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Swedish Banks' Reactions to the Negative Repo Rate

An explanatory study

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How have large Swedish universal banks reacted to the effects on their operations caused by the negative repo rate, and why? What are the implications of these reactions?

Abstract

The negative repo rate is a fairly new phenomenon in the Swedish economy, and it affects the operations of Swedish universal banks through an impact on different interest rates. The goal of the study was to identify and explain the main reactions of the four largest and most influential Swedish universal banks to the effects caused by the negative repo rate. Three main effects were identified: Stibor has fallen below zero per cent, there is lower expected return on interest rate products, and overall profitability pressure on the banks' operations. A qualitative method with six semi-structured interviews, with four different banks, was used to collect the primary data. The reactions to the effects are categorised into three different operations. When it comes to borrowing from the public, all banks have introduced negative deposit rates to their biggest corporate customers with treasuries and financial institutions, while staying at a rate of zero per cent for other companies and private customers. In the field of asset management of interest rate products, the three banks that could provide answers within this field all conveyed that they had begun making investments with longer maturity and somewhat higher risk in order to, at least, preserve the capital base invested. No internal risk limits on the interest rate products were changed to enable the actions previously mentioned since the actions taken lie within the existing risk exposure limits. The banks have however decreased fees on some interest rate products in order to make the products relatively attractive as an investment alternative despite the lower expected return. In the third field of business, lending to the public, two banks describe that a part of the recent mortgage margin increase is related to the negative repo rate, while the other two states that the increase is all due to changes in capital requirement regulations. None of the banks has increased other lending margins as a reaction to the negative repo rate. All the banks have started applying interest rate floors on loan agreements as a protection against falling interest rates. To conclude, the negative repo rate has affected the banks' operations and resulted in various reactions. These effects and reactions have implications for the banks' earnings and therefore profitability. A common factor explaining the reactions of the banks is the will to generate acceptable long-term return for the owners. This study provides a comprehensive overall description of the negative repo rate phenomenon from the bank perspective by presenting evidence and theory of how it has affected Swedish universal banks.

Key words: negative repo rate, Swedish universal banks, borrowing from the public, asset management of interest rate products, lending to the public

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Table of Contents

1. Introduction

1.1 Background

Sweden's central bank, the Riksbank, delivered the news of a negative key interest rate in February 2015. The Executive Board of the Riksbank decided to cut the repo rate by 0.1 percentage points to −0.10 %, applied from 18 February 2015, and to restore the interest rates for fine-tuning transactions to the repo rate +/− 0.1 percentage points (Riksbank, 2015). Since then, the repo rate has been lowered further. The rate of –0.50 % applies from 17 February 2016 and according to the Riksbank's (2016) press release, "*There is still a high level of preparedness to make monetary policy even more expansionary if this is needed to safeguard the inflation target*". In addition to the negative repo rate, the Riksbank has made extensive purchases of government bonds and announced additional bond purchases during the first half of 2016 as a part of their monetary policy. According to the Sveriges Riksbank Act (Riksbank, 2015), the objective for monetary policy is to maintain price stability. The Riksbank has specified price stability as a target for inflation; the annual change in the consumer price index is to be 2 %. One of the main tools used in pursuing this objective is the repo rate, which can be adjusted depending on the state of the economy in order to affect other interest rates. There is evidence that the repo rate adjustments play an important role in the development of many other interest rates in Sweden (Fransson and Tysklind, 2016). Changes in the repo rate directly affect the Stibor, which is the rate at which the banks borrow and lend money to one another during the day. Indirectly, the changes in the repo rate have an impact on other interest rates, mainly short-term rates.

In the field of research concerning the effects of the low and negative interest rates, Gibas, et. al (2015) have examined the consequences for Swedish banks. They identify different channels through which banks are exposed to falling and low interest rates and review the existing evidence on how the low interest rate environment might have affected the banks. Gibas, et. al recognize profitability as one of the main channels through which falling and low interest rates affect banks, mainly through falling margins on deposits. They have also described potential effects on other operations, e.g. lending to the public, and actions banks can take to manage the profitability pressure due to the low interest rates. According to Gibas, et. al, banks may increase lending margins and risk-taking or introduce negative deposit rates to customers as a reaction to the effects caused by the falling and negative interest rates.

1.2 Problematisation

The falling and low interest rates, as a result of the Riksbank's expansionary monetary policy, have impacted, e.g. banks' deposit margins negatively, and resulted in overall profitability pressure for Swedish banks (Gibas, et. al 2015). This makes it interesting to study how banks actually have managed the situation with profitability pressures, caused by the effects due to the negative repo rate, since banks are an influential intermediary in the Swedish financial market and their actions affect many functions in the economy (Swedish Bankers' Association, 2016). Gibas, et. al, describe possible actions that banks may take in order to manage the profitability pressures. One possible reaction is that banks can increase their risk-taking. This can be done, e.g. in the field of asset management of interest rate products, by changing internal risk exposure limits, which would enable investing in more risky securities. Another reaction could be to let the deposit rates follow the repo rate and fall to negative levels. The strategies on how to react to the profitability pressures may differ between banks depending on their willingness to accept higher risks or expose their customers to negative deposit rates. Therefore, it is both interesting and important, especially considering the topicality of the subject, to investigate how the Swedish banks have reacted to the negative repo rate and its effects, and understand why they have made these choices and what the implications of these reactions are for their operations. Knowing how banks have reacted is necessary in order to further understand the effects of the negative repo rate on other actors in the Swedish economy.

1.3 Purpose and Research Question

Negative interest rates are a relatively new phenomenon in Sweden, and have been a topic of intense discussion during 2015 and in the beginning of 2016. The Riksbank's expansionary monetary policy with a negative repo rate has evoked questions and criticism, especially about its effects on Swedish financial institutions, such as universal banks. Effects on the Swedish universal banks are of great interest since their core operations are connected to prevailing interest rates, and they are important intermediaries in Swedish financial markets. One of the major consequences of the negative repo rate is that banks' deposit margins are affected negatively (Riksbank, 2016); the negative repo rate has resulted in a situation where Swedish banks are making losses on borrowing from the public, since banks so far have chosen not to expose small and medium-sized companies and households to negative deposit rates.

The existing latest research in the field of effects of the negative repo rate on the Swedish banks' operations is produced by the Riksbank and is mainly based on their perception of the situation. Their perception may be biased taken into account that they might want to highlight aspects that support the current monetary policy exercised. Therefore, the focus of this study is to comprehend how the Swedish universal banks perceive the situation and how they have reacted to the current monetary policy. The paper aims to, by using interview data as a primary source, provide a better understanding of how the banks have reacted to the negative repo rate and which implications the effects and reactions have had for the banks' operations up until today. The operations of interest are borrowing from the public, asset management of interest rate products, and lending to the public, since these operations are the ones most likely to be affected by the negative repo rate, considering that these operations are strongly related to prevailing interest rate levels. Therefore, this study seeks to investigate the following research questions:

How have large Swedish universal banks reacted to the effects on their operations caused by the negative repo rate, and why?

What are the implications of these reactions?

1.4 Delimitations

Delimitations of this study befall in four broader dimensions: geographical location, field of business, size of company, and time-period. The negative repo rate imposed by the Riksbank does first and foremost affect the Swedish economy and its actors. Therefore, the study is limited to cover a specific geographical location, Sweden. Falling and low interest rate levels substantially affect the economic actors whose operations are strongly related to interest rates, such as financial institutions. Banks are directly affected by the repo rate through their placements at the Riksbank. Via universal banks, the effect of the repo rate is transferred to other economic actors in form of adjustments in different interest rates. Therefore, the repo rate affects universal bank's operations and eventually profitability. Since banks are directly affected by the repo rate and are an important actor in financial market, the study solely focuses on Swedish universal banks.

The banks chosen to be included in the study are based on the size of the bank itself. Only the four largest banks according to Swedish Bankers' Association are chosen since they constitute with a substantial part to the Swedish banking market and can therefore be

considered as a representative sample in order to study the research question. The four banks together make up about 75% of the Swedish financial market (Swedish Bankers' Association, 2016). Thus, the study focuses on investigating how large Swedish universal banks have reacted to the effects caused by the negative repo rate introduced by Sweden's central bank in February 2015. The relevant time-period can then be defined as after February 2015, and up until the present date of the interviews, April 2016.

1.5 Wordlist and Definitions

The following definitions are provided to increase the understanding of the topic discussed in this paper and to avoid misinterpretations of the words used to describe the phenomenon.

