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The fall of HQ Bank AB –

from an accounting perspective

Bachelor thesis in
Business and Administration
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Abstract

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Background and problem: In August 2010, HQ Bank's license was revoked by the SFSA (sw. Finansinspektionen). One of the reasons for the SFSA to revoke the license was HQ Bank's valuation of the financial instruments. Mr. Johan Dyrefors was the auditor of the bank at that time. Both he and the audit firm KPMG was reported to the SBPA (sw. Revisorsnämnden) since SFSA did not share Mr. Dyrefors opinion that the trading portfolio had been measured in a correct way. Therefore, we investigate how the SFSA and Mr. Dyrefors argue for their notion of the concept of an active market and what supports their opinions in current regulation and previous research, which also is the research question of this thesis.

Limitations: This thesis does not investigate the level of activity of the options, which existed in HQ Bank's trading portfolio, nor their markets activity properties. No deeper investigation of the underlying financial aspects, such as which measure of volatility is the most appropriate or examination of the fitness of valuation models, will be carried out since these topics concern financial economics rather than accounting. Neither the management of the bank nor how it affected the liquidation will be examined.

Method: An explanatory case study has been performed in combination with a qualitative text analysis to compare the parties' opinions and legal dogmatics to compare the opinions with the standards and current law. Finally, market data have been extracted from a financial instrument used in both the SFSA's and Mr. Dyrefors' line of argumentation.

Results and conclusions: Firstly, the parties agree that activity existed on the market, but their interpretation of whether it was large enough to be useful for the valuation diverge. Mr. Dyrefors' arguments, consistent with some academics, indicate that fair value is problematic when markets are illiquid and spreads are large. Secondly, our findings show that HQ Bank's definition of an active market lead to a possibility to manipulate the market, though this might not have been the purpose. Finally, lacks of general proofs from both parties' basis of conclusions reduce creditability in the discussion. As long as assumptions are fully motivated and consistently handled, both opinions may fall within the boundaries of the IAS 39. The fall of HQ Bank clearly indicates that the scope of interpretations in IAS 39 might be too broad.

Suggestions for further research: A quantitative study of the level of activity of the options in HQ Bank's trading portfolio or the properties of their market activity would be interesting, as well as if observable market data was used enough as input in the models and how this affected the accounting. Also, whoever aims to evaluate new valuation techniques, which improve characteristics of reliability, must be encouraged, since both science and regulation seems to be missing solutions to this fundamental accounting issue.

Keywords: HQ, active market, observable market data, fair value accounting.

Preface

We would like to thank our tutors Ph.D. Jan Marton and Ph.D. student Niuosha Samani who have helped us to navigate through the difficult process of writing an essay.

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Abbreviations

AG – Application Guidance

BC – Basis of Conclusions

EAP – Expert Advisory Panel

EU – European Union

FASB – Financial Accounting Standard Board

FCAG – Financial Crisis Advisory Group

GAAP – General Accepted Accounting Principles

GPPC – Global Public Policy Committee

IAS – International Accounting Standards

IASB – International Accounting Standard Board

ICAA – Internal Capital Adequacy Assessment

IFRS – International Financial Reporting Standards

IG – Implementation Guidance

PwC – PricewaterhouseCoopers

SFAS - Statement of Financial Accounting Standards

SFSA – Swedish Financial Supervisory Authority (sw. Finansinspektionen)

SBPA – Supervisory Board of Public Accountants (sw. Revisorsnämnden)

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1 Introduction

In this section, a resume of the history of HQ Bank will be described as well as a discussion of the problem, a research question will be formulated and limitations will be set.

1.1 Background

HQ Bank AB was founded in 1981 under the name Sven Hagströmer Fondkommission (Neurath, 2011). It was a part of the Swedish financial market for almost three decades until the Swedish Financial Supervisory Authority (SFSA) on the 28th of August 2010 announced the revocation of their banking license and that the SFSA was going to apply for the company to be entered into liquidation (SFSA, 2010).

In 2005, the auditor assistant of HQ Bank paid attention of HQ Bank's measurement of the company's trading portfolio. Internal control was conducted through traders controlling each other. The lack of external control of the used values affected the internal control negatively. The auditing firm KPMG suggested that the risk department would also be responsible for performing external control of the values used (Dyrefors, 2011).

In 2006, the same year as the company received its banking license, it was time for a rotation of auditor (ibid). The assistant auditor who had been criticizing the measurement of the trading portfolio was the natural successor, but HQ Bank rejected him. For years, the difference between the theoretical value and market value, the so-called *edge*, of HQ Bank's trading portfolio grew (Neurath, 2010). In the following year, the SFSA started to investigate the management of complex financial products among eight banks and securities companies, among them HQ Bank (SFSA, 2007). The investigation did not include the measurement of the trading portfolio, but concluded that there was a lot to criticize on how HQ Bank managed their trading operations (SFSA, 2008).

In 2009, the risk department of the company internally noted that reliable market values existed, which could be used in the measurement of the trading portfolio. The Board of Directors disagreed (Neurath, 2011). The bank established an internal capital adequacy assessment, *ICAA*, during the third quarter of 2007 and the first quarter of 2008. The purpose of the ICAA was to analyze HQ Bank's capital given the operations and the risks that the bank continuously was exposed for. Based on the ICAA, the SFSA requested a revised ICAA since the first one did not reach the expectations of the SFSA. The SFSA began to be suspicious about HQ Bank's level of risk and capitalization (SFSA, 2009).

During the spring of 2010, a new member with knowledge about valuation of complex financial instruments was elected to HQ Bank's board of directors (Neurath, 2011). The new board member conducted a preliminary valuation of the trading portfolio, which indicated that the difference between the theoretical value and the market value had increased over a long time. According to her, this was caused by an excess value in the trading portfolio, and she suggested to the board of directors a reconsideration of the measurement of the portfolio (ibid). An increasing difference between the theoretical value and the market value might indicate of a growing and systematic overvaluation of the instruments (SFSA, 2010).

The board of directors of HQ Bank eventually realized that the excess value of the trading portfolio had become untenable. They informed SFSA about their decision to liquidate the trading portfolio. On 25 May 2010 the bank realized significant losses in their trading and at the same time announced a profit warning of 200 million SEK (HQ AB, 2010).

HQ Bank used first-day results, which means that a completed transaction immediately can be revalued from market price to theoretical price. This resulted in the ability to book a profit as soon as the transaction was conducted (SFSA, 2010).

Later that summer, the SFSA conducted an investigation of the valuation of HQ Bank's derivatives. The investigation concluded there had been no independent party to examine the valuation model, which meant the bank had been given significant opportunities to manipulate the value of the trading portfolio. The SFSA also argued the bank had not made maximum use of market data and thereby not adhered to the accounting rules. The auditors had also pointed this out (SFSA, 2010b). The auditor of the company, Mr. Dyrefors, was reported to the SBPA by the SFSA (2011). Mr. Dyrefors argued that HQ Bank had reported satisfying information in its external financial reporting and that a reader with good knowledge of the trading business should be able to realize the risks that existed in the trading operations (Dyrefors, 2011). The SFSA considered whether to revoke the bank's license or to be satisfied with a warning. Due to the serious violations committed by the bank, the SFSA realized it was not enough with a warning. On the 28th of August 2010, the SFSA revoked HQ Bank's banking license (SFSA, 2010).

In the resolution for revocation of the banking license, the SFSA criticizes HQ Bank on the measurement and the accounting practices of the trading portfolio, the capital adequacy requirements, management control as well as the Board of Directors and the Managing Director. Regarding the measurement of the trading portfolio, the SFSA pointed out that the major parts of the derivative instruments had been valued by a theoretical approach since HQ Bank considered the market inactive (SFSA, 2010). At that time, Mr. Dyrefors was the auditor of HQ Bank. Among other things, the SFSA did not share Mr. Dyrefors opinion that the trading portfolio had been measured in a correct way.

The SFSA handed over the investigation to the Supervisory Board of Public Accountants (SBPA), which received the records that were going to become a disciplinary case regarding Mr. Dyrefors and the audit firm KPMG AB (SBPA, 2010). The SBPA asked Mr. Dyrefors to make a statement about the case filed by the SFSA, with special focus on the banks principles of valuation by answering questions regarding the audits of HQ Bank during the years of 2008 and 2009. One of the questions was if HQ Bank used “an acceptable application of IAS 39 despite lapses from the fundamental logic and technique in IAS 39” (ibid, p. 2).

The IAS 39 – Financial Instruments: Recognition and Measurement (IAS 39) is an accounting standard set by the International Accounting Standard Board (IASB). Its objectives are to recognize and measure financial assets, financial liabilities and some contracts to buy or sell non-financial items (IASC, 2009), such as derivatives. Derivatives should be measured to fair value.

The SFSA makes a statement to the SBPA and discusses if HQ Bank used an acceptable application of IAS 39. In October, SBPA announced a statement notifying Mr. Dyrefors an admonition in the disciplinary case (SBPA, 2011). This meant Mr. Dyrefors had not made severe mistakes in the audit of HQ Bank, which also included the measurements and valuations in IAS 39.

1.2 Problem discussion

IAS 39 states that quoted prices in an active market is the best evidence of fair value (EC Staff, 2011b). In the statement, where it was decided to revoke HQ Bank's license, the SFSA attached an appendix called "The bank's management of the trading portfolio from an accounting perspective" (SFSA, 2010, p. 31). The appendix is divided into four sections named (1) Flaws in the banks valuation techniques, (2) Calibration of the valuation techniques, (3) Accounting of Day 1-results and (4) Disclosures of risks and important circumstances.

In the first section, the SFSA (ibid) states "In the investigation, it has appeared that the bank on the 31st of December 2009 made the decision that the market had not been active for about 98 percent of all the derivative instruments in the trading portfolio", and continues "Furthermore had the bank, for about 70 percent of the derivative portfolio, used a valuation technique containing data which had not been observable in a market" (ibid).

It was the SFSA's opinion the bank had diverged from making maximum use of information from the market when measuring the financial instruments. Mr. Dyrefors states that "…finally I would shortly like to comment on the SFSA's report to the extent it concerns active market and close concepts. As far as I understand, the SFSA has misinterpreted the concept of activity" (Dyrefors, 2011, p. 28).

If the market is to be considered active, as the SFSA indicates, sections two and three are no longer a problem, and number four will become a minor one. The main issue in the HQ Bank case, from an accounting perspective, is whether the market is to be considered active or not through the usage of observable market data.

