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# 1.Introduction

The recent financial crisis is considered to be a regulatory failure. The current regulation is the Basel II regime, which is a regulation for global operating banks that was established by the G10 countries. Although the Basel regime is currently implemented by a lot of members, more and more countries are implementing the Basel II rules. The current crisis raised a lot of drawbacks and questions regarding the rules. Some global banks had a lot of trouble during the last year and need financial support although the reported financial ratios were almost stable. One of the problems was the level of capital required by banks in order to meet the Basel capital requirements. Some experts argued that capital requirements on Basel II are cyclical and tend to reinforce business cycle fluctuations. Others assert that the requirements are too conservative and offer possibilities for bank managers to report better ratios than the real situation is. A lot of banks used the Basel rules for hedging risk exposures using structured investment vehicles and therefore reduce their capital requirements, although the real risk does not decrease. This has also been a big topic in recent newspaper reports and forced the European Commission to publish possible changes of Basel II and work on Basel III. Furthermore new voices were raised against the calculated ratios under the current Basel Regime. Beside the Tier 1 capital ratio, a second ratio, which should be called "Leverage Ratio", could be introduced in order to meet the new challenges. A leverage cap could restrict banks from holding large leverage is the simple argument. On the other hand, a cap on leverage may dampen the growth of banks and their profitability because many banks are run as privately owned businesses. As a private investor this could increase the fees charged by the bank, in order to raise capital due to new capital requirements. In this master thesis I describe the past developments and current suggestions for Basel III. Furthermore I analyze the banks balance sheets by testing the leverage ratio.

## 1.1. Aim and Methodology

The regulatory requirement sets a minimum level of capital that the institution has to hold. The degree of that requirement is binding and depends on the type of institution. The Basel Accord of 1988 applies different credit risk weights by different positions. A bank that falls below the minimum adequate level is classed as undercapitalized.

A Leverage ratio requirement may also affect the asset allocation of banks that are constrained by the requirement. Banks are therefore likely to reduce low-risk weighted assets such as treasuries and increase riskier assets such as equities in order to gain from a stock market boom. One of the advantages of a leverage ratio should be the transparency of reporting and the simple calculation method to compare the ratio globally. The Tier 1 capital ratio is the ratio of a bank's core equity capital to its total risk-weighted assets. Is that ratio really a good and transparent indicator as banks can increase their risk-weighted capital ratio without raising capital? Considering the difficulties of complex financial products it is a priori not certain that the risk-based capital ratio is really a good indicator and better than simple ratios in capturing the overall risk of a bank due to regulatory arbitrage incentives.

The US leverage ratio is defined as a minimum ratio of Tier 1 capital to total adjusted assets of 3% for strong (under the BOPEC rating system of bank holding companies) and of 4% for all other banks. The total risk-based capital ratio (sum of Tier 1 and tier 2 capital divided by risk-weighted assets) should be at least 8%. The ratio applies only on a consolidated basis and does not account for off-balance sheets exposures. Such off-balance sheet activities do not appear on bank balance sheets but expose banks to risk.

During the financial crisis some voices were raised that Basel II is pro-cyclical. Regarding the Diamond/Dybvig model (1983) a bank with deposit insurance can provide liquidity insurance to a firm, which can prevent a liquidity crisis for a firm with short-term debt. On the other hand, in the second Basel II pillar liquidity risk means

risk regarding an asset that cannot be traded quickly enough in the market. An example for such a risk is reflected by a widening in the bid/offer spread for asset-backed securities. The problem of the model is that there is no distinction between systematic and unsystematic risk. A big bank could take a high leverage because in a financial crisis a systemic bank is provided by the government and would get financial support. There are incentives for banks to have higher debt, which could create moral hazard. But what is the best way to restrict leverage? Is Leverage a good complement measure to the risk-based capital model of Basel II?

In this thesis I examine the roles of different leverage ratios in banking regulation. I use different leverage ratios (simple & complex ratios) and take those ratios to compare US and European banks to Austrian banks. Leverage ratios should bear a significant negative relationship to the risk of subsequent bank failure. Are the most complex ratios (risk-weighted ratios) better than those naïve Leverage ratios as an effective predictor of bank failure over time and do the simpler ratios outperform the “complex” ratios?

The research is collected through Fed historical data, Central bank data, Federal Reserve Archival System for Economic Research (FRASER) of the Fed of St. Louis, Federal Reserve Economic Data (FRED) of the Fed of St. Louis, Equity Research from global banks such as Citigroup or JP Morgan, International Swaps and Derivatives Association, the Austrian National Bank Statistics and Reporting, Statistics from the International Monetary Fund, Bloomberg data and research papers. The data for Austrian banks is collected via annual and half-year reports. For international banks I also used annual and half-year interim reports and Bloomberg for calculating the ratios because big banks are better covered by Bloomberg than small listed firms.

## 1.2. Structure

I divide the thesis into three main parts. The first section will address the aspects of Banking regulation, the historical development of the Basel rules and pricing in general. Furthermore in this section Basel III suggestions and possible calculations of

a Leverage ratio are discussed. In the second part I will discuss the commercial banking sector. In this chapter I discuss the possible differences to investment banking and show the current market situation, especially the last financial crisis and the role of liquidity and government bonds, i.e. sovereigns. In the third and last part I examine the leverage ratio of European, American and Austrian banks.

## 2. Banking Regulation

Before 1933 times could be described as the period of free banking in the US. The regulation which exists prior to 1933 was the National Bank Act of 1863, which was largely ineffective.<sup>1</sup> The regulation of the Banking Act of 1933 reduced the rate of entry into commercial banking (comparison of the periods 1921-1935 to 1936-1962) by 50%.<sup>2</sup> In Europe, especially in Germany, the German Banking Act, which was also valid for Austria, was established in 1934 as we will see below. Generally, the banking regulation changed very slowly in history and often originated after a crisis. A good example for historic confidence in science is the efficient market hypothesis by Fama (1969), which was criticized but not fully rejected by many authors in the past. The hypothesis is connected with the Basel regulation and will therefore be shortly discussed.

### 2.1. Efficient market hypothesis

The efficient market hypothesis indicates that financial markets are efficient, which means that at any time security prices fully reflect any information available about a company and send signals for capital allocation. There are three forms of the efficient market hypotheses, the weak form, in which the information set covers just historical prices, the semi-strong form, in which any publicly available information (for example earnings announcements) is available and the strong form, in which also 'insider' information is available at any time.<sup>3</sup>

The efficient market hypothesis was important for designing the regulation of the Basel Accord on Banking Supervision by the Basel Committee. The riskiness of banks' holdings will be judged by market prices and ratings from private agencies (i.e. Standard & Poors, Moody's and Fitch). According to the EMH such rating contains reliable information. During the financial crisis much criticism arose, regarding the validity of the EMH.

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<sup>1</sup> See Peltzman (1965), p. 11.

<sup>2</sup> See Peltzman (1965), p. 48.

<sup>3</sup> See Fama (1969), p. 383.

94% of the S&P 500 firms are rated in the US, while only 53% of the firms have a credit rating in Europe, for example the DAX-30. Therefore most European banks should use the Internal (IRB) Approach rather than Standard Approach because the Standard Approach includes higher capital requirements for unrated securities. The risk weights of firms might only be feasible if rating agencies across the world act consistently across issuer category (corporates versus sovereigns) and through time.<sup>4</sup> The disclosure of Basel II, especially the third Pillar should provide investors with all relevant information to assess investments. The question is why investors had made poor decisions before the crisis, although such information was accessible? The answer is clear because there are already information asymmetries in the market. Furthermore some investors did not read the prospectus carefully. Due to the complexity of products such as Mortgage-Backed-Securities, Asset-Backed-Securities or Collateralized Debt Obligations, 'rational' investors failed to understand the risks or the securities during the sub-prime mortgage meltdown.<sup>5</sup> A lot of experts now believe that the efficient market hypothesis is no more valid. Some professionals argue that only the strong form of the hypothesis is wrong, others believe that all forms are no longer valid and justify this by the crisis. Malkiel (2003) argues that markets are efficient, because they do not allow investors to earn above-average risk-adjusted returns.<sup>6</sup> In my view financial markets do not operate perfectly due to asymmetries of information and principal-agent problems.

## 2.2. Crisis as a trigger for regulation in history

Mishkin (2007) outlines five categories of factors that cause financial crises. These factors are:<sup>7</sup>

- an increase in uncertainty due to a failure of an important financial institution,
- asset market effects on state of firms' Balance Sheets ,
- problems in the banking sector,
- an increase in interest rates, and
- Government Fiscal Imbalances.

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<sup>4</sup> See Danielsson et al. (2001), p. 12.

<sup>5</sup> See Schwarcz (2007), p.6ff.

<sup>6</sup> Malkiel 2003), p. 5.

<sup>7</sup> See Mishkin (2007), p. 206f.

All of these factors are interesting and show that banks play an important role in the economy. Furthermore there is an interaction between these points. Uncertainty due to a failure of an institution, a stock market crash or recession is not new in history. A crisis would make it harder for banks to separate good credit risks from bad ones and causes adverse selection. Due to effects of asset prices on balance sheets, banks will have fewer resources to lend and bank lending will decrease. If banks do not trust each other, a bank panic could occur. Due to the decline of bank lending during a crisis, the supply of funds available to borrowers decreases, and the interest rates grow. The results are adverse selection and moral hazard problems in credit markets. If people will not buy government bonds anymore, and there is a fear that those bonds could default (for example during the Argentine crisis 1999-2002), banks have to buy them and this would affect their balance sheets.<sup>8</sup>

The banking crisis of 1931 was the primary motive to establish a state supervision of all banks. The peak of crisis was the Black Friday on Wall Street which initiated the Great Depression (1929-1939). A direct response to this was the US Banking Act of 1933 (Glass-Steagall Act named after the legislative sponsors Carter Glass and Henry B. Steagall), which established the Federal Deposit Insurance Corporation (FDIC) as a temporary agency and separated commercial from investment banking. The US Federal Reserve System was established through the Federal Reserve Act in 1913.<sup>9</sup> In Austria, the Creditanstalt-Bankverein AG, which was established 1855, got also into trouble and triggered a bank run on German banks in 1931.<sup>10</sup> The Creditanstalt-Bankverein AG was financially restored by the Austrian Republic, the Austrian National Bank and the House of Rothschild (an influential family of bankers in Europe) and merged with the Wiener Bankverein in 1934.<sup>11</sup> The response to the bank runs was the German Banking Act (Kreditwesengesetz) in December 1934. This Banking Act was also valid in Austria until 1979 and was replaced by the

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<sup>8</sup> See Mishkin (2007), p. 206ff.

<sup>9</sup> See Basel Committee on Banking Supervision (2020), URL: [http://www.bis.org/bcbs/#Consultative\\_Group](http://www.bis.org/bcbs/#Consultative_Group), retrieved January 25<sup>th</sup>, 2010.

<sup>10</sup> See BaFin (2010), URL: [http://www.bafin.de/cln\\_171/nn\\_720486/EN/BaFin/Legalbasis/History/history.html#doc721614bodyText1](http://www.bafin.de/cln_171/nn_720486/EN/BaFin/Legalbasis/History/history.html#doc721614bodyText1), retrieved April 1<sup>st</sup>, 2010.

<sup>11</sup> See AEIOU (2010), URL: [http://www.aeiou.at/aeiou.encyclop.c/c796078.htm;internal&action=\\_setlanguage.action?LANGUAGE=en](http://www.aeiou.at/aeiou.encyclop.c/c796078.htm;internal&action=_setlanguage.action?LANGUAGE=en), retrieved April 1<sup>st</sup>, 2010.

Austrian Kreditwesengesetz of 1979. In January 1994 the Kreditwesengesetz was again replaced by the Federal Banking Act (Bankwesengesetz).<sup>12</sup>

In 1974 the troubled German bank Herstatt was forced into liquidation. Due to foreign relations, especially some banks had released payment of DEM to Herstatt in exchange for USD. Due to counterparty risks banks did not receive their USD payments. This was the trigger for the G10 countries to form a committee under the name Bank for International Settlements (BIS).<sup>13</sup>

The savings and loan crisis between 1980 and 1994 in the US has been the greatest banking collapse since the Great Depression.

The Asian Financial Crisis (1997-1998) is sometimes mentioned for introducing and the establishment of the Basel II Capital Accord.

The current financial crisis, which began in 2007, was triggered through liquidity failures of the market. Lehman Brothers is an example of a financial service firm, which filed for Chapter 11 bankruptcy in 2008. Northern Rock and IndyMac are two examples of bank nationalizations due to the crisis. In Austria, the Hypo Group is the latest example of nationalization.

## 2.3. Basel I regulation and weaknesses

The Basel Committee on Banking Supervision (formerly Committee on Banking Regulations and Supervisory Practices) was established by the central-bank governors of ten<sup>14</sup> countries (G10) in 1974, which has now eleven members because Switzerland joined the G10 in 1983.<sup>15</sup>

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<sup>12</sup> See OeNB (2010a), URL:

[http://www.oenb.at/de/ueber\\_die\\_oenb/wirtschaft/das\\_handbuch\\_der\\_oenb/finanzwesen\\_und\\_banken/oesterreichs\\_kapitalmarkt/wie\\_hat\\_sich\\_oesterreichs\\_kapitalmarkt\\_entwickelt\\_.jsp](http://www.oenb.at/de/ueber_die_oenb/wirtschaft/das_handbuch_der_oenb/finanzwesen_und_banken/oesterreichs_kapitalmarkt/wie_hat_sich_oesterreichs_kapitalmarkt_entwickelt_.jsp), retrieved April 1<sup>st</sup>, 2010.

<sup>13</sup> See Contingency Analysis (2010), URL: [http://www.riskglossary.com/link/basle\\_committee.htm](http://www.riskglossary.com/link/basle_committee.htm), retrieved February 25<sup>th</sup>, 2010.

<sup>14</sup> The G10 (Group of Ten) is made up of eleven members which are United States, United Kingdom, Switzerland, Sweden, Netherlands, Japan, Italy, Germany, France, Canada and Belgium.

<sup>15</sup> See Basel Committee on Banking Supervision (2009b), p. 1.

The first meeting was held in February 1975 and the first report published in September 1975 set Principles for the Supervision of Banks and joint ventures between host and parent authorities (Report on the supervision of banks' foreign establishments – Concordat).<sup>16</sup>

The Committee's members today are Argentina, Australia, Belgium, Brazil, Canada, China, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The Committee's Secretariat is based at the Bank for International Settlements in Basel, where the name of the 'Basel Accords' comes from. The Basel Committee has four sub groups. The sub-committees are:

- The Standards Implementation Group
- The Policy Development Group
- The Accounting Task Force
- The Basel Consultative Group<sup>17</sup>

Especially the Policy Development Group and the Consultative Group are important for implementing and developing capital ratios. Seven working groups are supporting the Policy Development Group. One of the subgroups is the Working Group on the Definition of Capital. This subgroup is working on the quality, consistency and transparency of capital, in particular the most important Tier 1 capital. The Consulting Group is publishing banking supervisory issues by contacting supervisors around the world.<sup>18</sup>

To strengthen the stability of the international banking system a first consultative document was published in December 1987. Following these comments the Basle Capital Accord (Basel I), which was published in July 1988, was amended in

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<sup>16</sup> See Basel Committee on Banking Supervision (2009b), p. 1f.

<sup>17</sup> See Basel Committee on Banking Supervision (2010), URL: [http://www.bis.org/bcbs/#Consultative\\_Group](http://www.bis.org/bcbs/#Consultative_Group), retrieved January 25<sup>th</sup>, 2010.

<sup>18</sup> See Basel Committee on Banking Supervision (2010), URL: [http://www.bis.org/bcbs/#Consultative\\_Group](http://www.bis.org/bcbs/#Consultative_Group), retrieved January 25<sup>th</sup>, 2010.

November 1991, July and December 1994 and April 1998.<sup>19</sup> The original text of the consultative document was changed only marginally. In the Basle Capital Accord, for example, preferred stock was divided into non-cumulative perpetual and cumulative preferred stock and the first one is included in the core capital while in the consultative document, there was no distinction.<sup>20</sup> The Basel I Accord, which was applied in end-1992, established a minimum capital ratio (capital to risk-weighted assets) of 8% and a core capital ratio (core capital which is Tier 1 capital to risk-weighted assets) of 4%.<sup>21</sup> The wish of the member countries was to set a precise ratio which could be used as an international indicator for comparison. The proposal of 1987 outlined that a low minimum boundary of that ratio would be difficult to reach for some banks in short-term. On the other hand a high ratio would not strengthen the balance sheets of the banks.<sup>22</sup>

This is an interesting point, because banks are almost operating on an international basis, as discussed later. Therefore the big topic of today, the internationalization of banks was not as important as it is today.

The tier 1 capital under Basel I covered:

- equity capital
  - o issued and fully paid-up ordinary shares/common stock and
  - o non-cumulative perpetual preferred stock (excluding cumulative preferred stock)
- disclosed reserves
  - o retained earnings,
  - o surplus capital i.e. share premiums,
  - o general and legal reserves and
  - o minority interests in the equity of subsidiaries.<sup>23</sup>

For calculating the risk-weighted capital ratio, goodwill will be deducted from Tier 1 capital. Direct investments in unconsolidated banking and financial subsidiaries and

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<sup>19</sup> See Basel Committee on Banking Supervision (1988), p. 2.

<sup>20</sup> See Basel Committee on Banking Supervision (1987), p. 4.

<sup>21</sup> See Basel Committee on Banking Supervision (1988), p. 13.

<sup>22</sup> See Basel Committee on Banking Supervision (1987), p. 18.

<sup>23</sup> See Basel Committee on Banking Supervision (1988), p. 3.

investments in capital of other banks and financial institutions (at the discretion of national authorities) will be deducted from total capital.<sup>24</sup>

Under Basel I, hybrid (debt/equity) instruments are quoted under Tier 2 capital, which was in detail.<sup>25</sup>

- undisclosed reserves
- asset revaluation reserves
- general provisions/general loan-loss reserves
- hybrid (debt/equity) capital instruments (for example: long-term preferred shares in Canada, perpetual subordinated debt and preference shares in the UK or mandatory convertible debt instruments in the US) and
- (fixed-maturity) subordinated debt

Furthermore the Tier 2 capital must not be over 100% of Tier 1 capital. The subordinated debt must be under 50% of Tier 1 capital. The general provisions/loan-loss reserves are limited to a maximum of 1.25% of risk-weighted assets. The capital base is the sum of Tier 1 and Tier 2 capital minus deductions as goodwill, investments in unconsolidated banking and financial subsidiary companies and investments in the capital of other banks and financial institutions.<sup>26</sup>

In April 1993 the Basel Committee issued a paper with emphasis on the treatment on market risks. The Committee suggested modifying the definition of permanent capital by adding a Tier 3 capital regarding subordinated debt. There are three differences to the tier 2 subordinated debt.

- The minimum maturity is shorter (two years).
- The debt is valued at par (compared to amortised over the last five years).
- There is a lock-in feature, which means the debt is available to absorb losses if allotted capital falls below an early-warning level of 20% above the minimum.<sup>27</sup>

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<sup>24</sup> See Basel Committee on Banking Supervision (1988), p. 6.

<sup>25</sup> See Basel Committee on Banking Supervision (1988), p. 14f.

<sup>26</sup> See Basel Committee on Banking Supervision (1988), p. 14f.

<sup>27</sup> See Basel Committee on Banking Supervision (1993), p. 10f.

The BIS published a research paper that pointed out that between 1990 and 2001 banks mostly issued subordinated debt with a maturity that is longer than 10 years.<sup>28</sup> Therefore the influence of Tier 3 capital was only marginal. The reason for a lock-in was that short-term debt is more appropriate for trading activities. The proposal comprised to limit the Tier 3 capital by 250% cap of Tier 1 capital allocated to support securities trading-book risks. The alternative to that was that Tier 2 plus Tier 3 capital should not exceed Tier 1 capital.<sup>29</sup> Subordinated Tier 2 debt is amortised in its final five years of maturity, which is nothing else than a call option. Tier 3 subordinated debt is not amortised.<sup>30</sup> As mentioned subordinated debt should not exceed 50% of Tier 1 capital, it should therefore not exceed 2% (50% of the maximum of Tier 1 capital ratio) of risk-weighted assets irrespectively of the total capital requirement filled by Tier 1 equity. An empirical analysis of G10 banks show that on average banks hold 3.6% of risk-weighted assets in subordinated debt.<sup>31</sup>

In November 1991 a Basel amendment was published to include the general provisions or loan-loss reserves in the capital, precisely in the Tier 2 capital, for calculation of the ratio. General provisions are used against the possibility of future losses but only not yet identified losses should be added to the capital.<sup>32</sup> In January 1996 the Basel Committee on Banking Supervision published a possibility for banks to use Tier 3 capital at the discretion of the national authority. Tier 3 capital consists of short-term subordinated debt with a maturity of at least two years and must be unsecured and fully paid up and can only be used as permanent capital to absorb losses in the event of insolvency. Furthermore it should not be repayable before the authority agrees and should be subject to a lock-in clause which means that interest and principal must not be paid if the bank falls below or remains below its minimum capital requirement. Moreover the Tier 3 capital is also limited to 250% of the Tier 1 capital. The Tier 3 capital could only be part of eligible capital if it could be used to cover and support market risk.<sup>33</sup>

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<sup>28</sup> See Basel Committee on Banking Supervision (2003), p. 2.

