).

5.5 The Market Perspective

According to interview object A there is no doubt about whether the FVA should be incorporated or not. His view is rather that the ones that are not incorporating it are the ones that will be outliers. A majority of the international financial institutions is already taking the FVA into consideration, both in their front offices and in their valuation, e.g., in their balance sheets. So the question is not if it should be incorporated, but how it should be incorporated (ibid). This since there still is not any consensus or consistent framework for how it should be done, resulting in different adjustments being made in every institution.

Person I, who is an external valuation expert, is recommending that one could use own funding spread as a proxy when estimating the FVA until more praxis has been established. The own funding spread will be a better adjustment than no adjustment at all. A solving to the problem to estimating an average funding curve, introduce by a practitioner in the branch, was that all financial institutions should share their own funding curves. Then, an average funding curve for the branch could easily be calculated. But the financial institutions turned down this proposition since they did not want to expose their funding curves in public. Person I also argues that there is no point of using a funding spread for a longer period than three months, since a longer funding spread would be less accurate, and since estimating a funding spread longer then three months will be harder to do.

Furthermore, according Person K, one larger financial institution in the Nordics will book a FVA charge, for the 2013 closure. It remains to see which of the institutions it is. The fact that one of leading institutions in the Nordics is incorporating FVA might be the starting signal for other financial institutions to start incorporating the FVA in their valuation for accounting purposes.

6. Analysis

In this section an analysis from the theoreticians view, the practitioners view and the valuation/accounting view, together with a discussion of the results, will be presented.

6.1 The Theoreticians View

As mentioned, there are theoretical arguments that an incorporation of FVA in the valuation should not be made. An incorporation would lead to arbitrage opportunities, and subjective prices would violate the principle law of one price. The incorporation of FVA would also violate the corporate finance theory.

Arbitrage opportunities might exist in theory, but according to the interviewed persons, it would not exist in the same way in practice. There are other factors than just the funding rate to take into consideration. Hull and White (2013) means that arbitrage opportunities will exist since different financial institutions would have different funding rates. This would, in theory mean that one could buy a derivative from a financial institution that have lower funding costs and then sell the derivative to a financial institution with higher funding cost, and in that way make an arbitrage. Practitioners within the institution argues that there are other aspects that are important as well, such as credit worthiness against the counterparty that one is in business with. One also have to take the transaction costs into consideration and the funding spread between the financial institutions has to be significant large to make an arbitrage lucrative, and today the funding spread between the financial institutions are not large enough. In addition, the arbitrageurs must also fund it, which would mean that the theoretical arbitrage-profits would be wiped out in the end anyway. According to Person E arbitrage opportunities are close to unreasonable. To make an arbitrage, one would need to have a financial environment with no transaction cost and an extremely low funding cost, and also counterparties with equal credit risk. Also, in today's financial situation it seems unlikely that arbitrage possibilities are profitable.

As mentioned, the incorporation of FVA inflicts with two theories, the law of one price and the classic financial theory. Both practitioners and theoreticians claims that the law of one price will be history if incorporating FVA in the valuation. As Mr Brigo, professor in financial mathematics at Imperial College London, states "It all depends on the bank's funding model, which is an internal thing, so banks will get different prices. You see it all the time in other markets, but in finance we have been trained to think there is a platonic price. One lesson of the financial crisis is this law of one price is gone," (Carver b, 2012). All financial institutions will have different funding spreads, which leads the derivative to have different prices, one subjective price from every financial institution. Hence, the assumption that two derivatives with the same risk will have the same price no longer holds. Person H means that demand and supply will still control the prices since the one with lowest funding cost will be the most competitive on the trade. The ones who are not funding themselves good enough will be eliminated from the market. Furthermore, Person B looks at it in another way. According to him, all prices will be subjective after the FVA, but the competitiveness in the market will in some cases lead to that the prices will be forced together anyway. Due to the competitiveness in the market, actors are willing to offer some of their marginal to close deals. Conclusively, demand and supply will still decide the prices since some institutions will be more compete-

tive due to lower funding costs, and competitive forces between the institutions will still occur. The market forces will still have a vital affect on the prices, in line with the theory.