The two statements of the SFSA and Mr. Dyrefors' opinions clearly diverge in the measurement of the derivative instruments. It is obvious that the parties have different points of view on how an active market (and close concepts) should be implemented. Considering the announcements from the auditor and the SFSA, there is a reason to believe that different opinions of what an active market is could have been a part of the fall of HQ Bank. To be able to evaluate the quality and soundness of the arguments, one also has to be able to compare them to the current regulation.

1.3 Research question

As pointed out in the previous section, the concept of an active market is crucial to the fair value measurement of financial instruments. In a principle-based framework such as the IFRS, two separate entities might end up with different interpretations and therefore different solutions to the same problem. It is however also possible that both solutions might be within the boundaries of current regulation. The concept of an active market involves subjective judgments of other close concepts such as quoted prices, observable market data, activity etc. What mattered in the case of HQ Bank when measuring if a market is active or, more specifically is as follows:

- How do the SFSA and Mr. Dyrefors argue for their notion of the concept of an active market and what supports their opinions in current regulation and previous research?

1.4 Limitations

This thesis does not investigate the level of activity of the options, which existed in HQ Bank's trading portfolio, nor their markets activity properties. No deeper investigation of the underlying financial aspects, such as which measure of volatility is the most appropriate or examination of the fitness of valuation models, will be carried out since these topics concern financial economics rather than accounting. Neither the management of the bank nor how it affected the liquidation will be examined.

2 Method

This section is about methods used in this thesis to provide an answer to the research question, about this thesis contribution to accounting research, and about on the reliability and validity of the methods used.

2.1 Methods used in this thesis

This case is considered specific, and the reasons of the observed accounting practices need to be explained. The underlying theories of the accounting research areas will be used to understand this single case, rather than produce any generalizations. The objective is to produce good explanations of the case through generating theories. Such a case study is considered an explanatory one (Ryan, Scapens & Theobald, 2002). The process of handling the empirical evidence is described below.

Firstly, a comparison between the differences in the parties' accounting choices has been made through a qualitative text analysis. The empirical evidence (adequate documents) has been selected from the SBPA case (Dnr. 2010-1391) which evaluates the audit of HQ Bank made by Mr. Dyrefors, and therefore implicitly also the accounting. The choice of documents has been limited to the SFSA (2010), Mr. Dyrefors statement to the SBPA (Dyrefors, 2011) and the SFSA's comment on Mr. Dyrefors statement (SFSA, 2011). These documents have been selected since they summarize all the relevant argumentation in the HQ Bank case. Essiasson, Gilljam, Oscarsson, Wängerud (2012) states that appropriate selections of the text should be chosen and systemized by logical order. An argumentation analysis has been carried out by asking questions to the empirical evidence.

The documents mentioned above have been read carefully and adequate keywords connected to the concept of the active market have been identified. Appropriate quotes have been chosen by extracting sections about fair value, observable market data/quoted prices and active market/activity – keywords within the concept of active market. The sections have been categorized in groups by the keywords mentioned above and thereafter filtered from duplicates and similar opinions to retain different opinions only. The keywords have simplified the selection of quotes, which in turn have been compared, and once again categorized into subgroups discussing the one and very similar issue. The quotes in each subgroup have formed answers to questions created afterwards. In this way, we have found out what the important issues of the HQ Bank case have been.

Secondly, the parties' arguments will be compared against theory and current law. An applicable method, derived from jurisprudence, is called legal dogmatics. The method can be divided into two levels, one of which it is the "scientific processing of all legal material" and the second where "sentences form a certain system, which enable to conceptually and systematically value the application of law" (Narits, 2007, p. 19).

One common opinion about legal material among practicing solicitors is that it can be divided into words of the act, preparatory work, case law and doctrine (Sandgren, 2005). Since case law has less to provide on the subject of accounting, words of the act (the standards), preparatory work as well as the doctrine must be considered when evaluating the arguments.

Reliability is whether the data is independent from the researcher while validity is whether the data reflects the real world (Ryan et. al, 2002). Another way to describe the concepts is whether errors are unsystematic (as in reliability) or systematic (as in validity) according to Essiasson et. al, (2012).

The reliability of the explanatory case study is above all dependent on the interpretations of the reviewed statements. To avoid adding bias to the study, the authors have performed an interpretation of the evidence independently. Thereafter, the interpretations have been compared, discussed and finally stated as a solution.

Regarding the validity of the study, evidence should be assessed by comparing it to other kinds of evidence on the same topic (Ryan et. al, 2002). The choice of questions is fundamental to a qualitative text analysis (Essiasson et. al, 2012). Since all evidence is official and most of it is published, our opinion is that the statements are the best sources for reflecting the points of view of the parties, i.e. Mr. Dyrefors and the SFSA. Therefore, no complementary interviews have been made. All correspondence between these two parties has been subject to translation by the authors since they are originally written in Swedish.

Where multiple sources of evidence agree on facts and opinions, these have been evaluated as true. If differences appear within a line of arguments of one of the parties, the last one stated chronologically has been used. If differences in opinions of basic facts are found, it is hard to validate the verity of the parties. Fortunately, this is outside the scope of this thesis.

Lacking objective evidence of the market activity in the study, an example in terms of market data from a financial instrument has been presented in the empirics and the appendix to exemplify which difficulties a financial preparer may face. Three columns showing the share of open interest traded, crosses where the ratio of volume traded in relation to open interest above 5%, as well as comments has been attached to the table. In the example, an activity ratio has been set to 5% to exclude the least significant transactions, just to show how difficult it is to actually choose a suitable limit of activity. The reason why this instrument was chosen is since both Mr. Dyrefors and the SFSA have presented information about it – i.e. both use it in their argumentation as basis of their opinions. Furthermore, it was also chosen because the edge was high according to the SFSA. Unfortunately, gaining access to a financial data service, showing the daily bid-ask *spread* (the difference between bid- and ask prices) of financial instruments historically, has not been possible. Evaluation of the occurrence of spreads as well as their magnitude has therefore not been feasible in this study.

2.2 Relevance of this thesis

The study is performed to understand how different opinions of an accounting concept could play a part in the liquidation of HQ Bank. The measurement problem of financial instruments is a current topic of discussion and makes the study both relevant and motivated. The process of revoking the banking license of HQ Bank is properly documented and is an excellent example of how serious the valuation problem of an active market actually is, which motivates the choice of study.

As stated above, this thesis will not produce any generalizations in the way that quantitative research methods may result in. This should, however, not be considered as proof of lack of relevance, since the aim of this thorough examination of the case should result in explanations. Those explanations might later become the basis of new research that may come up with such quantitative generalizations. That is, without our study, it is possible that such research might never be undertaken. This should be considered as our contribution to accounting research.

2.3 Method critics

The process of choosing questions previously described may seem reversed but encapsulates the strength of the fact that it is actually the text itself that tells us what questions are answerable what questions are not. The fact that the method described excludes issues not mentioned in the texts has been taken into consideration. In fact, it is implicit in the research question that such issues was excluded to be explained in the thesis since the parties' opinions, which are expressed in the texts, are the foundations of the case. Any text subject to translation may be considered biased due to linguistic interpretations. The wording of the translated quotes may appear simplified and inadequate, but is intentionally kept similar to Swedish in an effort to preserve the stringency of the opinions and avoid interpretation.

The case will be explained as if both of the parties were completely honest with basic facts and statements, which might be of a highly hypothetical nature. Such discrepancies will be avoided in the sections of analysis and conclusions.

The financial instrument described as an example in the empirics and the appendix does not reflect the general activity of options in the OMX exchange nor all of the options in the HQ Bank's trading portfolio. The instrument is a sample and should not be given more gravity than that. Still, it is an eminent example of what challenges the preparers of financial statements in HQ Bank faced, which the example aims to show.

3 Regulation

In this section, development of regulation and IFRS present and future standards covering financial instruments and fair value will be presented. Only relevant parts of the standards for this thesis will be discussed.

3.1 Development of accounting regulation of financial instruments

IASC was an international organization, founded in 1973 and when it reorganized in 2001 it changed its name to IASB. The IASB is the independent standard-setting body of the IFRS Foundation (Marton, Lumsden, Lundqvist, Pettersson, Rimmel, 2010). The IFRS Foundation is an independent organization working for developing a set of high quality, understandable and globally accepted International Financial Reporting Standards (IFRS) through its standard-setting body, the IASB. In 2002, EU decided that IFRS should be used in the consolidated financial statements for every European company listed on a stock exchange from 2005 (Smith, 2006). IFRS are principle-based standards, which implies qualitative characteristics. The purpose is to make the companies do their own interpretations and qualitative assessments inside the frame of the accounting principles (ibid).

Through a joint project between the IASB and the Financial Accounting Standard Board (FASB) in 2005, the boards discussed the future of reporting financial instruments and objectives with the aim of improving and simplifying them (FASB, 2012). Preparers, auditors and users of financial statements found the requirements for reporting financial instruments difficult (IASCF, 2008). In March 2008 the IASB issued a discussion paper named *Reducing Complexity in Reporting Financial Instruments*, which later was published by the FASB too. The boards' objective of the discussion paper was the convergence and improvement of requirements for measuring financial instruments (ibid).

Due the financial crisis in 2007-2009, the political pressure made the board to develop a new standard (Marton et. al, 2010). In October 2008, a group of senior leaders with broad international experience in financial market was assembled to identify the accounting issues that required the boards' urgent attention, named the Financial Crises Advisory Group (FCAG) (FASB, 2012).

3.2 Qualitative characteristics

Preparers applying the IFRS standards sometimes face issues in which general guidance is needed to produce accounting of good quality despite the absence of rules. Therefore, the IASB has published a conceptual framework to give guidance on how to handle situations where the standard is not clear enough (IFRS Foundation, 2011). Qualitative characteristics are general concepts of the conceptual framework. The two primary characteristics for this thesis are *relevance* and *reliability*.

3.2.1 Relevance

The IASB conceptual framework states that information must be *relevant* to be useful for decision-making needs of users (ibid). When influencing the economic decisions of users by helping them to evaluate past, present or future events, confirming or correcting their past evaluations, relevance is achieved. The predictive and confirmatory roles of information are interrelated by enabling the user to use information to predict what is going to happen in the future as well as confirming or correcting such previous predictions (Smith, 2006).

