

Uncovering covered bonds

The impact of a reform on the Swedish mortgage bond market

Master's Thesis in Finance

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Abstract

The thesis discusses the potential impact on the components of the cost of financing for Swedish mortgage institutes of new legislation giving them the opportunity to issue covered bonds, collateralized debt securities similar to the German pfandbrief.

Arguments for both a lower cost of financing through such bonds and a higher cost for the remainder of the financing exist, as well as a potential for the reform to reduce the total financing cost. However, the spread between mortgage bonds about to be converted to covered bonds and similar government bonds has not been substantially impacted by the prospects of such a conversion.

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1. Introduction:	3
1.1 Timeline	4
1.2 Research question, structure and methodology	4
1.3 Terminology	5
2. Institutional setting	7
2.1 Development of the covered bond market	7
2.2 EU	8
2.3 Swedish mortgage institutions	9
2.3.1 Mortgage portfolio Loan-to-Value structure	10
2.3.2 Financial structure:	11
2.3.3 Mortgage bond market:	13
2.3.4 Development of the mortgage bond spread:	14
2.4 The covered bond legislation	17
2.4.1 The role of legislation	17
2.4.2 The existence of a dominant jurisdiction	18
2.4.3 The role of ratings agencies in addressing differences in legislation	19
2.4.4 General characteristics	20
2.4.5 Supervision	21
2.4.6 Areas of uncertainty	21
2.4.7 Transparency	23
2.4.8 The dominant legislation revisited	23
3. Creditor expropriation and capital structure irrelevance	24
3.1 Credit risk for investors in Swedish mortgage institute debt	24
3.2 The Miller & Modigliani proposition of capital structure irrelevance	29
3.3 Assumed parameters of the M & M identity	30
4. Relaxation of the assumptions of M & M	33
4.1 Reduction in asymmetric information	35
4.2 Demand	40
4.2.1 Wider range of investors	40
4.2.2 Inclusion in indices	41
4.2.3. Larger exposures	42
4.3 Liquidity	44
4.3.1 Review of theory on liquidity premiums	44
4.4 Discussion	45
5. Assessing the impact of the reform on the mortgage spread	46
5.1 Announcement effects	47
5.2 The long-run impact of the covered bond reform	51
5.2.1 Variables included	51
5.2.2 Data	52
5.2.3 Results and specification tests	52
6. Conclusion	55
Annex A: The Average Bank-owned Mortgage Institute	56
Annex B: The Covered Bonds (Issuance) Act in relation to other European covered bond legislation	58
Reference List	61

1. Introduction:

Mortgages are an important instrument in promoting home-ownership and in substituting real property with financial assets. As mortgages are relatively standardized products the price is the most important means of competition. In turn the fortunes of mortgage institutes are heavily dependent on their cost of financing.

This masters' thesis examines the expected impact of the recently enacted Swedish covered bond legislation on total financing costs of mortgage institutes. The purpose of the legislation is stated to be to create "competitive financing opportunities" for Swedish financial companies, by making terms for financing more comparable between the EU-countries through access to a more integrated and standardized European covered bond market.

The legislation enables financial companies to issue bonds secured by a defined pool of assets on the company balance sheet. This aims to create a structure under which proceeds from the assets comprising the pool will continue to service the bond-holder's claims irrespective of company bankruptcy. Hence the securities will be able to achieve a better credit rating than the issuing institute, and as a consequence require a lower yield than the straight mortgage bonds that are currently issued.

The legislators aim can thus be seen as an attempt to provide Swedish mortgage institutes with cheaper financing opportunities through an improvement in contractual design¹ and through access to a larger debt market, employing the benefits that such a market could provide in terms of, inter alia, higher liquidity and higher demand. In turn this could translate into cheaper mortgages for Swedish consumers and companies.

However, mortgage institutes can not, for several reasons, finance themselves entirely through covered bonds. In the hypothetical event that financing solely from covered bonds would be possible it would yield the same result as that of financing entirely through senior unsecured debt. In the theoretical world of Miller and Modigliani² the implication of partially cheaper debt financing, given that the aggregate level of risk in the mortgage institute does not change, is that the saving achieved through covered bond issuance will be offset by the remaining debt financing becoming more expensive. At first glance this theory appears to apply perfectly to covered

¹ See Government Bill 2002/2003:107, p. 45-53.

² Modigliani, Franco, and Merton Miller, 1958, 'The Cost of Capital, Corporation Finance, and the Theory of Investment', *American Economic Review*, 48, 261-297.

bonds, as an issue of such securities by definition involves a transfer of risk from other sources of financing.

1.1 Timeline

The Swedish legislation, the Covered Bonds (Issuance) Act (2003:1223) was proposed on May 15th 2003 in Government bill 2002/03:107, containing the proposed legislation to be enacted by the Riksdag.

This was done on December 18th the same year, and the Act entered into force on the 1st of July 2004.

Following a period of preparations and dialogue between mortgage institutes, the responsible Government agency, Finansinspektionen (the Swedish Financial Supervisory Authority), and the ratings agencies, Nordea Hypotek was the first mortgage institute to apply for a license under the Act, filing an application May 31st 2005. The institute received a license on December 12th 2005,³ and Stadshypotek followed suit on September 14th,⁴ and SBAB applied for a license to issue covered bonds through a special purpose company on October 13th.⁵

Out of the last two leading mortgage institutes SEB Bolån, filed an application on February 9th 2006.⁶ Spintab has not filed an application as of today's date.

1.2 Research question, structure and methodology

The thesis essentially attempts to answer three questions:

- 1) What benefits do covered bonds offer to mortgage bonds and investors?
- 2) To what extent are these benefits created through expropriation of other bondholders, as the Miller & Modigliani proposition of capital structure irrelevance would appear to indicate?
- 3) What impact has the covered bond reform had on mortgage bond pricing until now?

The paper is structured as follows:

³ Nordea Hypotek receives license to issue covered bonds, December 12 2005, available from www.nordea.com

⁴ Stadshypotek applies for permission to issue covered bonds, September 14 2005 available from www.handelsbanken.com.

⁵ SBAB ansöker om Finansinspektionens tillstånd för utgivning av säkerställda obligationer, available from www.sbab.se

⁶ SEB BoLån lämnar in tillståndsansökan för att ge ut säkerställda obligationer, available from www.seb.com

Section 2 will give the institutional background, including an overview of the Swedish mortgage institutes and mortgage bond market, the political background and the general outline of the Swedish legislation. This section is based on a series of semi-structured interviews with mortgage institutes, regulators and other concerned parties, as well as on public documents and statistics, market data and the financial statements of the relevant companies.

Section 3 attempts to discuss the quantitative aspects of the first two questions.

The first part of the section looks at how the potential cost of collateralizing the covered bonds will be borne by unsecured creditors in a bankruptcy situation and provides some numerical examples based on an industry-average balance sheet in order to establish a “ballpark” estimate of the size of the compensation required by these investors. The second part of the section provides a contrasting example by using an adapted Miller & Modigliani proposition to explore the relation between a decrease in the cost of a mortgage bond and the increase in the cost of other debt. A concluding discussion attempts to reconcile these two examples.

This chapter primarily builds on the sources used in the previous section.

Section 4 explores less quantifiable potential aspects of the mortgage bond reform. Our interviewees and the preparatory works mention potential benefits that would be assumed away in the Miller & Modigliani proposition. The theoretical rationale behind such arguments is discussed.

Finally, section 5 concerns the third question, first by examining what effects on the mortgage spread can be observed in the periods of time around the events described in the timeline above, second by fitting a panel regression to the spread between a set of mortgage bonds and a similar government bond.

1.3 Terminology

In the international literature, both practical and academic, there appears to be some confusion as to what constitutes a *covered bond*. The term appears to be used imprecisely and without any particular definition. For instance, some sources appear to consider any bond that is issued by a bank, mortgage institute or similar entity that confers a claim to any or all assets, specified or unspecified, registered or unregistered to constitute a covered bond.

An exact definition of what type of debt security can be considered a covered bond may not be necessary for this thesis, but some type of boundary needs to be drawn in order to distinguish between on one hand such bonds that meet the criteria of the recently enacted Swedish legislation and comparable instruments issued under similar legislation in other jurisdictions, and on the other hand other types of debt securities.

Covered bonds can be defined as full recourse debt instruments secured against a pool of mortgage assets and/or public sector claims held separately in a special registry, to which investors have preferential claim in the event of bankruptcy of the issuing institution.⁷ With covered bonds, loans that comply with the requirements set by law are pooled together and funded through the issuance of secured bonds in an ‘on-balance sheet’ process.⁸

Hereafter, only such debt securities that grant the holders a post-bankruptcy claim in a specific independent pool of assets maintained on the non-consolidated⁹ balance sheet of the legal entity acquiring them from the original borrower, and that will be maintained separately rather than prematurely dissolved in the case of the legal entity’s bankruptcy will be considered *covered bonds*.

This definition can be compared to the criteria used in EC law, which can be found in Article 22 (4) of the so called UCITS directive¹⁰.

“...issued by a credit institution which has its registered office in a Member State and is subject by law to special public supervision designed to protect bondholders. In particular, sums deriving from the issue of these bonds must be invested in conformity with the law in assets which, during the whole period of validity of the bonds, are capable of covering claims attaching to the bonds and which, in the event of failure of the issuer, would be used on a priority basis for the reimbursement of the principal and payment of the accrued interest”.

⁷ See Report: The integration of the EU Mortgage Credit Markets, p.41

⁸ This is opposed to an ‘off-balance sheet’ process, such as that used in a securitization.

⁹ Depending on the circumstances of the specific transaction and the accounting principles used an SPV may need to be included in the *consolidated* financial statements of an issuer.

¹⁰ Directive 85/611/EEC of 20 December 1985 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS).

This definition is referred to in other EC legislation and is through implementation part of the legislation of member states. As we can see, EC law ties its definition to the existence of three phenomena:

- A collateral pool
- Priority in this pool in the event of issuer bankruptcy and,
- Public supervision

The definitions used by ratings agencies¹¹ are also tied to the existence and recourse to a collateral pool. However, our definition limits the use of the term to a class of debt securities that is relatively homogenous in various jurisdictions, it highlights most of the common features important to our study and distinguishes covered bonds from on the one hand *mortgage bonds*, i.e. debt securities issued by mortgage institutes that lack a security interest in such an independent asset pool, and on the other hand from the multitude of structured debt securities using a Special Purpose Vehicle (“SPV”) to create a security interest in a specific pool of assets.

2. Institutional setting

2.1 Development of the covered bond market

The German pfandbrief developed as a domestic product in the middle of the 1990’s. Not until the successful introduction and growth in Jumbo pfandbrief¹² issuance the product gained wide acceptance as an international baseline product, inducing the creation of pfandbrief-like products in other European jurisdictions. Legislation for pfandbrief-like, or covered bonds, has now been introduced in virtually all EU countries. Some of the success can be attributed to the non-growth of the government security market, making private bond products more interesting for investors. It has been argued that the part of the pfandbrief market that exhibits high liquidity and high credit quality, i.e. the Jumbo segment, has assumed some of the roles previously played by government debt.¹³

¹¹ To illustrate, Standards and Poor’s state that: “In essence, a covered bond can be viewed as a senior unsecured debt obligation of an issuing bank and recourse to a cover pool of mortgage or public sector assets. In general, the assets that serve as collateral for covered bonds remain on the bank’s balance sheet.”

¹² Jumbo pfandbriefe are characterised by an issue size exceeding € 1 Bn, a straight bond format, at least three market makers supporting trade in the issue and an official listing. See www.pfandbrief.org, the website of the Verband Deutscher Pfandbriefbanken.

¹³ See Pfandbrief style products in Europe.

2.2 EU

The European mortgage institutions have loans outstanding exceeding 4 trillion Euro. Covered bonds, with a volume outstanding of approximately 1.5 trillion Euros, is the second largest capital market segment in Europe after government bonds.¹⁴ By sheer size alone the mortgage bond market is an important component of a well-functioning EU economy. However, the European mortgage bond market is fragmented, which prevents the full benefits of such a scale to be utilized. Significant efforts have been, and are, made to improve upon the market structure by way of policy and legislation. The aim is to create a single integrated market within the European Union (EU), similar to the market for government securities.¹⁵ The benefits in terms of competitiveness from a larger and more liquid primary and secondary market for mortgage securities have been stressed by politicians and capital-market practitioners alike.¹⁶ Also, ample empirical evidence supports that demand for a currency/security is strongly related to its liquidity, and to achieve higher liquidity in key financial markets is one of the drivers of the current EU policy regime.¹⁷

From an EU perspective the rationale for creating standardized legislation and a more integrated financial market for mortgage funding is that a deeper and more liquid secondary market in mortgage debt would lead to lower funding costs for mortgage institutes and would bring reductions in credit and risk management costs as a result of diversification and scale of activity, and lower servicing costs.¹⁸ These benefits would in turn improve the economic growth in the EU.¹⁹

There have also been ideas of creating a *Euromortgage* or *Eurohypotec* which would be a security that would provide a minimum standardization of contracts, aimed at creating flexibility and transferability of real assets and facilitate better integration. Flexibility and transferability of real assets would in turn improve the prospects of a highly liquid pan-European secondary market for

¹⁴ See 'Capital markets and financial integration in Europe', Gertrude Tumpel-Gugerell, Member of the Executive board of the European central Bank, European Mortgage federation Annual Conference, Genval, 23 November 2004., p.2.

¹⁵ (COM (1999) 232).

¹⁶ 'Competitiveness and growth in the EU through the development of an integrated capital market and banking system', Charlie McCreevy, European Commissioner for Internal Market and Services, Institute of International Finance, Panel on "Regulation and Consolidation in the Financial Industry", Madrid, 1 April 2005.

¹⁷ Especially extensive is the research regarding how the liquidity in US Treasuries is an important factor in marketability regardless of the overall state of the economy. See for example *Liquidity, Maturity, and the yield of US treasury securities* and *Flight to liquidity premium*.

¹⁸ See Report: The integration of the EU Mortgage Credit Markets, p. 10.

¹⁹ See Report: The Benefits of a Working EU Market for Financial Services, p. 12.

mortgage securities.²⁰ The introduction of such an instrument would especially benefit the mortgage institutes in funding efforts.²¹ However, it is yet too early to say whether the efforts will lead to the materialization of such a security.

A further result from future integration of the European mortgage markets would be that acceptance of the Euro and Euro-denominated assets increases. This increased acceptance would subsequently lead to the EU economic area becoming a more powerful actor in the global capital markets.²²

In line with this, in the framework of overall harmonization efforts of the EU financial sector, secondary legislation creates regulatory benefits for covered bonds that will support demand for such securities. The gateway legislative piece, the so-called UCITS-directive²³ will be discussed below.

2.3 Swedish mortgage institutions

The Swedish mortgage market is dominated by five institutes, namely Nordea Hypotek, Spintab, SEB Bolån, Stadshypotek and SBAB. All except government-owned SBAB are subsidiaries to major banks, where Stadshypotek and Spintab are subsidiaries to Handelsbanken and Föreningssparbanken respectively.

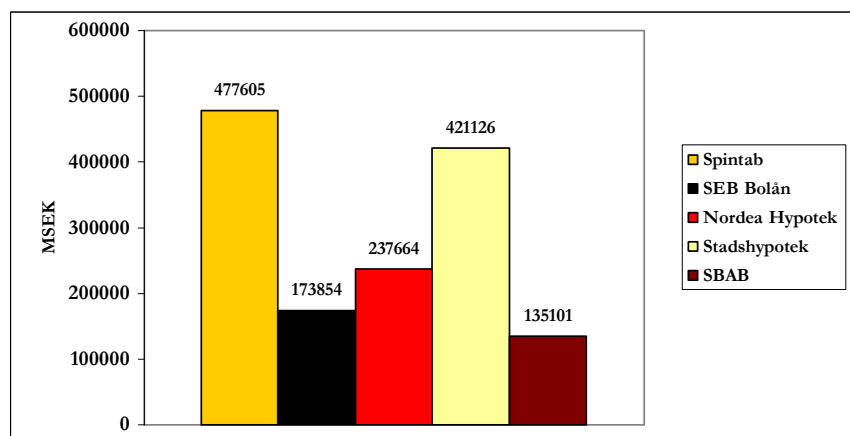


Chart 2.1 – Book assets of Swedish mortgage institutes 2004 12 31. Sources: 2004 Annual reports.