The incorporation of FVA also violates the classic corporate finance theory according to some theoreticians. The funding costs should not be included and influence the pricing and valuation of derivatives. Only the risk and future cash flows should be concerned, and the funding cost should not affect ones decisions. Replacing the risk-free rate with a higher funding rate is wrong, according to Hull and White (2013). They argue that there is no theoretical basis to that. One can argue against Hull and White with the argument; should not all possible relevant risks be considered when pricing and valuating derivatives? In a broader, corporate finance perspective, an incorporation of FVA might have an impact on the decision-making. For instance, an investment might appear more profitable without the funding cost included, and vice versa, leading to distortion. Due to this, an incorporation of FVA might lead to better decision-making.

6.2 The Practitioners View

As mentioned, the practitioners' view is that an incorporation of FVA is to be recommended. According to Person M, one should not focus too much on how high or low the funding value is, what matters are the understanding of why it is high or low. This view was discussed with every person interviewed, and they all agreed that the understanding is one of the fundamentals in the discussion. FVA is supposed to be a tool to give the traders in the front office the right incentives when they trade. Without FVA there is a risk that the front office avoid taking positions that could be profitable for the institution due to that the funding cost from Treasury is too high. According to Person B, some of the financial aspects are difficult for Treasury to consider, simply since they are so many, why Treasury appreciates the set up of the XVA-desk. A partition where the XVA-desk gets the greatest responsibility in this question is therefore to be recommended (ibid). It is far from obvious how to price the collateral internally, and that's where the XVA-desk comes in as an intermediary who understands the matter. Generally, Treasury has no problem when the front office creates a function that works for them, as long as the new function is not hiding away anything that can create problems. Moreover, Treasury sees the implementation of the XVA-desk as positive, as they will now have a speaking partner in the matter. According to Person E, the XVA-desk will grow fast. The Trading department are setting the prices, and then the XVA-desk takes over. Therefore a lot will hang on how the pricing in the front office is made. And once again, to do so, there need to be an understanding throughout the department.

Another positive aspect is that due to the incorporation of FVA the financial institutions are reviewing the asymmetry in a way that has not been done before. Previously, financial institutions in general used the risk-free rate, and then more or less used an arbitrary assessment of how much they should add to the price to make profit, while still being competitive. Now, the regulatory requirements are forcing the financial institutions to count every penny to make sure to make a profit on their business. This is of course not a simple procedure, but still necessary, while providing a much clearer picture of what the trades really cost. Therefore another argument for incorporating the FVA in the valuation and pricing is that all costs of

providing the derivatives is taking into consideration, and one will not enter trades that are not profitable if one are aware of the own funding costs. An incorporation will affect the front office and their business, and for that reason it is very important that the work of the XVA-desk is done correctly. According to Person E, business with derivatives has gone down during the past years. For that reason, it is of extra importance to do everything right with this new possible incorporation. If they would fail to incorporate the FVA, while other actors succeed, it would have devastating effects. Also, in the beginning there is a risk when incorporating the FVA that customers will be driven away. They will probably be negatively affected, mostly because of the lack of understanding, but according to Person E this will even out over time. The institutions themselves will, in time, have better understanding for what they are doing, and will thus be able to explain to their customers. For that reason, it is of big importance to make the time period of less knowledge as short as possible. Thus, before incorporating FVA, there need to be an understanding, not just about how it should be done, but also why it is done. As long as the understanding and knowledge is widely spread in the beginning, the time that the customers are uncertain will be shortened.

According to Person F, there are two main problems when pricing derivatives. Firstly, there is the problem faced due to multiple curves. As mentioned, financial institutions previously based their pricing on one risk-free rate curve. Now they must separate this from several other curves, e.g., the forward curve, thus what they say in most textbooks on interest rate derivative does not apply after the financial crisis, according to Person F. This problem will be further discussed in the Valuation/Accounting view. Secondly, there is a problem due to counterparty risk, which has emerged as something one must include in the pricing. One have to include an economical CVA, e.g., an insurance premium in the pricing, and then one have to charge for the money the institution have to hold in order to trade derivatives. DVA is a component that some of the institutions are including in their pricing, and others do not. Person F's view is that it does not need be involved, since it is included in their own default. However, much of what is in the pricing is captured by the FVA, which also captures about the same components as the DVA. In this matter Person E supports Person F. Person E argues that when looking at how pricing is done today compared to before, linear products, such as swaps, previously was based on yield curves. Now it is far more difficult. Institutions must consider which positions they have, how counterparties appear, what other pay-offs they have in their contracts and what the regulations say about how to deal with a particular customer, given a certain position. The set up of an XVA-desk would be the perfect way to cope with these problems, and the incorporation of FVA will make the institution more accurate and aware of their costs and where they arise. This is agreed by all of the persons interviewed. The set up of an XVA-desk is right in time, and it will help the institutions to cope with different problems that may arise.