Borrowing from the public refers to deposits placed at the banks, from households/private and corporate customers.

Interest rate products is used as an aggregate term for short- and long-term interest rate funds. Short-term interest rate funds, also money market or liquidity funds, invest capital in interest bearing securities, such as government securities and obligations, with shorter maturities than a year. Long-term interest rate funds, also obligations funds, invest capital in, e.g. obligations with maturities of longer than a year. (Avanza Bank AB, 2016).

Repo rate is the Riksbank's most important policy rate. They use the repo rate with the intention of affecting the short-term market rates, and as a result influence the rate of inflation in the economy (Riksbank Glossary, 2016).

Retail deposits are deposits from households and small and medium-sized non-financial corporations.

Risk exposure limits refer to bank-internal capital requirement limits on credit risk, market risk, and operational risk.

Stibor (Stockholm Interbank Offered Rate) is a reference rate that shows an average of the interest rates at which a number of banks active on the Swedish money market are willing to lend to one another without collateral at different maturities (Swedish Bankers' Association, 2016).

Universal banks are banks that offer services to companies and general public, such as keeping money in accounts and lending money, as well as offering investment advice and products (Cambridge Dictionaries Online, 2016). The largest universal banks in Sweden are Swedbank, Handelsbanken, SEB, and Nordea (Swedish Bankers' Association, 2016).

1.6 Outline

The remaining part of the paper proceeds as follows. Section two provides the literature review, the theoretical basis of this study, by presenting previous research relevant to the chosen topic and a theoretical framework needed to analyse the empirical data and, eventually, answer the research question. The third section, method, provides a description of the methodologies applied when conducting the study. After discussing the methodological considerations, the empirical data is presented in detail. The fifth section consists of the analysis of the interview data. In section six, the conclusions and implications derived from the analysis are presented and discussed. Then, the paper ends with a critical discussion related to the study and its contribution.

2. Literature Review

This section presents existing research relevant to the topic of the study; the effects of the negative repo rate on the Swedish universal banks' operations and the banks' reactions to these effects. The fields of business in the bank sector that are of interest in this study are borrowing from the public, asset management of interest rate products, and lending to the public. The section begins with the presentation of the research related to the effects of the repo rate on different interest rates. The next part introduces the latest and most relevant research in the field of low and negative interest rates and their effects on Swedish banks' profitability and operations. The last part in this section presents the theories related to a theoretical framework, which is used to analyse the empirical data in order to answer the research question. In the summary, the theoretical framework, which shows the expected reactions of the banks, is presented in a concise manner.

2.1 Effects of the Repo Rate on Different Interest Rates

Fransson and Tysklind (2016) have studied how different interest rates in the Swedish economy move when the Riksbank adjusts the repo rate. They have investigated the phenomenon both descriptively, by studying how various interest rates have moved in relation

to the repo rate historically, and quantitatively, by employing a model to estimate the initial effects on different interest rates in conjunction with a repo rate decision. They have found that most interest rates covary with the repo rate, the relationship is especially clear for shorter market rates, such as Stibor. In addition, they present evidence for that longer market rates, which are strongly affected by various risk premiums and the development of international interest rates, also show relatively high covariation with the repo rate. They find a close relationship between the repo rate and interest rates for households and companies; these interest rates are normally adjusted in line with repo rate adjustments.

When the Riksbank increases the repo rate, the banks' borrowing costs increase and they take the action of raising their interest rates, which results in more expensive loan agreements for customers, but also higher return on their deposit accounts at the bank. The same applies to when the Riksbank lowers the repo rate; the banks then act by lowering the interest rate for their customers, making it cheaper to borrow money, but at the same time lowering the return earned on deposit accounts at the bank. The interest rate changes applied by the banks affect other interest rates and therefore return expectations on interest rate products (Oxenstierna, 2010).

2.2 Previous Research

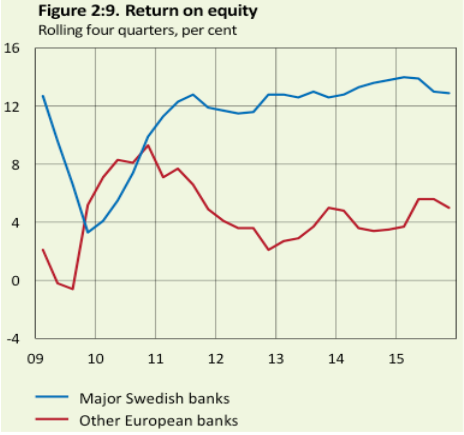
The Riksbank practices monetary policy, and by using tools such as the repo rate, it aims to affect other interest rates in order to control the economy and reach the targeted level of inflation (Söderström, 2008). The expansionary monetary policy with a negative repo rate is a relatively new phenomenon in Sweden and all the effects on Swedish universal banks' operations may not have occurred yet, or existed long enough to be recorded. The most relevant research, concerning the effects of the negative repo rate on Swedish universal banks' operations, is mainly produced by the Riksbank, and has primarily focus on how banks can act rather than how they actually have reacted.

According to Gibas, et al. (2015), banks can be affected by falling and low interest rates through different channels. One of the main channels identified is profitability. The low interest rates affect both the asset and liability side of the balance sheet. They state that lending rates typically decrease with falling key interest rates, which then lowers the asset side. On the liability side, the cost of deposits also decreases, but usually not to the same extent as the lending rate. This results in that lending rates decrease more than the cost of deposits, which leads to lower profits for the banks. Further on, Gibas, et al. (2015) convey that banks could, in theory, lower their lending rates as much as the deposit rates fall. In

addition to deposits and market debt, banks also need to fund themselves with equity. Equity does not have any cost of interest rates directly attached to it, but since the equity must be invested in assets, the return of the equity relies on interest rates since these affect the return of the assets. With low and falling interest rates, the return on equity decreases.

Gibas, et al. (2015) summarise that lending rates usually decrease more than the bank's funding costs, which result in decreasing profitability for the bank, and as a reaction, banks can take different actions to mitigate the effects of the low interest rates on the profitability. Banks can either accept the situation and continue operating as before or take further actions, such as increase lending margins, increase risk-taking or introduce negative deposit rates. Observing how Swedish banks have managed the falling interest rates during 2014 to 2015, it can be seen that the profitability has been fairly stable despite low and falling interest rates (Gibas, et al., 2015), which suggests that banks must have taken actions to compensate for profitability pressures caused by the low interest rates.

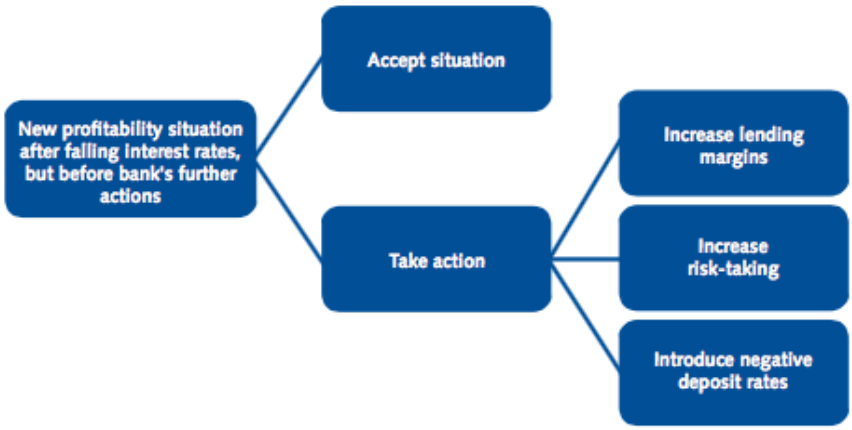
According to the Riksbank (2016), the overall effect of negative interest rates on Swedish banks' profitability, measured as return on equity, is limited and mixed. The effect is limited, since Swedish banks' profitability has been stable and relatively high, compared with other European banks, whose central banks have made interest rate cuts in recent years as well. The mixed effect refers to that banks can be affected by the repo rate differently, depending on the aspects affecting the exposure to the impact of negative interest rates. Some of the aspects can be related to Swedish banks' balance sheet structure, e.g. financing structure and the share of lending to households and companies of the total assets. These aspects contribute to possible differences in effects on profitability between Swedish banks. Therefore, the profitability can be affected in many ways, e.g. as a result of falling lending rates and funding costs, but also due to changes in credit losses, commission income, and lending volumes. The Riksbank concludes that there is nothing to suggest that low and negative interest rates have so far had a negative effect on banks' overall profitability, return on equity.



Source: Riksbank, Monetary Policy Report, April 2016.