²⁰ See Report: The integration of the EU Mortgage Credit Markets, p. 30 and p. 60.

²¹ See Green Paper on Mortgage Credit in the EU, Brussels, 17.6.2005, COM (xxx) 2005, Commission of the European Communities, p.14, see also The Euro bond market study, ECB, December 2004 p. 22.

²² See Report to European Financial Services Round Table, p.13.

²³ Directive 85/611/EEC

Their lending constitutes approximately 95% of the volume of outstanding mortgage loans. Despite this concentration the competition in the mortgage market in Sweden is characterized as strong.²⁴ At the end of 2004 the dominant actors had around 1330 Bn SEK in mortgage loans outstanding.²⁵ Chart 2 shows the proportion of lending to different customer categories:

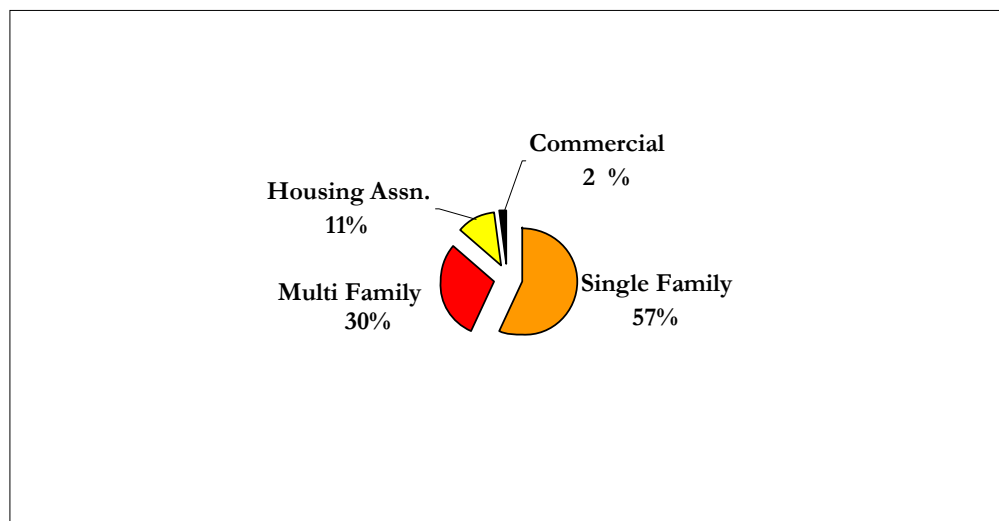


Chart 2.2: The distribution of mortgage institutes' lending. Sources: Bank och Finansstatistik 2004, Publ. Svenska bankföreningen.

2.3.1 Mortgage portfolio Loan-to-Value structure

The Loan-to-Value (LTV) structure of the mortgage institutes' portfolios is a critical factor in determining the upper bound of funding that can be obtained via the use of covered bonds. However, LTV-data is scarce which restricts our ability to draw any specific conclusions regarding how the statutory LTV limitations. In general, the portfolios are characterized by conservative LTV levels due to the two-tiered structure of mortgage products on offer.

A general "bottom" loan is generally offered for LTV levels below 75%, and a "top" loan for higher LTV levels up to around 95%. The "top" loan is generally offered at a substantially higher rate than the bottom loan inducing conservative LTV loans. However, over the past few years there has been a shift towards offering higher LTV lending as well as some market participants dropping the rate differential between "bottom" and "top" loans. This has led to an increase in LTV levels, but the increase has to some extent been mitigated by the strong price development of housing assets during the same period. The only publicly available source of LTV data is Spintabs annual report for 2003 which

²⁴See 'Euron och svensk bostadsfinansiering', Margareta Kettis, Lars Nyberg, Penning och valutapolitik 2/2000, Sveriges Riksbank.

²⁵ This figure does not include securitized assets which are off-balance sheet.

illustrates the proportion of lending in specific LTV ranges. According to this data slightly over 50% of the credits outstanding (slightly below 200 billion SEK) are secured by property within the 0-30% LTV range, while a negligible proportion lie above 75% LTV cutoff point permitted for covered bond collateral.

Lacking other data, this information will be used as an assumed blueprint for the credit portfolios of all mortgage institutes.

2.3.2 Financial structure:

To analyze the financial structure of Swedish mortgage institutes, we will take an average of the reports of the dominant market actors. In the interest of comparability we will exclude SBAB due to its different ownership and financial structure. The resulting composite balance sheet and income statement will be referred to as the Average Bank-owned Mortgage Institute (ABMI). For further details of the composition of the ABMI, see Annex A.

As regards the financing of the significant bank-owned mortgage institutes the dominant funding categories and their distribution are illustrated in Table 1 as weighted averages.²⁶

Financing source breakdown:		% of total capital		
	Total capital:	Equity:	Debt:	Other liabilities:
2004	100,00%	4,29%	92,28%	3,43%
2003	100,00%	4,48%	91,23%	4,29%
2002	100,00%	4,55%	91,75%	3,70%
2001	100,00%	4,80%	91,18%	4,03%
2000	100,00%	5,03%	89,97%	5,00%
FIVE YR AVERAGE:	100,00%	4,63%	91,28%	4,09%

Table 2.1- Average bank owned mortgage institute: Breakdown of financing. Sources: Annual reports 2000-2004

As can be seen, the ABMI is largely financed through interest-bearing debt

We can also note that in the five-year period the ABMI has decreased its reliance on equity financing. However, in absolute terms the equity of the ABMI has increased by 17% since 2000. The relative decline can be explained by the fact that total book assets have increased more, 38% in total. To expand the analysis, the following table illustrates the breakdown of debt of the ABMI.

²⁶Data regarding SBAB is thus excluded from this chart.

Financing source breakdown:		% of total debt						
	Total Debt:	Parent:	Other credit institutes:	Securities: Total	Bonds	Certificates	Others	Subordinated debt
2004	100,00%	32,13%	2,11%	65,76%	52,20%	13,54%	0,53%	0,00%
2003	100,00%	24,47%	0,35%	75,18%	57,57%	17,20%	0,90%	0,00%
2002	100,00%	27,02%	1,55%	71,43%	53,73%	17,35%	0,91%	0,00%
2001	100,00%	31,63%	1,08%	67,29%	50,26%	16,56%	1,12%	0,00%
2000	100,00%	28,53%	0,89%	70,52%	56,31%	13,02%	1,41%	0,06%
5-YR AVG:	100,00%	28,76%	1,20%	70,04%	54,01%	15,53%	0,97%	0,01%

Table 2.2 -Average bank owned mortgage institute: Breakdown of debt financing. Sources: Annual reports 2000-2004

In addition to the credit from the parent listed in the table, banks also have minor holdings of debt securities and subordinated debt issued by their mortgage institutes.

Potentially, parent bank funding is an important factor to take into account when analyzing the implications of conversion to, and future funding with, covered bonds.²⁷ The position of the parent as a creditor is impaired by a conversion to covered bonds, indirectly increasing the risk for the parent's investors.

Under the simplified assumption that the financing the mortgage institute obtains from the parent is drawn pro rata from the financing sources of the bank, as explained in Annex 2, it results in the following breakdown of ABMI financing:

Sources	Share of parent financing	Share of assets
Deposits	40,7%	13,8%
Credit institutes	20,6%	7,0%
Issued securities	19,9%	6,7%
Subordinated debt	3,1%	1,0%
Non-interest bearing	12,0%	4,1%
Equity	3,8%	1,3%
Total	100,0%	33,9%

Table 2.3: Origin of parent financing. Sources: Annual reports 2000-2004

As we see, approximately 15 % of the ABMI is funded through the parent's financial debt and equity.

The outlook for the mortgage institutes composing the ABMI have improved gradually over the studied five-year period, as can be illustrated by some improvement in their issuer ratings. The following table gives snapshots of the long- and short-term issuer ratings in 2002 and 2004.

²⁷ See the mortgage institutes' annual reports 2000-2004. The opposite, i.e. financing channelled from the mortgage institutes to parent banks appears to be very limited and will as a consequence be disregarded.

	Long		Short	
	2004	2002	2004	2002
Handelsbanken	AA-/Aa1/AA-	A+/Aa2/AA-	A-1+/P-1/F1+	A-1/P-1/F1+
Stadshypotek	AA-/Aa1/-	A+/Aa2/-	A-1+/P-1/-	A-1/P-1/-
FSB	A/Aa3/A+	A/Aa3/A+	A-1/P-1/F1	A-1/P-1/F1
Spintab	- /Aa3/AA-	- /Aa3/AA-	A-1/P-1/F1+	A-1/P-1/F1+
Nordea	A+/Aa3/AA-	A+/Aa3/AA-	A-1/P-1/F1+	A-1/P-1/F1+
Nordea Hypotek	-/Aa3/-	-/Aa3/-	A-1/P-1/-	A-1/P-1/-
SEB	A/AA3/A+	A-/A2/A+	A-1/P-1/F1	A-2/P-1/F1
SEB Bolån	- / - /A+	- / - /A+	- / - /F1	- / - /F1

Table 2.4 –Issuer ratings of Swedish banks and mortgage institutes (Standard & Poor's/Moody's/Fitch)²⁸

2.3.3 Mortgage bond market:

The Swedish mortgage bond market is the third largest in Europe,²⁹ with a volume outstanding of approximately 720 Bn SEK at the end of 2004.³⁰ The institutes currently issue straight mortgage bonds.³¹ They are secured against their aggregate balance sheet rather than against specific mortgages. The institutes issue *on tap*, meaning that they fund when need arises. The Swedish mortgage bond market consists mainly of benchmark bonds. These are characterized by their large outstanding volume for any given issue, which gives them strong liquidity.³² The underlying liquidity is supported by the dominating mortgage institutes through repurchase agreements with market makers, thereby creating artificial depth and liquidity in the markets.

The major investors in mortgage bonds are Swedish insurance companies³³, pension funds and mutual funds as well as financial companies/banks, with foreign investors accounting for an increasing proportion.³⁴ With the introduction of covered bonds demand from central banks as well as institutional investors outside the EU is set to increase.³⁵

²⁸ Sources: Annual reports. The earlier reference point has been chosen as 2002 as it is the first year that all companies have obtained a rating from at least one institute. Changes before that are limited to the Nordea ratings upgrades (from A+ and F1 respectively) by Fitch in 2001.

²⁹ 'Economic activity and housing finance in Sweden', Lars Nyberg, Deputy Governor of the Sveriges Riksbank, "EuroCatalyst Investment Focus: Nordic covered bonds", Frankfurt, 4 June 2004.

³⁰ Mortgage institutes' annual reports 2004.

³¹ So-called senior unsecured bonds with fixed coupons and bullet maturities.

³² Speech: Lars Nyberg at HSB Bank, 8th of November 2000, p. 6.

³³ Swedish insurance companies held 210 Bn SEK in mortgage bonds on March 31 2005. Thus they hold almost 30% of the outstanding volume. Source: Statistics Sweden.

³⁴ In 2000 foreign ownership amounted to 20% with around 16% of investments from the USA and Japan and 4% of investments from European investors. See 'Swedish housing financing and the EMU', Lars Nyberg, Deputy Governor of the Sveriges Riksbank, Economics Day held at HSB Bank, Stockholm, 8 November 2000, p. 6.

³⁵ Presentation: Euromoney Covered Bonds Forum, slide 9.

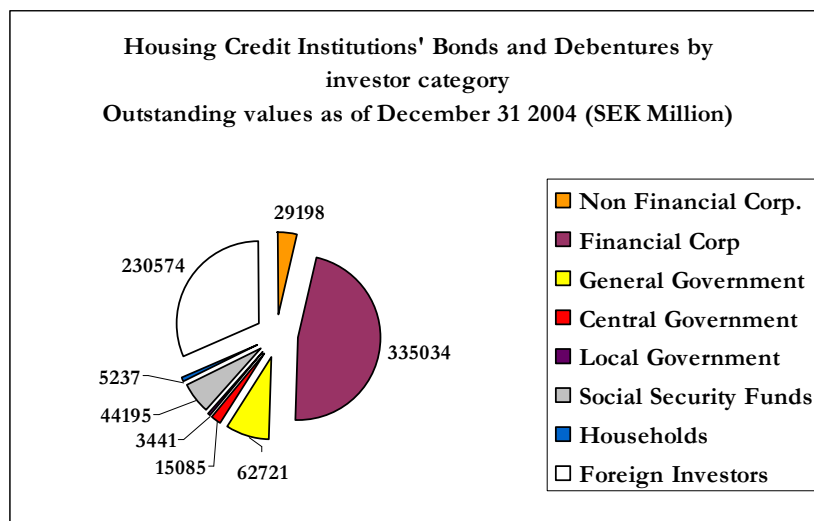


Chart 2.3: Investment in mortgage bonds by investor category year end 2004. Source: Statistics Sweden

2.3.4 Development of the mortgage bond spread:

As can be seen from the chart below, following a period of turbulence during the financial crisis in the early nineties the yields on Swedish treasury and mortgage bonds have declined more or less steadily over the last ten years. Further, they appear to move closely together, with no dramatic sustained shifts in level between the securities.

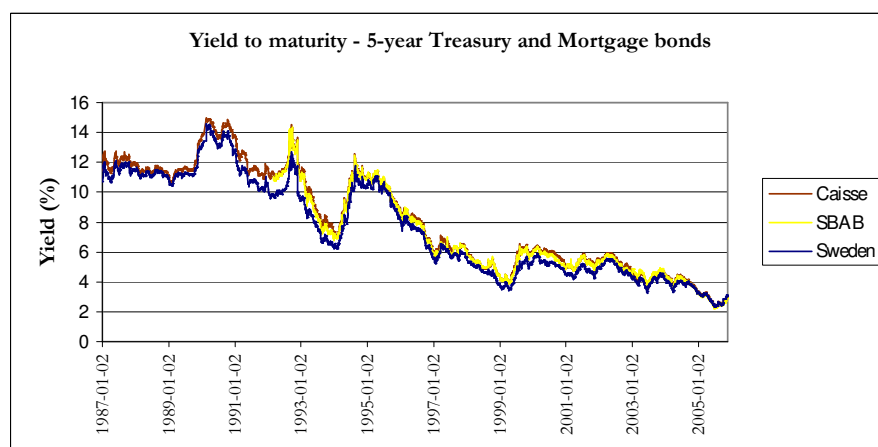


Chart 2.4 5-year Treasury and Mortgage bonds. Sources: Bank of Sweden

As illustrated below, the difference in yield between a mortgage bond with approximately five years remaining until maturity and a treasury bond with a similar maturity, the mortgage spread, appears to be at a historical low, having recently dropped below the levels of the late 1980's.

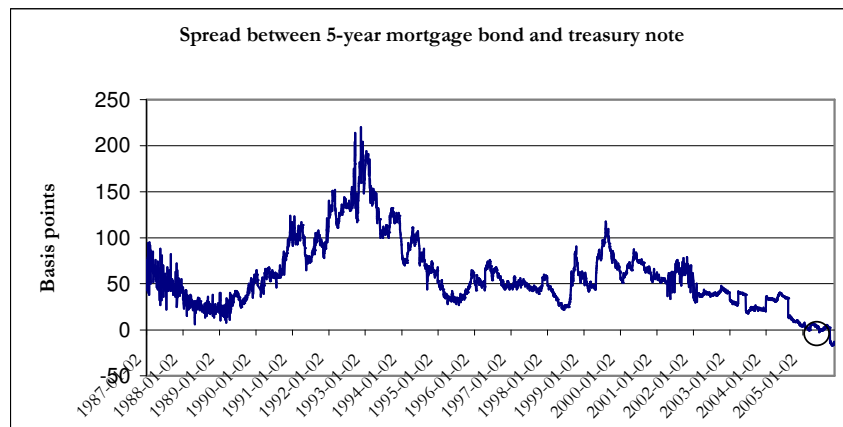


Chart 2.5 Spread between 5-year Treasury and Mortgage bonds. Sources: Bank of Sweden

One surprising conclusion that may be drawn is that, for the first time in the period for which data is available, mortgage bonds appear to be requiring lower yields than corresponding treasury bonds. However, this conclusion is at least partially false, due to the way data is compiled. The bonds used to calculate the five year bond market rates are chosen so that their remaining maturity is as close to five years as possible. This gives rise to mismatches that impact on the market yields, for instance the maturity mismatch between the bonds used from 2004-08-16 to 2005-09-30 is approximately nine months³⁶, while a new treasury bond with a maturity date of 2011-03-15 is used from 2005-10-01 and onward. The effect, illustrated with a circle in the chart, can be seen as a dramatic decline of the spread, from 2 to -13.5 basis points. Similar shifts can be seen throughout the data series.

