

The Euro 4 Billion Gambling Loss and Failure of the Mortgage Bank AHBR

Clinical Study on Risk-Shifting and Accounting Manipulation*

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Abstract

This paper analyzes a prominent bank failure and examines if the events can well be explained by theories on risk-shifting. The EUR 4 billion loss and failure of the German mortgage bank Allgemeine Hypothekbank Rheinboden (AHBR) was caused by excessive interest rate speculations between 2001 and 2005 and is considered as one of the most dramatic failures of a German financial institution for the last 50 years. What makes the AHBR clinical study interesting are several puzzles about the role of shareholders, management, debtholders and the banking supervisor. The results of the analysis are the following: (1) The gambling strategy was ex-ante not in the interest of shareholders. (2) Management initiated gambling via off-balance sheet interest rate swaps because this allowed earnings manipulation. (3) Monitoring and market discipline was not efficient because loan officers wanted to avoid transparency and necessary write-downs. (4) The German banking supervisor did not stop the gambling. We argue that findings from this individual case are also relevant to other bank failures, such as those connected with the recent subprime crisis. This paper offers a better understanding of bank failures and effects of earnings manipulations, and raises new research questions.

JEL Classification: G21, G32

Keywords: Risk-Shifting, Accounting Manipulation, Clinical Study

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1 Introduction

This paper is motivated by recent bank failures that are characterized by excessive risk taking and lack of transparency. Excessive risk taking takes place when bank managers engage in risky transactions that yield high profits for shareholders and bonuses for management if it succeeds, but leave creditors and other stakeholders of a bank with losses if it fails. Recent examples are the failures of the mortgage bank *Allgemeine Hypothekbank Rheinboden* (AHBR) in 2005, and, in the context of the current subprime crisis, *IndyMac Federal Bank*, *Bear Stearns*, *Northern Rock*, *IKB Deutsche Industriebank* and the publicly owned *SachsenLB*.¹ Losses connected with these bank failures were in many cases concealed by opaque financial reporting. Accounting manipulations comprise both legal and illegal measures, and will occupy attorneys and courts with the current subprime losses in the years to come.

The objective of this paper is to analyze the EUR 4 billion gambling loss and failure of the German mortgage bank *Allgemeine Hypothekbank Rheinboden* (AHBR) in 2005, and the discussion of theoretical results from the literature on risk-shifting based on insights gained from the AHBR analysis. The failure of AHBR was caused by excessive interest rate speculation between 2001 and 2005, and is considered as one of the most dramatic failures of a German financial institution for the last 50 years.² The financial crisis of AHBR was closely followed by many German and international market participants and banking supervisors³ and finally led to the intervention of the German banking supervisor and the sale of AHBR to US private equity investor Lone Star in 2005. Based on the more descriptive part about the AHBR failure, the paper addresses the following research questions: (1) Was the gambling strategy in the interest of AHBR's main shareholders? (2) If not, why did management start a hazardous gambling strategy? (3) Why did monitoring and market discipline fail? (4) Why did the German banking supervisor not stop the interest rate speculations? As the AHBR crisis developed over several years from 2001 to 2005, the actions of shareholders, management, relationship banks, other debtholders and the banking supervisor, are relatively well documented.⁴

The results of the paper are detailed insights into the EUR 4 billion gambling loss and failure of AHBR. Furthermore, these insights have implications for theories on

¹Total assets for 2004 were: AHBR EUR 77bn, Bear Stearns EUR 188bn, Northern Rock EUR 92bn, IKB EUR 38bn, SachsenLB EUR 60bn, and by comparison, Deutsche Bank EUR 840bn. The more prominent banks that were affected by the subprime crisis, such as UBS, Citigroup, and Merrill Lynch, were able to tap the capital markets to acquire new equity.

²For market color about the AHBR crisis see e.g. Financial Times, October 25, 2005.

³The Deputy Governor of the Bank of England, Sir Andrew Large, named AHBR along with GM/Ford, Refco and Delphi in a speech about financial stability and liquidity risks at a conference in London in November 2005.

⁴Such an explicit analysis would not be possible for more recent bank failures such as Northern Rock, IKB or SachsenLB.

risk-shifting. The theoretical results of this paper are the following: (1) Risk-shifting is not in the interest of shareholders if shareholders (or their agents!) are willing to support the firm with new equity upon financial trouble. (2) Not the level of bonuses or shareholder value orientation but the possibility of earnings manipulation may be the driver for management to invest in risky off-balance sheet instruments. (3) Monitoring does not work if loan officers have no interest in discovering bad news that leads to write-downs (*moral hazard* of loan officer). (4) The banking supervisor balances expected social costs from bankruptcy of a bank and from continued speculation, and might approve *gambling for resurrection* as long as it minimizes expected social costs.

We started our research on AHBR and raised the identified questions before the subprime crisis. We observed many events and behavioral patterns that are also typical for banking failures connected with the current subprime crisis. In summary, this paper provides a better understanding of bank failures and raises new research questions.

The paper is organized as follows: Chapter 2 reviews the literature on risk-shifting. Chapter 3 describes the origin and development of AHBR's interest rate speculations and the subsequent failure of the bank. The chapter covers AHBR's business model (section 3.1), AHBR's interest speculations from 2001 to 2005 (section 3.2), AHBR's losses from 2001 to 2005 (section 3.3), AHBR's accounting manipulations (section 3.4) and the collapse of AHBR in 2005 (section 3.5). Chapter 4 analyzes the events and relates them to theoretical assumptions and results from the literature on risk-shifting. The main aspects of interest are incentives of shareholders for risk-shifting (section 4.1), incentives of management for risk-shifting (section 4.2), transparency, monitoring and market discipline (section 4.3) and the role of the banking supervisor (section 4.4). Chapter 5 concludes. Background information about German banking regulation and characteristics of German covered bonds is provided in the appendix.

2 Risk-Shifting in the Literature

This literature covers risk-shifting and (1) shareholder incentives, (2) management incentives, (3) transparency and accounting manipulations, (4) monitoring and market discipline, and (5) regulation and banking supervision.

The focus of this review is on prominent papers in each field. The results from these papers are important for the public and academic debate on risk-shifting. This literature review is the basis for later analysis in section 4, where prominent

theoretical results or - in other words - *stylized facts* about risk-shifting and bank failure are contrasted with observations from the AHBR failure.

Shareholder incentives. Shareholders have incentives to take actions that jeopardize the payment of interest and principal to lenders. *Risk-shifting*, also called *asset substitution* or *gambling*, is one form of such actions and means that a firm increases its risk profile by investing in high-risk projects with a negative net present value.⁵ If a high risk-project is successful, shareholders get the full gain; if the high-risk project is not successful and the firm goes bankrupt, shareholders can walk away and the debtholders (who lose part or all of their interest and principal) bear the losses. Risk-shifting redistributes wealth from lenders to shareholders, and also reduces firm value (value of equity plus debt) compared with an "optimal" investment program of the firm.

Jensen and Meckling (1976) initiated research about conflicts of interest between the owner-manager who holds inside equity, shareholders who hold outside equity and debtholders. *Agency costs of debt* reflect conflicts of interest between shareholders and debtholders regarding the risk-level of the firm. They result from the risk-shifting incentive of shareholders based on their *limited liability* and the *option value of equity*. The original idea of viewing equity as a call option goes back to Black and Scholes (1973). To the extent that risk-shifting is not anticipated the expected value of equity increases and the expected value of debt decreases. Sophisticated debt investors anticipate risk-shifting and price the debt accordingly. The value reduction of equity that results from a risk-level above the *firm-value-maximizing* risk-level represents *agency costs of debt*. Jensen and Meckling (1976) argue that lower leverage mitigates incentives for risk-shifting and reduces *agency costs of debt*. Based on *agency costs of debt* and *agency costs of equity*⁶, Jensen and Meckling develop a theory of capital structure of a firm. Other factors besides leverage that mitigate incentives for risk-shifting are short-term debt, covenants, convertible debt (Green 1984) and a firm's reputation (Diamond 1989).

Another strain of the literature is on *gambling for resurrection*, i.e. moral hazard of agents (managers) at a time when the firm or bank is already in some trouble. Kane (1989, 1990, 1996, and 2001) has especially focussed on the Savings & Loan Crisis in the United States during the 1980s, where he analyzed forbearance of the banking supervisor and the costs to the public from continued *gambling for resurrection*.

⁵Note that high-risk projects with a *positive* net present value would be part of the "optimal" investment program. Investment in such projects is not part of the risk-shifting problem.

⁶*Agency costs of equity* reflect conflicts of interest between the owner-manager and shareholders that increase in leverage. They result from private benefits and potential insufficient efforts of the owner-manager.

Management incentives. John and John (1993) focus on top-management compensation and incentives of management for risk-shifting. They find that "*in addition to the role of aligning managerial incentives with shareholder interests, managerial compensation in a levered firm also serves as a precommitment device to minimize the agency costs of debt. The optimal management compensation derived has low pay-performance sensitivity*" (p. 949). This idea is taken one step-further by John, Saunders and Senbet (2000) who analyze banking regulation. They argue that directly influencing management compensation structures is more efficient in controlling bank risk-taking than indirect capital ratios.⁷

Hirshleifer and Thakor (1992) analyze incentives of outside managers regarding their reputation in the managerial labor market. They assume that a manager's goal is to maximize his reputation by a history of successful projects. The manager then prefers a *relatively safe project* (with a high probability of success, and mediocre expected returns) to a *high-risk-high-return project* (with a lower probability of success, and high expected returns). Incentives of managers thus mitigate the risk-shifting problem, but also create a conflict of interest with shareholders who prefer the *high-risk-high-return project*. While John and John (1993) do not explicitly address reputation in their model, this could be easily considered and would result in a higher optimal pay-performance sensitivity of management compensation.⁸

Transparency and Accounting Manipulations. For any form of preventing risk-shifting, transparency regarding the actions of management is important. Management (in coordination with shareholders) might, however, conceal its risk taking. Creative accounting, e.g. by recording activities off-balance sheet or by actively selecting assets only for reaching certain balance sheet ratios, can be one tool to circumvent transparency.⁹ The paper of Gunther and Moore (2003) analyzes the role of accounting restatements in the US banking industry. Their results indicate that the worse the real financial condition of the bank, the more likely it is that the initially filed accounting statement understates financial losses. Other papers that deal with transparency and bank failures are Allen and Carletti (2006) who analyze mark-to-market accounting and associated dangers of bank failure, and Instefjord (2005) who analyzes credit derivatives and their consequences for bank risk.

Monitoring and Market Discipline. Monitoring enables lenders to discover misbehavior of a borrower and eventually to punish the borrower by liquidation. Monitoring thereby disciplines the borrower and counters attempts to manipulate

⁷See also Dewatripont and Tirole (1994), Biais and Casamatta (1999) and Jeitschko and Jeung (2005) for research on incentives of management and risk-shifting. A more empirical analysis is provided by Jensen and Murphy (2004).

⁸John and John (1993) address risk-aversion of management in their model (p. 956), which has many things in common with reputation.

⁹See, for example, Tirole 2006, p. 86.

financial statements and/or to mislead investors. It is in the interest of the borrower to structure debt contracts that make monitoring most efficient as this will reduce borrowing costs. It is not so clear, however, which capital structure is optimal to induce efficient monitoring. It is argued that junior lenders are most sensitive to a borrower's risk and returns, and are therefore most efficient monitors. Mandatory subordinated debt for financial institutions has been suggested as a tool to increase market discipline since the 1990s, among others by the US Shadow Financial Regulatory Committee and the European Shadow Financial Regulatory Committee.¹⁰ In contrast to the position of proponents of subordinated debt, Park (2000) argues that junior lenders have only weak incentives to monitor. They are never willing to liquidate a project as any recovery value will first go to the senior lenders and they will most likely lose their investment. Sironi (2001) found in his study of the European subordinated debt market, that it is highly concentrated, dominated especially by large banks, that the issued subordinated instruments are mostly plain-vanilla and that despite several listings, the instruments are only traded in relatively illiquid secondary markets.

Regulation and Banking Supervision. The occurrence of several historical periods of financial instability and fragility has set up the presumption that regulation of capital markets is needed in order to prevent costly financial crises. Allen and Gale (2007) develop a framework to analyze optimal regulation and to prevent financial crises. Following the approach on analyzing banking regulation used by Bhattacharya, Boot and Thakor (1998), Freixas and Santomero (2003) analyze the theory of banking regulation and identify market failures, which make a regulation necessary. Calomiris and Litan (2000) analyze the conditions necessary to regulate the more and more complex international financial market place. The paper of Goodhart and Huang (1999) presents a model for the lender of last resort and takes the problem of *too-big-to-fail* and the idea of *constructive ambiguity* into consideration. The role of the regulator is the focus of Dewatripont and Tirole (1994). Hart (2000) gives an overview over different approaches to bankruptcy. Regulation and the risk-shifting problem is explicitly considered in Sinn (2001), Hellmann, Murdock and Stiglitz (2000), and John, Saunders and Senbet (2000). Santos (2001) provides a literature review.