<sup>29</sup> See Basel Committee on Banking Supervision (1993), p. 11f.

<sup>30</sup> See Basel Committee on Banking Supervision (2003), p. 6.

<sup>31</sup> See Basel Committee on Banking Supervision (2003), p. 7.

<sup>32</sup> See Basel Committee on Banking Supervision (1991), p. 2.

<sup>33</sup> See Basel Committee on Banking Supervision (1996), p. 7f.

In April 1999 the first working paper was published by a Research Task Force specialising in capital requirements and bank behaviour. The group analysed the impact of the Basel Accord of 1988 with focus on minimum capital requirements and capital ratios.<sup>34</sup> The report documented that the average total capital ratio (ratio of capital to risk-weighted assets) of the major G-10 banks rose from 9.3% to 11.2% between 1988 and 1996. However the reasons are controversial. Banks raised capital and boosted retained earnings in booms and cut loans in economic downturns. There is evidence that weakly capitalised banks sometimes reduce lending activities to lower risk-weighted assets and therefore increase the capital ratios. An important point is that innovations in the market, for example securitisations, made it possible for banks to use structured finance to increase their risk relative to minimum capital levels, but to avoid the limitation of capital requirements.<sup>35</sup> This is an important point, because such construction would make capital ratios no more meaningful and useless. The outstanding amount of, for example, non-mortgage securitisations of the ten largest US banks was roughly \$200 bn in March 1998. In Europe the amount surged from \$8.5 bn in 1995 to \$41 bn in 1997.<sup>36</sup> The distribution of the capital ratios of the G-10 banks narrowed between 1988 and 1992 and widened again to a higher level in 1996.<sup>37</sup>

In June 1999 the Basel Committee published a paper regarding supervisory lessons to be drawn from the Asian Crises. The Committee identified some issues which are relevant for future supervision. One of the topics was that capital levels of Basel I should be tailored to the riskiness of the bank. Attention should be drawn on core principles dealing with risk weightings, which should be individually changes and implemented by member countries.<sup>38</sup>

The first consultative paper regarding a proposal for a new Basel Capital Accord (Basel II) was published in June 1999. The paper exhibited proposed changes, for example the introduction of three pillars, to replace the 1988 Accord.<sup>39</sup>

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<sup>34</sup> See Basel Committee on Banking Supervision (1999a), p. 1.

<sup>35</sup> See Basel Committee on Banking Supervision (1999a), p. 2ff.

<sup>36</sup> See Basel Committee on Banking Supervision (1999a), p. 3.

<sup>37</sup> See Basel Committee on Banking Supervision (1999a), p. 43.

<sup>38</sup> See Basel Committee on Banking Supervision (1999b), p. 1ff.

<sup>39</sup> See Basel Committee on Banking Supervision (1999b), p. 1.

The Committee outlined the following weaknesses of Basel I:

- For too long a time focus was set on credit risks while neglecting the market risks. As above mentioned, the increase of innovations changed the situation of banks regarding risk-weighted assets.
- A bear market and differences of the measurement in certain countries made it necessary to align capital ratios on a global basis.
- Degrees of credit risk exposure are not sufficiently calibrated for the differentiation of borrowers' and default risks. Borrowers are classified in risk categories and there are no differences in credit ratings of individual borrowers.
- The arbitrage of regulatory capital requirement and divergences between true economic risk and risk measured in the 1988 Accord.
- Some problems due to modern innovations regarding risk mitigation techniques.<sup>40</sup>

The second and the third consultative paper for a new proposal of the Basel Accord were published in 2001 and 2003 where the most relevant points of Basel II were mentioned. Appendix 1 summarized the development of the capital ratios.

As discussed above, the working paper of 2003 handled the problem of subordinated debt. A further interesting point is that between 1990 and 2001, 5,600 issues of subordinated debt took place, which represented 50% of total banking assets of 210 banks in ten analyzed countries (Belgium, France, Germany, Japan, the Netherlands, Spain, Sweden, Switzerland, UK and US).<sup>41</sup> A further not surprising point is that the highest amount of subordinated debt was issued with roughly \$60 bn between 1999 and 2001.<sup>42</sup>

The 2004 working paper studied bank failures in Germany, Japan, Norway, Spain, Sweden, Switzerland, the UK and the US during the past 30 years. 90% of the analyzed banks reported capital ratios above the requirements imposed by the supervisor. The working group recorded as a reason that loss provisions were not

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<sup>40</sup> See Basel Committee on Banking Supervision (1999b), p. 8f.

<sup>41</sup> See Basel Committee on Banking Supervision (2003), p. 1.

<sup>42</sup> See Basel Committee on Banking Supervision (2003), p. 66.

included in asset impairment and therefore capital ratios were overvalued. While small institutions or parts thereof were historically usually liquidated, large commercial banks which were in trouble were rescued through mergers, capital injections and/or increased government control.<sup>43</sup>

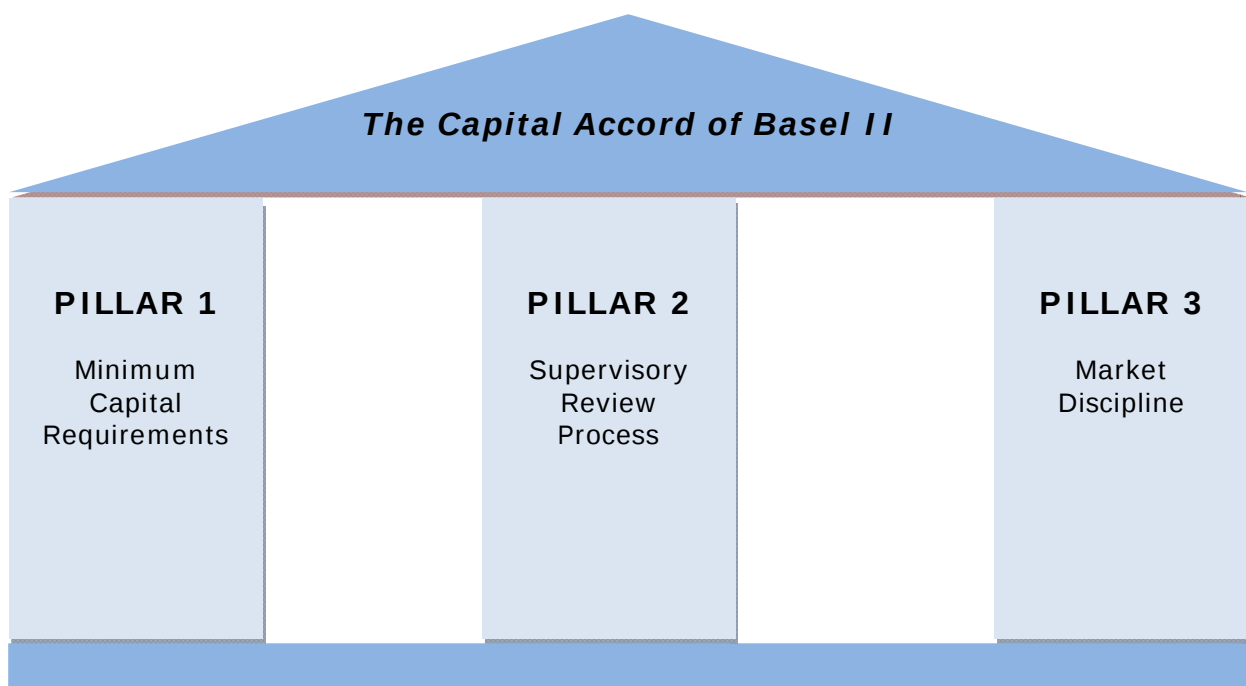
In June 2006 the Basel Committee published the Basel II revised framework, including elements of Basel I of 1988, the amendment of November 1995 and the Application of Basel II Trading Activities & Double Default Effect of April 2005.

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<sup>43</sup> See Basel Committee on Banking Supervision (2004), p. 1f.

## 2.4. Basel II regulation

On the 30<sup>th</sup> of June 2006 the European Commission published two directives relating to Basel II and transposing the new capital requirements into European law. The two directives (Banking Directive 2006/48/EC and Capital Adequacy Directive 2006/49/EC) came into effect as of the 1<sup>st</sup> of January 2007.<sup>44</sup> Basel II was incorporated into Austrian national law by the Solvency Regulation (Solvabilitätsverordnung) and the Disclosure Regulation (Offenlegungsverordnung), by which changes were effected in the Austrian Banking Act (Bankwesengesetz). According to Figure 1 the 2006 Accord included three pillars (Minimum Capital Requirements, Supervisory Review Process and Market Discipline) rather than just one like Basel I.



**Figure 1: The three pillars of Basel II**

Source: Basel Committee on Banking Supervision (2006), p. 6.

### 2.4.1. The first pillar

The first pillar represents the minimum capital requirement for credit, market and operational risk. The total capital ratio (capital defined as the Tier 1 and tier 2 capital

<sup>44</sup> See Directive 1006/48/EC and Directive 2006/49/EC of 14 June 2006 relating to the taking up and pursuit of the business of credit institutions and on the capital adequacy of investment firms and credit institutions.

to risk-weighted assets), which is also called the Capital Adequacy Ratio (CAR), must be at least 8%, which is stated in Equation 1. Tier 2 capital is capped by 100% of Tier 1 capital. The equity capital and published reserves from post-tax retained earnings should be at least 50% of the total capital base of the bank. The minimum capital requirement is defined by multiplying the capital requirements for market risk and operational risk by 12.5 (i.e. the reciprocal of the minimum capital ratio of 8%) and adding the sum of the risk-weighted assets for credit risk.<sup>45</sup> Tier 1 capital ratios have to be, as mentioned, at least 4%. The minimum ratio of core capital to risk-weighted assets is not defined, because for most countries the core capital is the same as the Tier 1 capital. The calculation of a core Tier 1 capital ratio compared to a Tier 1 capital ratio is shown in Equation 2 and 3.

$$\frac{\text{capital}}{\sum \text{credit risk-weighted assets} + 12.5 * (\text{capital charge for market} + \text{operational risk})} \geq 8\%$$

**Equation 1: Total Capital Ratio (incl. market and operational risk)**

Source: Basel Committee on Banking Supervision (2006), p. 12.

$$\frac{\text{core Tier 1 capital}}{\sum \text{credit risk-weighted assets}}$$

**Equation 2: Core Tier 1 Capital ratio**

Source: Basel Committee on Banking Supervision (2006)

$$\frac{\text{Tier 1 capital}}{\sum \text{credit risk-weighted assets}}$$

**Equation 3: Tier 1 capital ratio**

The risk weights are dependent on the exposure of the asset type. For calculation of the capital requirements for credit risks, banks can choose to use a standardized approach or an internal ratings-based approach, which must be approved by the bank's supervisor.<sup>46</sup>

The definition of equity capital has not changed since Basel I. The amount of Tier 1 capital is made up of:

- paid-up share capital/common stock
- reserves
- minority interests in the equity of subsidiaries
- innovative instruments (such as irredeemable non-cumulative preferred shares or instruments that incorporate a step-up provision)

<sup>45</sup> See Basel Committee on Banking Supervision (2006), p. 12.

<sup>46</sup> See Basel Committee on Banking Supervision (2006), p. 19.

- other capital instruments
- surplus capital from insurance companies<sup>47</sup>

Innovative instruments are limited by 15% of Tier 1 capital of that institution, net of goodwill. An example of innovative instruments is non-cumulative perpetual preferred stock, which is also called irredeemable non-cumulative preferred shares.<sup>48</sup> The Minority interest in equity accounts of consolidated subsidiaries in the form of a Special Purpose Vehicle<sup>49</sup> (not confounded with equity of subsidiaries) and should only be included in Tier 1 capital if the underlying meets the following criteria:<sup>50</sup>

- issued and fully paid
- non-cumulative
- able to absorb losses within the bank on a going-concern basis
- junior to depositors, general creditors, and subordinated debt of the bank
- permanent
- neither be secured nor covered by a guarantee of the issuer or related entity
- callable at the initiative of the issuer only after a minimum of five years with supervisory approval

Tier 2 capital consists of:

- undisclosed reserves
- revaluation reserves
- general provisions/general loan-loss reserves
- hybrid (debt/equity) capital instruments
- subordinated debt<sup>51</sup>

Hybrid capital instruments have to be unsecured, subordinated and fully paid-up, not redeemable at the initiative of the holder, and available to participate in losses

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<sup>47</sup> See Basel Committee on Banking Supervision (2006), p. 230.

<sup>48</sup> See Basel Committee on Banking Supervision (2006), p. 243.

<sup>49</sup> An SPV is defined as a legal entity in the form of a limited partnership, a limited liability company or a trust created by an originator i.e. a company to transfer assets to the SPV for a specific purpose, for example securitization transactions.

<sup>50</sup> See Basel Committee on Banking Supervision (1998), URL: <http://www.bis.org/press/p981027.htm>, retrieved February 25<sup>th</sup>, 2010.

<sup>51</sup> See Basel Committee on Banking Supervision (2006), p. 14ff.

without the bank being obliged to cease trading.<sup>52</sup> Hybrid securities are for example convertible bonds or cumulative preference shares which are Tier 2 capital. Other examples are mentioned above, for example long-term preferred shares in Canada. Most preferred shares are cumulative, which means that dividend payments are accumulated until they are finally paid. The difference to non-cumulative is clear, but issuance of those securities is more complex. Institutions use that, to meet the capital standards. In the last few years, some institutions issued non-cumulative preferred shares because for such preferred equity institutions have the incentive to pay dividends in order to send a positive signal to the market and investors expect a fixed payment. This situation gives banks more flexibility in financial stress. There will be no penalty if non-cumulative preferred shares are not paid. On the other hand common equity holders cannot get dividends if preferred shareholders have not received dividends. Banks could therefore issue non-cumulative preferred shares, which are qualified as Tier 1 capital, to increase the Tier 1 capital ratio. Subordinated debt, as mentioned, is normally the major part of Tier 2 capital.

The Tier 3 capital is made up of short-term subordinated debt covering market risk. Tier 3 capital is also limited to 250% of bank's Tier 1 capital that is required to support market risks. Therefore a minimum of 28.5% of market risks must be covered by Tier 1 capital.<sup>53</sup> Asset revaluation reserves i.e. latent gains on unrealized securities are subject to a discount of 55%.

Deductions from capital are again:

- goodwill (deduction from Tier 1 capital)
- increase in equity capital resulting from a securitization exposure such as that associated with expected future margin income resulting in a gain-on-sales that is recognized in regulatory capital as documented in paragraph 562. (deduction from Tier 1 capital)
- investments in subsidiaries engaged in banking and financial activities which are not consolidated in national systems (deduction 50/50% from Tier 1 and Tier 2 capital)<sup>54</sup>

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<sup>52</sup> See Basel Committee on Banking Supervision (2006), p. 246.

<sup>53</sup> See Basel Committee on Banking Supervision (2006), p. 16.

<sup>54</sup> See Basel Committee on Banking Supervision (2006), p. 17.

Where no deduction applies, the risk-weight of banks' holdings of other capital instruments will be 100%.<sup>55</sup>

The core capital, in Austria used for reporting, does not include innovative instruments such as non-cumulative perpetual preferred stock, which is a dividend for preferred shares that will not be accumulated if it is not paid. Innovative instruments are also called hybrid securities in the Austrian Banking Act, as defined in Article 24 (2) 5 and 6 of the Austrian Federal Banking Act. What is also an important point is that dividends which could be included in the equity capital should not be of fixed maturity. Hybrid Tier 1 capital represents innovative and non-innovative instruments are qualified under minority interests in the IFRS equity. All in all, innovative instruments such as non-cumulative perpetual preferred stock fall under Tier 1 capital, indirect investments over SPV are limited with 15% of Tier 1 capital and non-innovative fall also under Tier 1 capital while convertible bonds or cumulative perpetual preference shares as hybrid capital instruments fall under Tier 2 capital.

There are three approaches under Pillar I to calculate the capital requirements for the credit risk:

- Standardized Approach (SA)
- Foundation IRB Approach (FIRB)
- Advanced IRB Approach (AIRB)

Measuring the market risk, value at risk calculations can be used. Regarding the operational risk under Pillar I, there are the Basic Indicator Approach (BIA), the Standardized Approach (STA) and the Advanced Measurement Approach (AMA).<sup>56</sup>

## 2.4.2. The second pillar

Pillar II concerns banks on the one hand and Supervisors on the other hand. The second pillar postulates banks to implement a risk management system and to assess their capital adequacy relative to the risk profile, especially regarding the compliance with the minimum standards. Supervisory authorities have to evaluate

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<sup>55</sup> See Basel Committee on Banking Supervision (2006), p. 18.

<sup>56</sup> See Basel Committee on Banking Supervision (2006), p. 1ff.

credit institutions via supervisory review and evaluation process. They have to assess the risk profile of the banks and qualitative factors like strategy or management. The areas which are treated under Pillar II are risks that are not fully captured in Pillar I (e.g. credit risk concentration), factors that are not taken into account in Pillar I (e.g. interest rate risk in the banking book) and factors external to the bank (e.g. business cycle effects). The Supervisor may require banks in some circumstances to hold their own funds in excess of the minimum level under Pillar I.<sup>57</sup>

The supervisory review process is based on four principles:<sup>58</sup>

- Internal Capital Adequacy Assessment Process (ICAAP)  
Banks should assess their capital adequacy in relation to the risk profile as mentioned and should have a strategy for maintain the capital levels.
- Supervisory Review and Evaluation Process (SREP)  
Supervisors should evaluate capital adequacy assessments strategies of the banks, monitor their compliance by capital ratios and should intervene if it is necessary.
- Supervisory Measures  
Supervisors should expect banks to operate above the minimum regulatory capital ratios and should have the allowance to require banks to hold capital in excess of the minimum in Pillar I.
- Supervisory Intervention  
Supervisors are allowed to intervene at an early stage to prevent capital falling below the minimum levels and should maintain an action plan.

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<sup>57</sup> See Basel Committee on Banking Supervision (2006), p. 204ff.

<sup>58</sup> See Basel Committee on Banking Supervision (2006), p. 205ff.

### 2.4.3. The third pillar

Under the third Pillar, Market Discipline, banks have to ensure disclosure requirements on transactions and their risk strategies. The disclosure topics are:<sup>59</sup>

- Source of application
- Capital structure
- Risk exposures
- Risk assessment processes of different risks (market risk, equities, credit risk, operational risk)
- Interest rate risk in the banking book
- Credit risk mitigation techniques
- Securitisation
- Capital adequacy of the institution and
- IRB approaches

The aim of the third Pillar is to discipline the market participants.

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<sup>59</sup> See Basel Committee on Banking Supervision (2006), p. 226ff.

## 2.5. Basel II weaknesses

Jimenez and Saurina (2006) show that the capital requirement for banks under Basel II increases during a recession, because the probability of default increases. One way to lower the procyclical effect is adjust loan loss provisions by a stress test included in the second pillar of Basel II. Banks should use the provisions in good times as reserves for loan losses during a recession.<sup>60</sup> But in recent newspapers we saw different examples, which indicated that the reserves were not enough to cover the losses.

Excessive lending during a boom on the one hand and too conservative credit policies during a recession on the other hand, make a banking regulation even harder to handle.<sup>61</sup> It is difficult and costly for a bank to raise fresh external capital in bad times and this will force it to cut back lending activities, which will contribute to a worsening of the initial downturn.<sup>62</sup>

Goodhart (2005) shows, that the CAR for the IRB is lower during good times with strong growth than the standardised approach. Moreover, the variance of the IRB approach is higher. During a recession, the CAR for the IRB is higher than for the others. This is very important because banks want to shift their portfolio to a better rating and therefore use the IRB instead of the standardised approach. The rating might be better, but then the risk curve is also steeper. This is again an argument for the pro-cyclicality of Basel II.<sup>63</sup>

The problem is that only one single risk curve will be used in the Basel II framework, rather than a family of risk curves. Therefore the ratio of a capital charge for an AA credit and a BBB credit will be treated in the same way as an AA credit and a second AA credit, which was downgraded during a recession to BBB.<sup>64</sup> Kashyap and Stein (2005) underlined the cyclicity in capital charges, which depend on a bank's

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<sup>60</sup> See Jimenez/Saurina (2006), p. 91f.

<sup>61</sup> See Jimenez/Saurina (2006), p. 94.

<sup>62</sup> See Kashyap/Stein (2004), p. 18.

<sup>63</sup> See Goodhart (2005), p. 123f.

