

# **Differences in mortgage loan legislation and regulation between Norway and the United States of America**

*Are Norwegian mortgagors taking on more risk than necessary  
and are Norwegian banks issuing residential mortgages more  
often than a similar bank in the United States holding other  
variables equal?*

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Master Thesis in Financial Economics

**NORGES HANDELSHØYSKOLE**

This thesis was written as a part of the Master of Science in Economics and Business Administration at NHH. Neither the institution, the advisor, nor the sensors are - through the approval of this thesis - responsible for neither the theories and methods used, nor results and conclusions drawn in this work.

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*”Legal rules are to be judged by the structure of incentives they establish and the consequences of people altering their behavior in response to those incentives.”*

- David D. Friedman

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## Foreword

The idea for this master thesis was originally conceived during a lecture in Personal Finance at NHH in October 2011 that discussed how U.S. borrowers that defaulted could not be pursued for more money if the collateral didn't cover for the loan. I wanted to understand why the U.S. had this system and Norway didn't. Work started promptly with collecting data, reading newspapers, etc. Throughout my research and interviews with lenders and mortgage credit companies, I have learned a lot more about the mortgage loan industry in both the U.S. and in Norway, and I've discovered things that were surprising to me as well. I've also acquired some insight into the legislative system of both Norway and the United States and I feel I understand more about how laws are made, especially in the U.S. I didn't foresee how much work it took to understand law and I would probably have reduced the scope of the thesis if I had known this beforehand. But I'm pleased with the end product and with everything I've learned in the process. And even though the work at times seemed impossibly much to handle, I've stayed focused with great backing from friends and family. I would like to thank them for their support.

I also want to give my deepest thanks to my advisor on this thesis, Associate Professor Trond Døskeland at NHH for clearing some time in his busy schedule to advise me, even during the summer of 2012 when I wanted to get a head start on writing.

During my work I have interviewed several people in both the U.S. and in Norway. Writing this paper without their input would have been impossible. I would like to thank all of them for allowing me to visit them, ask questions and discuss the mortgage system. These people are: Vice President Greg May at Tompkins Trust Company, General Manager Jan Ove Styve at Sparebank 1 Nord-Norge, General Manager Roar Myrstad at Helgeland Sparebank, CEO Jan Kåre Raae at Gjensidige Bank Boligkreditt, CEO Ole Kjerstad at Møre Boligkreditt AS, CEO Øyvind Birkeland at DNB Boligkreditt, Division Head Håkon Røsand at DNB Boligkreditt, Division Head Fred Skarsteen at DNB Boligkreditt, Head of Marketing Kurt Mikalsen at Terra Boligkreditt, Category Manager Tone Halden at DNB Bank, Financial Advisor Inger Bonsaksen Dypvik at Nordlandsbanken, Financial Advisor Geir Hartviksen at Nordlandsbanken, Financial Advisor Marit Johansen at Fokus Bank, and Financial Advisor Eirik Langva at Sparebank 1 SMN.

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# 1. Introduction

The Financial Crisis of 2007 had devastating effects all over the World and politicians are still trying to solve problems with high sovereign debts and interest rates. One of the more positive results of the crisis is how it enables economists of today to learn from mistakes in the past. The crisis has been an integral part of almost all higher education courses in economics the later years.

The crisis started in the United States as high demand for mortgage backed securities in the years prior to 2007 drove some lenders to give credit to customers that had a low or even no chance of being able to repay their loans (sub-prime). In some cases there were even downright fraud mortgage originators giving loans to borrowers they knew couldn't repay. Sub-prime mortgages as a share of total mortgages rose from around 6% in 2003 to 20% in 2006 (Kindleberger & Aliber, 2011). Common for these loans was low starting interest rates (teaser-rates) that, once they were adjusted to the regular rate (option ARMs), became too high for the borrowers to handle, forcing them into default and subsequent foreclosure. With the high amount of foreclosures, housing prices started to decline which in turn caused more people to abandon their mortgages and homes driving prices even further down. In addition to this, the investment banks were stuck with mortgage-backed securities (MBS) that were not performing and started to sell these in a panic, causing large drops in prices on these. This in turn forced banks that had large amounts of MBS on their books to write down these and take large losses, marking the start of the 2007 crisis and following recession (Kindleberger & Aliber, 2011).

In the Norwegian media some “experts” have assigned much of the “blame” for the crisis to the U.S. legislation that offered homeowners to leave their property and loan to the bank, leaving the bank at loss (also known as *non-recourse*). However, as I will show here, this is a hasty conclusion. The option to leave the property is only a parameter that made the crisis stronger, but it is not the cause of the crisis. By showing how legislation and regulation are somewhat similar in both Norway and the U.S. and how actual lending practices are similar as well, I will argue that this option to leave is in fact more economically efficient than the current Norwegian system.

Most of the literature and media coverage about housing prices in Norway and the U.S. seem to concern small changes and adjustments to current regulation and not the fundamental

laws. An example is how the recent changes in the guidelines from The Financial Supervisory Authority of Norway (FSA) requiring 15 percent equity (85 percent Loan-to-Value ratio) has received a lot of press(The Financial Supervisory Authority of Norway, 2011). Some academic papers analyzing the recent change have also been written but common for them all is that no one seems to be questioning the more fundamental questions of mortgage legislation. One of the maybe more surprising results from studying U.S. mortgage law is that there are different foreclosure laws in the U.S. It is evident that there is a lot of generalization in this area in the media and even in lectures at NHH.

During my meetings with people in the banking industry I have yet to meet anyone that has reflected on the fundamentals of mortgage repayment. While it is natural for businesses to simply adhere to the current legislation, it is the job of researchers to investigate and ask questions about believed “truths”. This paper asks these questions in order to investigate the implications of the current legislation. As such, this can maybe be seen as a study within the realm of economic analysis of law which analyzes the economic effects of legislation (Friedman, 2000).

## 2. Method and structure

Analysis of mortgage legislation and regulation and how actors adapt requires extensive effort. It requires not only insight into finance, but also into law. This is complicated further by the fact that this study looks at different countries, in addition to how the U.S. law is divided into a federal and a state level. This study is mainly a literature study that collects information from various sources and attempts to compile them to create a somewhat complete view on the topic. The work on the thesis started in October 2011.

After an initial research phase on the topic and the issues facing the industry, interviews with lenders were conducted. The first interview was held in New York State in the U.S. in the spring of 2012. Three banks in Norway were interviewed during the summer. In September 2012 further interviews were held with two banks and four mortgage credit companies (issuers of covered bonds). All interviews were held in the offices of the interviewees.

The following banks were interviewed:

- Tompkins Trust Company, Ithaca, New York
- Nordlandsbanken, Sandnessjøen
- Sparebank 1 NordNorge, Sandnessjøen
- Helgeland Sparebank, Sandnessjøen
- Fokus Bank, Trondheim
- DNB, Oslo
- Sparebank 1 SMN, Ålesund

The following mortgage credit companies (“Boligkreditt”) were interviewed:

- Terra Boligkreditt
- DNB Boligkreditt
- Gjensidige Bank Boligkreditt
- Møre Boligkreditt

The interviews serve as input for the actual lending practices in both countries and for the securitization of mortgages in Norway. They add to the existing literature and legislation/regulation collected in that they describe what is actually going on. There are however some limitations to this approach. The most obvious is the choice of whom to

interview. Since the focus of this thesis is mainly on the Norwegian mortgagors only one interview was done in the U.S.

The interviews (except with the two banks in September) were booked well in advance and a set of questions was submitted to the interviewee prior to the interview. The questions asked in the U.S. are somewhat different to the ones in Norway, but not to the extent that it should result any problems with reliability (questions can be found in Appendix B and C). The interview was done in a relaxed setting and structured as an informal talk where the questioned served as guidance to the topics at hand. Direct questions on the topic of the thesis were avoided in the formal questions that were submitted prior to the interview in Norway. Instead, questions about the beliefs and thoughts on recourse were brought up during the interview following a build-up of prior questions that was intended to reveal the interviewee's initial thoughts on the topic and stimulate further reflection in that moment. Questions on the topic was also avoided beforehand to avoid any misinterpretation of the question since recourse seems to be taken for granted in Norway.

All interviews were recorded with the strict restriction that they be deleted once the thesis was done and only be used to make sure that all that was said was correctly recorded. In Norway the recording was also done on a tablet together with notes. Further restrictions on the interviews in Norway were that any direct reference in this paper to a specific interview that could identify the individual or institution should be avoided if possible. If it was unavoidable, the text would to be sent to the interviewee for review and approval. This was especially important for the interviews with the mortgage credit companies that sell covered bonds for funding, since incorrect information in the worst case could influence the price of their securities.

Once all data from interviews and email had been collected, this was reviewed and correlated with the literature and the thesis was written. During this time some correspondence over email with the Financial Supervisory Authority of Norway also contributed to this thesis in the areas of regulation on maximum loan-to-value ratios and insurance classification.

This thesis is divided into 14 chapters:

The first 3 chapters contain an introduction, methods used, and limitations and clarifications.

Chapters 4 and 5 explain mortgage loans and how lenders get funding in order to offer loans to their customers.

Chapters 6 and 7 go into the legislation and regulation concerning mortgage loans in Norway and in the U.S.

Chapter 8 and 9 first tries to give a historic overview of the 1987 bank crisis and its implications for mortgage customers in Norway. Then goes on to show what the situation in the Norwegian housing market is today. It also shows some key figures about debt levels and recent repayment problems (delinquencies).

Chapter 10 contains the results of interviews with several banks in Norway and in the U.S., including some mortgage credit companies in Norway that issue covered bonds. This chapter shows how the current lending practices are.

Chapter 11 and 12 contains discussions about the current system in Norway and its implications, and then suggest different types of regulation that could potentially be more economically efficient.

Chapter 13 points to weaknesses in this research and gives some suggestions for areas that need further research.

Chapter 14 contains the conclusion and some final remarks.

In the end I have added 4 appendixes: A dictionary, the questions that were asked banks, the questions that were asked mortgage credit companies and finally some details on all the interviewees.

### **3. Limitations and clarification**

In order to handle the work I've had to set some limitations for this study. First of all, this is a study of the systems of the United States and Norway only. No other countries have been studied. It's also a study of residential mortgages and does not discuss commercial mortgages. This is important to note as legislation can be different for businesses and individuals in regard to defaults.

Also, the study focuses on the legislation and regulation at the federal level. All nationwide banks, thrifts and credit unions are regulated at the federal level, but state chartered banks and thrifts that are not members of the Federal Reserve System are subject to state law. This state legislation and regulation is not studied in this thesis. However, since the individual U.S. states have different foreclosure laws this is included.

The complex nature of the U.S. Common Law structure means that it is virtually impossible to include judgments (common law) into the analysis, and as such only the statutes and rules have been analyzed. All interpretation of the laws is the authors own and no works with interpretations have been used, except for feedback from interviews.

Throughout the thesis the term "2007 crisis" will be used extensively. Unless specifically noted, this includes both the sub-prime crisis that led to the fall of Lehman in 2008 and the subsequent problems in the sector up until today.

The laws and regulations that are referenced have not been included in an appendix of the thesis. This is done simply because it would require too much space. However, there are several websites that contain the full laws and regulations free of charge and they are easy to find with popular search engines.

## 4. Mortgage loans

Most people would like to own their own home. Because the capital required to acquire one is so high, most people do not have such amounts readily available and must find other ways to finance the home. One of these ways is a mortgage loan. A mortgage loan is a type of loan where the property is set up as collateral in case of missed payments or default. An agreement is signed where the borrower (mortgagor) agrees to pay the lender (mortgagee) the loan amount (principal) back with interest over a set timeframe. A mortgage loan is commonly referred to as “a mortgage”. This is not entirely correct as *mortgage* refers to the security interest on a real property and *mortgage loan* is the loan that is associated to this interest. However, unless specifically mentioned, this thesis refers to mortgage loan(s) when using the word mortgage(s).

Mortgages can be divided into two categories: Residential mortgages and Commercial mortgages. Residential mortgages are loans issued with a residential property (a home) as collateral and commercial mortgages are loans issued with a commercial property (for example an office building) as collateral.

The agreement contains the terms agreed upon. The terms are such things as payback method, initial interest rate, rate adjustments, late payment penalties, foreclosure rights, etc. There is no set standard for a mortgage in this regard. There exists a whole myriad of different mortgage-types that are individually tailored to the needs for the mortgagor and the lender. The following represent the different characteristics of a mortgage:

### 4.1 Property

The property is the physical object (home) that the loan will be used to finance. The property will serve as collateral for the lender in the case that the mortgagor is unable to make payments and defaults on the loan.

### 4.2 Principal

Principal is the loan amount paid out by the lender to the borrower. The borrower and lender come to an agreement of how large the loan should be. The principal can in some cases also

include various fees associated with issuing the loan. As time progresses and payments are done, the principal is reduced in size. When the principal is reduced to zero the loan is considered paid back and the mortgage contract ends.

### 4.3 Interest rate

The interest rate is the payment that the lender receives for deferring the use of the money and instead giving the borrower the opportunity to use the money. It can be viewed as the “price” of a loan. The rate is given as a percentage of the principal. The interest rate ( $r$ ) is equal to a risk free rate ( $r_f$ ) plus a rate that reflects the risks that the lender takes on by giving someone the opportunity to use the money ( $r_r$ ).

The interest rate can either be fixed, variable or a combination of these. In a fixed rate mortgage, the interest rate is the same throughout the term of the loan. In a variable rate mortgage the rate can change over time. How and when the rate is changed is decided when the contract is signed. Usually the rate is set to change at predetermined intervals in time. These intervals can be as low as 30 days or as long as ten or even fifteen years.

At the time of an interest change, the contract will determine how much the rate can change and what factors decide the new rate. There are a myriad of different options available ranging from a completely market based variable rate, to rates that can't change more than a set amount in any direction. What the exact terms are for an interest change is largely determined by what financing options are available to the lender in the financial markets. Larger banks situated in the U.S. will commonly have more funding options available than a small Norwegian bank. This means that the U.S. bank would be able to offer loans from a more varied portfolio of products to the borrowers.

### 4.4 Nominal and effective interest rates

The interest rate that is used when issuing loans is called the nominal interest rate. Banks typically advertise this rate as the “interest rate” that the borrowers can apply for. The nominal rate is the basic annual interest rate less fees, payment fees and compound interest. For this reason the nominal interest rate does not reflect the actual cost of the mortgage for the mortgagor. The actual cost as a percentage can be found by calculating the effective



interest rate. The effective interest rate will be higher than the nominal because it includes all costs. The effective interest rate (APR) is calculated as follows:

First the internal rate ( $i_t$ ) at the payment period ( $t$ ) is calculated by solving the following equation:

$$NPV = \text{Principal} - \text{Origination fees} - \sum_{t=1}^n \frac{\text{Payment}_t + \text{Payment fee}_t}{(1 + i_t)^t} = 0$$

where:

**Payment<sub>t</sub>** = Payment due in period  $t$  (including interest payment), found by using amortization formula (see below)

When the internal rate ( $i_t$ ) is found, the annual percentage rate ( $r_e$ ) is found by solving:

$$r_e = (1 + i)^{\text{Number of periods per year}} - 1$$

The actual cost (effective rate) of the mortgage will increase as more fees are included at origination or with each payment. The effective rate makes it easier for borrowers to evaluate offers from different banks.

## 4.5 Repayment method

For residential mortgages repayment is usually done by amortization (an annuity) where the mortgagor pays interest and a principal payment at set intervals of time according to a schedule. These intervals are usually once per month, but can be both shorter (biweekly) and longer (quarterly). The amount that is due for payment can be calculated using the amortization formula:

$$\text{Payment}_t = \frac{\text{Initial Principal} * r_p * (1 + r)^n}{(1 + r)^n - 1}$$

where:

**r<sub>p</sub>** = Interest rate for each payment period, found by dividing the annual interest rate by the number of payments per year (Monthly payment: Annual interest rate/12 months)

**n** = Total number of payments

A type of repayment that was more commonly used in Norway previously was the serial loan. In this method the principal payment is divided evenly among the scheduled payments and accrued interest for the total remaining principal is paid together with that at every interval. This method of repayment results in higher payments in the beginning of the loan than an amortizing loan. It also makes the payments smaller over time because the amount needed to cover interest is smaller. This also means that serial loans are “cheaper” over time than amortizing loans, but the NPV is the same at origination for both types (cheaper in the sense that the total interest paid is lower because of faster repayment). This method of repayment is still in use in Norway but is more common for commercial than residential mortgages. The benefit of having an amortizing loan instead of a serial loan for private households is that the effect on liquidity is lower, which in turn can enable higher principals on amortizing loans than on serial loans. The formula for calculating the payment due in period  $t$  on a serial loan is found by (using the same notations as above):

$$Payment_t = Initial\ Principal * \left( \frac{1}{n} + r_p * \left( 1 - \frac{t-1}{n} \right) \right)$$

In the U.S. a repayment variant called balloon mortgage used to be common before the 2007 crisis. In this variant the maturity of the loan is set earlier than the amortization schedule; meaning at maturity there is a residual principal that is due for payment in the end. This variant provides more liquidity during the term of the loan, but requires a large payment of the principal at the end. Because of this design it is common to use this variant for someone that have a set a time for how long they would like to own a specific home, since the sale of the property would provide the necessary funds. The problem with balloon mortgages is however situations where housing prices have declined and the residual principal are higher than the value of the property. In the years since 2007 this has been a problem for many mortgagors and this product is not commonly offered in residential mortgages anymore, but it is still available for commercial mortgages. Balloon mortgages often come with a “reset option” which gives the mortgagor an option to convert the loan into a normal amortization loan at balloon maturity (Freddie Mac, 2012).

Another type of repayment is the interest-only mortgage. Under such a contract the mortgagor pays only interest over the term of the loan and pays the entire principal at the end

of the contract. Every payment is then just a percentage of the principal. The percentage is determined by dividing the annual interest rate with how many payments there are per year.

In some cases it can also be possible to obtain a loan that requires no interest or principal payments. Such loans are called reverse mortgages. These special mortgages are a way to get access to parts of the equity that a property may have and use the money for other things. Reverse mortgages are commonly obtained by people in retirement that have low or no debt on their home and who want to spend parts of the equity that is “locked up” in their home. A reverse mortgage can be paid out as a lump sum, as a monthly payment or can function as a revolving line of credit. In the case of the latter the mortgagor can make payments to the loan to reduce the principal, which in turn will increase the credit available to the mortgagor for later use.

## 4.6 Loan-to-Value ratio

The loan-to-value ratio (LTV) is the ratio between the loan amount and the market value of the property. Commonly calculated as a percentage, the LTV can have values ranging from 0% to over 100% in some cases. The LTV is dependent on the amount of equity (down payment) that the mortgagor uses for the purchase of the property. The higher the down payment, the lower the initial LTV will be.

Because the housing market is fluctuating and can be hard to predict, it is common for lenders to require that the LTV isn't above a certain value when the loan is originated. This is done to protect the bank from a situation where lower housing market prices push the LTV above 100%. Mortgages that have a higher LTV than 100% are often called “underwater mortgages” and represent a substantial risk for the lender. Mortgagors that default on an underwater mortgage can cause losses for the lender if the liquidation of the property does not cover the residual value of the loan.

## 4.7 Guarantees

In cases where the LTV is high, the bank will often require that someone guarantee for the loan (a guarantor). A guarantee will cover the residual principal for the lender after a foreclosure and is a transfer of risk from the lender to the guarantor. Because this reduces the risk and provides added security for the lender, better terms can be given to the borrower

than would have been possible without the guarantee. In some instances, a guarantee will be required by the lender. A guarantor can be a government agency, another bank or other individuals like friends and family of the mortgagor. This also includes government sponsored programs that issue top-financing mortgages to homeowners taking secondary priority on the collateral in the event of default.