¹⁰It is argued that market levels of subordinated debt can serve as leading indicators of bank fragility, and can be useful for the banking supervisor. Necessary preconditions that have to be fulfilled so that subordinated debt is effective in creating market discipline, such as regular offering of subordinated debt by each bank, have been suggested by several authors (see, e.g., Osterberg and Thomson 1992, Evanoff and Wall 2001, Bliss 2001, Blum 2002, Gropp, Vesala and Vulpes 2006, the Basel Committee on Banking Supervision 2003, Sironi 2001, González-Rivera and Nickerson 2002). For the positions of the European Shadow Financial Regulatory Committee see Benink and Schmidt 2000.

3 The Failure of AHBR

This chapter describes the development from the beginning to the end of AHBR's interest rate speculations. The following section gives some basic background on AHBR's business model. Section 3.2 then describes the speculations between 2001 and 2005. The consequences for AHBR's financial position during these years is discussed in section 3.3, and the final collapse of AHBR is discussed in section 3.4. The study in this chapter is mainly based on AHBR's annual reports from 2001 to 2005 (in the following denoted as AHBR 2001, AHBR 2002, etc.), press reviews from *Börsen-Zeitung* (BZ), the premier German financial newspaper for bankers, *Financial Times* (FT) and *Euroweek*, a weekly for European capital market professionals.

3.1 AHBR's Business Model

AHBR was formed in 2000 by the merger of former *Allgemeine Hypothekenbank AG, Frankfurt*, and *Rheinboden Hypothekenbank AG, Cologne*, which resulted in the largest German mortgage bank at that time. The bank was one of the leading providers of residential and commercial real estate financing and public sector lending. AHBR refinanced the loans primarily with the issuance of so-called *Jumbo-Pfandbriefe*, a special and very liquid form of covered bonds. Unlike Mortgage Backed Securities (MBS), like Collateralized Debt Obligations (CDOs), or Asset Backed Securities (ABS), the *Pfandbriefe* are highly regulated and must meet strict criteria in order to fulfill the requirements of the German Covered Bond Act (CBA - *Pfandbriefgesetz*).¹¹ Still in 2004, AHBR ranked as second largest issuer¹² with a market share of 11% behind the market leader Eurohypo (16%).¹³ AHBR was well known within the German mortgage banking sector for term transformation, i.e. the bank lent out long-term (typically maturity over five years) and refinanced itself short-term, ranging from tapping the interbank market up to the issuance of *Pfandbriefe* with a maturity of up to five years. Since AHBR could always tap the markets or use refinancing facilities of the Bundesbank with its *Pfandbriefe*, their strategy was less risky than that used by many banks or Special Investment Vehicles (SIVs) during the current subprime crisis. The bank was quite successful with this strategy and profited from a relatively steep yield curve in the years before 2001

¹¹For a detailed overview of the differences between these instruments and the requirements of the CBA see Appendix A.9.

¹²Based on total assets as of year end 2004 (vdp „Der Pfandbrief“ 2005, p. 60). The year 2004 was AHBR's last year with normal business, whereas 2005 was largely influenced by extraordinary items during the selling process of the bank.

¹³The total volume of the Jumbo Pfandbrief market in 2004 was EUR 399.3 billion (AHBR 2004, p. 52).

(Die Zeit 12/15/05).

AHBR's Capital Structure. An overview of AHBR's main investor groups is provided in Table 1. The complete AHBR balance sheet and profit & loss statement at the end of 2001 is shown in appendix A.1.

Type of Capital	EUR million	Main Investors	Investor Type
Equity	565	BGAG, BHW	Institutional
Silent partnerships	372	DZ Bank, DEVK	Institutional
<i>Genussschein</i>	572	-	Retail
Subordinated debt	485	-	Institutional
To banks	11,132	Deutsche Bank, etc.	Institutional
To customers	9,254	-	Institutional
Public <i>Pfandbriefe</i>	60,943	-	Retail & institutional
Other securitized bonds	6,192	-	Institutional
Other	519	-	-
Total liabilities	90,034		

Table 1: AHBR's main investor groups in 2001

The principal shareholder of AHBR with a 50% stake was *Beteiligungsgesellschaft der Gewerkschaften* (BGAG), a holding company of the major German trade unions. BHW, a publicly listed bank, who had a 39% stake, was also controlled by trade unions. The detailed ownership structure of AHBR in 2001 is shown in appendix A.2.

The two largest silent partners (*Stille Gesellschafter*) were DZ Bank, the central bank of the German co-operative banks, which had invested about EUR 140 million as silent partner, and the insurance corporation DEVK with an investment of about EUR 30 million (BZ 02/04/06 and BZ 04/28/06). Though these silent partners have no rights regarding any entrepreneurial decisions, they have the right to conduct an extensive analysis of the corporations' books (Section 233 of the German Commercial Code), in other words, they have nearly the same information rights as the blockholders of the corporation.

Beside subordinated liabilities AHBR had *Genussscheine* (profit participating shares) outstanding of about EUR 567 million. These instruments contain on the one hand a high fixed interest rate payment of between 5.50% and 8.625% for the investor, but are on the other hand fully exposed to any losses in the annual statement of the issuing corporation, which directly leads to a reduction of their redemption payment. Therefore, any investor in such a junior lien financial instrument should exert a significant monitoring effort in order to calculate his risks and to come to a risk-adequate investment decision. However, the investors in the *Genussscheine* were mainly private investors, who each invested small amounts and who were mainly interested in the high yield.

3.2 AHBR's Interest Speculations from 2001-2005

General situation in 2001. The takeover of the Rheinboden AG by Allgemeine Hypothekenbank AG (AHB) in 2000 did not turn out as profitable as initially expected. At the presentation of AHB's annual results for the year 2000 Horst Alexander Spitzkopf, chairman of the management board, declared a return on equity after tax of 15% as goal for the year 2003 for the new formed AHBR (BZ 03/21/2001). Additionally, management expected a total profit from the takeover of EUR 150 million within the next five years, with only nonrecurring expected costs of EUR 11.2 million. Unfortunately, management's expectations did not materialize but merger related losses of EUR 103.7 million in 2001 (AHBR 2001, BZ 04/24/2002b) put management under pressure.

The beginning of AHBR's speculations. After September 11th 2001, the development of the global economy and the reaction of the leading central banks, Federal Reserve and the European Central Bank, was unclear. The development of the interest rates was of particular interest for the bank due to its mortgage business. AHBR engaged in swap agreements in the course of its normal business to hedge its interest rate exposure against its prediction of high long-term interest rates, which would have hurt the bank's profits from term transformation (BZ 07/02/02, p. 17). In this situation, the management of AHBR decided to get more and more engaged in the swap market based on the assumption that interest rates would rise after a short slump.¹⁴ Management expected extra profits from swap contracts to increase returns on their low margin public sector financing business.¹⁵ AHBR's interest rate cash flows are shown in figure 1. Real estate investors and the public sector who each borrowed money from AHBR typically had fixed interest payments. AHBR refinanced these loans via *Pfandbriefe* which also had a fixed coupon. The loans typically had a 15-20 year maturity, and *Pfandbriefe* typically had a 3-7 year maturity. AHBR payed fixed and received floating in the swaps, which results in profits for rising interest rates and losses for falling interest rates.

No credit support for swap transactions. AHBR's interest rate swaps were unsecured so that the only immediate effects under the swap contracts were peri-

¹⁴As stated in AHBR's annual report (2001, p. 45): "As regards the bank's earnings position we expect interest rates to rise across all maturity segments in 2002. [...] Positive earnings performance will therefore depend on [...] the correct positioning of the Bank in the interest rate environment."

¹⁵As stated in AHBR's annual report (AHBR 2002, p. 45): "Existing derivative transactions, [...], were made in order to hedge interest rate and currency risks, and to improve the margin on lending business."

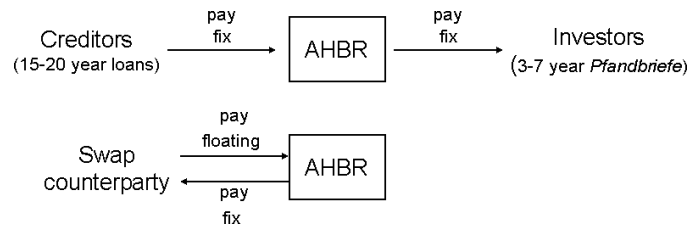


Figure 1: AHBR's interest rate cash flows

odic settlements of interest payments. A credit support annex (CSA)¹⁶ is market standard in the anglo-saxon capital markets for a while, but only became market standard for transactions between banks in Germany over the last years. According to AHBR's financial statements, AHBR did not have any agreements about credit support for its swap positions, and therefore did not have to provide any collateral or margin payments for its swap contracts.

Development of interest rates. The interest rate market developed against the predictions of AHBR's management. The slump of interest rates turned out to be a significant change in the interest rate trend.. After a small reduction of 25 bps at the end of August 2001, the ECB reacted to 9/11 with a drop of 50 bps in mid September and another 50 bps reduction in November 2001. Against AHBR's expectation the interest rate remained at this level till December 2002 when it dropped down even further by 50 bps to 2.75%. The bottom was finally reached at 2.00% in June 2003 and it took until December 2005 till interest rates began to rise - ironically the month when AHBR was sold to Lone Star (which means that shareholders finally acknowledged that the bet on rising interest rates had failed). The development of ECB interest rates (main refinancing operations) and Euro swap rates are shown in figure 2.¹⁷ The maturity of AHBR's interest related business at the end of 2001 was mainly medium-term to long-term (EUR 36bn up to 1 year, EUR 45bn between 1 and 5 years, and EUR 56bn over 5 years).

Volume of AHBR's swap contracts. The financial problems of AHBR were caused by the huge volume of swaps that management had closed and which was much higher than the total volume of outstanding loans and the interest risks they represent. Based on the total volume of mortgage loans and public sector loans in 2001 of EUR 77.4 billion (AHBR 2001, p. 60), the volume of swaps outstanding

¹⁶A Credit Support Annex (CSA) regulates credit support (collateral) for over-the-counter derivative transactions to mitigate the credit risk (counterparty risk) arising from positions with positive market values. The party with a negative position has to transfer collateral to the party with a positive position according to the rules of the CSA. A CSA is an annex to the International Swaps and Derivatives Association (ISDA) agreement.

¹⁷Source: European Central Bank (available at www.ecb.int).

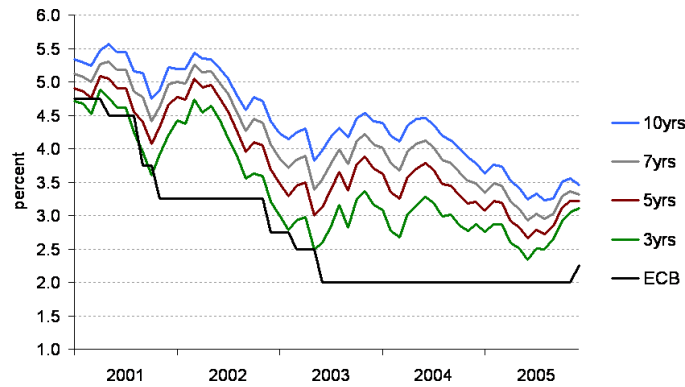


Figure 2: ECB main refinancing operation vs. EUR swap rates

was nearly twice that volume, amounting to EUR 138.5 billion (AHBR 2001, p. 71). While AHBR already had significant losses from its swap engagements in 2001 the bank's speculation increased significantly till the end of 2002, when the total volume of loans was EUR 67.7 billion (AHBR 2002, p. 34) and the volume of swaps reached EUR 206.6 billion (AHBR 2002, p. 45), which was more than three times the outstanding loans. Figure 3 gives an overview of the development of the outstanding interest rate swap volumes and the interest bearing business of the bank.

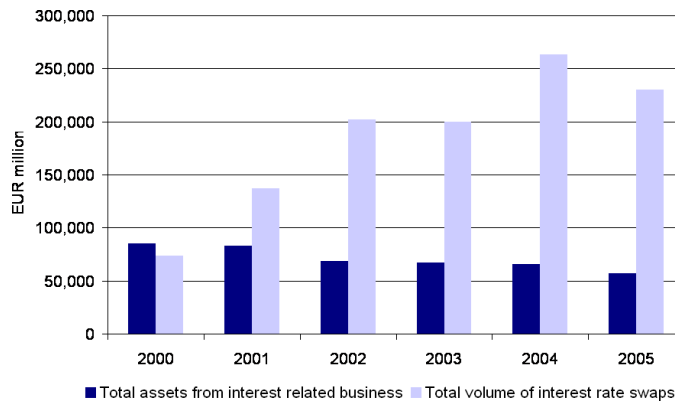


Figure 3: AHBR's interest-bearing business and outstanding swap volumes

It seems that AHBR's management had switched from a hedging strategy to outright speculation by the end of 2001, at the latest at the beginning of 2002. Since the volume of interest rate swaps even rose after 2002, it seems that management and shareholders had started *gambling for resurrection*. This development fundamentally changed the risk profile of AHBR: It migrated from the relatively safe business of a mortgage bank towards a hazardously speculating bank that more resembled a hedge fund.