<sup>64</sup> See Kashyap/Stein (2004), p. 21f.

customer mix and the used credit-risk models. They suggested setting the CAR down from 8% to 6%, whenever the GDP growth falls below a threshold.<sup>65</sup>

Northern Rock had a concentration of assets in mortgage products of 75%, just before 2007. The rate of asset growth was around 25% before 2007. The concentration of mortgage products would have reduced their capital requirements under Basel II because mortgage products are treated as low-risk assets. The objective of the management of Northern Rock was to force mortgage products and drive their expansion. In 2007 the Tier 1 capital ratio was around 11% of risk-weighted assets, but only 2% of total assets, because the risk-weighted assets were only 16.7% of total assets.<sup>66</sup> This example demonstrates one of the problems of Basel II.

Another suggestion is to use a smoothed trend of asset prices to estimate the gap between the current asset price and its fundamental value that could solve the problem of cyclicity. The problem is that this would be inconsistent with the efficient market hypothesis. Goodhart (2005) suggested relating the capital requirement on bank lending to the rate of changes of asset prices, for example the CAR on mortgage lending is related to the rise in house prices (relative to Harmonised Index of Consumer Price Inflation).<sup>67</sup>

## 2.6. Basel III reform package

Between 2006 and 2009 no significant paper regarding the capital adequacy ratios were published by the Basel Committee.

In January 2009 the Basel Committee published a consultative document with proposed enhancements to the Basel II framework to strengthen the response to the financial crisis. The proposal suggested using higher risk weights for re-securitization (especially collateralised debt obligations) exposures.<sup>68</sup> The idea of an introduction of

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<sup>65</sup> See Kashyap/Stein (2004), p. 28f.

<sup>66</sup> See Blundell-Wignall/Atkinson/Lee, (2008), p. 9.

<sup>67</sup> See Goodhart (2005), p. 126.

<sup>68</sup> See Basel Committee on Banking Supervision (2009c), p. 1.

a leverage ratio, beside the current capital ratios, to intensify evaluation of capital adequacy under stressed conditions was mentioned for the first time.<sup>69</sup> The introduction of a leverage ratio similar to equity/asset ratio but with focus on off-balance sheet exposures was also mentioned in the IMF paper published in February 2009. The idea behind it is to constrain excessive leverage in the upswing, as it was the case between 2003 and 2007.<sup>70</sup>

Based on the consultative document of July 2009, the Basel Committee published a paper with emphasis on revisions to the Basel II market risk framework. Due to innovations, some risks are no more captured. Therefore the measures for risks in the trading book, for example for unsecured credit products, should be included. This paper was the first one suggesting to change the Basel II framework due to financial crisis.<sup>71</sup> In this paper, there were no improvements regarding a new leverage ratio.

| Month    | Year  | Item                                                                          |
|----------|-------|-------------------------------------------------------------------------------|
| January  | 2009c | Consultative Document<br>(Proposed enhancements to the Basel II framework )   |
| July     | 2009d | Revisions to the Basel II market risk framework                               |
| December | 2009a | Consultative Document<br>(Strengthening the resilience of the banking sector) |

**Table 1: The development of the Basle Accord between 2006 and 2010 with focus on the first Pillar (Capital Adequacy Ratios)**

Source: The Basel Committee on Banking Supervision

In December 2009 the Basel Committee published again a consultative document to strengthen the regulation standards. This reform package should draw lessons of the recent financial crisis. The most significant problem had been the excessive on- and off-balance sheet leverage on the one hand, and not enough liquidity i.e. own capital funds on the other hand. The pro-cyclical effect of leverage strengthens the crisis instead of weakening it. The liquidity shortages in the banking system were transferred to the whole financial system und real economy, resulting in a credit

<sup>69</sup> See Basel Committee on Banking Supervision (2009c), p. 25.

<sup>70</sup> See IMF (2009), p. 13.

<sup>71</sup> See Basel Committee on Banking Supervision (2009d), p. 1.

crunch. Due to bad liquidity, the public sector had to intervene with capital injections, guarantees and in the worst case by nationalisation.<sup>72</sup>

Moreover, the Basel II Committee suggested using long-term data horizons (i.e. through the cycle) to estimate probabilities of default and introduced downturn loss-given-default estimates to calibrate risk functions for converting loss estimates into regulatory capital requirements. This should be used to dampen the cyclical effect of the minimum capital requirement.<sup>73</sup>

The three agreements reached in the September 2009 meeting considered the following elements:<sup>74</sup>

- First of all, the quality, consistency and transparency of the capital base will be raised. Under the current approach, banks could hold as little as 2% common equity to risk-based assets, before application of regulatory adjustments.
- Secondly, the risk coverage ratio of the capital framework will be strengthened, especially regarding credit risk exposure arising from derivatives, repos, and securities financing activities.
- Thirdly, a new leverage ratio would be included. This measure regards the Pillar I and should help to fight against excessive leverage in the banking system. The discussion is not yet finalized because other suggestions were raised to use the leverage ratio under Pillar II and not under the strict capital requirements.
- The fourth and fifth suggestions concern measures to increase capital buffers in good times and a global minimum liquidity standard i.e. liquidity coverage ratio.

The leverage ratio should be introduced as a supplement measure to the risk-based ratios of Basel II. This new ratio should avoid destabilizing the financial system by constraining the leverage in the banking sector and should be a non-risk-based “backstop” measure. For using the leverage ratio the Basel Committee defined the capital as the Tier 1 capital or the predominant form of Tier 1 capital (common shares

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<sup>72</sup> See Basel Committee on Banking Supervision (2009a), p. 1f.

<sup>73</sup> See Basel Committee on Banking Supervision (2009a), p. 66f.

<sup>74</sup> See Basel Committee on Banking Supervision (2009a), p. 2f.

and retained earnings which is common Tier 1 capital) as relevant. Items that are deducted, for example goodwill or deferred taxes should be made from the capital and from the total exposure.<sup>75</sup> Current adjustments concerned only the Tier 1 capital or a combination of Tier 1 and Tier 2 capital but did not regard the common equity component of Tier 1 capital. Therefore banks could report high Tier 1 ratios, although they have low levels of common equity. This leverage ratio is net of provisions and valuation adjustments. It is not allowed to reduce the exposure using physical or financial collateral. Off-balance sheet items, which were included, have to use a flat 100% credit conversion factor. It is an important factor that off-balance sheet items are included, because this was also a major source of leverage during the crisis, which will be discussed later. To standardize the accounting of IFRS and US GAAP regarding the netting of derivatives and repurchase agreements, some adjustments should be made.<sup>76</sup>

As mentioned above, some banks reported high Tier 1 ratios but had low common equity. Due to lost confidence, the Basel Committee suggested to use tangible common equity (exclusive goodwill from common equity, because that is not realisable in insolvency).<sup>77</sup> Under the current approach, some countries implemented a common equity to risk-based assets ratio (inclusive goodwill), which must be at least 2%.<sup>78</sup> Citigroup, for example, issued common stock and exchanged preferred for common shares. Such shares are called mandatory convertible preferred shares, which are part of the common equity under Basel II. As a result the bank increased their tangible common equity.<sup>79</sup> By such a conversion a bank can avoid taking additional money but would not bring in more cash. This would only satisfy regulators.<sup>80</sup> Furthermore the financial crisis showed that credit losses and write-downs came out of retained earnings, which are part of the tangible common equity. Therefore Tier 1 capital base should only be the sum of common shares and retained earnings.<sup>81</sup>

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<sup>75</sup> See Basel Committee on Banking Supervision (2009a), p. 61f.

<sup>76</sup> See Basel Committee on Banking Supervision (2009a), p. 13.

<sup>77</sup> See Basel Committee on Banking Supervision (2009a), p. 13.

<sup>78</sup> See Basel Committee on Banking Supervision (2009a), p. 4.

<sup>79</sup> See Citigroup Inc. (2009), URL: <http://www.citigroup.com/citi/press/2009/090227a.htm>, retrieved January 25<sup>th</sup>, 2010.

<sup>80</sup> See Solomon (2009), URL: <http://online.wsj.com/article/SB124165234893993679.html>, retrieved January 25<sup>th</sup>, 2010.

<sup>81</sup> See Basel Committee on Banking Supervision (2009a), p. 4.

Share premium (stock surplus) could be included in the common equity, i.e. as a part of Tier 1 capital, if the shares giving rise to the capital in the way that firm raises capital in excess of the nominal value of the shares which is paid by shareholders for a share i.e. what the shareholder pays in excess of the nominal value of a share. Preferred shares are excluded and must be included in the capital to which it relates. Minority interests are also excluded from the common equity. Furthermore, there should be no adjustments of common equity regarding unrealised gains or losses on debt instruments, loans, receivables, equity, own use properties and investment properties (available-for-sales reserves). Goodwill and other intangibles, as mentioned above, are deducted from the common equity component of Tier 1 and are net of any associated deferred taxes.<sup>82</sup> Deferred tax assets on future profitability due to accounting purposes to be realised should be deducted (net of deferred tax liabilities) from the common equity. Deferred tax assets which do not rely on the future profitability i.e. prepayments to tax authorities (receivables from the local taxing authority) should be added to the relevant sovereign risk weighting. Investments in own shares (treasury stock) should also be deducted from the common equity. If investments in other financial institutions exceed the value of 10% of the common stock of that institution, the whole amount must be deducted from the common stock. If the common stock of all other financial institutions in aggregate exceed 10% of the bank's common equity (after all adjustments), then only the amount above 10% should be deducted.<sup>83</sup> Cash flow hedge reserves from the common equity which are not recognised on the balance sheet should be reduced from the common equity part. Changes in the fair value of all liabilities, which are due to changes in the credit risk of the banks, should be filtered out. The current filter only applied to Tier 1 level reduction of gains and losses on liabilities which are fair valued. Pension fund assets should also be deducted. This is because benefit pension funds could absorb losses on a going concern basis.<sup>84</sup> Table 2 summaries the baseline proposal for implementing a leverage ratio.

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<sup>82</sup> See Basel Committee on Banking Supervision (2009a), p. 23.

<sup>83</sup> See Basel Committee on Banking Supervision (2009a), p. 24f.

<sup>84</sup> See Basel Committee on Banking Supervision (2009a), p. 26.

| <b>Issue</b>                                                  | <b>Baseline proposal plus additional options</b>                                                                                                                                                                                                               |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Definition of capital</b>                                  | Tier 1 capital and the predominant form of Tier 1 capital and additional total regulatory capital as defined                                                                                                                                                   |
| <b>Exposure: Valuation adjustments and provisions</b>         | Exposure measures follow accounting treatment i.e. net of provisions and other valuation adjustments                                                                                                                                                           |
| <b>Cash and cash-like instruments</b>                         | Include cash and cash-like instruments and additional exclude liquid assets as defined by the WGL                                                                                                                                                              |
| <b>Off-balance sheet items and written credit derivatives</b> | Include the identified Off-balance sheet items with a 100% credit conversion factor (CCF). Written credit protection is included at notional value and additional apply a lower CFF for unconditionally cancellable commitments (or Basel II standardised CFF) |
| <b>Credit risk mitigation and on-balance sheet netting</b>    | Do not reduce exposure for physical or financial collateral and do not allow on-balance sheet netting                                                                                                                                                          |
| <b>Items deducted from the capital measure</b>                | Consistency between the capital and exposure measure                                                                                                                                                                                                           |
| <b>Securitisations</b>                                        | Use accounting data and additional accounting on-balance sheet exposure plus underlying loan portfolio securitisations that have been de-recognised                                                                                                            |
| <b>Other derivatives (excluding credit derivatives)</b>       | Do not allow any netting (accounting or regulatory) and additionally Basel II netting                                                                                                                                                                          |
| <b>Repurchase agreements and securities finance</b>           | Do now allow any netting of repo and reverse repo positions and additionally Basel II netting for repo-style transactions                                                                                                                                      |

**Table 2: Summary of the baseline proposal for a leverage ratio**

Source: Basel Committee on Banking Supervision (2009a), p. 65f.

Non-cumulative perpetual preferred shares are also included in Tier 1 capital in the suggestion for strengthening the resilience of the banking sector but other innovative instruments such as step-ups are excluded. The use of call options need to be approved by supervisory. Tier 2 Capital will be simplified by removing sub-categories and set criteria. Tier 2 Capital will need to meet the minimum standard of being subordinated to depositors and general creditors. Subordinated debt has to be issued and paid-in, is neither secured nor covered by a guarantee of the issuer and has an original maturity of at least 5 years. There must be no incentives to redeem. For loan-loss reserves, the cap of 1.25% of total risk assets will be eliminated.<sup>85</sup> The amortisation will be done on a straight line basis during the final 5 years to maturity. Tier 3 Capital will be eliminated. Non-innovative hybrid capital will no longer be

<sup>85</sup> See Basel Committee on Banking Supervision (2009a), p. 21.

included in Tier 1 capital.<sup>86</sup> Table 3 gives an overview of the changes from Basel II and the Basel III proposal.

|                | <b>BASEL II</b>                                                                        | <b>BASEL III</b>                         |                |
|----------------|----------------------------------------------------------------------------------------|------------------------------------------|----------------|
| <b>Tier 1</b>  | Paid-up share capital/common stock                                                     | Paid-up share capital/common stock       | <b>Tier 1</b>  |
|                | Reserves                                                                               | Reserves                                 |                |
|                | Minority interests (in the equity of subsidiaries)                                     | -                                        |                |
|                | Non-cumulative perpetual preferred stock                                               | Non-cumulative perpetual preferred stock |                |
|                | Instruments including a step-up provision (currently limited to 15% of Tier 1 Capital) | -                                        |                |
|                | Other capital instruments                                                              | -                                        |                |
|                | Surplus capital (from insurance companies)                                             | -                                        |                |
|                |                                                                                        |                                          |                |
| <b>Tier 2I</b> | Undisclosed reserves                                                                   | -                                        | <b>Tier 2I</b> |
|                | Revaluation reserves                                                                   | -                                        |                |
|                | General provisions/loan-loss reserves (up to 1.25% of total risk assets)               | General provisions/loan-loss reserves    |                |
|                | Hybrid capital instruments                                                             | Non-eligible hybrid Tier 1 securities    |                |
|                | Perpetual Subordinated debt                                                            | Subordinated debt                        |                |
| <b>Tier 3</b>  | Short-term subordinated debt                                                           | -                                        | <b>Tier 3</b>  |

**Table 3: Basel II versus Basel III capital base**

Source: Basel Committee on Banking Supervision (2009a), p. 1ff.

The key adjustments regarding deductions of Tier 1 capital are shown in Table 4. While there is no change between Basel II and Basel III proposal regarding the deduction of goodwill and other intangibles, there is a slight change in the deduction of deferred tax assets. Under Basel III, deduction of Tier 1 capital is only allowed for deferred tax assets which are used for future profitability. Investments in financial entities (i.e. cross-shareholdings between domestic banks) changed significantly under the Basel III proposal. Deductions must be made for investments in unregulated entities, while under current requirement, deductions are lower and such investments are deducted only 50% from Tier 1 and 50% from total equity capital, net

<sup>86</sup> See Basel Committee on Banking Supervision (2009a), p. 15f.

of intangibles. Under the current proposal, 100% of excess expected losses are deducted from Tier 1 capital. Under the current approach, only net unrealized losses on marketable securities are deducted from Tier 1 capital, while under Basel III, both unrealized gains and losses are deducted from Tier 1 capital.

| <b>Deductions of Tier 1 Capital</b>                                                   |                                                                                                                       |                                                                                                                                                                            |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                       | <b>Basel II</b>                                                                                                       | <b>Basel III</b>                                                                                                                                                           |
| <b>Goodwill and other intangibles</b>                                                 | Only goodwill will be deducted from T1 common equity (net of impairment and amortization)                             | Deducted from T1 common equity (net of deferred tax liabilities)                                                                                                           |
| <b>Deferred tax assets</b>                                                            | Deferred tax assets (exceeds 20% of Tier 1 capital) ex for eligible collective provisions are deducted and netted off | Deducted from T1 common equity (net of deferred tax liabilities) when future profitability is required. (if not e.g. tax prepayments included in sovereign risk weighting) |
| <b>Investments in own shares (Treasury shares)</b>                                    | Shares held on behalf of third parties are not deducted, all others are deducted                                      | Deducted (including the look-through basis for index securities)                                                                                                           |
| <b>Investments in banking, financial, insurance entities outside regulatory scope</b> | 50/50 deducted from Tier 1 and Tier 2 net of intangibles                                                              | Deducted if it falls outside scope of regulatory consolidation (100% deduction from Tier 1 for excess expected losses)                                                     |
|                                                                                       | Unrealized losses on securities (net)                                                                                 | Unrealized gains and losses on securities                                                                                                                                  |

**Table 4: Deductions form Tier 1 capital (Basel II versus Basel III)**

Source: Basel Committee on Banking Supervision (2010), Citigroup Inc. (2010), p. 7.

The overall objectives of the leverage ratio, supplement to risk-based ratios, are:<sup>87</sup>

- dampen excess cyclical of the minimum capital requirement,
- promote more forward looking provisions,
- conserve capital to build buffers at individual banks and the banking sector that can be used in stress and
- achieve a broader macro prudential goal of protecting the banking sector from periods of excess credit growth.

<sup>87</sup> See Basel Committee on Banking Supervision (2009a), p. 7.

One negative aspect is that Basel III suggestions could enlarge counterparty credit risk exposure due to strengthened requirements, for example mark-to-market losses due to credit valuation adjustments.<sup>88</sup> Therefore the gap between the denominator and numerator of the Tier 1 capital ratio would be widened.

The proposal also comprised some changes in the definition of capital, but did not suggest any specific cap of a leverage ratio and further details on the procedure of calculations. In the next chapter I will formulate the suggestions for a calculation mentioned most often.

The pro-cyclical effect of leverage was also a topic of the Geneva report on the world economy in January 2009. The loss spiral is a simple concept to explain the mechanism. If the prices of assets of a bank fell, the net worth would fall faster than the rate at which the asset falls in value. To compensate, the banks could sell their assets.<sup>89</sup> The second concept, which also explains that leverage is pro-cyclical, is called margin/haircut spiral.<sup>90</sup> The difference between the current market price of a security and the price at which it is sold is called the haircut in the repurchase agreement (repo), which is a money market instrument in which the selling party agrees to repurchase a security in the future.<sup>91</sup> The maximum restriction on leverage is determined by the haircut. If the haircut of a repo is 2%, the first bank can borrow \$98 for \$100 worth of securities. To hold \$100 worth of securities, the second bank must come up with \$2 of equity. Therefore the maximum permissible leverage (assets to equity) of the first bank is 50. If a shock reduces the haircut to 4%, the permitted leverage will be reduced to 25, therefore the bank will have to raise new equity.<sup>92</sup> The new rules could cut down the core Tier 1 ratios of the European banks Lloyds Banking Group and Credit Agricole to nearly 4%. Barclays Tier 1 ratio could fall to 5%. Analysts at Credit Suisse believe that the Tier 1 ratio could be reduced from 9.6 to 8.1 by end of 2012. The effects of Basel III in relation to higher funding of equity capital, could cost European banks roughly \$200 bn. The Basel III proposal

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<sup>88</sup> See Basel Committee on Banking Supervision (2009a), p. 28.

<sup>89</sup> See Brunnermeier et al. (2009), p. 15f.

<sup>90</sup> See Brunnermeier et al. (2009), p. 16.

<sup>91</sup> Morris/Shin (2008), p. 11.

<sup>92</sup> See Morris/Shin (2008), p. 12.

would affect the capital ratios on both sides, the numerator will be reduced due to reduced capital while the denominator will rise due to higher riskiness of assets.<sup>93</sup> Moreover if prices drop, the lending channel will run short. Therefore margins increase and the risk also increases, which leads to higher external funding costs and forces banks to be risk-averse. When many financial institutions de-lever their positions simultaneously, liquidity will be reduced. Both of the spirals lead to procyclicality of leverage. Empirical results for big US investment banks show that leverage is high when the balance sheet is large and vice versa. The leverage ratio can reinforce an asset price shock.<sup>94</sup> To counter the problem Brunnermeier et al. (2009) suggest to take leverage, maturity mismatch and estimates of bank credit expansion into account using the CAR measure.<sup>95</sup> Therefore the CAR should be multiplied by a factor which relates to macro-prudential/systemic risk. This factor would increase the capital requirements during leveraging and decrease during periods of deleveraging. It is suggested that the focus for the capital ratio should be tier 1 ratio rather than tier 1 and tier or core tier 1 capital.<sup>96</sup> In the case of Northern Rock, Shin (2008) reported the importance how the leverage ratio is calculated. He recorded, as presented in figure 2, that the leverage with common equity in the denominator is the best one while shareholder equity (common equity plus preferred shares) and total equity (shareholder equity plus subordinated debt including deposits) could distort the real picture how levered an institution is.<sup>97</sup> Under Basel II capital requirement, subordinated debt and preferred shares are used as buffers against loss. On the other hand, subordinated debtholders and preferred shareholders are only another class of creditor to the bank because they do not have control of the operations of the bank as common equity holders. Northern Rock's Leverage on common equity increased from 22.8 in June 1998 to 86.3 in December 2007 while the leverage on total equity was roughly only 40 in December 2007.<sup>98</sup> Bear Stearns had a leverage ratio (total assets to shareholders equity) of 33.5 when it collapsed in 2007.<sup>99</sup>

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<sup>93</sup> See Slater (2010), URL: <http://in.reuters.com/article/businessNews/idINIndia-45850920100202>, retrieved February 3<sup>rd</sup> 2010.