Guarantees are financial contracts and can thereby have a large variety of terms, but the most important one is the coverage. Generally a guarantee will cover all losses that arise from the delinquencies of a borrower to a lender, but guarantees given by companies and government agencies normally have a limited coverage (A standard mortgage insurance policy covers 20-30% of the lost mortgage principal (Jaffee, 2006)). This is done to reduce the cost of acquiring and holding the guarantee. The reason is that the risk transferred and the price of the guarantee is closely related. An unlimited guarantee from a large and financially robust company is really a transfer of virtually all risk from the lender to the guarantor and the lender is left with a near risk free investment. However, unless the guarantor performs a similar underwriting process on every loan as the originator, he would normally require a higher risk-premium than the lender (including profit). Proper underwriting is aimed at attempting to understand the full scope of the risk associated with every loan. If this process is left with the originator the guarantor must rely on the documentation and quality system provided by the originator. Even with periodic checks and audits the guarantor has no way of knowing the actual risk. This introduces an agency problem which the guarantor can price by setting a higher risk-premium. Because the loan wouldn't be totally risk free for the lender, he would require a small risk-premium (including profit). The total cost for the mortgagor is thereby higher than in a situation with limited coverage.

For guarantees given by individuals it is common to have no limit on the coverage. That is because these types of guarantees aren't normally paid for by the mortgagor (friends and family that provide guarantees do that in good faith to help to their closest). Since the lender has the incentive to require full coverage and the guarantee has no monetary cost for the mortgagor, unlimited coverage is common. Lenders will do a thorough economic analysis of the individual guarantor to determine if he has sufficient assets to cover the potential loss should the mortgagor default on his loan. It is also common to require the guarantor to provide added collateral.

## 4.8 Foreclosure

If the mortgagor is unable to make payments according to the payment plan, the lender has the option to start the process of foreclosing. Foreclosure is the legal process of terminating the loan agreement and acquiring and selling the property. The time it takes to complete a foreclosure process depends on the legislation, which can vary by state and country. The process can take anywhere from a couple of months to two years. In a foreclosure the lender will usually sell the property on the open market as soon as possible to cover for the loan, even in cases with underwater mortgages.

Because foreclosure has both monetary and non-pecuniary (reputation, status, stigma, etc...) costs both the lender and the mortgagor would like to avoid the process. For that reason, the lender will often allow the mortgagor to miss some payments if there is a reasonable chance that he will be able to pay more in the future. Being flexible as a lender will generally reduce overall costs for both parties.

## 4.9 Fees

During the origination and issuing of a mortgage there are some fees that the mortgagor has to pay. The fees and sizes vary between countries and between banks, but they can be divided into three groups. The first group is all the fees that the bank takes to cover its administrative costs with issuing the mortgage. The second group is legal fees like escrow fees, notary fees, attorney fees and the like. The last group is fees to the government. These fees are recording fees and taxes.

## 4.10 Prepayment

Prepayment is the process of repaying the mortgage loan ahead of schedule. By making extra payments on the principal, the amount paid at every scheduled payment will go more towards repayment than accrued interest. For a regular amortizing loan this will in turn reduce future interest, which in turn will increase principal payments and reducing the overall cost of the loan.

For lenders prepayment is mostly not beneficial. Even though prepayment will reduce the risk by lowering the LTV, reducing the principal also reduce interest income and force the

lender to find new investment opportunities. This isn't usually a problem for variable rate mortgages, but for fixed rate mortgages that have rates higher than the market interest rates ( $r > r_m$ ) it will reduce income. It is therefore common to have clauses in the contract that stipulate that the mortgagor has to cover the difference to the lender if the market rate is lower than the mortgage interest rate ( $r > r_m$ ). If the market rate is higher than the mortgage interest rate ( $r < r_m$ ) the lender can give new loans at higher rates, and the bank will pay the difference to the mortgagor.

Prepayment is also a problem for mortgages that have been securitized and sold to the capital markets. Financial institutions that sell securities are responsible for the cash flow to the bond-holders and must replace the reduced interest income. This means that even for variable rate loans there can be a clause that requires the mortgagor to pay a fee for every prepayment.

In general prepaying on a mortgage can be a financially sound decision because the overall costs are reduced. But every situation is different and the mortgagor is faced with a choice between alternative spending of his extra liquidity. Rationally, prepayment should only be done if it represents a higher value than an alternative investment. The relationship between the interest rate on the mortgage,  $r$ , and the interest gained on an alternative investment,  $r_a$ , determines if prepayment is rational. If the interest rate on the mortgage is lower than the interest gained on an alternative investment ( $r < r_a$ ), then the mortgagor should invest in alternative investments instead of prepaying and vice versa.

But even if a mortgagor *should* prepay his mortgage, there are many other factors that determine whether or not he *will*: Beliefs about future mortgage interest rates (for example will higher rates in the future make prepayment more beneficial), liquidity situation in the future and the need for a "safety net" (buffer), and risk appetite/aversion. Personal preferences and utility are also very important factors that will affect perceived value of prepayment. Research in behavioral economics has also shown that perceived value depends on the circumstances (Pindyck & Rubinfeld, 2009). For example, for a person that is used to high housing prices in their home town, relocating to a new city with lower housing prices can make this person perceive prices in the new city as bargains. The persons housing price reference point determines his behavior and the same could be the case in terms of prepayments and interest rates. If the person perceived the interest rates as being too high, he would probably be more likely to prepay. Another effect from behavior economics is loss

aversion. This is an effect observed from experiments where persons tend to put more value on a loss of an asset than they put on acquiring the same asset (Pindyck & Rubinfeld, 2009). Related to housing, this effect could be observed with people that won't sell a house that has lost value to buy a new one because they would want to avoid realizing the loss on their original home.

## 4.11 Credit score and mortgage underwriting

Before issuing a loan, the lender needs to assess the borrower's ability to repay the loan or creditworthiness. This process is called mortgage underwriting. When lending money there is always the chance that the borrower can become delinquent and/or default on the loan, inflicting losses on the lender. This credit risk must be evaluated for every single borrower. Many lenders rely solely on their own assessment of the creditworthiness of a potential borrower. To do this they collect relevant documentation that shows income, taxes, and assets. Usually this data, together with demographic information (household size, children, cars, etc...) is entered into a computer that uses a statistical model to determine the likelihood of a delinquency. However, some lenders might use specialized analysts that do this part of the underwriting manually.

Lenders might want to check with other sources for details on creditworthiness as reference when doing the underwriting of a mortgage loan. A central source of data is the credit reporting agencies/bureaus. These agencies collect information about individuals and historical data concerning their financial status and credit history. Lenders can purchase reports on individuals from these bureaus when assessing the creditworthiness of a borrower.

The agencies also use statistical models to calculate a credit score or rating. In the U.S. there are three national credit reporting agencies (CRAs); *Equifax*, *Experian*, and *TransUnion*. They use a model developed by the *Fair Isaac Corporation* (FICO) to compute the "FICO Score". Using their own collected data they generate a weighted score in the range of 300 to 850 based on payment history (35%), amounts owed (30%), length of credit history (15%), new credit (10%), and types of credit used (10%) (Fair Isaac Corporation, 2012). A higher score means better credit / lower credit risk. A corresponding rating is given based on the score, ranging from "Bad" to "Great". Because the CRAs use their own data on file when computing the score, the resulting score can be different between them.

The most frequently used providers of credit information in Norway are *Lindorff* and *Bisnode Norge AS* (through its subsidiaries *AAA Soliditet AS* and *Dun & Bradstreet Norway AS*). Together with reports that contain data about credit and payment history, they also use their own statistical models to create an individual credit rating. For example will Bisnode create a score from 1 to 10 with a higher score indicating better creditworthiness (Bisnode Norge AS, 2012), but details about the models are not readily available to researchers.



## 5. Funding and Securitization

In order to provide loans a lender must be in possession of excess money in some form. A bank can obtain money (funding) for lending in two ways; either by obtaining deposits from customers, or by getting loans in the capital market. The capital market is a marketplace where investors can lend money to companies or governments. Investors here are typically large institutions like hedge funds, pension funds, and sovereign wealth funds, but also investment banks and very wealthy individuals invest in this market. Traditionally deposits were a major source of funding (and still is for smaller banks), but in the last part of the 1900's, international capital markets became the largest source. Funding in the capital markets can happen by either issuing debt bonds or by securitization. It is common for issuers of both types to provide collateral. In securitization, assets are commonly pooled together into a separate entity which then issues bonds with those assets as collateral. Debt bonds issued by banks are often senior of other loans that the banks have issued, meaning that they have priority to the assets of the bank should it default. They are as such referred to as "senior debt". As a large diversified customer with a solid capital base, banks can get loans with better interest for their funding than individual consumers can. This make them able to obtain funding in the market and then issue loans to their customers at a higher interest, earning money from the interest difference (interest margin). Funding in the capital markets is considered long term funding. Another financial market is the money market. This is a market where financial institutions provide short term (up to 1 year) loans to each other. A central part of this market is the interbank markets where banks provide even shorter term loans to other banks (often just day, termed "overnight" loans). This market helps banks manage liquidity and ensures that banks are able to fund their daily operation.

In 1970 the *Government National Mortgage Association* (Ginnie Mae) introduced mortgage pass-through securities (Bodie, et al., 2009). By pooling together mortgages into a relatively homogenous pool, new securities that represent a share of the pool could be sold in the financial market. This process is called *Securitization*. The buyers of these securities then receive a share of the principal and interest payments that mortgagors make to the pool. This was an important innovation as it made the issuing of loans in a local area no longer dependant on the local banks financial solidity. By selling loans to issuers of these securities, the local bank could dramatically increase its lending activities. Securitization allows financial institutions to create pools of mortgages and sell securities that are tailored to

investors needs, allowing for a very large investor base and consequently easy access to funding for the banks. These *Mortgage-Backed Securities* (MBS) can both be unbundled into *interest-only* securities (both fixed rates and adjustable/variable rates) and *principal-only* securities, or they can be bundled into complex securities. Typical investors in MBS are investment banks, hedge funds, and pension funds.

A Mortgage-Backed Security can both be an ownership claim to a pool of mortgages or an obligation that is secured by such a pool (Bodie, et al., 2009). The issuer of these securities are not the actual banks that originated a loan, but a specialized company, government agency, or entity whose core business is buying mortgages and creating, marketing, and selling securities. Banks can then receive funding by originating mortgages and selling them for a profit to these securitization entities. These entities earn a profit from selling shares of the pool. Because the size of these entities enables them to purchase mortgages from a larger geographical area than that a local bank can service, they receive diversification benefits which in turn increase profits.

In Norway, banks have received funding through loans from other banks and investors. MBS wasn't introduced in Norway until 2007 when a lengthy study and review by the Norwegian government resulted in legislation for *covered bonds*. Covered bonds are bonds that have priority on the assets of the issuer in the event of a default. Today, the Norwegian issuers of covered bonds are specialized residential mortgage credit companies (named "Boligkreditt") that are subsidiaries of the major banks. The banks will transfer their loans to the books of the subsidiary which in turn issue covered bonds on the asset pool. Cash gained from the selling of these bonds are then transferred to the banks which in turn can use this to fund new loans. The covered bonds are subject to a special legislative and regulatory regime which includes both independent and governmental inspectors and limits on LTV (Finance Norway, 2012). Credit risk is reduced by pooling residential mortgages into a separate entity and issuing covered bonds on this pool. This means that funding through covered bonds is cheaper (lower interest) than loans from investors and/or banks. This in turn reduces interest rates for mortgagors that have LTVs below the limit (75%) and increases banks competitiveness (by enabling lower margins).

Prior to the 2007 crisis the banks' deposits were not sufficient to fuel their growing business and they increased reliance on securitization, covered bonds and interbank markets (European Central Bank, 2009). The ECB reports that deposits have become the

preferred source of funding in the EU after the crisis, but that is mainly as a result of liquidity becoming a scarce good. Once liquidity returns other sources of funding again, they will most likely increase in popularity.

## 6. Norwegian legislation and regulation of mortgages

### 6.1 The Norwegian law structure and The Financial Supervisory Authority of Norway

Norwegian law is usually viewed as a part of the civil law tradition, but it is influenced by both common law and by traditional Roman law (La Porta, et al., 2008). The distinction of the civil law tradition to common law is that in civil law only the legislature may create laws. That means that in a civil law system, precedent is not binding to any court even if the precedent was established by a higher court. The court will on a case-by-case basis evaluate the case at hand against the legislation and can consult other decisions by itself or other courts, but there is no formal precedent that must be followed. In practice decisions by the Norwegian Supreme Court carry substantial weight in the interpretation of legislation by other courts, especially for its own future decisions.

The Norwegian Law is divided into a superseding hierarchy that from the top contains the Constitution (“*Grunnloven*”), the acts or statutes (the laws issued by the legislators), followed by regulations and finally circulars (guidelines and interpretations). Legislation is passed, amended and repealed by the members of the Norwegian Parliament, the *Storting*. The laws can delegate regulatory authority to the government ministries or agencies which can pass, amend, repeal regulations, and/or further delegate regulatory authority. Guidelines and commentaries are the individual regulatory authorities’ interpretation of how a law or regulation should be interpreted (Bertnes, 2012).

The main body of legislation concerning banks, insurance companies, and other financial institutions in Norway are The Commercial Bank Act (Forretningsbankloven, 1961), The Mutual Savings Bank Act (Sparebankloven, 1961), The Insurance Act (Forsikringsvirksomhetsloven, 2005), and The Financial Institutions Act (Finansieringsvirksomhetsloven, 1988). These laws delegate regulatory authority to The Ministry of Finance which in turn has delegated some regulatory and all supervisory

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authority to the Financial Supervisory Authority of Norway (FSA)<sup>1</sup>. In addition to these laws are the more specific laws concerning contracts within the business area of financial institutions. These are The Financial Contract Act (Finansavtaleloven, 1999) and The Insurance Contract Act (Forsikringsavtaleloven, 1989) which defines how financial institutions should offer, negotiate and sign contracts. Especially important in the area of mortgages is chapter 3 of the Financial Contract Act that concerns credit contracts.

The FSA's mission is stated in The Financial Supervisory Authority Law (Finanstilsynsloven, 1956), §3, first paragraph, as follows:

*“The Financial Supervisory Authority shall ensure that the institutions it supervises operate in an appropriate and proper manner in accordance with law and provisions issued pursuant to legislation and with the intentions underlying the establishment of the institution, its purpose and articles of association.”*

In order to achieve its mission, the FSA supervise with the whole financial sector in Norway. It strives to promote financial stability and orderly market conditions and ensure that financial contracts are honored. It also deals with problems that may arise in the financial sector. An important premise for the FSA is that Norwegian businesses must have the same competitive conditions as those enjoyed by institutions in other European Economic Area member states<sup>2</sup> (The Financial Supervisory Authority of Norway, 2009). As such the FSA conduct supervision of financial institutions prioritizing financial stability, functioning markets, and macroeconomic monitoring and supervision.

On November 24<sup>th</sup> 2010 the FSA announced its new strategy for the period 2010-2014. In this strategy the FSA states that they will put extra emphasis on investor and consumer protection and that the requirements and inspection activities are well known (The Financial Supervisory Authority of Norway, 2010). In March of 2012 the Ministry of Finance issued a Consultation (“Høring”) where it proposed an amendment to the mission statement in §3. This amendment specifies that the FSA should also ensure consumers rights and interests. The amendment suggested reads:

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<sup>1</sup> A complete list of delegated authority from the Ministry of Finance to the FSA can be found at: <http://www.regjeringen.no/en/dep/fin/Selected-topics/finansmarkedene/delegert-myndighet-fra-finansdepartement.html?id=435119>

<sup>2</sup> The European Union, Iceland, Liechtenstein and Norway.

*“(above text) ..., including to ensure that the institutions under its supervision take into account the interests and rights of the consumers in their business.”*

The proposed amendment was in general received positively and the Ministry of Finance is currently in the phase of reviewing all the comments. It can be regarded as very likely that the amendment will be passed soon. Even though many of the Consultation respondents<sup>3</sup> stated that the FSA in last couple of years have ensured consumers interests and rights, this will now state this practice as law. This is clear indication that the FSA will put more emphasis on consumer protection in the future than it has in the past.

## 6.2 License to operate

Any financial institution that seeks to operate in Norway must obtain a license to do so. This license is granted by the FSA through an application process where the applicant provides all documentation that must be regarded as relevant for the processing of the application. Based on a number of criteria defined in The Financial Institutions Act §3-3 (Finansieringsvirksomhetsloven, 1988). Amongst these requirements are minimum capital requirements (5 million euro) and that all persons in leading positions must be regarded as suitable for the positions (have the necessary experience, etc.).

An important factor in the application is that the applicant must specify what products they wish to market. A license is only valid for the product categories it was issued for. For insurance companies the Regulation on separation of types of insurance as the basis of granting licenses (Forskrift om inndeling i forsikringsklasser, 1995) gives a thorough list of possible insurance types. Once license is given, the FSA will conduct regular supervisory activities on the operations of the institution. The FSA can withdraw the license if the institution is in gross violation or repeated violation of any law and regulation for the area in which they operate.

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<sup>3</sup> A list with links to the Consultation respondents letters can be found at: <http://www.regjeringen.no/en/dep/fin/Documents-and-publications/hoeringer/hoeringsdok/2012/horing---lovfestet-forbrukersvar-for-f/hoeringsuttalelser.html?id=676491>

## 6.3 Mortgage loans

As mentioned above mortgage loans are a form of credit contract and are subject the legislation in chapter 3 of the Financial Contract Act (Finansavtaleloven, 1999). Much of the contents in this law concerns consumer protection and specifies what the lender must do. The most noteworthy paragraphs here are: §46a that define the lenders obligation to disclose information before signing any contract, §46b on the lenders obligation to evaluate the creditworthiness of the consumer, §46c on the lenders obligation to give the consumer thorough explanations, and §47 on the lenders obligation to discourage the consumer to loan money if he believes it could be difficult for the borrower to repay the loan.

Additionally, §53 and §54 concerns prepayments. §53 state that the borrower has the right to prepay his loan either partially or completely before maturity of the loan. It also states that the lender may not charge a fee from the consumer if this happens. The only exception were a lender can charge a fee is, according to §54, if the consumer prepays on a fixed-rate loan when the current variable rate is lower than the fixed rate. If the variable rate is higher than the fixed rate on the loan, the bank must compensate the consumer unless the contract specifies something else and the consumer is made aware of that before signing. §9 of the Regulation on credit contracts (Forskrift om kredittavtaler, 2010) provides further details on how the variable rate is calculated and how the consumer is to be made aware if he won't be compensated in an high variable rate/low fixed rate – situation.

Chapter 3 of the Regulation on credit contracts (Forskrift om kredittavtaler, 2010) contains details on how the effective annual rate is to be computed and which costs are to be included. The regulation also includes an appendix that contains a detailed description on the standardized European data-form on consumer credit which specifies what information needs to be included in a credit contract.

## 6.4 Loan-to-Value ratio

Through its supervisory role the FSA attempts to achieve financial stability and conducts macroeconomic monitoring. An important role in that regard is to evaluate consumer credit and especially mortgages. Prior to 2011 (in March 2010) the FSA had issued regulation requiring financial institutions to conduct special assessment on the prudence of the loans they issued when the LTV was higher than 90%. In March 2011 the FSA, worried by the

increase in consumer debt during a time with historically low interest rates, issued a Circular letter with new Guidelines for prudent lending practices for mortgages (The Financial Supervisory Authority of Norway, 2011). The objective with the guidelines was to “...*help with solidity in the financial institutions, promote financial stability and ensure consumer protection.*”

These guidelines specifies that the LTV should normally not be higher than 85% and that in the calculation of the LTV, all loans mortgaged on the property is to be included in the calculation of the LTV. In addition, banks must use an interest rate that is 5 percent higher than the rate on the loan it issues in its evaluation of the creditworthiness of the borrower. As such it requires the lender to do a thorough assessment of the liquidity-situation of the borrower in each case.