6.3 The Valuation/Accountant View

A possible incorporation of FVA is linked to several obstacles. As mentioned, one of the main tasks to deal with is the discrepancy between the adjustment made in the front office and the adjustment made in the valuation department. The front office needs to consider the compete-



tors when pricing their derivatives, i.e., when making a funding adjustment. If they price their derivatives higher than their competitors, there is a risk that they will lose customers. Therefore, they need to be aware of how their competitors act, and how they cope with FVA. As a result of this, they also need to consider their customers. The front office needs to consider the price that the customers are willing to pay when adjusting their price for the funding costs. The adjustment made in the front office is also depending on the FTP given from Treasury. As mentioned, the FTP is the financial institutions internal funding rate given by Treasury, i.e., the rate of which the front office can borrow money from Treasury. Depending on the rate provided by Treasury, the front office has to adjust their prices differently.

The valuation department needs to consider the overall funding cost of an exit price. The risk is that the valuation department creates a value that is not accepted or recognised in the front office. The chosen institution has, according to Person H, above average when it comes to borrowing costs in relation to other financial institutions. There is a risk that the Valuation department may produce a weighted average based on other institutions borrowing costs, which the Treasury department is not aware of. The easiest way for the valuation department to create a theoretical financial curve is to close one of its positions against another institutions or against a company dealing with the positions. Then the question arises whether this counterparty's funding cost should be taken into account in the chosen institutions adjustment, in order to get a correct exit price.

The discrepancy between the front office and the valuation department is something that the chosen institution needs to cope with in order to incorporate the FVA properly. The best way to cope with the problem would, according to Person H, be if the financial institutions could sit down in a forum and discuss suitable approaches, a proposal that is backed up by the authors.

According to IFRS 13 the valuation of derivatives should reflect an exit price of the derivative, i.e., what a third party is willing to pay for the derivative. This leads to problems in the valuation department. Person J argues that IFRS 13 is too entangled to exit price, because it is not reflecting what is happening in the institutions own front office. Instead it is reflecting an average price against the market. The problems regarding which funding rate to use to receive an exit price in line with IFRS 13 is of significant importance for the valuation department. Which funding rate is the most accurate? One practitioner argues that the own funding rate should work as a proxy. Others insist that an average funding curve is a better proxy. Another argues that the funding rate should be different for every trade. Thus, one can state that IFRS 13 in one way is complicating the incorporation of FVA in the valuation of derivatives, by the reason of the exit price concept.

One solution to solve which funding curve that is to be used to receive an exit price valuation is to estimate an average funding curve, for example for a branch or industry. This would mean that funding curves from several institutions in the industry has to be compiled and an average funding curves calculated. This would solve the problem of estimating an exit price, and balance sheets would be easier to compare, but there are obstacles on the way. Institutions own funding costs is very sensitive information and institutions are probably unwilling to disclose their funding information. To estimate an average funding curve was tried earlier this year with the larger financial institutions in London, but no one was willing to

expose their funding rates leading to that the project to estimate an average funding curve failed. There is also a chance that market values will be inflated, and that values therefore will be misleading in an accounting view. It will also be misleading to have an average funding curve as proxy for the FVA adjustment since the purpose with IFRS 13 is to reflect business real values. Once again IFRS 13 is too entangled to the exit price. Although, as mentioned, one positive aspect is that balance sheets will be easy to compare, which is one important role of the accounting standards, if not the most important. Conclusively, today the concept with average funding curves is in theory a proper way to estimate an exit price but with pitfalls in the estimation and calculation.