<sup>94</sup> See Brunnermeier et al. (2009), p. 16f.

<sup>95</sup> See Brunnermeier et al. (2009), p. 29.

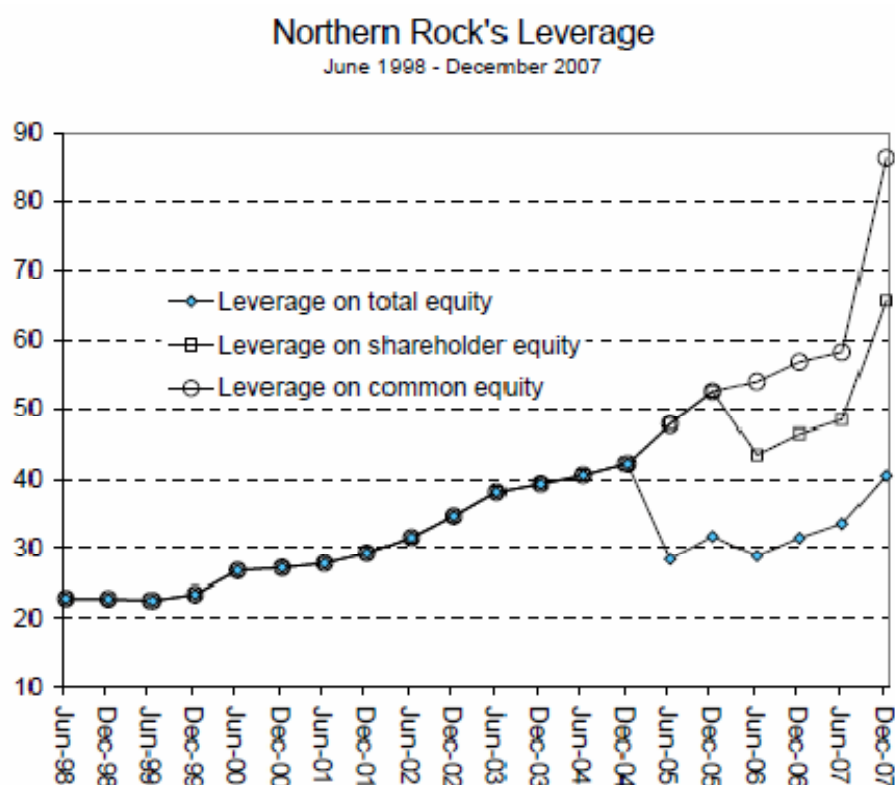
<sup>96</sup> See Brunnermeier et al. (2009), p. 30f.

<sup>97</sup> See Shin (2008), p. 16ff.

<sup>98</sup> See Morris/Shin (2008), p. 25f.

<sup>99</sup> See Katz/Katz (2008), URL: [http://www.bloomberg.com/apps/news?pid=20601109&sid=aYJZOB\\_gZiOI](http://www.bloomberg.com/apps/news?pid=20601109&sid=aYJZOB_gZiOI), retrieved May 27<sup>th</sup>, 2009.

The traditional view on financial regulation neglects the importance of externalities by actions of one financial institution that impacts another, for example the balance sheet maturity mismatch. Two ideas are suggested. The first one is that constraints on the composition of assets could be made. The second idea is to limit the raw leverage ratio, rather than risk-weighted assets. Constraints of building-up leverage during good times could be used as a dampener in the financial system. On the one hand this raw leverage ratio could work for the debtor and creditor as well on the other hand such a leverage ratio does not take into account the riskiness of the assets.<sup>100</sup>



**Figure 2: Northern Rock's Leverage**  
Source: Shin (2008), p. 16.

The latest example of nationalisation in Austria was the Hypo Group Alpe Adria. On the 14<sup>th</sup> of December 2009 the sixth largest Austrian bank, sorted by total assets, was nationalised by the Austrian government to avoid a bank collapse. The shareholders BayernLB, Grazer Wechselseitige (Austrian Insurer) and the Austrian

<sup>100</sup> See Shin (2008), p. 20f.

state of Carinthia will inject about €1 billion. The most significant reason given was bad loan provisions that caused a loss of more than €1 billion in 2009. This was the second time that Austria had to rescue a bank because Kommunalkredit had also been nationalised in November 2008. BayernLB has writedowns on its investment of €2.3 bn. The Austrian government injected €450 m.<sup>101</sup>

## 2.7. Leverage ratio

Formally capital ratios were introduced in regulation in the US in 1981. Before 1981 minimum requirements for capital itself were set. The FDIC set the minimum primary capital (initial investment of shareholders, retained earnings and capital reserves) standard at 5% of total assets for larger regional institutions and 6% for community banks.<sup>102</sup> The Basel Capital Accord of 1988 determined that the minimum capital ratio of banks (total capital to risk-weighted assets) should be 8% by end of 1992.<sup>103</sup> This was the first time that the risk-weights were introduced. The Tier 1 capital ratio was set to be at least 4%. The sum of Tier 1 and Tier 2 capital will be the capital base. Tier 1 capital elements are permanent shareholders' equity (issued and fully-paid share capital/common stock and perpetual non-cumulative preference shares) and disclosed reserves (share premiums, retained profit, general reserves and legal reserves). Tier 2 capital is the sum of undisclosed reserves, asset revaluation reserves, general provisions (as explained below), hybrid capital instruments and subordinated debt.<sup>104</sup> The core capital is the Tier 1 capital.<sup>105</sup> The Basel Committee recommended the risk-weighted approach for international comparison reasons allows off-balance-sheet exposures to incorporate it in the measure and does not deter banks to hold liquid assets with low risk.<sup>106</sup>

For the Basel II approach there were suggestions to use a supplementary capital measure, i.e. leverage ratio or a large exposure limit in the first pillar or allow

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<sup>101</sup> See Bryant/Wilson (2009), URL: [http://www.ft.com/cms/s/0/75467b10-e917-11de-a756-00144feab49a.html?nclick\\_check=1](http://www.ft.com/cms/s/0/75467b10-e917-11de-a756-00144feab49a.html?nclick_check=1), retrieved December 20<sup>th</sup>, 2009.

<sup>102</sup> See Gilbert/Stone/Trebing (1985), p. 14.

<sup>103</sup> See Basel Committee on Banking Supervision (2009), p. 2.

<sup>104</sup> See Basel Committee on Banking Supervision (1988), p. 13ff.

<sup>105</sup> See Basel Committee on Banking Supervision (1988), p. 3.

<sup>106</sup> See Basel Committee on Banking Supervision (1988), p. 7f.

supervisors to force banks to operate above the minimum capital requirement.<sup>107</sup> The Basel II Committee set the minimum capital requirement for credit, market and operational risk again to 8%. This ratio is called total capital ratio and is defined as the regulatory capital to risk-weighted assets. The Tier 2 capital is limited to 100% of the Tier 1 capital, which has remained unchanged since 1988. The Tier 1 capital remained the same as clarified in Oct. 1998. The Tier 2 capital is limited to 1.25% of risk-weighted assets under the standardised approach which was incurred in the amendment of 1991. The Tier 3 capital has remained also unchanged since Sept. 1997. The total risk-weighted assets are defined by multiplying the capital requirements for market and operational risk by 12.5 which means the reciprocal of the minimum capital ratio of 8% and adding the risk-weighted assets for credit risk.<sup>108</sup>

As Bernanke reported, banks are well capitalized with at least Tier 1 capital to risk-weighted assets at 6% and a minimum Tier 1 tangible common equity ratio (excl. goodwill) of 4%.<sup>109</sup>

Currently, three countries are using or planning to use a leverage ratio, which are US, Canada and Switzerland. The calculation differs in all countries. The US leverage ratio is calculated by dividing the Tier 1 capital to total adjusted assets (derivatives netting) on a consolidated basis and does not include off-balance-sheet exposures. The ratio should be at least 3% for “strong” rated banks and 4% for all other banks. The Leverage ratio is therefore an indicator of how close the bank is to insolvency. The Canadian leverage ratio is calculated by dividing the total assets (including off-balance sheet exposure) by its Tier 1 and Tier 2 capital. The multiple should be smaller than 20 which is a ratio on a reverse basis of at least 5%.<sup>110</sup>

The FINMA, the Swiss Supervisory Authority, has introduced a ‘new’ leverage ratio to limit the leverage of banks, especially for Credit Suisse and UBS which are Swiss systemic banks. The Swiss Leverage ratio is calculated by dividing the Tier 1 capital to total assets and set a minimum of 3% at consolidated level and 4% at individual

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<sup>107</sup> See Basel Committee on Banking Supervision (2004), p. 3.

<sup>108</sup> See Basel Committee on Banking Supervision (2004), p. 12.

<sup>109</sup> See Bernanke (2009), URL: <http://www.federalreserve.gov/newsevents/speech/bernanke20090511a.htm#f5>, retrieved January 25<sup>th</sup>, 2010.

<sup>110</sup> See Financial Systems Department of the World Bank’s FPD Vice Presidency (2009), p. 2.

level. The SNB suggested that leverage over 20 is not prudent in good times, which means that the capital base should be at least 5% of the total assets. To leave the banks enough time in the ongoing turbulent time, these targets should be applied as of 2013 at the earliest.<sup>111</sup>

It is not yet formulated whether the leverage ratio will be monitored by supervisors under Pillar II or a strict requirement under Pillar I of the changed Basel Accord. The study of Estrella, Park and Peristiani (2000) pointed out that a leverage ratio predict bank failure over one- or two-year time horizons. On the other hand, risk-weighted ratios tend to perform better indicators over the longer horizon than leverage ratios.<sup>112</sup>

Therefore the calculation is not yet defined for an implementation. The calculations are summarized in the equation 4 to 6. Equations 4 to 6 show an overview of the current minimum capital requirements of the ratios, beside the fact that the minimum capital requirements vary throughout countries.

$$\frac{\text{common equity}}{\text{risk - weighted assets}} \geq 2\%$$

**Equation 4: Minimum Common equity ratio**

Source: Basel Committee on Banking Supervision (2006)

$$\frac{\text{Tier 1}}{\text{risk - weighted assets}} \geq 4\%$$

**Equation 5: Minimum Tier 1 capital ratio**

Source: Basel Committee on Banking Supervision (2006)

$$\frac{\text{Total Capital (Tier 1,2 and 3)}}{\text{risk - weighted assets}} \geq 8\%$$

**Equation 6: Minimum Total Capital ratio**

Source: Basel Committee on Banking Supervision (2006)

Equation 7 to 9 show the new calculations under the Basel III approach with different adjustments as mentioned. The Tier 3 capital, for example was abolished and the composition of the Tier 1 and Tier 2 capital changed.

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<sup>111</sup> See SNB (2009), p. 7.

<sup>112</sup> See Estrella/Park/Peristiani (2000), p. 50.

$$\text{Common equity ratio} = \frac{\text{common equity (new)}}{\text{risk - weighted assets}} \geq x\%$$

**Equation 7: Common equity ratio under Basel III**

Source: Basel Committee on Banking Supervision (2009a)

$$\text{Tier 1 ratio} = \frac{\text{Tier 1 (new)}}{\text{risk - weighted assets}} \geq x\%$$

**Equation 8: Tier 1 ratio under Basel III**

Source: Basel Committee on Banking Supervision (2009a)

$$\text{Total capital ratio} = \frac{\text{Tier 1} + \text{Tier 2 (new)}}{\text{risk - weighted assets}} \geq x\%$$

**Equation 9: Total capital ratio under Basel III**

Source: Basel Committee on Banking Supervision (2009a)

The leverage ratio (LR) should be, according to BIS, a non-risk-sensitive, comparatively simple monitoring and control measure. The most important calculation of a Leverage ratio is the second Leverage ratio that is Tier 1 capital to total assets. The other two calculation methods are summarized in Equation 11 and 12. Using the common equity or the Total capital rather than the Tier 1 capital could also be valued to see the best calculation method and possible differences if there are any.

$$\text{Leverage ratio 1} = \frac{\text{common equity (new)}}{\text{total assets}}$$

**Equation 10: Leverage ratio 1**

Source: Own view according to Swiss, Canadian and US measurement

$$\text{Leverage ratio 2} = \frac{\text{Tier 1 (new)}}{\text{total assets}}$$

**Equation 11: Leverage ratio 2**

Source: Own view according to Swiss, Canadian and US measurement

$$\text{Leverage ratio 3} = \frac{\text{Tier 1} + \text{Tier 2 (new)}}{\text{total assets}}$$

**Equation 12: Leverage ratio 3**

Source: Own view according to Swiss, Canadian and US measurement

## 2.8. The Austrian Banking Sector

Under the Austrian Banking Act a credit institution refers to an institution authorised to carry out banking transactions under Austrian federal law (Article 1 (1) Federal Banking Act). Such transactions include activities like:

- accepting funds from other parties for financial management and depository purposes
- carrying out non-cash payment- and billing transactions
- granting loans and closing loan-related contracts
- taking custody of securities and managing these for customers
- issuing different means of payment (e.g. credit cards, checks)
- issuing securities (e.g. bonds)

The Austrian banking sector is divided into three main categories (single-stage, two-stage and three-stage banks) and eight sectors. Single-stage banks are independent of superior institutions holding. This means joint stock banks (Aktienbanken pursuant Article 51 Federal Banking Act) like the BAWAG P.S.K. AG or Unicredit Bank Austria AG, state mortgage banks (Landeshypothekenbanken pursuant Article 11), building and loan associations (Bausparkassen pursuant Article 4), Special purpose banks including severance funds, real estate funds and investment companies (Sonderbanken pursuant Article 93) and branch offices (Zweigstellen pursuant Article 28) refer to single-stage banks.<sup>113</sup> Special purpose banks are corporations with specific tasks, especially financing exports (OeKB), granting investment loans, managing investment funds, issuing credit cards or preparing severance funds.<sup>114</sup> Two-stage sector banks are defined as having a number of credit institutions and one superior institution with certain interference abilities and responsibilities. This must not be a corporate group. It does only mean that a superior credit institution consolidates its financial statements. The superior institutions have the coordination and liquidity management function, which means that it can control the liquidity of all institutions through compensatory operations. Under this category, Savings Banks (Sparkassen pursuant Article 56) e.g. Erste Bank AG and Volksbank credit

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<sup>113</sup> See Schnabler (2007), p. 2f.

<sup>114</sup> See Schnabler (2007), p. 4.

cooperatives (Volksbanken pursuant Article 69) e.g. ÖVAG are included.<sup>115</sup> The Raiffeisen credit cooperatives (Raiffeisenbanken pursuant Article 558) belong to the three-level sector in Austria. The lower stage of individual Raiffeisen banks exists in all of the states (provinces). The holders of the ownership rights in the competent state banks of the province in which they are situated constitute the second level of the sector. The nine state-banks hold ownership rights in the superior (third level) central institution, namely the Raiffeisen Central Bank.<sup>116</sup>

In Austria, 51 Joint stock banks and private banks head offices (784 branch offices), 55 savings banks (997), 11 state mortgage banks (997), 545 Raiffeisen credit cooperatives (1689), 68 Volksbank credit cooperatives (478) and 4 building and loan associations (43), 92 special purpose banks (11), 29 member State credit institutions (5) are covered by the OeNB in the fourth quarter of 2009.<sup>117</sup> In Austria, in total 855 head offices and 4172 branch offices are registered.<sup>118</sup>

Table 5 compares the total assets of the Austrian banking sector between 1995 and 2008. At the end of December 2008, joint stock banks had the largest market share in terms of total assets (29%) by €308 bn out of €1047 bn total assets, followed by Raiffeisen cooperatives and savings banks, which accounted for 25% and 17% of total assets. Total assets increased sharply from €390 bn to €1047 bn from 1995 to 2008. In 1995 the largest banking sector had been savings banks by one third of total assets. The total assets of special purpose banks such as investment companies increased from €28 bn in 1995 to €102 bn in 2008, although the offices of such banks were only 107 out of 5727 at the end of 2008. This is an interesting point, because 2% of Austrian banks have a volume of total assets of 10%, which is quite high.

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<sup>115</sup> See Schnabler (2007), p. 4f

<sup>116</sup> See Schnabler (2007), p. 6.

<sup>117</sup> See OeNB (2010b), URL: <http://www.oenb.at/isaweb/report.do?report=3.1.1#optionen>, retrieved March 25<sup>th</sup>, 2010.

<sup>118</sup> See OeNB (2010c), URL: <http://www.oenb.at/isaweb/report.do?lang=EN&report=3.1.2>, retrieved March 25<sup>th</sup>, 2010.

| <i>Total assets (in € bn)</i>         | <b>1995</b> | <b>2008</b> |
|---------------------------------------|-------------|-------------|
| <b>Joint stock banks</b>              | 111         | 308         |
| <b>Savings banks</b>                  | 121         | 177         |
| <b>State mortgage banks</b>           | 21          | 96          |
| <b>Raiffeisen credit cooperatives</b> | 78          | 265         |
| <b>Volksbank credit cooperatives</b>  | 17          | 79          |
| <b>Building and loan associations</b> | 14          | 20          |
| <b>Special Purpose banks</b>          | 28          | 102         |
|                                       | <b>390</b>  | <b>1047</b> |

Table 5: Total Assets (in € bn) of 1995 and 2008  
Source: OeNB

Figure 3 shows the changes of total assets of the Austrian Banks and the number of banks between 1995 and 2008. While the total assets increased by 168%, the number of banks declined by 12%, from 5727 (1041 head offices) in 1995 to 5027 (855 head offices) in 2008. Joint stock banks had the largest total asset growth of roughly 22% or €65 bn compared to 2007. According to 1995, Volksbank credit cooperatives and state mortgage banks had the largest asset growth of 365% and 357%. The total asset growth of joint stock banks between 1995 and 2008 was 178%.

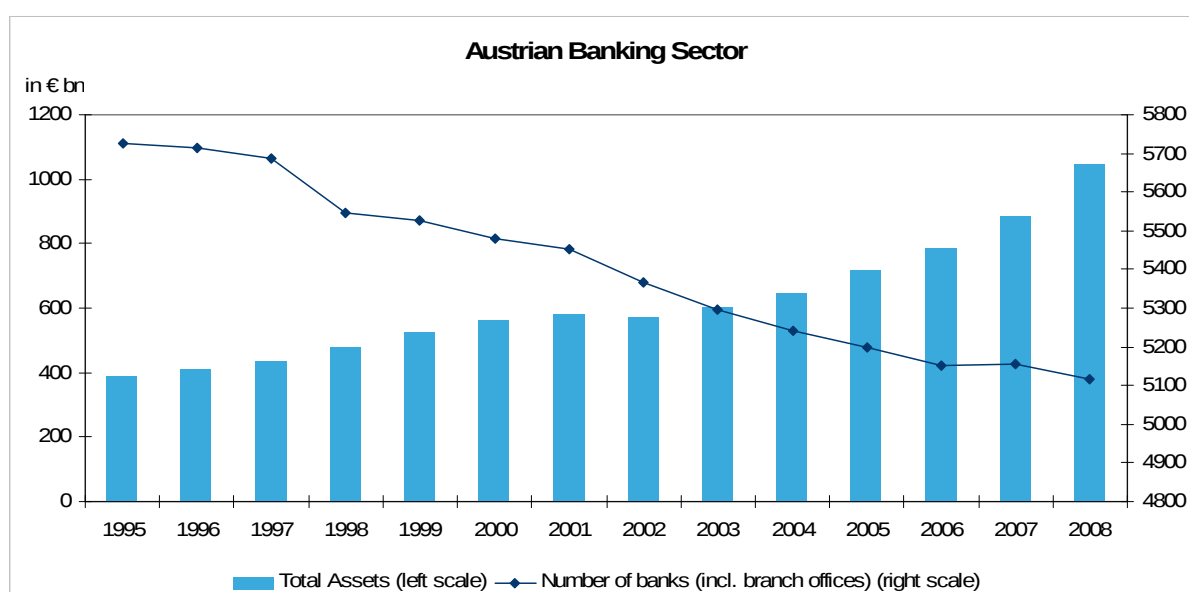


Figure 3: Total Assets versus Number of banks (incl. branch offices) between 1995 and 2008  
Source: OeNB

The total number of monetary financial institutions as head offices (MFIs) in the Euro Area stood at 8,076 in December 2009. In comparison with January 1999, this is a decrease of 1,726. In the European Union, there were 10,192 MFIs in December 2009, a decrease of only 717 from 10,919, compared to January 1999. The vast majority of credit institutions are commercial banks, savings banks, postal banks, credit unions, while money market funds are the minority. In Austria, 820 banks are included (791 credit institutions, 28 money market funds, 1 central bank)<sup>119</sup> with an aggregated balance sheet total of €830 bn.<sup>120</sup> The top 6 of Austrian banks by total assets (UniCredit Bank Austria, Erste Group, RZB Group, ÖVAG, Hypo Group, BAWAG P.S.K. Group) had an aggregate amount of €700 bn, which is roughly 84%, by the end of 2008.