Deviation from the 85% LTV requirement can only be done if there exists other forms of collateral, guarantees, or if a special assessment of the prudence of the loan has been done. The FSA does not set any requirements for this assessment, but suggests that the Board of Directors of the financial institution should draft the requirements for such an assessment. This means that it is up to the individual institution to decide if they want to adhere to the guidelines, but all deviations are to be identified and reported to the FSA. The FSA will then, through its mandate as supervisory authority, evaluate the practices and decide if the bank must change them. Failure to adhere to such an order could result in loss of license to operate as described above.

## 6.5 Guarantees

The Insurance Act (Forsikringsvirksomhetsloven, 2005)<sup>4</sup> and Regulation on separation of insurance types as the basis of granting licenses (Forskrift om inndeling i forsikringsklasser, 1995)<sup>5</sup> allows for mortgage insurance issued by insurance companies that have obtained a license to do so by the FSA. The Law divides the insurance market into three types of insurance classes: Casualty insurance, life insurance, and credit insurance. Insurance companies may only operate within its own class.

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<sup>4</sup> §1-2, §1-3

<sup>5</sup> §2-14



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Mortgage guarantees are a variant of credit insurance, where the credit given to a mortgagor is insured by a third party with the mortgagee (the lender) as a beneficiary. According to the Regulation on what insurance that should be counted as credit insurance (Forskrift om kredittforsikringer, 1989)<sup>6</sup> credit insurance “... includes losses that arise as a consequence of a policyholder’s delinquency of his economic obligations to a third party”. It also states that “residual value insurance” is determined as being credit insurance. Official Norwegian Report 52 of 1983 (NOU , 1983) p. 168 gives further specifications on credit insurance. It divides them into two categories depending on who pays the premium and who the beneficiary is. Insurances where the premium is paid by the beneficiary are regarded as *Credit Insurance* (classification 15), and insurances where the beneficiary is a third party is called *Guarantee Insurance* or *Suretyship* (classification 14).

Because of the separation of insurance types (Forskrift om inndeling i forsikringsklasser, 1995), only insurance companies that have a license as a credit insurance company may sell mortgage insurance. According to the FSA’s registry<sup>7</sup> the companies that have a license to operate as credit insurance companies in Norway are: *Atradius Credit Insurance*, *Euler Hermes Kredittforsikring* and *GIEK Kredittforsikring*. Atradius and Euler Hermes are both subsidiaries of foreign insurance companies and GIEK is the only Norwegian company. However, GIEK only handles insurance for export businesses and are as such not a company that can offer domestic mortgage insurance. This means that the only possible companies that can market mortgage insurance in Norway are Atradius and Euler Hermes, but they do not offer this currently. This means mortgage insurance is not readily available for consumers in the Norwegian market. To remedy this, the Norwegian mortgage-market relies on individuals guaranteeing for mortgagors. This can be family or friends of the mortgagor that will personally guarantee for the loan.

The Norwegian government has a housing program for people with special needs. At the cornerstone of this program is the bank “*Husbanken*” (The Norwegian State Housing Bank, NSHB). The NSHB offers housing support, grants and loans to these groups based on the current regulation<sup>8</sup>. It can give loans with a secondary priority to the collateral in the event

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<sup>6</sup> “Regulation on what insurance that should be counted as credit insurance”, §1-b and §3

<sup>7</sup> The registry is available at: <http://www.finanstilsynet.no/en/Secondary-menu/Finanstilsynet-registry/>

<sup>8</sup> Legislation, regulation and guidelines for the NSHB can be found at: <http://www.husbanken.no/om-husbanken/forskrifter/>

of default. This is however no insurance and the mortgagor still need to fulfill his obligations to both banks in the event of default. The NSHB is as such not assuming the position as a guarantor of the loan, but rather facilitating a purchase of a home with a high LTV. It is also important to note that the private banks in these cases needs to perform a special assessment of the prudence of the loans given to a customer should the LTV be above 85% (The Financial Supervisory Authority of Norway, 2011) as described earlier.

## 6.6 Foreclosure

The Norwegian foreclosure process is regulated by The Judicial Enforcement Act (Tvangsfullbyrdelsesloven, 1992). A lender may file for foreclosure as early as 14 days after notice of foreclosure was sent to the mortgagor. The notice may be sent on the day of the maturity of the first missed payment at the earliest<sup>9</sup>. When filing for a foreclosure the lender petitions for the district court (“*Tingretten*”) to issue a judicial enforcement on the borrower through the bailiff (“*Namsmannen*”). The bailiff will evaluate the claim and supporting documentation. The borrower has one month to respond to the bailiff and add documentation or to challenge the claim. If it is established that the claim is valid and the documentation is sufficient, the claim will be sent to the district court for a decision. Once the court has made a judgment the bailiff will handle the foreclosure sale of the property. If the sale covers the loan and the costs of the foreclosure process, the residual is paid out to the borrower. Norwegian mortgage loans are recourse, which means that in the event that the sale does not cover the loan and the costs, the borrower is personally liable for the residual. Through a district court judgment the bailiff can seize and sell the borrowers other assets to make the lender “whole”. Once a foreclosure sale has been made, there is no redemption period and the mortgagor must vacate the property.

Foreclosure can only be executed if the borrower is unable to make his mortgage payments. If the mortgagor is just unwilling to pay, but has the funds or liquid assets available to do so, the district court will issue a judgment to have the bailiff seize the funds to pay the lender. §5-12 of the Judicial Enforcement Act (Tvangsfullbyrdelsesloven, 1992) also states that foreclosure may be postponed by the bailiff or the district court, if the reason for the missed

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<sup>9</sup> §4-18

payments was unemployment, sickness or other “special events”. Such postponement generally requires an agreement of repayment of the missed payments. If subsequent payments are missed, the postponement is revoked.

## 6.7 Recourse

Mortgage loans in Norway are full recourse. This means that in the event that a foreclosure doesn't raise enough money, the district court can force the sale of other assets to cover for the loan (and foreclosure costs). In some situations the borrower does not have any other assets that can be sold or any money to pay the residual claim. The district court can in these instances order the employer of the borrower to withhold parts of the salary of the borrower and pay that amount to the lender in accordance to a repayment plan.

If the residual is substantial, the borrower can file for a settlement in accordance with The Debt Settlement Act(Gjeldsordningsloven, 1992). A debt settlement is an agreement between the debtor and the creditor(s) that specifies a new repayment plan and can be thought of as a type of bankruptcy. This plan can contain clauses where claims and/or rates are reduced, payment periods are changed, maturity is extended, etc. The law gives borrower the choice of either entering a volunteer settlement with the lender (after bargaining with the lender and coming to an agreement, or he can file for a forced debt settlement. In the volunteer settlement, the debtor must reveal all information he has about known creditors to the bailiff. The bailiff will contact all known creditors and send them documentation for the claims that the debtor has reported. The bailiff also issues a public announcement that a debt settlement has been filed for and that all creditors must report their claims within three weeks. According to §4-1, once the time is up the debtor must draft a proposal for repayment.

The law lists specifically what this proposal must and should contain<sup>10</sup>. Of special note is §4-3 that states that the debtor may only keep as much of his income as is considered by the court as needed for subsistence of himself and those he has a legal duty to provide for. Also §4-6 that requires the sale of all assets that are not necessary to sustain a minimum standard of living and §4-8 that determines how the funds should be divided between the creditors. When the debtor has proposed his plan, the bailiff will make sure that it is in accordance

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<sup>10</sup> All paragraphs from §4-2 to §4-10

with the law and then send it to the creditors for approval. The creditors have three weeks to approve or disapprove the plan. §4-12 require that all the creditors must approve of the plan to make it valid. A creditor that doesn't approve must disclose the reason to this.

If not all the creditors agree to the volunteer debt settlement, the debtor can file for a forced debt settlement and send his proposal for a repayment plan. In a forced debt settlement the bailiff will send the case directly to the district court that will determine if the payment plan is in accordance with the law. In addition to the requirements for a volunteer debt settlement, a forced debt settlement has some special features listed in §5-2. This is that a forced debt settlement limited in time. A typical time period is 5 years and can only be more than 8 years in very special cases, and can never be longer than 10 years. Once this period is over, the debtor is completely free of all debt and creditors lose any residual claim.

## 7. U.S. legislation and regulation of mortgages

### 7.1 The U.S. law structure and the regulation authorities

U.S. law is a part of the common law tradition and it can be divided into three major classes of law: Constitutional law, statutory law, and common law (judge-made) (Friedman, 2000). Statutes are laws implemented by the legislators at the federal, state or local level. Common law is the interpretation of the Constitution and the statutory law. The law structure is a superseding hierarchy with the U.S. Constitution at the top, followed by federal statutes, state constitutions, state statutes and local municipalities' statutes. The jurisdiction between the federal court system and the state court system is specifically spelled out in the respective constitutions (United States Courts, n.d.). Since every state is regarded as a separate sovereignty, a state is only bound by what the U.S. Constitution specifically says should be handled at the federal level. This means that in many issues that are not covered by the Constitution, there could potentially be an entirely different state law for each state<sup>11</sup>.

In a common law system, precedent is of high importance. It is through the many decisions that judges have made over the years that the actual law is formed. A court at any level (district court, court of appeals, Supreme Court) is bound by its former decisions and by all other courts at a higher level. This means that analysis of common law can be very complex as it not only includes the actual laws and statutes, but also the previous decisions that courts have made over time.

Issues that arise from securities and banking regulation are under the jurisdiction of the federal courts, but cases under contract law and real property is within the jurisdiction of the state courts. However, any state court may interpret the U.S. Constitution and federal statutes in a case brought to it under a state law. If the case is brought to a state supreme court, the U.S. Supreme court may review it and decide if the interpretation of the federal law is correct (United States Courts, n.d.). Because of the legislative structure of the U.S. law, banks are subject to both federal and state regulation.

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<sup>11</sup> An example of this is foreclosure law

Unlike Norway that has centralized much of its financial regulatory authority with the Ministry of Finance and the FSA, the banking regulatory authority in the U.S. is highly fragmented. Covering all the legislation and regulation in every state is too much for this study. At the federal level, the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank, 2010), Title III, removed some agencies and divided regulatory and supervisory authority to the Office of the Comptroller of the Currency (OCC), the Federal Reserve, and the Federal Deposit Insurance Corporation (FDIC). Each one of these regulates and supervises their specific parts of the banking industry.

The OCC is responsible for licensing (chartering), regulating, and supervising national banks, thrifts and savings institutions, including branches and agencies of foreign banks in the U.S. The Federal Reserve has the primary supervisory authority for state banks (licensed by the state government) that have elected to become a member of the Federal Reserve System (state member banks). Those institutions that are not state member banks or saving associations are supervised by the FDIC. All state banks are also supervised by their state government. In addition, all holding companies of banks and thrifts (companies that own or control a bank/thrift) are supervised by the Federal Reserve. Finally credit unions (not-for-profit financial institutions owned by its members/customers) are regulated and supervised by the National Credit Union Administration (NCUA).

To promote consistency in the supervision of the banking industry the Federal Financial Institutions Examination Council (FFIEC) was created by Congress in 1978. The FFIEC consists of members from all the aforementioned agencies and functions as an arena all regulatory authorities can exchange views on regulatory issues and supervisory practices. The FFIEC issues uniform standards for examination of institutions and coordinates the supervision of financial institutions.

Dodd-Frank (Dodd-Frank, 2010) also established the Consumer Financial Protection Bureau (CFPB). With the CFPB, consumer financial protection authority is mostly consolidated in one place. The goal of the CFPB is to: *"watching out for American consumers in the market for consumer financial products and services"*. This means that the CFPB monitors all financial institutions in the U.S. in regard to consumer protection.

## 7.2 License to operate

There are three authorities that can charter (issue a license) a new financial institution. Each authority that has the authority to charter a financial institution within its regulatory realm can do so if an applicant submits an application together with supporting documentation. The requirements to obtain a license vary between the different types of institution (credit union, thrift, or commercial bank). The federal acts that regulate chartering/membership of new institutions are the Federal Credit Union Act of 1934 for credit unions, the Federal Reserve Act of 1913 for state banks that elects to become members and all holding companies of banks and thrifts, and the Federal Deposit Insurance Act of 1950 for state chartered institutions that are a part of the Federal Deposit Insurance. All these laws give the regulatory authority to issue licenses and revoke these in case of repeated failures to adhere to the laws it supervise under.

In addition to the federal agencies that supervise financial institutions the individual states also have regulatory authorities that supervise the industry that operate within their state. Any organization that falls in under one of the categories of the federal laws will be subject to that regulation and then to any special state laws after that (state laws that are not in violation with federal). Reciting all the relevant laws in that regard here would be too complex and is omitted here, but can be found by visiting the individual state's website<sup>12</sup>.

## 7.3 Mortgage loans

Because of the fragmented authority of financial institutions the complete picture of the laws concerning financial contracts such as mortgage loans is complex. At the top level, the federal laws of the *U.S. Code Title 12: Banks and Banking* contain most of the laws concerning mortgages. In addition to those come the consumer protection laws under *U.S. Code Title 15, Chapter 41: Consumer Credit Protection*. The regulations at the federal level are contained within the Code of Federal Regulations, Title 12: *Banks and Banking*. Title 12 of both the U.S. Code and the Code of Federal Regulation (CFR) is divided into different chapters concerning each authority (the OCC, the Federal Reserve, the FDIC, etc). Within

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<sup>12</sup> Two examples: New York Department of Financial Services <http://www.dfs.ny.gov/> and Nevada Division of Financial Institutions <http://www.fid.state.nv.us/>

each chapter are the regulations concerning businesses that operate under that regulatory authority. With the recent implementation of Dodd-Frank the most important regulation in regard to mortgage lending is Chapter X with the CFPB as authority. Chapter X is extensive and contains regulation that is meant to level some of the information asymmetry that exists between a professional lender and a consumer. It also contains regulation to enable the authorities to monitor and supervise the mortgage industry. Examples here are §1003 *Home Mortgage Disclosure* which requires lenders to make reports on the mortgages they issue to the public, §1007 and §1008 *S.A.F.E. Mortgage Licensing* which requires mortgage originators to certify that their employees are trained in mortgage regulations, §1014 *Mortgage Acts and Practices - Advertising* which sets standards for how mortgages can be marketed, §1024 *Real Estate Settlement Procedure Act* which sets requirements how the mortgage settlement and issuing of loans should be, and maybe the most important, the §1026 *Truth in Lending* which requires the lender to disclose terms and costs in order to promote the informed use of consumer credit.

## 7.4 Loan-to-Value ratio

To ensure prudent underwriting standards and sound lending practices the different authorities have established joint guidelines for lending called *Interagency Guidelines for Real Estate Lending Policies*<sup>13</sup>. These policies are related to the FDIC *Real Estate Lending Standards*<sup>14</sup> that mandates that the bank itself (national banks under the authority of the FDIC) must create their own lending policies and limit based on a small set of requirements, one of them being that “*The lending policies must*

Loan category	Loan-to-value limit (percent)
Raw land .....	65
Land development .....	75
Construction:	
Commercial, multifamily, <sup>1</sup> and other non-residential .....	80
1- to 4-family residential .....	85
Improved property .....	85
Owner-occupied 1- to 4-family and home equity	( <sup>2</sup> )

<sup>1</sup> Multifamily construction includes condominiums and co-operatives.

<sup>2</sup> A loan-to-value limit has not been established for permanent mortgage or home equity loans on owner-occupied, 1- to 4-family residential property. However, for any such loan with a loan-to-value ratio that equals or exceeds 90 percent at origination, an institution should require appropriate credit enhancement in the form of either mortgage insurance or readily marketable collateral.

*Table 1: LTV limits from Interagency Guidelines (12 CFR Appendix C to Part 208)*

<sup>13</sup> 12 CFR Appendix C to Part 208 (57 FR 62896, 62900, Dec. 31, 1992; 58 FR 4460, Jan. 14, 1993; 63 FR 58621, Nov. 2, 1998)

<sup>14</sup> 12 CFR Part 34 (57 FR 62889, Dec. 31, 1992)



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*establish:...Prudent underwriting standards, including loan-to-value limits, that are clear and measurable*". The Interagency Guidelines' LTV limits can be seen in Table 1. Note that these limits are supervisory limits which mean that the loans can still be originated but the authorities will do supervisory reviewing and take action if necessary. In the table we can see that there is no limit imposed on "*Owner-occupied 1- to 4-family and home equity*", meaning that 100% LTV is possible for mortgagors that live in the home themselves. The only requirement is that if the LTV is higher than 90% mortgage insurance is required. An important exception in the guidelines is that mortgage loans that are guaranteed by the U.S. government and its agencies or the state governments are exempt from these LTV requirements as long as the guarantee covers the residual LTV above the said limits.

## 7.5 Guarantees

United States legislation<sup>15</sup> allows individuals to purchase this guarantee as a service from public companies, called Private Mortgage Insurance (PMI). The PMI will cover the loss a lender would get in the event of a default (after the collateral has been sold). A typical mortgage insurance covers the lender for losses in an amount equal to the first 20-30% of the lost mortgage principal (Jaffee, 2006). The PMI only covers losses that arise from the credit risk of the borrower. This means that all other factors that could potentially cause mortgage defaults and damage to the collateral is not covered (wind, fire, floods, etc). Separate insurance must be obtained to cover such risks.

The insurance premium on the PMI is normally paid by the mortgagor every month as a percentage of the outstanding principal. The insurance remains in place until the property is sold or the mortgage is refinanced. Once the LTV is below 80% the mortgagor can, under the Homeowners Protection Act, cancel the insurance. If the LTV is below 78% then the insurance firm must cancel the policy (The Federal Reserve, 2007).

The U.S. Federal Government also provides mortgage insurance through The Federal Housing Administration (FHA) and The Veterans Administration (VA). The FHA offer

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<sup>15</sup> As a result of the McCarran-Ferguson Act, insurance in the U.S. is regulated by the individual States and can therefore vary from state to state. The National Association of Insurance Commissioners (NAIC) has written "model code" for laws that most States have adopted (Jaffee, 2006).

mortgage insurance on loans that fall in under one of its programs<sup>16</sup> and that are made by FHA-approved lenders in the U.S. Approval is given to lenders that complete an online application meeting a set of requirements. In order to be approved lenders must fulfill a set of requirements<sup>17</sup> and send an application to the FHA for approval. The VA offers mortgage insurance for Veterans, Servicemembers, reservists and certain unmarried surviving spouses (U.S. Department of Veterans Affairs, 2012). Just as with private mortgage insurance, these Federal programs will cover the potential loss the lender could incur in the event of a default.

## 7.6 Foreclosure and recourse

The individual States in the U.S. have their own foreclosure laws<sup>18</sup>, but the general procedure (U.S. Department of Housing and Urban Development, n.d.) is that borrowers can miss 3 monthly payments before the lender can send a letter demanding payment of the amount delinquent. This “Notice to Accelerate” letter gives the borrower 30 days to pay or to find some agreement with the lender. If this is not done, the lender can start foreclosure proceedings. However, it is common for lenders to contact the borrowers even after the first missed payment to investigate why payment have been missed. Subsequent missed payments will also be investigated. The timeframe of the legal foreclosure proceedings and following sale of the property varies by state.