As a consequence, while the chart above may be indicative of the general trend, a comparison between bonds with similar maturities may be more informative when the aim is to isolate the effects of the covered bond reform. This is done for a selection of bonds with similar maturities below.

³⁶ Caisse bond with a maturity date of 2009-03-18 and a treasury bond with a final maturity of 2009-12-01

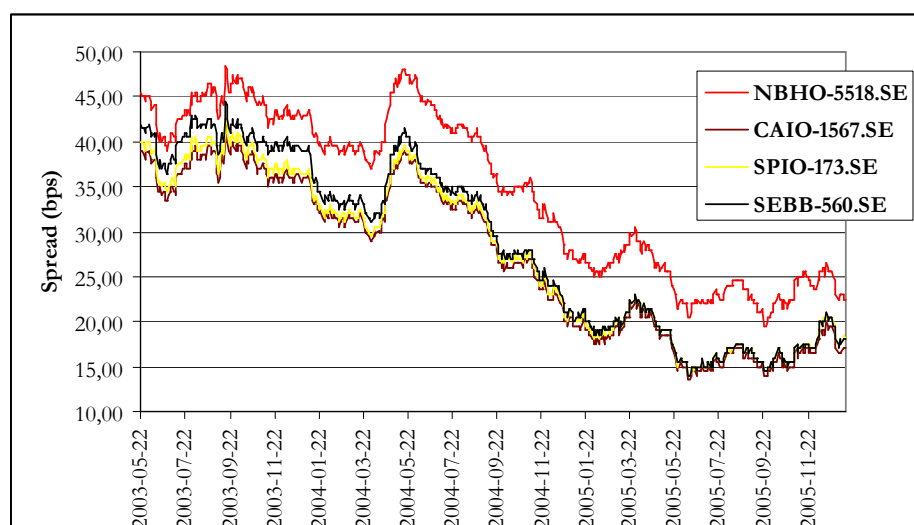


Chart 2.5 – The development of the mortgage bond - government bond spread since 2003. Sources: SIX Trust

Bond	Issuer	Coupon rate	Issue date	Maturity	Outstanding volume(KSEK*)
NBHO-5518.SE	Nordea Hypotek	4.50	2003-03-19	2008-09-17	27 500 000*
CAIO-1567.SE	Stadshypotek	6.00	2002-06-18	2008-06-18	15 387 000
SPIO-173.SE	Spintab	5.00	2002-06-18	2008-06-18	17 130 563**
SEBB-560.SE	SEB Bolån	4.75	2002-06-18	2008-06-18	8 426 000
SO-1040.SE	Sweden	6.50	1997-05-05	2008-05-05	56 783 000

*For Nordea Hypotek the disclosed amount is in kEuro

** Book value

Table 2.5 – Bonds used in Chart 2.5

The chart examines the mortgage spread over the period of time since the covered bond legislation was enacted in Sweden. As can be seen the yields on benchmark mortgage bonds issued by the different institutes are fairly similar and the spread against the comparable government security has tightened from around 40 bps to 15 bps between 2003 and 2005.³⁷

One reason for the tightening of these spreads is the demand for higher returns in the prevailing low interest rate environment.³⁸ Another reason is the shift by life insurance companies away from government bonds and into higher-yielding corporate bonds. Market participants cite the passing of the covered bond legislation as an important factor in promoting the decrease in the mortgage spread due to the expectation that outstanding bonds will be converted.³⁹

³⁷ See also, Financial Stability Report 2005:1, p. 7.

³⁸ See Euro bond market study, p.22, December 2004, ECB.

³⁹ Interviewee G, Interviewee E, Interviewee F, Interviewee B.

Analysts' estimates of the degree to which the tightening of this spread is due to the expectation of a conversion to covered bonds vary, as do the expectations as to whether these expectations have been fully discounted. The one quantified estimate that we have been given places this effect at around 10 basis points. The remaining tightening of the spread shown above, 15 basis points, would then be attributable to general market factors.⁴⁰

2.4 The covered bond legislation

2.4.1 The role of legislation

The existing national legislation determines to what extent securities can be collateralized by a limited pool of the issuer's assets in general, what assets may be used as collateral, as well as whether there are any conditions under which this collateralization will cease to be valid.

In other words, the legislation of the relevant jurisdiction will determine the degree of discretion the issuer has in determining the terms of the covered bonds to be issued, to what degree these bonds will distinguish themselves from straight non-collateralized bonds and what risks for non-recovery that exist in default.

Further, the legislation applicable to the issuer in relation to comparable foreign legislation will determine whether the "covered bonds" will be comparable to similar instruments internationally, which has implications for the level of standardization of the securities and hence the degree to which securities issued under different jurisdictions can be regarded as equivalents differing only in terms of maturity, yield and rating.

Finally, the terms of the legislation in relation to the legislation of potential investors will determine what indirect effects will occur for the investor. Such indirect effects will primarily be tax effects and capital coverage requirements for financial sector companies.⁴¹

⁴⁰ Interviewee I and Interviewee A.

⁴¹ As an example the Swedish Act (1994:2004) on Capital Adequacy and Large Exposures generally assigns a weight of 20 % to non-public debt securities. However, an exception based on EC law (Article 63 (2) of Directive 2000/12/EC, referring to the above-mentioned UCITS directive definition) makes bonds issued under the Covered Bonds (issuance) Act or "comparable" foreign debt securities subject to a 10 % risk weight. It can be assumed that a debt security sharing some, but not all, of the characteristics of a Swedish covered bond might not be considered "comparable", and hence not subject to the reduced risk-weighting provisions in the Act. As the Swedish rules are based on EC Law, similar provisions exist in all Member States.

This has three implications:

- 1) If the national legislation differs too much from legislation constituting the international norm (“dominant legislation”) securities established under it will not be considered substitutes, creating uncertainty for investors and hence lower demand for the securities.
- 2) If the national legislation awards investors better protection than the dominant legislation the issuer might not be adequately compensated.
- 3) If the legislation differs from the dominant legislation investors may be put in a different position with regard to capital coverage and tax effects, impacting demand.

2.4.2 The existence of a dominant jurisdiction

Since covered bond type products are primarily an EU phenomenon⁴² EC law must be considered dominant in the sense above. To the knowledge of the authors, the main pieces of relevant EC legislation are the various directives regulating various types of financial institutions. These rules will mainly consist of capital adequacy and large exposure rules of the type exemplified above. In other words, EC law sets the framework under which investors within the Common Market operate, and as a consequence creates the conditions that need to be met for a debt security to be treated as a covered bond for these investors.

As the directives are implemented in Sweden, legislation has been passed incorporating these provisions into Swedish Law.

However, as the Covered Bonds (Issuance) Act is an independent, non-EU piece of legislation incorporation of the directive provisions does not in itself determine the technical characteristics of covered bonds or their conformity to dominant legislation. It does however mean that Swedish financial institutions are bound by the same capital adequacy ratios and other rules as other EC companies. Hence, depending on conformity or non-conformity with dominant legislation, the same investor side effects will be realized for them as for other EC financial institutions.

⁴² By April 2005 legislation had been enacted in 17 member states and was in preparation in two more. As regards non-EC countries Switzerland, Norway, Russia, Romania and Bulgaria had enacted legislation, and Ukrainian covered bond legislation was in progress. See VDH presentation Dr Stöcker.

Further, the German pfandbrief-market is by far the largest and oldest market for covered bond type products. As a consequence it can be expected that investors are most familiar with bonds issued in accordance with German legislation, and German legislation can thus be considered dominant with regard to the attributes of covered bonds and the underlying collateral pool.

2.4.3 The role of ratings agencies in addressing differences in legislation

Covered bond issues are generally rated by one or more of the international rating agencies.

Unlike ordinary mortgage bonds secured without priority against the entire balance sheet of the mortgage institute covered bonds, due to the existence of and the priority of the bonds in the cover pool, have different conditions under which prepayment may be impacted on.

As a consequence a covered bond issue will need to be rated separately from the issuer.

The methodologies developed for covered bonds by rating agencies examines the national covered bond legislation in order to determine whether it allows for the creation of bankruptcy-remote cover pools and gives investors sufficient protection. This evaluation is done in the first stage of a ratings process.⁴³

To illustrate the Standard & Poor's ratings methodology approach "The legal framework is reviewed to ensure that it allows investors timely repayment of interest and principal in the issuing bank's insolvency",⁴⁴ whereas the Fitch Ratings methodology asks the initial question "Can the cover pool and related covered bonds survive the insolvency of the issuer?" which is said to be largely contingent on the legal framework.⁴⁵ Moody's Expected Loss methodology at least implicitly appears to take the same approach.⁴⁶

These approaches to the role of the legal framework appear to be largely similar, if with possible differences in nuances and emphasis.

Once this question has been answered affirmatively legislation appears to be disregarded, at least explicitly. Credit risks and the cash flow patterns are modeled and stress-tested to obtain the likelihood for timely repayment. This in turn gives the level of overcollateralization needed to obtain a certain rating. Hence, the rating procedure should control for certain differences in legislation. For instance, as the underlying asset portfolio will be evaluated, any differences relating to e.g. the minimum quality of the assets used as cover in the pool or differences relating

⁴³ Interviewee K

⁴⁴ S & P – Approach to rating European Covered Bonds Refined.

⁴⁵ Fitch Ratings European Covered Bond Rating Methodology

⁴⁶ Moody's Rating Approach to Covered Bonds.

to the types of asset permitted as cover can be assumed to be controlled through the evaluation of credit risk. Similarly, the treatment of liquidity facilities is to be taken into account in cash flow models.

The implication of this is that differences in legislation between countries are taken into account, and to a large extent neutralized, by the methodologies of the rating institutes. In turn this leads to the conclusion that for the purpose of comparisons between securities by the investor the rating of a covered bond is more important than the legislation under which it is created.

In particular, such requirements in a national legislation that aim at ensuring the quality of the collateral backing the covered bonds can be assumed to be largely irrelevant from an investor point of view, as the rating of the issue will evaluate the same criteria in a more detailed, and for the higher ratings desired more demanding way.

2.4.4 General characteristics

The Swedish Covered Bonds (Issuance) Act (2003:1223) enables banks and credit market undertakings⁴⁷ to issue debt secured by a pool constituting of mortgages and public sector claims. The Act states that in order for a company to issue covered bonds effectively it needs to be a bank or credit market undertaking as defined by Swedish law. It also needs to fulfill certain formal requirements. Finally, the interests of existing bondholders and other creditors need to be safeguarded at the initial covered bond issue. According to the act, existing bondholders need to be protected either through conversion into covered bonds or in an equivalent manner according to a plan approved by the SFSA. Other creditors are to be protected through the requirement that the issuer shows that its financial stability is not jeopardized by the issuance of covered bonds. Following the initial issue these requirements are no longer applicable. Presumably the rights of creditors are sufficiently protected by the publicly available knowledge that the institute is licensed to issue covered bonds.⁴⁸

In the case of issuer bankruptcy the pool is kept separate from the remainder of the issuer's estate to meet the bondholders' claims under the terms of the bonds, as well as claims from derivatives counterparties.

⁴⁷ Sw: Kreditmarknadsföretag.

⁴⁸ Interviewee L.

The cover pool will be dissolved according to the payment schedule of the bond, thus minimizing risk as regards timing of payments as well as the amount recoverable, while the remainder of the issuer's assets will be subject to ordinary bankruptcy procedures.

2.4.5 Supervision

As the companies that are permitted to take advantage of the legislation are under the scrutiny of the Swedish Financial Supervisory Authority the fulfillment of these criteria will fall under the general supervision of this agency. However, in order to guarantee transparency the Act provides certain covered bond-specific mechanisms, namely that a registry containing information on the bonds as well as on each individual credit used as collateral needs to be maintained, as well as additional information on public credits, substitute collateral and derivatives.

In order to ensure that the registry is correctly maintained an independent inspector is appointed for each issuer. This independent inspector is also supposed to monitor that the assets are assigned correct values and that the matching requirements are maintained at all times.⁴⁹

2.4.6 Areas of uncertainty

One area of uncertainty is how the initial transition from the existing type of mortgage bonds to covered bonds will be conducted. Part of this uncertainty relates to how the statutory requirements for obtaining an SFSA license for issuance of covered bonds are to be interpreted, in particular the provisions for the equal treatment of, and protection of, debtors.

The Act implicitly distinguishes between three creditor categories in these provisions.

- 1) The holders of debt securities that are to be converted.
- 2) The holders of debt securities that are not to be converted.
- 3) Other creditors.

Groups 1 & 2 are to be treated equivalently, whereas the relatively unimportant⁵⁰ “other creditors” category is to be protected by the existence of a plan subject to SFSA approval showing that their standing is not compromised. While this may be ambiguous, in practice the “equivalent treatment” criterion will be interpreted that other investors should “not have to suffer a significantly larger risk of non-payment” due to the conversion to covered bonds.⁵¹

⁴⁹ These independent monitors may be lawyers, accounting firms or real-estate consultants. Interviewee C.

⁵⁰ This group primarily consists of 1) trade creditors, who generally have claims that are both relatively short-term and small enough to be practically irrelevant for our study, and 2) the parent bank, which can be expected to waive equal treatment rights in order to not complicate the conversion. See the financial breakdown above.

⁵¹ Sw: ”Inte behöva tåla en väsentligt högre risk att inte få betalt.” Interviewee C.

In other words, it appears that some increase in risk without a corresponding increase in return would be accepted without violating the equal treatment and protection provisions.⁵²

One remaining question mark relates to the ability, following the bankruptcy of an issuer, of the administrator in bankruptcy to ensure that liquidity in the collateral pool is managed to meet the outflows necessary to service the payments on covered bonds. Our interviews⁵³, as well as a legal opinion on the Covered Bonds (Issuance) Act by a leading Swedish law firm indicate that the powers of the administrator in bankruptcy are to some extent limited under Swedish law.⁵⁴ To the extent that this is true the consequences are that adequate arrangements need to be provided in advance through direct overcollateralization of the asset pool and/or higher costs for liquidity facilities arranged pre-bankruptcy. See below for a discussion of liquidity management as a potential source of creditor conflict.

A concluding remark regarding the sufficiency of the protection awarded investors by these arrangements can be made. In theory a situation may occur where the real estate market contracts, forcing the issuer to exclude proportions of the cover pool that no longer fulfill maximum LTV requirements. Simply put such an issuer would not have a sufficient level of higher-quality assets, thus creating an under funded cover pool prior to bankruptcy. Such a pool would apparently be dissolved when bankruptcy occurs, reducing recovery rates and disrupting contractual payment schedules.

When confronted with this scenario interviewees point out that it is highly theoretical, and that no structure can protect sufficiently against apocalypse scenarios.

One interviewee, asked about sudden declines in asset prices of 15-20% maintains that the portfolios are of sufficient strength to prevent this from causing a problem.

Further, the continuous turnover of the credit portfolio that occurs ensures that an inflow of mortgages marked to recent property values will occur, allowing for a continuous substitution of assets in the collateral pool. Thus the consensus among interviewees is that the scenario outlined above is a largely hypothetical problem.⁵⁵

⁵² Related to this are practical matters that must be solved so that conversion to covered bonds to be possible, involving for instance to what extent consent of bondholders is required for conversion, how such consent is to be obtained, to what extent the terms of outstanding bonds will be (or in the case of for instance default clauses and other covenants that would interfere with the post-bankruptcy collateral pool) renegotiated.

As all these matters except for the question regarding renegotiation of terms are in substance practical concerns, only impacting initial issue costs, they can be disregarded.

⁵³ Interviewee G, Interviewee K and Interviewee L.