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<sup>119</sup> See ECB (2010), URL: <http://www.ecb.int/press/pr/date/2010/html/pr100120.en.html>, retrieved March 25<sup>th</sup>, 2010.

<sup>120</sup> See ECB, Statistical Data Warehouse

### 3. Commercial Banking

In this chapter I present a short revision of the development of investment banking and the separation to commercial banking, if there is a separation. Further the leverage and derivatives in financial institutions will be discussed in general. Moreover liquidity and leverage will be illustrated as well as the role of sovereigns, which are also called government bonds.

#### 3.1. Investment versus commercial banking

As we heard, the Glass-Steagall Act separated commercial from investment banking in the US after the Great Depression in 1933. In 1999 the US Congress repealed the Glass-Steagall Act and replaced it by the Gramm-Leach-Bliley Act. In 2008, after a lot of criticism and at the beginning of the financial crisis, the investment banks were forced to change their status into commercial banks for tighter regulation purposes.<sup>121</sup> After the Glass-Steagall Act, the investment bank Morgan Stanley for example was formed by Henry S. Morgan and Harold Stanley. In Europe the two activities can be combined in one single firm. Originally investment banks acted as brokers and helped customers raise funds or give advice on mergers and acquisitions, while commercial banks offer traditional services like taking deposits. The separation is controversial. Commercial banks are financial intermediaries with high leverage i.e. a large proportion of short-term debt such as deposits. The commercial banks' funds are moreover used to offer loans to firms and individuals. Investment banks also offer activities like trading and brokerage, asset management, and underwriting and advisory services as mentioned. Such banks therefore use their assets to issue debt. One of the possibilities is called asset backed securitization.<sup>122</sup> It is clear that commercial banks exist because firms and individuals do not always have access to financial markets issuing bonds and stocks. The reason for the existence of the role of investment and commercial banks is always the same: information asymmetry. The traditional banking, which is borrowing short and lending

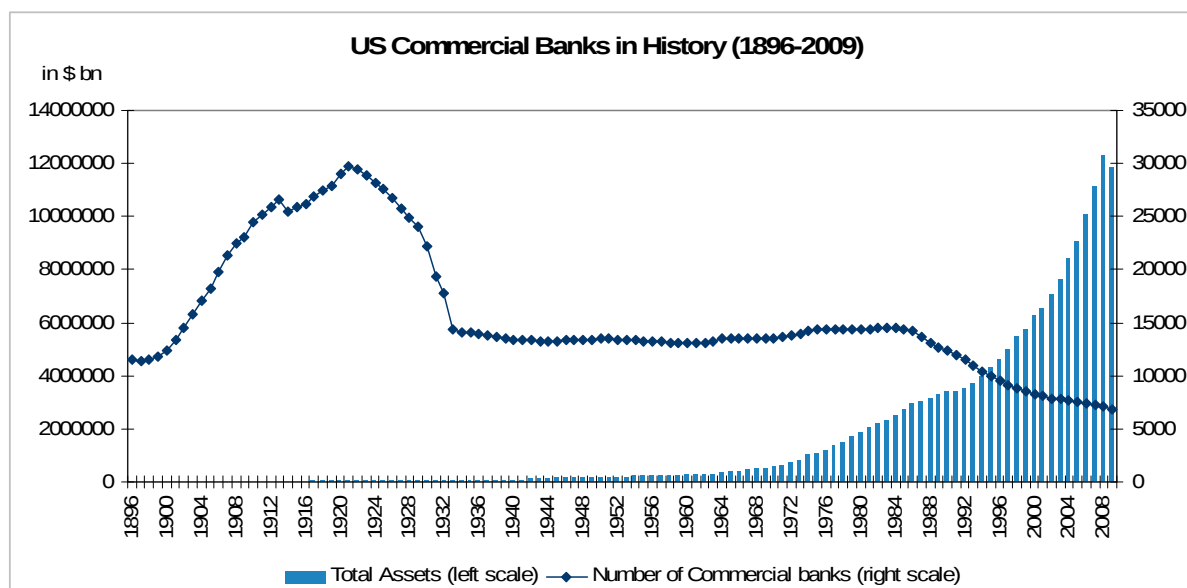
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<sup>121</sup> See Wiebe, (2010), URL: <http://www.handelsblatt.com/politik/international/obamas-vorbild-glass-steagall-act-von-1933;2516803>, retrieved January, 21<sup>st</sup>, 2010.

<sup>122</sup> See Iannotta (2010), p. 2ff.

long is no more valid. Mishkin (2007) outlined, that in the US, the importance of commercial banks as a source of funds to non-financial borrowers shrunk from 40% in 1974 to 30% in 2005<sup>123</sup> which is quite enough including the fact that the number of banks also decreased.

By the end of 2009, in the US the number of commercial banks which had Total Assets above \$1 bn was 514 out of 6839 total national banks. The largest 514 commercial banks had a total share of total assets of 90%<sup>124</sup>, which is an impressive figure and shows the problematic of the size and their allocation in terms of total assets, as we will see later. Figure 4 shows the number of US Commercial Banks and their Total Assets in History between 1896 and 2009. The number of commercial banks decreased by 69%, from 23,098 to 6,839, in the 100 years from 1909 to 2009. The total assets skyrocketed in the same period from \$18,145 bn to \$11,846,114 bn. Especially the First and Second World Wars influenced the picture. In 1945 at the end of the Second World War, the number of commercial banks in the US stood at 13,302 while the total assets stood at \$157,582 bn.



**Figure 4: Number of US Commercial Banks (FDIC-Insured) 1896-2009**

Source: FDIC, FRASER Federal Reserve Bank of St. Louis

By the end of 2009, there were 6,458 credit institutions in the Euro Area registered by the European Central Bank, which is slightly below the number of the US

<sup>123</sup> See Mishkin (2007), p. 257.

<sup>124</sup> See FDIC (2009), URL: <http://www2.fdic.gov/SDI/main4.asp>, retrieved May 16th 2010.

Commercial Banks. Compared to overall monetary financial institutions in the Euro Area this is a market share of 80% (6458 out of 8076). In Austria and Germany there is an integrated provision of financial services ('universal banking system'), which means that there is no clear distinction between commercial and investment banks. Some banks, like the Deutsche Bank AG, also operate in niche products like brokerage and other special investment services.

### 3.2. Leverage and derivatives in financial institutions

The bank balance sheet is a list of banks' assets and liabilities. The total assets are the sum of total liabilities plus capital. The liabilities are the sources of a bank for example checkable deposits, non-transaction deposits and borrowings. The assets illustrate the use of funds. Examples are reserves, loans and securities. Banks with deposits need reserves to fill the reserve requirements and to have excess reserves to meet their obligations when funds are withdrawn.<sup>125</sup> Excess reserves are also an insurance against costs with deposit outflows.<sup>126</sup> Important factors that could increase the risk of banks, but is not considered on the balance sheet, are off-balance-sheet instruments and activities.<sup>127</sup>

Commercial banks normally have a leverage ratio between 10 and 12. Lehmann Brothers had a ratio of 30 with only 3% equity of total assets at the end of 2007.<sup>128</sup> At the end of 2007 the UBS and Credit Suisse were highly levered, UBS with a simple leverage ratio of 53.<sup>129</sup> Normally investment banks have leverage ratios between 20 and 25.<sup>130</sup>

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<sup>125</sup> See Mishkin (2007), p. 222.

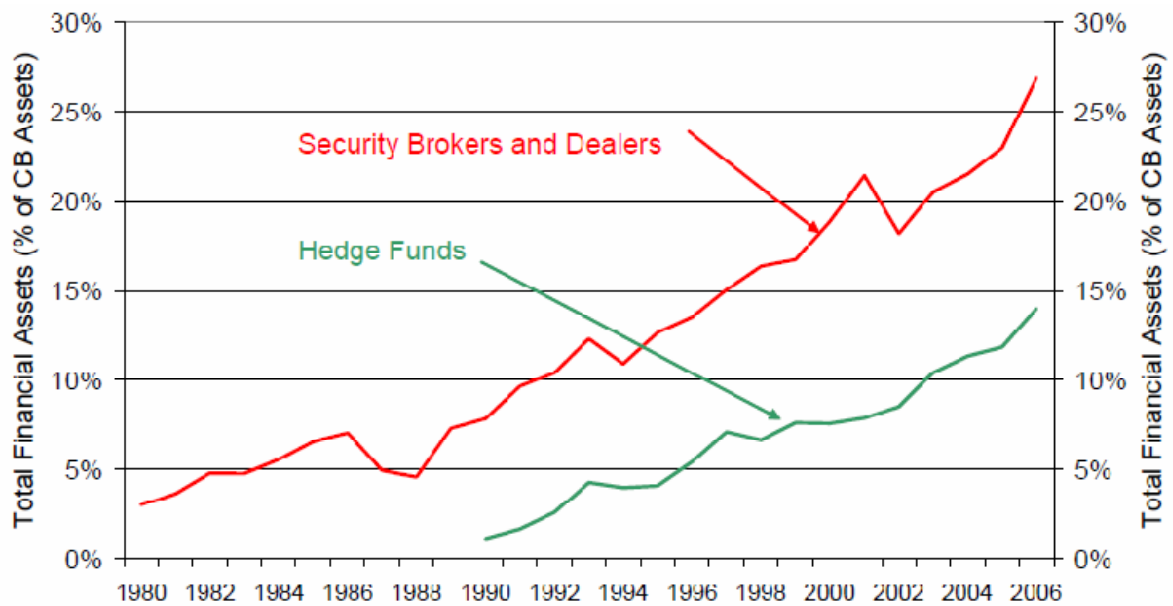
<sup>126</sup> Mishkin (2007), p. 229.

<sup>127</sup> See Mishkin (2007), p. 241f.

<sup>128</sup> See Morris/Shin (2008), p. 14.

<sup>129</sup> See Morris/Shin (2008), p. 23.

<sup>130</sup> See Greenlaw et al. (2008), p. 37.



**Figure 5: Total Financial Assets of Financial Intermediaries as % of commercial banks Total Assets**  
Source: Adrian/Shin (2008a), p. 10, Board of Governors of the Federal Reserve and HFR.

Figure 5 shows Security Brokers and Dealers and Hedge Funds total financial assets on the balance sheet relative to commercial banks. For the Hedge Funds, the total assets under management (with reference to total shareholder equity) are used. This value is multiplied by a leverage of 2 as a proxy. The combined balance sheet Security Brokers and hedge funds therefore is over 50% of commercial banks balance sheet. A problem might be that the balance sheet is marked to market, so reactions could be proportionally large. The balance sheet as a decoupled figure is not a good indicator, because in the past Long Term Capital Management's (LTCM) balance sheet was relatively small to the total financial sector and the impact was a dramatic one.<sup>131</sup>

A combination of leverage and total assets could be a better indicator. Adrian and Shin (2008) found out that leverage is procyclical because, even when leverage is large, total assets are large. They show a positive relationship between the change in leverage and the change in total assets. On the other side, leverage is positively related to short-term debt, repos and other collateralised borrowings. Especially the balance sheet increases through repos and reverse repos, which is a contract when an institution sells a security and simultaneously agrees to buy it back at a fixed price on a fixed future date. Therefore investment banks use repos for financing

<sup>131</sup> See Adrian/Shin (2008a), p. 10.

activities.<sup>132</sup> The balance sheet of investment banks has often shown a lot of short-term claims i.e. repos and reverse repos which are marked-to-market.<sup>133</sup>

The current credit crisis was enhanced by two mechanisms. The first one has been constituted by problems in the interbank funding market, especially collateralized debt obligations (CDOs) and asset-backed commercial papers (ABCPs). These assets are held by leveraged institutions like Security brokers, off-balance-sheet vehicles or hedge funds specializing in mortgage securities.<sup>134</sup> More than half of the ABCP daily issuance has maturities of 1 to 4 days. The average maturity of outstanding paper is about 30 days.<sup>135</sup> ABCP are often held by money market mutual funds. The most traditional ABCP program is the multi-seller program, in which a bankruptcy-remote conduit purchases receivables and loans from multiple firms. The sponsor is typically a financial institution that provides the conduit (Special Purpose Vehicle) with a committed liquidity line.<sup>136</sup> In the end of July 2007, there were 98 multi-seller programs with \$525 bn ABCP outstanding, which was 45% of the total ABCP outstanding. Other ABCPs are issued by collateralized debt obligations in the form of structured investment vehicles. Structured investment vehicles (SIVs) are highly-rated securities which do not have explicit agreements with their sponsoring banks for committed back-stop liquidity lines to cover short-term liabilities. The difference to structured investment vehicles (SIVs) is that CDOs are not actively managed and tend to rely on explicit, but only partial liquidity support.<sup>137</sup> Sovereign debt and high-grade corporate bonds remain stable in the early times of crisis.<sup>138</sup> This situation for sovereigns changed in the later stage of the crisis as we will see later. The second problem arose from the subprime mortgages. The credit quality of mortgages began to fall in the early 2007.<sup>139</sup>

In the summer of 2007, the US Asset-Backed Commercial paper market erupted. Due to decline in confidence in mortgage financial intermediaries and rating downgrades of structured mortgage securities, investors got reluctant to roll over

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<sup>132</sup> See Adrian/Shin (2008a), p.11f.

<sup>133</sup> See Greenlaw et al. (2008), p. 37.

<sup>134</sup> See Greenlaw et al. (2008), p. 41.

<sup>135</sup> See Covitz/Liang/Suarez (2009), p. 7.

<sup>136</sup> Covitz/Liang/Suarez (2009), p. 8ff.

<sup>137</sup> See Covitz/Liang/Suarez (2009), p. 8.

<sup>138</sup> See Greenlaw et al. (2008), p. 41.

<sup>139</sup> See Greenlaw et al. (2008), p. 41.

ABCPs and the outstanding ABCP amount plummeted by \$190 bn, roughly 20% in August and additional \$160 to \$830 bn by the end of 2007<sup>140</sup>, as Figure 6 exhibits. The total value of asset-backed commercial paper outstanding fell by 37% from August 2007 to August 2008.<sup>141</sup>

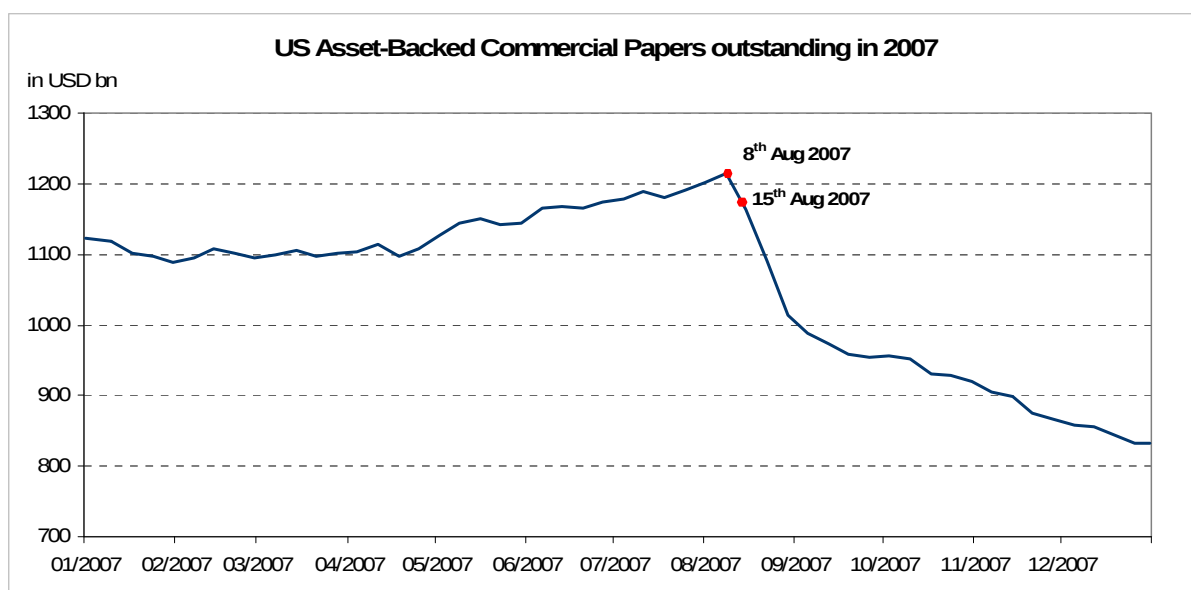
In chapter Basel II weaknesses I mentioned the example Northern Rock. Northern Rock, which was the fifth largest UK mortgage bank, sorted by mortgage assets, began to get into trouble during the early time of the financial crisis, in mid-2007. On the 14<sup>th</sup> of September 2007, the Bank of England announced a liquidity support for Northern Rock. Some days before, on the 9<sup>th</sup> of August, short-term borrowing through securitized notes ran dry. The British mortgage lenders had many off-balance sheet investment vehicles in their portfolio, for example Asset-backed commercial papers with high exposures in the US subprime market. Their business focus was focused on non-retail funding such as interbank deposits and covered bonds and only 23% of its liabilities were retail deposits. The total assets of Northern Rock grew from £17.4 bn in June 1998 to £113.5 bn in June 2007. Between 8<sup>th</sup> and 15<sup>th</sup> of August, the amount of outstanding Asset-backed commercial papers dropped sharply by 4%, as stated in Figure 6. The problem therefore was not only the off-balance sheet investments, but also that they used short-term funding from the same Special Purpose Vehicle Pool.<sup>142</sup>

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<sup>140</sup> See Covitz/Liang/Suarez (2009), p. 1.

<sup>141</sup> See Kacperczyk/Schnabl (2009), p. 1.

<sup>142</sup> See Shin (2008), p. 2ff.



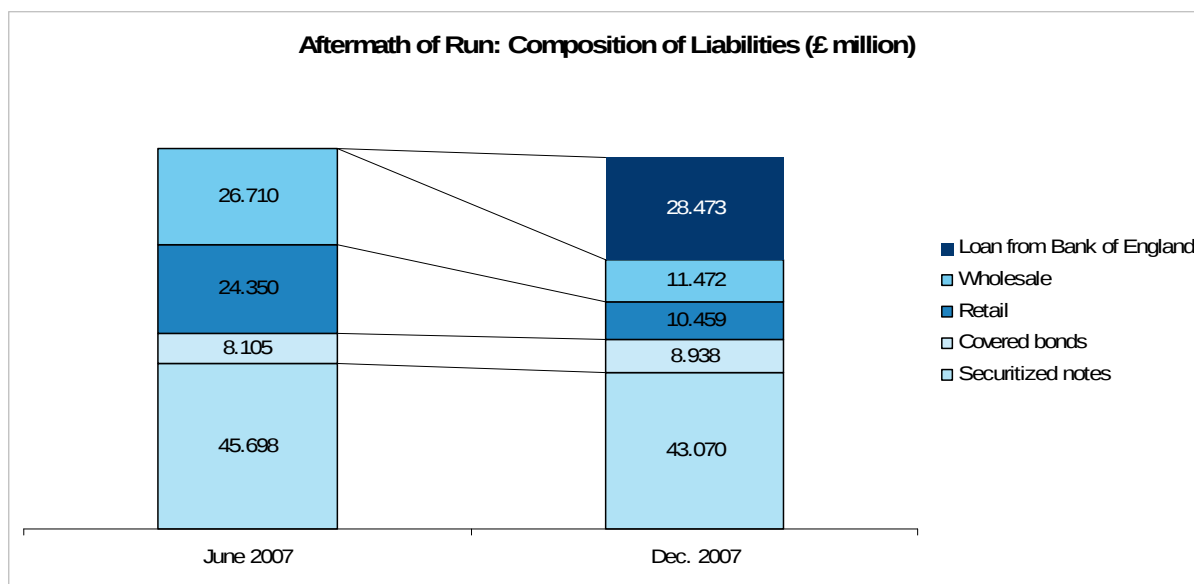
**Figure 6: Asset-Backed Commercial Papers outstanding**  
Source: Board of Governors of the Federal Reserve System

Figure 7 shows the composition of liabilities of Northern Rock before and after the run and the liquidity support from the Bank of England. While covered bonds and securitized notes stood relatively constant, there were significant changes in retail deposits and wholesale funding i.e. non-retail funding (without covered bonds and securitized notes). Wholesales liabilities drop from £26.7 bn to £11.5 bn between June and December 2007. The wholesales liabilities were mostly short-term or medium-term and the maturing loans and deposits were not renewed by the investors. Furthermore the pool of the special investment vehicles was the same as the short-term wholesale funding i.e. short-term creditors.<sup>143</sup>

The retail deposits plummeted from £24.4 bn to £10.5 bn by more than 50%. These deposits show a large reduction in postal account deposits and offshore deposits while the typical customer deposits fall less.<sup>144</sup>

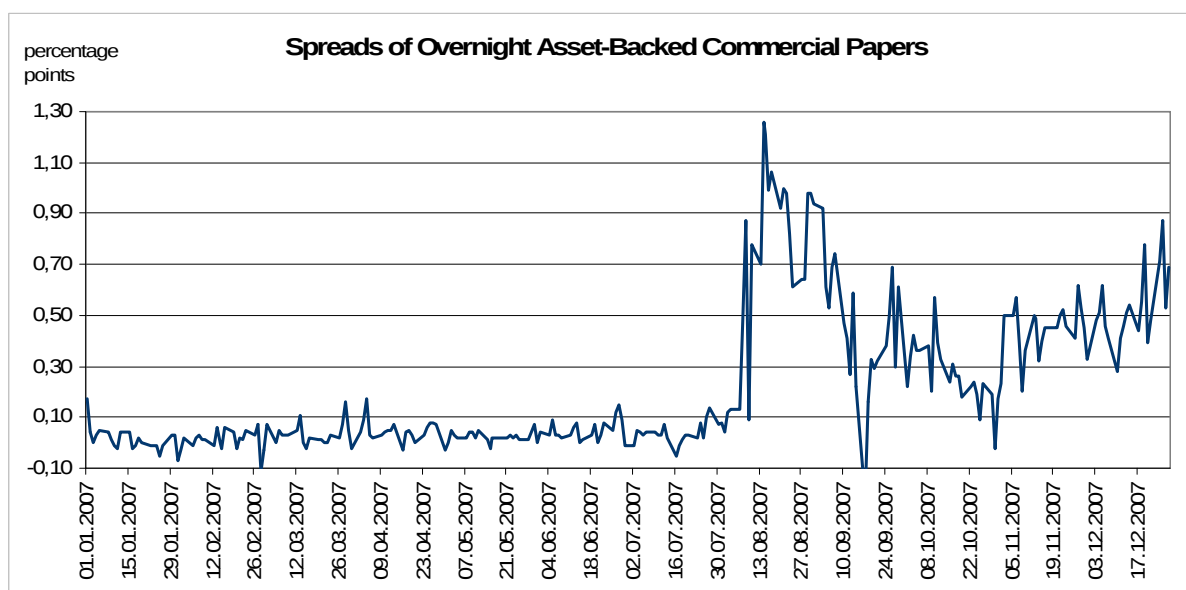
<sup>143</sup> Shin (2008), p. 10ff.