After a foreclosure sale there is a redemption period in which the homeowner may repossess the property. Timeline and procedures regarding redemption varies by state, but in general the homeowner may pay the outstanding loan balance and all costs incurred during the foreclosure process (U.S. Department of Housing and Urban Development, n.d.).

In the event that a foreclosure sale will not cover the loan the laws is different in each state in regard to what options the lender has to pursue the borrower. Ghent & Kudlyak (2011) found in their study of foreclosure law in the U.S. that most states allow for a deficiency judgment. There are some restrictions on judgments in some states making them both time-

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<sup>16</sup> There are a large number of different programs depending on the property, the borrower and/or the type of loan. A complete list on Single Family FHA Insured Mortgage Programs can be found at: [http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/housing/sfh/insured](http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/insured)

<sup>17</sup> A list of requirements can be found at: <http://portal.hud.gov/hudportal/documents/huddoc?id=ReqApproval-LEAP.pdf>

<sup>18</sup> Details on the different state laws can be found at: <http://www.foreclosurelaw.org/>

consuming and costly to obtain for the lender. An example of such a restriction is that in some states the lender must deduct the fair market value from the loan and not the actual foreclosure sale price. The fair market value is set by an independent appraiser or a jury. In addition there are some states that allow the borrower to contest the appraisal of the property, which in turn increases the time and cost for the lender. This means that lenders in practice have less recourse in states that require a lengthy judicial foreclosure process than those states where the process is quicker (Ghent & Kudlyak, 2011). In addition to this the states that allow deficiency judgments also allow borrowers to declare bankruptcy and by that remove remaining deficiency judgments. A few states have forbidden deficiency judgments on homes or purchase mortgages and in others the process is so burdensome that lenders are better off not pursuing for a deficiency judgment. Ghent & Kudlyak (2011) classified 11 states as being effectively non-recourse: Alaska, Arizona, California, Iowa, Minnesota, Montana, North Carolina (purchase mortgages), North Dakota, Oregon, Washington, and Wisconsin.

To illustrate the effects of restrictions on deficiency judgments like mentioned above one can consider the following made up general example: A person falls behind on his mortgage payments and is after repeated attempts unable to agree with the bank on a new repayment plan. The residual loan plus interest is \$200,000. The bank decides it has no other option than to foreclose the property. The bank's attorney will schedule a foreclosure sale through the Sheriff or Public Trustee's Sale. The sale goes through but because it was a foreclosure sale the property wasn't as popular as similar properties in the area so it sold for only \$150,000. The bank is left with a residual claim of \$50,000 plus accrued interest and foreclosure fees and costs. The bank's attorney can file for a deficiency judgment for the remainder, but because this was a foreclosure sale, the independent appraiser or jury will value the property. They don't have to consider the reduced value through foreclosure sale and can value the property at fair market value resulting in a valuation of the property to \$210,000. This results in the bank not getting a deficiency judgment because their claim is not deemed to be "fair" since the sale price was lower than the actual value.

It is clear from this example that the costs and risks for the lender pursuing a deficiency judgment after a foreclosure in most cases are higher than the benefit. This results in banks preferring only to do the foreclosure sale and write-off any remainder.

## **8. The Norwegian bank crisis of 1987-1993 and its consequences**

Norway liberalized the credit markets during the 1980s at the same time as the central bank key policy rate was set by the government to a rate that was below the market rate (Grytten & Hunnes, 2010). This created the incentive to invest instead of saving, as the real interest rate after tax was negative. This resulted in a large credit boom that was greater than in other countries during the 1980s boom. Because of the worldwide boom the oil prices were at record levels and Norway had a considerable inflow of capital. This resulted in eagerness by the banks to provide credit and credit granted rose by 164% from 1983 to 1987 and house prices increased by 211% from 1980 to 1987 (Grytten & Hunnes, 2010). As the oil price plummeted from around 40 USD per barrel in December 1985 to less than 9 USD per barrel in 1986, the Norwegian foreign trade turned into massive deficits. The government tightened its fiscal and monetary policy. On October 19<sup>th</sup> 1987 (Black Monday) the Dow Jones Industrial Average Index fell 22.6% resulting in a 20% reduction of the Oslo Stock Exchange Index the following day (Grytten & Hunnes, 2010).

Because of the liberalization of the credit markets, Norwegian banks had expanded rapidly in both Norway and internationally. The easy credit supply meant that the banks went abroad to find new customers, which made them find customers abroad that native banks wouldn't do business with. When the economic cycle turned in 1987 these customers caused severe losses for the Norwegian banks. In addition to this, as the government tightened its policies, unemployment rose as businesses struggled in the economic downturn. This forced people out of their homes and caused nominal house prices to decline by more than 30% from 1987-1992. This was the worst real estate crash ever recorded in Norway and happened as GDP stagnated and investments declined by 21.7% (Grytten & Hunnes, 2010). Commercial banks lost 5.8% on loans in 1991 and mutual savings banks lost 2.7% in 1989, culminating in the state taking over control over the three largest commercial banks by 1993.

The result of the bank crisis had devastating effects for many private households. After years with easy access to credit and negative real interest after tax households had taken substantial debt. When the government tightened spending and policies many people lost their jobs and could no longer pay on their mortgages. After the 1987 crisis Norwegian media started to use the word "debt-slave" about people that had more debt than assets and

were forced to spend most of their earnings to repay their debts. The situation of being so amassed in debt that it seems virtually impossible to get out of it created the word reflecting the hopelessness of the situation that these people got into. A search done on the website *Retriever.no* (ATEKST) that index most of Norwegian national newspapers and parts of the local newspapers show that the word was not used prior to 1987 and was only 3 in 1990. This changed in 1991 as the use increased to 75, followed by 86 in 1992, before gradually subsiding to a level between 31 and 58 until 1999. Stories in the newspapers at this time told stories about people that lost their jobs and everything they owned as a result, and still had debts to pay. The Debt Settlement Act (Gjeldsordningsloven, 1992) as explained in Chapter 6.7 was introduced in 1992 as response to remedy the situation for these people.

It should be mentioned that the media coverage at the time might have caused inflation in the beliefs about how many actually could be classified as a “debt-slave”. There is no clear definition which means anything from someone whose mortgage is underwater, to someone who has actually sold all assets and has nothing but debt left. An article in the Oslo newspaper *Aftenposten Morgen* on September 19<sup>th</sup> 1991 (Hegna, 1991) sheds some lights into this as the Institute of social research (“Institutt for sosialforskning”) reported that only 1% of Norwegian households had an underwater mortgage and were forced to sell their home to acquire something cheaper. At the same time 10% of people that rented apartments had old mortgage debt. It was their estimate that the number of debt-slaves was 20,000 while the Norwegian Savings Banks Association operated with numbers of 60,000. (According to Statistics Norway (SSB) the number of households in Norway was 1.75 million in 1990).

## 9. Mortgages and private debt problems in recent years

Debt problems have been the focus of the media in recent years as well. Even before the 2007 crisis was there focus on debt-slaves. As shown in Figure 1 (blue line) the term was used after the 1992 crash in housing prices and then declined a bit until it started to rise around 2000. After this there has been a sharp almost consistent rise in the usage of the word. Nominal average housing prices for the “average” home of 100 square meters have been added to the figure as the red line. This shows how the increase in focus in the media somewhat correlates to the increase in prices.

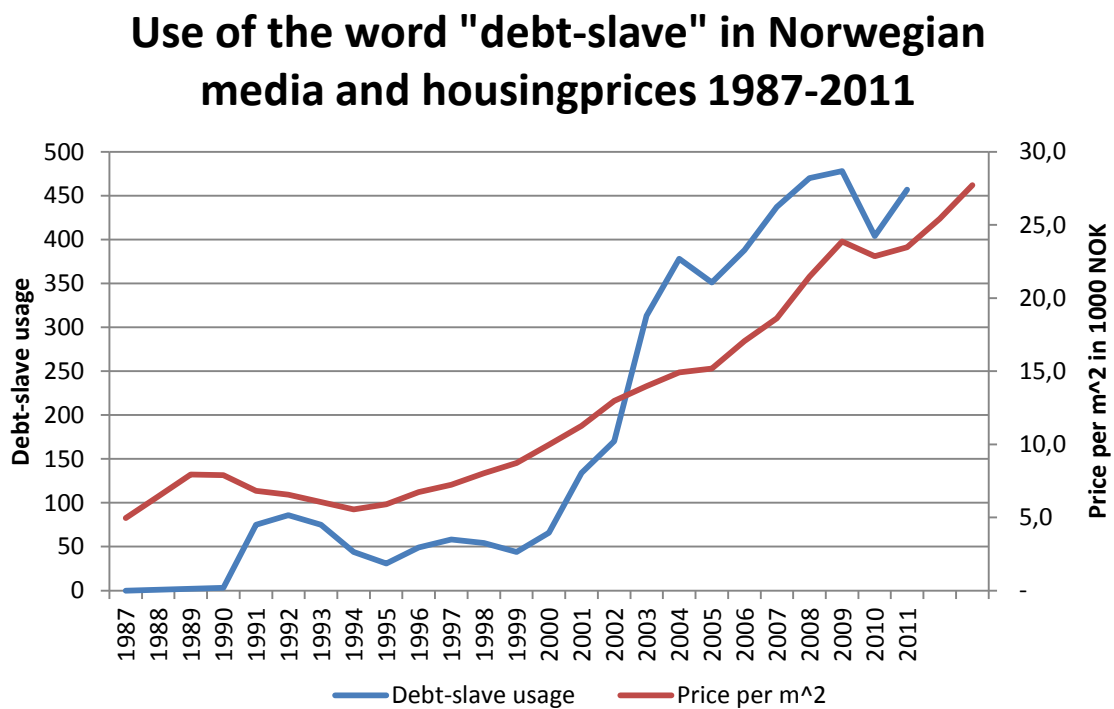


Figure 1: Use of the word debt-slave and housing prices (Retriever, 2012)(Norwegian Association of Real Estate Agents, 2012)

It's important to note here that the use of a term in the media is not the same as saying there are more people that are struggling with debt. But what the figure could indicate is that the media seem to be aware of the rising housing prices and are writing articles that concern a type of situation that could be a reality if the housing prices turn. Do note however that in 1991 the term starts to get used just as the prices fall as one would expect. The introduction of the Debt Settlement Act (Gjeldsordningsloven, 1992) in 1992 could explain why the term

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is reduced in usage even as prices continue to fall into 1994. It should be noted here that the increase in the use of the word could also be related to the fact that there have been an increase in publications over time (most importantly the 1265 websites that Retriever covers). This means that some of the increase we see in Figure 1 could be the result of this. However, checking for this in Retriever by limiting the search to exclude websites still shows the same general graphical formations as the blue line in Figure 1, and the peak around 2009 is significantly higher than the 2004 peak, which again is significantly higher than 1992 peak.

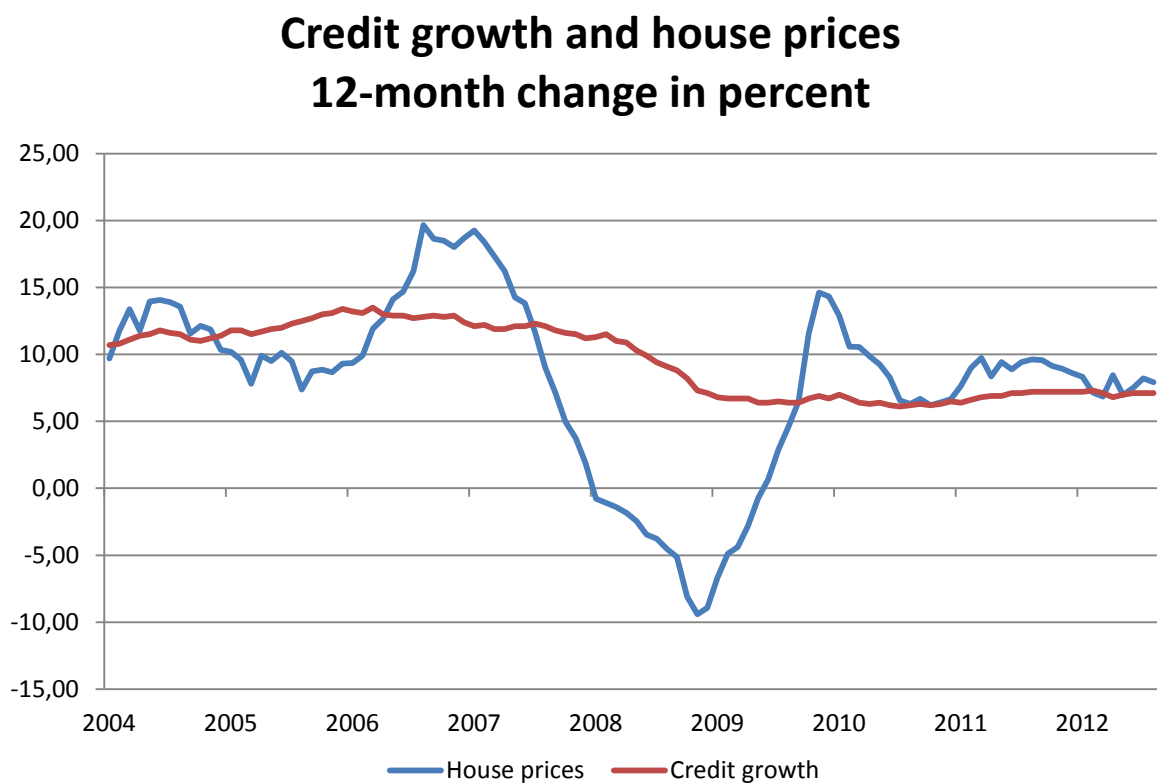
Figure 1 also shows us how the nominal prices since 1998 have more than doubled, and that during a period in which the Consumer Price Index has risen by 31.2% (Statistics Norway, 2012). The reasons for this discrepancy are probably many. First of all the unemployment rate has been in this period have been historically low with around an average of 3.5%. In addition the increases in wages and cheap imports from low-cost countries of consumer products like clothes and electronics have made it possible for people to spend more money on housing than before. Immigration and general population increases have also been attributed to being the reason for the increase. Even though economic downturns in the Western World reduce demand for oil, the Arab Spring and uncertainty in the Middle East has kept oil-prices at a fairly high level further “fueling” the economic growth in Norway. Norges Bank (2012) writes in their *Monetary Policy Report 3 – 12*:

*“There is vigorous activity in the construction industry and in oil-related industries, while other manufacturing segments are feeling the impact of weak external demand and high costs. Household consumption is growing at a moderate pace and saving has increased further, while debt and house prices are still rising faster than income”*

The underlined text is important here because it illustrates the positivity that arises during a boom. Kindleberger and Aliber (2011) call this the mania phase of a foreboding financial crisis. Such a mania in an asset class (like real estate or stocks) leads to further increases in prices and a euphoria which in turn induces investors and lenders to be more optimistic and contribute further. During a mania it is often proclaimed from someone that the traditional business cycles have become obsolete (Kindleberger & Aliber, 2011) and this is taken for granted by other people. In the current case of Norway this seems not to be the case. The increasing real estate prices in Norway have gotten much attention from most of the

authorities and academia. Especially after the real estate crash in the U.S. in 2007. The Norwegian central bank (Norges Bank) has included statistics and comments in their publications and expressed worry. Increased prices and debt was also a reason for the change of LTV policy that the FSA implemented in 2011 (The Financial Supervisory Authority of Norway, 2011).

But even though the authorities and academia are aware of the possibility of a bust of a housing bubble, ordinary mortgagors might not think that it will happen since prices keep rising. This is illustrated in Figure 2 that shows how the credit growth has been relatively correlated to housing prices except for a downturn in 2008-2009 when the financial crisis reduced funding for banks and caused some investors to sell property. Even though we are not near the levels of 2007, the increases are still steadily above 7% per year (equals to doubling every 10 years).



*Figure 2: Credit growth and house prices, 12-month change in percent (Norges Bank, 2012)*

Looking further into debt burdens, Figure 3 shows how the steady increase from Figure 2 looks when accumulated. Even though the figure shows a small reduction in 2009, Norges Bank expects the number to increase when the data for 2010 is ready. But even so, this



figure shows that near 11% of households have a debt burden as a percentage of disposable income<sup>19</sup> that is above 500%. Looking at the bank crisis in 1987-1992, there was around 7% at most that had more than 500% debt to disposable income, suggesting that an economic downturn of similar magnitude today would have devastating effects for a large group of people. This group of people is subject to high risks if the interest rates should increase. The statistics released by Norges Bank does not reflect how many of these have fixed rate loans and how many are variable rate. As of June 2012, only 9.8% of loans in Norway are fixed rate. The rest are marked adjusted rates and most of these are contracts with rates that can be changed by the lender with six week notice. Even though many of the debtors that have debts above 500% of disposable income may have fixed rate contracts, it is still reasonable to believe that a majority of these have a variable rate.

### Household debt burden

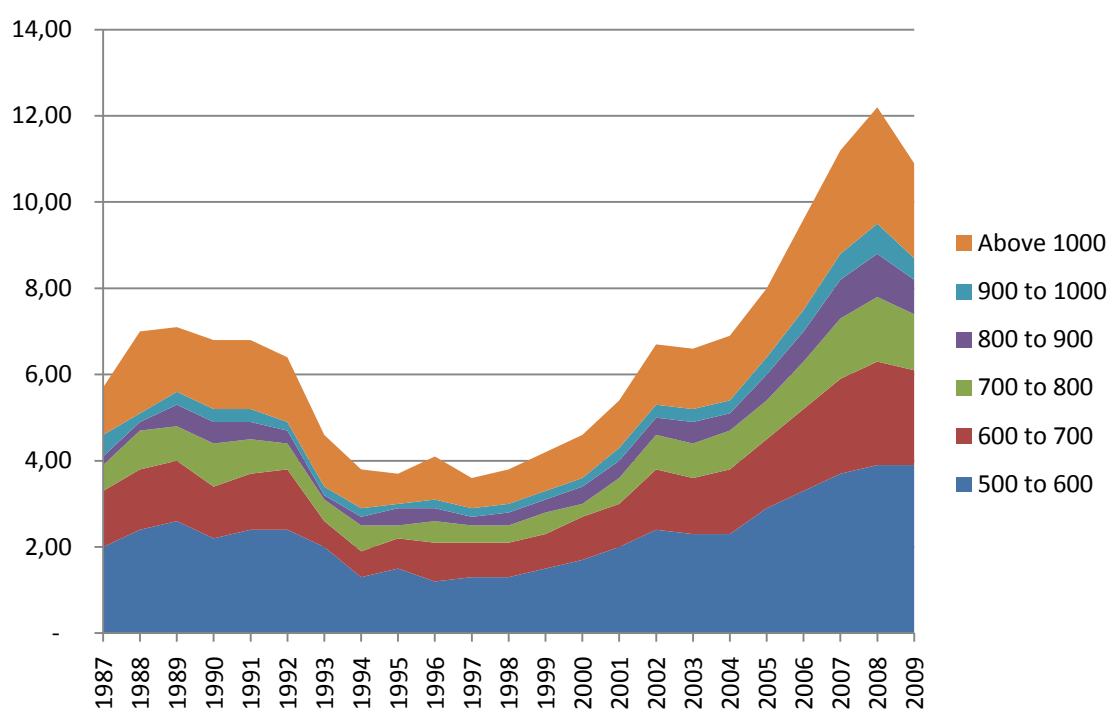


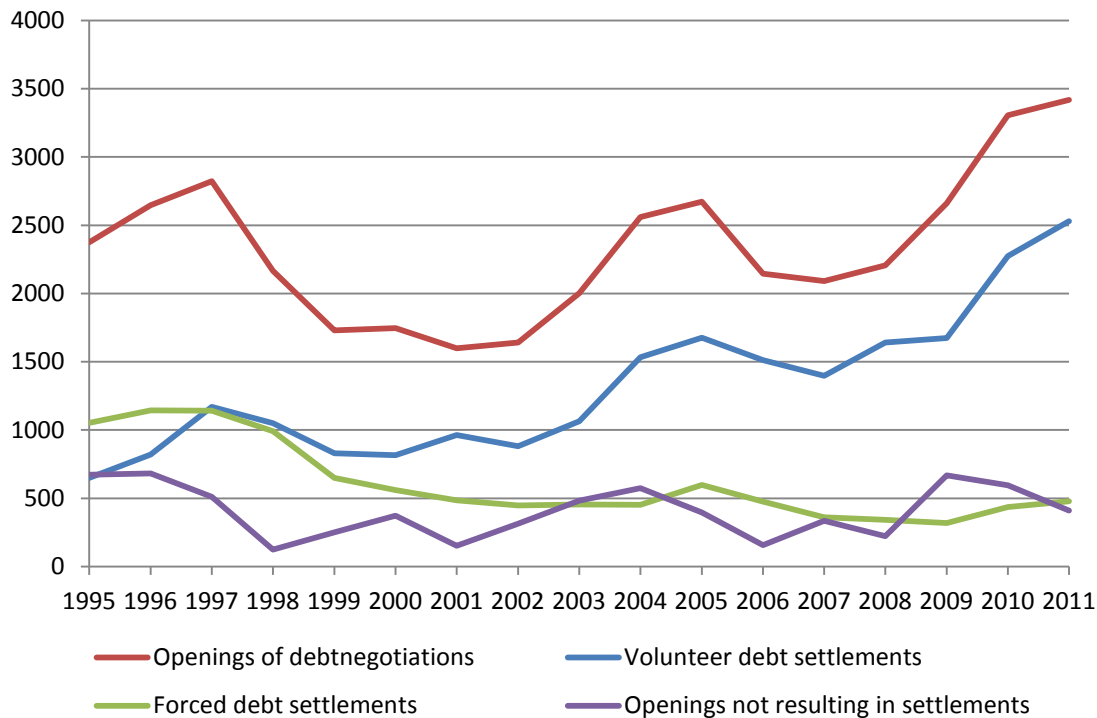
Figure 3: Households excluding self-employed with a debt burden above 500 percent of disposable income. 1987-2009. (Norges Bank, 2012)

Given the increase in debt burden it is natural to think that there would be an increase in delinquencies as well. Statistics on delinquencies are was not collected until March 2008 and

<sup>19</sup> Disposable income = Sum of (salaries, income from business, capital income, welfare and social support, and other sources of income) less the sum of (taxes, capital expenditures and other expenditures)

they also include both businesses and individuals, making them unfit for this study. But we do have statistics from 1995 until today on openings of debt settlement negotiations.