Furthermore, the sustained economic downturn of the global economy in the af-

termath of 9/11 and additional specific problems in the German real estate loan market hit AHBR's credit business. Like many other banks in the 1990s AHBR had financed several projects in Eastern Germany, which turned out to be bad investments, and suffered severe losses from non-performing loans in the period from 2001 to 2005.¹⁸

Resignation of management in mid 2002. A special audit from the accounting firm PwC confirmed in mid 2002 that AHBR's management was informed about the swap business and associated risk by its internal risk management system early in time, which showed that the speculation was not the action of some employees and a failure of the control system (as in the case of Barings 1995 or Société Générale 2008). The chairman of the management board, Horst Alexander Spitzkopf, and the responsible Head of Treasury in the management board, Heinz-Gerhard Großmann, resigned from their positions after the release of the PwC report in September 2002 (BZ 09/17/02). The members of the supervisory board decided not to discharge the former managers Spitzkopf and Großmann for the fiscal year 2002.

3.3 AHBR's Losses from 2001-2005

Development of AHBR's losses. The development of interest rates and AHBR's huge interest rate exposure led to enormous losses, as illustrated in figure 4 (AHBR 2001-2005). The figure contains cumulative realized losses from swap contracts booked through the P&L¹⁹ as well as market values of pending swap contracts for 2004 and 2005. Market values for the years from 2000 to 2003 are not available because reporting of these figures is not mandatory under German reporting requirements. Economic losses from swap contracts were approximately EUR 5.7 billion at the end of 2005. These losses were partly offset by an increased market value of AHBR's assets that exceeded the increased market value of AHBR's liabilities. As noted earlier, real estate loans and public sector loans (AHBR's assets) typically had a 5-15 year maturity. The market value of these loans thus increased as interest rates decreased. The increase in market value of AHBR's liabilities was less significant as AHBR typically refinanced with *Pfandbriefe* in 3-7 year maturities. AHBR thus created hidden reserves.

¹⁸We cannot state the exact size of non-performing loans from the equivalent annual report, but the quantity of foreclosure proceedings (*Zwangsvorsteigerungen*) gives an impression of the development. The number of pending foreclosure sales in AHBR's annual report developed in the years 2001 to 2005 as follows: 585; 805; 837; 595; 504. During the same period of time, the number of accomplished foreclosure sales nearly octuplicate: 118; 204; 764; 871; 903.

¹⁹Yearly swap losses for were EUR 100m, EUR 76m, EUR 463m, EUR 171m and EUR 175m for 2001 to 2005, respectively.

AHBR's investors lost a total of EUR 4 billion over time. An explanation for this figure is that this loss consists of approximately EUR 5.7 billion losses in the swap market and EUR 1.7 billion net market value appreciations from AHBR's on-balance sheet business. If AHBR's engagement in the swap market had been adequate in relation to its other assets and liabilities - as was probably the case in the year 2000 - swap losses would not have caused a problem.

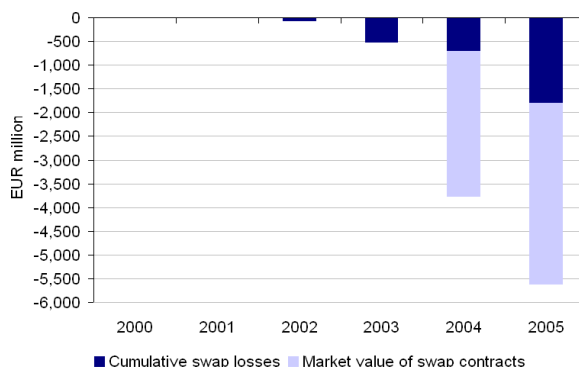


Figure 4: Economic losses from swap contracts

Cash injections and guarantees. Since AHBR's operating results were insufficient to cover the losses from swap contracts, the banks survival depended on repeated cash injections from AHBR's shareholders. Additionally, the German banking supervisor BaFin obliged the shareholders to grant a guarantee towards AHBR in 2002 to cover future losses (AHBR 2002, p. 10, BHW 2002, p. 70).

Total losses of AHBR's investors. The distribution of losses to AHBR's investor groups is shown in figure 5 (AHBR 2001-2006).²⁰ The main losses were borne by AHBR's shareholders, a total of about EUR 3.2 billion that accumulated over the years from 2001 to 2005. These losses include *destruction of the shareholder value* of AHBR. The bank was valued at EUR 1.5 billion at the beginning of 2001 according to an external valuation requested for the takeover of Rheinboden AG by Allgemeine Hypothekbank AG (BHW 2001), and was finally sold to Lone Star at a negative purchase price of EUR 380 million, which reflects that total original shareholder value was lost. The cash injections of AHBR's shareholders totaled EUR 1.25 billion over the years 2001 to 2005. AHBR's silent partners (*stille Gesellschafter*) who had invested a total of EUR 372 million also took a major hit. In 2006, they finally accepted an agreement with the new owner Lone Star to participate in AHBR's enormous financial losses for FY 2005 and to write down their investment by 70-75%, which represents a loss of between EUR 260 and 280

²⁰The figure shows losses that occurred until the sale of AHBR in December 2005, as well as losses that were subsequently allocated to silent partnerships and *Genussschein* investors in 2006.

million. At the end of 2006 the nominal amount of silent partnerships was further written down to EUR 34 million.

The nominal amount of AHBR's *Genussscheine* (profit participation rights) was written down from EUR 567 million to EUR 207 million at the end of 2005. One year later the nominal amount was further written down to EUR 83 million²¹. Final results are pending as investors have filed a suit against AHBR and its new owner.

Subordinated debt investors, senior debt investors (such as AHBR's relationship banks) and Pfandbrief investors finally did not bear any losses. The main contribution of AHBR's relationship banks in this crisis was the liquidity shield of EUR 2.5 billion in November 2005. As the sale to Lone Star was successful, the relationship banks did not suffer any losses, but they obviously had a high risk exposure until the refinancing of their loan.

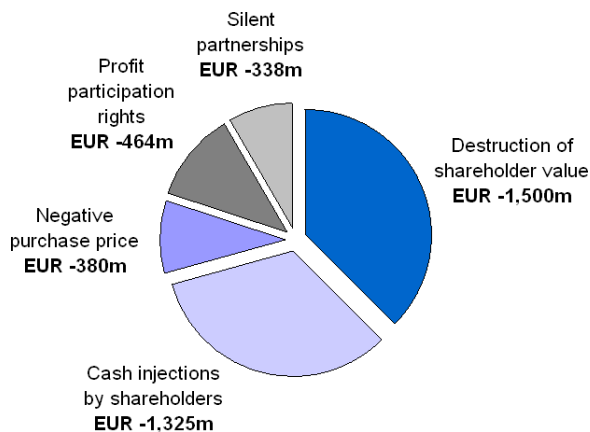


Figure 5: Losses of AHBR's investors from 2001-2006 (total of EUR 4 billion)

3.4 AHBR's Accounting Manipulations

How to hide EUR 4 billion financial losses? While preparing its annual statement for 2001 AHBR was trying to downplay and hide its losses that were incorporated in the negative market value of its swap contracts. Figure 6 (AHBR 2001-2005) shows AHBR's annual results. AHBR showed a positive annual net profit in each annual statement between 2001 and 2004, which was important for AHBR in order to conceal its true financial situation. The positive annual results also allowed AHBR to make interest payments for the *Genussscheine* and the silent partners (BZ 04/28/06). The net loss of more than EUR 1 billion for 2005 is mainly due to the re-evaluation (or realization in the market) of swap contracts by AHBRs'

²¹EUR 83 million at the end of 2006 results from EUR 207 million at the end of 2005 minus EUR 104 million loss allocation and EUR 20 million maturities

new owner Lone Star, who acquired AHBR in late 2005.

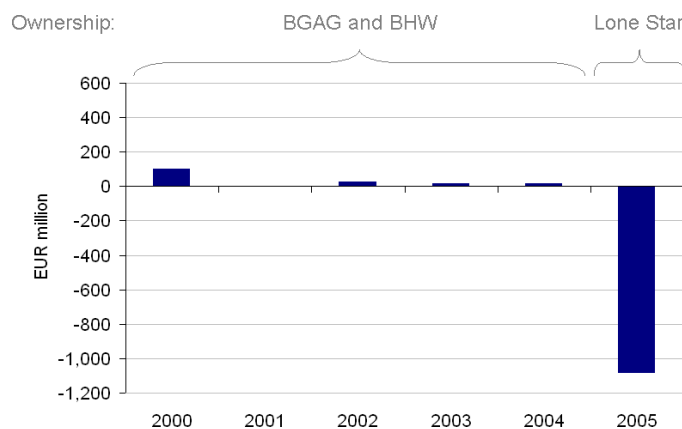


Figure 6: AHBR's annual results

From an accounting perspective the interest rate swaps had two very important characteristics: First, the closing of an interest rate swap did not lead to an immediate cash outflow or payment, since they are typically closed at a fair value of zero. As discussed in section 3.2, AHBR did not have to provide credit support (collateral) for its swap contracts. Second, neither the market value from the swaps nor the total volume of closed interest rate swaps appeared in the profit and loss account or in the annual balance sheet, since AHBR filed its annual statement under the rules of the German commercial code (*Handelsgesetzbuch – HGB*).²² Since interest rate swaps are a pending transaction, they are not shown on the balance sheet and the accounting rules allow hiding the result from the interest rate swaps by offsetting against the "Interest Income".²³ Nevertheless, the financial statements must represent a fair and true view of the firm.

Figure 7 gives an idea about the underfunding of swap contracts. Market values of swap contracts are not available for 2001 to 2003, but it is clear that provisions for swap losses were significantly too low from an economic perspective. The funding of pending swap losses was mainly ensured by the shareholders' guarantee for any losses (AHBR 2002, p. 6). Provisions of EUR 600 million in 2005 were paid by shareholders to a trust, which was set up as an additional shield against losses.²⁴ In summary, AHBR's true exposure and pending losses were not transparent, but the off-balance sheet liability from swap contracts was ensured by the off-balance sheet guarantee from shareholders.

²²A reform of the HGB that partially aligns the German HGB with IFRS is currently being discussed in the German parliament under the name *Bilanzrechtsmodernisierungsgesetz (BilMoG)*.

²³As stated in AHBR's annual report (AHBR 2001, p. 65): "Results from the liquidation of derivatives [...] have been reallocated to the P&L item Interest income [...]"

²⁴The capital was held on trust by Ernst Welteke, the former president of the German Bundesbank, BZ 01/22/2005.

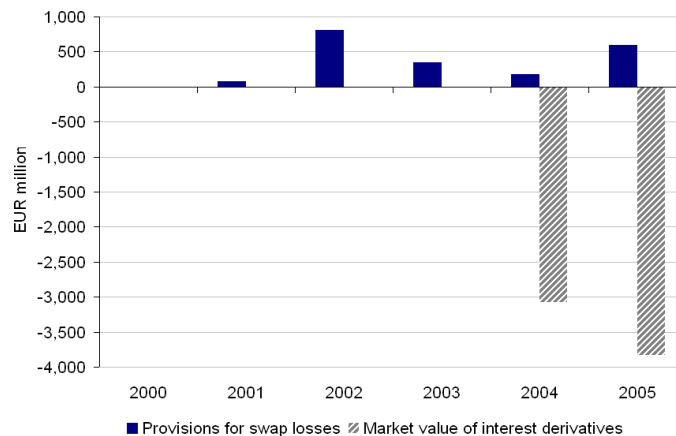


Figure 7: Underfunding of swap contracts

When preparing the annual statements for 2001, AHBR's management did not intend to build any provisions for pending swap losses. Continued discussions between the bank and its auditors from KPMG concerning the accounting for the anticipated losses caused the BaFin in mid 2002 to appoint a special audit from PricewaterhouseCoopers (PwC) (BZ 04/24/2002a and BZ 07/02/02). PwC confirmed the accounting principles and valuation methods used by KPMG. As a consequence the bank set up a contingency reserve under section 340f of the German Commercial Code for anticipated future losses from the swap deals. KPMG was reappointed as statutory auditor for the Annual Statement of 2002. Although KPMG's valuation methods and suggested accounting rules were confirmed in the special audit by another audit firm, the supervisory board decided to switch to the auditors of Deloitte & Touche for the statutory audit of 2003 (BZ 05/10/2003). Deloitte & Touche is, as AHBR's last auditor, meanwhile under pressure to explain the correctness of the bank's financial position after 2002.

Figure 8 (AHBR 2001-2005) gives an indication of the realized losses from swap contracts as estimated from the setup and change of the section 340f reserves in AHBR's financial statements (AHBR 2001-2005). In particular, the losses of EUR 462.8 million for the year 2003 are striking. This could reflect the strategy of new management to unwind swap contracts in order to reduce negative swap positions. These losses were booked against a section 340f reserve of EUR 808.2 million that was set up in 2002 in order to stabilize the bank and to relieve future years from any swap burdens. Unfortunately, this kind of *earnings bath* turned out as insufficient, as interest rates remained at historically low levels and more losses materialized.