⁵⁴ See Legal opinion on covered bonds, Vinge Advokatbyrå KB, available from www.bankforeningen.se.

⁵⁵ Interviews with mortgage institute representatives and the SFSA.

2.4.7 Transparency

Despite the fact that the cover registry is at least partially a mechanism supposed to guarantee transparency it is not kept public, and is as a consequence not accessible for the bondholders. This means that, barring additional information provided by the issuer, the bondholder will have to accept the SFSA conclusions at faith.⁵⁶ In our interviews this fact has been subject to some criticism.⁵⁷ Certain mortgage institutes have also expressed the intent to provide as much additional information regarding the asset pool as is possible.⁵⁸ It can also be noted that the SFSA themselves in their reply to the draft legislation expressed the opinion that the registry should be made public. The final decision making the registry non-public information was based on protecting the integrity of information concerning individual customers and their mortgages.⁵⁹

2.4.8 The dominant legislation revisited

How does the Swedish Covered Bonds (Issuance) Act compare to German legislation and to the exceptions in EC law giving covered bonds preferential treatment?

To begin with the simpler of these questions, the question of conformity with EC law, bonds issued under the Act appear to fulfill the criteria of UCITS 22(4).

This is stated to be the intention of the legislator and is confirmed by independent sources such as the VDH. Further, from a review of the UCITS definition all criteria appear to be fulfilled.⁶⁰

As a consequence EU investors will be able to treat investments in covered bonds issued under the act according to the preferential rules that apply to covered bonds in UCITS and other directives. This can be expected to have a beneficial effect on demand for the debt securities of Swedish mortgage institutes. The more important consequences of this will be examined later.

The main differences between Swedish and German legislation (as well as a few other European jurisdictions) are examined in Annex B. As can be seen they are primarily of such nature that they are controlled for by credit ratings, and hence they should be potentially considered more or less equivalent by the investor as regards the protection awarded by the covered bond structure.⁶¹

⁵⁶ It is stated in the preparatory works of the Act, *Govt. Bill 2002/03:107* p. 78, that the registry is kept non-public out of concern for the personal integrity of the mortgage holders, whose mortgages are included in the pool.

⁵⁷ Interviewee H.

⁵⁸ Interviewee J

⁵⁹ Interviewee C

⁶⁰ To recapitulate, the UCITS criteria are the collateral pool, priority in this pool in the event of issuer bankruptcy and public supervision.

⁶¹ Obviously this does not translate into them being perfect substitutes regardless of issue currency, maturity etc. for each individual security, however the fact that the security is issued under Swedish rather than for instance German law should not matter to the investor.

3. Creditor expropriation and capital structure irrelevance

3.1 Credit risk for investors in Swedish mortgage institute debt

In comparison with the investor planning to hold an unsecured bond to maturity the investor in a covered bond issued under the Swedish legislation draws two direct benefits in the case of mortgage institute bankruptcy;

- Assuming the collateral pool is sufficient to match the covered bonds the bondholder will receive the full amount of both coupon payments and face value.
- Since the pool is maintained independently of bankruptcy procedures the bondholder is more likely to receive payment in accordance with the original payment schedule.

The receipt of full payment is obtained at the cost of remaining non-secured creditors, as full recovery for holders of covered bonds in a default situation results in a lower recovery rate for the non-secured creditors.

The following expression illustrates the recovery rate of creditors in the event of insolvency if the company is funded fully by unsecured debt.⁶²

$$\boxed{\text{Recovery rate}} = \boxed{1 - \text{LGD}} = \boxed{\frac{\text{Assets}}{\text{Bonds} + \text{Other Liabilities}}}$$

For the sake of brevity, from now on A will refer to the value of assets, B denote bonds and L other liabilities.

The following expression illustrates the recovery rate of unsecured debt and other liabilities when a proportion of assets is pledged as collateral, C, to the covered bonds. Initially we assume that C is equal to B, in other words the collateral is assumed to be equal to the par value of the bonds, the absolute minimum allowed for in the Act under ideal conditions.⁶³

$$\boxed{1 - \text{LGD}} = \boxed{\frac{A - C}{L}} = \boxed{\frac{A - B}{L}}$$

⁶² Equity is the primary absorber of losses and will as a consequence have to be erased in order debt holders to suffer a loss, i.e. for bondholders to enjoy a less than 100% recovery rate.

⁶³ See Annex B

As has been discussed above, in order to realize the second advantage, that of timely post-bankruptcy payment the pool must not only have sufficient assets, but also to be able to provide liquidity at the time of bond payments. In other words, given the likely scenario of a less than perfect match of duration of assets and liabilities the collateral pool must also contain provisions to achieve continuous liquidity. This will result in costs for the administrator of the pool, and hence create a requirement for additional assets to support the pool. This charge on the pool will be referred to as C(L).⁶⁴

Similarly any other mismatching of collateral assets and covered bonds, such as in currency, will give rise to further collateral requirements, C(C), further undermining the position of other creditors in bankruptcy.

$$\boxed{1 - \text{LGD}} = \boxed{\frac{A - C}{L}} = \boxed{\frac{A - (B + C(L) + C(C))}{L}}$$

Under circumstances where the collateral pool consists of a cross-section of the assets of the issuer⁶⁵, a pool that barely meets all statutory criteria would have same capacity to service debt and would be forced to default under exactly the same stresses as the issuer. It would then obtain approximately the same rating.⁶⁶

As a consequence, in order to obtain a higher credit rating for the covered bonds, rating agencies can be expected to require further collateral to use as “shock protection”. The overcollateralization demanded by rating agencies is defined as: OC[Rating].

$$\begin{aligned} \boxed{1 - \text{LGD}} &= \boxed{\frac{A - C}{L}} = \boxed{\frac{A - (B + C(L) + C(C) + \text{OC(AA)})}{L}} \\ \boxed{1 - \text{LGD}} &= \boxed{\frac{A - C}{L}} = \boxed{\frac{A - (B + C(L) + C(C) + \text{OC(AAA)})}{L}} \end{aligned}$$

⁶⁴ As mentioned above, this cost should be higher on expectation depending on the possibility to manage liquidity post-bankruptcy.

⁶⁵ In reality, given the quality requirements of assets this does not entirely reflect the truth. As appears to be the case from the overview of mortgage institute assets above the limitation on commercial property will not be a binding constraint. 2 % of the outstanding volume of mortgages in Sweden is used to finance commercial property, while the Act allows for a share of 10 %. Also, the fact that mortgage institutes provide loans exceeding the permitted LTV level means that at these assets will not be represented in the pool. However, as both these facts reinforce our argument they can be safely disregarded.

⁶⁶ Disregarding subsequent asset substitution.

To clarify, a higher rating requires more OC and invariably a lower recoverable amount for residual claimants.⁶⁷ A rating of AAA requires a larger overcollateralization than, for instance, the lower AA-rating. Similarly the $OC(AAA) > OC(AA)$ and the relationship between overcollateralization and residual recoverable amount is illustrated by the following expression⁶⁸;

$$\boxed{\frac{A - (B + C(L) + C(C) + OC(AA))}{L}} > \boxed{\frac{A - (B + C(L) + C(C) + OC(AAA))}{L}}$$

To summarize, the following factors can be believed to impact on the expected recoverable amount of unsecured debt in the case of default. If market pricing of risk is efficient and the change in recoverable amount is substantial the factors below should also influence any observable effect on the issuer's cost of unsecured debt in line with the Miller-Modigliani proposition:

- Degree of covered bond financing (Covered bonds to assets ratio)
- Degree of mismatching between terms of incoming and outbound cash flows.
- Cost to ensure liquidity matching
- Currency mismatching of assets and liabilities
- Cost of exchange rate swaps
- Desired rating of covered bonds
- Rating of issuer⁶⁹

These factors could be used to estimate a regression model for the loss given default, but the approach is practically limited by the fact that no defaults of covered bonds have occurred historically. However the overall impact can be illustrated in simplified terms using a two-period bond valuation model, in which there is a probability of default, $P(d)$, at $t=1$ that the mortgage institute's assets will decrease dramatically in value, triggering a bankruptcy.

⁶⁷ This residual will be returned to unsecured creditors at the dissolution of the estate. Given the uncertainties surrounding this, the fact has been assumed away in our calculations.

⁶⁸ It can be noted that there are differences in rating methodology, the so-called notched approach taking the issuer's rating as a starting point versus structured approach which practically exclusively looks at the cash flows of the pool. In practice, assuming a base-case where a cross-section of existing assets are used as collateral, reinforcement coming from either more credits or higher-quality credits, the structured approach should lead to an implicit weight being assigned to the quality of the originator's credit portfolio. As a consequence, both methods should in practice relate the amount of overcollateralization required to the relation between originator rating and desired rating of the covered bonds.

⁶⁹ As determined by asset quality, capitalization and similar factors.

$$\text{Bond value} = \frac{B * ((1-P(d))+P(d) * (1-LGD))}{(1+r)}$$

Using the ABMI balance sheet, and modeling an event that results in a 20% decrease⁷⁰ in asset values and subsequently causes the institute to enter default⁷¹, the recoverable amount of different debt categories without covered bonds will be:

ABMI Balance sheet				Defaulting ABMI Balance sheet				Recovery:
Assets:	100%	Credit institutes	31,60%	Assets:	100%	Credit institutes	26,41%	83,58%
		Bonds	48,17%	Loss:	-20%	Bonds	40,26%	83,58%
		Certificates	12,49%	Total:	80%	Certificates	10,44%	83,58%
		Other Debt	0,49%			Other Debt	0,41%	83,58%
		Other Liabilities	2,97%			Other Liabilities	2,48%	83,58%
		Equity	4,29%			Equity	0,00%	0,00%
		Total	100,00%			Total	80,00%	80,00%

Table 3.1 – Recovery rates prior to conversion.

The new financing situation following the issue of covered bonds of course does not change the fact that equity is the initial loss absorber, and will be consumed before creditors face a decline in recovery rates. Further, the collateral pool will be maintained as a unit in the bankruptcy. Hence, the collateral pool is removed from the asset side of the balance sheet, and the covered bonds from the financing side. In this case, with the added assumption that the degree of overcollateralization required to maintain the statutory matching criteria as well as to obtain an AAA-rating for the covered bonds is 5%, the recovery on different sources of financing will be:

Covered bonds				Recovery:	Δ Recovery
Assets:	100,00%	Credit institutes	19,57%	61,93%	-21,65%
- cover	50,58%	Bonds	48,17%	100,00%	16,42%
Loss:	-20,00%	Certificates	7,73%	61,93%	-21,65%
Total:	80,00%	Other Debt	0,11%	61,93%	-21,65%
		Other Liabilities	2,03%	61,93%	-21,65%
		Equity	0,00%	0,00%	0,00%
		Total	77,61%	77,61%	-2,39%

Table 3.2 – Recovery rates after conversion, OC + C(C) + C(L) = 5 %.

⁷⁰ This assumption is in line with the general drop in house prices reported by Statistics Sweden (SCB) during the crash of 1991-1993. In the case of a similar event the 20% drop in house prices does not directly translate to a 20% drop in the value of the mortgage institutes' assets. However, if the drop would be 10% the loss experienced for the different creditors would still hold, with an effect on yields differing only in magnitude from the ones illustrated in this section.

⁷¹ Of course, a drop in asset prices alone will not cause a mortgage institute to enter default. The trigger would be that a large number of homeowners default on their loans.

From this point, the probability of default-weighted bond valuation model can be used to explore the relationship between overcollateralization of covered bonds and yield to maturity of a 6-month zero-coupon for levels of probability of default corresponding to different Moody's long-term issuer ratings⁷², and hence the impact of a changing recovery rate on certificate prices.

$$\Delta \text{ Bond value} = \frac{B * ((1-P(d))+P(d) * (1-LGD_1)) - B * ((1-P(d))+P(d) * (1-LGD_2))}{(1+r)}$$

The following graphs illustrates the results, along with the effects extrapolated to five years as would be the case for a five-year zero coupon bond or a continuously rolled-over portfolio of certificates.⁷³

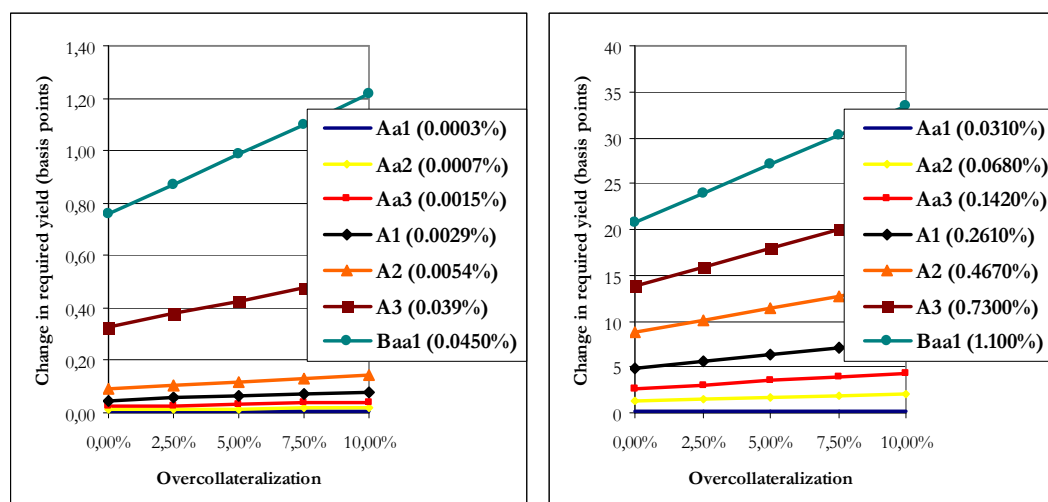


Chart 3.1 Changes in required return - 6 months and 5 years.

As we can see, the effect is fairly negligible for the six-month security. Only in the case of a P(d) corresponding to a Baa1 rating (a lower rating than any Swedish mortgage institute currently has) will an increase in required yield of one basis point be justified.

It can also be noted that in our example, the hypothesized 20% drop in housing prices occurs during one six month period, whereas during the early 90s the same decline took two full years.

⁷² As extrapolated from Moody's rating approach to covered bonds. This would correspond roughly to the issuer having this rating prior to conversion. Note that the 6-month probability has been reached through simple extrapolation, not compensating for the changing risk of a ratings downgrade. This only leads to a limited loss in precision, relatively speaking, as this risk can be expected to be limited and close to constant over a one year period.

⁷³ Note that due to the risk of ratings migration the 5-year probability of default does not correspond exactly to the 6-month probability.

Thus, barring the existence of compensatory provisions⁷⁴ for existing non-secured creditors at the time of conversion to covered bonds such creditors will be expropriated in favor of the holders of newly converted covered bonds.⁷⁵ Such provisions in the Swedish legislation have been discussed above. However, in practice these effects should be minimal as long as the only unsecured debt securities remaining are of short maturities.

In the following section, the potential creditor expropriation will be explored from another perspective, that of the Miller & Modigliani proposition of capital structure irrelevance.

3.2 The Miller & Modigliani proposition of capital structure irrelevance.

The Modigliani Miller framework in essence considers the cash flows from an asset discounted by an appropriate risk neutral interest rate to determine the value of the asset. In this framework the company cost of capital remains constant regardless of its financial structure. Any differences in the cost of financing sources will be reflected by an equivalent difference in risk, and vice versa. The original capital structure framework only considers a mix of straight debt securities and equity, but under the assumptions that are given it is possible to extend the financial structure of the model company to include additional classes of securities. Further, as shareholders' residual claim to the company assets is subordinated to all creditors risk-shifting between debt categories should not directly affect the value of the equity. As a consequence, under this limited view the cost of equity capital should be unaffected. This results in the following adjusted Miller & Modigliani expression:

$rD = C/D * rC + B/D * rB + Ce/D * rCe + O/D * rO$ D = Debt , C = Credit Institutes, B = Bonds Ce = Certificates, O = Other Securities
--

The M&M framework implies that the risks inherent in the variability of the cash flows from the firm's assets are all that matters. All other risks are at least implicitly assumed away. When applied

⁷⁴ See above for a discussion of the sufficiency of such provisions in the Covered Bonds (Issuance) Act.