Another solution to the funding curve problem is that one could use different funding rates depending on the characteristics of the derivatives. According to Kancharla (2013) there are three funding curves that one can use (hereafter referred to as the different funding rate concept). Firstly, if one is holding the trade to maturity one should use the own funding rate as a proxy for estimating the FVA. Secondly, if one have a similar counterparty taking over the trade, the average funding curve should be used as proxy. Finally, if one is unwinding, the funding rate should be the cost that will be charged to one by the counterparty to unwind. This solution is more adaptable compared to static average funding curve concept. The different funding rate concept to use, as proxy, is more adapted after the specific trade of a derivative. This could lead to less discrepancy between the front office and the valuation department. But this method is less in line with IFRS 13 and the valuation against the exit price. The question arises if the exit price really is reflecting the fair value.

A third solution could be to use own funding curve as proxy to calculate the FVA as one practitioner argues. It is better to use the own funding curve then not doing an adjustment at all. Using the own funding curve as a proxy would mean that the discrepancy between the front office and valuation department would be slightly smaller in comparison to the other two solutions, since the own funding curve also reflects the valuation and pricing in the front office. Using the own funding rate would mean that an exit price would not be reflected in the same way as an average funding curve is. But using the own funding rate as proxy will mean that all the trading that are happening in the front office will also be reflected in the valuation, which the average funding curve is not reflecting. One can make an assumption why the fair value according to IFRS 13 is reflected by the exit price and not the value that is reflected by the own funding rate. This would according to some of the persons interviewed be a more fair value rather than the exit price, since the exit price is not reflecting what are happening in the trading in the front office. The exit price reflects a more general price.

Furthermore, since the chosen institution works in a relatively small market with a few large actors, there might be implications to be the first to introduce a FVA. Therefore an important aspect will be to consider how the other actors are acting on the market. According to one practitioner from one of the large consulting companies, one of the larger financial institutions in the Nordics are incorporating FVA in their books for 2013. This is a sign that an incorporation of FVA is in progress between larger institutions in the Nordic area. The incorporation between others actors in the area will therefore be an important decision aspect for the chosen institution when deciding whether to incorporate FVA in the valuation for derivatives or not. If everyone is incorporating FVA in the valuation and not the chosen institution,

they will risk being an outsider. Therefore it is important to synchronise an incorporation of FVA with the other actors in the Nordic area.

Today, the chosen institution includes both CVA and DVA in their balance sheet. It is possible that other institutions do it differently. The same applies for the back up made for financing costs. Preferable would be to group CVA, DVA and FVA to a single post in the balance sheet called “Fair Value Adjustment”, instead of including them all separately. This is also a topic to discuss, perhaps in co-operation with the other financial institutions, in order to reach a consensus in how to deal with the adjustment method. From an accounting point of view, the various financial institutions' annual reports would be more comparable if there was an industry-average, but in reality there would be a miss-match between the different institutions' front offices and valuation departments. It would be illogical to have an industry-average curve when the whole purpose of IFRS is to reflect the real operational value. How would the front office act if, for example, another financial institution would want to close a deal with the chosen institution in an FVA-world? How would one ever be able to close deals in such world, where for example another institution says that the deal is worth 10, but the chosen institution says that, according to their adjustment, the deal is worth 11, who would be right? This leads the discussion back to the question whether there should be an industry-average or not. In the current situation the hazard for financial institutions is that no one really knows when to make a profit or a loss, since no one is taking the funding into consideration.

6.4 Discussion

The interviews within the institution fulfilled their purpose, which was to give the authors a present overview of where the institution stands facing the FVA issue. The same applies to the purpose of the interviews with the external actors, which was to provide an understanding of how other institutions, partly the international ones, but also the domestic ones, have acted in regard to the subject.

The general view from the interviews is that all the different departments are positive to an incorporation of FVA and that an incorporation should be executed in the near future. Nevertheless, there are obstacles within the institution, such as the general understanding for the consequences of an incorporation, and also the general knowledge. One of the findings was that there is a lack of knowledge between the different departments. A fraction of the institution was well informed in the subject, but a majority of the institution was not informed at the same level, which might be a problem when an incorporation is to be done. Therefore, the institution has to extend the knowledge through the organisation.