3.2.2 Reliability

Information is considered *reliable* when it is free from errors and bias and when the users can rely on that it represents what it either purports to represent or at least could be expected to represent. The notion of free from errors implies the *verifiableness* of the information by comparing it to some kind of evidence, and bias could be the consensus between different evaluations. The last part about whether the users could rely on it involves a form of *validity*, which means that the financial accounting describes aspects of reality (ibid).

Since financial statements provide standardized information to different parties using it to make investments and credit decisions, it is important that the accounting numbers are relevant and reliable. The meaning of the words reliability and relevance can be in conflict; that is why it is important to make sure that the investors and other stakeholders receive the information they need to make the right decisions (Laux & Leuz, 2010).

3.3 Option basics

IAS 32 paragraph 11 defines a *financial instrument* as "any contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of another entity." (EC Staff, 2011). A *derivative* is a financial instrument which price is based on an underlying asset with a notional amount, requires a little initial investment and has a payoff at a future date (Marton et.al 2010). One type of derivate is the *financial option*. An option is a contract between two parties for a transaction at a pre-determined price and future date (Berk & DeMarzo, 2007).

The *holder* (owner) of the contract has the opportunity, but not the obligation, to exercise the option at a future date. If the option is exercised, the transaction of the underlying asset will be executed. The *writer* (seller) of the contract of course has to comply with the holders' decision. If the holder of the contract decides not to execute the transaction, the option becomes worthless. The holder is also said to be long in the contract while the seller is short (ibid).

A *call* option gives the holder the opportunity to buy the underlying asset and the *put* option the opportunity to sell it. The pre-determined price is called the *strike price* or the *exercise price*, that is, the price at which the underlying transaction will occur upon exercise. Beyond bid- and ask prices, the market also defines an *open interest*. This shows the total amount of unsettled contracts, which is also called the *depth* of the market (ibid).

3.4 IAS 39 – Financial instruments: Recognition and Measurements

Derivatives are a financial asset or a financial liability. When recognized initially, the entity shall measure it at its fair value. The concept of fair value of financial instruments is defined in IAS 39 paragraph 9:

> "*Fair value* is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction."

3.4.1 Active market with quoted prices

Further requirements for determining the fair value of a financial asset or liability is defined in IAS 39 paragraph 48 A and AG 69 – AG82 of appendix A, IAS 39. Paragraph 48 A states that quoted prices in an active market is the best evidence of fair value. This forces the preparer of financial reports to evaluate whether the financial instrument is regarded as quoted in an active market or not.

Further guidance on this topic is given in AG 71, appendix A, IAS 39, which states that a financial instrument is regarded as quoted in an active market if quoted prices are readily and regularly available from an exchange, dealer, broker, industry group, pricing service or regulatory agency, and those prices represent actual and regularly occurring market transactions on an arm's length basis.

In this paragraph, five prerequisites of an active market are defined: the financial instrument must be *readily* and *regularly available* and those prices must represent *actual* and *regularly occurring* market transactions on an *arm's length basis*.

This is where the decision, whether the financial instrument is quoted in an active market or not, take place. Yet, one has to find what the underlined words above mean. Below, interpretations of some of the underlined words above will be presented.

PriceWaterhouseCoopers' (PwC) interpretation of *readily available* is that the pricing information is currently accessible (PricewaterhouseCoopers, 2011). This implies the accounting entity's conditions of receiving the market information published in one way or another. A securities company or market maker would easily gain access to such information while an ordinary mid-size corporation not primarily engaged in trading activities may not.

The meaning of the second prerequisite *regularly available* is transactions occurring with a sufficient frequency to provide pricing information on an ongoing basis, according to PwC (ibid). Temporary absence of transactions or a decrease in volume of transactions does not necessarily mean that a market has become inactive. The overall conclusion of the PwC statement is that the phrase *regularly available* is a matter of judgement, meaning that each accounting entity must form their own decision about if the market data is *regularly available* or not. PwC gives no further guidance on the prerequisites *actual*, *regularly occurring* and *arm's length basis*.

The Global Public Policy Committee (GPPC, 2007) issued the paper about determining fair value under IFRS in illiquid and uncertain situations. Although the GPPC (2007) paper is not aiming to interpret IFRS, the committee states that regularly occurring market transactions does not mean that there need to be a consistent number of market transactions from one period to another. Disregarding observable prices in an active market if the market is relatively thinner or illiquid as compared to previous periods would be inappropriate.

Absence of transactions for a period of time does not provide sufficient evidence that there is no active market. If they are occurring frequently enough to obtain reliable pricing information on an ongoing basis, the market would be considered active (ibid).

Furthermore, AG 71 continues to state that fair value is defined in terms of a price agreed by a willing buyer and a willing seller in an arm's length transaction. The objective of determining fair value for a financial instrument traded in an active market is to arrive at the price at which a transaction would occur at the end of a reporting period, without modifying or repacking it. The price is also to be determined in the most advantageous market to which the entity has immediate access. Finally, AG 71 concludes that the existence of published price quotations in an active market is the best evidence of fair value and when they exist, they are used to measure a financial asset or liability. It is important to remember that published price quotations are defined as actual and regularly occurring market transactions.

As stated above, the accounting entity is given the freedom of making its own interpretations of weather they are able to get the market data and if it is occurring often enough to be useful, which finally will lead to a decision whether the market is active or not. An IASB Expert Advisory Panel (EAP) from IASB summarizes the problem of measurement as follows (IASCF, 2008b);

> There is no clear line between active markets and inactive markets. However, the biggest distinction between prices observed in active markets and prices observed in inactive markets is typically that, for inactive markets, an entity needs to put more work into the valuation process to gain assurance that the transaction price provides evidence of fair value or to determine the adjustments to transaction prices that are necessary to measure the fair value of the instrument. The issue to be addressed, therefore, is not about market activity *per se*, but about whether the transaction price observed represents fair value.

The quote from the report has not been approved by the IASB, although it could be considered useful guidance to the processes used when measuring fair value (ibid). The EAP argues that the question of if a market is to be active or not is about whether the observed transaction prices present fair value. Further, the IASB EAP (IASCF, 2008b) continues to explain that the active market is one in which transactions are taking place regularly. What is considered regularly is a matter of judgement and depends on the facts and circumstances of the market for the instrument being measured, similar to the interpretation made by PwC above.

PwC further states that the emphasis of determining whether a market is active or not is on the level of activity (PricewaterhouseCoopers, 2011). If only a small volume of a particular instrument is traded relative to the amount of the instrument in issue or trading is infrequent, quoted prices in those markets will not be suitable for determining fair value. PwC's recommendation to the entity is to use a valuation technique to determine a fair value.

When current bid and asking prices are unavailable, AG 72 in appendix A states that the preparer must use the most recent transaction, as long as there has not been a significant change in economic circumstances. If the entity can demonstrate that the last transaction price is not fair value, the price is adjusted. Please note that the market is still considered active, meaning that for a financial instrument to be regarded as quoted, prices must represent actual and regularly occurring transactions.

3.4.2 Inactive market with valuation techniques

Paragraph 48 A countinues to state that if the market is not considered active, an entity establishes fair value by using a valuation technique (EC staff, 2011b). The objective of the valuation technique is to establish what the transaction price would have been on the measurement date in an arm's length exchange motivated by normal business considerations. Such valuation techniques includes arm's length market transactions between knowledgeable, willing parties, if available, reference to the current fair value of other financial instruments that is substantially the same, discounted cash flow analysis or option pricing models. An important prerequisite is that the valuation technique must make maximum use of market inputs and rely as little as possible on entry-specific inputs (ibid). That is, the entity making the valuation is free to use which technique ever applicable, as long as it makes maximum use of market inputs (and therefore also rely as little as possible on entry-specific inputs). IAS 39 paragraph AG74 states that if a valuation technique is commonly used by market participants and if it is demonstrated to provide reliable estimates of prices obtained in actual market transactions, that technique should be used by the entity (EC staff, 2011).

IASB EAP (IASCF, 2008b) ascertains the possibility of different estimates of fair value may meet the objective of fair value measurement and therefore be in compliance with the accounting guidance in IFRS. The existence of different estimates reflects the judgement and assumptions applied as well as the inherit uncertainty of estimating the fair value of instruments. If a market is considered inactive, an entity first looks for recent transactions in the same instrument. If such transactions can be found, this price shall be used unless there is evidence that it does not represent fair value (ibid). Determining if an observed transaction price is representative of fair value depends on facts and circumstances. Sometimes significant judgement is required about whether individual transactions represents the price of which an orderly transaction between market participants on the market date would have occurred.

Furthermore, the IASB EAP (IASCF, 2008b) states that prices obtained from brokers and/or pricing services can provide evidence of fair value. This can though be problematic, since brokers and pricing services are likely to rely more on models based on entry-specific information than on actual transactions if the market is not active. Before using such prices, the accounting entity must obtain an understanding of how the prices were determined to assess whether they are consistent with the fair value objective or not.

3.5 IFRS 7 – Financial instruments: Disclosures

The IFRS 7 is about requirements for disclosing information. The standard presents the fair value hierarchy, which reflects the significance of the inputs used in making the measurements. It is divided into three different levels, Level 1, 2 and 3 instruments (EC staff, 2011b).

The pyramid below is developed by Ernst&Young and shown in the article *How fair is fair value*, 2005, and gives a good indication of how fair value should be determined. The first advice is to use unadjusted, quoted prices for identical assets or liabilities in active markets whenever that information is available. If it is, the financial instrument is classified as a Level 1 instrument. If this information is not available, quoted market prices for similar assets and liabilities should be used. If this is the case, the financial instrument is classified as Level 2 instruments. If there is no such information, other valuation techniques should be used to determine the fair value. If there is no observable market data, the financial instrument is a Level 3 instrument (Ernst&Young, 2005).