⁷⁵ Alternatively, in a scenario of efficient markets and a fair price renegotiation of the coupon rate of covered bonds on conversion the covered bonds will be fairly priced, and the benefit will be captured by the equity holders. As will be discussed below, according to our interviews such a renegotiation is not envisioned by any mortgage institute.

to fixed coupon debt the only variability of cash flows are those caused by the default of the debtor.⁷⁶

In other words, when undertaking an analysis of debt financing under a partial M&M framework only default risk is relevant. Thus, under M&M any and all changes in yields or yield spreads are therefore fully attributable to the perfect functioning market adjusting discount rates or, equivalently, probabilities of default to new information. Under the M&M framework it would therefore be possible to isolate the changes in yields for different classes of securities and analyze them from the view that an equilibrium cost of capital exists.

3.3 Assumed parameters of the M & M identity

The basic financial structure of the mortgage institutes presented in tables 2.1 & 2.2 will be assumed to be held constant on conversion.

The consensus among most interviewees is that all outstanding mortgage bonds will be converted to covered bonds. As a consequence, all longer-term debt securities in the ABMI will be assumed to be converted. Therefore, the ratio of covered bonds to assets in the adapted M&M identity will be set to the pre-conversion ratio of bonds to assets in the ABMI balance sheet.

To determine the required return on covered bonds, the May 31 2005 yield to maturity on an outstanding mortgage bond will be used.⁷⁷ As our interviewees generally expect the market to already have discounted gains from conversion this return will be used as cost of covered bonds in the post-conversion identity.

The return used in the pre-conversion M&M identity can only be reached indirectly, by controlling for market factors not related to the anticipated conversion. To estimate an upper bound scenario, we will assume that the entire 25 basis point decrease of the mortgage spread is due to the prospect of an imminent conversion.

Using marked-to-market returns rather than historically reported costs is equivalent to assuming that the existing mortgage bonds will be bought back by the institute and new covered bonds will

⁷⁶ Floating rate debt securities will also be exposed to interest rate risk. This can be disregarded for the purpose of our analysis if the assumption is made that the reliance of fixed versus floating rate securities is unchanged by the switch from the current type of mortgage bonds to covered bonds. As the type of coupon can be exposed to be driven by the interest risk management needs of the company this assumption appears safe to make.

⁷⁷ Of course, using the observed return on a single bond on one specific day as an estimate for the post-conversion cost of covered bonds is a gross oversimplification and assumes away a great deal of important complications. Our justification for this is that the calculations are intended to be more of an illustrative example, and also that the actual cost of covered bonds used will not impact on the result to any great extent. Quite simple, some assumption needs to be made, and selecting a observed daily return from just before the covered bond applications occurred appears reasonable.

be issued, or equivalently that it is ignored that changes in bond financing costs will manifest gradually rather than immediately as outstanding bonds expire and new ones are issued. These timing aspects will be ignored as for our analysis the long run effects are more relevant.

Our interviewees doubt that conversion will have a noticeable effect on the required return of certificates. A partial reason is the low risk of default on a short-maturity security.

Our calculations above⁷⁸ appear to support this, however from a theoretical standpoint this may be an unsatisfactory explanation. Even small changes in the risk should impact on the required return of investors. We will examine two scenarios where the cost of other existing financing must be impacted in order for the Miller & Modigliani identity to hold.

- the price of short term debt is affected due to the increase in risk,(case 1)
- and the case reflecting the views of our interviewees, i.e. no reaction in the price of short term debt, (case 2).

For the “credit institutions” and other debt components the historical cost will be used in the pre-conversion identity. The post-conversion identity will be balanced either assuming even risk distribution (case 1) or “taking up slack” from certificates (case 2).

Extending the discussion, the possibility that risk might be transferred from covered bonds to equity might be touched upon. The analysis above makes the assumption that investors buy new securities of the same type on the maturity of their certificates. In reality, each roll-over period might see investors either choosing to invest elsewhere or demand a higher coupon. While this is of course the case regardless of whether the institute has issued covered bonds or not, the likelihood that certificate investors take the guaranteed payoff at the point of maturity instead of reinvesting can be expected to increase the riskier the reinvestment. As we have shown, the certificate recovery rates are lower and hence the default risk of the certificates higher in the institute issuing covered bonds than one only issuing straight bonds. Further, the extrapolation of the model to five-year bonds illustrates how this effect would appear for the longer term investor.

Given the existence of an “exit option”, in that investors will respond to adverse business conditions by refusing to contribute short-term financing or to do so at significantly higher rates,

⁷⁸ See 3.1.

the certificate-holders are to some extent protected from this risk, and as a consequence do not need to require a higher return immediately.⁷⁹

This refinancing risk will instead be borne by the equity of the company, and hence ultimately by the shareholders of the parent company.

Further, for institutes that must increase their reliance on short-term financing due to statutory requirements on collateral quality a larger proportion of the balance sheet will be exposed the risk of not being refinanced, or being so at higher rates.

However, the mortgage institutes generally do not face explicit required return targets, and the expectation of our interviewees is that equity will be unaffected. As a consequence and due to the lack of reliable benchmarks no potential effects on the required return on equity will be calculated.

	Total	Credit institutes	Bonds	Certificates	Others
Pre-conversion:					
-% of debt	100,00%	34,19%	52,11%	13,51%	0,19%
cost		2,18%	2,73%	2,21%	10,8%
Weighted cost	2,49%	0,75%	1,42%	0,30%	0,02%
Scenario 1:					
-% of debt	100,00%	34,19%	52,11%	13,51%	0,19%
cost		2,57%	2,48%	2,21%	10,8%
Δ cost		0,39%	-0,25%	0,00%	0,00%
Weighted cost	2,49%	0,88%	1,29%	0,30%	0,02%
Δ Weighted cost	0,00%	0,13%	-0,13%	0,00%	0,00%
Scenario 2:					
-% of debt	100,00%	34,19%	52,11%	13,51%	0,19%
cost		2,45%	2,48%	2,48%	11,05%
Δ cost		0,27%	-0,25%	0,27%	0,27%
Weighted cost	2,49%	0,84%	1,29%	0,34%	0,02%
Δ Weighted cost	0,00%	0,09%	-0,13%	0,04%	0,00%

Comparing these results with the projected effects based on our bond valuation models above, we can see that under the assumption that the Miller & Modigliani proposition of capital structure irrelevance is valid, we would see effects on the required return of other debt securities of a completely different magnitude than what our probability of default model proposes.

This discrepancy can partially be explained by the difference in assumptions.

⁷⁹ Compare with a puttable bond..

While the probability of default model makes rather conservative assumptions, the M & M calculations explore an extreme upper bound scenario in which the entire tightening of the mortgage spread is due to a prospective conversion to covered bonds.

These calculations will be returned to later, after a more reliable effect of the prospect of a covered bond conversion has been estimated.

However, to compare the results at this stage we instead assume a zero-recovery on certificates scenario in our bond valuation model, once again using a 5% total excess cover pool and a probability of default corresponding to an Aa3 rating. The result is an impact of 12 basis points on the required yield to maturity, less than half of what the M & M calculation gives. This would in turn, should the M & M proposition hold and the zero-recovery scenario be used, result in an estimated spread impact in the vicinity of 10 basis points.

4. Relaxation of the assumptions of M & M

The assumptions that the Miller & Modigliani proposition of capital structure irrelevance rely on must be relaxed in order to conform to the reality that the capital markets are not completely efficient in the sense their theory assumes.⁸⁰

The most fundamental and well explored violation of the M&M proposition is of course taxes.⁸¹ When considering the effects of taxes on the cost of financing it appears to be prudent to say that there is neutrality between the taxation of current Swedish mortgage bonds and taxation of covered bonds, both for issuers and for investors.⁸²

⁸⁰ Miller, Modigliani (1958) p. 268.

⁸¹ Miller, Modigliani (1958) p. 272.

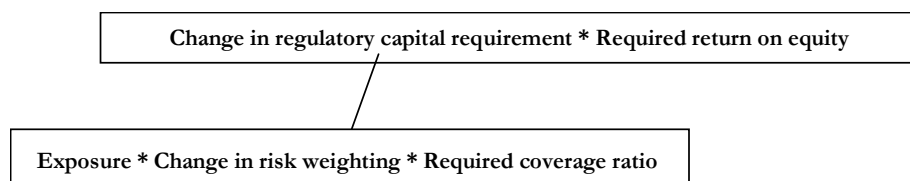
⁸² However, for certain categories of investors there is an interaction between tax aspects and the lower risk-weighting of covered bonds for the purpose of calculating minimum capitalization requirements, allowing a larger proportion of the enterprise to be financed through debt and hence allowing for larger tax shields. As a consequence investor demand for these securities will increase, potentially affecting the required return on covered bonds.

This effect will be studied below, for the moment it will suffice to establish that the existence of income taxes does not at this stage require an adaptation of our framework.

There are other factors that the Miller & Modigliani framework does not consider, and the influence of these factors may in turn differ between current mortgage bonds and covered bonds issued under the act. They should be considered as potential sources of value creation as they decrease the inefficiencies in the market. Such factors include, but may not be limited to:

- A decrease in required regulatory capital resulting in a lower investor opportunity/capital cost for holding the securities.⁸³
- A decrease in information asymmetries regarding the quality of the product.
- Increased demand at any given price, which may be brought about in several ways:
 - A wider investor base.
 - Inclusion in global fixed income indices.
 - A different regulatory treatment allowing the financial sector investors larger exposures.
- Liquidity, which can be expected to translate into a lower liquidity premium for investors.

The effect from the reduction in regulatory capital is relatively easy to estimate.



The exposure is equal to the total amount of mortgage bonds outstanding, 720 Bn SEK. A substantial part of investors are required to meet regulatory capital requirements⁸⁴. The required capital coverage ratio is 8 % of total credit risk exposure, and as we have seen the change in risk weighting is 10%. When assuming that the return on capital demanded by investors is 10% the required yield on the bonds decreases by 8 bps.

$$[\text{Exposure} * 10 \% * 8\%] * 10 \% = \text{Exposure} * 8 \text{ bps}$$

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⁸³ As created by the UCITS-conformity of the bonds as has been discussed above

⁸⁴ See “The mortgage bond market” section above.

This change in risk weighting could decrease regulatory capital in the order of 5.76 Bn SEK for the investors in covered bonds, given that all investors face this capital requirement

However, this matter becomes less straightforward when considering the new Basel II capital coverage rules, which are to be implemented by 2007. These rules will rely on more detailed rating of credit risks. As a consequence the regulatory capital requirement will also be a function of the actual default risk of the securities. In general, it can be said that as the impact of default risk on capital costs is assumed to be captured by the M&M identity by extending it to include cost of regulatory capital, it should following Basel II implementation be possible to incorporate these effects in the M&M identity.

However, aggregated industry regulatory capital coverage is projected to be the same following the implementation of Basel II. As a consequence, the contribution of regulatory capital from placements in covered bonds will be assumed to be the same.⁸⁵

In the following sections we review theories that explain the benefits that a covered bond delivers to issuers and investors. We would like to point out that while we have placed studies in certain sections, most could be placed in some or all other sections below due to the interaction and overlap between the phenomena studied.

4.1 Reduction in asymmetric information

The implicit assumption of costless information and perfect markets made by M&M is rarely observed in reality. Instead issuers and investors have access to different levels of information and costs for information acquisition.

First consider the object of potential investors' information acquisition, i.e. the nature of information necessary. As covered bond cash flows optimally are not affected by issuer bankruptcy the primary object of an investor's information production regarding the security should shift from the issuer's quality⁸⁶ to the quality of the subset of the issuer's assets

⁸⁵ Interviewee D

⁸⁶ The issuer's quality in turn depends on a number of factors, ranging from the quality of current assets relative their future composition as a consequence of macroeconomic factors, market structure, and internal procedures and quality control.

collateralizing the covered bonds. As the object of information production becomes more limited the information needed and the cost for obtaining such information becomes smaller.⁸⁷ Further, the lower bounds of this quality are regulated by law, meaning that a “static worst case”⁸⁸ can to some extent always be assumed. In other words, covered bonds can be assessed with a more limited set of information than straight debt and are as a consequence less information-sensitive.

Generally asymmetric information takes two forms:

Adverse selection occurs when there is uncertainty regarding the characteristics of the product for sale. To illustrate, uncertainty associated with assessing the quality of a good leads to deterioration of the market for the product. This is commonly associated with a lemons market as described by Akerlof.⁸⁹

In the context of our study adverse selection problems will impact directly on the level of security selection and pricing. Uninformed investors can be assumed to require a “lemons premium” to compensate for private information held by the issuer and more informed traders.

The second form of asymmetric information problem described in theory is that of moral hazard. A moral hazard problem occurs between contracting parties when an informed party performs actions that are not in the best interest of a less informed counterparty, thus taking advantage of superior information.

The existence of moral hazard will affect the post-issue behavior of the covered bond issuer. Potential moral hazard problems can, for instance, take the form of an expropriation of bondholders in favor of shareholders, or alternatively an expropriation of security holders in general in favor of management. Indirectly this will also impact on security selection and pricing.

A decrease in asymmetric information between issuer and investor, and between different classes of investors, can be considered to be a source of value. In the case of covered bonds relative straight mortgage bonds the decrease in asymmetric information can be attributed to the legal requirements facing a covered bond and the difference in security design between the two.

⁸⁷ Compare Moody's and S & P ratings methodologies for diverging views on to what extent the issuer-specific factors still need to be considered.

⁸⁸ I.e. the lowest quality the assets can have today.

⁸⁹ Akerlof, George A., 1970, 'The Market for "Lemons": Quality Uncertainty and the Market Mechanism', *The Quarterly Journal of Economics*, Vol.84, No. 3, 488-500

4.1.1. Review of theories on asymmetric information and contractual design

In a complete and perfect market, such as that of M & M, the financial structure of a company is irrelevant. Also, the design of a financial security could be deemed irrelevant in that context. In reality things are quite different. There have been numerous studies that in order to investigate phenomena related to contractual design come to discoveries regarding the impact of asymmetric information and incomplete markets on the optimal design of a security. In these studies they uphold all but one of the assumptions from the M&M framework, while the condition they investigate is relaxed.

In their study Allen and Gale⁹⁰ (1988) create a benchmark model where they, under symmetric information, take into account the incompleteness of markets in order to create a theory on how to design a security optimally. They incorporate transaction costs of issuing securities into their model in order to determine the optimal security design, and one of the most striking conclusions they arrive at is that optimal securities can create a strictly better allocation of risk for any positive issue cost than straight debt and equity. This in fact means that given transaction costs and different investor preferences there is a certain optimal security risk structure that appeals to specific groups of investors, creating value for the issuer by allocating payoffs to the group that values them the most.

Another study that focuses on demand driven security design under is that of Gorton and Pennacchi⁹¹. An important observation that they make is that if a firm issues securities that are sensitive to how informed the outside investor is compared to informed investors; equivalent to insiders, the securities may face a lemons problem. However, they show that if the firm issues risk free debt the problem could be alleviated and the firm would avoid paying a premium to “uninformed” investors, since the risk free security is insensitive to the information held by different types of investors. The risk free nature of securities also has the benefit of facilitating liquidity in the sense that uninformed traders do not face the risk of losses to informed traders. Covered bonds are not risk free, in the sense that some credit risk remains despite collateralization and corresponding high rating. As a consequence regulatory capital is still necessary for risk protection. They are generally considered less risky than a straight mortgage

⁹⁰ Allen, F., and D. Gale, 1988, ‘Optimal Security Design’, *Review of Financial Studies*, 1, 229-263.

⁹¹ Gorton, Gary, and George Pennacchi, 1990, ‘Financial intermediaries and liquidity creation’, *Journal of Finance*, 45, 49-72.

bond. The move towards a less risky asset could be a source of value creation in the sense that they become less information sensitive, and attract more uninformed investors.

Boot and Thakor⁹² take the discussion regarding security design a step further by discussing how under rational expectations, a security's design with regards to information sensitivity affects its marketability and pricing by investors. They, in contrast to the previously cited studies focus on the supply side of security design and their model aims to maximize the information content of the equilibrium prices, which in turn determines the issuer's revenue. They argue that a partitioning of cash flows into different securities, or tranches of a single security, enhances the value of the cash flows, as it makes informed trade more profitable. In essence their results show that an informed investor will earn a higher return on information investment by allocating his wealth to the information sensitive tranche of the security. Their study provides a theoretical explanation for the rationale for securitization previously only found in practical literature.