## Debt settlements and negotiations 1995-2011



*Figure 4: Openings and results of debt negotiations in accordance with the Debt Settlements Act (Brønnøysundsregistrene)*

Figure 4 is based on information acquired by email from Brønnøysundsregistrene (the official registry service of Norway) and shows how debt settlements have increased over time<sup>20</sup>. The increase in debt settlements had three spikes; in 1997, 2005 and 2011. It would be reasonable to think that debt settlements are lagging the economical cycles, which could explain that these spikes are around 3 years after a “bust” or end of a crisis (1987-1992 bank crisis, 2001 dot com bubble, and 2007-2008 financial crash). We can also see that when the debt levels are reduced Figure 3, the number of openings increases. This is expected and indicates that debt settlements are closely related to the cases of very high debt-to-income

<sup>20</sup> This statistic was only registered after 1995, which is unfortunately means we don't pick up on all the results since 1992 (when the law came). Regrettably statistics on civil administration of justice for deficiency judgments started to be recorded after March 1<sup>st</sup> 2008 so no prior statistics are available. They also include both businesses and individuals, making them unfit for this study.

ratios. Figure 4 shows that we are now at an all time high in debt settlement openings, even though the economy is still booming, which may be a source of concern. It should be noted that these numbers are all aggregate for the total debt and is not exclusively housing debt. The actual number of cases that concern mortgages is probably much lower because mortgages in Norway are recourse and mortgagors are incentivized to prioritize repayment of mortgage debt before other debts (assuming findings from Ghent and Kudlyak (2011) holds true for Norway as well).

## 10. Lending practices in Norway and the U.S.

Lending practices can, and often do, vary from lender to lender. Assuming that lenders also operate in accordance with legislation and regulation in the area they operate, the practices can vary between countries. In evaluating the legislation and regulation between nations it is therefore important to research the actual lending practices. This is not only to find out if lenders operate in accordance to regulation, but more importantly to find out how practices have developed as a result of the regulatory environment. Because most lenders have the primary objective of maximizing profit (except for maybe credit unions and some mutual savings banks), they will adapt to this environment accordingly. The extreme case in this case could be how some mortgage originators issued loans prior to the financial crisis. Because all the credit risk was moved from the originator and into mortgage-backed securities, and originators got a fee for every loan, they had the incentive to be more lenient on their underwriting standards with catastrophic results. Though it has been established that some of these originators engaged in downright fraud, it shows that businesses adapt and often in ways that the regulators didn't intend or foresee.

### 10.1 Practices and views from the United States

Tompkins Trust Company has seen profit margins on mortgages shrink over time, mostly because of regulatory requirements but also due to competition. An example of regulatory impact is the revision of the "Good Faith Estimate" from the Real Estate Settlements Procedure Act (12 CFR §1024) that requires TTC to give an estimate on closing cost and hold those costs for ten days while the customer can go out and shop for lower fees at competitors. This represent an additional risk for the lender as most of the costs are set by third parties and can be changed by those third parties without notice to TTC. This and other regulation has made residential mortgages more of a commodity now than in the past and customers has benefited.

Currently, with the low interest rates in the market, TTC only offer fixed rate and 3- and 5-year adjustable rate mortgages. With 30 year fixed rate loans as low as 4%<sup>21</sup> it doesn't make

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<sup>21</sup> Was 4% at the time of the interview. Current rate is 3.5% as of November 13th 2012.

financial sense for TTC to offer 1-year adjustable rates because they would have to be at 1.5%-2% to get people interested in them. Currently 80% of the new mortgage applications are fixed rate.

TTC does everything when it comes to issuing new mortgages. They solicit customers, originate loans, process them, gather documentation, underwrite, close, and service loans. It would be extremely unusual for them to sell loans to another lender and they do not securitize the loans. This has been the philosophy since before the 2008 crash. This conservative nature together with high underwriting standards made sure TTC “survived” the crisis with very moderate delinquencies. Today, prior to issuing loans they hire an independent NY State appraiser to look at the property and then use this report together with documentation of the loan applicant’s income, proof of assets and bank statements for the last three months. Credit reports are also collected as an extra reference. Regulation also ensures the appraiser complete independence both from the bank and from the realtor.

In regard to downpayment (equity requirements) the common practice is less than 20% downpayment (more than 80% LTV), but in those cases there would need to be some level of insurance or guarantee. Guarantees or insurance must be from FHA insurance, VA guarantee, or a PMI (Private Mortgage Insurance) coverage of the top 25% equity with the costs of these items being paid by the borrower. In the cases with PMI the max LTV is 95%, with FHA the max is 97%, and VA allows 100% in most cases.

Even though New York is classified as a recourse state (Ghent & Kudlyak, 2011) TTCs typical practice is that they will sue and foreclose under the terms of the mortgage to take the property and sell it. Only in rare cases will they sue the individual. The philosophy is that by the time borrowers get to foreclosure they have no or limited assets, so suing serves no purpose, it rather increases the cost for them as a lender.

When explained about the Norwegian legal system and asked to contrast it to the U.S. system, Mr. May said Norwegian banks had an advantage to U.S. banks. The main reason is that the many consumer protection laws in the U.S are so strong that in reality the bank can only go after either the property or the individual, but not both. Since the property might be the only asset worth something in the event someone is delinquent, it makes more sense to get that. In that regard it would seem like the Norwegian system offers an advantage to the lender, but disadvantages the borrower.

## 10.2 Practices and views from Norway

### 10.2.1 Banks

All the banks that were interviewed reported that they originate loans for mortgages all over Norway, but primarily within the geographical region where the branch offices are located. Mortgagors with loans that live in another part of the country, usually have a history with the bank and can have relocated to a new place but keeping their old bank. All banks report that the older generations of customers are less likely to change banks, but young adults have less loyalty. Banks feel that the competition is fierce and that they to adapt constantly in order to be competitive, even for the banks in the more rural areas (but loyalty seems higher for these than in the cities). This has put pressure on the margins for all banks, but they don't see any immediate likelihood of any consolidations in the future. Further pressures on the margins will rather result operational optimization than consolidation. Banks also mention that increasing share-of-wallet is of high importance to increase profits.

Banks in Norway report that the global financial crisis has had little or no effect on their operation (at the branch level). If anything, the recession following the financial crisis have lowered interest rates to such levels that private investments and purchases have increased, thus increasing demand for loans. The prudent lending practices guidelines released in 2011 by the FSA (The Financial Supervisory Authority of Norway, 2011) was mentioned by all banks as having a devastating effect on lending to young adults. Several banks told examples of graduating students with high salaries (above 500,000 NOK (roughly 83,000 USD)) that had no equity that had no chance of getting a mortgage. Without help from parents that could either supply equity or guarantee for the loan it was impossible for the banks to give loans.

When evaluating a mortgage application, banks review tax reports, pay stubs (proof of income), appraisals and/or the prospectus for the property and also credit rating reports. In addition, the agreed purchase price for the property is checked in a national register called *Eiendomsverdi*. This system keeps track of all sales and appraisals all over Norway. Containing statistical models for valuation, bank officers can enter information into *Eiendomsverdi* about any property and get an assessment of the market value of the property. The reliability is highly dependent on how many sales there have been in the area. In the rural areas with few sales *Eiendomsverdi* might not produce any meaningful result. In

those cases the banks usually require an appraisal. The appraisal is ordered and paid for by the customer (in those cases) and the appraiser is independent of the bank.

One problem with evaluating applications that all banks report is that there is no national credit register. This means that only loans that have been registered with collateral can be discovered when checking the credit report of the applicant. The problem with that is that the customer could have gotten a credit card or an unsecured loan in another bank or financial institution. If the customer willfully withhold this information from the bank, the bank could risk issuing a loan to someone that otherwise wouldn't get it.

All banks had computerized systems that automatically underwrote and approved the loans if they fulfilled strict criteria. Special cases had to be evaluated by hand. In one bank the practice was to call in the customer for a meeting and help the customer with creating a liquidity-budget. This bank reported that sitting together with the customer and creating a budget gave both the bank and the customer a better understanding about the creditworthiness of the customer. In contrast, one of the other banks let the customer apply through a website which sends the application to a loan officer. The loan officer would then check the numbers and documentation and after a phone call to the customer, approve or decline the application. All banks reported that in the approval process they checked to see if the customer could handle an interest increase of 5% (this is required in the FSA guidelines).

There were some differences between the banks in eagerness to approve loans. Some claimed they were very conservative, while others explained that increasing market share was important and that they thus used more time with the applications to see if they could create a structure that would be within the guidelines of the FSA. One of the market share oriented banks explained that they encouraged customers that had high salaries but low equity to visit the local welfare-office (“NAV”) to apply for special loans there that could serve as extra security for the bank loan (second priority on collateral). This bank was not asked to explain this further so it is unknown if the bank was aware that the FSA guidelines require that the sum of all loans with the property as collateral are to be included when calculating the LTV. It could be that the bank asked customers to get unsecured loans from NAV, but this is unknown. The same bank pointed out that the FSA allows for a *special prudence assessment* (“særskilt forsvarlighetsvurdering”) and gave the impression that they often used that as a tool in order to give loans to customers that otherwise wouldn't get one. None of the banks revealed what their assessment included.

One of the more conservative banks brought up NAV and said they wondered how the employees at these offices could be qualified to issue loans. Especially since the bank officers have a requirement to be certified as a financial advisor while NAV-employees have no such requirement. This bank said it tried to avoid or discourage their customers from getting a mortgage in such a situation, both in discussions and on paper (a paper they required customers to sign). This was included in together with documentation that they had suggested that the customer sign health insurance as well.

Covered bonds were also mentioned by all banks as a cheap way of funding that they used extensively. The branch offices reported that they got guidelines from corporate headquarters that all loans should, if possible, be structured in such a way that they qualified for being transferred to a mortgage credit company. A few of the banks claimed that this had to be done if they wanted to stay competitive and offer low interest rates to their customers. A typical structuring of loans was to issue two loans, one that was the equivalent of 75% LTV, which they transferred to the credit company, and one loan that had the top 10% (up to a max of 85%) that they kept on the banks books. The loan that was kept in the bank got higher interest and as such, one of the banks said that they frequently set the loan that goes to the credit company as interest-only. This means that the customer would first repay the loan that the bank has itself and then start payments of the principal in the first loan.

Banks also report that consumers prioritize housing debt before other debts, focusing on repaying that first. One officer said that it was important to remember that in the rural areas, defaulting on a mortgage and having a subsequent foreclosure was associated with great stigma. This officer claimed that customers in rural areas therefore had a higher incentive to repay their debts than customers in the larger cities. Banks also report that they attempt to help struggling customers to repay by restructuring the debt, or give extensions. All banks reported they did this, but there were differences in how long they would let a customer be delinquent. This varied from 45 days to 60 days. The more conservative banks were more willing to give extensions than those that pursued market shares. Also, officers in rural areas said that they often knew the customer personally, which had the effect that they were more willing to help the customer with restructuring. If customers show little ability and/or willingness to repay, all banks transferred the debt collection process to the company *Lindorff*. This company specializes in collecting debt and once loans were sent there, the bank officers had no further involvement with the case or customer. Only two of the banks told about foreclosures that they had experienced in the past (once instance each). In general



it was said that foreclosures and losses was very small, but no one could tell any details about the process as it is done by Lindorff. When asked about debt settlements, only one bank officer had experience with that. This officer explained that even though the law doesn't specifically set levels of debt needed to get a settlement, the courts are in practice very strict and the debt must be at least 400 to 500 thousand NOK (66 to 83 thousand USD) in order to get it.

When explained about the U.S. mortgage system, banks first reaction was generally surprise. Their impression was that it seemed bad and that it would hurt consumers because banks would limit credit more than today. Most officers declared that they would be more reluctant to give loans if they had non-recourse. Follow up questions comparing this situation to commercial loans where the credit risk lies more with the bank and suggesting a higher interest (better payment for risk), made bank officers more positive to the prospect of non-recourse. Not in any way welcoming such a system in Norway, the officers agreed that it makes sense to move more credit risk (and thus more responsibility for good underwriting) over to the bank. In light of the differences one of the bank officers said that it would seem that the current Norwegian system doesn't fit very well into our idea of Norway as a social democratic society.

Officers in banks were positive when told about PMI. No one had heard about such insurances previously and they often misinterpreted it, thinking it was the same as a traditional Norwegian debt-insurance (debts are paid if policyholder becomes severely ill or disabled). Such insurance would reduce credit risk for the bank which in turn meant that they would probably issue loans to customers with PMI. If they had non-recourse together with PMI they claimed they would be more positive than without PMI, but still negative to the fact that they had non-recourse. It was evident that the officers didn't value PMI as high as they did the benefit of having recourse.

### **10.2.2 Mortgage Credit Companies (Covered Bonds issuers)**

The mortgage credit companies note that funding through covered bonds have increased in importance and that investors have shown great interest in the securities. All companies report that their "typical investor" are large scale institutional investors like insurance companies and pension funds that have a mandated duty to invest in high rated securities (DNB Boligkreditt said that many of their current investors were institutional investors from

Germany). The financial crisis was felt early on as the Norwegian covered bonds market was launched in 2007. There was no liquidity in the market and little trust, which meant that the covered bonds couldn't be sold in the market. At that time the Norwegian government along with the Norwegian central bank (Norges Bank) launched an "exchange-program" in which the credit companies could trade their covered bonds with the government and receive Norwegian government bonds in return which they could use as collateral for loans. Once the liquidity crisis ended around 2008 the market for covered bonds increased dramatically and there has been high demand for Norwegian covered bonds both in Norway and internationally. All companies noted that DNB Boligkreditt most likely have better liquidity in their covered bonds than the other companies can achieve. This is due to its size and ability to issue bonds that are large enough in size to be picked up by the largest international funds and investors.

None of the companies believed that there is any reason to think that European investors would pull out of Norwegian covered bonds if the Euro-crisis was "solved" and faith restored in other securities in Europe. It was rather a common belief that it would be the securities with restored faith that would experience a price increase (lower interest rates) and demand for Norwegian covered bonds would remain strong because of the strong reputation that these securities have. For national government bonds it was said that faith was restored and the price increased beyond Norwegian covered bonds, investors would prefer Norwegian covered bonds because they represent a high rating at a slightly higher interest than government bonds.

The regulatory environment for covered bonds in Norway is very strict. There are specific rules on which loans can be moved from the banks and over to the credit companies for securitization. Current regulation stipulates that the LTV on residential housing can't exceed 75% and for holiday-homes it must be below 60%. No loans can be put into the credit company if the LTV is higher. In addition to monitoring by an independent investigator appointed by the FSA quarterly, all credit companies must monitor LTV regularly. This is done by checking the value of all properties within the credit company against official values from a national value register (Eiendomsverdi.no). There are different practices here for every credit company. Some check these values every three months while others do these checks monthly. LTVs that are higher than the limits will still be within the cover pool, but is to be valued as having zero value. As the total cover pool must always be higher than the net present value of all issued covered bonds. If the cover pool is at risk of falling below the

value of the covered bonds, extra collateral must be placed in the cover pool. This collateral can either be new loans that have LTVs below 75%, or it can be especially liquid and secure bonds or bank deposits (other collateral than loans can maximally be 20% of the cover pool).

All credit companies report that they perform stress-tests in which they simulate different scenarios in which the property values are dramatically reduced and liquidity in the market dries up. The specific parameters for these tests was not discussed, but it was reported that the price reduction on housing varied from 20% to 50% and that it in some cases increased delinquencies was added to the test as well. Only one of the credit companies ran tests on a 50% drop and most did tests on 30%. The tests were run either monthly or quarterly. According to the law, the FSA supervises the liquidity- and risk-management (interest rate risk and foreign currency exchange risk), but in the interviews this wasn't specifically mentioned.

Credit companies clearly stated that the prices obtained for covered bonds was directly related to the fact that Norwegian mortgages were recourse loans. Without recourse there is higher risk, which in turn would reduce prices on the bonds (higher interest). How strong the effect of recourse is was hard to tell for anyone, but consensus was that there was an effect. When presented with the U.S. system and especially the concept of mortgage insurance, credit companies were negative and believed it would still leave credit risk with the banks and credit companies, thus reducing prices on covered bonds.

Companies also report that being under the scrutiny of the rating-agencies has a strong disciplinary effect on their operation and they feel it is an added security for investors. The rating agencies also follow the market through all the credit companies and can easily spot differences which in turn mean that they will question these.

## 11. Implications of Norwegian legislation

Norwegian and U.S. legislation are for the most part similar. Many of the laws and regulation are put in place for consumer protection are similar in that they attempt to address the problem of information asymmetry between the bank (a financial professional actor) and the consumer (a financial amateur). A typical example of the similarities is that both countries require that the lender disclose all relevant information before signing mortgage contracts. Within this rule lies the obligation to calculate the effective annual rate or APR and disclose this to the customer, not only when offering a loan, but also in marketing loans. However, there are some substantial differences as well. The most important one is recourse. Norwegian mortgages are full recourse, which means the bank can sue the mortgagor for further payments even after a foreclosure sale. In the U.S. there are 11 states (Ghent & Kudlyak, 2011) that can be classified as non-recourse, and even more that in practice seems to be non-recourse. In the interview with the U.S. bank, it was said that the bank wouldn't normally sue the individual because of high costs. These costs were both pecuniary and non-pecuniary. An important non-pecuniary cost was reputation. A lender that sues even after foreclosure will get a negative reputation and lose customers, as they will flock to lenders that are more lenient.