2.3 Theoretical Framework

Gibas, et al. (2015) present the following figure to describe the general actions banks can take if their profitability falls as a result of falling interest rates. This figure was used as a starting point when defining the research question and deciding to focus on studying the reactions of the Swedish universal banks to the effects caused by the negative repo rate. The actions in the figure are related to three lines of business in universal banks: borrowing from the public, asset management of interest rate products, and lending to the public. In the summary section, a developed, new version of this figure is presented. The developed version is based on the existing research and theories concerning the topic. It is used as the main analysis tool later in the paper by comparing the expected reactions presented in the framework to the actual actions taken by the banks.



Source: Riksbank, Economic commentary 16, 2015.

2.3.1 Research Related to Borrowing from the Public

In their study of how different interest rates in the Swedish economy move when the Riksbank adjusts the repo rate, Fransson and Tysklind (2016) noted that the repo rate adjustment of March 2015 had less of an impact on deposit rates compared to the impact on lending rates for households and companies. They believe that the lower impact depends on the banks' unwillingness to introduce negative deposit rates for households and most corporate customers.

Kotomin, et al. (2011) have examined the sensitivities of aggregate balances of retail and institutional money market funds, and their potential substitutes, bank deposits, to changes in short-term interest rates. They found that institutional money market fund and deposit cash flows are sensitive to changes in short-term interest rates. In addition, they

discovered that institutional investors appear to take advantage of arbitrage opportunities between returns on money market funds and alternative investments, such as deposits. The negative correlation between balances of institutional money market funds and changes in interest rates suggests that some institutional investors move their money out of money market funds to invest in other securities. Retail money market fund flows are found to be substantially less sensitive to interest rate changes than institutional flows. The likely reason given for this is the lack of sophistication among retail investors. They also found that deposits, both large and small, vary directly with short-term interest rates.

In Sweden, the Riksbank has the responsibility of controlling the inflation and with the repo rate affect it (Nyberg, et al., 2006). If the Riksbank increase the repo rate, the market rates increase as well. The changes in the interest rate levels is floating, meaning that no one can predict exactly how the interest rate will change between two periods. It is the expectations and correct judgement of the interest rate movement that will decide the pricing of the bank's interest rates. The short interest rate is more floating than the long one and is affected by the inflation expectations. With high interest rates, people with loans are negatively affected, while it positively affect the people with savings accounts (Nyberg 2000).

Another field of research that can be used to explain banks' behaviour is related to how to perceive the goal of the bank. The shareholder view suggests that bank's ultimate goal is to create satisfactory value for the owners (Anthony, et al., 2014). When deciding how to act, management of the bank usually selects the course of action they believe will increase the profitability most. Gibas et al. (2015) describe that if banks introduced negative retail deposit rates, this would mean a risk of deposit or cash withdrawals. They explain that losing the retail deposit today may become costly for banks in the long run, since once the interest rates start to rise, banks would have to get these deposits back.

2.3.2 Research Related to Asset Management of Interest Rate Products

In the field of interest rates and bank risk-taking, the recent line of research argues that the relatively low interest rates of early to mid 2000s can be seen as a factor that triggered increased risk-taking appetite of banks in search for higher yield (Delis and Kouretas, 2010). The theory, according to this line of research, suggests that "a low interest rate environment drives, *ceteris paribus*, bank margins and information asymmetries down". Delis and Kouretas (2010) have empirically analysed whether the relationship between bank risk-taking and the level of interest rates is prevalent in the 16 euro-area countries over the period 2001-2008. Bank risk assets are defined in their study as all bank assets except cash, government

securities at market value and balances due from other banks. They present strong empirical evidence that a low interest rate environment unambiguously increases risk-related bank assets and alters the composition of euro area bank portfolios toward a more risky position. Their study is focused on the relationship between bank risk-taking and the general level of interest rates, they experiment with various interest rates, such as short-term rate, a long-term rate, the central bank rate and a bank level lending rate. They find that the negative relationship between bank risk-taking and interest rates is stronger for banks that engage in non-traditional banking activities.

When it comes to banks' risk-taking, Gibas, et al. (2015) state that many funds often can increase their risk-taking within its pre-determined investment strategies, mandates, by investing in riskier, and sometimes less liquid, assets. By increasing risk, the bank can earn higher return; this is called the trade-off theory between risk and return (Berk and DeMarzo, 2013). It is a principle that potential return increases with a higher level of risk. Low risk, the level of uncertainty over a certain bond, stock or similar, usually means low potential return. High risk on the other hand usually means high potential return. The idea is that it is not possible to earn high returns unless there is a risk of losing the invested capital.

Domian (1992) has examined the relation between fund maturity and interest rates using Granger-causality tests. If interest rates are falling, fund managers should lengthen their maturities in order to maintain the yields at current levels. Some of the research in this field suggests that the average maturity on, e.g. money-market mutual funds is a good indicator of which way professional money managers think interest rates are heading. The results of Domian's study show that interest rates Granger-cause the average fund maturity, it is not the maturity that causes the interest rates. Therefore, fund managers tend to lengthen maturities after interest rates decline and shorten maturities after rates rise. According to Liang (2001), when the performance of funds rises or falls, changes can be made to their fees to match this performance, e.g. a poor performance would lower the fees.

2.3.3 Research Related to Lending to the Public

Studying how different interest rates in the Swedish economy move when the Riksbank adjusts the repo rate, Fransson and Tysklind (2016) found that the impact on lending rates for households and companies, due to the repo rate adjustment March 2015, was the same as usual, even though the repo rate was negative to start with. Therefore, they conclude that the impact of the repo rate adjustment was not significantly changed by the fact that the repo rate

was already negative; the repo rate still has a close relationship with interest rates for households and companies.

Gibas, et al. (2015) suggest that one possible way to handle the profitability pressures of low and falling interest rates is that banks increase their lending margins, which is the spread between their floating lending rates and Stibor. In addition, according to recent research, the use of interest rate floors have steadily increased in European loan agreements over the last three years (Simmons & Simmons, 2015), meaning that where loan agreement includes an interest rate floor, should the reference rate turn negative, the interest paid by the borrower will be the margin. Therefore, a negative interest rate will not erode lending margins if the interest rate floor is applied.