Building on their own previous research and that of others DeMarzo and Duffie⁹³ create a model describing the tradeoff between the lemons problem and the effectiveness of securitizing cash flows. Their results indicate that the optimal design is created ex ante to minimize the expected ex post cost of asymmetric information. They show that the most important factor in determining marketability is not the level of risk inherent in the assets backing the security but rather how information sensitive the cash flows are. Their model indicates that debt will be chosen exactly due to its lower sensitivity to information. They also show that there is an advantage in issuing standardized securities along the lines described in Gale⁹⁴, as familiarity with a security type decreases the costs for gathering information.

Jenkinson⁹⁵ expand the theoretical framework regarding security design by empirically investigating and identifying the rationale of tranching. Their most important findings are that tranching is not only dependent on aspects regarding asymmetric information. How the tranching is executed is also dependent on market conditions such as segmentation, market incompleteness and post-issuance liquidity.

⁹² Boot, A., and A. Thakor 1993, 'Security Design', *Journal of Finance*, 48, 1349-1378.

⁹³ DeMarzo, Peter, and Darrell Duffie, 1999, 'A Liquidity Model of Security Design', *Econometrica*, Vol. 67, No.1, 65-99.

⁹⁴ Gale, D., 1992, 'Standard Securities', *Review of Economic Studies*, 59, 731-756.

⁹⁵ Jenkinson, Maciej Firla-Cuchra, 2004, 'Security design in the real world: Why are securitization issues tranching?'

Repullo and Suarez⁹⁶ discuss the optimal mix of informed and uninformed financing of a firm and show that a mix of both is preferred in order to uphold a credible threat of liquidation. The credibility of a threat to liquidate a mortgage institute is conceivably small for unsecured bondholders, and it can be argued that the negative effects of being incapable of employing such a threat is somewhat counteracted by the secured nature of covered bonds. Thus, through collateralization, investors in longer-term debt securities are compensated for not having the exit possibility that investors in short-term debt have.

In the Francois and Morellec⁹⁷ study on bankruptcy procedures a discussion regarding the uncertainties of payoffs in default is a central theme. Their study is relevant in this context since an essentially risk free security backed by both legal and contractual documentation to secure the claims of creditors, such as a covered bond, is less susceptible to renegotiation when the debtor is in distress compared to straight mortgage bonds. The result is a smaller amount of uncertainty for all investors, and hence they are inclined to demand a lower yield.

These theories and their implications are directly linked to the theories on securitization. A securitization is tranching to fit specific investor needs and to maximize the benefits of both informed and uninformed investors. In such a pool the highest priority tranche and the lowest priority tranche are those that are least and most sensitive to the investor's level of information respectively and investors will invest in what suits them the best. If one applies the rationale of securitization to covered bonds there are striking similarities between the covered bonds and the top priority tranche in a securitization.

To apply the discussion above to covered bonds, the following characteristics serve to reduce their information sensitivity:

- Standardization; covered bonds vary significantly only in easily observable characteristics such as coupon, maturity and rating.
- Supervision; between the activities of the Financial Supervisory Authority, the independent supervisor and the separate rating of covered bond issues extensive information will be equally accessible to all potential investors.

⁹⁶ Repullo, Rafael, and Javier Suarez, 1998, 'Monitoring, Liquidation, and Security Design', *The Review of Financial Studies*, Vol.11, No. 1, 163-187.

⁹⁷ François, Pascal, and Erwan Morellec, 2004, 'Effects of Bankruptcy Procedures', *The Journal of Business*, Volume 77, Number 2.

- Collateralization; as has been discussed the existence of collateral in itself reduces the scope of information necessary.

Hence covered bonds give rise to smaller adverse selection problems as the benefits for informed traders such as market participants and insiders decreases. In turn the decrease in uncertainty regarding quality stimulates demand from uninformed investors, subsequently facilitating liquidity.

The control of moral hazard aspects of asymmetric information is taken care of through the contractual design by limiting the possibility and benefits to the borrower of renegotiating or entering strategic default while the credible threat of liquidation is upheld.

Under the assumption that investors are aware of the theoretical benefits of covered bonds in relation to unsecured bonds the signal of issuing covered bonds might then be interpreted by investors as a sign of quality.

4.2 Demand

The practical extensions to the highly theoretical studies reviewed above will now be examined along with some studies supporting that there are tangible benefits for Swedish institutes to issuing covered bonds over straight mortgage bonds.

4.2.1 Wider range of investors

A factor that has been stressed in our interviews, as well as in the preparatory works of the Act is the access to a larger and more diversified investor base. There are two mechanisms that are brought forward that might contribute to this effect.

One is that in comparison with the current mortgage bond, covered bonds may be more in conformity with the placement rules of institutional investors as well as more in line with their preferred habitat in terms of risk and maturity.⁹⁸ For instance, investors required to invest at least a certain proportion of their assets in AAA-rated bonds or in pfandbriefe and comparable securities can not hold current Swedish mortgage bonds in that part of their portfolio.

Second, given the increased similarity with the widely accepted pfandbriefe, investors will be more familiar with the security. This will, it has been proposed, lead to easier investment decisions and hence easier acceptance. In practice the Swedish covered bonds will be increasingly

⁹⁸ A discussion about preferred habitat theory can be found in “Information content of the term structure of interest rates, p.8, Browne, Frank, and Manasse, Paolo, 1989, “Information content of the term structure of interest rates”, Working paper No. 69, OECD Department of Economics and Statistics.

viewed as “EU-standard covered bonds”. Further benefits resulting from this harmonization are that the high demand for mortgage securities from investors outside the EU can be met and leads to higher prices for EU Mortgage bonds.⁹⁹ Non-EU institutional investors have historically been dissatisfied with mortgage securities displaying too much variety in structure between states/domiciles, making it difficult and costly for them to determine how to invest and how to best achieve diversification.¹⁰⁰

This is very much in line with the theoretical models reviewed above regarding benefits of security standardization as well as how uninformed investors choose to act when the security is information insensitive, namely they will be more inclined to invest.

4.2.2 Inclusion in indices

Another, more indirect, factor cited to improve demand for Swedish covered bonds compared to the current mortgage bond is the inclusion of the former in a larger number of bond indices focusing on European covered bonds as well as inclusion in global bond indices. To name but a few, Lehman Brothers, MSCI, and iBoxx operate such indices.¹⁰¹ This is more a result of the standardization of the bond product across the EU, which has led to the mortgage market becoming a more important factor in the EU-financial market, than a stand alone result of Swedish participation.

The intuition behind the statement that inclusion in indices leads to higher demand is supported by numerous studies conducted on how the price of securities react on announcement of index inclusion. Dhillon and Johnson¹⁰², Pruitt and Wei¹⁰³ and Masse et al.¹⁰⁴ among others have examined the phenomenon of price increases related to inclusion in indices. They have all found that there is a sustained price effect not in line with the efficient markets hypothesis, due to inclusion. There have been some attempts at explanation and relevant explanations that stand out are; the price effect is attributable to the increased demand from index funds on inclusion thus

⁹⁹ Effectively the price increase is identical with a lower required yield on a security.

¹⁰⁰ Speech Gertrude Tumpel Gugerell, Member of the ECB Executive Board, 23rd of November 2004.

¹⁰¹ See ‘Investing in Europe’s central asset class; an investors perspective and potential issues of asian markets’ - Robert Parker, Vice President Credit Suisse Asset Management, Euromoney Covered Bonds Forum, Tokyo, 7 June 2005.

¹⁰² Dhillon, Upinder, and Herb Johnson, 1991, ‘Changes in the Standard and Poor’s 500 List’, *The Journal of Business*, Vol. 64, No.1, 75-85.

¹⁰³ Pruitt, Stephen, and K.C. John Wei, 1989, ‘Institutional ownership and changes in the S&P 500’, *Journal of Finance*, 44, 425-442.

¹⁰⁴ Masse, Isidore, Robert Hanrahan, Joseph Kushner, Felice Martinello, 2000, ‘The effect of additions to or deletions from the TSE 300 Index on Canadian share prices’, *The Canadian Journal of Economics*, Vol. 33, No.2, 341-359.

driving up liquidity, and that inclusion leads to closer scrutiny by investors thus lowering bid-ask spreads. These two explanations are intertwined.

The potential inclusion in an index is also contingent on other attributes of a specific bond issue. For instance, if an issue is denominated in SEK it can not be included in an index representing Euro denominated bonds. Given that the mortgage institutes issue SEK denominated bonds the demand surge will likely not be as strong as if Euro denominated bonds were to be issued. However, there are also advantages of issuing in SEK. The diversification away from the Euro is likely to appeal to some investors, as well as the fact that there are only a small number of issuers that would consider issuing in SEK, thus supporting demand.¹⁰⁵ Although it is difficult to give a numerical benchmark for the effect of index inclusion, it is reasonable to believe that it is a source of value creation.

4.2.3. Larger exposures

EC law, in the above-mentioned UCITS-directive, limits the degree of exposure an investment fund may have to a single individual issuer to 5 % of their funds. However, the directive contains an exception for covered bonds, allowing for exposures of up to 25 % if certain criteria are met. At least in theory this opens for an opportunity for investors to increase the weight of covered bonds in their portfolios. However, intuitively it appears unlikely that this 5 % limit is a binding constraint in the asset allocation decisions of investors, as they will likely wish to diversify more. As a result the introduction of this exception will have little or no effect on the demand for covered bonds thus not impacting price or yield in a significant way.

4.2.4 Stability of market – Contagion effects

Crises in financial markets are a reality that all investors face. A crisis in one market often gives rise to contagion effects, the crisis spreading to other markets and leads to severe drops in asset values, or similarly the required yield increases. The stated reasons for why this happens are many, but in particular the theories regarding flight to quality and flight to liquidity presented by Longstaff¹⁰⁶ and Vayanos¹⁰⁷ have special bearing when trying to isolate the benefits that covered bonds could be believed to enjoy compared to straight mortgage bonds in times of crises. These

¹⁰⁵ It is of course possible for investors to swap into different currencies, but at a cost.

¹⁰⁶ Longstaff, Francis, 2002, 'The Flight-to-Liquidity Premium in US Treasury Bond Prices', *Journal of Business*.

¹⁰⁷ Vayanos, Dimitri, 2004, 'Flight to quality, flight to liquidity and the pricing of risk', Working Paper 10327, NBER Working Paper series.

theories state that, during crises, investors tend to avoid investments that are illiquid and perceived as risky and instead invest in assets that are of higher quality and excellent liquidity. The most striking example being AAA rated sovereign- and treasury securities. Hence, during crises the demand for bonds of high quality and high liquidity will increase relative demand lower quality and less liquid bonds. This affects the premiums on assets with different risk profiles, favoring covered bonds compared to straight mortgage bonds.

Applying the theories on covered bonds would imply that they provide investors as well as issuers with a safer situation relative straight mortgage bonds during a crisis. The investor will be relatively better off with regards to the price development on assets held. The issuer will also be relatively well off as the demand for any new issues of covered bonds will be relatively high, if the need to issue more debt is pressing. As a consequence, all other things equal, a covered bond with a higher rating than an unsecured bond will experience a smaller yield increase than a traditional senior straight mortgage bonds during crises. The effect of a major crisis is illustrated by the changes in the Swedish mortgage spread during 1998 when LTCM and the default of several sovereigns such as Thailand and the Russian Federation created contagion effects that rippled through the global financial markets, as seen in the graph below.



Chart 4.1. This graph is based on the difference between a Swedish treasury security and a Handelsbanken Caisse bond of similar maturity. The Caisse bond is the base of the OMX-MORT Index which makes it a suitable benchmark for mortgage yields. Source: SIX Trust

4.3 Liquidity

Any improvement in liquidity from replacing straight mortgage bonds with covered bonds is to a large extent co-determined by the factors cited above regarding security design and demand increases. A theoretical interpretation of the change in security design is that the uninformed, liquidity trading will increase at the expense of informed trading. This would mainly be due to the decreased benefit of informed trading. Stated differently, the information sensitivity of the covered bond is lower than that of the straight mortgage bond leading to a lower liquidity premium, interpreted as the gain to informed traders, and at first glance a lower cost of debt for the mortgage institutes. Also, after conversion to covered bonds the demand for the securities is set to increase, in turn facilitating increased liquidity in the short-term but also in the long-run. The short-term, “on the run”, effects will disappear after any initial demand shock has subsided, whereas some long-term effect of increased liquidity is likely to remain inducing a lower liquidity premium. However this holds only under the assumption that all mortgage institutes will indeed convert into covered bonds. If all institutes do not convert it is unclear how the smaller volume in the two security classes will affect their liquidity. However, all interviewees have indicated that they will convert their outstanding bonds to covered bonds, though only three institutes have applied for a license at this point.

4.3.1 Review of theory on liquidity premiums

Amihud and Mendelson¹⁰⁸ essentially consider a liquidity premium a reflection of the value to investors of the option of liquidating their holdings before maturity. The liquidity spread is then considered to be a function of the traits of the security such as volatility and time to maturity as proposed by common option-valuation models such as the Black-Scholes formula as well as the transaction costs of liquidation (in Black-Scholes terms the strike price of the liquidation option). The studies of Amihud and Mendelson, as well as studies inspired by them, focus on the difference between the time to maturity of securities and their yield differential. As the transition from the current type of mortgage bonds and covered bonds can not be expected to result in any changes in bond maturities these studies do not provide direct guidance in explaining the differences between security classes. However, they do provide an insight into the drivers of the liquidity spread. As all parameters of the Black and Scholes formula except potentially transaction costs (or strike price) are unchanged the proper way to indirectly capture the liquidity component

¹⁰⁸ See Amihud, Yakov, and Haim Mendelson, 2000, ‘The liquidity route to a lower cost of capital’, *Bank of America Journal of Applied Corporate Finance*, Volume 12, Number 4 and Amihud, Yakov, and Haim Mendelson, 2001, ‘Liquidity, Maturity, and the yield of US treasury securities’, *The Journal of Finance*, Vol. 46, No.4, 1411-1425.

of the mortgage spread is to compare the difference in yields between liquid and illiquid securities of the same type sharing the same maturity and approximately the same volatility, controlling for the other factors of our model.

Examples of such studies are Koziol & Sauerbier¹⁰⁹, who model the determinants of liquidity spreads and test their model on the German Jumbo-pfandbrief market. In their study the average spread over corresponding government securities, controlled for credit risk and regulatory capital requirements is considered to constitute the liquidity spread. In the data set of the study the average liquidity premium for the period of Jan 2000-Dec 2001 is 19 bps.

The above-mentioned Mercer Oliver Wyman study¹¹⁰ compares spreads between on one hand the German jumbo pfandbrief market and government bonds, and the Danish mortgage bond market and government bonds on the other, resulting in an estimated liquidity benefit of 10-20 bps from creating an integrated EU mortgage bond market. However, while the Swedish covered bond reform can be expected to improve liquidity the end result will not be perfect integration with the jumbo pfandbrief market, because the difference in terms and structure of the different securities makes them less than perfectly interchangeable. As a consequence, such complete benefits as envisioned in the MOW study can not be expected to materialize as a direct consequence of the Swedish covered bond reform.

4.4 Discussion

The above empirical research and theories give the impression that any decrease in the mortgage spread can be explained by the correction of inefficiencies in the allocation and pricing of debt capital. All arguments seem plausible from a theoretical point of view. However, the question is to what extent these theories are applicable to the Swedish mortgage bonds, or in other words, whether the benefits that the theories referred to indicate might manifest themselves.

A starting point in examining this is to study how mortgage bonds are priced, and whether the steps that have been taken by some of our studied institutes have in fact been rewarded by the market when pricing their bonds. A fairly basic attempt at this will be done in the following section.

¹⁰⁹ Koziol, Christian and Peter Sauerbier, 2003, 'Valuation of Bond Illiquidity: An Option-Theoretical Approach', Working Paper 03-02.

¹¹⁰ Study on the financial integration of European mortgage markets, Low, Simon, and Matthew Sebag-Montefiore, European Mortgage Federation and Mercer Oliver Wyman p. 75.