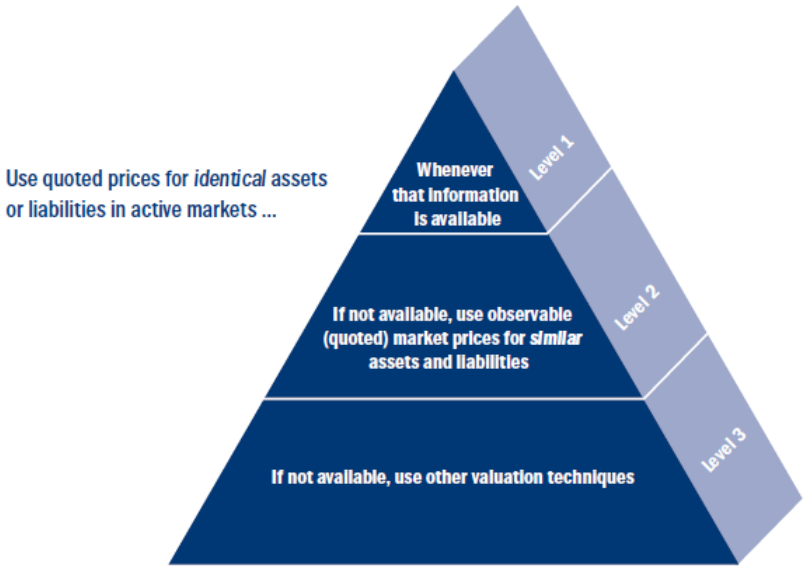

Figure 1 – IFRS 7 - Fair value hierarchy (Ernst & Young, 2005, p. 3)

3.6 IFRS 9 – Financial instruments

IFRS 9 Financial instruments was established as a project at IASB to replace the IAS 39 (IASB, 2012). The project was set-up in three phases being published gradually. The first phase is called classification and measurement, outlining how the financial instruments are going to be classified and how the different categories of instruments are going to be measured. For simplification, two of the categories included in IAS 39, were excluded in IFRS 9 (IASB, 2012).

IFRS 9 is an example of actions taken against the financial crisis. Through IFRS 9 it will be clearer how to handle financial assets in companies. The base is that all financial assets should be valued to fair value. Though, if the company's business model and the assets characteristics make amortized cost more reasonable to use, then the amortized cost should be used (Marton, 2010).

The replacement of IAS 39 is only one example on IASBs developments after the financial crisis. Another example is the amendments to IFRIC 9 and IAS 39, which concern the issue about embedded derivatives. The reason for this amendment was to prevent any diversity in practice developing as a result of the amendments made to IAS 39, which permits the reclassification of particular financial assets (IASB, 2012b). The valuation of financial instruments was an actively discussed subject already before the financial crises, but even more discussed afterwards. Since IFRS 9 has not been adopted by EU yet, the accountants still have to follow the recommendations from IAS 39 (Marton, 2010).

At this moment, IASB has deferred the mandatory effective date of IFRS 9 to 1 January 2015. The amendments also provide relief from restating comparative information and require disclosures (in IFRS 7) to help users of financial statements to understand the effect of applying IFRS 9 (IASB, 2012c).

3.7 IFRS 13 – Fair Value Measurement

In spring 2011 (IFRS Foundation, 2011b), IFRS 13 was issued by the IASB since they recognized the need for guidance on measuring fair value in IFRS (IASCF, 2007). The standard defines fair value consistently in the framework and replaces the dispersed requirements for measurement in individual standards. IFRS 13 is the result of the work by the IASB and the FASB to develop common requirements for measuring fair value and for disclosing information about fair value measurements in accordance with IFRS and US Generally Accepted Accounting Principles (GAAP) (IFRS Foundation, 2011b).

IFRS 13 handles the situation where no observable market data exists and valuation models have to be used to determine fair value. According to paragraph 67 in IFRS 13 (ibid), valuation techniques used to measure fair value shall maximize the use of relevant observable inputs and minimize the use of unobservable inputs, which is similar to the requirement in IAS 39 AG 71 (ibid).

IFRS 13 define observable inputs as "inputs that are developed using market data, such as publicly available information about actual events or transactions, and that reflect the assumptions that market participants would use when pricing the asset or liability". Unobservable inputs are defined as "inputs for which market data are not available and that are developed using the best information available about the assumptions that market participants would use when pricing the asset or liability" (ibid).

In the IFRS 13 Basis of Conclusions (BC), the IASB acknowledges some of the points made in the IASB EAP-report (IASCF, 2008b) previously mentioned, including adjustments for measurement uncertainty, e.g. if there is a significant decrease in volume or level of activity and an entity has determined that a transaction or quoted price does not represent fair value (IFRS Foundation, 2011). Special consideration should also be taken to the word relevant, which did not exist in IAS 39. The purpose of this was that the IASB wanted to remove the focus from the observability criteria, moving towards relevance (ibid).

In paragraph 70, IFRS 13 states that "if an asset or liability measured at fair value has a bid price and an ask price (e.g. an input from a dealer market), the price within the bid-ask spread that is most representative of fair value in the circumstances shall be used to measure fair value regardless of where the input is categorized within the fair value hierarchy" (ibid).

4 Frame of reference

In this section, theory of fair value accounting in relation to quoted prices, illiquidity on the market and accounting choices will be presented. This material will be used to provide a theoretical view on the research question.

4.1 Fair Value Accounting

In financial accounting, the trend has gone from valuing assets at historic costs to the use of market-based measures such as fair value in a larger extent. However, valuing to fair value is not always without problems. There have been discussions about whether the fair value measurement worsened the crisis for bank holding companies. The major argument in this discussion is that fair value may not be relevant for assets that are held with a long-term perspective since it can be misleading, especially in a time of crisis and when markets are illiquid. Though, for held-to-maturity securities, fair value accounting is not required, and therefore this argument is not relevant anymore (Laux & Leuz, 2010).

The IASB has its primary focus on investors and users of accounting and have therefore chosen to concentrate the valuation of certain assets at fair value, including financial instruments, to show a fairer view of assets of an entity (Marton et. al, 2008). To arrive at the price where a transaction could take place, all market data available should be considered. This information might be prices from recent transactions in the same or a similar instrument, quotes from brokers and/or pricing services and other inputs. If the market is no longer active, a valuation technique has to be used to determine the fair value (IASCF, 2008b).

There are both positive and negative opinions about the fact that fair value accounting is taking over the historical cost accounting. Laux and Leuz (2009, p. 102) states that "fair value reflects current market conditions and hence provides timely information". The result of this is increased transparency and encouraged corrective actions. According to the AAA (1998), fair value accounting measures the current value and is more value relevant. They also state that fair value numbers are more highly associated with stock returns than historical cost accounting.

Laux and Leuz (2009) also summarize some of the pros and cons of fair value accounting. According to them, few people argue that historical costs are useful for liquid assets in bank's trading books, and therefore promote the fair value in this aspect. However, historical costs could be an alternative for loans for example, if they are held to maturity.

Fair value accounting allows write-ups, and this allows banks to increase their leverage in booms which historical cost accounting does not. By prohibiting asset write-ups, historical cost accounting actually creates hidden reserves. In this aspect, fair value accounting actually influences banks to take appropriate measures earlier, which gives early warning signals for hindering a crisis. Through this, fair value accounting may reduce the severity of a crisis (Laux & Leuz, 2009).

4.1.1 Fair value accounting and quoted prices

Companies are supposed to use a fair value of their assets and liabilities. The fair value definition is from IASB and has the same meaning as its market value, and IASB sometimes use the term mark-to-market as a synonym for that definition. If the assets and liabilities exist on an active market, the values are easy to determine. However, there is not always an active market for the companies' assets and liabilities. If there is no active market, there is no market value. To be able to overcome this problem, the standard gives the companies the advice to use a mathematic model to determine a fair value (Ernst&Young, 2005). Valuation model consists of prices and other relevant information, which are generated by market transactions involving identical or comparable assets or liabilities. The inputs in the valuation model could be observable or unobservable inputs. Observable inputs are developed on the basis of available market data, and unobservable inputs are inputs for which market data are not available. (IASCF, 2009).

Concerns have been raised by Marton, Rehnberg and Runesson (2009) with the problem of fair value measurements in the absence of active markets and quoted prices. In these situations, the instruments have been evaluated as level 2 or level 3 in the fair value hierarchy in IFRS 7. These measurements are considered to require substantial judgment (ibid).

According to Ernst&Young (2005), mathematically modeled calculated fair value is a problem for reliability and relevance since for many assets such as pension costs, provisions and impairments, there is no active market. In all of these cases, the fair value will be determined by management assumptions about the future and valuation models. In his opinion, these predictions are subjective and referring to opinions of a partial group, rather than to a market. Another aspect of the valuation models is that very small adjustments might result in large changes of the fair value determined.

4.1.2 Fair value measurement, mark-to-model and illiquidity

Mark-to-model is when a valuation technique is used with unobservable inputs to estimate fair value (Heaton, Lucas and McDonald, 2010). Hitz (2007) means that by using mark-to-model, fair value loses its capacity to efficiently collect and aggregate consensus expectations of the cash flow profile of a relevant position. Rather than market information, model-based fair value incorporates management's private information and assumptions. The collected and aggregated consensus expectations of the cash flow profile of the relevant position, may in this way be considered acceptable if, and only if, functioning markets are available.

Barth, Beaver and Landsman (2001) also ascertain that reliability of derivatives' fair values is particularly questionable because estimation technologies for derivatives are developing.

Ball (2006) states that fair value is problematic in jurisdictions where markets are illiquid, spreads are large and where there is subjectivity in mark-to-model estimates of fair value. Under IFRS and the fair value accounting, reliance on judgement has been widely expanded together with illiquid markets. Some IAS standards require assessments of future cash flows that are considered subject to large degree of discretion (ibid).

Schmidt (2009) develops two views on how rational buyers and sellers are willing to transact in scenarios of low liquidity and/or high information asymmetry and test these on the IFRS definition of fair value. The first view is the highest marginal price of the buyer, i.e. the highest price a seller *could* (though rationally would not) transact at.

The second view is to look for a transaction price within the range determined by both rational parties' marginal prices. The conclusion from this view is that situations may arise where no arm's length transactions are possible, resulting in the fair value notion not being applicable.

Easley and O'Hara (2010) argue that bid and ask prices are unsuitable metrics of fair value in markets with uncertainty. Prices quoted by brokers and dealers in illiquid markets with uncertainty are biased by individual beliefs about best- and worst-case outcomes rather than averages of possible results.

4.1.3 Accounting choices

The IFRS are considered to be more principle-based than alternative regulatory frameworks (Marton and Runesson, 2011). There appears to be a consensus that judgement is allowed to play an important role in the principle-based accounting standards (Marton & Runesson, 2011), which may lead to accounting choices (Fields, Lys and Vincent, 2001).