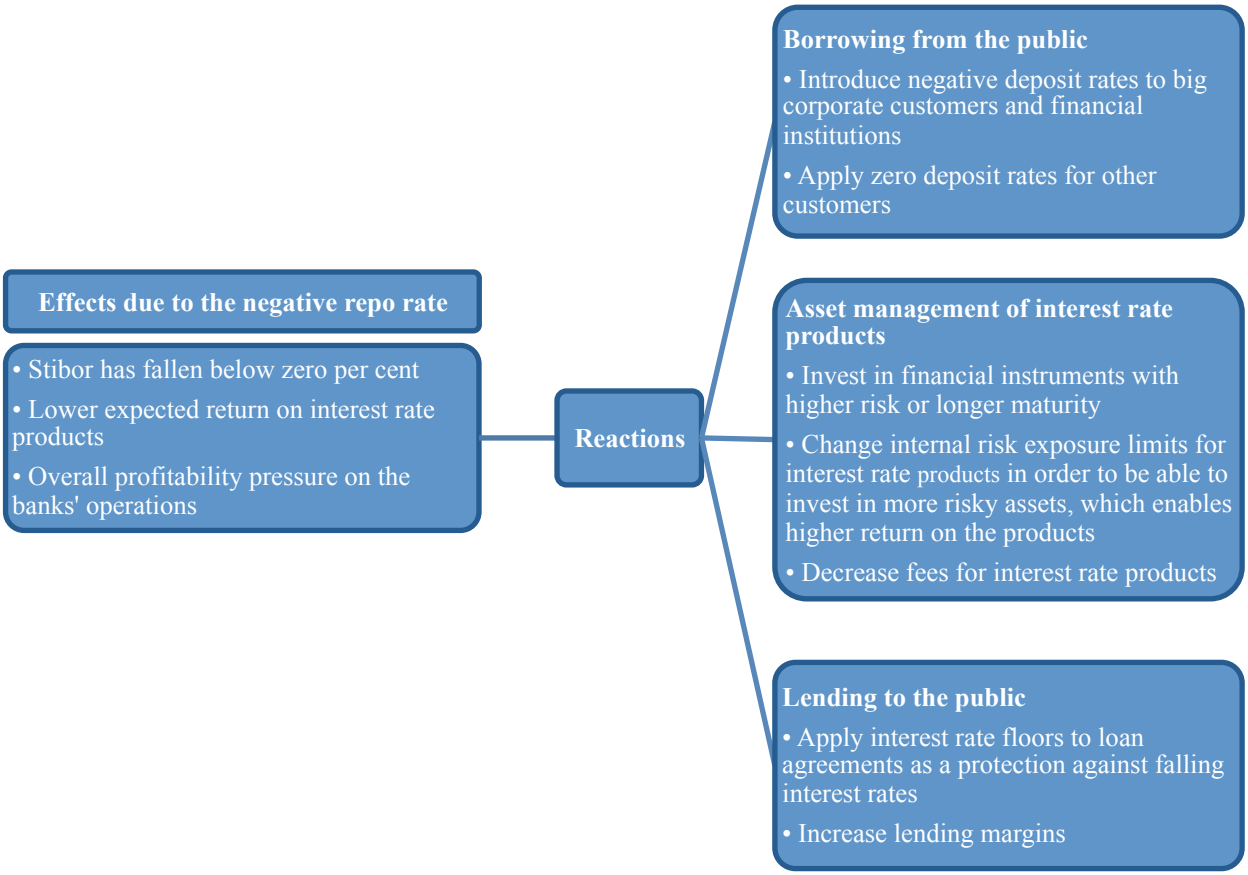
2.4 Summary

As presented above, there is some existing research on the effects of the low and falling interest rates on Swedish banks and how the banks might react to these effects. However, there has been no detailed investigation of how the banks actually have reacted to the negative repo rate and its effects. The main effects due to the negative repo rate can be explained by Fransson and Tysklind's (2016) theory of how different interest rates in the Swedish economy move when the Riksbank adjusts the repo rate. When it comes to borrowing from the public and the expected reactions taken by the banks, the research from Kotomin, et al. (2011) suggests that banks would charge institutional investors and big corporate customers negative deposit rates in order to prevent arbitrage activities. Other customers are assumed to face zero deposit rates, since Gibas, et al. (2015) describe that if banks introduced negative retail deposit rates, this would mean a risk of deposit or cash withdrawals and future costs.

In the field of asset management of interest rate products, it is probable that, as a reaction, banks have started to invest in financial instruments with higher risk or longer maturity in order to improve the return of these products. This could be explained by the findings of Delis and Kouretas (2010) and Domian (1992). This may result in changes in internal risk exposure limits if the risk-taking, by investing in more risky assets, has increased substantially. Liang's (2001) finding, that when the performance of funds rises or falls, changes can be made to their fees to match this performance, explains why it can be assumed that banks probably have changed the fees of some interest rate products.

When it comes to lending to the public, the assumed reaction, based on Gibas, et al. (2015), is that banks have increased lending margins due to the effects of the negative repo rate. Another likely reaction is that banks have started to apply interest rate floors to loan

agreements as a protection against falling rates (Simmons & Simmons, 2015). Other reactions, such as improving overall cost efficiency, were disregarded since they are considered normal business activities, not as specific reactions to the negative repo rate. The figure below presents the theoretical framework; the identified main effects due to the negative repo rate and the expected actions to these effects, taken by the banks. This framework is used when conducting the interviews and analysing the empirical data.



3. Method

In this section, an account of the process of carrying out the research is given. The relevant methodological aspects needed to investigate the research problem are presented and discussed, such as research method, sample and scope, data collection, ethical aspects, and how the interviews were transformed into empirical data.

3.1 Research Method

The objective of this study is to investigate *how* large Swedish universal banks have reacted to the effects caused by the negative repo rate. The study seeks to explain *why* the banks have taken these actions. Given the exploratory and explanatory nature of our study, Holme and Solvang (1997) recommend a qualitative method. The qualitative approach is chosen since it enables the possibility of generating rich empirical data for the purpose of the study (Eisenhardt and Graebner, 2007). By conducting interviews it becomes possible to access the main effects of the negative repo rate from the banks' perspective and identify the reactions to these effects. This cannot be achieved, e.g. by only reading financial reports, since the information provided in these reports include other effects as well and the disclosure is not detailed enough to separate the effects of the negative repo rate. Using a semi-structured interview technique to collect the data is deemed to be an appropriate approach, since it enables the coverage of common themes as well as giving the opportunity to adjust to the interview situation (Kreiner and Mourtisen, 2005). The qualitative method, with semi-structured interviews, can be considered to be a suitable choice for studying a research question aiming to study "how" some specific phenomenon has taken place (Myers, 2009). Concerning the interview questions presented in the interview guide (see Appendix), small modifications were made during the interviews to further investigate some questions, as well as to reflect the knowledge of the interviewees.

3.2 Sample and Scope

The study is limited to Swedish universal banks, referred to as Bank A, Bank B, Bank C and Bank D in order to keep the data anonymised. The reason for choosing more than one bank is that multiple observations enable the study to gain stronger arguments for validity, as well as giving the possibility to compare how different banks have handled the effects due to the negative repo rate (Farquhar, 2012). The banks chosen are all large in the Swedish economy and has great impact on the economy as a whole. Swedbank, Handelsbanken, SEB, and Nordea are the largest banks in Sweden and account for about 75% of the Swedish financial market (Swedish Bankers' Association, 2016). Because of their substantial market share and influence on the financial market, these four banks can be seen as a representative sample of the Swedish bank sector and therefore as suitable objects for data collection.

3.3 Data Collection

Semi-structured interviews were used to gather the primary data used in the study. In total, six interviews were conducted for the data collection for this study. The representatives from the banks were contacted with the criteria of having great knowledge within both borrowing from the public and lending to the public, or asset management of interest rate products. All the interviewees had high positions in their respective fields, banks' treasuries and asset management businesses, as well as several years of experience in the bank sector as a whole. From Bank A, one representative was interviewed who had knowledge of all three fields. Bank B and C had two representatives interviewed each, one with knowledge of borrowing/lending from/to the public and the other with knowledge of asset management of interest rate products. From Bank D, only one representative was able to participate in the study, with knowledge of borrowing/lending from/to the public. When preparing for the data collection, an interview guide was created. Firstly, standard questions and topics to be covered were prepared. These were set as an overall structure, while still giving room for flexibility and follow-up questions based on the answers received during the interview. The interviews took place at locations chosen by the interviewees, in their offices or another room within their work building. The interviews lasted approximately 35 minutes, the one where the representative had knowledge about all fields included in the study took 50 minutes.

3.4 Ethical Aspects

When creating the interview guide and later conducting the interviews, certain ethical aspects were considered. In the beginning of each interview, the interviewees were informed, according to the guidelines from the Swedish Research Council (2010), about the following:

1. The aim and purpose of the study.
2. That participation is optional, and that the respondents can choose not to answer certain questions or discontinue at any time.
3. That all data is treated confidentially
4. That the collected data will be used only for research purpose unless otherwise is agreed.

Overall, this study has been carried out with the mindset of not violating the ethical principles of research discussed by Booth et al. (2008). According to their view, there are some obvious

aspects to consider, which has been of great importance when conducting this study. The exact principles mentioned are the following:

1. Ethical researchers do not plagiarize or claim credit for the results of others.
2. They do not misreport sources, invent data, or fake results.
3. They do not submit data whose accuracy they don't trust, unless they say so.
4. They do not conceal objections that they cannot rebut.
5. They do not caricature or distort opposing views.
6. They do not destroy data or conceal sources important for those who follow.

3.5 From Interviews to Empirical Data

The interviews were held in Swedish in order to avoid possible communication problems that might appear when having interviews with a language foreign to the interviewees. The data collected by semi-structured interviews was transcribed and translated into English afterwards. The data was then divided into two parts, the effects due to the negative repo rate, and then the reactions to these effects. Citations have been left out of the empirical data. This decision was made since direct quotes do not contribute any remarkable depth to the topic of the study. What is important is identifying the actions actually taken by the banks, not the way the interviewees verbally communicate the reactions. The validity of the interviewees' answers was ensured by comparing them to available information found from the banks' webpages, annual reports, and other publications in order to verify the data collected to the best extent. No significant data was found that would contradict the information provided by the interviewees, and therefore, no such results are presented in the empirical findings of the study.

4. Empirical Data

This section presents the empirical data collected by semi-structured interviews with six representatives in total from four Swedish universal banks. The data is organised in the following manner; first, the effects mentioned by the representatives, caused by the negative repo rate, are presented. The next part of the section presents the different actions taken by the banks as a reaction to these effects. The reactions are categorised into three main fields of business in the banks: borrowing from the public, asset management of interest rate products, and lending to the public.