5. Assessing the impact of the reform on the mortgage spread

As has been discussed in 3.1 and 3.3 above our interviewees have had conflicting opinions regarding how big an impact on the mortgage spread the prospect of a conversion to covered bonds has had. This section will attempt to assess the market response in two ways.

In section 5.1 the performance of the Nordea Hypotek NBHO-5518 and the Stadshypotek CAIO-1567 bonds will be examined in the time period at which the companies applied for a license to issue covered bonds, and in the Nordea Hypotek case, received one. This aims to uncover whether there has been an announcement effect on the spread versus government bond SO-1040 in reaction to the news.

In section 5.2 the spread between the same bonds will be examined over a longer period through a panel regression model. This study, which also includes Spintab bond SPIO-173, will attempt to control for other factors that might explain the spread differences, such as differences in rating and general market factors, as approximated by the return on SO-1040 itself.

As a starting point in this part of our analysis we will summarily examine the claim made by several interviewees that the mortgage spread is highly correlated with the return on government bonds, as well as how any such correlation has developed over time. The following graph, where $t=0$ is the time the Act was passed, illustrates the correlation between the bonds:

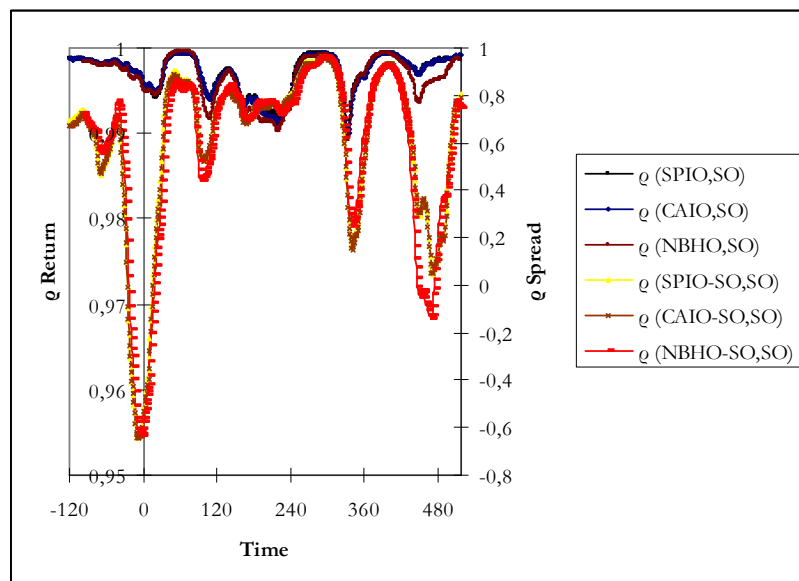


Chart 5.1 – 90-trading day rolling correlations between the bond return and spreads.

As can be seen, the correlations between the returns on the different mortgage bonds and the government bond remain close to perfect for the entire period.

However, the correlations between the spreads against the government bond and its return appear to be less stable, becoming negative for all spreads during the intervals ending around the time the Act was passed. A similar effect can be seen for intervals ending around the time of the Nordea Hypotek application and licence, being most pronounced for the Nordea Hypotek bond.

A similar examination of the spreads indicates that they too are strongly correlated, however with a slight decrease in correlation between the NBHO bond and the two others towards the end of the period.

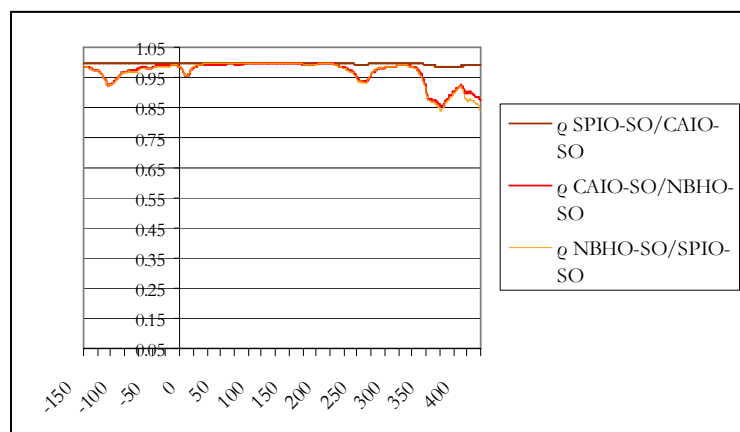


Chart 5.2 90-day rolling correlation - spreads between examined bonds and SO-1040

5.1 Announcement effects

The first significant event, $T(1) = 0$, that will be examined for the possibility of an abnormal spread reaction is the date when Nordea's application for a license to issue covered bonds was registered at the SFSA. While the application was filed on May 31st, it was not, to the best of our knowledge, accompanied by a press release, so the date when it became published in the daily SFSA itinerary will be used as the event date.

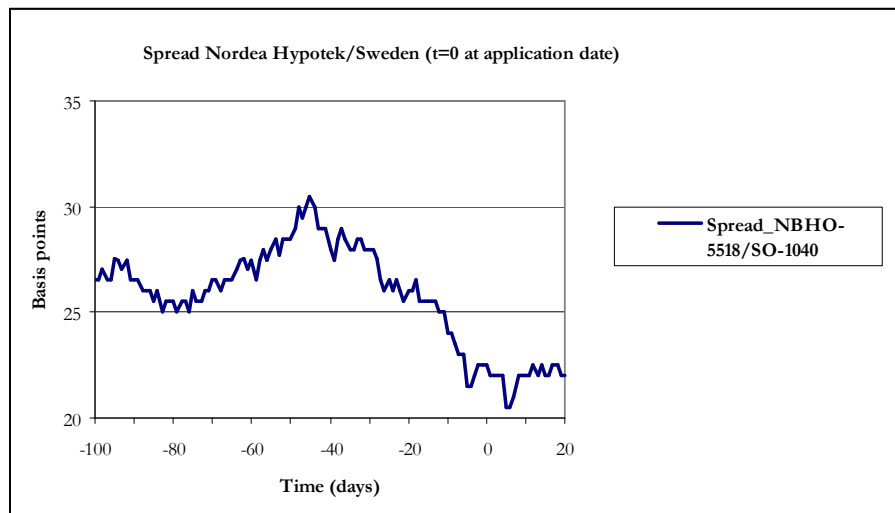


Chart 5.3 Spread Nordea Hypotek/Sweden ($t=0$ at 2005-06-02)

There appears to have been a spread decrease of roughly 1,5 basis points at $t = 5$, reversed at $t = 7$ & 8. However, at the event date the spread is unaffected.

The relationship between NBHO-5518 and the matched-maturity SPIO-173 is similar, with NBHO-5518 being priced consistently between 5 and 6 basis points above the Spintab bond.

Date	$t(l)$	Spread NBHO-5518/SO-1040	Δ Spread NBHO-5518/SO-1040	Spread NBHO-5518/SPIO-173	Δ Spread NBHO-5518/SPIO-173
2005-05-31	-2	22.50	0.50	6.50	0.00
2005-06-01	-1	22.50	0.00	6.50	0.00
2005-06-02	0	22.50	0.00	7.00	0.50
2005-06-03	1	22.00	-0.50	6.50	-0.50
2005-06-07	2	22.00	0.00	6.50	0.00
2005-06-08	3	22.00	0.00	6.50	0.00
2005-06-09	4	22.00	0.00	6.50	0.00
2005-06-10	5	20.50	-1.50	6.50	0.00
2005-06-13	6	20.50	0.00	6.50	0.00
2005-06-14	7	21.00	0.50	6.50	0.00
2005-06-15	8	22.00	1.00	7.00	0.50

The next development that might be worth examining is the application filed by Stadshypotek at September 14 2005, $T(2) = 0$. Unlike the Nordea application, this was accompanied by a press release publicized on the company website.

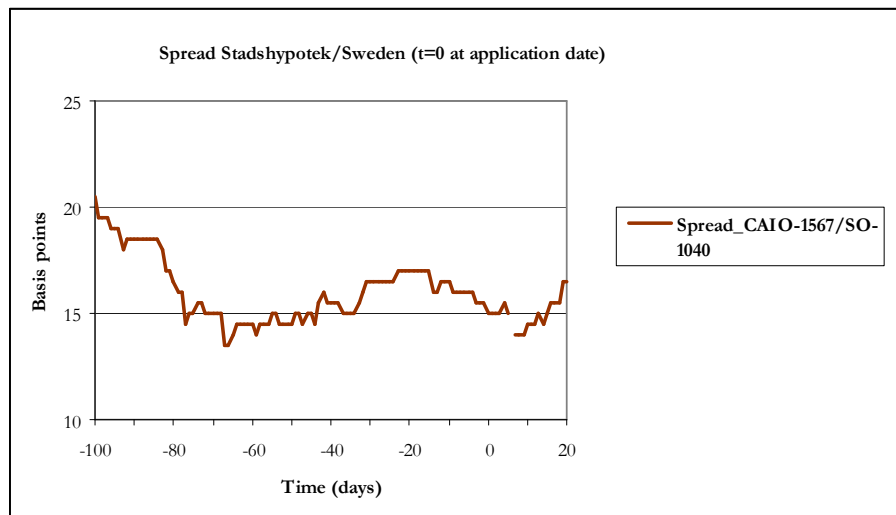


Chart 5.4 Spread Stadshypotek/Sweden (t=0 at 2005-09-14)

Once again, the conversion announcement appears not to have been accompanied by any significant spread reaction. While the spread against SO-1040 decreases somewhat at $t=5$ & 7 to climb again in the following period this effect is minor, a full seven days after the announcement and reversed in the following period. More or less the same pattern can be observed against SPIO-173.

Date	T(2)	Spread CAIO-1567/SO-1040	Δ Spread CAIO-1567/SO-1040	Spread CAIO-1567/SPIO-173	Δ Spread CAIO-1567/SPIO-173
2005-09-12	-2	15.50	0.00	-0.50	0.00
2005-09-13	-1	15.50	0.00	-0.50	-0.00
2005-09-14	0	15.00	-0.50	-0.50	0.00
2005-09-15	1	15.00	0.00	-0.50	0.00
2005-09-16	2	15.00	0.00	-0.50	0.00
2005-09-19	3	15.00	0.00	-0.50	0.00
2005-09-20	4	15.50	0.50	0.00	0.50
2005-09-21	5	15.00	-0.50	-0.50	-0.50
2005-09-22	6				
2005-09-23	7	14.00	-1.00	-0.50	-0.00
2005-09-26	8	14.00	0.00	-0.50	0.00

The final date, $T(3) = 0$, that will be examined is December 12 2005, when Nordea Hypotek was granted the license to issue covered bonds applied for in May. The SFSA decision was made public on their website the same day, and a press release was issued by Nordea.

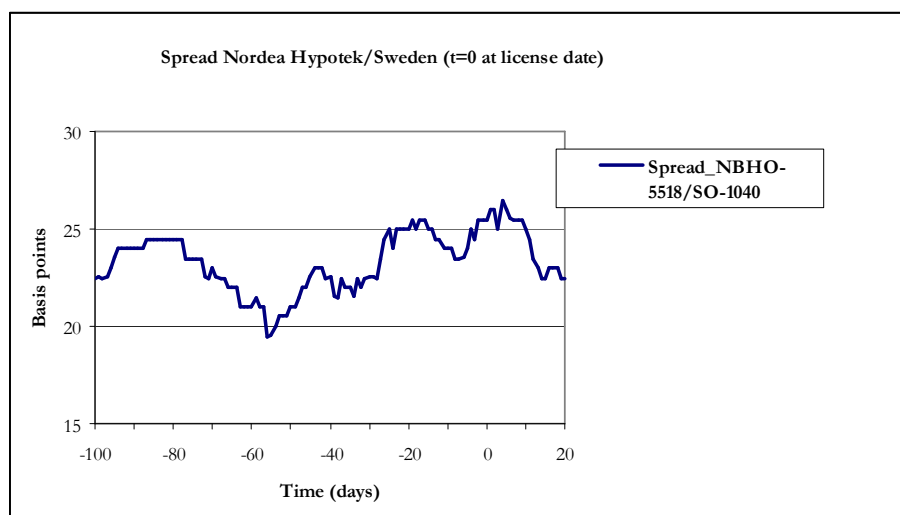


Chart 5.5 Spread Nordea Hypotek/Sweden (t=0 at 2005-12-12)

As can be seen, the situation resembles that on the previous dates. The spread against both bonds used for comparison remains fairly stable. In this case, the spread against the SPIO bond in fact increases on the event day, reversing a change from the previous day.

Date	T(3)	Spread NBHO-5518/SO-1040	Δ Spread NBHO-5518/SO-1040	Spread NBHO-5518/SPIO-173	Δ Spread NBHO-5518/SPIO-173
2005-12-08	-2	25.50	1.00	6.00	0.50
2005-12-09	-1	25.50	0.00	5.50	-0.50
2005-12-12	0	25.50	0.00	6.00	0.50
2005-12-13	1	26.00	0.50	5.50	-0.50
2005-12-14	2	26.00	0.00	6.00	0.50
2005-12-15	3	25.00	-1.00	5.00	-1.00
2005-12-16	4	26.50	1.50	6.00	1.00
2005-12-19	5	26.00	-0.50	5.50	-0.50
2005-12-20	6	25.50	-0.50	5.50	0.00
2005-12-21	7	25.50	0.00	5.00	-0.50
2005-12-22	8	25.50	0.00	5.00	0.00

In general, spread movements surrounding the announcement days appear close to non-existent, and do not warrant examining through a more rigorous event study.

5.2 The long-run impact of the covered bond reform

5.2.1 Variables included

To further examine the potential impact of the covered bond reform on mortgage spreads a panel regression is run. In doing this, we examine to what extent the mortgage spread has been impacted on by three events.

- The enactment of the Covered Bonds (Issuance) Act.
- The application by the issuer of a given bond for a license to convert.
- The granting of a license by the SFSA.

Further, we control for the following factors:

- The return on SO-1040 – as we have seen there is a high level of correlation between the return on this security and the spread of our studied bonds against it.
- Credit rating – we use Moody’s issuer ratings of the mortgage institutes, as three of the bank-owned mortgage institutes have obtained a Moody’s rating (see table 2.4).
- Difference in maturity – remaining time to maturity reasonably has an impact on the required yield. Any maturity difference must be taken into account to facilitate comparison.

Out of these control variables, the return on SO-1040 is somewhat problematic. It would be useful to also control for the decreasing remaining maturity, as the credit risk component of the spread can be expected to decrease over time. However, the inclusion of an additional time variable would cause collinearity issues, and hence one is excluded.

Variable name	Description	Expected sign
Spread_SO	The spread between the quoted day end YTM of the bond and that of SO-1040 (%)	N/A
Diffmaturity	Correction variable for differences in expiry (days)	+
Rating_Aa1 Rating_Aa2	Control dummies to capture any spread impact due to rating differences	-
Act Application License	Dummy variable to capture any market reaction for the specific events on individual bond level	-
Ret_SO	The quoted day end YTM of SO-1040 (%)	+

5.2.2 Data

The data on daily bond yields to maturity used for the dependent variable Spread_SO and the independent variable Ret_SO is daily quotes on SPIO-173, CAIO-1567, NBHO-5518 and SO-1040. All return data are obtained from SIX Trust and the series run from the first day Trust contains observations for all bonds, March 24 2003, to January 12 2005. One trading day, September 22 2005, has been excluded due to missing values.

The information used to determine ratings is obtained from the annual reports of the companies and, in the case of the Stadshypotek ratings upgrade, from the bank.

The information regarding the Act dummy is taken from the Covered Bonds (Issuance) Act.

Finally the information on Application and License dummies are drawn from press releases available on the company websites with the exception of the Nordea application, regarding which information has been provided by the SFSA.

5.2.3 Results and specification tests

As we have seen in chart 5.2. there is a strong correlation between the dependent variables of our cross-sectional observations.