Moreover, other obstacles that have to be solved are the practical ones, such as problems with what funding curve to use and how to reflect an exit price in the valuation. To use an average funding curve, or to use an own funding curve or some other approach, to reflect an exit price in line with IFRS 13, needs to be settled for an incorporation to be successful.

Also, the Nordic market is a relatively small one, why activities by different institutions are tending to have major impacts on the other ones, or on the institution itself. An early incorporation might lead to loss of customers, and the same goes for a late one, why an incorporation also is about timing.



7. Conclusion

In this section a conclusion of the thesis and its purpose, together with suggestions of further investigation, will be presented.

The main task to investigate was if FVA should be included in the valuation of derivatives for accounting purposes in line with IFRS 13 in the chosen institution. When bringing all aspects together there seem to be little doubt that an incorporation should be executed. This is first of all based on the fact that all financial instruments valued at fair value should incorporate all relevant aspects when determining a fair value, including the funding cost. Furthermore, arbitrage opportunities are not a factor that needs to be considered by the institution. The LOP is not obsolete, yet. Hence, the prices will be unique after an incorporation, but the competitiveness in the market will push the prices together in the end anyway. Despite what the theoreticians say, it is how the practitioners chose to act that decides the outcome of the debate, i.e., the practitioners act is de facto what will apply.

However, there are several factors that need to be taken into consideration regarding when it should be done, i.e., when the timing is good. The uncertainties regarding what funding curve to use, and the discrepancy between the different departments (i.e., the Valuation department, Front Office and Treasury) needs to be further investigated. Hence, there needs to be both a deep understanding and a well-functioning interplay between all of the departments before a possible incorporation could be conducted. The XVA-desk will help contribute to this understanding and interplay, which in turn will help to counter the risk of creating different values in different business areas. However, it is important that the XVA-desk is transparent and has a close cooperation with the other related departments. Therefore the chosen institution needs to assure that there is a common understanding and collaboration with regards to FVA in the different areas within the institution. Other factors, such as how the Nordic competitors act, and how the customers will react to an incorporation, need to be assessed.

To cope with these factors, it is suggested that the institution should put together a project group from different departments in order to perform a pre study. This study should analyse the factors revealed above and other relevant aspects that might not have been covered in this study and come with a solution of how and when FVA should be incorporated in the Fair Value for financial instruments for accounting purposes.

Consequently, the conclusion from this case study is that the chosen institution should take immediate actions to start an investigation on how and when FVA should be incorporated. The institution has to understand and act on the factors mentioned above, and hence prepare for an incorporation. The suggested pre study needs to result in sufficient knowledge and concrete actions, because now that their competitors have started to act, the institution needs to be able to do the same.

8. References

- Avanza Bank AB, 2013. *Information om Handel med Optioner, Terminer och andra Derivatinstrument*. [Online] Stockholm, Sverige: Avanza Bank AB Available at: https://www.avanza.se/aza/depa/blanketter/risk_info_derivat.pdf [Accessed 06 November 2013].
- Basel Committee on Banking Supervision, 2011. ISBN 92-9131-079-4 *Application of own credit risk adjustments to derivatives*. Basel: Bank for International settlements.
- Bell, J. (2000) *Introduktion till forskningsmetodik*. Studentlitteratur, Lund
- Berk, J. & DeMarzo, P., 2013. *Corporate Finance*. 3rd ed. California: Pearson Education Limited.
- Björklund, M. & Paulsson, U. 2012. *Seminarieboken: Att skriva, presentera och opponera*, Studentlitteratur, Lund
- BIS, 2013. *BIS.org*. [Online] Bank of International Settlements Available at: http://www.bis.org/statistics/r_qa1309_hanx23b.pdf [Accessed 10 December 2013].
- Cameron, M., 2013. The Black art of FVA. *Risk Magazine*, 28 Mars. p.4.
- Carver, L., 2012a. Traders close ranks against FVA critics. *Risk Magazine*, 6 September. p.7.
- Carver, L., 2012b. Quant Congress Europe: FVA ends 'Platonic price', says Brigo. *Risk Magazine*, 11 Oktober. p.1.
- Carver, L., 2013. Barclay's and JP Morgon among first to centralise 'XVA' desks. *Risk Magazine*, 30 August p.2.
- Carver, L., 2013. Introducing the XVA desk - a treasurer's nightmare. *Risk Magazine*, 29 August p.5.
- Deloitte Touche Tohmatsu Limited, 2003. *IAS 39 — Financial Instruments: Recognition and Measurement*. [Online] Deloitte Touche Tohmatsu Limited Available at: <http://www.iasplus.com/en/standards/ias/ias39#link0> [Accessed 15 November 2013].
- Deloitte Touche Tohmatsu Limited, 2013. *International Accounting Standards Board (IASB)*. [Online] Available at: <http://www.iasplus.com/en/resources/ifrsf/iasb-ifs-ic/iasb> [Accessed 8 November 2013].
- Deloitte, 2013. *International Accounting Standards Board (IASB)*. [Online] Available at: <http://www.iasplus.com/en/resources/ifrsf/iasb-ifs-ic/iasb> [Accessed 8 November 2013].
- Dennehy, W., Naidoo, K. & Sukha, S., 2013. *Risk.net*. [Online] ABSA Available at: <http://www.risk.net/risk-magazine/advertisement/2300466/sponsored-statement-absa> [Accessed 12 December 2013].