4.1 Effects Due to the Negative Repo Rate According to the Banks

The banks explain that changes in the repo rate directly affect the overnight rate, which is the rate at which the banks borrow and lend money to one another during the day. Indirectly, these changes have an impact on other interest rates, mainly short-term rates. The size of the effect, due to the change in the repo rate, on interest rates with a longer duration depends on how expected the Riksbank's adjustment is. One of the effects caused by the negative repo rate has been that the Stibor, at all maturities, has fallen below zero per cent. The negative Stibor affects deposit rates for the public, households and companies, since Stibor is often used as a reference rate for deposit rates. The deposit margin is normally defined as the difference between a market rate, such as 3-month Stibor and the interest on deposits. The negative Stibor suggests that deposit rates should also be below zero in order to maintain the normal deposit margin.

According to the banks, the impact on Stibor also affects lending to the public, since lending agreements with floating interest rates tend to follow, directly or indirectly, reference rates such as 3-month Stibor; e.g. the bank lends money for 50 basis points over Stibor, Stibor+50bps. In this scenario, if the 3-month Stibor were below -50bps, like it was for a while, the bank would be obligated to make interest payments on the lent money instead of receiving interest payments. When it comes to lending to the public and profitability of the bank, it is the credit spread that is important; if the Stibor were negative enough, the spread would be negative for the bank when assuming that there are no interest rate floors.

The banks further explain that the repo rate is strongly related to the return generated by interest rate funds and the decision-making regarding duration and mandates of these funds. The most substantial effect on asset management of interest rate products due to the negative repo rate has been the change in return expectations; how the investors perceive the future potential and attractiveness of the interest rate product market. Asset management of interest rate products generates income for the banks through fees and commissions, which are related to the value or return of the managed assets, trading volume, or a combination of these. Commission fees can vary or be predetermined. Generally, falling interest rates have positive effect on the return from interest rate funds when you own the fund and have long-term holdings. Buying interest rate products now when the interest rate levels are extremely low, will result in low expected return since it is unlikely that the interest rates would fall much further in the near future. Due to the negative repo rate, interest rates have fallen to exceptionally low levels, which has reduced the attractiveness of the interest rate product market in terms of expected returns. This has resulted in increased demand for financial

instruments higher up in the yield curve; investors are taking the next step, from government obligations to mortgage obligations etc. The low interest rates have positive effect on demand for more risky products, such as corporate bonds, according to the banks.

The negative repo rate has not had any remarkable impact on volumes for borrowing from the public, according to the banks. There has been an increase in demand for loans among private customers, since the negative repo rate has resulted in low loan costs, making it attractive to borrow money. The demand has most likely also increased because of rising real estate prices in Sweden. When it comes to lending to companies, there is no changes in lending volumes due to the negative repo rate; the demand for loan is low despite the decreased interest rates on loans, the companies already have the liquidity they believe they need for the investments they want to go forward with. Altogether, the banks mention that the negative repo rate has resulted in an overall profitability pressure on their operations, mostly in form of increased administration and legal costs, e.g. due to the need to renegotiate loan agreements or other contracts. They also describe that they experience overall margin pressures on the net interest income.

4.2 Reactions to the Effects According to the Banks

The following part describes the actions taken by the banks, as a reaction to the effects caused by the negative repo rate. The reactions are categorized into the fields of business studied: borrowing from the public, asset management of interest rate products, and lending to the public.

4.2.1 Reactions to the Effects on Borrowing from the Public

Apply Deposit Rates of Zero for Small/Medium-Sized Companies and Private Customers

One possible reaction to the negative Stibor is to introduce negative deposit rates for small/medium sized companies and private customers in order to avoid losses that would incur in form of negative deposit margins if the banks decided not to go below zero with deposit rates. When it comes to these customers, all four banks still have a deposit rate of zero per cent.

Bank C states that the biggest effect on borrowing from the public, when not introducing negative deposit rates, is the change in the way that the bank makes money: instead of generating revenue, deposits now appear as cost for the bank. Despite this, banks have been reluctant to introduce negative deposit rates for the majority of companies and private

customers. The unwillingness to cut deposit rates below zero, so that the bank would get paid for deposits from the public, has resulted in negative deposit margins and losses on borrowing from the public. The reason given for why they have not decreased deposit rates below zero, is that these customers would probably feel uncomfortable with having to pay for their deposits, according to Bank A. Bank B even goes as far as saying that these customers regard negative interest rates as abnormal and may not understand why they should pay for having money in the bank, this problem is brought forward by all the banks. The representative for Bank B also explains that banks can not always charge customers the whole cost due to the fact that there is no acceptance or willingness to pay for some services, this is the case with negative deposit rates. Another reason for the unwillingness is that the banks rely on that they will get back these losses in the future when short-term interest rates increase, and therefore there is no urgent need to expose customers to negative deposit rates. The representative from Bank A reveals that if interest rates, lead by further decreases in the repo rate, fell even more, the bank would need to rethink whether they can afford having zero interest rate on deposits from the small/medium companies and private customers.

All the banks mentioned the fear of losing deposits, if customers wanted to withdraw their funds from the bank due to negative deposit rates, as a reason for not going below zero with these customers. This would lead to a problematic situation, especially if the withdrawals occurred fast, since borrowing from the public, in form of deposits, is an important part of the financing base in the banks. Therefore, the lost financing would need to be replaced by other financing alternatives and it might not be an easy task in the short time period. In addition, all the representatives say that another reason for staying at 0% is that other banks haven't started charging negative interest rates for these customers.

A final cause to why banks have not introduced negative interest rates for private customers and the majority of the companies is that their computer systems cannot handle negative interest rates, they are not built for it. E.g. the Bank C estimates that the cost for manual adjustments for around 4 million accounts if charging negative interests for private customers or the cost for replacing the systems would exceed the cost for accepting the short-term losses on borrowing from the public caused by the effects due to the negative repo rate. All the banks believe that the negative interest rates only are a temporary phenomenon. Bank D expresses that risking the long-term customer relations, with something temporary, is not worth considering.

Introduce Negative Deposit Rates for Big Companies and Financial Institutions

One possible reaction to the negative Stibor is that the banks introduce negative deposit rates to some customers in order to avoid the losses resulting from placing liquidity overnight at the Riksbank with negative interest rates while charging the customer the zero interest rate for their deposits. According to the representative for Bank A, the negative repo rate has the largest impact, in terms of profitability, on borrowing from the public if the bank does not choose to introduce negative deposit rates to customers. Deposits are short-term by nature, which suggests that negative interest rates create substantial losses, due to the banks' unwillingness to go below zero with deposit rates. There is also another way to see deposits, as a longer-term financing. With this perspective, deposits still have some longer-term value despite short-term losses. Bank B expresses that, in the short term, deposits are regarded as a cost due to the effects of the negative repo rate. This, since the liquidity at the end of the day must be placed overnight at the Riksbank, which with the negative repo rate becomes a cost.

All four banks convey that they have charged negative interest rates for big companies with professional treasuries, banks, and other financial institutions. The representatives explain that the reason to why these customers must pay negative interest rate is because they are well aware of how the financial market works, the financial reality, and the consequences of the Riksbank´s aggressive monetary policy. In addition, negative deposit rates are introduced to these actors in order to prevent arbitrage opportunities; instead of depositing money with market prices, the actors could place the money on transaction account with zero interest rate and take advantage of the pricing difference.

4.2.2 Reactions to the Effects on Asset Management of Interest Rate Products

Investing in Financial Instruments with Higher Risk or Longer Maturity

The lower expected return on interest rate products makes asset managers work differently compared to the situation before the negative interest rate was introduced. Increasing the duration of financial instruments in their fund portfolios is something all three banks mention they do, as well as investing in more risky assets, in order to preserve the capital invested in interest rate products, or in the best case to generate return. E.g. asset managers in Bank B have to actively search for investment opportunities, which give zero or better margins over Stibor. They do this, e.g. by changing durations for obligation funds, where they can move from 0 to 8 years in duration, and by changing the credit risk exposure by investing a larger portion in corporate bonds instead of government bonds. One difficulty with the negative repo

rate is, when it comes to money market funds where the limits are tighter, that they only can go up to one year of duration. What they have done there instead is to increase the modified spread duration, the credit rated average life, on the credits they have. By buying credits to a larger extent as well as these having longer credit rated average life, the expected payoff gets better. The representative from Bank D was not able to answer questions about this.