In order to keep positive annual results, AHBR had to create extraordinary income. Already by the end of 2001 shareholders had to contribute about EUR 200 million in cash (BZ 04/18/2002). In 2002 the worsening of the interest rate development

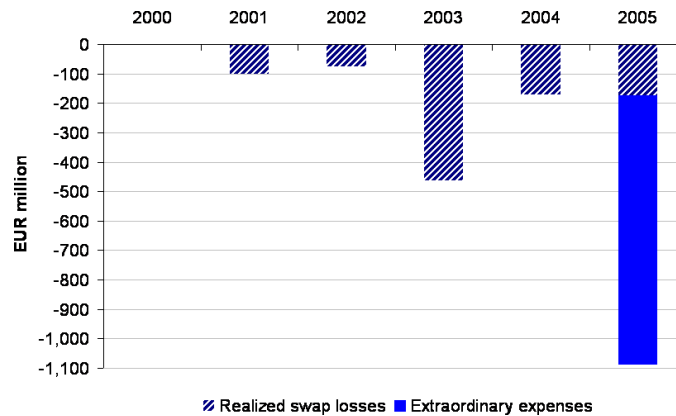


Figure 8: Realized losses from AHBR's swap positions

as well as AHBR's increased interest rate exposure made another cash injection of about EUR 450 million necessary. The cash injections appeared as extraordinary income of EUR 68 million in 2001 and EUR 632 million in 2002. These measures jointly safeguarded the bank's survival until the beginning of 2005, when the shareholders had to sell the bank and accept a negative purchase price of EUR 380 million. In addition, the bank terminated early swap agreements throughout the years, which had a positive market value in order to generate further funds. Figure 9 gives an overview over the funds provided by the shareholders and realized via early swap terminations.

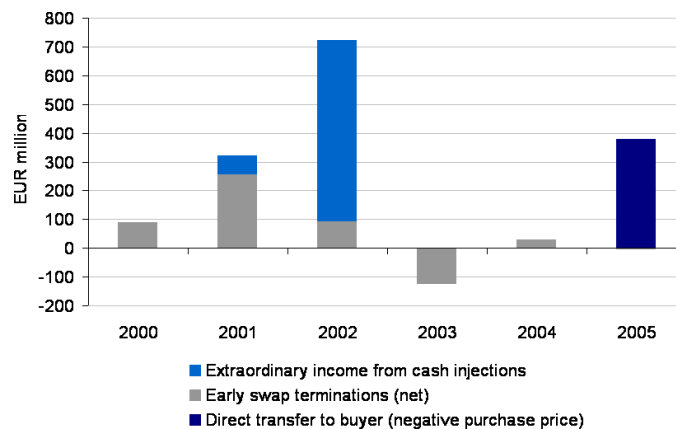


Figure 9: Shareholders' cash injections and early swap terminations

AHBR's earnings manipulation consisted of downplaying pending losses and measures to create extraordinary profits. This created on the one hand sufficient funds for the distribution of profits to the silent partners and to the investors in *Genussscheinen*, and on the other hand masked the real financial condition of AHBR which safeguarded its continuity of business.

Reactions from Rating Agencies. The rating agencies reacted in mid 2002 with a downgrade of AHBR's financial strength from A- to BBB, A2 to Baa1 and A to BBB+ (S&P, Moody's and Fitch, respectively). They did not change their rating after 2002 until the crisis finally culminated in October 2005, shortly before the sale to Lone Star was finally closed. The rating of AHBR's unsecured senior debt was lowered from investment grade (BBB) to junk (BB+) by S&P. The *financial strength* rating was changed from C- and C/D to E by Moody's and Fitch, respectively.²⁵ The complete development of AHBR's issuer and instrument ratings from 2001 to 2005 is shown in appendix A.4.

With the downgrade of AHBR's long-term credit rating in the middle of 2002 by S&P, Moody's and Fitch, it should have become clear to all professional market-participants that the bank was in serious financial difficulties with negative consequences for the bank's reputation. After the replacement of the management team in September 2002, the new management set up several restructuring plans in order to enhance AHBR's financial situation and to regain the trust of the markets and its investors. Standard & Poor's and Fitch, which rate the *Pfandbriefe* on a stand-alone basis, kept their AAA ratings. Moody's, however, generally using a different rating approach, downgraded the *Pfandbriefe* to A1 in 2002, which was the worst rating of any German *Pfandbrief* at that time.²⁶ The decrease of AHBR's issuer ratings in 2002 as a consequence of its financial problems in 2001 caused a significant widening of the spreads in AHBR financial instruments (AHBR 2002) and had at least two effects on the banks' position: First, the costs for refinancing rose and worsened AHBR's financial situation; second, the bank might have even got into problems to refinance itself due to a loss of credit standing in the covered bond market.²⁷

The Role of Silent Partners and Debt Investors. In spite of high amounts at risk we did not find any sign of active monitoring. In case of the DZ Bank, which had a silent partnership, any deep and thorough monitoring would have resulted into immediate value adjustments in DZ Bank's balance sheet, which was - as the balance sheet of most other German banks - relatively weak at that time (Handelsblatt 02/18/06). *Genussschein* investors also had to bear substantial losses in 2005 (and even in the following years).

²⁵Moody's defines a *financial strength* rating of C as "adequate intrinsic financial strength", and E as "very modest intrinsic financial strength".

²⁶The upgrade in 2004 of AHBR's *Pfandbriefe* by Moody's is due to the introduction of a new CBA in Germany, which led to an improved standing of the creditor in the case of an insolvency of the mortgage bank, and can not be referred back to an improved situation at AHBR.

²⁷Following the reviews announced by the rating agencies in April 2002 the Bank decided against any major transactions (AHBR 2002, p. 26).

Although at first glance, AHBR had several investors who had *the incentive* and *the possibility* to perform active and thorough monitoring, monitoring by investors was in fact very weak. The banks in their role as silent partners were in a weak position to impose pressure on AHBR or to uncover the real financial situation, since both steps would have caused repercussions against their own, similarly weak balance sheet. The mass of private investors engaged in AHBR's *Genussscheine* was simply too dispersed. These investors faced the problem that individually monitoring was prohibitively expensive, even if they had received the needed information.

AHBR itself was clever enough to keep its real financial condition as opaque as possible in order to thwart any monitoring from the very start by showing a sufficient annual surplus each year to cover the payout to its investors with the farthest monitoring rights.

The Role of the Regulator and Banking Supervisor. In his function as German banking supervisor, BaFin has detailed insight into the financial situation of German banks and other financial services corporations. The statutory auditors' long form report for 2001, the report of PwC's special audit in 2002 that was requested by BaFin (BZ 07/02/02), and finally the long form report of 2002 provided BaFin with information about the risks at AHBR. From our point of view, BaFin must have had a clear picture of the situation at AHBR with all the information received.

Between 2001 and October 2005 BaFin closely followed the activities at AHBR, but presumably did not pressure AHBR to clean up its balance sheet and unwind its interest rate exposure, which probably would have caused AHBR's bankruptcy. Effectively, BaFin allowed AHBR to continue its speculations and to *gamble for resurrection*.

BaFin's strategy between 2001 and October 2005 can best be described as *supervision* and *controlling external social costs*. For the former (*supervision*), BaFin increased the monthly reporting requirements for AHBR (Bundesregierung 2006), and AHBR became more transparent in time. However, it was only in mid 2005 when AHBR published its annual report for 2004, that AHBR explicitly showed its swap exposure at market values - a negative value of around EUR 3 billion.²⁸ Regarding the latter (*controlling external social costs*), BaFin arranged repeated cash injections and guarantees from AHBR's main shareholders, thus internalizing AHBR's gambling losses as far as possible, and upheld AHBR's solvency until late

²⁸Surprisingly, the negative value of EUR 3 billion vs total equity (book value) of below EUR 1 billion did not get much attention in the market. Section 4.3 addresses the question why monitoring and market discipline was not effective.

2005 (AHBR 2002, p. 19, BHW 2002, p. 70).²⁹

BaFin has been subject to strong criticism from debt investors, market participants and politicians for not stopping AHBR's interest rate speculations between 2001 and late 2005. However, as AHBR generally acted in accordance with German accounting standards (HGB) and was formally solvent until late 2005, it is not sure on which grounds BaFin could have stopped the interest rate speculations. One consideration is that AHBR had to follow the rules of the German Covered Bond Act (*Pfandbriefgesetz*) which prohibited mortgage banks to close large derivative positions for any other purpose other than hedging.³⁰ The decision rationale of BaFin is further analyzed in section 4.4. Interestingly, in defense of BaFin's behavior in the AHBR failure, the German government made the following statement (Bundesregierung 2006): "BaFin acts in the interest of the public, protects the trust of the public in the efficiency of the financial market and the banking industry, and does not act in the interest of high-risk investors."

3.5 Collapse of AHBR in 2005

The whole dimension of the financial disaster was finally revealed in an ad-hoc press release from AHBR on October 25th 2005, where the management stated that the bank would either be sold completely or in parts to an investor, or the alternative would be its liquidation (AHBR ad hoc 2005). This caused the rating agencies to put the bank's issuer rating on junk status (ratings for *Pfandbriefe*, however, were confirmed) on October 27, 2005. During these days the market making in AHBR's *Pfandbriefe* nearly stopped and the high liquidity of *Pfandbriefe* - one of the most important properties, especially for international investors - ceased to exist. The market-makers and the "Pfandbrief-community" put the outstanding reputation of the covered bond as a whole at risk, since the investors could not find any counterparty in the market to sell their AHBR *Pfandbriefe* to. The following is a comment from Euroweek (10/28/05): *Investors attracted to Pfandbriefe by their supposed credit quality and liquidity were left flailing as the usual quotations of two-way prices for large tickets at tight bid/offer spreads fell away and liquidity vanished. ... Market-making commitments were a cornerstone of the market conventions that constituted the jumbo Pfandbrief market, ... Since market-making ground to a near-halt on Tuesday morning, bankers with an interest in the Pfandbrief market have been working almost as hard to find a solution to the market-making problem as the*

²⁹The role of the banking supervisor during the collapse of AHBR in October 2005 is discussed in the next section.

³⁰BaFin was accused of forbearing the interest rate swap speculation, see LG Frankfurt, *Urteil vom 25. Januar 2006*, 3/9 O 143/04.

wider German banking community are on AHBR's survival. The liquidity problem is also reflected in the following quotation from a London banker: "There is one major lesson to be learned, ... and this is that even if you eliminate credit risk to a large degree - which hopefully we have achieved in the covered bond market - you cannot eliminate liquidity risk" (Euroweek 11/11/05). Interestingly, the same experiences were made during the US subprime-crisis in mid 2007 and are one of the key lessons learned so far. The market-making in AHBR *Pfandbriefe* finally returned to a normal level with an adequate pricing of the *Pfandbriefe* within a couple of days.

Liquidity shield organized by BaFin. In November 2005, under the organization of BaFin, the five leading German banks (Deutsche, Dresdner, Commerzbank, Postbank and Hypovereinsbank) provided in cooperation with the Depositors Guarantee Fund (*Einlagensicherungsfonds*) a liquidity shield of EUR 2.5 billion for AHBR in order to calm the markets. Although AHBR was a mortgage bank and individual deposits played no role in the bank's business model, BaFin engaged the Depositors Guarantee Fund presumably in order to reach a quick solution and to send a robust signal to the market regarding the safeguarding of AHBRs' liquidity. The core objective of BaFin and the involved parties was to ensure an orderly conclusion of the AHBR transaction and to avoid a sale, or even worse, a liquidation of the bank at fire sale prices, shortly before the selling process would have been completed (dpa-AFX 11/16/05, BZ 11/15/05 and BZ 11/17/05).

Sale to private equity investor Lone Star. AHBR was finally sold to the private equity investor Lone Star in December 2005 at a negative purchase price of EUR 380 million, i.e. the owners had to pay cash to the investor in order to get rid of the bank. Keeping in mind that the shareholders had already spent EUR 600 million at the beginning of 2005 for financial precautions, the negative purchase price reached EUR 980 million (BZ 12/09/05). As stated by Norbert Massfeller, the head of BGAG at that time, BGAG had to accept a negative price to release the guarantees from the trade unions towards AHBR's remaining risks (Financial Times Deutschland 10/26/05).

Risks for the German Financial System. While the *Pfandbriefe* from AHBR massively were affected by the mistrust of investors³¹, the bonds of other issuers

³¹The widening of the AHBR spreads reached a peak level of up to 24 bp above the ordinary covered bond swapspread by the end of October 2005 and remained in a range of 12 bp to 16 bp till February 2006, i.e. well after the closing of the deal with Lone Star (vdp 2006, p. 16).

were traded almost as usual and remained largely unaffected by the AHBR crisis.³² Consequently, it is not apparent why the German financial sector was so nervous about the AHBR crisis. To understand the situation we have to look at three possible risks for the German Financial System: (1) A liquidation of AHBR assets at fire-sale prices may have led to pressure on market prices of the underlying real estate collateral. (2) A loss from claims against AHBR may have led to financial instability at other financial institutions. (3) A liquidation of AHBR may have damaged the good reputation of the German *Pfandbrief*.