In the article *Empirical research on accounting choice* Fields et. al (2001, p. 256) define accounting choice as: "An accounting choice is any decision whose primary purpose is to influence (either in form or substance) the output of the accounting system in a particular way, including not only financial statements published in accordance with GAAP, but also tax returns and regulatory filings.". This definition is clearly broad and includes the choices in timing of adoption to new standards as well as real decisions made to affect the accounting numbers. Examples of decisions made to affect the accounting numbers might be reducing costs to increase earnings (ibid). In some cases, managers might use accounting choices to be able to increase their own compensation.

This is consistent with the idea of earnings management. Healy and Wahlen (1999, p. 368) define earnings management as follows: "managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers".

According to Fields et. al (2001), the condition for earnings management to be effective is that at least some users of accounting information must be either unable or unwilling to sort out the effects of the earnings management. The authors continue the article with the argumentation for an accounting system with room for judgement. The main argument is that new situations arise regularly, which requires new accounting rules. It would be impossible to cover all of the new situations companies face, which a rule-based system has to.

According to Landsman (2007), one of the problems with accounting choices is that it might also lead to moral hazard. The problem with moral hazard is that managers estimate the fair value of Level 3 instruments with their private information, and from this, they choose appropriate values as inputs to their valuation models. This might lead to a situation where the managers choose to use information that gives them personal advantages such as increased bonus-based compensation. Managers can do this by write-ups of assets in good times and time impairments in worse times, when the company has gone badly and they would not receive a bonus anyway. Barth and Clinch (1998), on the other hand, conclude that managers do not manipulate bond fair value for private gains, but can estimate better fair values of bonds since they have private information regarding the bonds.

5 Empirics and analysis

In this section, adequate parts of correspondence will be presented together with an explanation and analysis, which link the arguments, provided in the regulation and frame of reference sections with the empirics.

5.1 Was the market active for HQ Bank's trading portfolio?

In the revoking of the license, the SFSA (2010, p. 9 and p. 31) discusses *how the bank has measured the trading portfolio by valuing the majority of the instruments theoretically* and continues ascertaining that *the bank considered the market inactive for 98 percent of all derivative instruments in the trading portfolio*:

> The SFSA's investigation shows that the major part of the derivative instruments, which has been included in the bank's trading portfolio, has been measured pursuant to a theoretical valuation. According to the bank, the reason for this has been that the market for these instruments has been inactive.
>
> In the investigation, it has appeared that the bank as of the 31st of December 2009 judged the market not active for about 98 percent of all derivative instruments in the trading portfolio.

According to the SFSA (2011, p. 2), *quoted prices have existed and they must make maximum use of observable prices even if the market is considered inactive*:

> Quoted prices have existed in almost all positions in DAX and OMX by the turn of year 2009/2010. The SFSA holds out that, in compliance with the IFRS, [an entity] must make maximum use of observable prices even if the market is considered inactive.

The SFSA (2010, p. 31-32) ascertains that *there have existed observable current market transactions, which have been executed close to the annual financial statement*:

> The SFSA has also noted that in some cases observable current market transactions exists in the same instrument which was executed close to the annual financial statement 2009 and the financial statement of the first quarter 2010. The bank has not used actual transactions in the same instrument as basis of the measurement notwithstanding the existence of such transactions.

Mr. Dyrefors (2011, question 4, p. 24) explains his *point of view of the activity in the market*:

> The activity in the market has been nonexistent, or close to nonexistent, for many of the options, which HQ Bank has had in its trading portfolio. For this reason, it was necessary for HQ Bank to measure a significant share of the options in a model …

Mr. Dyrefors **(**2011, question 4, p. 8) explains *what observable market data is*:

> Observable market data includes direct market prices or information which may be derived from an observable price in the market. It is not necessary that the market from where the information is received is active in order to be able to regard it as observable market data, i.e. there may even be observable market data in an inactive market.

Mr. Dyrefors (ibid) shows *which observable market data has been used as input in the model*:

> Observable market data from active markets for similar instruments has been used as input in the model ...
>
> ... in combination with this, inputs in the model was observable market data from inactive markets for the instrument as such and similar instruments ...
>
> ... finally, historical market data ... was used as input in the model

Mr. Dyrefors (2011, question 4, p. 28) *summarizes the SFSA's basis for the revoke of the license by concluding*, among other things:

> As far as I am concerned, the SFSA has misinterpreted the concept of *activity*. In several considerations the reasoning of the SFSA gives the impression that if an instrument is listed on an exchange, it is also automatically traded in an active market.

The SFSA (2011, p. 7) returns to Mr. Dyrefors statement about the revoke of license by ascertaining that *Mr. Dyrefors claim is false*:

> Mr. Dyrefors claims the SFSA has misinterpreted the concept of activity and mixed it with liquidity and therefore ended up wrong in the value hierarchy ... The claim is false.

Analysis

HQ Bank considered the market as inactive for 98% of all derivative instruments in the trading portfolio. The SFSA does not answer to the question if they consider the market for HQ Bank's derivative instruments as active or inactive, but instead, they mention that there has been quoted prices during 2009 and 2010 that should have been used. Mr. Dyrefors shows that observable market data from the inactive market has been used, but he does not mention to what extent the quoted prices are used in the valuation model. This shows what the parties disagree about; if the entity had made maximum use of quoted prices from the inactive market. Mr. Dyrefors defends his use of quoted prices by stating that the market was inactive. According to the SFSA, this does not really matter. They still focus on what IAS 39 states; the entity must make maximum use of observable prices.

It is also interesting to discuss why the SFSA does not indicate if they think the market for HQ Bank's derivative instruments was to be considered active or not. Instead, they mention that there have been current market transactions close to the annual financial statement. This shows that there has been more than only liquidity on the market, and this might mean that the SFSA consider that some activity on the market existed. In other words, they state that there have been market transactions, but they do not state how many transactions there have been. Mr. Dyrefors, on the other hand, states that the activity in the market has been non-existent, or close to non-existent, and for this reason, it was necessary to HQ Bank to measure the significant share of the options in a model. They basically agree on the fact that some activity on the market existed, but according to Mr. Dyrefors, it was close to non-existent. The SFSA does not state how large they consider the activity on the market. Both parties agree on the fact that some activity existed, but their interpretations about if that activity was large enough to be useable for the valuation of the financial instruments diverge.

From this argumentation, we can state that the parties agree that quoted prices for the financial instruments existed, though Mr. Dyrefors consider them as unusable. PwC support this argument; since they state that if only a small volume of a particular instrument is traded relative to the amount of the instrument in use or trading is infrequent, quoted prices in those markets will not be suitable for determining fair value. They also recommend the accounting entity to use a valuation technique to determine a fair value in this situation.

In Mr. Dyrefors and SFSA's reasoning, activity seems to be a fundamental problem. If there would have been guidance in standards on how to measure the activity, and if the activity on the market is enough to use for determining the fair value, this problem probably would not exist.

5.2 Of what importance is quoted prices to fair value?

The SFSA (2011, p. 6) ascertains *the importance of quotes prices when determining fair value*:

> Quoted prices are according to the SFSA's point of view the absolute most reliable indicator in order to determine fair value. This even holds in an inactive market where quoted prices reasonably reflect how the market would be expected to price the instruments.

On *observable market data quoted by so-called market makers and requirements of quotation of prices at use of a valuation technique* Mr. Dyrefors (2011, question 4, p. 21) ascertains:

> As long as ordinary participants do not care about executing transactions, the quoted prices of the market makers remain nothing more than quoted prices. The prices are not a basis of transactions.
>
> This guarantee of liquidity in the market is not the same thing as the prices that have been quoted are representative when measuring fair value ... since the quoted prices did not result in transactions...
>
> ... a likely approach [is] to require similar demands on quotation of prices when valuing with a valuation technique when the market is not active.

Analysis

According to IAS 39, quoted prices in an active market is the best evidence of fair value. It also states that a financial instrument is regarded as quoted in an active market if quoted prices are readily and regularly available from an exchange, dealer, broker etc., and those prices represent actual and regularly occurring market transactions on an arm's length basis. The SFSA agree to the standards view about quoted prices importance to fair value, and also states that this even holds in an inactive market where quoted prices reasonably reflect how the market would be expected to price the instruments.

Mr. Dyrefors does not really share this view. He focuses on the importance of the ordinary participants' transactions on the market and further states if they did not care about executing the transactions, the quoted prices would remain nothing more than quoted prices. He also states that the quoted prices on the market for HQ Bank's financial instruments did not result in transactions. This is unfortunately something we do not investigate closer in this thesis, e.g. if few transactions make quoted prices reliable, but we can clearly see how the views of the SFSA and Mr. Dyrefors diverge according to the quoted prices importance of the fair value measurement of HQ Bank's financial instruments. How different the parties interprets the IAS 39's guidance in how to use the quoted prices, even if the market is inactive, might also indicate a lack of understanding the concepts.

5.3 How should observable market data be treated?

The SFSA (2011, p. 7) states *a certain scope of manipulation of closing rates may exist*:

> Naturally, even with quoted bid and ask-prices a certain scope of erroneously quoted prices and manipulation of closing rates may exist.

The SFSA also ascertains the *importance of mid-price when estimating fair value* even if the difference in prices would be unreasonably large. *The difference between bid and ask-price, if such prices exist, forms an interval*, which should be the *best available indicator of fair value*, according to the SFSA (2011, pp. 6-7):

> Would the difference in price [between bid and ask-prices] be unreasonably large, the mid-price could be used for an estimation of fair value. If both ask and bid-price exist, it is possible, within an interval of prices, to execute actual transactions in the instrument in question, regardless of whether the prices would be quoted by a market maker or some other participant. This interval of prices should therefore make the best indicator of fair value available.

Mr. Dyrefors (2011, question 4, p. 22) explains the purpose of the valuation technique in IAS 39 and *his opinion of what weight observable bid and ask-prices in an inactive market should be given in determining fair value*:

> The purpose [of the valuation technique] is thus to arrive at a value which corresponds to a transaction price on the measurement day in an arm's length transaction and which has been carried out in normal considerations. Thus, it is not about an observed bid or ask-price in an inactive market. However, an observed price normally constitutes the starting-point when the transaction price is … derived.
>
> It is also important to emphasize that the IFRS framework does not dictate that a certain method shall be used ahead of another. Simply phrased, the IFRS framework only requires that one fair value shall be measured and that the technique shall be based on making maximum use of observable market data.

Analysis

The SFSA states that the mid-price between bid and ask-prices would be important when estimating fair value, even if the difference would be unreasonably large. Mr. Dyrefors on the other hand explains his opinion of what weight observable bid- and ask-prices should be given in the process of determining fair value in an inactive market.