Changing Internal Risk Exposure Limits for Interest Rate Products

With the negative interest rate, the expected return on interest rate products has decreased. This may force the banks, according to Bank B, to take more risk in order to achieve the same return as before the negative interest rate. This is said to be natural since if you want to earn the same return as before, you need to take more risk. The representative for Bank A describes the bank as a low-risk bank, and that it has very strict rules when it comes to risk taking within asset management of interest rate products. No risk limits are changed to enable higher risk taking because of the negative repo rate. The risk limits they have are absolute risk limits. These are measured each day and do not change, even though there is movement in the interest rate, up or down, or even as far as being negative. If the customers want higher return, they will switch products rather than the bank changing the risk limits for the products themselves. Bank B and C say that given the current market conditions, it is easy to become attracted to take on additional risk to achieve the same levels of return as before, and they say that it is very important to be aware of this fact. No risk limits has been changed to enable the changes made due to the negative repo rate, since the changes made are within the existing risk exposure limits. Most often when banks work with fund management, they have quite broad limits, which are narrowed down through the fund specifications. The representative from Bank D was not able to answer questions about this.

Decrease Fees for Interest Rate Products

As a reaction to the lower expected return on interest rate products, Banks A and B have been forced to lower their fees for funds. They mention that this is done since the return the bank can achieve with the negative interest rate is lower than before when it comes to money market funds and interest rate funds. When the customers do not receive the same return as before, it forces the banks to lower the fees to make it attractive for customers to still invest in the products and regard them as a valid option for investing their money. The representative in Bank C says that one effect caused by the negative repo rate is that asset management experiences some price pressures; lower return expectations have resulted in decreased fees

for funds, just as indicated by banks A and B. The representative from Bank D was not able to answer questions about this.

4.2.3 Reactions to the Effects on Lending to the Public

Introduce Interest Rate Floors

As a reaction to the Stibor falling below 0%, all banks has introduced a so called interest rate floor to all new loan agreements, as well as negotiating this into old ones where it is possible. For example, bank D identifies interest rate floors as the main reaction when it comes to lending to the public. The floor means that the reference rate can not fall below zero. Therefore, in the case of Stibor+50bps, the lowest interest payment that the bank can receive is 50 basis points over zero. The interest rate floors prevent the profitability impact from decreasing interest margins. Without the floors on loan agreements, the negative repo rate would affect the spreads in lending and therefore impose pressure on the bank's profitability. The representative from Bank A concludes that the negative repo rate does not have significant effects on lending to the public when it comes to the bank's profitability, mostly due to these interest rate floors. The interest rate floor is important since interest margins received on lending are a primary income source for the banks. Bank D explains that with interest rate floors, no customer can end up in a situation where the bank is paying the customer for the money the bank has lent.

Increase Mortgage Margins

When asked whether the banks have actively reacted to compensate for losses, caused by negative margins on deposits, from borrowing from the public, the representative in Bank A mentioned increases in mortgage margins in Sweden. The person explains that some of the increase in mortgage margins can be connected to efforts to compensate for losses on the borrowing side. The majority of the margin rise is, however, explained by regulatory aspects, such as increases in capital requirements. The representative for Bank B explains that the negative interest rate has had other consequences than just the lower interest rate levels. One clear effect is that asset prices, such as stock and real estate prices, have increased. E.g. in Stockholm, the real estate prices have reached the all-time high, which in turn has increased the volumes for lending to private customers. Therefore, the low interest rate levels, due to low repo rate, have resulted in higher mortgage volumes. According to Bank B, it is highly probable that there is a link between the effects of the negative repo rate and the increase in

mortgage margins in Sweden; that the bank tries to compensate for losses on the borrowing side caused by the negative repo rate. Since the bank is not charging the majority of deposits negative interests, it becomes natural to compensate for these losses in other parts of the operations, e.g. in form of higher mortgage margins. Bank C has not increased lending margins to private customers due to the negative repo rate. According to the representative, the increase in mortgage margins is only related to increased regulation. The representative for Bank D also states that the increases in lending margins are mostly related to increased capital requirements for lending and the connection to the negative repo rate is insignificant.

Increase Other Lending Margins

None of the banks could identify any significant adjustments to other lending margins due to the negative repo rate. They regard the negative repo rate this as a temporary issue, and are unwilling to make too big changes, which can hurt the business in itself. Despite having an overall profitability pressure now when the interest rate levels are low, the banks explain that they choose to think long-term and not place too much concern in losses occurring in short term because of the negative repo rate, even though it has affected the banks and their businesses.

5. Analysis

This section describes and analyses the main effects, due to the negative repo rate, affecting the banks' operations and the major actions taken by the banks in order to respond to these effects. The effects and reactions of interest are those identified by the banks, presented in the empirical data section. The data is analysed by comparing the empirical evidence to the theoretical framework presented in the literature review section. The theoretical framework presents the perception of the expected effects and reactions, caused by the negative repo rate, based on the existing research in the fields relevant to the topic.

5.1 Effects and Reactions According to the Banks

The table below summarizes the main effects, according to the banks, on their operations due to the negative repo rate: Stibor has fallen below zero per cent, there is lower expected return on interest rate products, and overall profitability pressure. The table specifies the different actions to these effects taken by each bank.

Effect	Operation	Reaction	Bank A	Bank B	Bank C	Bank D
Stibor has fallen below zero per cent	Borrowing from the public	Apply deposit rates of zero for small/medium sized companies and private customers	YES	YES	YES	YES
Stibor has fallen below zero per cent	Borrowing from the public	Introduce negative deposit rates to big companies and financial institutions	YES	YES	YES	YES
Stibor has fallen below zero per cent	Lending to the public	Apply interest rate floor to loan agreements as a protection against falling interest rates	YES	YES	YES	YES
Lower expected return on interest rate products	Asset management of interest rate products	Invest in financial instruments with higher risk or longer maturity than before the negative repo rate	YES	YES	YES	n/a
Lower expected return on interest rate products	Asset management of interest rate products	Change internal risk exposure limits for interest rate products in order to be able to invest in more risky assets, which enables higher return on the products	NO	NO	NO	n/a
Lower expected return on interest rate products	Asset management of interest rate products	Decrease fees for interest rate funds in order to maintain these funds as a relatively attractive investment alternative for customers	YES	YES	YES	n/a
Overall profitability pressure on the banks' operations	Lending to the public	Increase mortgage margins to compensate for losses in deposit margins and profitability pressures	YES	YES	NO	NO
Overall profitability pressure on the banks' operations	Lending to the public	Increase other lending margins	NO	NO	NO	NO

5.2 Effects on the Banks' Operations

The empirical data shows that all four banks mentioned the effect the negative repo rate has on short-term interest rates, such as Stibor; the Stibor has fallen below zero. The fall in Stibor and other reference rates has affected banks' operations in form of lower deposit rates. Lending rates to the public are also affected since these interest rates tend to follow Stibor, or other reference rates, which moves in relation to the repo rate. The banks do however mention

that there are many other factors than just the repo rate affecting the decision-making when setting the interests rates, such as the interest rate levels in Europe. This result is consistent with Fransson and Tysklind's (2016) finding that most of the interest rates in Sweden covary with the repo rate, especially the shorter market rates. They also identified the effect of other factors, such as the development of international interest rates, on longer market rates. In general, the changes in the repo rate, even though it is negative, seem to have the same effect on development of other interest rates, such as Stibor, in Sweden, as before the repo rate became negative. The effect on Stibor, described by the banks, is consistent with the identified effect in the theoretical framework.

The three banks, A, B, and C, that were interviewed in the field of asset management of interest rate products described that the repo rate is strongly related to the return generated by interest rate funds and the decision-making regarding duration and mandates of these funds. The most substantial effect on asset management of interest rate products has been the change in return expectations; due to the negative repo rate, interest rates have fallen to exceptionally low levels, which has reduced the attractiveness of the interest rate product market in terms of expected returns, since it is unlikely that interest rates would fall much further in the near future. This is in line with Oxenstierna (2010) and how the financial market works and how the return expectations change with changes in interest rates. The empirical evidence for lower expected return on interest rate products is consistent with the identified effect in the theoretical framework.

According to the empirical data, all the banks mentioned that the negative repo rate has resulted in an overall profitability pressure on their operations, e.g. in form of increased administrations and legal costs. They also experience overall margin pressures on the net interest income. This is consistent with Gibas, et al. (2015) finding, which indicates that both sides of the bank's' balance sheet are affected by low and negative interest rates. Lending rates decrease more than the cost of deposits, which leads to profitability pressure for the banks. The overall profitability pressure on the banks' operations, described in the empirical data, is consistent with the identified effect in the theoretical framework.