The first and second risk, which can be viewed as contagion risk in the traditional sense, was relatively low. AHBR's main assets were claims against investors in residential and commercial real estate (secured by mortgages) and claims against the public sector. More relevant in the case of AHBR was the third possibility, potential damage of the *Pfandbrief* as a cheap financing instrument, which can be viewed as an indirect form of contagion. Already in October 2005, AHBR's *Pfandbriefe* liquidity was temporarily suspended. The sudden stop in the market-making of AHBR's Jumbos came as a complete surprise to the covered bond investors, who explicitly assess the liquidity of *Pfandbriefe* beside the high credit quality as one of their main investment decisions.³³ The breakdown of the market was not anticipated, since the rating agencies confirmed that the credit rating of the *Pfandbriefe* did not change at the same time when they finally downgraded AHBR to junk status.³⁴ As a consequence of the market-makers' behavior market participants questioned the credit quality of AHBR's *Pfandbriefe*. A bankruptcy at AHBR would have meant that investors would have found out if the mortgages that served as collateral for their AHBR *Pfandbriefe* in fact fully recover their value. Market participants were afraid that such a "*Pfandbrief test*" would reveal that *Pfandbriefe* are not fully covered and are thus more risky than investors thought. The consequence would have been that for the assessment of the credit quality of a *Pfandbrief*, rating agencies and investors would also have had to take into account the financial strength of the issuer. Accordingly, the successful *Pfandbrief* model, i.e. the refinancing of public sector loans and mortgages via a collateralized bond that has an "AAA"-rating 'per se', would not work anymore. One of the basic ideas of the *Pfandbriefe* – cheap refinancing based on an independent credit rating for the *Pfandbriefe* on a

³²The jumbos of other issuers, however, have come under pressure since AHBR's problems flared, widening on average 1 bp, according to DrKW research, [...]. 'The fact that most of these are from German issuers could indicate that the negative AHBR headlines could have a contagion effect', said a DrKW analyst." (Euroweek, 11/11/05).

³³Based on the 2005 report of the Bundesbank, the total volume of *Pfandbriefe* in circulation was EUR 976 billion by the end of 2005; AHBR's Annual Report shows an amount of EUR 41 billion of outstanding *Pfandbriefe*. Therefore, liquidity ceased to exist for about 4 per cent of the German Covered Bond market.

³⁴This irrational behavior of the market-makers was explained with risk management strategies of the credit departments, which mainly assess the creditworthiness only based on AHBR in a single credit line exposure and do not differentiate between the totally different risks of a covered bond and an unsecured subordinated bond (Euroweek 10/28/05 and BZ 11/03/05).

stand-alone basis – would vanish with negative consequences for the whole economy. The unanticipated sudden breakdown of the market-making caused a general loss in confidence of investors as they interpreted the stop in market making as a signal from the market-makers that they did not believe in the creditworthiness of the *Pfandbriefe*. This led to a selling wave at the end of October 2005 that was mainly referred back to Asian investors (BZ 10/27/05).

The German banking sector wanted to safeguard the *Pfandbrief* reputation absolutely and keep the trust of investors in their quality and liquidity. Since the whole European covered bond sector is modeled on the German Pfandbrief archetype and the German Pfandbrief leads the market in terms of outstanding volume, a German Pfandbrief crisis was even a threat to the whole European financial sector.

Aftermath. This relatively favorable end of the AHBR crisis for the stability of the German financial system was mainly possible because the overall banking market was in a strong position in 2005 (by contrast to 2001, 2002 and 2003), and a new investor class, private equity, that was interested in German bad loans and exposure to the German real estate market, had emerged. However, not all market participants feel that they were treated fairly. Silent investors and *Genussschein* investors took significant loss allocations for 2005 and 2006 P&L losses. A dispute between Lone Star and silent investors was settled out of court in 2006. A legal procedure of several *Genussschein* investors against Lone Star is still ongoing. Furthermore, the speculation strategy is still subject to a legal proceeding of AHBR/Lone Star against two of AHBR's former management board members.

4 Analysis and Theoretical Discussion

In this section we analyze important aspects of AHBR's failure and relate them to theoretical results from the literature. Each section starts with a theoretical result, as stated in Chapter 2, and an observation from the AHBR clinical study that is in contrast to the theoretical result - what we call *AHBR puzzle*. An overview of these puzzles is provided in appendix A.7.

4.1 Shareholder Incentives for Risk-Shifting

As discussed in the paragraph on shareholder incentives in Chapter 2, a result from the literature is that *shareholders have a limited liability and benefit from*

risk-shifting (to the degree not anticipated by debtholders).

AHBR puzzle: *AHBR's main shareholders were not willing to let AHBR go into default, and protected AHBR with equity injections and guarantees. They could, therefore, not benefit ex-ante from a risk-shifting strategy based on limited liability of shareholders and potential additional losses of debtholders. The risk-shifting strategy was not in the interest of shareholders.*

The discrepancy between the theoretical result and the AHBR puzzle goes back to the assumptions of Jensen and Meckling's (1976) model. The assumptions of Jensen and Meckling that are of interest for this analysis, and also widely used by other authors, are as follows:

- Shareholders have a limited liability and act as rational investors.
- Asset prices are determined according to the CAPM. Accordingly, shareholders are well diversified and indifferent towards non-systematic risk.
- A more risky strategy has the same systematic risk as a less risky strategy.

Incentives of shareholder representatives. Most importantly, the representatives of BGAG did not act as rational *investors*, but rather as rational *agents* (in the sense of principal-agent theory) or *lobbyists*. It can be assumed that they acted in their self-interest, perhaps in the interest of trade-unions, but not in the interests of trade-union members. The situation in 2001/2002 was as follows: BGAG had a history of bad investments and had lost several billion Euros in the 1980s and 1990s, most notably *Neue Heimat* (1986) and *co-op* (1988/1989). Trade unions were also under pressure during these years because many members left the unions for political reasons. Furthermore, trade unions are the main lobbyists for employment rights and job security, and it would have been extremely unpopular to let a firm go into default. As a consequence, trade unions could not afford another failure, and it was rational for representatives of BGAG to support AHBR with cash injections *as lobbyists*, although it was irrational *as investor*. As described in the previous section, BGAG and the trade unions supported AHBR financially as long as possible up to their own debt limit and repeatedly injected huge amounts of equity when losses accumulated at AHBR. Incentives of shareholders for risk-shifting are based on their *limited liability*. As the German trade unions were not willing to use their *limited liability* and to step-away from their AHBR investment after gambling losses accumulated, they could (ex-ante) not potentially profit from the risk-shifting strategy.

Risk and utility of shareholders. In contrast to the second assumption above, AHBR's main shareholder, the trade unions represented by the holding company BGAG, were not diversified at all - their by far largest asset in 2001 was AHBR. As a consequence, additional non-systematic risk decreased utility of shareholders. Furthermore, in contrast to the third assumption above, AHBR increased its systematic risk by speculating on rising interest rates (interest rates are positively correlated to market returns). This also decreased utility of shareholders. The decrease in utility from non-systematic and systematic risk, however, can in principle be outweighed by higher expected residual claims of shareholders from a risky strategy (which demands limited liability of shareholders as a prerequisite).

Result from the clinical study (1): *Risk-shifting is not in the interest of shareholders if shareholders (or their representatives!) are willing to support the firm with new equity upon financial trouble. Shareholder representatives may not act in the interest of shareholders during a bank crisis.*

4.2 Management Incentives for Risk-Shifting

As discussed in the paragraph on management incentives in Chapter 2, a result from the literature is that *a management compensation structure with low pay-performance sensitivity induces a conservative investment strategy of the firm.*

AHBR puzzle: *Although AHBR's management compensation structure had a low performance-pay sensitivity, management started a hazardous gambling strategy.*

As discussed in chapter 3, AHBR's performance was relatively low following the takeover of the Rheinboden AG by Allgemeine Hypothekbank AG (AHB) in 2000. The situation was not dramatically bad, but management was looking for measures to improve earnings. Shareholders typically aim to induce value creating activities and to prevent opportunistic behavior by management through an adequate compensation structure and restricting liquidity.

AHBR's management compensation structure. To our knowledge AHBR's management received part of their compensation as a performance related bonus, but they did not have high pay-performance sensitivity³⁵ (AHBR 2001-2005). In designing the optimal management compensation structure, AHBR's shareholders had to balance out positive effects of high pay-performance sensitivity - which reduces management's private benefits - and positive effects of low pay-performance

³⁵An alternative term for a management compensation structure with high pay-performance sensitivity is *high powered incentive scheme*.

sensitivity - which serves as a pre-commitment device versus debtholders and reduces agency costs of debt (John, Saunders and Senbet 2000). It was in the interest of shareholders to prevent excessive risk-taking by management (as discussed in the previous section). A compensation structure for AHBR's management with a low pay-performance sensitivity therefore made perfect sense for AHBR's shareholders. Figure 10 shows a managerial incentive scheme for low pay-performance sensitivity. Assuming accounting earnings are the performance measure for management, expected earnings are X and management is offered a speculative asset where it can gain or lose an amount Y management then has a relatively low upside from higher earnings of $X + Y$ and a relatively high downside from lower earnings of $X - Y$. The upside represents management's additional bonus, while the downside means losing the job. Reputation of management in the labor market, as discussed by Hirshleifer and Thakor (1992), could also be part of the upside and downside. The preliminary result from this analysis is that the compensation structure did not reward AHBR's management to take on (excessive) risks, but induced management to search for measures to improve earnings at low risk.

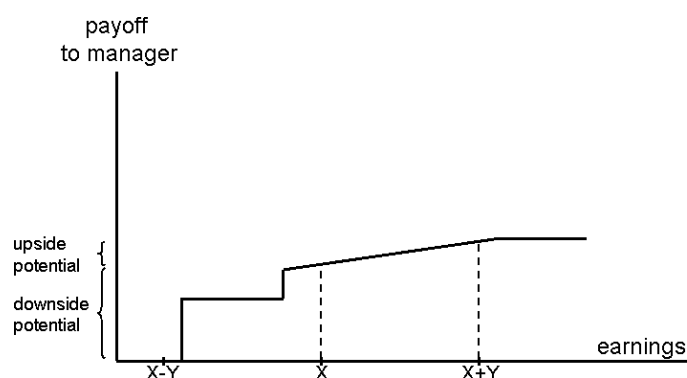


Figure 10: Example for low pay-performance sensitivity

Management's choice for interest rate speculation. Investments in interest rate swaps perfectly matched the criteria of management. Firstly, they presumably thought that they could outperform the market and thereby improve earnings (overconfidence). Secondly, the potential of accounting manipulations made this a relatively risk-free strategy for management. These two aspects are discussed in the next paragraphs.

Overconfidence and liquidity. AHBR had experience on the field of successful term transformation during the 1990s (BZ 01/22/2005). The confidence of AHBR's management in its knowledge regarding interest rate developments may have been

the starting point for the speculation in 2001 and the explanation for a massive increase of swap positions in 2002. Investors can generally discipline management - and counteract investments based on overconfidence - by restricting liquidity. As discussed by Jensen (1986), managers try to avoid thorough monitoring of their investors by financing projects internally. This link between the free cash flow problem³⁶ and management's overconfidence is also discussed by Heaton (2002). He characterizes managers as optimistic when they systematically overestimate the probability of good firm performance and underestimate the probability of bad firm performance. The analysis by Heaton (2002) does not rely on the classical assumptions of asymmetric information and the rational agency costs approach. Optimistic managers may invest in negative net present value projects even when they are loyal to their shareholders. Heaton argues that value decreasing projects of optimistic managers can be prevented by restricting liquidity, as the manager then has to search for external funding. AHBR's management, however, circumvented any disciplining measures by investing in unfunded instruments. This aspect also potentially boosted the magnitude of risk-shifting at AHBR.

Earnings Manipulation. AHBR's earnings manipulation fits well in the interpretation discussed in Tirole (2006). This ranges from *accounting methods*, where managers have substantial discretion over annual results within the boundaries of accounting standards, over *timing of income and losses* to *window dressing* by using off-balance sheet instruments. Swap contracts under German accounting standards (as many off-balance sheet instruments under various accounting standards) create hidden values and hidden losses. The more risky the assets, the higher the hidden reserves and losses and the more suitable they are for earnings manipulation. On the one side, management can improve accounting earnings through the unwinding of swaps with a positive market value. On the other side, potential negative market values of swaps are not transparent to outsiders in the short term. In order to conceal the earnings manipulation strategy, AHBR's management had to choose assets that were part of their normal business. Ironically, AHBR's management invested in very risky assets in order to make accounting earnings more stable. This view is summarized in table 2.

	shareholder value	earnings
	(long term effect)	(short term effect)
consequences	more volatile	less volatile

Table 2: Consequences of speculation with swap contracts

³⁶Jensen (1986, p. 323) defines free cash flow as cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital.

The possibility of earnings manipulation may be the driver for management to invest in risky off-balance sheet instruments. It prevents the implementation of an efficient management compensation structure that is based on the precondition that the performance measure of management is observable and can not be manipulated. As a consequence, lack of transparency through off-balance sheet instruments is costly to shareholders as it increases agency costs.