The IASB EAP-report (IASCF, 2008b) states that significant judgement may be required about whether individual transactions meet the fair value criteria or not, which depends on facts and circumstances. Unless evidence is found that such transactions do not support fair value, they should be used. This is in line with the IFRS 13 interpretation, also acknowledging the EAP-report, that observable inputs must be *relevant* in order to reflect fair value.

Some academics do not share the view that if both bid and ask prices exist, the best indicator of fair value available would be to determine it within the interval of these prices. Ball (2006) states that fair value is problematic when markets are illiquid and spreads between bid and ask-prices are large as well as the fact that there is subjectivity in mark-to-model estimates. The different opinions in this case are a typical example of when fair value is problematic.

Schmidt (2009) has shown different views in which rational buyers and sellers are willing to transact in scenarios of low liquidity and/or high information asymmetry and tested these on the IFRS definition of fair value. The conclusion of one of the views is that a situation has arisen where no arm's length transactions are possible and therefore, the fair value notion becomes inapplicable. If the exemplified view above is chosen, this could be the case.

Finally, the IASB EAP-report (IASCF, 2008b) states that prices obtained from brokers and/or pricing services can provide evidence of fair value. This requires an understating of how the prices were determined and if they are consistent with the fair value objective. In contrast to what SFSA states above, it does matter who posts the quoted price, since some market participants determine their posted quoted prices in the model world. Easley et. al. (2010) agree on this by concluding that such bid and ask-prices are unsuitable of determining fair value in illiquid markets because they are biased by individual beliefs about best- and worst-case outcomes rather than averages of possible results. The quoted prices posted by market makers, as the SFSA mentions, may therefore not be suitable for an entity's determination of fair value.

5.4 How should few or minor transactions be treated?

If no or a few transactions have been made, the SFSA (2011, p. 6) ascertains that *this is of secondary importance for determining fair value, and thus the prices have a very large information value*:

> It must be considered of secondary importance [for determining fair value] that if no or a few completions or transactions have been made on quoted price or if the so-called market maker quoted them. The fact that completions could have happened is enough for the prices to have a high information value.

The SFSA (2011, p. 7) also claim to have *investigated the supply of quoted bid- and ask-prices of DAX- and OMX-contracts* which have been included in HQ Bank's edge calculations and *the price difference between those historically* which has been presented in an appendix in their statement, as well as in this thesis (see chapter 8. Appendix):

> The SFSA have investigated the supply of quoted bid- and ask-prices of DAX- and OMX-contracts which has been included in HQ Bank's edge calculations and the price difference between those historically (see appendix).

According to Mr. Dyrefors (2011, question 4, p. 14) the *measurement should correspond to pricing and should not be erroneously biased by minor transactions at divergent prices*:

> The measurement should correspond to a representative pricing, and not erroneously be biased by minor transactions at divergent prices.

Mr. Dyrefors audited activity reviews performed by HQ Bank's risk function which, according to Mr. Dyrefors (2011, question 4, p. 18), among other things showed that *observable market data either only regarded quoted prices, alternatively sporadic marginal transactions* (see figure 3 in appendix for a sample activity review):

> ... the observable market data that existed in the market [regarded] either bid or ask-prices which were not reinforced on transactions, alternatively were reinforced with sporadic marginal transactions.

Mr. Dyrefors (2011, question 4, p. 23) finds *the size of the transactions has resulted in an element of uncertainty in the measurement*, which therefore did not by certainty imply that *a larger position could have been sold to the same price*. Mr. Dyrefors concludes that *the prices several times lacked a stable reason or at least required an evaluation and adjustment to reflect fair value*:

> It shall be especially mentioned that ... the prices which have existed in the market that has regarded extremely minor transactions per se constitute an element of uncertainty for the measurement. The circumstance that transactions regarding solitary contracts fueled a certain price does not by certainty mean that the same price could be affixed to a measurement of a multiplicity larger position. The prices have also several times been at levels which clearly have lacked a stable reason or at least required evaluation and eventual adjustment to be a basis of a reasonable and true fair value-measurement.

Analysis

The SFSA states that quoted prices have a very large information value, even though no or few transactions have been made or if they were quoted by a market maker and claims to have investigated the supply of bid- and ask prices as well as the price difference (spread) between those. In the screenshot from Bloomberg in the appendix, the SFSA (2011) does not show the supply of bid- and ask prices, but only the spread between them. Mr. Dyrefors on the other hand, concludes that measurement should not be erroneously biased by minor transactions and that the observable market data either regarded quoted prices only, alternatively sporadic marginal transactions. Mr. Dyrefors (2011) has shown this for a sample instrument in figure 3 attached in this thesis appendix. According to Mr. Dyrefors, those facts added an uncertainty to the measurement and several times the prices had been at levels, which lacked a stable reason or at least required an adjustment to reflect fair value. Both parties make statements, which they do not provide proof of, e.g. the SFSA does not present any investigation of the supply of bid- and ask prices. Unfortunately, lacks of general proofs from both parties' basis of conclusions reduce their credibility in the discussion.

To show what challenges the preparers of financial statements in HQ Bank faced, basic observable market data have been collected from an instrument which both the SFSA and Mr. Dyrefors use in their line of argumentation. Table 1 in appendix shows market price, volume traded and open interest extracted from Thomson Datastream in a put-option traded in the OMX Nordic exchange with expiry date 2010-04-16 and strike price 920. The table also shows the volume traded in relation to the open interest (the way PwC recommends to measure activity above) and crosses indicate where the ratio is above 5%, which could be considered as a measure of a marginal transaction. The example shows that in 14 out of 81 trading days (76 without the non-trading holidays), the activity has been above the 5% ratio. But is the 5% ratio a suitable limit of defining a marginal transaction, and if not, what is a suitable limit? Further on, are 14 out of 76 trading days (roughly 18%) enough to decide whether the underlying transactions may be useful in determining fair value?

The point of the example above is to show that as long as the assumptions are fully motivated and consistently handled, both opinions may fall within the limits of the regulation. Though, none of the parties show any *complete* convincing evidence that the method they advocate is better than the other party's.

5.5 Did HQ Bank's definition of an active market make accounting manipulation possible?

On the evaluation of activity in HQ Bank's definition, the SFSA (2011, p. 4) criticizes the bank because *it had been possible for the trading department to influence the validation technique, which made it manipulable*:

> The *evaluation of activity* had been designed so that HQ Bank only needed to regard their positions as traded in an active market if they have been minor relative to the volume of the traded contract in question. With this definition it was possible for the trading department to influence the valuation technique; by increasing their positions enough, they could make sure that the market was defined as inactive … The evaluation of activity, which according to Mr. Dyrefors had been crucial to how the measurement of the positions was derived and controlled, was thus manipulable.

To be able to *judge whether the market was active or not*, Mr. Dyrefors (2011, question 4, p. 14) explained that HQ Bank solved the complex of problems by *a quantitative definition*:

> In the light of that the framework does not give a precise definition of the requirement of activity, simultaneously as the evaluation of activity is of crucial meaning to the valuation technique, it was important to HQ Bank to have a clear definition of what they considered as an active market and routines which ensured a consistent application in compliance with the given definition. HQ Bank developed therefore the following definition, which concretizes HQ Bank's view on active market.
>
> HQ Bank finds that an active market exists if more than 50 percent of HQ Banks position is sold per day, that at least three such days occur during a week and that at least three such weeks occur during the latest period of three months.

The ambition of the definition was, according to Mr. Dyrefors (ibid), that *observable market data should be handled in a true and consistent way in the operations*:

> The ambition of HQ Bank has been to apply a technique to define if an active or inactive market exists which is compatible with the principles of IFRS and which ensures that the observable market data has been handled in a true and consistent way in HQ Bank's operations.

Mr. Dyrefors (2011, question 4, p. 15) thought it was good that *HQ Bank defined what an active market was and that subjectivity and arbitrariness therefore should be minimized* and that *HQ Bank had not chosen the best solution when they placed the activity of the market in relation to their own volume*:

> From an auditing perspective I think it was good that HQ Bank defined how they viewed the concept of an active market and how HQ Bank aimed to apply the concept in the operations. Thereby HQ Bank created an opportunity for a consistent handling with a minimized degree of subjectivity and arbitrariness …
>
> In analogy with IAS 39, HQ Bank required that prices represented actual and regularly occurring market transactions at businesslike terms …
>
> My opinion is that HQ Bank did not choose the best solution when they chose to intercept the requirement of a certain size by placing the activity in the market in relation to the own volume.

Analysis

The possibility to define an active market is a problem, especially in this case, since participants with a large influence on the market, like HQ Bank, might control the market directly by not executing certain transactions. This might lead to other problems since if there is no activity on the market, the fair value should be determined from a valuation model where management has a large influence on which inputs is chosen. This opportunity for managers might unfortunately lead to earnings management, since the managers can choose to increase revenues in good times to increase bonus compensations, and realize losses in worse times when they would not get bonuses anyway. Therefore, the opportunity for companies to judge and define when a market is active might be problematic if it is not handled extra carefully.

The SFSA states that the trading department was able to influence the valuation technique by actions to control whether the market was considered active or not and therefore, manipulation was possible. Mr. Dyrefors certainly agrees that HQ Bank did not choose the best solution for the requirement of a certain size since it leads to a possibility of manipulation. He, however, promotes the strengths of having a quantitative definition by reducing subjectivity and arbitrariness and in that way increasing consistency and reliability. As a part of the audit, no further investigation has been done of how to define an active market. One major concern is why Mr. Dyrefors did not question HQ Bank's definition of an active market earlier.

HQ Bank did not share all the important information they knew about the financial derivatives with investors and other stakeholders and therefore they violated the qualitative characteristic reliability, which leads to information asymmetry. The fact that HQ Bank withheld important information from the investors made the investors incapable of making reasonable decisions concerning investments in HQ Bank.

HQ Bank's definition of an active market actually lead to the possibility to manipulate the market activity, though manipulation might not have been the purpose. However, from the definition, the market for 98% of the financial instruments in the trading portfolio is considered inactive. Since the market is inactive, a valuation model has to be used to be able to determine fair value for the instruments. Hitz (2007) states that fair value lose its capacity to efficiently collect and aggregate consensus expectations of the cash flow profile of a relevant position by using mark-to-model. He also states that by using valuation models, managers' private information and assumptions is incorporated rather than market information. If this statement is considered to be true, one big reason to the fall of HQ Bank might be their definition of an active market.