5.3 Reactions to the Effects

5.3.1 Reactions to the Effects on Borrowing from the Public

The data collected shows that all the banks explain the reluctance of charging the majority of customers, households and small/medium-sized companies, negative deposit rates by stating

that these customers would probably feel uncomfortable if they had to pay for their deposits as they believe this is abnormal, since they do not understand the economics behind the negative deposit rates. The banks further state that they all believe the negative repo rate environment is temporary, and instead of making huge investments in systems and other necessary tools, which can handle the negative repo rate effects, they accept the losses from the negative deposit margins since these losses are considered to be lower than the cost of the investments. In addition, all the banks mention that none of the other banks have started charging these customers negative deposit rates, and that there is a risk of losing deposits if they started to do so. Losing deposit would lead to financing problems in the short term. Therefore, banks regard the action of not charging these customers negative deposit rates as a best practice in order to create long-term value for the owners (Anthony et. al, 2014). Thus, the banks want to prevent deposit and cash withdrawals by accepting short term losses in order to generate value in the longer term. If deposits are lost, it costs to get them back later on once the interest rates starts to rise (Gibas, et al., 2015).

All four banks have been unwilling to charge the majority of their customers negative deposit rates. Therefore, small/medium-sized companies and private customers are now facing zero interest rates on deposit accounts, instead of negative interest rates which they should be faced with according to Fransson and Tysklind's (2016) findings that interest rates to households and corporate customers normally tend to follow the repo rate adjustments. The reluctance of introducing negative deposit rates is in line with the proposed reaction in the theoretical framework. Large corporate customers and financial institutions, on the other hand, are facing negative deposit rates. The reason given by all the banks is that by introducing negative deposit rates they prevent arbitrage opportunities that would otherwise arise to these customers. This is consistent with the general theories of how banks' interest rates move in relation to the movements and adjustment expectations of the repo rate (Nyberg, 2000). The findings of Kotomin, et. al (2011), that institutional investors appear to take advantage of arbitrage opportunities between returns on money market funds and alternative investments, in this case deposits, further explain why banks have introduced negative interest rates to these customers. This is also consistent with the expected reaction described in the theoretical framework.

5.3.2 Reactions to the Effects on Asset Management of Interest Rate Products

The interview data shows that the three banks, A, B, and C, who answered the questions regarding the asset management of interest rate products, on some level, have started to invest

in financial instruments with higher risk or longer maturity than before the negative repo rate. E.g. Bank B conveys that they have more actively sought out financial instruments with higher risk-adjusted return now that the interest rates, and return on many interest rates products, are extremely low due to the negative repo rate. Also, the three banks mentioned that they have increased the duration of some of the products in their fund portfolios in order to achieve higher expected return; the higher the duration, the higher the expected return. None of the banks have changed their internal risk exposure limits in order to enable investing in more risky assets, this since the current limits are broad enough to allow taking the necessary actions to increase the expected return. Unaltered risk exposure limits are in line with the perception of Gibas et. al (2015) that many funds often can increase their risk-taking within its pre-determined investment strategies, mandates, by investing in riskier, and sometimes less liquid, assets. The investing in financial instruments with higher risk-adjusted return can be explained by the findings of Delis and Kouretas (2010), that the low interest rate environment alters the composition of bank portfolios toward a more risky position. Changing the length of duration is consistent with Domian's (1992) theory that fund managers lengthen maturities after interest rates decline and shorten maturities after rates rise. This behaviour is consistent with the theory of risk-return trade-off (Berk and Demarzo, 2013); in order to achieve higher expected return in the low interest rate environment, banks have to invest in more risky assets, take more risk. The need to invest in more risky assets and generate higher expected return could be related to the banks' effort to create value to shareholders (Anthony et. al, 2014). The action of investing more in financial instruments with higher duration and expected return, and therefore also risk, shows that the empirical data is in line with the reaction suggested in the theoretical framework.

The three banks have decreased their fees for interest rate funds in order to maintain these funds as a relatively attractive investment alternative for customers, now that the return expectations for many interest rate funds are low. This is consistent with findings of Liang (2001) that changes in fund fees are performance related; poor performers lowered their fees. Decreased fees are in line with the expected reaction presented in the framework.

5.3.3 Reactions to the Effects on Lending to the Public

As a reaction to the Stibor falling below 0%, all banks have introduced a so called interest rate floor to all new loan agreements, as well as negotiating this into old ones where it is possible. This is a protection against falling interest rates to prevent a situation where the customer could end up receiving interest payment on money they have borrowed from the bank. The

use of interest rate floors is in line with the recent empirical evidence (Simmons & Simmons, 2015) of how banks can protect their loan agreements against falling interest rates. The banks mention that spreads received from lending activities are an important part of the net interest income and the bank's profitability. The action of preserving the spreads by introducing interest rate floors can be explained by classical financial theory; the purpose of the companies is achieving satisfactory profits and profitability for the owners (Anthony et. al, 2014). Without interest rate floors, many lending agreements with floating rate would have faced margin pressure, and therefore the profitability for the owners, ceteris paribus, would have decreased. Applying interest rate floors is in line with the proposed reaction in the framework.

According to Gibas, et al. (2015), one way to handle the profitability pressures of low and falling interest rates is that banks increase their lending margins. Two of the four banks, A and B, mentioned that some of the increase in mortgage margins can be related to the effects of the negative repo rate as a mean to compensate for losses on deposit margins and other profitability pressures. In addition, Bank B explains that low interest rates on lending in combination with increased real estate prices have resulted in higher demand for mortgage loans in Sweden. Banks C and D stated that they have not included the effects of the negative repo rate in their mortgage margins; the increase in mortgage margins is almost entirely explained by increases in capital requirements. Therefore, the reaction of the banks C and D is inconsistent with the reaction proposed in the theoretical framework, while the reaction of bank A and B is in line with the framework.

None of the banks could identify any significant increases in other lending margins due to the negative repo rate. The reason to why they are reluctant to make any more changes in margins is because of the mind-set that the negative interest rate environment is expected to be short-term. Therefore, the banks are not trying to compensate for profitability pressures by increasing lending margins in the short term since this creates a risk of losing customers if they have to pay higher interest rates in order to increase the margins. This decision is made in order to keep their customers so they can create value in the long run when interest rates rise. This reaction is in line with the theory of creating value for the owners (Anthony, et al., 2014), but it is not in line with the expected reaction presented in the framework. To conclude, the expected reaction of increasing lending margins is only partly consistent with the empirical data, since not all banks have increased their lending margins.

6. Conclusions and Implications

This study investigates the effects of the negative repo rate on four Swedish universal banks' operations and how these banks have reacted to these effects. The aim of the study is to identify and explain the major actions taken by the banks in order to manage these main effects. The empirical data was collected conducting six semi-structured interviews with four Swedish universal banks. The analysis shows that the actions taken by each bank, to a great extent, are the same. This finding is fairly expected since the banks included in the study have similar operations and business structure consisting of, e.g. borrowing from the public, asset management of interest rate products, and lending to the public. The similarity between the four banks implicates that they should all be faced by almost the same effects. Because of this similarity, the actions taken to manage the effects should also be close to the same.

The main effects presented in the theoretical framework are that Stibor has fallen below zero per cent, there is lower expected return on interest rate products, and overall profitability pressure. All the proposed effects in the framework were consistent with the empirical data provided by the representatives of the banks. In the theoretical framework, the assumed reactions based on the existing research are presented. The majority of the presented reactions were in line with the empirical data. The major reactions, according to the banks, can be categorized into three different fields of business: borrowing from the public, asset management of interest rate products, and lending to the public.

When it comes to borrowing from the public, two reactions were identified. One reaction described by all the banks was to introduce negative deposit rates to big companies with professional treasuries and financial institutions. The reason to this, according to the banks, is that these actors understand the financial market and might take advantage of arbitrage opportunities resulting from not charging negative deposit rates. This reaction seems to be in line with the general view of the banks' role in the financial market as an intermediary whose task is to improve the efficiency of the market. The other reaction, similar for all four banks, was to not introduce negative interest rates for small/medium sized companies and private customers, and instead stay at a deposit rate of zero per cent. The main argument, given by the banks, was that having to pay for deposits at the bank would be perceived as abnormal by the majority of the customers. Therefore, negative deposit rates could violate the long-term relationship with the customers and through that also the value creation for the owners. The reluctance to introduce negative deposit rates has affected borrowing from the public; the previously positive deposit margin has become negative. Thus,

the negative reference rate has made the deposit operation to become a less attractive, loss-generating business, instead of the profit-generating business it previously was. This means that the banks' net interest income is negatively affected by the change in deposit margins.