A prerequisite for the success of earnings manipulations was obviously that relationship banks and other debt investors of AHBR did not perform their monitoring tasks carefully. This aspect is discussed in the next section.

Result from the clinical study (2): *Managements incentives for risk-shifting may be driven by the possibility to manipulate earnings, irrespective of the underlying compensation structure.*

4.3 Transparency, Monitoring and Market Discipline

As discussed in the paragraph on monitoring and market discipline in Chapter 2, a result from the literature is that *relationship banks and other large debt investors, especially subordinated debt investors, have strong incentives to monitor a bank. They thereby impose discipline on the borrower.*

AHBR Puzzle (3): *Monitoring through relationship banks was ineffective and market discipline failed.*

The easiest way to explain this puzzle would be lack of transparency. As already described, German accounting standards (HGB) made it easy for AHBR not to report off-balance sheet swap engagements in the public financial statements. Nevertheless, relationship banks, bond investors and other investors of AHBR had direct access to AHBR's management and could, as part of their monitoring, have requested information about off-balance sheet items. Therefore, the analysis needs to go one step further and find out why relationship banks and debtholders did not create transparency as part of their monitoring duties.

The question why relationship banks did not more actively perform their monitoring tasks is analyzed based on the following assumptions of the theory:

- The monitor knows the risk of hidden actions (moral hazard) by the borrower and adjusts the intensity of its monitoring accordingly.
- The monitoring banks are rational and maximize their expected returns.

There is no conflict of interest between relationship managers (and loan officers) and the ultimate investors, i.e. the shareholders of the relationship bank.

Misleading signals. We think that the first assumption above does not hold in the case of the AHBR failure. AHBR's debt investors got misleading signals that made them underestimate the risk of speculations (hidden actions) by AHBR. The bank was publicly rated and also under the observation of BaFin, the German banking supervisor. Neither the rating agencies nor BaFin identified and made public AHBR's true financial situation. The German Covered Bond Act also set strict limitations on the activities of AHBR. Additionally, AHBR had many prominent relationship banks. A very interesting aspect is that AHBR made full interest payments to profit participation rights (*Genussschein*) investors between 2001 and 2004, although a fundamental of profit participation rights is that payments are only required when the issuer has positive earnings. As discussed, AHBR had had significant economic losses since 2001, but managed to show positive earnings in its financial statements from 2001 to 2004 (see also figure 6). The legally unnecessary interest payments to *Genussschein* investors were of course costly to AHBR and its shareholders. However, it allowed AHBR to keep up the appearance that everything was satisfactory. As a consequence, it is plausible that all creditors felt relatively safe and did not see the need for thorough monitoring.

Moral hazard of relationship managers and loan officers. Regarding the second assumption above, let us review the situation of AHBR's relationship bankers and loan officers during that time. First, many market participants had a very profitable business relationship with AHBR. For example, they were counterparts in AHBR's interest rate swaps and bookrunners for AHBR's public bond issues, so they earned good fees from AHBR. Relationship managers did not want to endanger their business relations with AHBR. Second, in the years between 2002 and 2004 the German banking sector itself suffered from a large range of economic problems. The financial condition of many banks was strained, e.g. due to remaining problems from the former *Neue Markt* or due to non-performing loans. In this situation, a tight and intensive monitoring of a presumably weak mortgage bank such as AHBR would only have resulted in more value adjustments and write-downs in the balance-sheets of the other banks. These adjustments would have been related to the valuation of credit exposure against AHBR via interest rate swaps and bank loans. In summary, even if relationship bankers knew that thorough monitoring of AHBR was necessary, it is possible that they did not do it in order not to endanger their revenues from AHBR and not to detect bad news. These incentives of relationship bankers were

obviously driven by short term performance goals, and were not in the interest of their shareholders. It could be interpreted as moral hazard of the relationship banker.

Subordinated Debt. Regarding the role of subordinated debt, it is fair to say that although AHBR used all kinds of presumed market disciplining instruments as suggested by González and Nickerson (2002), i.e. subordinated debt, silent partnerships and an equity controlling single major shareholder, none of those instruments showed any prewarning signs before the crisis finally culminated in 2005. The reason why market discipline through subordinated debt fails becomes clear based on the following theoretical considerations:

- Subordinated debt induces market discipline when the following *three preconditions* are fulfilled: (1) uninsured risk-sensitive liabilities make up a significant portion of the bank's funding, (2) the bank taps the market frequently enough for its borrowing costs to reflect its risk profile adequately, (3) the bank's management responds to the market signals (Sironi 2001).
- Subordinated debt investors will approve gambling of resurrection because they are similar to equity investors in a bank failure scenario (Park 2000).

In the case of AHBR, none of the subordinated debt instruments was publicly listed or traded on a liquid secondary market. The last time AHBR had tapped the subordinated debt market was on January 12, 2001, i.e. well beyond the time when the interest rate speculation started and the corresponding losses accumulated. AHBR's shares stayed unlisted and the shareholder structure remained nearly completely unchanged over the years.³⁷ Furthermore, AHBR's profit participation rights were held by retail investors who usually do not perform intensive monitoring. AHBR's silent partnership investor, DZ Bank, was in a position to perform thorough monitoring. However, even if DZ Bank realized AHBR's true financial situation at some point after 2001, it was rational for DZ Bank to support a gambling for resurrection strategy as their claims were otherwise worthless. A liquid market where DZ Bank could have sold their claims to some uninformed liquidity traders did not exist. In summary, subordinated debt did not exert any effective direct discipline on AHBR until the time when the whole dimension of AHBR's financial disaster was disclosed (AHBR ad hoc 2005) and the five leading German banks had to provide a liquidity shield for AHBR under the organization of BaFin (BZ 11/15/05). From the point of view of the market participants and the banking supervisor, it must have been clear

³⁷A pre-condition for the sale of BHW to Postbank in 2005 was that BHW got rid of its stake in AHBR and was relieved from any obligations (Financial Times Deutschland 10/26/05).

to both that the subordinated instruments did not convey any useful information regarding AHBR's creditworthiness and that they had to search for other, more significant sources of information. We conclude that the inefficiency of subordinated instruments in exerting market discipline can be well explained by existing theories. In the absence of the conditions already identified in the literature such as frequent new issues, subordinated facilities did not work as a signaling device.³⁸

The main result of this section relates to the role of relationship banks (3): *Monitoring does not work if loan officers have no interest in discovering bad news that lead to write-downs (moral hazard of loan officer).*

4.4 The Role of the Regulator and Banking Supervisor

As discussed in the paragraph on regulation and banking supervision in Chapter 2, it is generally assumed in the literature that *regulation has the goal of preventing risk-shifting, and the banking supervisor should stop excessive risk-taking by a financial institution.*

AHBR Puzzle (4): The German banking supervisor did not stop the interest rate speculations until 2005, although it had the relevant information as early as 2001/2002.

Conflicting goals of the German banking supervisor. According to its mission statement, the German banking supervisor BaFin has the following goals (BaFin 2008b):

- that the German financial system continues to function properly and remains competitive and stable and that its integrity is preserved;
- that the trust of investors and insurance policyholders in this system is maintained;
- that market operators conduct themselves fairly.

We think that the unusual behavior of BaFin is based on inherent conflicts between its goals which emerged during the AHBR crisis. We argue in the following that the first two goals cited above, maintaining a stable financial system and maintaining investors' trust, created a conflict for BaFin during the AHBR crisis. BaFin placed

³⁸The analysis of the role of subordinated debt during the current subprime crisis probably offers more interesting insights into market reactions during a banking crisis, and could help to examine the necessary conditions for subordinated instruments as a signaling device.

most importance on its first goal and disregarded its second goal. BaFin's third goal did not play a crucial role in the prevention of AHBR's failure.

Based on the ideas of Wall and Eisenbeis (2000), figure 11 illustrates the conflict a banking supervisor faces when a crisis is imminent. The supervisor has to balance his decision between stabilizing the financial system and maintaining the trust of investors along the efficient frontier.

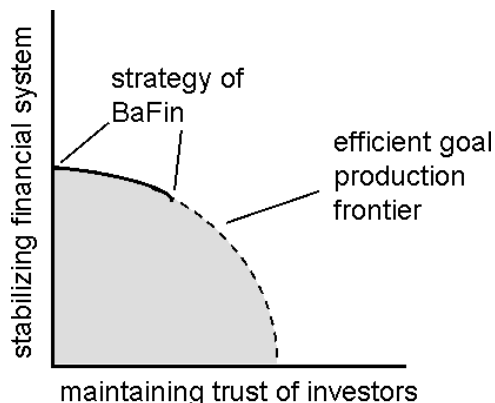


Figure 11: Conflicting goals of the German banking supervisor

An alternative approach in analyzing the role of the regulator and supervisor is to consider whether he maximizes his own goals, as discussed by Thakor (1993) under the title *self-interested bank regulation* and by Freixas and Santomero (2003). This approach is probably also part of the explanation of BaFin's behavior, as it might have pursued the self-interest goal in order to prevent any criticism for not having avoided the problems at AHBR right from the start.

First goal: Stabilize financial system. BaFin had to judge how best to achieve their goals. The situation for BaFin at the beginning of 2002 was as follows: A fully-fledged unwinding of the outstanding swap agreements during the year 2002 would have led to a massive direct impact on AHBR's profit and loss statement and probably would have caused the collapse of AHBR, a top three mortgage bank. A direct consequence would have been the "*Pfandbrief test*", as discussed in Section 3.4. BaFin and the whole German banking sector were extremely keen to protect the extraordinary reputation of the *Pfandbriefe*. It was necessary to avoid problems at AHBR spilling over on to the *Pfandbrief* community or even negatively affecting refinancing costs of the German banking sector as a whole. BaFin presumably feared contagion effects on other German banks and especially on the outstanding reputation of the German *Pfandbrief*. Freixas and Santomero's finding (2003) that the regulator and banking supervisor especially should react to the failure of a bank when a risk of contagion is imminent, becomes very clear in the course of the

AHBR failure. From BaFin's perspective, an unwinding of AHBR's swaps meant incalculable risks.

The preferred solution of a banking supervisor in such a situation is often to find a strong competitor prepared to acquire the bank in difficulties. At that time, however, none of the German banks were in a financial position to absorb a takeover of AHBR with all its problems. In summary, BaFin feared high *social costs* from an AHBR bankruptcy and threatening contagion effects, and consequently missing its first goal as cited above.

Second goal: Maintaining trust of investors. It seems that BaFin decided to back AHBR's obfuscation strategy, being in accordance with section 340f of the German Commercial Code, at the expense of its second goal of maintaining the trust of investors.

Strategy of BaFin. BaFin's primary rationale was presumably the following: As long as any losses from the swap speculation are allocated to AHBR's equity or a limited number of subordinated debt holders, i.e. especially silent partners and profit participation rights investors, gambling can proceed. From BaFin's point of view, those investor groups concerned had sufficient means and rights to monitor AHBR thoroughly. Additionally, the profit participation rights were compensated for risk assumption with high interest coupons of up to 8.625%, i.e. well above the market rate at that time. As long as sufficient funds were available, any senior lenders would not negatively be affected by continued gambling at AHBR and contagion effects would stay away. The investors in *Pfandbriefe* were explicitly safeguarded anyway due to the high coverage of *Pfandbriefe* and the additional security through the Covered Bond Act. A second rationale for BaFin not to stop the gambling was probably very simply to gain time. The German banking industry was recovering from year to year, so that a possible solution regarding AHBR without market turbulence became more and more likely.

Instead of taking the risks of financial instability, BaFin chose a *forbearance* strategy to cope with the threatening bankruptcy of AHBR. Forbearance in the financial context is defined by Kane (1996) as a policy of leniency or indulgence in enforcing an obligation owed by another party, especially by allowing a financial institution to operate with dangerously low or negative net worth. As described in section 3.3, this was the case at AHBR, presumably already in 2002. Beside the risk of further accumulating losses, forbearance has the undesired effect that it leaves the banks' stockholders in control of forbearance assets (Kane 2001). BaFin assumed with

its forbearance strategy the responsibility for a successful solution of the AHBR crisis. Kane (1996) expresses this responsibility a bit more drastically: *"In allowing an insolvent institution to operate as a decapitalized zombie, the insurer accepts responsibility for the zombie's further losses."*

In order to implement its strategy, reliable information was crucial for BaFin to keep pace with the developments at AHBR. BaFin had good information regarding the real financial situation at AHBR from the very beginning of the interest rate speculation in 2001 and followed the bank's development closely throughout the years. The more BGAG struggled to cover AHBR's losses and the more the German banking sector recovered, the more BaFin exerted pressure on AHBR's main shareholder BGAG to find an acceptable solution regarding the bank's future. When AHBR finally nearly collapsed during the sale process in 2005, the German banking sector was strong enough to grant a liquidity shield of EUR 2.5 billion as bridge loan under the management of BaFin, until the sale of AHBR to Lone Star was successfully completed.

The behavior of BaFin reflects its understanding that the banking supervisor is not 'per se' responsible and cannot afford to keep every bank running. Instead, the banking supervisor is much more responsible for the banking sector as a whole, which also influences its decision making. This could also lead in particular cases to losses for individual investors, for which the banking supervisor cannot be blamed.