Eklund, J., Sandström, M. & Stenkula von Rosen, J., 2012. *Riksbank.se*. [Online] Sveriges Riksbank Available at:

http://www.riksbank.se/Documents/Rapporter/Ekonomiska_kommentarer/2012/rap_ek_kom_nr06_121210_sve_uppdaterad_130131.pdf [Accessed 10 December 2013].

Ernst & Young, 2012. *Reflecting credit and the funding adjustment in fair value*. Survey. United Kingdom: Ernst & Young Ernst & Young.

FinCAD Corporation, 2011. *Basics of Credit Value Adjustments and Implications for the Assessment of Hedge Effectiveness*. [Online] FinCAD Corporation Available at: <http://www.cmegroup.com/education/files/fincad-hedge-accounting-kpmg-3.pdf> [Accessed 12 November 2013].

Hull, J. & White, A., 2013. *Valuing Derivatives: Funding Value Adjustments and Fair Value*. Toronto: University of Toronto University of Toronto.

IFRS, 2012. *IFRS Fair Value Measurement*. [Online] IFRS Foundation Publications Department Available at: <http://www.ifrs.org/Use-around-the-world/Education/FVM/Documents/EducationFairvaluemeasurement.pdf> [Accessed 8 November 2013].

ISDA, 2013. *2013 Standard Credit Support Annex (SCSA)*. [Online] The International Swaps and Derivatives Association, Inc. (ISDA),: ISDA Available at: <http://www2.isda.org/search?headerSearch=1&keyword=ISDA+Publishes+2013+Standard+Credit+Support+Annex+%28SCSA%29> [Accessed 4 December 2013].

Jacobsen D.I (2002). *Vad, Hur och varför? Om metodval i företagsekonomi och andra samhällsvetenskapliga ämnen*. Studentlitteratus, Lund

Kancharla, S., 2013. *Numerix*. [Online] Available at: http://nx.numerix.com/The_OIS_FVA_Relationship_The_Evolution_of_OTC_Derivative_Funding_Dynamics.html [Accessed 10 December 2013].

KPMG, 2012. *IFRS Practice Issues for Banks: Fair value measurement of derivatives - the basics*. [Online] KPMG Available at: <http://www.kpmg.com/global/en/issuesandinsights/articlespublications/ifrs-practice-issues/pages/ifrs-practice-issues-valuation-derivatives.aspx> [Accessed 12 November 2013].

Laughton, S. & Vaisbrot, A., 2012. In defence of FVA - a response to Hull and White. *Risk Magazine*, p.4.

Lu, D. & Juan, F., 2011. *SSRN*. [Online] Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1803823 [Accessed 14 November 2013].

Nelson, R.M., 2013. *fas.org*. [Online] Concessional Research Service Available at: <http://www.fas.org/sgp/crs/row/R40977.pdf> [Accessed 10 December 2013].

Rehlon, A. & Nixon, D., 2013. *Bank of England*. [Online] Bank of England Available at: <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2013/qb1302ccps>



[bs.pdf](#) [Accessed 30 November 2013].