<sup>144</sup> Shin (2008), p. 12.



**Figure 7: Aftermath of Run: Composition of Liabilites (in million £)**  
Source: Shin (2008), p. 10.

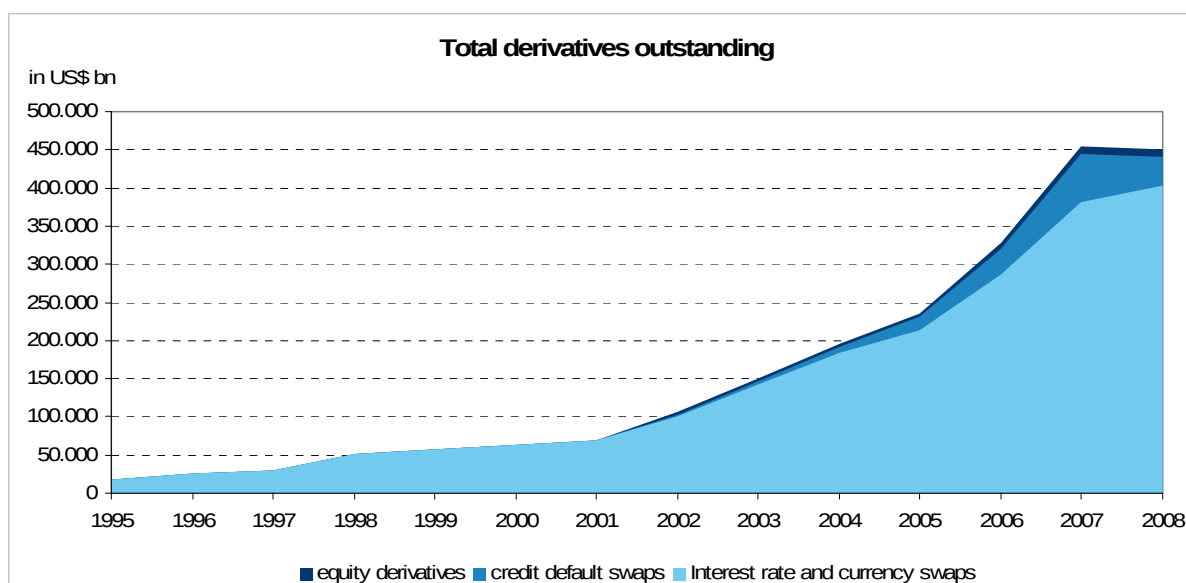
Banking institutions began to hoard their cash positions in order to meet their ABCP obligations and became hesitant in interbank lending markets. Therefore the risk spreads for overnight interbank funding widened sharply, while the outstanding amount decreased. Figure 8 shows that the daily spreads of the AA-rated Asset-Backed Commercial Papers over the target federal funds rate in the US Market widened from 0.1 to roughly 1.1 by 1 percentage points in July and August 2007.



**Figure 8: Spreads (Overnight AA Asset-backed Commercial Paper Interest Rate to Effective Federal Funds Rate) of Overnight Asset-Backed Commercial Papers**  
Source: Board of Governors of the Federal Reserve System, Federal Reserve Bank of St. Louis

Liquidity injections of national and central banks enabled opportunities for financial intermediaries to expand their balance sheets by borrowing from the central bank and forward lending to other parties.

Figure 9 summarizes the notional amount outstanding (gross nominal of all deals concluded and not yet settled on the reporting date) of interest rate and currency swaps, equity derivatives and credit default swaps from 1995 to 2008. The data is collected by the International Swaps and Derivatives Association (ISDA) which conducted detailed surveys of overall over-the-counter derivatives activities and has collected data since 1987 of transactions or reporting institutions worldwide. The notional amount outstanding of overall derivatives dramatically skyrocketed from \$17 trn in 1995 to \$441 trn by the end of 2008. The notional amount of interest rate derivatives outstanding, for example interest rate swaps, interest rate options, forward rate agreements and foreign exchange contracts such as currency swaps, by the end of 2008 was roughly \$403 trn which is roughly 90% of the overall outstanding amount. The most important OTC derivatives are interest rate contracts, especially interest rate swaps with a 77% market share of roughly \$309 trn out of \$403 trn overall interest rate and currency contracts. The rapid growth of derivatives was mostly due to the growth in interest rate contracts. The total credit default swaps outstanding was roughly \$38 trn by the end of 2008 and fell by 38% compared to 2007 due to the financial crisis, while the other derivatives outstanding increased. The notional amount of equity derivatives, which are especially options and futures, had been roughly \$8.7 trn with a market share of only 2% by the end of 2008.



**Figure 9: Total derivatives outstanding 1995-2008 (in USD bn)**  
Source: ISDA Market Survey (annual data)

### 3.3. Liquidity, Leverage and the role of Sovereigns

The importance of liquidity was emphasized by a lot of economists. Goldstein (2008) argued that much of the crisis was due to liquidity. Especially large banks in the G-7 countries have reduced the share of liquid assets before the crisis such as treasuries and got their liquidity by short-term borrowing.<sup>145</sup> In response to increase in prices, financial market liquidity can be seen as a rate of growth of aggregate balance sheets.<sup>146</sup> On a theoretical basis, if it is assumed that a financial institution holds 100 worth of securities, with debt worth 90 and the price of debt is assumed to be constant for small changes in total assets. If the price of securities increases by 1% to 101, the Leverage will fall from 10 to 9.18 (securities worth 101 divided by equity worth 11). When the bank has a target leverage of 10, then it must take additional debt and purchase securities. On the other side, if Leverage is too high, the bank could sell their securities and paying down debt. When the leverage of banks is procyclical, then leverage is high during booms and low during busts.<sup>147</sup>

If financial markets are not liquid, i.e. a greater supply of assets, which are marked-to-market, tends to put downward pressure on its price. Therefore weaker balance

<sup>145</sup> See Goldstein (2008), p. 6.

<sup>146</sup> See Adrian/Shin (2008a), p. 4.

<sup>147</sup> See Adrian/Shin (2008a), p. 10f.

sheets lead to greater sales of the assets, which put the asset's price down. When asset prices decrease, banks leverage tends to be higher. When asset prices increase, financial intermediaries' balance sheets become stronger and their leverage tends to be low and financials tend to hold surplus capital.<sup>148</sup> Adrian and Shin (2008) show that key balance sheet forecast changes in the Volatility Index of implied volatility in the stock market.<sup>149</sup>

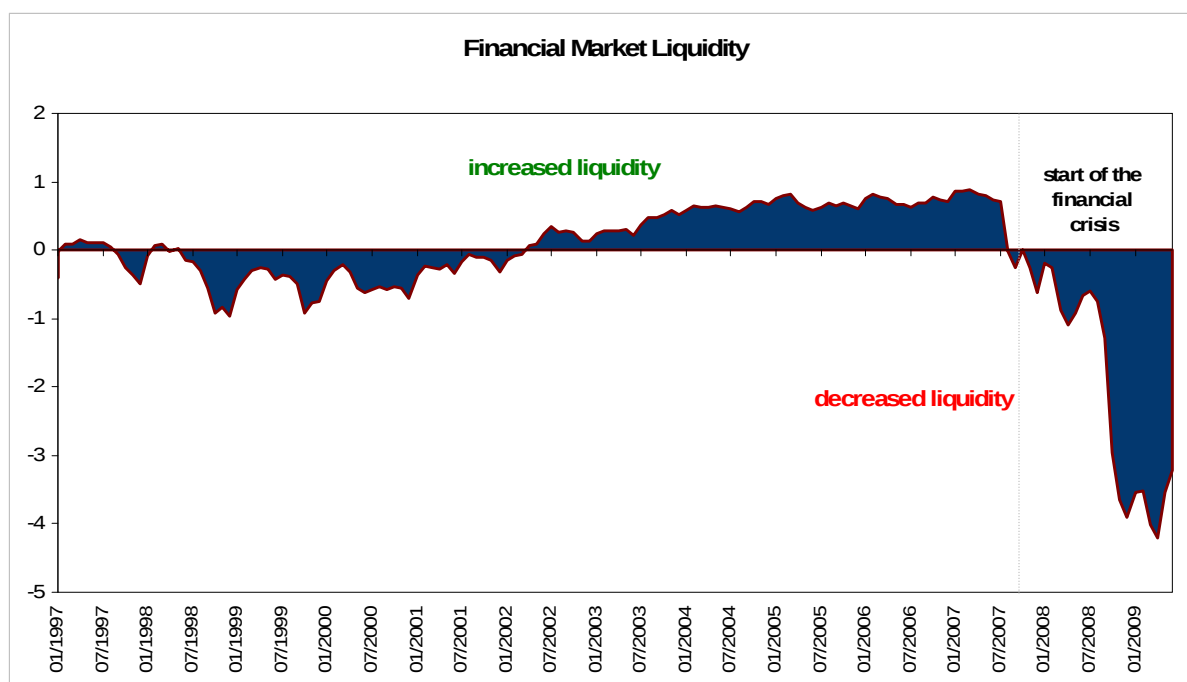
Figure 10 shows the development of the liquidity index on a monthly basis between the 1<sup>st</sup> of January 1997 and to 30<sup>th</sup> June of 2009. The Liquidity Index, which is published by the Bank of England, shows the number of standard deviations from the mean. It is a simple unweighted average of nine liquidity measures, normalised on the period 1999-2004. The series shown is an exponentially weighted moving average. After 1997 the indicator is more reliable as it is based on a greater number of underlying measures. Liquidity measures incorporate the gaps between bid and offer prices on bonds, currencies and stocks, the ratio of market returns to trading volumes and spreads in the credit market.<sup>150</sup> The decline which started in August 2007 is mostly due to the sharp decline in the interbank market liquidity and a response to US sub-prime market downturn. Bank's funding became vulnerable to a sudden shift in financial market conditions and worsened the credit conditions. The sharp decline of liquidity was across the global market. Especially the dramatic fall in the Liquidity Index was due to negative effects on prices of securitised assets which are globally linked to each other. Such a fall was exacerbated by the high leverage of financial institutions. A number of institutions needed financial support from the public sector including Lehman Brothers and Bear Stearns.

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<sup>148</sup> See Adrian/Shin (2008a), p. 37.

<sup>149</sup> See Adrian/Shin (2008a), p. 12.

<sup>150</sup> See Bloomberg definitions



**Figure 10: The liquidity index from 01-01-1997 to 30-06-2009 (monthly basis)**

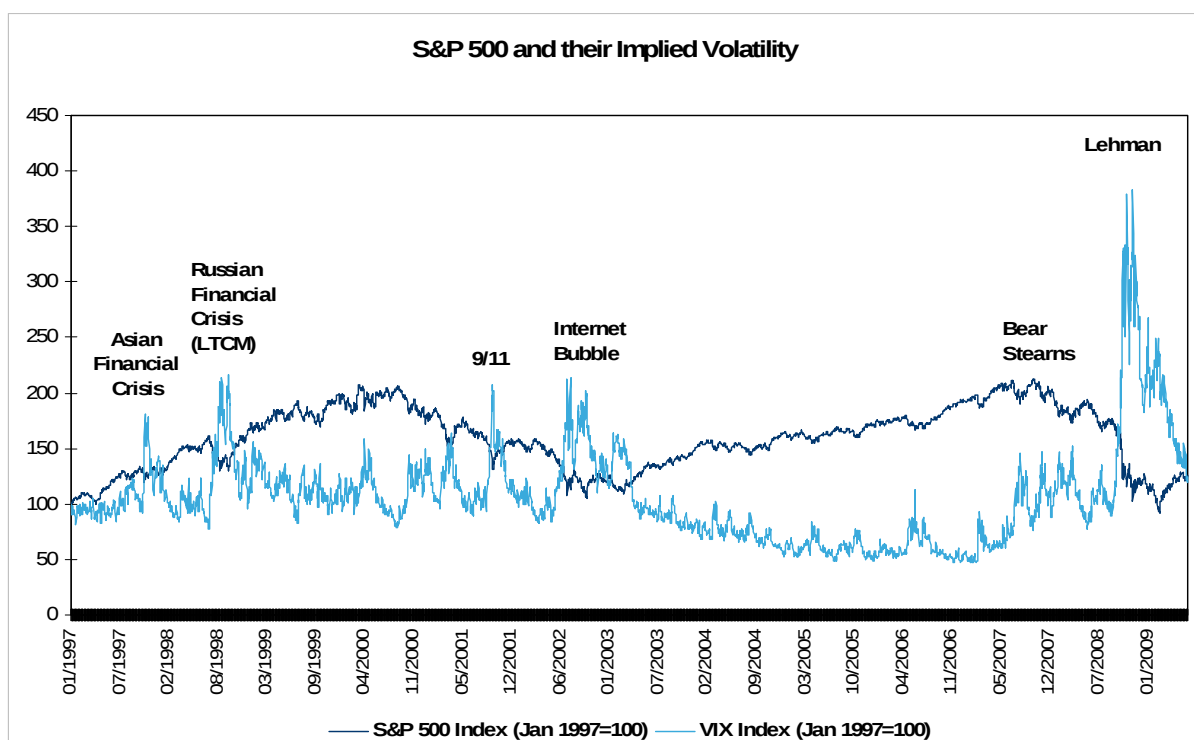
Source: Bank of England, Bloomberg, Chicago Board Options Exchange, Debt Management Office, London Stock Exchange, Merrill Lynch, Thomson Datastream & Bank calculations

The Chicago Board Options Exchange Volatility Index (VIX), which was introduced in 1993, equals the implied volatility (estimation of future volatility) on the S&P 500 Index. The S&P 500 index publishes prices of the 500 large-cap stocks traded in the US. The VIX reflects aggregate financial market volatility and the price of risk. The VIX is used as a benchmark for US stock market volatility, is often used for financial market conditions as measure of 'fear'. The index estimates expected volatility by averaging the weighted prices of the S&P 500 put and call options over a wide range of strike prices.<sup>151</sup>

In history, the VIX reflects investor fear regarding a potential drop in the US stock market. The S&P 500 and the VIX Index are normalized on January 1997. Recent crises are plotted in Figure 11. Every few years an event shocked financial markets. Previous crises are the Asian Financial Crisis (1997), the Russian Crisis including Long-Term-Capital-Management (1998), 9/11 (2001), the DotCom bubble (2000-2002) and the recent problems with Bear Stearns collapse (2007) and Lehman filing for Chapter 11 (2008). The dramatic downturn in the market in late 2008 can also be seen in the VIX graph. On a normalized basis (starting point 01-01-1997) the VIX

<sup>151</sup> See CBOE (2009), p. 1.

rose by almost 80% during the Asian Financial Crisis from the beginning of 1997 to November 1997. The 100% upward slope was reached during the Russian Financial crisis in 1998 and again on 9/11 and the DotCom Bubble. The years between 2003 and 2007 were years of steady growth. While the collapse of Bear Stearns had less impact on the VIX index, the Lehman failure had the historical highest impact on the VIX Index, which rose by 4x times higher than the levels before. Due to the turmoil, the S&P 500 fell off to the levels of 1997. During these years, the VIX fluctuated between 10 and 35 and dropped sharply to 89 at the end of 2008. The Lehman bankruptcy triggered a very high volatility “regime”.



**Figure 11: Development of the S&P 500 and the VIX Index normalized from Jan 1997 to Jan 2009**  
Source: Bloomberg

Historically it is known that sovereigns have always be seen as a safe investment which can not default. A lot of scientists had build models, for example the CAPM of Treynor, Sharpe, Lintner and Mossin in the 1960s, and took the yield for long-term government bonds as a risk-free rate. The current situation is different and sovereigns play a role in the development of the crisis. The Argentina's debt crisis, starting in 2001, has been the biggest default ever in terms of

monetary amounts (\$ 90 bn).<sup>152</sup> Greece is the latest addition, which peaked at 115% debt/GDP ratio by 2009, and according to IMF estimations could again increase to 150% by the end of 2011. The highest US debt-to-GDP ratio was 109% at the end of World War II.<sup>153</sup> As we heard recent crisis had significant impacts on global equity markets. The domestic impact on crisis depends on perceived global systemic risk and contagion effects on financial institutions. We are now in the fourth stage of the cycle, the sovereign risk phase. In the first stage, the financial crisis was in the built-up period, where sovereigns were almost stable and volatility markets largely ignored the problems. It started with the US housing price bubble in the subprime mortgage market in 2007. Afterwards other commercial and investment banks were affected by the mortgage meltdown and the market for asset-backed commercial papers. In the first time only highly leveraged banks were largely affected and defaulted. The second stage was the systemic outbreak as Figure 12 summaries. This chart shows the 10-year German government bond yield compared to the 10-year government bond yield to PIIGS (Portugal, Italy, Ireland, Greece, and Spain) which is simply called the yields spread between 10-year Greek government bonds and their benchmark 10-year German Bunds. Through the massive liquidity shortages of banks, some financial institutions ran into problems i.e. Northern Rock, Bear Stearns and later Lehman.

In the third stage the central banks intervened in October 2008 to lower interest rates to provide liquidity and foreign currency. During this phase, national governments wanted to stabilize the domestic market by expanding insurance on guarantees for depositors and guarantees for banks. The IMF, for example, issued loans to Hungary (\$15.7 bn) and the Ukraine (\$16.4 bn) and granted loans to Belarus, Bosnia & Herzegovina, Iceland, Latvia, Moldova, Poland, Romania and Serbia. Banks in the EU have already nearly \$1.5 trn assets invested in Central and Eastern Europe. The crisis has underscored the interdependence between financial markets in the US and European economies.<sup>154</sup> Central banks engaged in direct injections of capital to support banks balance sheets which were also necessary in the case of Austria. Due to the Lehman bankruptcy, credit markets were frozen up and the CDS contracts that

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<sup>152</sup> See Olivares-Caminal (2010), p. 91.

<sup>153</sup> See Dickson, (2010), URL: <http://www.washingtontimes.com/news/2010/mar/26/cbos-2020-vision-debt-will-rise-to-90-of-gdp/>, retrieved August, 17<sup>th</sup>, 2010.

<sup>154</sup> See Jackson (2009), p. 2f.

referenced Lehman led to high counterparty risks. The crisis demonstrated that financial markets are interdependent across national borders. As we have seen, a lot of financial institutions are “too big to fail” and covered by the central bank which is banking system without an explicit Lender of Last Resort. This could explain why low interest rates did not work successfully. Furthermore, the monetary policy of central banks by narrowing interest rates to zero and injecting capital didn’t work because banks didn’t channel the capital into the real economy.