From the perspective of the German financial system, it seems that BaFin chose *the lesser of two evils*. BaFin successfully managed to avoid a crisis of the Pfandbrief market and minimized external *social costs*. The losses were *internalized* and born by AHBR's equity and *Genussschein* investors. However, BAFIN's apparent acceptance of AHBR's accounting manipulations and violence of the German Covered Bond Act is controversial.

Result from the clinical study (4): *The banking supervisor balances expected social costs from bankruptcy and from continued speculation, and might approve gambling for resurrection as long as it minimizes expected social costs.*

5 Conclusion

The EUR 4 billion gambling loss and failure of AHBR is an interesting and complex episode of German banking history and financial regulation. This paper contrasts assumptions and results from the literature on risk-shifting with observations from

the AHBR failure and discovers several puzzles.

Results of the paper. An interesting contribution of this paper is that risk-shifting is not generally in the interest of shareholders. In this case management incentives remain the sole explanation why a firm starts investing in highly risky assets. We have showed that management has strong incentives to use unfunded and off-balance sheet financial instruments for earnings manipulation. While these instruments can be used to make short term accounting earnings more stable, they make shareholder value and firm value much more volatile. We argue that managerial moral hazard, such as investment in risky assets for the purpose of earnings manipulation, should be given more attention as a potential origin of the risk-shifting problem. As management incentives are largely linked to a lack of transparency, more complete and market-oriented accounting standards such as IFRS and the new regulatory framework Basel II will close some gaps. However, we expect that creative accountants and investment bankers will develop new products that conceal financial positions and potential losses. Monitoring by relationship banks has its weaknesses when relationship managers (agents of the lender) also have incentives to conceal losses of the borrower in order to avoid write-downs. This demands a more active role of the banking supervisor. An interesting finding is that the banking supervisor presumably approved *gambling for resurrection*. We have shown in our analysis that the banking supervisor might not act in the interest of all investors and faces conflicting goals when a crisis is imminent.

Relevance of results for subprime failures. We think that findings from the AHBR case study are also relevant to other bank failures, such as those connected with the recent subprime crisis. For example, the German banks *IKB* and *SachsenLB*, two traditionally very prudent banks, invested enormous amounts relative to their balance sheet in US subprime off-balance sheet structures. Although each bank tried to make high profits with their subprime investments, the shareholders of *IKB* and *SachsenLB* could ex-ante not profit from risk-shifting. Their shareholders, *Kreditanstalt für Wiederaufbau* and the State of Saxony respectively, were as public authorities not able to permit the banks to declare bankruptcy and had to cover any losses occurred. Similarly, as in the case of AHBR, the origin of risk-shifting was management, not shareholders. The situation was somehow different for publicly listed investment banks such as Citigroup, Merrill Lynch, UBS, Morgan Stanley or Bear Stearns. Their shareholders could at least ex-ante profit from risk-shifting as they were in principle able to let the banks go into default by walking away. Lack of transparency, however, also created incentives for management to use unfunded, off-balance sheet instruments for earnings manipulation. Additionally, as the sub-

prime crisis clearly shows, lack of transparency is not a unique characteristic of Germany's traditional accounting standards HGB, but is also a major problem for other accounting standards, such as US-GAAP or IFRS. Both were long praised for their *true and fair view* and mark-to-market accounting rules. However, banks and financial institutions all over the world and under almost all accounting standards kept their subprime investments off-balance and away from shareholders' monitoring for a long time, and meanwhile had to uncover their real subprime exposure and suffer severe losses.

We think that the analysis in this paper is relevant beyond the individual case, and that it could be fruitful for the theoretical literature on risk-shifting to embrace some of the insights and ideas from this clinical study.

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A APPENDIX

A.1 AHBR 2001 financial data

Table 3 shows AHBR's balance sheet for 2001 and table 4 shows AHBR's P&L data for 2001.

	Assets	Liabilities	
Cash Reserves	59	11,132	Due to banks
Due from banks	26,519	9,254	Due to customers
Due from customers	50,924	67,135	Securitised liabilities
Bonds and other fixed-interest securities	10,862	236	Other
Shares and other non fixed-interest securities	704	245	Deferred items
Participating Interests	23	485	Subordinated liabilities
Shares in associate companies	30	572	Profit participation certificates
Recovery claims on public authorities	170	38	Provision for general banking risk
Deferred items	678	101	Subscribed capital
Other	65	372	Silent partnerships
		448	Capital reserves
		16	Other Capital and reserves
Total Assets	90,034	90,034	Total liabilities

Table 3: AHBR 2001 balance sheet data (in EUR million)

	Expenses	Income	
Interest expenses	4,595	4,939	Interest income
Commission expenses	30	5	Current income
General administration expenses	100	13	Commission income
Depreciation fixed assets	5	4	Other operating income
Depreciation etc. (claims on customers)	110	68	Extraordinary income
Depreciation etc. (investments)	6		
Extraordinary expenses	108		
Taxes on income	62		
Other expenses	13		
Profit for the year	0		
Total expenses	5,029	5,029	Total income

Table 4: AHBR 2001 P&L data (in EUR million)

A.2 AHBR's ownership structure in 2001

Figure 12 shows AHBR's ownership structure in 2001³⁹, the year in which the bank's financial downturn began.

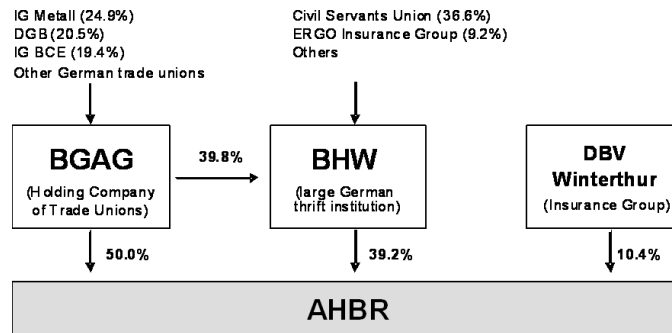


Figure 12: AHBR's ownership structure in 2001

A.3 Losses of AHBR's investors over time

Figure 13 shows the timing of losses of AHBR's investors.

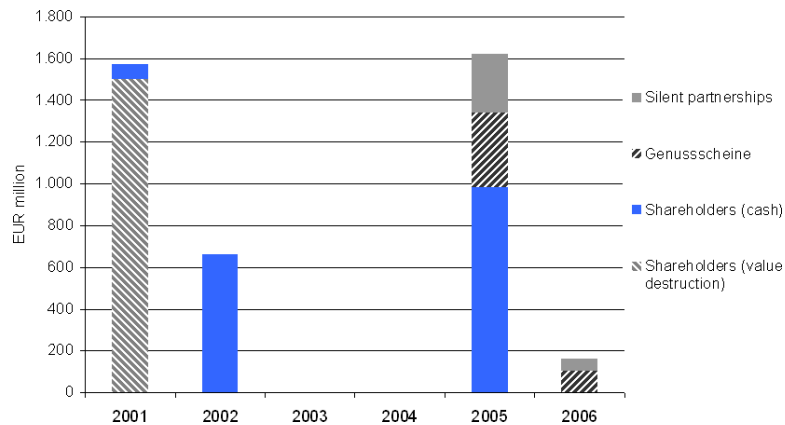


Figure 13: Losses of AHBR's investors from 2001-2006 (total of EUR 4 billion)

³⁹The remaining 0.4% shares were held by other, unknown shareholders and were not listed on any stock exchange (AHBR 2001, p. 43).

A.4 Development of AHBR's public ratings

Table 5 shows the development of AHBR's ratings.

	2001	2002	2003	2004	2005
Long-term debt					
S&P	A-	BBB	BBB	BBB	BB+
Moody's	A2	Baa1	Baa1	Baa1	Baa3
Fitch	A	BBB+	BBB+	BBB+	BBB-
Short-term debt					
S&P	A-2	A-3	A-3	A-3	B-
Moody's	P-1	P-2	P-2	P-2	P-3
Fitch	F1	F2	F2	F2	F3
Financial Strength					
S&P	-	-	-	-	-
Moody's	C+	C-	C-	C-	E
Fitch	B/C	C/D	C/D	C/D	E
Public Sector covered bonds					
S&P	AAA	AAA	AAA	AAA	AAA
Moody's	Aa1	Aa3	Aa3	Aa1	Aa1
Fitch	AAA	AAA	AAA	AAA	AAA
Mortgage covered bonds					
S&P	AAA	AAA	AAA	AAA	AAA
Moody's	Aa2	A1	A1	Aa3	Aa3
Fitch	Aa+	Aa+	Aa+	Aa+	Aa+

Table 5: AHBR's ratings

Source: AHBR's annual reports 2001-2005.

A.5 Development of AHBR's capital structure

Figure 14 shows the split up of the bank's capital and reserves (AHBR 2001-2005). The retained losses of EUR 442 million in 2005 were carried forward in future years.

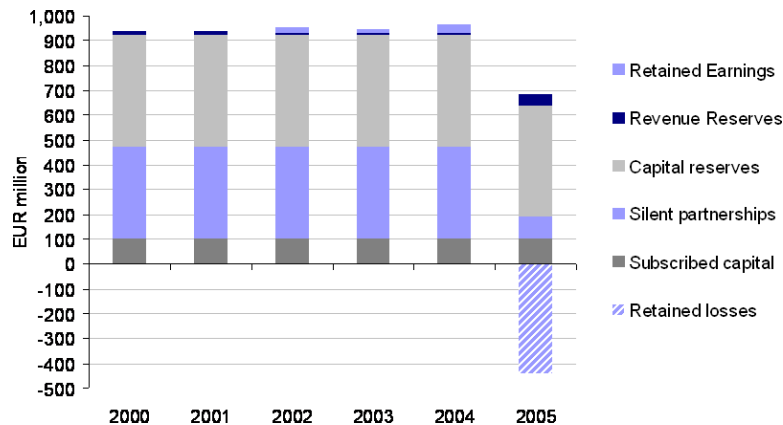


Figure 14: AHBR's capital and reserves

Figure 15 shows the composition of the bank's *Genussscheine* (profitti participa-

tion rights) and other subordinated liabilities (AHBR 2001-2005). *Genussschein* investors had to bear substantial losses in 2005 (and even in the following years), while subordinated liability investors were unaffected.

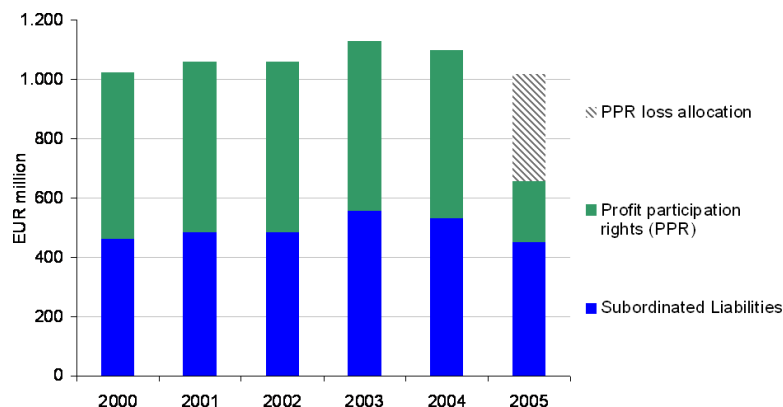


Figure 15: AHBR's *Genussschein* and subordinated liabilities

A.6 Development of AHBR's business

Figure 16 shows the declining business of AHBR between 2001 and 2005 (AHBR 2001-2005).

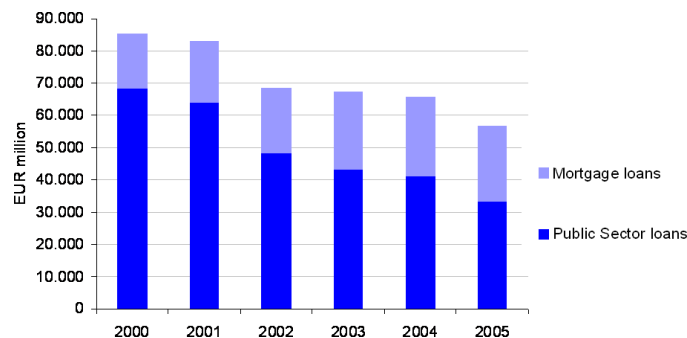


Figure 16: AHBR's mortgage business

Figure 17 shows the development of AHBR's main refinancing instruments (AHBR 2001-2005). It can be seen that first, in line with the shrinking mortgage business, the total amount of debt decreased, and second, the refinancing was done more and more via the interbank credit market instead of *Pfandbriefe* (shown in the figure as securitised liabilities).

A.7 Overview on AHBR puzzles

Figure 18 shows an overview on the AHBR puzzles.