In the interviews with the Norwegian banks, reputation and other non-pecuniary costs was not mentioned at all when talking about how banks react to delinquencies. Banks would just send the loan to the debt collector and not think more of it. Though they all tried their best to get a private arrangement with the debtor, once they felt there was no hope, they sent it away. Not evaluating the non-pecuniary costs could be a result of culture. In Norway it is a tradition that you "must repay your debt" and this lies deep with people. Not paying debt is regarded as not taking responsibility for your actions, and forcing other people to pay for your "crimes". This was especially noticeable in the interviews when the U.S. non-recourse loans were brought up in interviews. All banks reacted negatively and said that wasn't a good system. Many also laid blame to non-recourse as the trigger for the financial crisis. This implies that the understanding of the triggers of the U.S. crisis is misunderstood, or at least is based on lack of information. It's been well established that the reason for the crisis was that originators of mortgages were, through securitization, able to transfer all credit risk to a third party and through that was incentivized to originate as many loans as possible, fueled by Wall Street's demand for mortgage backed securities (McLean & Nocera, 2010).

Non-recourse basically had no real effect when the customers that got loans (sub-prime) had no assets and very low income. Some originators were engaged in what can only be described as fraud, when selling mortgages to investors that they knew would default.

At the heart of the matter of recourse is the point that you “repay what you owe”. A point that seems both reasonable and just. But it can be questioned if it is necessarily so when the reasons for the default are things outside the individuals control? Most Norwegians like to think that their society is what they call a social democratic society in which people take care of each other. If someone becomes ill, the public health system will treat them practically free of charge as health care is paid for by tax payers. Students enjoy free education and extra benefits are given to students with low income and wealth to make sure education is available to everyone. In this picture recourse doesn’t harmonize well with the idea that Norwegians take care of each other. It is only if you own absolutely nothing and don’t have a job with a salary that is high enough to provide for yourself or your family that the welfare office (NAV) will offer financial support. And even then, money will be transferred to the creditors.

A common way to handle the problem of things outside our control is insurance. In explaining insurance Friedman (2000) use the notion of moving money from a situation today in which you have a lot of money, to a future where you have little. The premium includes the dollars you move plus the cost and profits for the insurance company to do so. Private Mortgage Insurance (PMI) and FHA and VA guarantees are some of the tools that the U.S. has used to protect banks from losses. The government guarantees from FHA and VA ensure that low-income households and veterans are able to purchase a home, and PMI ensures that everyone who doesn’t qualify for the government program still can get a mortgage with a low downpayment by paying a bit more in interest.

The Norwegian regulation of insurance allows for mortgage insurance, but it can only be offered by credit insurance companies. There are only two such companies today that operate in Norway and they only sell credit insurance to businesses. The reason why credit insurance companies doesn’t sell PMI in Norway might be that there is simply no demand for the product. Because insurance represents an added cost on a mortgage that already might be seen as “expensive” by the mortgagors, they can think that they can’t afford it. The actual cost of the insurance must be weighed against a possible reduction in mortgage interest rate. Lenders in Norway that issue loans with high LTV require higher interest rates

for such loans today. If they had insurance, it would most likely lower the interest rate on the loan correspondingly. With a large insurance company that has better diversification possibilities than the lender, it is actually possible that we could have a scenario in which the cost of the PMI was less than the cost of added rates without it. But this also depends on other factors like the administrative cost plus profit for the insurance company.

The view of insurance as only an added cost with small benefits could mean that Norwegian mortgagors are most likely not aware of the risk that they are taking. Lenders in the U.S. require PMI or guarantees for LTVs above 80%, which means that the lender as a professional is able to identify the risk. A contrasting view here is that since the mortgagor is paying for the PMI, it is in the lender's interest to require it because the lender takes on less risk at no cost (the mortgagor pays for the insurance). But if this perspective was true (that this is just beneficial and the lender requires it because he can), it would imply that some lenders could drop this requirement in order to be more competitive. Since most lenders require PMI, it is an indication that PMI is worth the extra cost. In light of this it is natural to assume that Norwegian mortgagors are either not fully aware of the credit risk that they take on, or that they didn't know that PMI existed (they haven't heard about it and don't ask for it from insurance companies).

Financial products are often hard for laymen to understand. They are often complex and require education and experience to fully understand. For regular people that don't have this competency it is natural for them to rely on banks and insurance companies to give advice on financial issues. This is well known and the Norwegian financial sector has recognized this and has introduced a certification called *Authorized Financial Advisor*. The information asymmetry in regard to financial contracts means that the consumer relies on the lender offering good advice. From the interviews it was clear that none of the Norwegian bank officers had heard about mortgage insurance. This can be explained simply with the fact that loan officers in the branch offices are just the front-end people that sell the financial products that the headquarters have decided on.

The psychological phenomenon of unrealistic optimism is the bias that people expect bad things to only happen to other people and not themselves (Weinstein, 1980). Thorough research into this phenomenon over many years has found that people's views on the risk they are exposed to, is biased. People will either say that they are less at risk than the average person, rather than saying that they are at greater risk. It is reasonable to think that this

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phenomenon also plays a part in regard to mortgages. They might think that their jobs are secure, that interest rates will be low, that their house will be more worth in the future, or that they will always stay healthy. It is the obligation of the bank to make sure that they do an assessment of the mortgage applicant's ability to repay the loan. Some of these issues are things that the bank can't foresee either, but it would be expected that a loan officer of a financial institution would know more about macroeconomics and have a clearer view of "where the World is going" than the average borrower. Norwegian lending officers do some of this assessment today by checking if the borrower can handle an interest increase of 5%, but this is only a FSA mandated guideline. Macroeconomic effects on individuals weren't brought forward as something the lenders assessed when giving loans. Some banks did mention that they sometimes assessed the employer of the mortgagor and said it could sometimes be easier to give a loan to someone that had a public position (employees of the Norwegian State have strong job protection). This indicates that a lender, knowing that recourse is always available, will give loans to anyone that fulfill the regular requirements and that have a relatively secure job.

With recourse, the credit risk for the bank is substantially lower in Norway than in the U.S., because more of the credit risk is moved to the borrower in Norway. For the bank this makes sense. It reduces risk for the bank which in turn can offer lower rates. However, for the individual this might not be such a good deal. Because there is no insurance available, mortgagors are stuck with this risk and can at best remove some by acquiring health insurance in case they get ill. But it still leaves many situations that could cause default on the mortgage. If the credit risk was with the bank, it has not only credit insurance and securitization available to it, but it also benefits from a diversification effect. Except for the rare cases of a widespread total collapse in housing prices combined with a recession and high unemployment, the cost for the banks to hedge the risk would be lower than for the individual.

This means that Norwegian banks have lower credit risk on mortgages than a U.S. bank. This combined with good economic times and a large increase in demand for mortgages means banks have good incentives to grant mortgages. The largest bank in Norway, DNB, and their CEO Rune Bjerke announced on their Capital Markets Day, September 6<sup>th</sup> 2012, that DNB would focus more on residential mortgages and less on commercial loans in the future (Nyheim & Gilbert, 2012). At around the same time the covered pool of DNB Boligkreditt was around 495 billion NOK (82,5B USD). Bjerke said that mortgages spreads

the risk better than the corporate sector and that it secured cheaper funding than loans to other sectors.

These statements from the single largest bank in Norway builds up under the notion that banks are more than willing to issue more loans to mortgagors because the risk is lower and funding is cheap, increasing margins and profits for the banks. During the 1987 Norwegian bank crisis, the mortgagors prioritized to repay their mortgage debt before any other expenses. This led to lower consumption which in turn reduced businesses income and then caused people to lose their jobs. Losing their jobs meant that they couldn't repay their debts and the banks went belly up. Businesses rely on banks to provide credit so that they can operate, but it might be that letting banks fail earlier could have prevented some jobs from being lost, provided the Norwegian government would have stepped in and provided credit to businesses. Letting banks fail has been the source of much debate in the international financial markets since Lehman Brothers went under in 2008. Any definitive answer to the right way to handle a bank crisis might never be found, and we have no indication that the answer will come any time soon.

In October 2012, the FSA released a report called Financial Developments – October 2012 (The Financial Supervisory Authority of Norway, 2012). The FSA write here that they have investigated the eighteen largest banks to see if they are conforming to the regulations requiring a max LTV of 85% and checks to see if mortgagors are able to handle a 5% increase in rates (The Financial Supervisory Authority of Norway, 2011). They found that the *special prudence assessment* was in some cases quite different between the banks, and one bank didn't even have any requirements for this assessment. Only a few banks had stated in the requirements that all loans with the property in question as collateral is to be included in the calculation of the LTV. This is consistent with my findings from the interviews, as some officers reported that using the welfare system for extra loans was a method to circumvent the 85% LTV requirement. The FSA also found that 14% of the total amount of loans had an LTV above 85%, with large differences between banks. One of the banks had 18% loans above 85% LTV. In addition, 8% of the total loans showed a liquidity deficit when rates were increased by 5%. One bank had issued loans with a liquidity deficit (with 5% rate increase) in 19% of its total loans.

The FSA report shows that banks are still giving loans to customers that the FSA believes should not get them. This is indication that the banks are weighing in the ability of the



customer to repay his loan even after default. If loans were non-recourse and more credit risk were with the banks, it is reasonable to think that the amount of loans above 85% and the loans to customers in risk of liquidity deficits would be lower.

Historical housing prices for Norway since 1819 show an average price change per year of 4.34% and a standard deviation of 13.3% (Norges Bank (2012) and Eitrheim, et al. (2004)). Based on these numbers and simplifying the visualization of the data with the assumption that price changes over time have a normal distribution<sup>22</sup>, we can model the probabilities for changes in housing prices for Norway like in Figure 5.



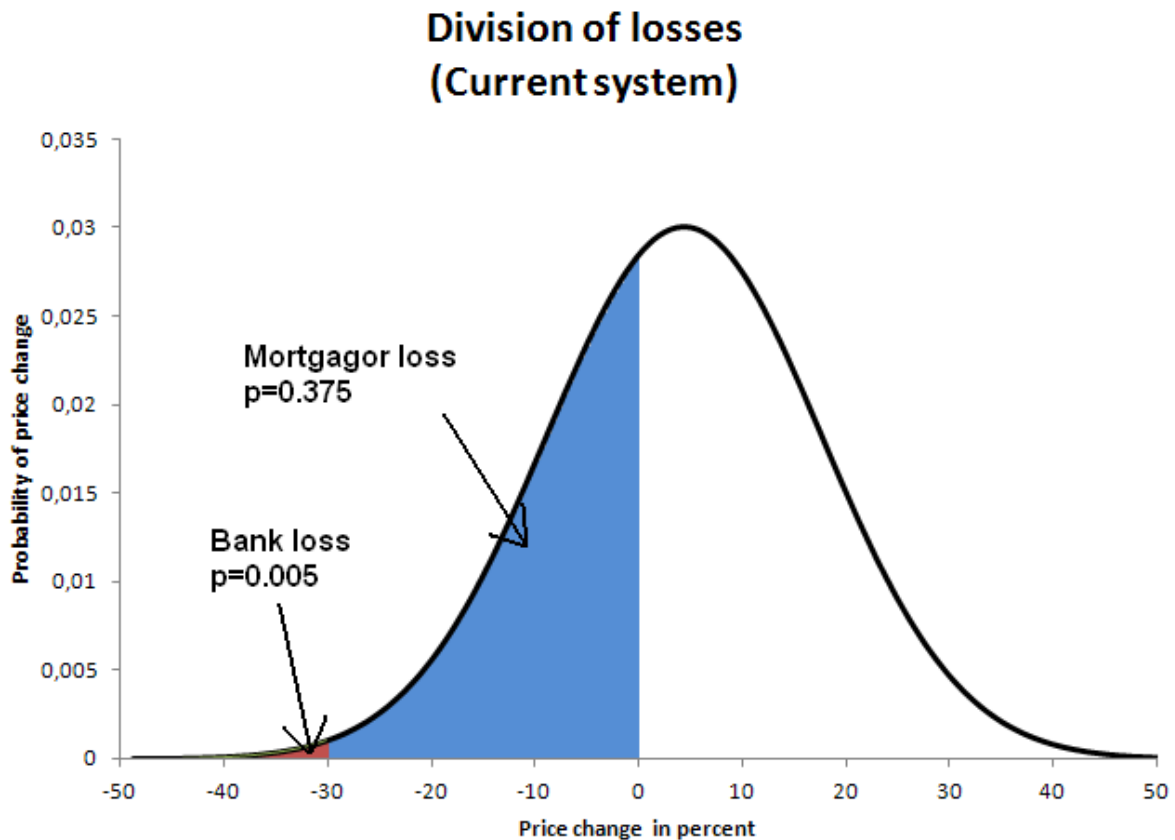
*Figure 5: Probability distribution of price changes in the Norwegian housing market based on historical data*

Using this model, we can visualize how the credit risk is distributed between the different actors (mortgagor, lender, bank, state, insurance company) under different systems. Using an example where a Norwegian customer right after the origination of a loan are faced with the probability function above we can see how the losses are divided. Figure 6 shows the probabilities of losses and how these are divided between the mortgagor and then bank under

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<sup>22</sup> This is only done to simplify and for visualization since housing prices changes in Norway are not actually normally distributed. See Figure 11 and Figure 12 in Appendix E for further details.

the current Norwegian system. Here we also assume that there are no strategic defaults and that the customer will try very hard to make mortgage payments. In this scenario a large macroeconomic shock that reduces house prices with more than 30% will cause the mortgagor to lose all assets and his job (income), forcing the bank to take losses.



*Figure 6: Division of losses after a default under the current Norwegian system.*

As seen, much of the losses are taken by the mortgagor. In this model the mortgagors will over time take on 98.7% of the losses and the bank/lender will be subject to losses of 1.3%. In addition, the financial crisis have introduced the term “too big to fail” on some of our financial institutions. The concept is that there are some institutions that have grown so large and are so interwoven into many layers of the economy that they can’t be allowed to go bankrupt. A thorough discussion of this term and its applicability warrants a master thesis in itself, but in short it is reasonable to assume that some very large lenders could have an implicit guarantee by the state. Small lenders that have special importance in the area where they operate could also be the subject of such an implicit guarantee. This limits the lenders losses and protects him from extreme outlier events.

## 12. Alternative legislation and implications

We have seen that there are two factors that clearly distinguish the U.S. and Norwegian mortgage market: Recourse and mortgage insurance. In the U.S. mortgage insurance has developed as a result of non-recourse. Banks require mortgage insurance in order to move credit risk to an insurance company. Ghent and Kudlyak (2011) show that recourse only affects defaults by lowering borrowers' sensitivity to negative equity. There is no difference in default rates between non-recourse and recourse states in the U.S. This means that recourse only has an effect for people that have underwater mortgages in that it reduces the probability that they will default. They also find that it recourse is only significant for properties of high value (more than \$200,000), and that recourse gives lenders a better bargaining power. A more surprising finding of Ghent and Kudlyak (2011) is that interest rates are actually lower in non-recourse states than in recourse states. This in spite of the expectation we might have that recourse would cause lenders to have less losses and thus be able to charge lower interest.

The results from the U.S. and the interview with the bank there shows that U.S. lenders are making profits just fine without recourse (perceived non-recourse for TTC in New York). In fact, Tompkins Trust Company had a return on equity of 12.07% as of December 12<sup>th</sup> 2011. The Norwegian banks interviewed had 11.4% (DNB/Nordlandsbanken), 5.6% (Helgeland Sparebank), 8.5% (Sparebank 1 NordNorge), 1.4% (Fokus Bank/Danske Bank), and 12.8% (Sparebank 1 SMN). Comparing ROE directly isn't a reliable indicator that we can use to rate the different banks, but it does show that TTC achieves great results without using recourse. Knowing that the U.S. economy has seen better times, the TTC result is even better.

What we do see from the U.S. is that origination and underwriting of mortgages are very thorough today. This is both because of tightened regulation (Dodd-Frank, 2010) but also a more conservative attitude which is needed in the difficult economic times. The use of PMI and government guarantees for high LTV mortgages seems to remove most of the losses that could potentially occur without it. The high degree of competition and costs of foreclosure means that banks are reluctant to sue mortgagors for a deficiency judgment.

In sum, all these findings seem to indicate that non-recourse is adaptable for lenders, as long as there is PMI to cover some of the credit risk. However, as researchers have pointed out,

with non-recourse there is always the possibility that some “underwater” mortgagors will default on their mortgage even if they can afford to pay them, also known as *strategic default*. Guiso et al. (2011) show that the willingness to default is affected by both pecuniary and non-pecuniary factors, confirming results from interviews in Norway that non-pecuniary factors like moral, stigma, and social cost are relevant.

The alternatives for a changed regulation in Norway could be the following:

- U.S. variant (non-recourse, insurance available)
- Only insurance (full recourse, insurance available)
- Non-recourse only (non-recourse, no insurance available)

### **Implication of U.S. variant in Norway**

According to the literature and interviews the U.S. variant with non-recourse (for those states that really are in practice) and PMI would change the Norwegian mortgage industry. In a situation where the lender is faced with increased credit risk, he not only has to be more diligent in originating and underwriting, but he must also secure his loans better. The lender can hedge his positions in the capital markets with purchasing different securities and credit insurance. Credit insurance for the bank will have a cost that is baked into all loans that the lender gives. A variable rate mortgage represents a higher risk of default than a fixed rate because interest rates can potentially change quickly and by a large value. It is therefore likely that a Norwegian lender in such a system would be more insistent on issuing more fixed rate mortgages and adjustable rate mortgages with interest ceilings. Such products can easily be secured in the capital markets lowering risk for the lender, but may increase costs for the borrower.

It is also likely that use of PMI would increase for high LTV mortgages. If PMI was introduced in Norway, it is important that the FSA issue regulation that limits its use to only high LTV mortgages. Prior to the U.S. Homeowners Protection Act (HPA) of 1998 borrowers could be forced into purchasing a PMI that with a low LTV (less than 80%), provided little added security but still had a high price (The Federal Reserve, 2007). The HPA also states that PMI will automatically be cancelled for all LTVs below 78%.

A change to the U.S. system does however move credit risk from financial amateurs over to professionals in the banks. It would only be reasonable to assume that lenders are more able to assess risk than the borrower. However, non-recourse introduces an added agency

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problem. As explained earlier there is the risk that borrowers will default even if they could pay their mortgage (strategic default). Rationally, a borrower with an underwater mortgage will evaluate if defaulting will benefit him more than continuing to pay on his mortgage. Guiso, et al. (2011) simplifies the decision with to a situation with a balloon payment that is due today (repay all debt), and defines that a borrower will not default if:

$$H_t - D_t + K_t > 0$$

where  $H_t$  is the house worth at time  $t$ ,  $D_t$  is the mortgage-balloon payment due, and  $K_t$  is the net benefit of non-defaulting.

The central point with strategic default is here the net benefit of non-default,  $K_t$ . This includes the pecuniary and non-pecuniary costs with default. Important costs would be costs related to relocating, negative credit history, price of alternative housing (and/or rent for a rented house), is there other housing available, stigma and reputation in the community, emotional attachment to the house, and lost tax benefits.