As a consequence we test a regression correcting for cross-sectional correlation against one under the assumption of homoskedasticity. Calling the homoskedastic regression “basic” and the other one “correlated”, and performing a likelihood-ratio test to examine whether the increase in log-likelihood indicates the presence of cross-sectional correlation we get the following result:

Likelihood-ratio test

(Assumption: basic nested in correlated_AR1)

LR chi2(2) = 3545.67

Prob > chi2 = 0.0000

Further, a Wooldridge test reveals that autocorrelation is also present. Performing the test, STATA gives the following result:

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

Test statistic: $F(1, 2) = 2557.102$

Prob > F = 0.0004

Performing a second likelihood-ratio test between a regression with panel-wise correlation and a model with AR1 autocorrelation and a panel-wise correlation we obtain the following result:

Likelihood-ratio test

(Assumption: correlated nested in correlated_AR1)

LR chi2(2) = 5277.29

Prob > chi2 = 0.0000

Given these tests, the following regression appears to be the most appropriate one:

Cross-sectional time-series FGLS regression

Coefficients: generalized least squares

Panels: heteroskedastic with cross-sectional correlation

Correlation: common AR(1) coefficient for all panels (0.9602)

Estimated covariances	=	6	Number of obs	=	2118
Estimated autocorrelations	=	1	Number of groups	=	3
Estimated coefficients	=	8	Time periods	=	706
Wald chi2(7)	=	868.70			
Log likelihood	=	9115.733	Prob > chi2	=	0.0000

spread_so	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]
ret_so	.0392832	.0043091	9.12	0.000	.0308376 .0477288
act	-.0202383	.0054566	-3.71	0.000	-.0309331 -.0095436
application	-.0234984	.0057859	-4.06	0.000	-.0348386 -.0121581
license	-.020251	.0063905	-3.17	0.002	-.0327762 -.0077258
rating_aa1	-.0070633	.0022651	-3.12	0.002	-.0115029 -.0026237
rating_aa2	-.0062436	.0024845	-2.51	0.012	-.011113 -.0013741
diffmaturity	.0007368	.0000304	24.27	0.000	.0006773 .0007963
_cons	.170873	.0162433	10.52	0.000	.1390368 .2027093

As we can see, all coefficients are significant. However, it would appear that the impact of the covered bond reform is fairly limited. One puzzling result in particular is the relative size of the coefficients for the act, application and license dummies. Given the construction of the

regression these coefficients are not additive, indicating that the market has barely reacted to the applications of Stadshypotek and Nordea Hypotek, and somewhat negatively to the Nordea Hypotek license.

However, given that the confidence intervals for these dummies overlap the results are somewhat inconclusive. Nonetheless, as the upper bound of the confidence interval does not exceed zero the impact does appear to have been positive¹¹¹, albeit it has a very limited economic significance. This is in line with the expectations of our interviewees, and could possibly corroborate the idea that the market priced in conversion at an early stage of the reform.

Another result that is interesting is the size of the coefficients for our ratings dummies.

Compared to the Aa3 default, our regression indicates that the premiums added for Aa1- and Aa2-ratings are less than one basis point.

While this appears to be supported by data such as chart 2.5, or possibly even exaggerating the impact of credit ratings, the probability of failure calculations in section 3.1 indicate that the premium should both be larger and that the difference between them should be larger.

In our interview series the argument has been made that Swedish mortgage bonds are priced irrespective of issuer rating, as investors are not overly concerned by the small differences in default risk between the institutes. This would appear to be supported by our regression.

A possible explanation for the low impact of ratings differences might be a perception that Swedish banks and mortgage institutes are protected by an implicit government guarantee. During the financial systems crisis of the early 90's an Act was passed that provided a guarantee for all creditors of Swedish banks.¹¹² As a consequence, and in the light of the importance of a functioning banking system, there may be more or less legitimate expectations that the banks are “too big to fail” and that investors will be at least partially protected in the event of bankruptcy.

The by far most important coefficient is the one for Ret_SO, the return on SO-1040. Since the yield to maturity on this bond has ranged from 2.2 % to 4.2 % over the investigated period, the contribution of this variable to the mortgage spread has ranged from around 18 to around 10 basis points, or between half and three quarters of the spread.

¹¹¹ Or negative, depending on perspective. A smaller mortgage spread is a good thing, peeps!

¹¹² For a description of these events, see for instance Ingves, Stefan & Göran Lind, 1996, *Hanteringen av bankkrisen – sedd i efterhand*, *Penning & Valutapolitik* 1/1996.

This variable captures both the general interest level and the declining time to maturity, two very important factors determining the yield on a bond. As a consequence the fact that this is the dominant variable is not very surprising, but the fact that it together with the intercept eclipses the remaining variables is remarkable.

Finally, the sizable autocorrelation found to be present in our dataset is something of a mystery.

6. Conclusion

Given the results of the panel model, it would appear that the covered bond reform has had a very limited impact on the cost of financing through mortgage bonds up until today's date.

Why this might be is hard to say, but a few alternative hypotheses can be put forward.

The first is of course that no covered bonds have yet been issued, and that it is quite possible that investors are waiting until further details are made public. If this is the case, the majority of the benefits are not yet factored into the prize.

Most of the benefits mentioned in section four would be hard to put a price tag on in advance, but the change in credit risk might also be hard to properly assess until the mortgage institutes release the results of their discussions with the SFSA and the ratings agencies in the form of a tangible offer.

A second interpretation stems from the apparent indifference to issuer rating investors in Swedish mortgage bonds demonstrate, also indicated in section 5. Given that the main advantage of a covered bond is the enhanced position of the investor in the case of the issuer's default, a market that more or less dismisses the risk of default, or that of significant losses in the case of default, might not be inclined to reward a covered bond issuer. The non-quantitative benefits discussed in section four might still manifest themselves, but just as in our first hypothesis they have not been priced in at today's date.

Given that Nordea Hypotek has obtained a license and indicated that they will convert in the near future, which one of these interpretations is correct will hopefully be revealed in the near future.

Annex A: The Average Bank-owned Mortgage Institute

To properly analyze the financial structure of Swedish mortgage institutes, we have elected to attempt to create a weighted industry average balance sheet. This is done using accounting figures drawn from the financial reports of the institutes in the years 2000-2004.

- Year-end figures are used due to the lower level of disclosure in quarterly reports
- In order to focus on the dominating group of bank-owned mortgage institutes we exclude SBAB, which has a markedly different financial structure.
- When identifying the mortgage institutes' sources of financing, also taking into account the funding from credit institutions, regarding it as originating from the parent alone, and subsequently breaking it down on a pro rata basis.
- No relevant differences in the accounting treatment need to be adjusted for.
- Subordinated debt will be included in "other liabilities".

	Assets		Interest-bearing debt						Other liabilities	Equity
	Total		Credit institutes		Securities					
			Total	To Parent	Total	Bonds	Certificates	Others		
Spintab 2004	477605	438227	70022	69988	368205	285001	82935	269	20538	18840
- % of assets	100%	91,76%	14,66%	14,65%	77,09%	59,67%	17,36%	0,06%	4,30%	3,94%
- % of debt	100%	15,98%	15,97%	15,97%	84,02%	65,04%	18,93%	0,06%	N/A	N/A
SEB Bolån 2004	173854	162088	66322	66322	95766	70360	25405	0	3978	7788
- % of assets	100%	93,23%	38,15%	38,15%	55,08%	40,47%	14,61%	0,00%	2,29%	4,48%
- % of debt	100%	40,92%	40,92%	40,92%	59,08%	43,41%	15,67%	0,00%	N/A	N/A
Nordea Hypotek 2004	237664	219563	104175	104175	115388	111407	3972	0	7593	10509
- % of assets	100%	92,38%	59,92%	59,92%	66,37%	64,08%	2,28%	0,00%	4,37%	6,04%
- % of debt	100%	64,27%	64,27%	64,27%	71,19%	68,73%	2,45%	0,00%	N/A	N/A
Stadshypotek 2004	421126	389221	173572	148130	217690	164348	51301	2041	12856	19049
- % of assets	100%	92,42%	41,22%	35,17%	51,69%	39,03%	12,18%	0,48%	3,05%	4,52%
- % of debt	100%	100,00%	44,36%	37,86%	55,64%	42,00%	13,11%	0,52%	N/A	N/A
Average Bank-owned Mortgage Institute (ABMI)										
Total	327562	302275	103523	97154	198752	157779	40903	578	11241	14046
- % of assets	100%	92,28%	31,60%	29,66%	60,68%	48,17%	12,49%	0,18%	3,43%	4,29%
- % of debt	100%	100,00%	34,25%	32,14%	65,75%	52,20%	13,53%	0,19%	N/A	N/A

The identification of parent financing is intended to show what the sources of the financing channelled to the mortgage institute from the parent bank (and potentially directly or indirectly from the rest of the group) are.

To accomplish this, the liability side of the consolidated balance sheet is adjusted to "de-consolidate" the mortgage institute.

This is done in four steps:

1. The liabilities of the mortgage institute are deducted from that of the group. As the mortgage institute annual report includes financing provided from other group companies, while these are eliminated in the process of consolidating the group accounts this is done net of within-group financing.
2. However, step 1 results in a consolidated balance sheet with the contribution of the mortgage institute removed. This does not properly compensate for the elimination of group transactions. To do this, net financing is added back to the consolidated balance sheet once more.
3. The equity of the mortgage institute is eliminated from the consolidated balance sheet.

The result is an approximation of the passive side of the group balance sheet as it would look if the mortgage institute was a stand-alone company. This allows us to examine the financial structure of the remainder of the group, and as a consequence track the part of mortgage institute financing that is provided by the rest of the group to the ultimate sources.

When doing this, some further accounting differences between the groups need to be addressed, and some further adjustments need to be made to compensate for problematic results.

Currency aspects:

- The Nordea reports use Euro as their reporting currency. For comparison purposes all reports have been transformed into SEK using the market exchange rate available for 2004-12-31. However, between 2001 and 2003 the reports of Nordea Hypotek are in SEK. For the purposes of adjustments to the consolidated Nordea balance sheets these reports are converted using the exchange rate that has been used in consolidation, i.e. the respective balance date exchange rates.

Issued securities:

- The Statshypotek annual report does not contain any information on holdings of debt securities from group companies.
- SHB & SEB do not have an item called "other securities" in the notes to their annual reports.
- None of the annual reports studied provide information on how securities held within the group are distributed between different categories. As a consequence the distribution is assumed to be pro rata. However, for FSB/Spintab see below.
- The item "other securities" is reported to be higher for Spintab than in the consolidated statements in the years 2000 and 2004. No explanations to this can be found when

comparing the accounting principles used in preparing the Spintab and FSB reports. This situation appears to indicate a situation where some outstanding securities belonging to the company issued by Spintab are held by other group companies, and as a consequence are assumed to have been eliminated in the consolidated balance sheet. The balance is treated as a within-group financing. As a consequence, the passive side of the FSB balance sheet does not contain any “other securities”.

Annex B: The Covered Bonds (Issuance) Act in relation to other European covered bond legislation

Under the Swedish legislation the cover pool may be comprised of mortgages secured in property for residential, agricultural and commercial purposes not exceeding Loan-to-Value (LTV) ratios of 75 %, 70 % and 60 % respectively. Mortgages secured up to a 75% LTV in a share in a housing association¹¹³ are also permitted. Due to their more risky nature mortgages secured in commercial property are limited to a maximum of 10 % of the collateral pool.

Finally, debt secured in public sector credits may be included in the pool.

Additionally up to 20 % of the pool may be secured by assets (“substitute collateral”) that liquid and with a low-risk profile. In practice this means securities assigned with the lowest risk weightings in the Act on Capital Adequacy and Large Exposures, i.e. primarily government and municipal debt securities. The purpose of allowing such substitute collateral is stated to be to aid in liquidity matching as well as to create possibility for covered bond issues before the collateral already exists.¹¹⁴

Under certain circumstances, according to the preparatory works of legislation, primarily during the start-up phase of a mortgage institute’s business or during temporary liquidity problems higher risk substitute collateral may be permitted and/or up to 30 % of the pool may be secured by such assets. Such exceptions need to be endorsed by the SFSA.

¹¹³ Sw: Bostadsrättsförening

¹¹⁴ See preparatory works for Prop 2002/03:107, p. 72 f.

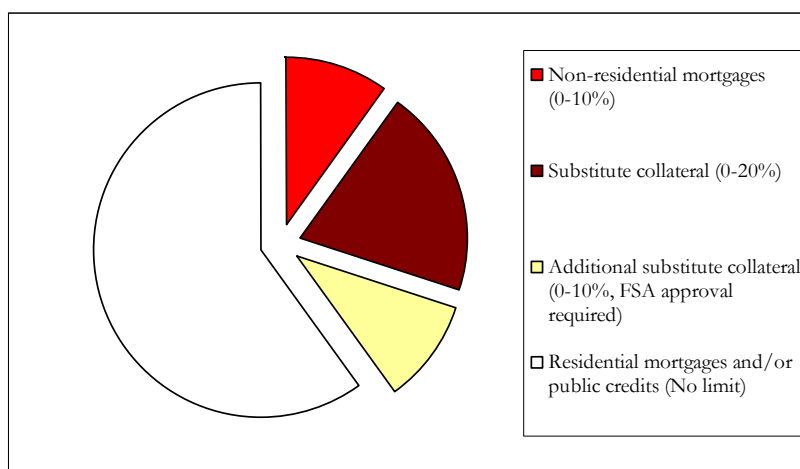


Chart A.1 – Allowed composition of the collateral pool.

In order for the pool of collateral to be effective in the bankruptcy of the issuer the following conditions are to be met in the construction of the pool as well as throughout its subsequent maintenance.

- In order for the UCITS directive exemption to be valid, the pool is to be matched in terms of nominal (“current”) values to the total face value of the bonds secured by the pool.
- Further, the terms of the mortgages and supplementary assets comprising the pool are to have such terms that a “good balance” with the terms of the bonds is attained. This is considered to be the case when the present value of the assets comprising the pool exceeds the present value of the bonds. For the purpose of attaining this “good balance” derivatives may be used. The treatment of such derivatives will be discussed below.
- Finally, the cash flows from the assets are at all times to be matched to the bond payments and other outbound cash flows in order to safeguard the liquidity of the pool.
- The SFSA Regulations and General Guidelines add certain stress tests controlling for market risks under which these conditions need to remain valid. First, the pool NPV needs to remain positive in the case of a sudden and sustained $\pm 1\%$ parallel shift of the swap rate curve. Second, the NPV must remain positive in the case of a 10 % sudden and sustained change in value of any currency that assets or liabilities are denominated in.

Minor short term deviations from these matching requirements are permitted, but in the case of a longer term deviation the pool is to be dissolved.¹¹⁵

	Sweden (pre-act)	Sweden	Denmark	France	Germany	Spain
Name of product	No legally protected term	Säkerställda obligationer	Realkredit-obligationer	Obligations Foncières	Pfandbriefe	Cedulas hipotecarias
Share of European mortgage bonds outstanding (End of 2003)	3,89%	N/A	14,89%	5,60%	67,97%	2,76%
Preferential right in bankruptcy	No	Yes	Yes	Yes	Yes	Yes
Funding limit through mortgages in pool	N/A	60/70/75% of property value	40/60/70/80/84% of mortgage lending value	60/80/100% of mortgage lending value/market value	60% of mortgage lending value	70/80% of mortgage lending value
Substitute collateral permitted in pool?	N/A	Yes	No	Yes	Yes	No
Limit to substitute collateral	N/A	20/30%	N/A	20%	10%	N/A
Cover register	No	Yes	No	No	Yes	No
Independent supervision	No	Yes	No	Yes	Yes	No
Special public supervision	Yes	Yes	Yes	Yes	Yes	Yes
UCITS	No	Yes	Yes	Yes	Yes	Yes

Table A.1 – Covered bond legislation for dominant jurisdictions. Based on ‘Comparison of Covered Bond Legislation in Europe’, Dr. Stöcker, Verband deutscher Hypothekenbanken, 8 April 2005.

As we can see, the Covered Bonds (Issuance) Act has brought the Swedish legislation closely in line with the dominant German legislation. Further, the principal differences are such that they will largely be controlled for by the ratings procedure, as has been discussed above.

¹¹⁵ It can be noted that the composition of the pool is not fixed. As long as the matching principles are met at all times substitutions into and out of the pool are permitted while the issuer is not bankrupt.

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- H Legal officer, Pension fund
- I Analyst, Parent bank of mortgage institute
- J Treasury, mortgage institute
- K Financial services analyst, Ratings institute
- L Partner, Law firm

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