In the old Keynesian view, a liquidity trap is defined as a situation in which short-term nominal interest rate is zero. Increasing money supply has no effect in a liquidity trap and monetary policy is ineffective because short-term nominal interest rate can not be less than zero as long as commercial banks hold excess reserves at zero interest with the central bank.<sup>155</sup> The liquidity preference theory suggested that holding long-term securities, for example bonds, will yield a premium to investors rather than short-term securities due to greater uncertainty about the liquidity. In practice this is dependent on the term structure of interest rates. According to Keynes, liquid assets are bills and call loans because they are realisable at short notice without loss and therefore investments are more liquid than advances. Hicks (1962) explained that the term “without loss” should be used in a comparative manner, for example the book value to the current market value.<sup>156</sup> Hicks defines the term ‘Liquidity’ itself as *the judgment of the adequacy of liquid assets that are comprised in it to meet the claims which are made upon them*.<sup>157</sup> Furthermore for judging liquidity, someone should use conventional rules such as ratios.<sup>158</sup> In general, the judging of liquidity is not easy and short-term liquidity problems forces banks into bankruptcy.

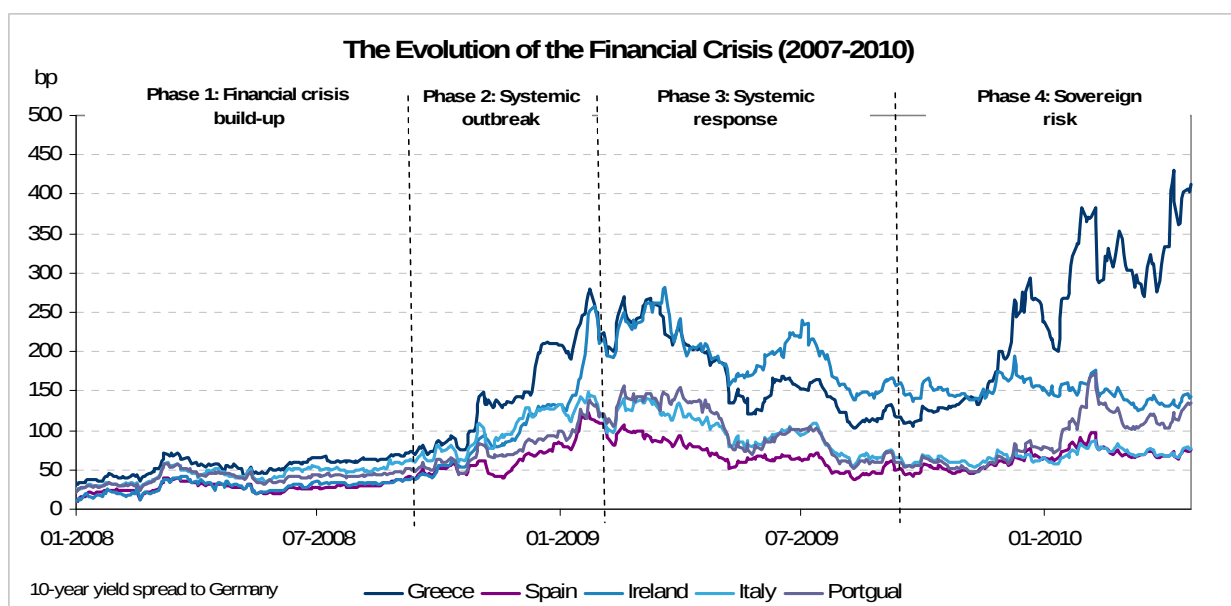
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<sup>155</sup> See Keynes (1936), p. 37f.

<sup>156</sup> See Hicks (1962), p. 789ff.

<sup>157</sup> Hicks (1962), p. 794.

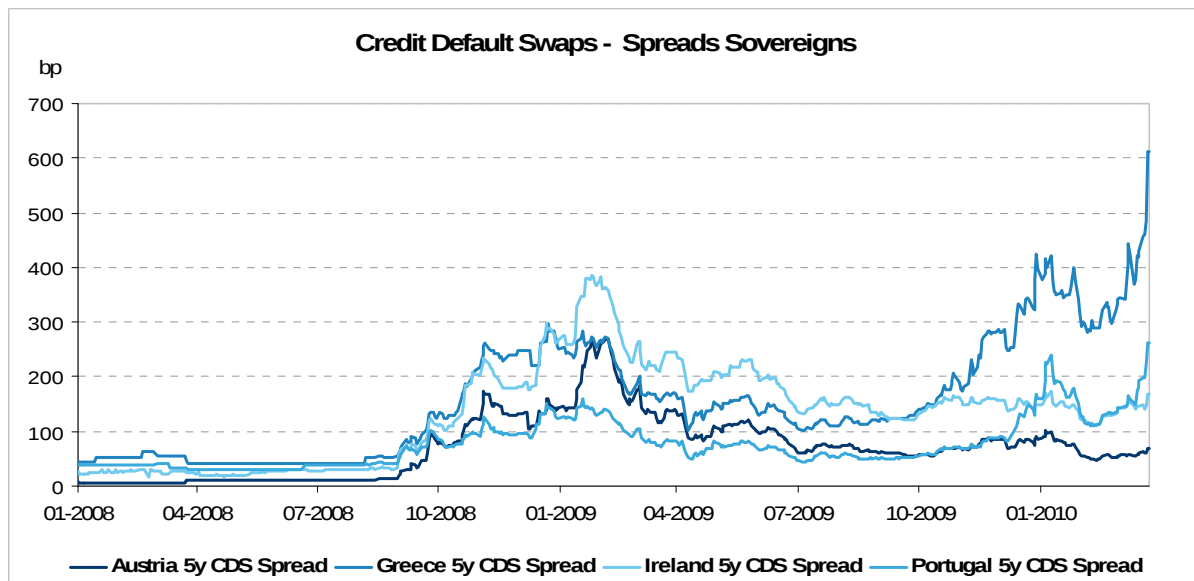
<sup>158</sup> See Hicks (1962), p. 794.



**Figure 12: 10-year sovereign spreads (Greece, Spain, Ireland, Italy, Portugal to Germany as a benchmark) (01-01-2008 to 21-04-2010)**

Source: Bloomberg, IMF, Ithuba Capital Research

In the fourth stage financial markets, on bank balance sheets or sovereign balance sheets, do not support leverage and liquidity will be withdrawn as a part of policy exits. Therefore sovereign credit risk premiums increased substantially in some of the major economies which are most hit by the crisis. By the 21<sup>st</sup> of April the Irish and Portuguese yield spreads were by 142 bp and 134 bp, while Spanish and Italian yield spreads were below 80 bp, but also rose in the first quarter 2010. In the fourth stage the Greek yield spread over German bunds rose by 73% to a new high of 413 basis points from the 1<sup>st</sup> January to 21<sup>st</sup> April 2010, as investors demanded a yield of 7.23% for a 10-year Greek bond, compared with a 3.10% yield on German bunds. Therefore there is a contagion of spreads for PIIGS sovereign spreads, because spreads are increasing due to increasing sovereign default risk of Greece. After April, the Greek spreads increased again. This was mainly due to private investors, who withdrew money from their deposits in the fear of taxes on deposits and the uncertainty of the banking system. The transmission of sovereign risks to the banking system could subvert financial stability as a whole. The effects of the de-leveraging process of banks are most challenging because banks have to write down loan losses. Poorly capitalized banks furthermore have to file for bankruptcy or need support from the government. Further stages are currently uncertain, but it might be possible that sovereign problems spill back to the banking sector.

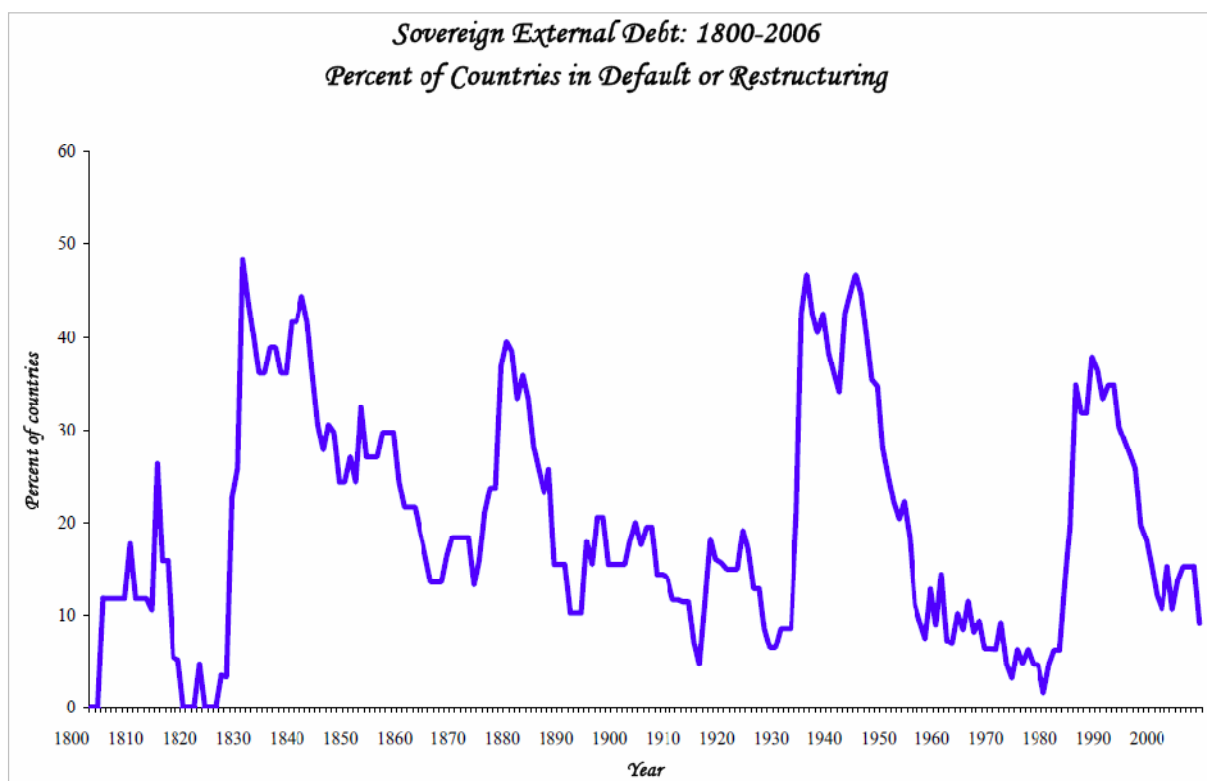


**Figure 13: 5y CDS Spreads Austria, Greece, Ireland, Portugal (01-01-2008 to 23-04-2010)**  
Source: Bloomberg

Figure 13 gives an overview of the development over 5-year CDS spreads of Austria compared to Greece, Ireland and Portugal. The spreads for five-year Greece CDS increased to almost 600 basis points in 2010. This means that the costs of protecting government debt for five years against default in Greece is still rising. The influence of Greece on other countries is illustrated in the chart because also spreads of CDS of Portugal and Ireland widened. By the end of 23th of April 2010 the Austrian spreads were at around 67 basis points which is a dramatic difference to Greece. The Figure also provides the last chart of the evolution of the financial crisis and the contagion of spreads. It is not surprising that rating agencies firstly cut the banks credit rating of the four largest Banks in Greece and secondly downgraded Greek bonds to junk status.

Figure 14 plots the percentage of countries in default or restructuring historically during any given year for the years 1800 to 2006. The dataset obtains more than 90% of global GDP and shows sovereign default on external debt which is government default on its own external debt or private sector debts that were publicly guaranteed. The sovereign default is defined as the failure to meet a principal or interest payment on the due date. The periods also include instances where rescheduled debt is extinguished in terms less favorable than the original obligation. The Figure shows that long periods with a high percentage of all countries were in a state of default or restructuring. There were five peaks or default cycles. The first one

was during the Napoleonic War. The second runs, between 1820 and 1840 when nearly 50% of the countries in the world were in default. The third episode started in the early 1870s. The fourth episode started with the Great Depression of the 1930s in which also nearly half of the countries were in default. The most recent default cycle was between 1980s and 1990s, which was the emerging market debt crisis.<sup>159</sup>



**Figure 14: Sovereign External Debt 1800-2006 (includes 60 countries)**  
Source: Reinhart/Rogoff (2008), p. 4.

### 3.4. Are banks too big to fail?

Analysts of J.P. Morgan (2010) see a problem due to the size of banks even when banks' total assets are relatively high compared to national GDP. They found out that banks in Europe have usually higher percentages of total assets to GDP ratios than banks in the US, Japan and China.<sup>160</sup>

The size of the banks could be measured by the reported total assets, the adjusted assets (estimation of the US GAAP for non US banks), the risk-weighted assets (as

<sup>159</sup> See Reinhart/Rogoff (2008), p. 3f.

<sup>160</sup> See J.P. Morgan (2010), p. 1.

defined by the BIS) or total assets less insured deposits and less Tier 1 capital. The equity research report of J.P. Morgan ranked the 25 largest banks in Europe, the US and APAC (Asia-Pacific) by total assets in 1990. A not surprising point is that large banks operate in multiple jurisdictions, which means for example UBS has 11% assets domiciled in the home country, i.e. Switzerland and 89% of assets domiciled in other countries. This is a clear fact of the interconnectedness of global banks. Especially non-US banks have low proportions of their assets in the home country.<sup>161</sup>

Table 6 and 7 show the 25 largest global banks sorted by total assets in the years 2008 and 1990. The assets are compared with their national (nominal) GDP. The tables attribute the significant increase of the balance sheets in the last two decades. The sum of the assets of the top 25 banks was \$6.8 trn in 1990, and quadruplicated to almost \$43.7 trn in 2008. In 1990 many the leading global banks, in terms of total assets, were located in Asia, whereas in 2008 European Banks are top-ranked. The Asian banks were on top also due to mergers, for example Dai-ichi Kangyo Bank, Fuji Bank and the Industrial Bank of Japan merged to Mizuho Holdings Inc in October 2000.<sup>162</sup> Regarding, European banks, most European countries rely heavily on bank finance in contrast to the US.

In 1990, none of the banks had a balance sheet which was greater than their national GDP. Compared to 2008 six of the 25 banks had greater assets than the 'home' GDP. Noticeable is also that the percentages of assets to national GDP increased sharply over time. One reason of that is the increase in the derivatives market and Leverage, although there is a reporting difference in European and American banks because US banks permit greater netting of exposures relating to derivatives.<sup>163</sup> The globalization and internationalization of banks is again pointed out in the tables.

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<sup>161</sup> See J.P. Morgan (2010), p. 5f.

<sup>162</sup> See Mizuho Holdings (2000), URL: [http://www.mizuho-fg.co.jp/english/company/info/html/20000929release\\_eng.html](http://www.mizuho-fg.co.jp/english/company/info/html/20000929release_eng.html), retrieved January 25<sup>th</sup>, 2010.

<sup>163</sup> See J.P. Morgan (2010), p. 7.

| Rank | Company                               | Country        | Region | Assets (\$bn) | % 'home' GDP |
|------|---------------------------------------|----------------|--------|---------------|--------------|
| 1    | Royal Bank of Scotland Group          | United Kingdom | Europe | 3.500         | 131%         |
| 2    | Deutsche Bank AG                      | Germany        | Europe | 3.073         | 84%          |
| 3    | Barclays PLC                          | United Kingdom | Europe | 2.992         | 112%         |
| 4    | BNP Paribas                           | France         | Europe | 2.896         | 101%         |
| 5    | HSBC Holdings PLC                     | United Kingdom | Europe | 2.527         | 95%          |
| 6    | Credit Agricole                       | France         | Europe | 2.307         | 80%          |
| 7    | J.P. Morgan Chase                     | United States  | US     | 2.175         | 15%          |
| 8    | Citigroup Inc.                        | United States  | US     | 1.938         | 14%          |
| 9    | Mitsubishi UFJ Financial              | Japan          | APAC   | 1.933         | 39%          |
| 10   | UBS AG                                | Switzerland    | Europe | 1.885         | 383%         |
| 11   | Bank of America Corp.                 | United States  | US     | 1.818         | 13%          |
| 12   | Societe Generale Group                | France         | Europe | 1.577         | 55%          |
| 13   | Mizuho Financial Group Inc.           | Japan          | APAC   | 1.546         | 31%          |
| 14   | Banco Santander                       | Spain          | Europe | 1.464         | 91%          |
| 15   | Unicredit Group                       | Italy          | Europe | 1.459         | 63%          |
| 16   | Industrial & Commercial Bank of China | China          | APAC   | 1.430         | 33%          |
| 17   | Wells Fargo & Co                      | United States  | US     | 1.310         | 9%           |
| 18   | Sumitomo Mitsui Financial             | Japan          | APAC   | 1.121         | 23%          |
| 19   | China Construction Bank               | China          | APAC   | 1.107         | 26%          |
| 20   | Credit Suisse Group AG                | Switzerland    | Europe | 1.095         | 222%         |
| 21   | Bank of China                         | China          | APAC   | 1.018         | 24%          |
| 22   | Dexia                                 | Belgium        | Europe | 922           | 182%         |
| 23   | Intesa Sanapaolo                      | Italy          | Europe | 888           | 38%          |
| 24   | Goldman Sachs Group Inc.              | United States  | US     | 885           | 6%           |
| 25   | Commerzbank AG                        | Germany        | Europe | 872           | 24%          |

**Table 6: Global Banks, sorted by Total Assets year 2008**

Source: Bloomberg, IMF

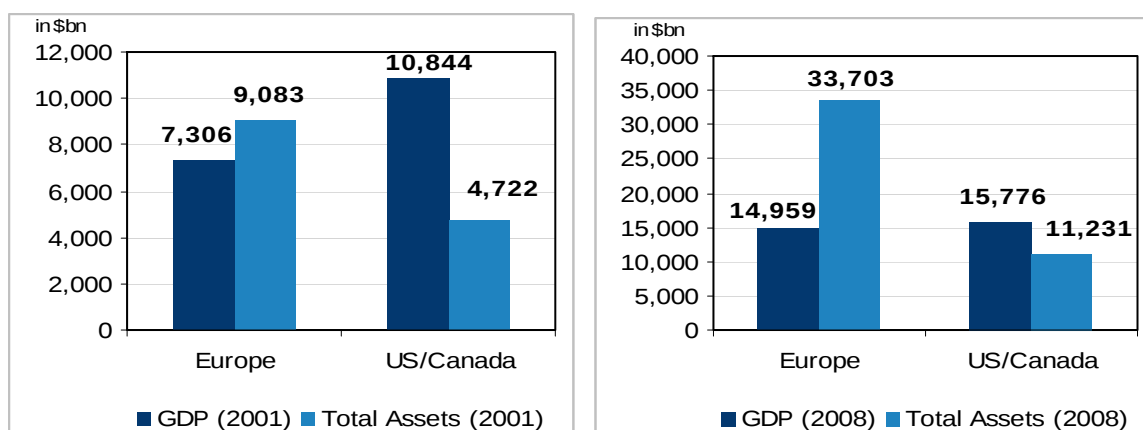
Furthermore total assets are an indicator for potential losses of a banking system. A high percentage of assets to national GDP could enable large losses in the whole banking systems of a country. The tables also show that America has a less concentrated banking system compared to Europe. The ratios of the largest banks are significant lower than in Europe. The largest two banks in the US, J.P. Morgan Chase and Citigroup had a ratio of roughly 15%, while the largest European Banks had ratios above or slightly below 100%.

| Rank | Company                    | Country        | Region | Assets (\$bn) | % 'home' GDP |
|------|----------------------------|----------------|--------|---------------|--------------|
| 1    | Dai-ichi Kangyo Bank       | Japan          | APAC   | 428           | 13%          |
| 2    | Sumitomo Bank              | Japan          | APAC   | 409           | 13%          |
| 3    | Mitsui Taiyo Kobe Bank     | Japan          | APAC   | 409           | 13%          |
| 4    | Sanwa Bank                 | Japan          | APAC   | 403           | 12%          |
| 5    | Fuji Bank                  | Japan          | APAC   | 400           | 12%          |
| 6    | Mitsubishi Bank            | Japan          | APAC   | 392           | 12%          |
| 7    | Credit Agricole            | France         | Europe | 305           | 20%          |
| 8    | BNP Paribas                | France         | Europe | 292           | 20%          |
| 9    | Credit Lyonnais            | France         | Europe | 287           | 6%           |
| 10   | Deutsche Bank AG           | Germany        | Europe | 266           | 19%          |
| 11   | Barclays PLC               | United Kingdom | Europe | 259           | 14%          |
| 12   | Tokai Bank                 | Japan          | APAC   | 250           | 23%          |
| 13   | Norinchukin Bank           | Japan          | APAC   | 250           | 8%           |
| 14   | Mitsubishi Trust & Banking | Japan          | APAC   | 238           | 8%           |
| 15   | NatWest                    | United Kingdom | Europe | 233           | 7%           |
| 16   | Bank of Tokyo              | Japan          | APAC   | 223           | 21%          |
| 17   | Societe Generale Group     | France         | Europe | 220           | 7%           |
| 18   | Sumitomo Trust & Banking   | Japan          | APAC   | 219           | 15%          |
| 19   | Mitsui Trust & Banking     | Japan          | APAC   | 211           | 7%           |
| 20   | Industrial Bank of Japan   | Japan          | APC    | 209           | 6%           |
| 21   | Long-Term Credit Bank      | Japan          | APAC   | 201           | 6%           |
| 22   | Dresdner Bank AG           | Germany        | Europe | 187           | 10%          |
| 23   | UBS AG                     | Switzerland    | Europe | 183           | 71%          |
| 24   | Yasuda Trust & Banking     | Japan          | APAC   | 176           | 5%           |
| 25   | Daiwa Bank                 | Japan          | APAC   | 171           | 5%           |

**Table 7: Global Banks, sorted by Total Assets year 1990**

Source: J.P. Morgan (2010), p. 7.