The costs here are all variable and must be determined in every single situation. However, there is a benefit with defaulting that is not brought up in the research from the U.S.: The benefit of living in a house while the foreclosure process is underway and saved mortgage repayments in this period. Norwegian foreclosure law states that the individual living in the house has the right to remain in the property until the foreclosure sale has been made. Only if there is reason to believe that the individual would damage the property or make the sale difficult can he be removed, and then only by a court order (Tvangsfullbyrdesloven, 1992)<sup>23</sup>. This requires non-recourse, and if the mortgage payments are substantial, would increase the risk of strategic default in Norway.

The price of alternative housing is also an important factor. When evaluating strategic default, the individual would be faced with the problem of a negative credit history and would have had a hard time to get a new mortgage. This means that he would be forced to rent housing for many years. If the costs of renting are higher than purchasing a house, this is an added cost for the mortgagor (reducing benefit of default). However, if the price of renting is lower than purchasing a house, it represents value. Adding to this is whether or not

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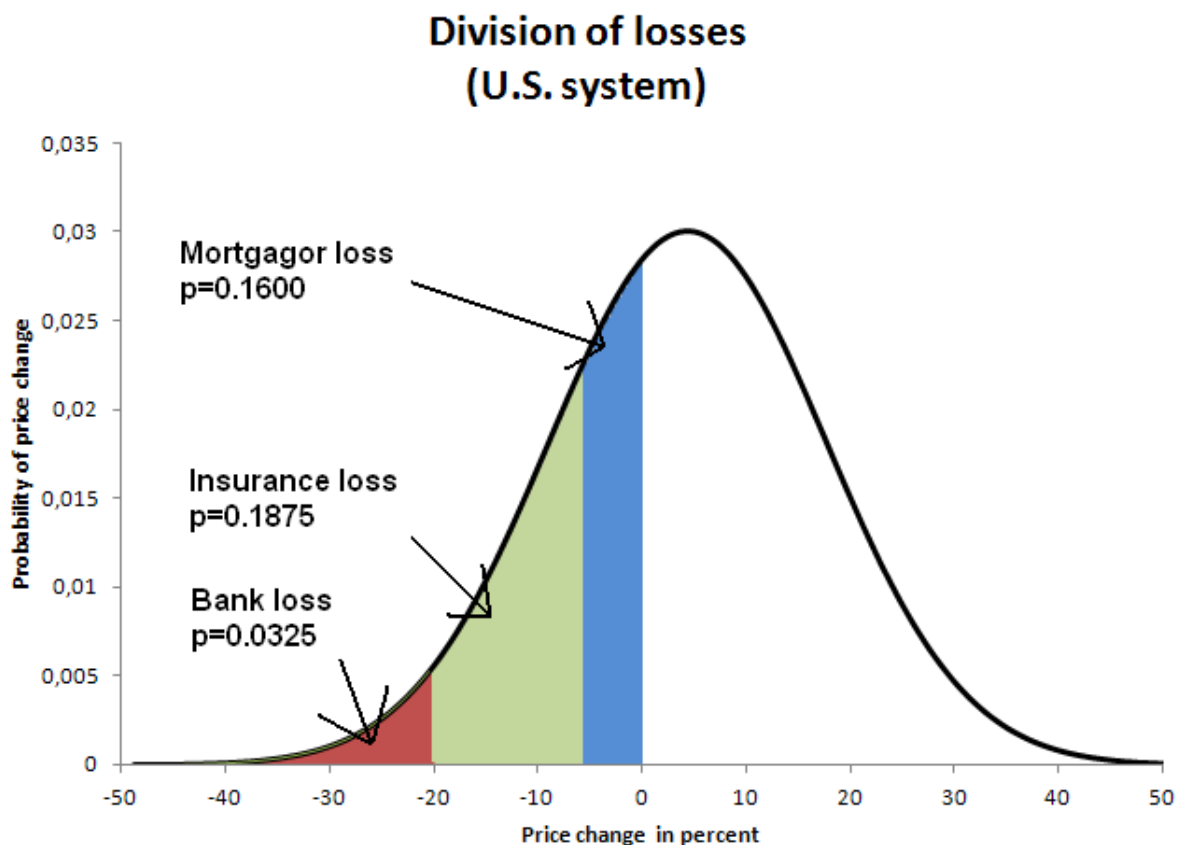
<sup>23</sup> §11-14

there is other housing available in the area. This factor is largely related to the geographical area in which the mortgagor resides. Ghent and Kudlyak (2011) found that defaults was related to high value houses only, which would mean that in the more rural areas of Norway, default is unlikely to occur because the values of the properties are lower than in the cities. From interviews we can also assume that the social costs with default are larger in the rural areas, and as such play a more important role for these types of housing.

With non-recourse and PMI we can expect tighter credit standards. This will reduce credit given to the housing market in Norway, thus having a dampening effect on the great increases of the last decade, especially in the cities. The interviews with the mortgage credit companies also revealed that recourse would be a factor that investors in covered bonds would evaluate when purchasing bonds. It is reasonable to believe that the prices on covered bonds would decrease (higher interest), which in turn would mean higher funding costs for the banks. This in turn would increase the interest rate that the borrower gets on his mortgage loan. However, an investor in covered bonds would also know that non-recourse requires better underwriting, which in turn could offset the added interest from non-recourse itself, explaining the somewhat surprising result from Ghent and Kudlyak (2011) that interest rates in non-recourse states are lower than in recourse-states.

A final positive effect of the U.S. system for Norway would be that the FSA would not need to release guidelines on maximum LTV and could instead publish further guidelines on underwriting standards. This would give more freedom to the banks to determine their own risk-acceptance level and take on loans that they are comfortable with. From the interviews the officers welcomed PMI as a product. It was said that such a product could remove max LTV limits and rather give the bank (and insurance company) the ability to charge the customer more interest for loans with high LTV. This would mean that young adults with large salaries could get loans with low downpayments that they today are unable to acquire.

Using the same model as in the previous chapter, the division of losses can be visualized under this system, as seen in Figure 7.



*Figure 7: Division of losses after a default under the U.S. system.*

Figure 7 shows how with the introduction of insurance and non-recourse, the losses are more distributed very differently from the current system discussed in Chapter 11 (Figure 6 on page 66). In this model we have assumed that the LTV restriction by the FSA is reduced to 95% (downpayment minimum of 5%) and that the insurance policy covers the top 20%. The probability of a loss for the mortgagor goes down from 37.5% in the current system, to 16% in this system. Most of this reduction is absorbed by the mortgage insurance company (18.75%), but the bank increases its probability from 0.5% to 3.25%. Looking only at the losses, the mortgagor will take on 42.1% of the losses, the insurance company 49.3% and the bank 8.6%. We see here that more than half of the potential losses will be covered by professional actors, which would most likely increase diligence with these in terms of better underwriting.

### **Implications of only insurance**

Changing the Norwegian system with only introducing insurance like PMI provides the same benefit as the above system: High LTV loans can be given more often as they are secured by an insurance company issuing a guarantee (the insurance). Policyholders can

decide if they want to pay for insurance or if they want to save money for a downpayment. The downside of PMI is that it could become a “standard” in which all banks would require. The introduction of PMI should therefore be regulated like in the U.S. with a minimum LTV level. Being able to purchase insurance also means that borrowers can “secure” themselves from future claims by using extra money today, preventing having to spend that money in the future when they have little.

A problematic point with PMI not discussed above is the effect of systemic crashes on the insurance industry. There are only two providers of credit insurance in Norway today which means they would have a large exposure to systemic risk in the housing market. Because a housing crash often is confined within a country, diversification of the risk for the insurance company is also important. It is unclear if the repurchase market for mortgage insurances in the World capital market is available. This can be researched further prior to an introduction of the product (and regulation).

Going back to the model of loss distribution, Figure 8 shows how losses are distributed now:

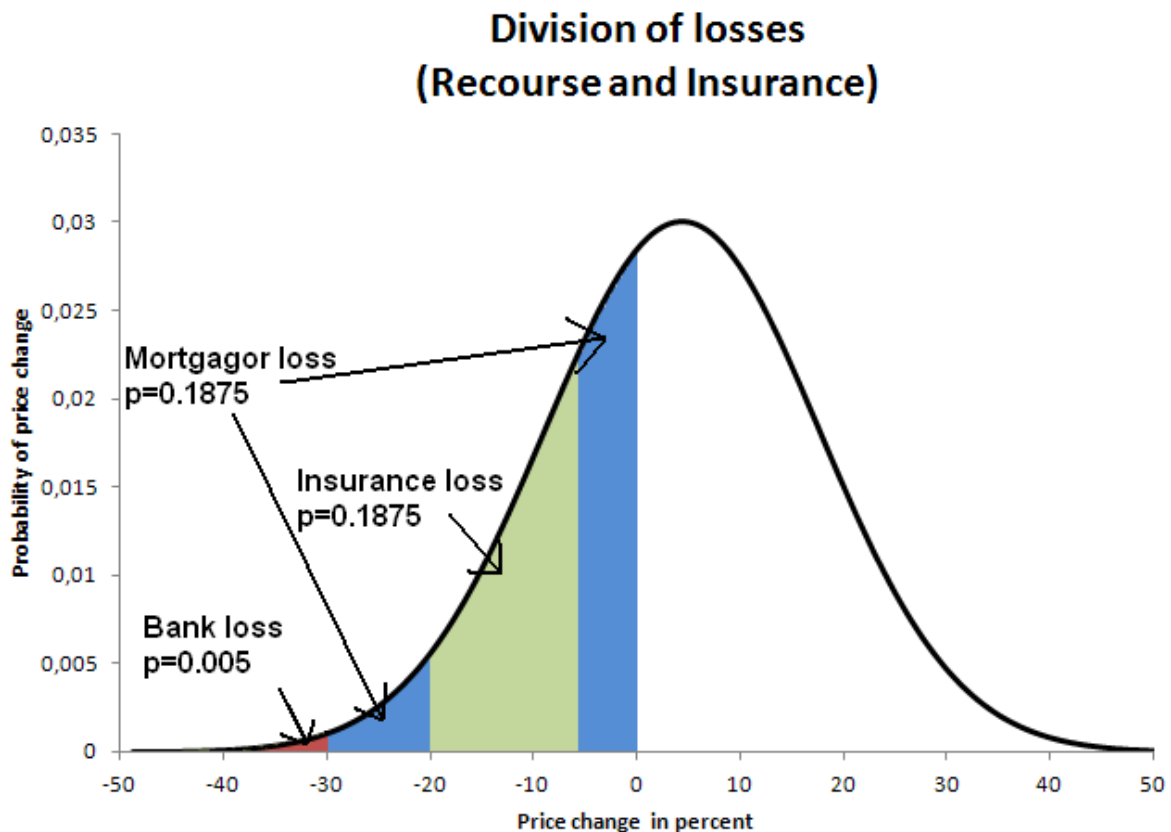


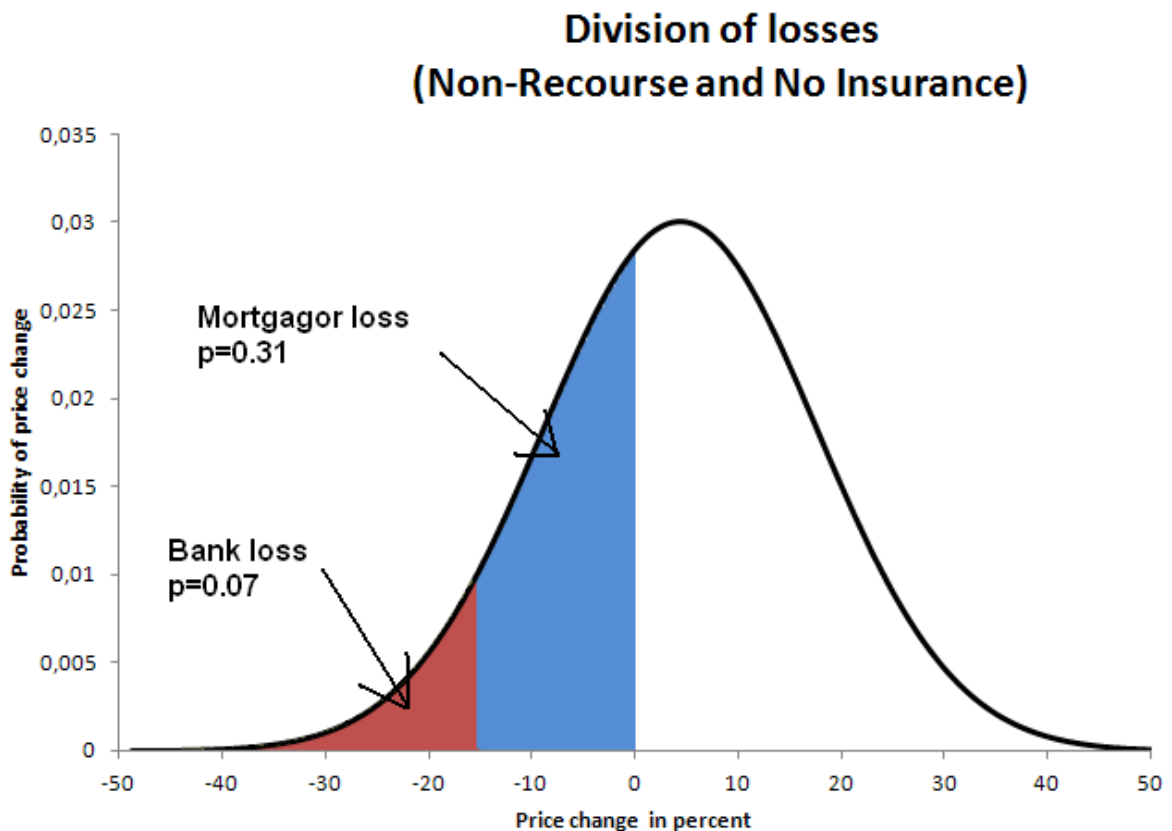
Figure 8: Division of losses after a default with full recourse and insurance available.



Here the same assumption that the FSA will reduce the downpayment requirement is used. We see that the losses are divided evenly between the mortgagor and the insurance company. The bank has the same position as it did under the current system and is indifferent in this model. Here the division of losses will be 49.3% for both the mortgagor and the insurance company, while the bank faces a loss of 1.3%.

### **Implication of only non-recourse (without insurance)**

Having a system with non-recourse and no insurance would have had a negative impact on loan volume in Norway. With non-recourse, banks would most likely have required higher downpayments, lowering LTV at origination. This would in turn have had a negative impact on groups of people with little or no ability to save money for equity, forcing them to stay on the rental-market forever. It is likely that rental prices would have increased and impacted house prices negatively.



*Figure 9: Division of losses after a default with non-recourse and no insurance.*

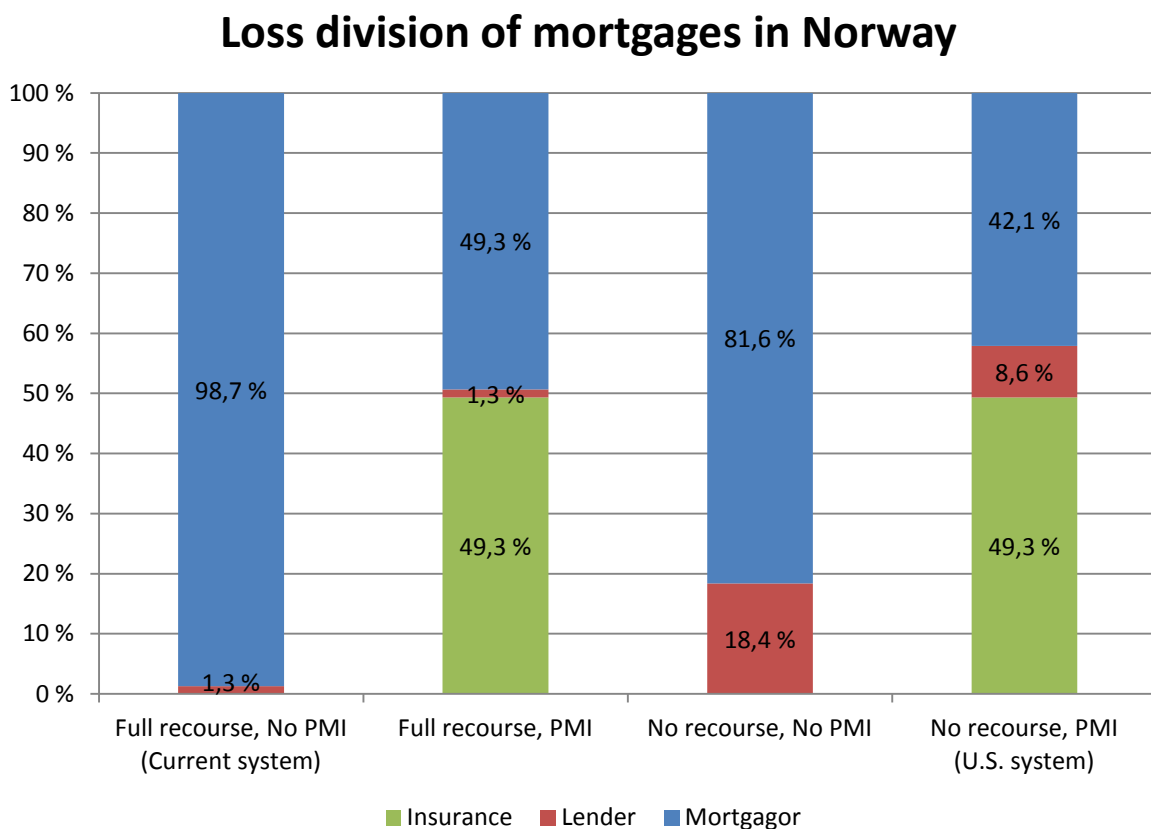
In Figure 9 it is assumed that the 85% max LTV requirement is upheld. No recourse increases the probability of loss for the bank from 0.5% in the current system to 7% in this

system. The mortgagor lowers his probability of a loss correspondingly from 37.5% to 31%. The expected losses for the mortgagor will under this system be 81.6% and for the bank it will be 18.4%.

Introducing non-recourse only is therefore not an option that should be considered.

### *Visualization of losses in all systems*

All the different systems discussed in the previous divide credit risk differently between the various actors. In addition to the actors described above, the state could also play an important role. Norway's social democratic system builds upon the foundation that those that have more should help those that have less. In order to achieve this The Norwegian State act as a middleman by, amongst other things, providing social benefits and universal health insurance. These benefits reduce overall risk of default, and ensure income for people. Instead of handling this "guarantee" in the models it is better to think about it as a guarantee against extreme outliers. Figure 10 shows all the different systems and the loss division in one graph.



*Figure 10: Loss division of mortgages in Norway. Current system and alternative systems.*

A last note on the U.S. system is that we see the insurance company has the largest amount of expected loss in this single scenario. But because it is most likely the largest actor it is reasonable to assume that it is therefore the most diversified. Their diversification benefit is as such larger than the other actors and makes this system more economically efficient.

### **13. Weaknesses and opportunities for further research**

Studying law and finance is an interesting topic, but it also is a complex task for someone without legal education. The interpretations of law, unless noted, are my own. This means that there could be errors in several of the areas concerning law. However, the probability of errors is somewhat reduced by the fact that interviews were held with people from several parts of the mortgage industry.

A problem with the interviews is that only one bank in the U.S. was interviewed. Multiple banks within the same state could have discovered differences, especially in regard of suing for a deficiency judgment in New York (NY allows this). One of the limitations in this thesis is that studying state law and past judgments requires too much work. A problem with that is that there could be judge-made law (common law) within New York State that explains why the bank interviewed there didn't sue for a deficiency judgment even though New York was believed to be a recourse state. Whether or not that is the case is unknown. The study could also have benefited from interviewing issuers of mortgage backed securities, and lenders from other states than New York. The U.S. bank interviewed did not securitize its mortgages like all the banks in Norway did. Practices could be quite different in Norway if the lenders in Norway kept all the loans on their own books.