Ryan, S.G., 2008. *Fair Value Accounting: Understanding the Issues Raised by the Credit Crunch*. [Online] Council of Institutional Investors Available at:

<http://www.uic.edu/classes/actg/actg593/Readings/Fair-Value/Fair-value-accounting-Understanding-the-issues-Ryan.pdf> [Accessed 8 November 2013].

Sawyer, N., 2012. FVA should be included in derivatives pricing say survey respondents. *Risk Magazine*, 10 December. p.2.

van der Wielen, L., 2013. *Guide to the ACI - Operations Certificate*. 1st ed. Amsterdam, Netherlands: Double Effect.

Appendix 1 – Interview substratum

1. General Questions

Can you give us your general thoughts on FVA, for example, what is positive with FVA? What is negative with FVA? How important is the theoretical vs. the practical perspective regarding FVA?

2. Treasury specific

What is the best way to estimate the funding curve? Do you see any issues with the estimation?

Some argue that setting up an XVA desk might draw the power from Treasury to trading with regards to liquidity management, what is your view on that?

What is your view with regards to what funding cost that treasury should charge the traders with? What should that cost be?

What is your view on the choice of liquidity spread curve? Is it possible that it would generate arbitrage opportunities? Would you say that your traders' behaviour is aligned and responsive to the banks true funding costs?

3. Trading specific

Do do you think that FVA, DVA and CVA will affect trading behavior? If yes, how?

Some argue that the growing use of collateral will kill of the FVA debate in a couple of years. What is your view on that? How quickly do you think this could happen in Sweden?

How do you see on the arbitrage opportunities? Will there be possibilities of Internal arbitrages?

How realistic do you think it would be that you can make trades below market just because you are discounting with your own funding curve, which might be higher than the market funding curve?

At which rate should Treasury lend to the front office? Will this be the same rate that traders will charge your clients?

Is there a possibility that profits will be wiped out when traders borrow from Treasury, that in turn borrows through bond or interbank?

Will you have competitive issues if including FVA in your derivative valuation, i.e., is there a risk of losing clients?

Since everyone will have different funding spreads, is there a risk that you will not agree on a fair price, and theoretically never close the trade?

Where would you see it as most adequate to set up an XVA desk from an organizational perspective and why?

What are the major concerns by setting up a XVA desk, both internally and externally?

4. XVA-desk specific

In which department would you see it as most adequate to set up an XVA desk from an organizational perspective and why?

What are your incentives for the set-up?

How will the desk differ from the Treasury department?

What will be the responsibility of the XVA-desk?

What would you say is the mainly difference between FTP and FVA?

How will you handle the overlap between DVA and FVA? What is your view on this from a valuation perspective?

What is your view on the differentiation between the market funding and the funding used in FO?

What are the major concerns by setting up a XVA desk, both internally and externally?

5. Valuation/Accounting Specific

What is your view regarding valuation for non-collateralized derivatives? Should an adjustment for the funding cost be included?

Some argue that the law of one, platonic price is history. What is your view on that? Will the price/value be too subjective/unique by including the institutions own cost of funding?

Traditionally the incorporation of a risk free rate for valuation of derivatives has been argued to be the adequate method. Are you of the opinion that this methodology is still valid?

Another aspect has been that there should only be the relevant risks that should be included in the valuation (for example in corporate finance theory) rather than the riskiness of the busi-

ness that undertakes the deal. What is your view on this? Would you say that there a difference between Construction costs vs. Accounting valuation? Is your view that by incorporating FVA in your valuations you will approach a more accurate market value?

Some say that by adding FVA to the valuation one will drive the valuation from the economic value back to the model value. What is your view?

From an accounting perspective the Fair Value should be seen as an exit price and hence FVA for accounting purposes should not be calculated by using the own funding cost, but more exact a general funding cost. What is you view on this with regards to the inconsistency with the FVA calculated in Front Office? And how can a general funding cost be estimated properly?

Certain market participants argue that the liquidity spread of a third party potential buyer would have to be used to determine FVA in conformity with IRFS. Would you agree? If yes, is it feasible? How would it be done? Own funding spread as a proxy for market funding cost?

5. Risk Specific

How would your work be affected by a potential incorporation of FVA?

Do you think an incorporation would affect your low risk-profile?

If yes, would this be a positive or a negative affect?