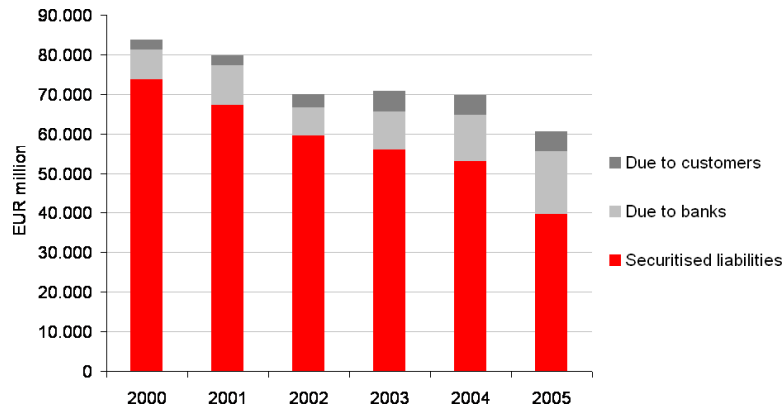


Figure 17: AHBR's main refinancing instruments

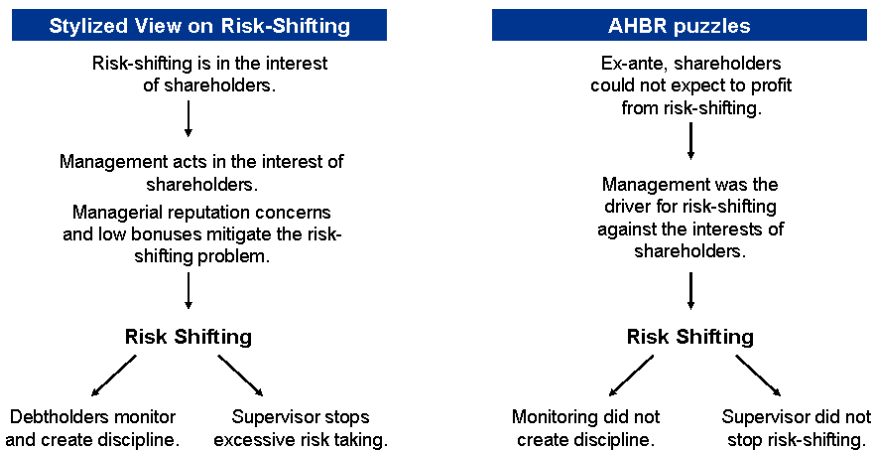


Figure 18: Overview on stylized facts and AHBR puzzles

A.8 German Banking Regulation

The main supervisory bodies in Germany are *Bundesanstalt für Finanzdienstleistungsaufsicht* (BaFin), the federal financial supervisory authority, and *Bundesbank*, the German central bank. The general regulatory framework is the *Kreditwesengesetz* (KWG or BA), the German banking act, which is replenished with further regulations for special fields or products in the capital market. Section 6 of the Banking Act sets the primary objectives for the work of the BaFin.⁴⁰

The banking regulation in Germany is particularly focused on safeguarding financial stability as stated in BaFin's Mission Statement, which lists as further goals the proper functioning of the financial system, maintaining the trust of investors and insurance policy holders and the fair conduct of the market operators among themselves. BaFin is directly responsible for the supervision of banks, financial

⁴⁰The following paragraphs are also based on information from BaFin's website, in particular on BaFin's functions (BaFin 2008a) and on BaFin's Mission Statement (BaFin 2008b).

services institutions, e.g. securities trading banks, and insurance companies. BaFin gets support from the Bundesbank in fulfilling its duties⁴¹, which is in particular responsible for the collection and analysis of data from the banks and financial institutions, which have to file certain documents, e.g. concerning their credit risks or their regulatory capital, with the Bundesbank, which has to provide the information from the analysis of the documents to BaFin. Additionally, both agencies coordinate their behavior in all other fields of banking supervision such as regular or extraordinary audits and interviews with banks.

The banking supervision is divided into two phases: first, the authorization process, i.e. BaFin grants and revokes banking licenses, and second, the ongoing supervision of the business activities of banks. In the first phase, BaFin checks that any new institution is endowed with a particular minimum amount of own funds, has a fit and proper senior management and a viable business plan indicating the nature of the planned business including the organizational structure and the proposed internal control system. The second phase focuses on the financial stability of any credit institution, i.e. it regulates the required amount of own funds depending on the risk of its business, ensures the bank has adequate liquidity and an organizational structure consistent to the nature and scale of the banking business and compliant with the regulatory framework. New standards for the regulation of capital structure were set by the adoption of Basel II in German law as required by the EU Capital Requirement Directive (CRD).⁴²

A.9 Characteristics and Regulation of German Covered Bonds

The *Pfandbriefgesetz* (PfandBG or CBA in the following), the German covered bond act, further specifies the regulatory requirements for mortgage banks such as AHBR. The strict regulatory framework for covered bonds is positively acknowledged by external rating agencies such as Standard & Poor's, Moody's and Fitch.⁴³

Pfandbriefe, the German form of Covered Bonds, are issued in Germany typically

⁴¹The cooperation between BaFin and Bundesbank is specified in Section 7 of the German Banking Act and a Memorandum of Understanding relating to the Supervision of Credit and Financial Services Institutions of October 31st, 2002

⁴²Implementation via the following regulations: Mindestanforderungen an das Risikomanagement (MaRisk), Solvabilitätsverordnung (SolvV), Groß- und Millionenkreditverordnung (GroMiKV).

⁴³S&P (2005), p. 2: "There is a clear legal framework for German Pfandbriefe, which is well established [...]. One of the principal aims of this legislation is to ensure that cover pool assets are available at all times to provide for interest and principal payments on the outstanding Pfandbriefe even in the case of the insolvency of the issuing bank."; Fitch (2004), p. 1: "[...], German Pfandbriefe were taken as a model in several European countries where legal frameworks were reactivated or created from scratch in the late 1990s to enable the issuance by certain financial institutions of similar instruments secured on portfolios of mortgage loans or public sector debt."

by a mortgage bank, but can also be issued by any other financial institution.⁴⁴ The bond is collateralized with a designated pool of assets, i.e. mortgage loans or public sector loans. Additionally, the Pfandbriefe are secured with recourse to the issuing institution's assets, if the designated pool of assets is insufficient to repay the claims of the investors.⁴⁵ This joint collateralization of the Covered Bond with a cover pool and recourse to the originator is the main distinctive feature to an Anglo-Saxon mortgage-backed security (MBS), where a true transfer of risk to the investor has taken place with the transfer of an asset pool to a special purpose entity, which acts as the only collateral. A test of the recoverability of the designated pool of assets – a so called Pfandbrief test – or a recourse to the assets of the issuing institution has never happened so far in the history of the German Pfandbriefe, since all have been repaid timely and in full. More details about characteristics of German covered bonds as well as a comparison with a true sale or a synthetic sale of loans are shown in appendix 1.

As a result of high regulatory requirements, the Pfandbrief is assessed as one of the leading capital instruments in Germany and even across the rest of Europe.⁴⁶ Besides the extraordinary credit quality of covered bonds, yielding a “triple A” rating from Standard & Poor's for nearly all covered bonds issued in Germany (Moore 2000, p. 51; Standard & Poors 2006, p. 4) based solely on the high-quality collateral regardless of the bank's counterparty rating⁴⁷, it is the liquidity of the covered bonds which makes this financial instrument so popular and interesting for international investors (Moore 2000, p. 18). The vital importance of liquidity is ensured by the Minimum Standards of Jumbo Pfandbriefe, which require for each Jumbo issued a minimum of three market makers, who pledge to quote bid/ask prices simultaneously up to a closing of EUR 15 million.⁴⁸ This market making yields the high liquidity and the possibility of trading the covered bonds at anytime.

The Covered Bond Act replenishes the BA taking into account the special product portfolio, the refinancing by issuing covered bonds and the risks of these financial services provided by mortgage banks. The CBA sets higher regulatory standards for the granting of a banking license of a mortgage bank compared to a deposit-taking

⁴⁴Before the introduction of the new CBA in July 2005, the former Mortgage Bank Act required that only specialized banks could act as mortgage banks (CBA Section 2.1 - License).

⁴⁵Dierick et al. (2005), p. 45; CBA, Section 4 “Matching Cover” and Section 30.1, 30.6 “Insolvency, Appointment of the Cover Pool Administrator”.

⁴⁶Moore (2000), p. 135: “[...], the Pfandbrief is no longer an esoteric and illiquid instrument suitable only for consumption among buy-and-hold investors in Germany. Instead, it is a benchmark product that no European fixed income investor or bond analyst can afford to overlook.”

⁴⁷Moore (2000), p. 132; Moore (2000), p. 51 “The fact that the rating is dependent not on the issuer's strength but on the collateral quality of the Pfandbrief further underlines the outstanding credit quality of this type of instrument.”

⁴⁸Association of German Pfandbrief Banks: Section 4 of the „Minimum Standards of Jumbo Pfandbriefe”. The market makers have to quote prices during the term of the Jumbo Pfandbrief as long as there is sufficient outstanding volume to maintain a liquid market. (http://www.pfandbrief.org/d/internet.nsf/tindex/en_minimum.htm)

credit institution, e.g. the minimum amount of own funds is five times higher for a mortgage bank (CBA Section 2.1). Additionally, the CBA sets very strict requirements concerning the quality of the mortgages, which act as collateral for the covered bonds, i.e. the mortgages can only be valued to a maximum of the first 60 % of the hypothecary value (CBA Section 14), there are several requirements concerning the location of the real estate encumbered with a mortgage (CBA Section 13), so that the investors of the covered bonds are safeguarded with sufficient and valuable collateral. The assets used as security for a covered bond have to be recorded by the mortgage bank in an individual register maintained for the respective covered bond (CBA, Section 5). This cover register contains the assets which may not be included in the insolvency estate if insolvency proceedings are opened in respect of the issuing bank; only the creditors of the respective covered bond shall be satisfied by the covered register.⁴⁹ In order to ensure that the coverage of the issued covered bonds is sufficient at all times, an independent *cover pool monitor* who is responsible for the value of the pledged properties being established in accordance with the statutory order of the CBA, shall be appointed at each mortgage bank.⁵⁰ The mortgage bank has to release quarterly reports, which contain in detail the amount of outstanding covered bonds and the designated nominal value of the collateral and the present value of the collateral (CBA Section 28).

⁴⁹CBA, Section 30 “Insolvency, Appointment of the Cover Pool Administrator”; the clear dissociation of the cover pool from the insolvency estate also played a crucial role in the change of Moody’s rating methodology and its significant rating upgrade of many German Covered Bonds in 2004 and 2005, see e.g. Moody’s (2005), vdp Annual Report 2005, p. 3 and p. 13.

⁵⁰CBA, Section 7 “Cover Pool Monitor and Deputy“: The Cover Pool Monitor must have certain professional skills, e.g. Be a certified auditor or sworn accountant, to qualify for the required expertise and experience. Additionally, the independence of the Cover Pool Monitor results from his appointment and the payment of his remuneration directly by the BaFin, CBA Section 11 “Fee, resolving of disputes”. See also CBA, Section 8 “Duties of the Cover Pool Monitor“.

The following table provides an overview on characteristics of German covered bonds (Pfandbriefe) vs. alternative financings.

	Covered bond (Pfandbrief)	Synthetic securitisation	True-sale securitisation
Originators'/ issuers' motivation	Refinancing	Management of risk and of regulatory and economic capital; refinancing, where appropriate	Management of risk and of regulatory and economic capital; balance sheet structure management; refinancing
Independent legal basis	Pfandbrief Act	No	No
Basic structure	Formation of a pool of exposures (cover fund) to additionally hedge debt certificates (covered debt certificates)	Hedging of a pool of exposures by means of guarantees or credit derivatives with or without a refinancing function as well as with or without a special-purpose vehicle	Legally binding transfer of a pool of exposures to a special-purpose vehicle
Tranching	No	Yes	Yes
Recourse to the originator	Yes, cover fund serves as additional collateral	Generally, no recourse	Generally, no recourse
Balance sheet effect	No	No	Generally, contraction
Capital relief on the underlying exposures for the originator	No	Possible	Possible
Risk weighting pursuant to Principle I and the Solvency Regulation	Principle I: 10%; Solvency Regulation: Standardised Approach, 10%; IRB Approach, LGD of 11.25% as appropriate	Principle I weighting of securitisation positions: generally, 100%; Solvency Regulation: Standardised Approach, at least 20%; IRB Approach, at least 7%, where appropriate 6%	
Requirements for the underlying pool of exposures	Legal requirements and requirements imposed by rating agencies	No restrictions; quality is factored into the credit rating issued by the rating agencies	No restrictions; quality is factored into the credit rating issued by the rating agencies
Exchange of assets after the beginning of the transaction/issue	Yes	Consequence: potentially no regulatory capital relief on securitised assets for the originator	Consequence: potentially no regulatory capital relief on securitised assets for the originator
Requirements for the originator/issuer	Legal requirements (banking business pursuant to Banking Act, BaFin approval required, strict qualitative requirements) and requirements imposed by rating agencies	No restrictions; quality is factored into the credit rating issued by the rating agencies	No restrictions; quality is factored into the credit rating issued by the rating agencies

Table 6: Characteristics of German covered bonds vs. alternative financings

Source: Deutsche Bundesbank 2006