Regarding the asset management of interest rate products, all three banks that were able to answer the questions related to the topic, mention that they, as a reaction, have invested in financial instruments with higher risk or longer maturity in order to maintain the capital base invested in interest rate products or in best case find investments that generate return. They also mention that they have decreased the fees for the funds whose expected return has fallen, due to the negative repo rate, to make these products relatively attractive as investment opportunities. The lower expected return on interest rate products implicates that investors probably will start investing in products with more risky assets, such as obligations and stocks, in order to achieve a satisfactory return on their money, now that the expected return on interest rate funds is low. This may eventually result in more risky portfolios for the asset management operations as the banks start to offer products with higher return, and risk, in order to satisfy customers' return demands. Banks have not changed any risk exposure limits for interest rate products, and they do not plan on doing so either. Instead of the banks changing the risk limits, it is rather the customers who will choose other products, which has the risk exposure and expected return required. If investors start demanding more risky interest rate products, this will eventually affect the banks' net commission income positively, since commission fees are usually related to the expected return on the funds.

In the field of lending to the public, all four banks state that they have introduced interest rate floors to new loan agreements as well as negotiated them into old ones where possible as a protection against falling interest rates. This reaction is natural since lending to the public stands for about 69 % (Riksbank, 2016) of the Swedish banks' assets, and if there were no interest rate floors, the banks would face interest margin pressures when the reference rate falls below zero. In addition, they would make losses on outstanding floating rate loans if the lending margins became negative. Without interest rate floors banks would need to reconsider their way of making money, since interest margins from lending operations are the main factor affecting net interest income and have a great impact on banks' earnings.

There were differences between the theoretical framework and the empirical data regarding the increases in lending margins. The only margin affected by the negative repo rate, according to the banks, was the mortgage margin. Other margins were said to be unaltered. Banks A and B convey that the negative repo rate is one factor affecting the increase in their mortgage margins, whereas banks C and D say that the increase in mortgage

margins is almost entirely explained by the changes in capital requirement regulations. All the banks recognize that the negative repo rate environment has increased the demand for loans among households in Sweden. One explanation for increased demand is low borrowing costs, the other is rise in assets prices, such as real estate. Therefore, people can and have to borrow more to be able to afford the assets. This has created an opportunity for the banks to compensate for overall profitability pressures caused by the effects of the negative repo rate, by increasing mortgage margins in a field of business with currently high demand. Banks C and D have probably found another way to compensate for the profitability pressures than the increase in mortgage margin. One possible way might be to focus on finding cheaper market funding, since the proportion of market funding in Swedish banks is approximately 56 % of total financing (Riksbank, 2016). All in all, the increased demand on loans from households positively affects the net interest income.

To conclude, a common factor explaining the reactions of the banks seems to be the will to generate acceptable long-term return for the owners and minimize the impact of the profitability pressures caused by the effects of the negative repo rate.

7. Critical Discussion

Partly because of the limited scope of a bachelor thesis, concerning both time frame and length of the paper, there are some areas where improvements could have been made, both when it comes to the depth and validity of the study. The choices regarding the delimitations may prevent the comprehension of the phenomenon, since relevant information from fields that are excluded from the study may remain undetected. This lowers the validity of the study. Considering the complexity of the negative repo rate phenomenon, and the aim of identifying the effects and the banks' reactions, the delimitations are necessary in order to arrive at somewhat valid and clear conclusions, which can contribute to the research in the field of the effects of the negative repo rate. Some delimitations could have been altered to increase the validity of the study. To begin with, the fact that the focus in this study is on universal banks in Sweden disregards the possibility that banks have compensated for profitability pressures on group level. The banks' operations in other countries are not scrutinized and therefore it cannot be concluded whether banks have increased risk-taking or made other changes in operations abroad. Further on, when it comes to the time frame chosen, banks may have taken actions to improve profitability at the expense of higher risk, or made other changes, already before the repo rate became negative.

The chosen research method was a qualitative study and the data was collected by semi-structured interviews. The qualitative study was considered to be a suitable method since the effects of the negative repo rate and the reactions taken by the banks cannot be found by simply looking at the annual reports or other written sources due to the difficulty of separating the effects of the negative repo rate from other factors. It can be argued that a qualitative method does not offer the same validity as a quantitative method, but considering the subject and the aim of the study, it is more suitable to use a qualitative method to obtain the information required in order to answer the research question.

The empirical data was collected from four Swedish universal banks, by interviewing six representatives in total. The number of interviews suggests that the data may be incomplete and some effects and reactions may have been disregarded. However, considering the abnormal nature of negative interest rates, the statements from the representatives can be considered to reflect the banks' overall strategies on how they have managed the effects of the negative repo rate. This is further supported by the fact that all the representatives held positions requiring deep understanding and insight of the organisation as a whole. The reliability and validity of this study would have improved if the number of respondents was increased, and if the respondents added were from different positions and departments. When it comes to the reliability of the interview answers, the process of comparing the interview information to other data sources can be regarded as a reasonable mean to ensure that the answers collected are legitimate. It would also add depth to the study to increase the number of banks in the research in order to gain an overall view of the financial market as a whole and its reaction to the negative interest rate environment.

8. Contribution of the Study

Central banks are increasingly using negative interest rates as a mean to boost growth and raise the level of inflation (The Guardian, 2016). Yet, the research in the field of the negative interests rates and their effects on banks' operations and actions is unelaborated, which implies that more research is needed in order to better understand how the negative interest rates affect bank's operations and how the banks have reacted to these effects. In addition, the most relevant and latest studies related to this field are provided by the Riksbank. The present study aims to contribute to the existing research by investigating the effects, due to the negative repo rate, on Swedish universal banks' operations and actions from the bank perspective. Therefore, the stance taken in the study is more from the side of bank behaviour

and less from the side of the central bank's policy goals. The findings of the study give a more comprehensive understanding of how the negative repo rate has affected the banks' operations and actions, which is necessary when trying to understand how the negative repo rate affects other actors in the Swedish economy.

9. Future Research

This study has identified and explained the main reactions of the banks due to the effects of the negative repo rate. A further research could try to quantify the profitability impact of these effects and reactions. The banks interviewed mentioned that negative interest rates have resulted in manual adjustments, extra working hours, and legal costs, to mention a few. Quantifying these costs and other factors affecting profitability would provide further understanding of the phenomenon and its impact on the financial market in Sweden. This information could eventually be used to assess the real impact of the Riksbank's monetary policy.

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Appendix - Interview Guide

Before the interview, ask/inform about the following:

- Anonymisation (all identifying details will be removed from the interview data presented in the thesis, regarding interviewee, workplace etc.)
- Will you allow us to record the interview using audio recording?
- The interviewee can pass questions or end the interview whenever he/she pleases

1. Work setting

- How long have you served in your current role? Bank sector?
- Could you describe your role briefly?
- What is the intended output of your work?
- How is your work related to the repo rate?
- How important is the repo rate in your work and decision-making? Why?

2. Repo rate and borrowing from the public

Has the negative repo rate affected borrowing from the public? (Yes/No)
How has the negative repo rate affected borrowing from the public?

- Deposit rates (households/companies)
- Deposit margins (households/companies)
- Borrowing volumes (households/companies)
- What is the most remarkable effect on borrowing from the public due to the negative repo rate?

How have you reacted to these effects? Why?

Has the negative repo rate affected in any other way?

3. Repo rate and lending to the public

Has the negative repo rate affected lending to the public? (Yes/No)
How has the negative repo rate affected lending to the public?

- Lending rates (households/companies)
- Lending margins (households/companies), mortgage margins, other?
- Lending volumes (households/companies)
- What is the most remarkable effect on lending to the public due to the negative repo rate?

How have you reacted to these effects? Why?

Has the negative repo rate affected in any other way?

4. Repo rate and asset management of interest rate products

Has the negative repo rate affected asset management of interest rate products? (Yes/No)
How has the negative repo rate affected asset management of interest rate products?

- Has the repo rate affected investment decisions/behaviour?
- Have invested volumes in some financial instruments changed? Which? Why?
- Has any internal risk exposure limits changed because of the negative repo rate in order to enable changes within asset management of interest rate products? (Yes/No) How? Why?
- What is the most remarkable effect on asset management of interest rate products due to the negative repo rate?

How have you reacted to these effects? Why?

Has the negative repo rate affected in any other way?

5. Concluding remarks

- Can we contact you via email for clarifications or additional questions?
- Do you wish to receive a final version of the thesis?