This thesis relies on the results from Ghent and Kudlyak (2011). The dataset that they worked on was around 3 million mortgages from the U.S. in the period 1997 to 2007. It has been established that during this period, especially towards the end, several mortgage originators committed fraud by not performing correct underwriting. This could potentially offset some of the results in that paper.

Further research that could be done is to attempt to calculate the "risk premium" that U.S. banks charge in extra interest on their loans, compared to Norway. Ghent and Kudlyak (2011) had the surprising result that the interest was lower in non-recourse states than recourse. Research into trying to calculate the difference between Norway and the U.S. would be quite interesting, but will probably require a lot of effort, especially trying to identify mortgages that are similar enough to be compared. Calculating the risk premium could get an indication for what the price of allowing a Norwegian borrower a non-recourse loan (correcting for mortgage insurance). Alternatively, using framework similar to Guiso et

al. (2011) one could look at the option to default without recourse as a real-option and use financial theory on real option pricing to determine the price of recourse/non-recourse.

Another research topic is into culture and finance: Why are U.S. lenders “investing” when giving a mortgage, but Norwegian lenders are just granting someone a loan? Are there cultural differences that can explain why Norwegian mortgagors today scoff at the U.S. system, while Americans are reasonably content with their system?

Finally, further research into the borrowers’ behavior and utility would be both useful and interesting. By examining consumers risk perception of mortgages one could determine the viability of providing insurance. Following risk perception studies, a survey could have helped to determine what price people are putting on the risk. This could have enabled us to answer the questions: “How much borrowers pay for mortgage insurance in Norway?” and “How much extra interest would borrowers pay to get the option of non-recourse on a mortgage?”

## 14. Conclusion and final remarks

I started this thesis with a quote from David Friedman about how legal rules should be judged. Studying the buildup of housing prices combined with the issuing of covered bonds and the DNB CEO Rune Bjerke announcing households are their primary focus, shows how Norwegian lenders can cause worry for many an economist. The Central Bank of Norway (Norges Bank) has in their Monetary Policy Reports over several years pointed out that the buildup of household debt is of worry to them. If Norway would be the subject of a negative macroeconomic shock it is more than likely that many people would be put in a difficult position. Mortgage insurance would provide mortgagors with an ability to secure themselves against such shocks. The same would be the case if Norway had non-recourse mortgages. Even though such mortgages would be more expensive than today's variable rate mortgages, risk has been transferred from the borrower and over to the lender. The lender, as a professional, and the bank itself, has better opportunities to evaluate this risk and put the correct price on it than borrowers. Norwegian borrowers are most likely not aware of the risk they are exposed to. If they knew this, we would probably see a higher rate of fixed rate loans and insurances in Norway.

Non-recourse gives the incentive for the banks to tighten credit standards. This was undisputed in all interviews. Better credit standards would normally reduce the amount of defaults. Ghent and Kudlyak (2011) found that the default rate was independent of recourse, which would indicate that lenders with non-recourse give fewer loans, but within that group, people still default as often as other groups. Fewer loans could lead to undesirable outcomes. This means that if non-recourse is introduced, PMI or government guarantees should also be put in place to increase lending. Such a system would also enable the removal of start-loans from NAV (the Norwegian Welfare Administration) and rather give NAV the ability to guarantee for loans like the FHA does in the U.S. This would mean that the professional loan officers in banks would be the ones that evaluated all loan applications, removing the probability that a government employee with low education approved loans.

A final remark can be made that the current Norwegian system seems to put the individual borrower in the position of being solely responsible for the loan. In the U.S., with non-recourse it would seem that some part of the responsibility is put on the lender as well. The rationale here could be that a lender is in fact investing in an individual when he gives a

loan. I encourage the reader to reflect on this difference in views and ask some important questions: Is Norway really providing banks with more protection than it gives the consumer? Why has the politicians decided this? Do they know what the implications are? I propose that only by asking questions about the seemingly fundamental basics of our economic system and the laws that build up under it can we truly understand why things are as they are.

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## Appendix A - Dictionary

ARM – Adjustable Rate Mortgage, a variable rate mortgage where the rate can change at set intervals

Collateral – Physical object or money that can be used as security for the lender

Covered Bonds – Mortgage backed security that has priority to the assets in the asset pool. The asset pool is kept within a separate entity that is fully owned by the bank.

Deficiency – The difference between the remaining principal and interest (total amount owed) on a loan and the total amount collected at closing of the loan.

Deficiency judgment – A court judgment and public record of the amount owed and by whom.

Disposable income – The sum of (salaries, income from business, capital income, welfare and social support, and other sources of income) less the sum of (taxes, capital expenditures and other expenditures)

Funding – A term used by banks for how the bank finances itself. Often referring to loans it gets from investors, or money obtained by the issuing of bonds.

Mortgage – A term for the process of obtaining security for debt.

Mortgage Backed Securities – A paper that gives the right to the proceeds (payment and/or interest) from a pool of mortgages.

Mortgagee – A lender that has given a loan and received security for the loan.

Mortgage loan – A loan that is secured with a property as collateral.

Mortgagor – A borrower that has used his property as collateral for a loan.

Non-recourse debt – Debt that is only secured by the property (the mortgage) and can't be used as the basis of obtaining a deficiency judgment.

Recourse debt – Debt that is both secured by the property (the mortgage) and that can be used as the basis of obtaining a deficiency judgment.

Special prudence assessment – A term used by the Financial Supervisory Authority of Norway for the process of thoroughly evaluating a high LTV loan against a list of requirements defined by the bank.

Strategic default – Describes a default caused by a borrower that could repay his debt but chose not to.

## Appendix B – Questions for banks

Could you explain a bit about how this branch is operated and if there are special rules that must be followed that the HQ has defined?

What can you tell me about the market share for this bank in this region? Who are your competitors?

Is it possible to assess the market share for mortgage loans alone?

Do you offer mortgage loans for customers all over the World? Or do you only give loans to property in Norway (U.S.)?

What is your total assets, ROA and ROE? How would you say your branch does it compared to the rest of the company?

Earlier this year we've seen more pressure on the interest spread as a result of high competition and higher financing costs in the capital markets. Is this something you have noticed at your branch office? Do you get an impression that the customers are "shopping around" for the best interest rates?

What is your personal opinion about whether or not the competition is going to be even harder or if we are going to come to a point where margins can't be pushed further?

In the U.S. it is expected that further consolidation of the banking industry will occur to realize benefits of scale. Do you see any such events happening here (in Norway)?

Has the 2007 financial crisis have any impact on your branch?

Can you tell me about the process of originating and underwriting a new mortgage? What do you do? What documentation do you require?

Where are the loans put? Do you keep them on your books or are they transferred to a mortgage credit company or do you sell them?

If you use a mortgage credit company, do you have any knowledge of how they operate? Do you know if "your" mortgages are more popular than others?

If you keep the loans on your own books, how do you handle the risk for default on these loans? Do you purchase credit default swaps?

How “close” would you say that you are to the housing market? Are you well aware of the price levels and the sales in the region? How do you acquire this information?

How important would you say that it is to be aware of the market fluctuations in the housing market?

Do you have any extra requirements to the borrower than the FSA require? (Not asked in U.S.)

Have you noticed any effects of the 85% max LTV requirement of the FSA? (Not asked in U.S.)

In the U.S. the regulation gives the borrower the opportunity to leave the loan and the house, so that the bank would have to take any losses if the value of the property is below market value (non-recourse). If we would have gotten this system in Norway, what effects would you think it would have? (U.S. bank told about Norway and asked to explain what would happen if he had this system in the U.S.)

What is the percentage of losses?

Are there special local issues in terms of default or delinquency that you think is important here?

Can you tell me about what the process is when a customer fails to make payments?

How far do you go in attempt to get a private arrangement about repayment with a delinquent customer?

Have you been involved in debt settlements and are there more voluntary settlements than forced? (Not asked in U.S.)

Do you have any thoughts about the importance of debt settlements for financial stability in Norway? Does it bear any at all? (Not asked in U.S.)



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## Appendix C – Questions for mortgage credit companies

Can you tell me a bit of how you operate? What are the most time consuming tasks for example?

What is your market share compared to other companies?

How would you characterize the risk profile of your bank (the originators)? Are they conservative, neutral, or aggressive?

Can you tell me how the daily contact with the bank is? Do you have a feel for the market fluctuations and the need for new loans (demand for credit)?

How is the demand for covered bonds? Has it changed over time?

If the demand has increased: How do you perceive the future?

Can you tell me what the typical investor in your covered bonds are?

DNB is one of the largest covered bonds issuers in Norway and is owned by the Norwegian State. Do you think that means something for the investors in covered bonds? (all companies asked about this)

What will happen when the covered bonds swap with the government closes next year? Will you be able to place new loans in the market, or have you done so already for these (swapped back already)?

What will happen if Europe shows signs of rapid recovery. Will European investors continue to buy Norwegian covered bonds instead of other securities? Is it possible that we can have a credit drought?

What would happen if you couldn't sell new covered bonds?

What is the typical maturity of your bonds? Has this changed over time?

What is the preferred LTV for mortgages you get from the bank?

What happens to loans that have a LTV higher than 75%?

It has been discussed that covered bonds can influence the housing prices in that it is a source of cheap funding. How is your perspective on that statement? Has covered bonds made it too easy to get funding?

Can you tell me something about the process of obtaining a rating? That includes both rating of the company as a whole and rating of the individual loan (the bonds). How is your contact with the rating agencies?

Are the covered bonds you issue callable?

Are you concerned for the rising housing prices?

Rune Bjerke and DNB announced that they will increase their mortgage portfolio recently. What is your comment on this? What impact would this have?

Are your company more/less vulnerable to fluctuations in the housing market than others?

In Finance Norway's report from the Covered Bonds Forum 2011, the Board writes that it is desirable that covered bonds will count as Level 1 liquidity, but is this in any way realistic when it is obvious that there is some risk in these papers? Isn't Level 1 supposed to be zero-risk papers and cash?

Do you issue covered bonds that are interest only?

Are there any loans in your covered pool that is underwater? (LTV>100%)

What would happen if the value of the covered pool is below the value of the issued covered bonds?

In the U.S. a mortgagor that defaults on his mortgage can leave the property and loan to the bank. But here in Norway the borrower is still responsible for repaying his debts. Do you think this has any effect on covered bonds? How?

What would have happened if we would have gotten the same system as in the U.S.? Would funding through covered bonds have become more difficult?

This is about whom should be left with the risk: The professionals or the amateurs (mortgagors). Isn't it reasonable to think that it would be simpler for the banks to assess the true level of risk than a layman?

Do you have any thoughts about the morality of the issue?

Are there any other important issues with the risk of default that we haven't talked about and that you know of?

## **Appendix D – Details on the different interviewees**

### *Tompkins Trust Company*

Tompkins Trust Company (TTC) is a subsidiary bank of Tompkins Financial Corporation. Tompkins Financial Corporation is a public company listed on the NYSE Amex that operates in New York State and recently expanded to Pennsylvania through an acquisition. It had \$3.4 billion in total assets as of December 31<sup>st</sup> 2011 and is a state chartered non-member of the Federal Reserve. Its primary federal regulator is the FDIC.

Website: <http://www.tompkinstrust.com/>

### *Nordlandsbanken*

Nordlandsbanken is a commercial subsidiary bank of DNB. The bank operates in the northern parts of Norway but do have some accounts with persons from other parts of the country. Until October 1<sup>st</sup> 2012, the bank operated as a separate entity with DNB as owner, but has now been incorporated into DNB. The branch office in Sandnessjøen estimates it has around 30% market share in the region. Nordlandsbanken had \$6.2 billion in total assets as of December 31<sup>st</sup> 2011.

Website: <http://www.nordlandsbanken.no/>

### *Helgeland Sparebank*

Helgeland Sparebank is an independent mutual savings bank in a region of the northern part of Norway (Helgeland). It primarily services the local region but do have some accounts with persons located in other parts of the country. The branch office in Sandnessjøen estimates it has around 30% market share in the region. It had \$3.8 billion in assets as of December 31<sup>st</sup> 2011.

Website: <http://www.hsb.no/>

### *Sparebank 1 NordNorge*

Sparebank 1 NordNorge is a mutual savings bank that operates all over the northern parts of Norway, including Spitsbergen. They also have an office in Murmansk, Russia, through a joint venture with a Russian bank. The branch office in Sandnessjøen estimates it has around 30% market share in the region. Their customers are mostly from the regions in which they

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operate, but they also have customers from other parts of Norway. Sparebank 1 NordNorge had \$11.8 billion in total assets as of December 31<sup>st</sup> 2011.

Website: <http://www.snn.no>

### *Fokus Bank*

Fokus Bank is a subsidiary commercial bank of Danske Bank in Denmark. Fokus operate all over Norway with a main office in Trondheim. Their estimated market share is 5% of the Norwegian retail market. Danske bank had \$595 billion in assets as of December 31<sup>st</sup> 2011.

Website: <http://www.fokus.no/nb-no/om-fokus-bank/InEnglish/Pages/in-english.aspx>

### *Sparebank 1 SMN*

Sparebank 1 SMN is a mutual savings bank that operates in the middle parts of Norway. Their customers are mainly located in the region in which they operate and they have an estimated 35% market share in this region. Sparebank 1 SMN had \$16.9 billion in total assets as of December 31<sup>st</sup> 2011.

Website: <http://www.smn.no>

### *DNB*

DNB is Norway's largest commercial bank and is a part of the Oslo Børs Stock Exchange Index. DNB operates all over Norway, and also have branch offices in many countries in Europe. In addition they have offices in the U.S., Brazil, Chile, India, China, and Singapore. DNB had \$354 billion in total assets as of December 31<sup>st</sup> 2011.

Website: <http://www.dnb.no>

### *Terra Boligkreditt*

Terra Boligkreditt is a covered bonds issuer owned by 79 banks and OBOS. These banks operate all over Norway. Bonds issued by Terra had an Aa2 rating by Moody's as of May 4<sup>th</sup> 2012. Terra has a self imposed max LTV of 60% for mortgages in its cover pool. The total cover pool was \$6.75 billion as of March 31<sup>st</sup> 2012.

Website: <http://www.terra.no/english/investorrelationstbk/Sider/TerraBoligKreditt.aspx>

### ***DNB Boligkreditt***

DNB Boligkreditt is the covered bonds issuer for the largest bank in Norway, DNB. DNB has about 30% market share in Norway. The covered bonds issued by DNB have an AAA/Aaa rating by all three rating agencies. Max LTV for mortgages in its cover pool is 75% (regulation requirement). The total cover pool was \$88.4 billion as of September 30<sup>th</sup> 2012.

Website: <http://www.dnb.no/en/about-us/investor-relations/funding.html>

### ***Gjensidige Bank Boligkreditt***

Gjensidige Bank Boligkreditt is a covered bonds issuer owned by Gjensidige Bank, a subsidiary of the insurance company Gjensidige Forsikring and operates all over Norway. Boligkreditt is rated AA+ by Standard & Poor's. Max LTV for mortgages in its cover pool is 75% (regulation requirement). The total cover pool was \$0.77 billion as of March 31<sup>st</sup> 2012.

Website: <http://gjensidige.com/web/Front+Page/Investor+relations/Gjensidige+Bank>

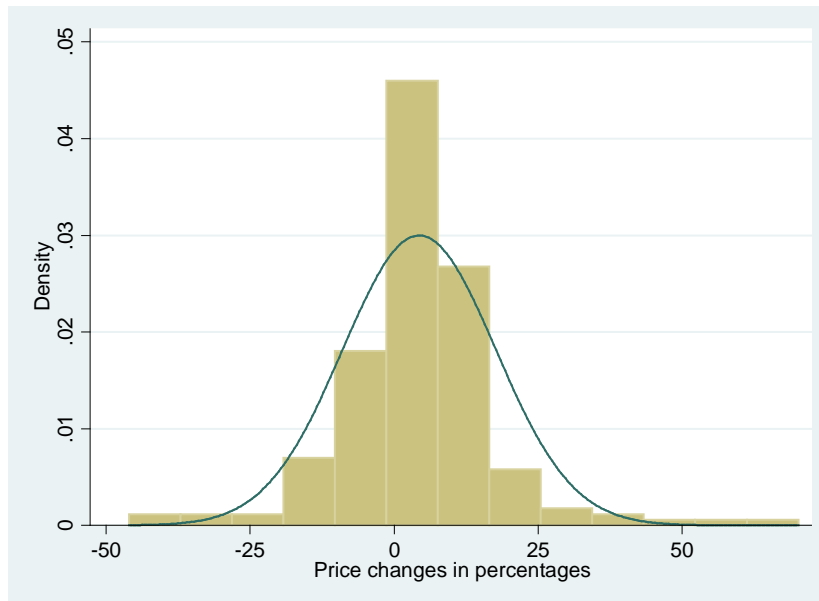
### ***Møre Boligkreditt***

Møre Boligkreditt is the covered bonds issuer for Sparebanken Møre. Its covered bonds are rated Aaa by Moody's. Sparebanken Møre operates mainly in the northwestern region of Norway. Max LTV for mortgages in its cover pool is 75% (regulation requirement). The total cover pool was \$1.84 billion as of September 31<sup>st</sup> 2012.

Website: <http://www.sbm.no/default.aspx?menu=113>

## Appendix E – Extra figures

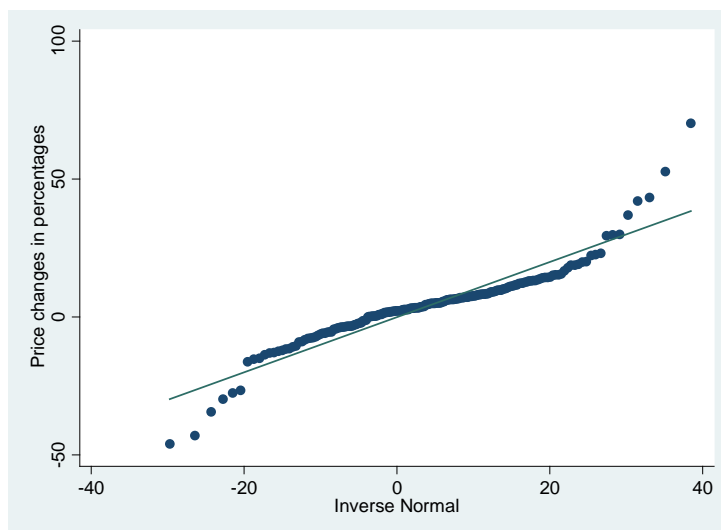
### *Histogram of housing prices in Norway 1819-2011*



*Figure 11: Price changes in percent compared to a normality curve, indicating that houseprices in Norway the last 192 years are not normally distributed.*

The Shapiro-Wilk W test for normal data reports a p-value of 0.00000, forcing a rejection of the null-hypothesis that there is normality.

### *Q-Q Plot of housing prices in Norway 1819-2011*



*Figure 12: Q-Q Plot of housing prices in Norway 1819-2011.*

The Q-Q Plot shows how the two distributions (house prices vs. normal curve) compare to each other. The closer the dots are to the line, the better is the fit of the house price distribution to the normal distribution. From Figure 12 we see that for the most part the plot is close to the normal curve, but it is the outliers that represent very large price changes that cause violation of normality. Removing all price changes from -50% to -20% and all from 30% to 70% would probably make for a better fit. However, excluding the extreme price changes is unreasonable for a proper discussion into defaults, which would most likely only happen with extreme price changes.