The problem with using a valuation model for the financial instruments is that it might lead to moral hazard. Managers can choose appropriate inputs in the valuation model, since they use private information for the estimation of the Level 3 instruments (Landsman, 2007). The SFSA implies that HQ Bank actually did this and one reason to why they insist that HQ Bank did not use as much observable market data as possible.

6 Discussion and conclusion

In this section, a short summary of the most important issues from the empirics is presented. Also, a discussion about general problems that cannot be connected to the empirics, but are connected to the case, is held. Further, a conclusion and suggestions to further research will be presented.

6.1 Discussion

The first problem with HQ Bank is that the definition they chose for what an active market is gave them the power to control if the instruments should be considered to exist on an active market. HQ Bank and Mr. Dyrefors consider the market for the financial instruments as inactive but some transactions actually existed during 2009 and 2010. Mr. Dyrefors and the SFSA agree on the fact that there have been quoted prices for the financial instruments, but their opinions about if these quoted prices are useful or not diverge. Since HQ Bank and Mr. Dyrefors consider the market as inactive; a valuation model is used to determine the fair value of the financial instruments. Different types of inputs in the model are known, but not the extent of every input. According to Ernst&Young (2005), previous research has shown that a very small change in the inputs can lead to large changes in the final value. This might lead to unreasonable book values.

Fair value is not only one stated value. From the definition in IAS 39, several different values can actually represent fair value and still be inside the boundaries of the standards. This is because the models allowed in the standards leave significant scopes for interpretations and valuations, which may lead to manipulation of the book value. When there is no active market, valuation models are an alternative to determine the fair value. Previous research has shown that valuation models are directly inappropriate to estimate fair value. Academics have criticized valuation techniques under fair value together with derivatives. Bart, Beaver and Landsman (2001) ascertain that reliability of derivative's fair value is questionable because estimation technologies are developing. If that is the case, the question is what estimation is more appropriate than fair value. One alternative to fair value is historical cost accounting. However, few people argue that historical costs are useful for liquid assets, but historical cost accounting might be an alternative for financial assets that are held to maturity. For this type of assets, fair value is not relevant, since the asset is held to maturity no matter what the value is at the moment.

The major problem seems to be that many deem fair value accounting inadequate, but there are no suggestions presenting better alternatives. Fair value is easy to determine if there is an active market, but the problems with fair value starts when there is no active market. The question about what could be a suitable alternative to fair value when the market is not active remains unanswered. Another problem not handled in the empirics is that IAS 39 states in paragraph AG74 that if market participants commonly use a valuation technique and if it is demonstrated to provide reliable estimates of prices obtained in actual market transactions, that technique should be used by the entity. The first problem with this paragraph is the meaning of commonly used and reliable estimates of prices. Secondly, when does a model become commonly used and when does it provide reliable estimates of prices? If there is one, every entity would probably use this model and fair value accounting would be less problematic. This statement more or less explains the fair value accounting issues; the scope for interpretations and valuations around fair value accounting are too large.

6.2 Conclusion

Firstly, the parties agree on the fact that some activity on the market existed but their interpretation about if that activity was large enough to be able to use for the valuation of the financial instruments diverge. Further, Mr. Dyrefors' arguments, consistent with some academics, indicate that fair value is problematic when markets are illiquid and spreads are large. The quoted prices posted by market makers may be less suitable for an entity's determination of fair value.

Secondly, the use of valuation models may incorporate managers' private information and assumptions rather than market information. HQ Bank's definition of an active market actually leads to possibilities to manipulate the market, though; this might not have been the purpose.

Finally, lack of general proof from both parties' basis of conclusions reduces their creditability in the discussion. As long as the assumptions are fully motivated and consistently handled, both opinions may fall within the boundaries of the regulation. Therefore, we also conclude that the fall of HQ Bank clearly indicates that the scope of interpretations in IAS 39 might be too broad.

6.3 Suggestions for further research

It would be interesting to get access to proper third party financial services as e.g. Bloomberg and delve into low-frequency liquidity measures to examine the activity in the financial instruments.

To investigate the valuation model of HQ Bank closer and examine if the observable market data was used enough would be interesting. Also, to explore HQ Bank's financial reporting to see how the valuation of the financial instruments actually affected the accounting would be another interesting topic of research.

It is essential to encourage whoever aims to evaluate new valuation techniques to improve characteristics of reliability, since both science and regulation is clearly missing solutions to this fundamental accounting issue.

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Figures and tables

Figure 1 –Ernst&Young (2005), p. 3.

Figure 2 – SBPA. (2010). *Disciplinary case – the authorized public accountant Mr. Johan Dyrefors*, Dnr 2010-1391, act no. 33.2-7, p. 4, appendix of SFSA, (2011).

Figure 3 – Dyrefors (2011), question 4, p. 17.

Table 1 – Thomson Reuters Datastream Advance 4.0, Time series request of OS300410920P, data types MP (Market Price), VM (Volume traded), OI (Open Interest), start date: 2009-10-01, end date 2010-01-21, retrieved 2012-05-23.

8 Appendix

SFSA's screenshot from Bloomberg

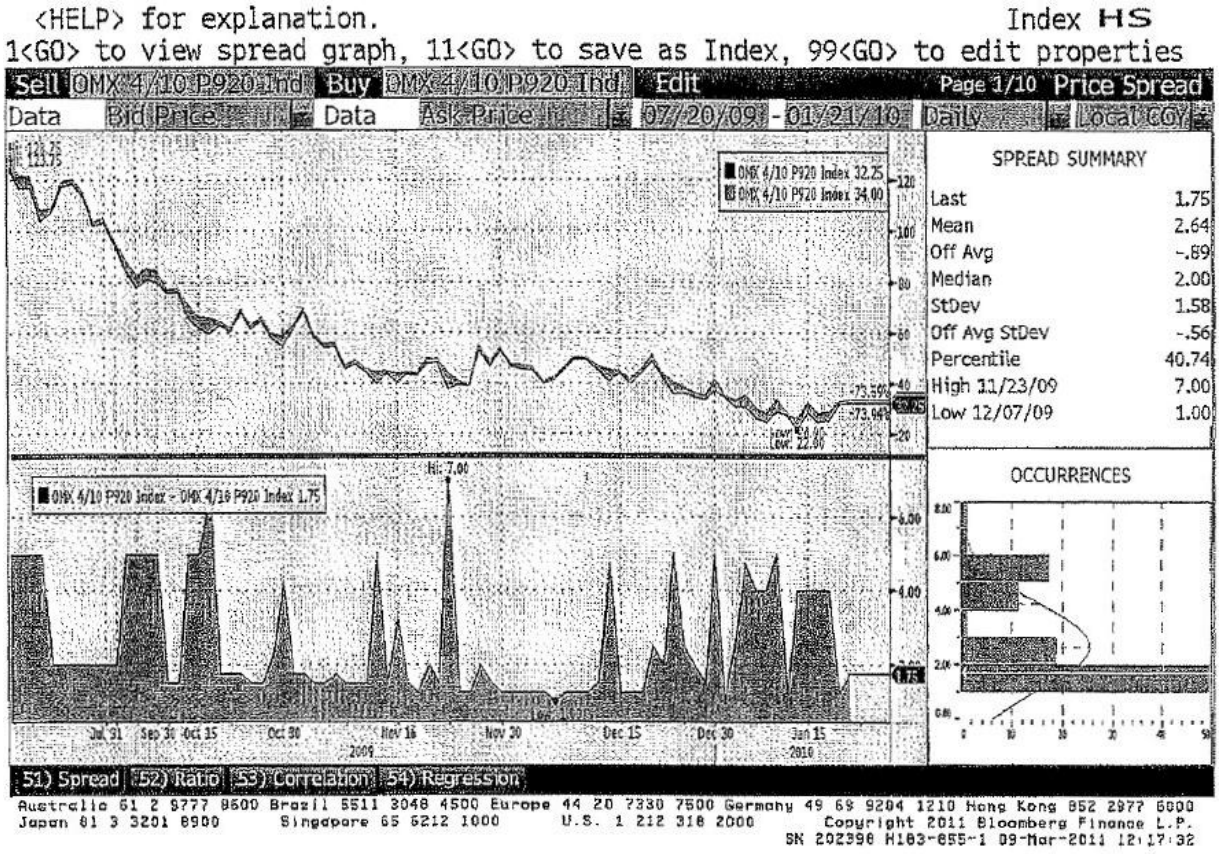
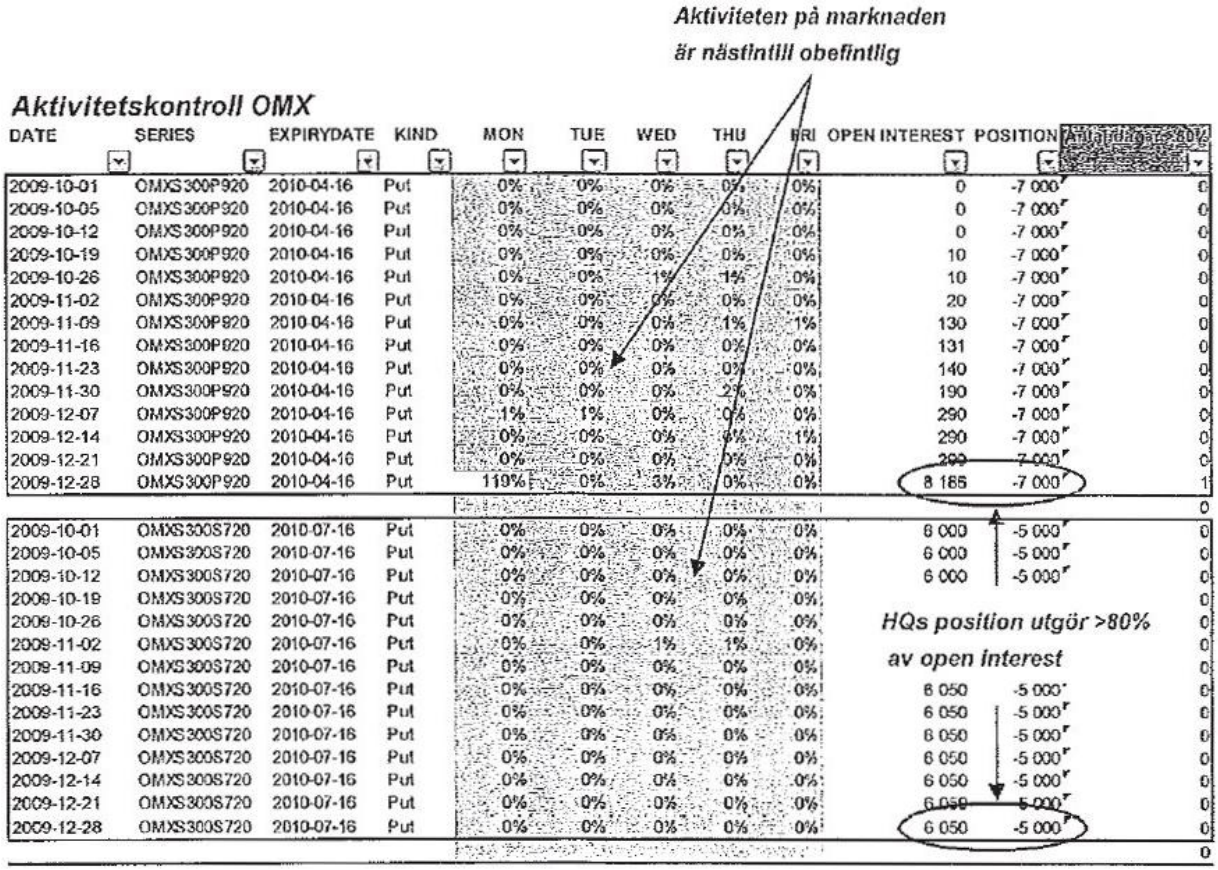


Figure 2 – SFSA's screenshot from Bloomberg showing the bid- and ask prices and the spread between them. The instrument shown is OMX 4/10 P920, which is the same as Mr. Dyrefors has based a review of activity upon as shown in the upper section of the next page.

Mr. Dyrefors' activity review



DATE	SERIES	EXPIRYDATE	KIND	MON	TUE	WED	THU	FRI	OPEN INTEREST	POSITION	Antal dagar > 80%
2009-10-01	OMXS300P920	2010-04-16	Put	0%	0%	0%	0%	0%	0	-7 000	0
2009-10-05	OMXS300P920	2010-04-16	Put	0%	0%	0%	0%	0%	0	-7 000	0
2009-10-12	OMXS300P920	2010-04-16	Put	0%	0%	0%	0%	0%	0	-7 000	0
2009-10-19	OMXS300P920	2010-04-16	Put	0%	0%	0%	0%	0%	10	-7 000	0
2009-10-26	OMXS300P920	2010-04-16	Put	0%	0%	1%	1%	0%	10	-7 000	0
2009-11-02	OMXS300P920	2010-04-16	Put	0%	0%	0%	0%	0%	20	-7 000	0
2009-11-09	OMXS300P920	2010-04-16	Put	0%	0%	0%	1%	1%	130	-7 000	0
2009-11-16	OMXS300P920	2010-04-16	Put	0%	0%	0%	0%	0%	131	-7 000	0
2009-11-23	OMXS300P920	2010-04-16	Put	0%	0%	0%	0%	0%	140	-7 000	0
2009-11-30	OMXS300P920	2010-04-16	Put	0%	0%	0%	2%	0%	190	-7 000	0
2009-12-07	OMXS300P920	2010-04-16	Put	1%	1%	0%	0%	0%	290	-7 000	0
2009-12-14	OMXS300P920	2010-04-16	Put	0%	0%	0%	0%	1%	290	-7 000	0
2009-12-21	OMXS300P920	2010-04-16	Put	0%	0%	0%	0%	0%	290	-7 000	0
2009-12-28	OMXS300P920	2010-04-16	Put	119%	0%	3%	0%	0%	8 185	-7 000	1
											0
2009-10-01	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%	6 000	-5 000	0
2009-10-05	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%	6 000	-5 000	0
2009-10-12	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%	6 000	-5 000	0
2009-10-19	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%			0
2009-10-26	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%			0
2009-11-02	OMXS300S720	2010-07-16	Put	0%	0%	1%	1%	0%			0
2009-11-09	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%			0
2009-11-16	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%	6 050	-5 000	0
2009-11-23	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%	6 050	-5 000	0
2009-11-30	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%	6 050	-5 000	0
2009-12-07	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%	6 050	-5 000	0
2009-12-14	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%	6 050	-5 000	0
2009-12-21	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%	6 050	-5 000	0
2009-12-28	OMXS300S720	2010-07-16	Put	0%	0%	0%	0%	0%	6 050	-5 000	0
											0

Figure 3 – Activity review OMX by Mr. Dyrefors, which shows the daily trade in the end of year 2009. The upper section shows the instrument OMXS300P920 (same as shown by the SFSA on previous the page). The Swedish texts say: "The activity on the market was almost non-existent" and "HQ Bank's position constitute >80% of open interest".

Thomson Reuters Datastream request of OMX 4/10 P920 (OMXS300P920)

Instrument: OS300410920P

Put-option traded in OMX with expiry date 2010-04-16 and strike price 920.

Period 2009-10-01 - 2010-01-21

DATE	MARKET PRICE	VOLUME TRADED	OPEN INTEREST	SHARE OF OI TRADED	> 5%	COMMENT
2009-10-01	104,5	0	0	-		
2009-10-02	104,5	0	0	-		
2009-10-05	104,5	0	0	-		
2009-10-06	104,5	0	0	-		
2009-10-07	104,5	0	0	-		
2009-10-08	104,5	0	0	-		
2009-10-09	104,5	0	0	-		
2009-10-12	104,5	0	0	-		
2009-10-13	104,5	0	0	-		
2009-10-14	104,5	0	0	-		
2009-10-15	104,5	0	0	-		
2009-10-16	104,5	0	0	-		
2009-10-19	104,5	10	10	100,0%	X	
2009-10-20	104,5	0	10	0,0%		
2009-10-21	104,5	0	10	0,0%		
2009-10-22	63,875	0	10	0,0%		
2009-10-23	61,375	0	10	0,0%		
2009-10-26	68,625	0	10	0,0%		
2009-10-27	62,25	0	10	0,0%		
2009-10-28	64	50	60	83,3%	X	
2009-10-29	60,5	50	10	500,0%	X	
2009-10-30	56,875	0	10	0,0%		
2009-11-02	62,125	0	10	0,0%		
2009-11-03	69,125	0	10	0,0%		
2009-11-04	59,25	0	10	0,0%		
2009-11-05	55	0	10	0,0%		
2009-11-06	55,5	10	20	50,0%	X	
2009-11-09	46,5	0	20	0,0%		
2009-11-10	48,5	0	20	0,0%		
2009-11-11	45,5	0	20	0,0%		
2009-11-12	44	60	80	75,0%	X	
2009-11-13	43,5	50	130	38,5%	X	
2009-11-16	42,375	0	130	0,0%		
2009-11-17	44,25	0	130	0,0%		
2009-11-18	43,625	0	130	0,0%		
2009-11-19	49	0	130	0,0%		
2009-11-20	49	1	131	0,8%		
2009-11-23	41	5	126	4,0%		
2009-11-24	40,375	0	126	0,0%		
2009-11-25	39,5	6	120	5,0%	X	
2009-11-26	45	20	140	14,3%	X	
2009-11-27	47,5	0	140	0,0%		
2009-11-30	53,625	0	140	0,0%		

List countinues at the next page.

DATE	MARKET PRICE	VOLUME TRADED	OPEN INTEREST	SHARE OF OI TRADED	> 5%	COMMENT
2009-12-01	47,375	0	140	0,0%		
2009-12-02	46,625	0	140	0,0%		
2009-12-03	43,25	150	190	78,9%	X	
2009-12-04	43,25	0	190	0,0%		
2009-12-07	41,75	50	240	20,8%	X	
2009-12-08	40	50	290	17,2%	X	
2009-12-09	50,125	0	290	0,0%		
2009-12-10	49,875	0	290	0,0%		
2009-12-11	46,75	0	290	0,0%		
2009-12-14	43,375	0	290	0,0%		
2009-12-15	44,875	0	290	0,0%		
2009-12-16	40,875	0	290	0,0%		
2009-12-17	45,125	0	290	0,0%		
2009-12-18	45,75	50	290	17,2%	X	
2009-12-21	43,5	0	290	0,0%		
2009-12-22	38	1	290	0,3%		
2009-12-23	37,75	0	290	0,0%		
2009-12-24	37,75	#NA	290			*Christmas eve*
2009-12-25	37,75	#NA	290			*Christmas day*
2009-12-28	35,5	8354	8079	103,4%	X	
2009-12-29	34,75	0	8079	0,0%		
2009-12-30	38	175	8186	2,1%		
2009-12-31	38	#NA	8186			*New years eve*
2010-01-01	38	#NA	8186			*New years day*
2010-01-04	35,5	0	8186	0,0%		
2010-01-05	33,25	135	8296	1,6%		
2010-01-06	33,25	#NA	8296			*Swedish holiday*
2010-01-07	32,75	100	8396	1,2%		
2010-01-08	32,75	0	8396	0,0%		
2010-01-11	32,75	0	8396	0,0%		
2010-01-12	29,25	5100	7800	65,4%	X	
2010-01-13	28	20	7800	0,3%		
2010-01-14	28	0	7800	0,0%		
2010-01-15	30,75	0	7800	0,0%		
2010-01-18	30,75	0	7800	0,0%		
2010-01-19	27,25	0	7800	0,0%		
2010-01-20	32,375	0	7800	0,0%		
2010-01-21	29	400	8200	4,9%		
				SUM:	**14**	(page 1 and 2)
				TOTAL:	**81**	(page 1 and 2)

MARKET PRICE: Where the exchange issues a settlement price this value will be stored.
In the event that the option has not traded, the last mid bid/ask price will be calculated and stored.
In the event that only bid or ask is available on that day, this value will be stored.
VOLUME: Volume is the total cumulative volume for all individual option series.
OPEN INTEREST: The total open positions for all individual option series.
The total number of options contracts that have been entered into and not yet liquidated.
SHARE OF OI TRADED: Volume / Open Interest
> 5%: Cross (X) where Volume / Open Interest is above 5% (>5%)

Source: Thomson Reuters Datastream Advance 4.0 retrieved 2012-05-23.
Replicate by: Chose time series request, Series/list: OS300410920P (DS Mnemonic),
data types: MP, VM, OI, start date: 2009-10-01, end date: 2010-01-21.

Table 1 – Thomson Reuters Datastream request of OMX 4/10 P920.