Figure 15 supports the difference of the banking system in Europe and US. The Figure shows the sum of the total assets of the Top 25 European and US/Canadian banks. While the GDP of the Top 25 European Banks doubled from \$7.3 trn in 2001 to \$15 trn in 2008, the total assets of the balance sheets tripled from \$ 9 trn to \$33.7 trn. In America the situation is different. The GDP was higher than the total assets, despite the fact that the gap between the two figures tightened. In 2001 GDP was around \$10.9 trn with total assets of \$4.7 trn, while the numbers increased to \$15.8 trn and \$11.2 trn. This is an indicator that the balance sheets rose disproportionately to national GDP.



**Figure 15: Total Assets for Top 25 Banks in US/Canada and Europe<sup>164</sup> versus GDP in 2001 and 2008**  
Source: Bloomberg, IMF

Table 8 shows that the situation in Austria is almost the same as in most European countries, a concentration of assets of only some banks. The top 6 Austrian banks, ranked by total assets held in sum €694 bn at the end of 2009. In Austria, the six banks UniCredit Bank Austria, Erste Group, RZB Group, ÖVAG, Hypo Group and Bawag P.S.K. Group were called 'systemic relevant banks'. The biggest two banks UniCredit Bank Austria and Erste Group had roughly a 75% ratio of Total Assets to national GDP.

The cross-border financial assets and liabilities in Austria (including Direct Investment, portfolio investment, loans, deposits, derivatives and reserve assets), i.e. the rate of internationalization, was 582% of GDP at the end of 2008. In 1999 the rate of internationalization was only around 280% of GDP. The highest figures are displayed by debt securities. Austrian's external financial assets were around €767 bn.<sup>165</sup>

| Rank | Company                        | Country | Region | Assets (€bn) | % 'home' GDP |
|------|--------------------------------|---------|--------|--------------|--------------|
| 1    | UniCredit Bank Austria         | Austria | Europe | 204          | 74%          |
| 2    | Erste Group                    | Austria | Europe | 202          | 73%          |
| 3    | RZB Group                      | Austria | Europe | 151          | 55%          |
| 4    | Österreichische Volksbanken AG | Austria | Europe | 54           | 20%          |
| 5    | Hypo Group                     | Austria | Europe | 42           | 15%          |
| 6    | BAWAG P.S.K. Group             | Austria | Europe | 41           | 15%          |

**Table 8: Top 6 Austrian banks, sorted by Total Assets in the year 2009**

Source: Annual Reports Companies, IMF

<sup>164</sup> Europe including UK, Germany, France, Switzerland, Spain, Italy, Belgium, Denmark, Sweden

<sup>165</sup> See Fuchs (2009), p. 6ff.

## 4. Leverage in commercial banks

When the financial system as a whole holds long-term illiquid assets financed by short-term liabilities, any bank could cause stress to another one in the system, even if some banks are resistant against greater stress to the assets due to maturity mismatch.<sup>166</sup> Adrian/Shin (2006) exhibited that many of bank's liabilities are not counted as money and not all items of them qualify as money. Especially the first point is more relevant in a financial system that relies on capital markets more than on the banking system. As stated above, capital markets play a much bigger role in the past. Other items of liabilities such as repurchase agreements or certificates of deposits are under the control of the banks and tend to be most volatile over time. For a bank-dominated financial system, where liabilities of the banking sector can be identified with various components of money, excess liquidity means excessive growth of the money stock. To measure the growth of the Leverage, in a financial system, off-balance sheet items such as OTC derivatives are also important, even more important for a valid size.<sup>167</sup>

In the following chapters 4.1 and 4.2 I present the methodology, the results of the regression analysis and the calculated leverage ratios in comparison to the Basel II regulation standards. Furthermore in the chapter 4.3 I discuss further possibilities of an implementation.

### 4.1. Methodology

The primary sources of the data for the analysis are the reported annual reports and half-year interim reports. To complete these tables, Bloomberg data was also used. The analysis is based on a time series data of individual banks' balance sheets from global player in Europe and America over a five year period on a half-year basis from Q4/2005 to Q4/2009. Furthermore the Top 5 Austrian Banks are used to compare the results with the biggest banks globally.

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<sup>166</sup> See Adrian/Shin (2008b), p. 1.

<sup>167</sup> See Adrian/Shin (2006), p. 15ff.

For European Banks I used Royal Bank of Scotland (GB), Credit Agricole (FR), Barclays PLC (GB), Deutsche Bank (GE) and UBS (SZ) rather than BNP Paribas or HSBC Holdings PLC because data sources are better usable. The American banks used for the analysis are Bank of America (formerly Merrill Lynch), JP Morgan Chase & Co, Citigroup Inc, Wells Fargo & Co and US Bancorp with are the Top 5 US banks according the Total Assets by the end of 2009. The Austrian banks used are the Volksbanks AG (ÖVAG), the Erste Group, the Raiffeisen Zentralbank Österreich AG, the UniCredit subsidiary Bank Austria and the Hypo Group rather than the BAWAG. The reason is, as mentioned above, the Hypo Group had a lot of troubles in the past and this might be a good comparison with other banks. Furthermore the period between 2005 and 2009 covers the situation before the financial crisis, during the crisis and the situation in the current development. Additionally, the change between Basel I and Basel II (2008) is also included, which is relevant for the Bankscope database.

Using the Top 5 banks, regarding the balance sheet, for analysis is also better than using smaller ones, because as also mentioned above, the biggest banks have many total assets and cover more than ten smaller banks and can therefore affect the stability of the banking system as a whole. The global Canadian und Japanese banks are excluded from the sample.

On the Basis of Basel, the following ratios are being calculated for the 15 banks between Q4/2005 and Q4/2009:

- Tier 1 Ratio
- Capital Adequacy Ratio (Total Capital Ratio)
- Core Tier 1 Ratio (which is Tier 1 capital minus Minority interests, hybrid Tier 1 capital such as trust preferred securities), preference shares and other innovative Tier 1 capital)
- Shareholders Equity to Risk-Weighted Assets
- Leverage Ratio 1 (Shareholders Equity to Total Assets)
- Leverage Ratio 2 (Tier 1 Capital to Total Assets)
- Tier 1 Capital (excluding Minority Interests) to Total Capital
- Core Tier 1 Capital to Total Assets

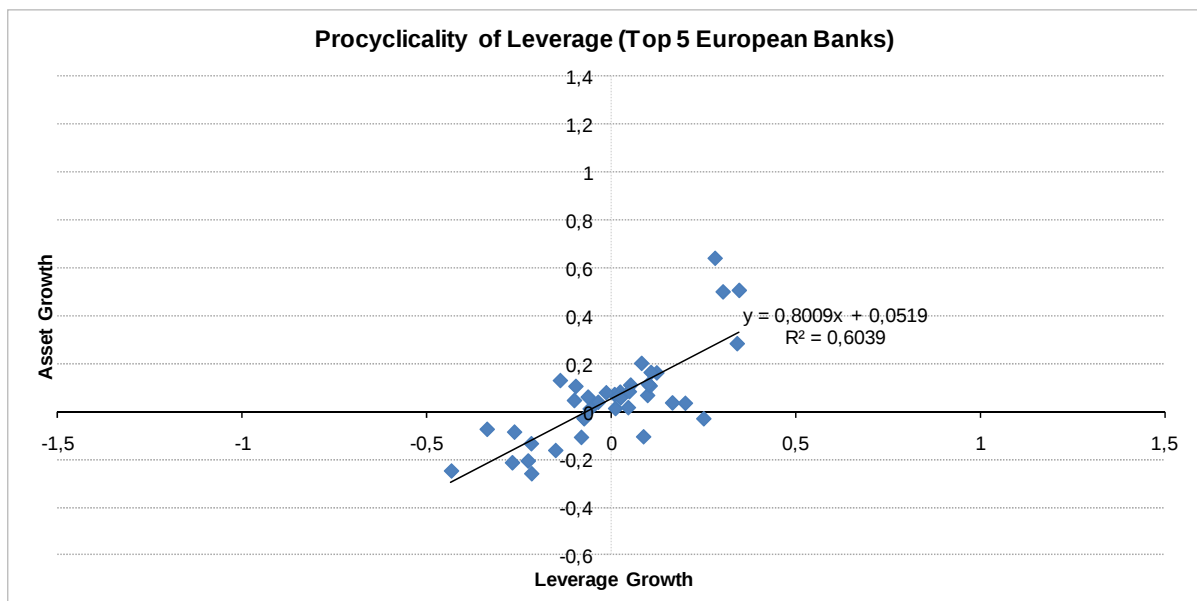
- Leverage Ratio 3 (Total Capital to Total Assets)
- Reported Tier 1 Ratio of US Banks

For the analysis I took the simple mean of the ratios for the banks. For European and US Banks the share prices, the Return on Equity (Profit after Tax divided by Shareholders Equity) and the Return on Capital are also calculated.

Moreover, in order to find out whether the relationship between Leverage and the bank's balance sheet dependency still holds, some bank's return measures are calculated. Therefore the linear regression is used to determine whether there is a significant linear relationship between the independent variable  $x$  (Leverage growth) and the dependent variable  $y$  (Asset growth) at a significance level of 0.01. The null hypothesis states that the slope is equal to zero, while the alternative hypothesis states that the slope is not equal to zero, which means that there is a significant linear relationship between the Leverage growth and the Asset growth.

## 4.2. Results

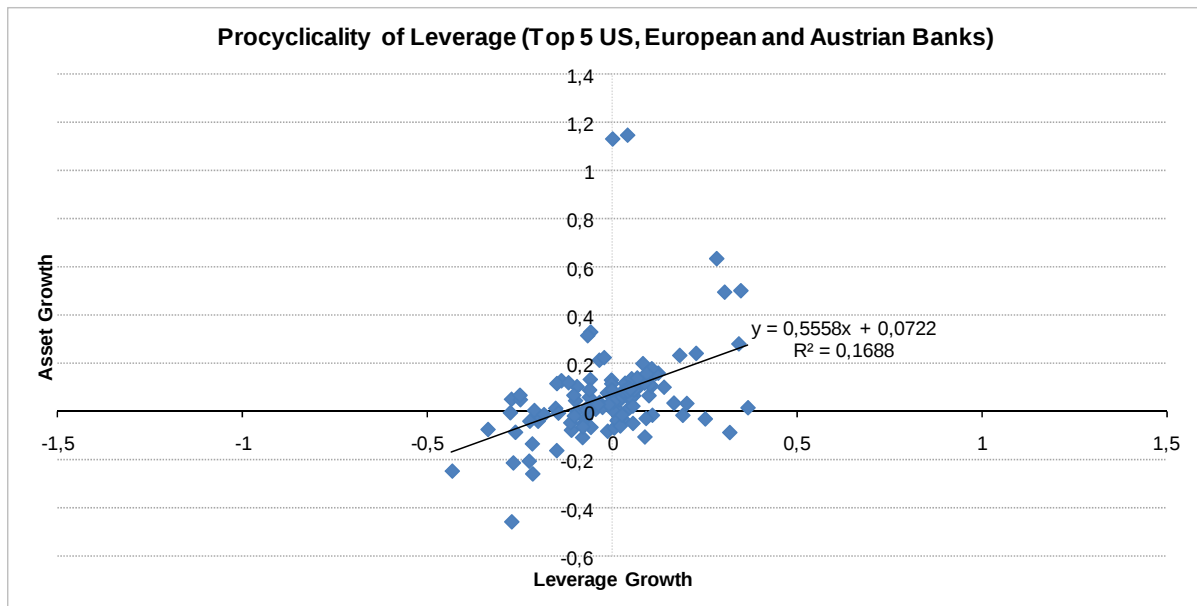
Figure 16 shows a scatter plot. The horizontal axis measures the change in the Leverage growth (Total Asset to Shareholders Equity), while the vertical axis measures the change of the Total Assets on a half-year basis between Q4/2005 and Q4/2009 of the above mentioned five European Banks. The Figure points out the positive relationship between Leverage Growth and Asset growth. The regression statistics is included in the Appendix 11.



**Figure 16: Linear Regression of Asset to Leverage Growth of Top 5 European Banks (Q4/2005-Q4/2009)**

Source: Annual Reports, Bloomberg, Own calculations

Testing the time series for the European Banks between Q4/2005 to Q4/2009 on a half-year basis, the p-value for the intercept is 0.0115 and therefore more than the significance level of 0.01, which means that the null hypothesis is not rejected. Therefore there is a significant relationship for European Banks between the Leverage growth and the Asset growth with a coefficient of determination ( $R^2$ ) of 0.60. This means that  $R^2$  is near 1 and therefore 60% of the total variance in Y is explained by the linear regression model which is quite good.



**Figure 17: Linear Regression of Leverage to Asset Growth of all Top 5 Banks (Q4/2005-Q4/2009)**  
Source: Annual and Interim Reports, Bloomberg, Own calculations

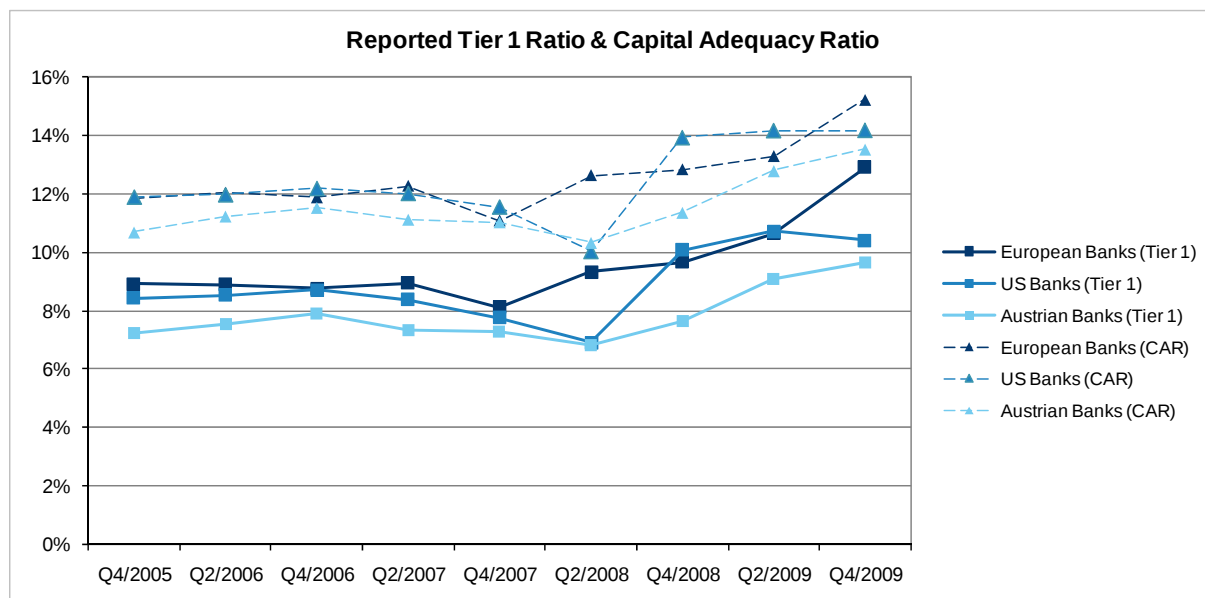
In Figure 17, again the scatter plot shows the relationship of Asset growth to Leverage growth. This scatter plot shows again a positive relation, which means Leverage grew, when Total Assets rose.

For the regression test of all 15 banks between Q4/2005 and Q4/2009, p-value is less than 0.01, which means that the null hypothesis is rejected and there is no significant relationship including the data of all banks. The coefficient of determination is 0.17.

All in all, this means that the top European banks are targeting Leverage and will adjust their balance sheets to hit the ratio, while the evidence including all banks is mixed across countries.

Figure 18 shows the comparison of the mean of the Tier 1 ratios and the Total Tier Ratios (Capital Adequacy Ratios) for European, US and Austrian Banks between Q4/2005 and Q4/2009. The calculated ratios are attached in Appendix 16. The chart illustrates that the two measures simultaneously change up and down. After introduction and the use of Basel II regulation in Q1/2008, the ratios rose in all cases on average, in spite of the financial crisis and liquidity shortages of global banks. Furthermore the Tier 1 ratios and the Total Tier ratios of all banks were significant

over the minimum, defined by the BIS, of 4% and 8%. The difference to the BIS definitions was around 2%, although UBS had the highest average ratios of 12.13% and 15.43%.



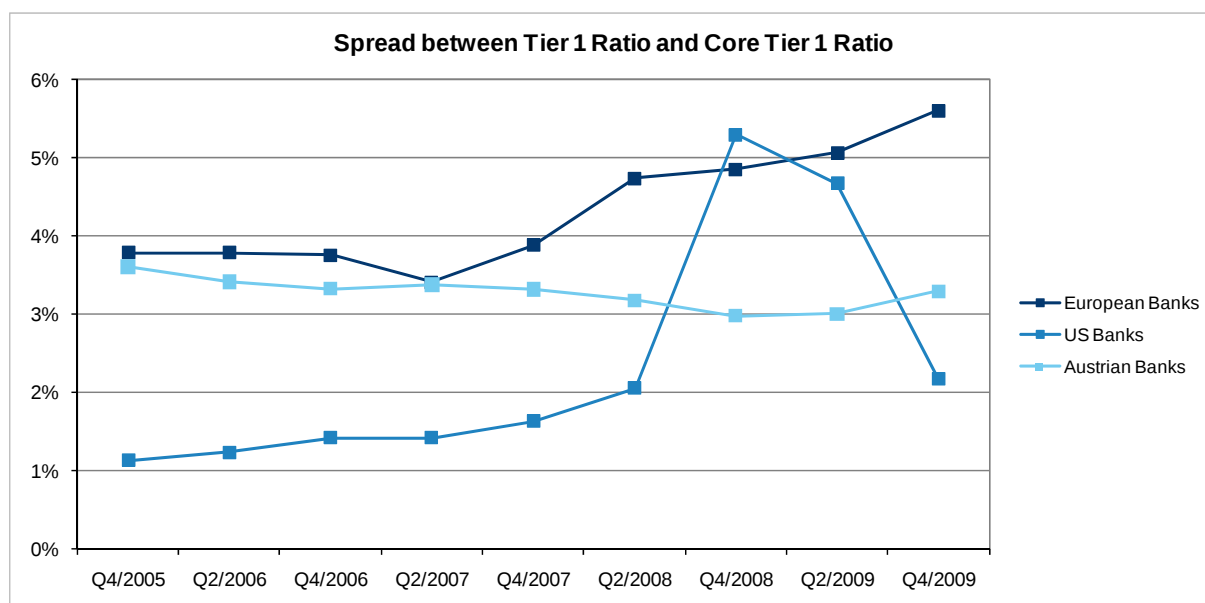
**Figure 18: Reported Tier 1 Ratio & Capital Adequacy Ratio (Q4/2005-Q4/2009)**  
Source: Own calculations

In order to compare the core Tier 1 capital to the Tier 1 capital I calculated the difference. The core Tier 1 capital is made up of the regulatory Tier 1 capital net of Minority interests, hybrid Tier 1 capital such as trust preferred securities, preference shares and other innovative Tier 1 capital. The reason is that some changes could be implemented by the Basel III application. Figure 19 shows the spreads between the two ratios in percentage points. The results show that such hybrid Tier 1 capital is more important for the European and Austrian banks than the US banks. Furthermore European banks significantly increased their hybrid capital after the implementation of Basel II. After deduction of the mentioned hybrid capital and minority interests the mean of the Tier 1 ratios for European and Austrian banks only ranged between 4% and 6% between Q4/2005 and Q2/2009, which is slightly over the defined BIS minimum. Therefore hybrid capital and Minorities are an important part of the Tier 1 capital in Europe and especially in Austria.

In detail, Minority interests are roughly 40% of Tier 1 capital for the top 5 European Banks and 16% of the Tier 1 capital for the Austrian Banks in Q4/2009. The

interesting point is also that the importance for Minorities for European Banks increased from 17% to the mentioned figure of 38% in Q4/2005 while Austrian Banks showed the reverse development. For the US Banks Minority interests stood constant on a 5% level of overall Tier 1 capital of the analysed banks. The analysis is shown in Figure 20. The fraction of the Minority interests changes over the time on a constant basis calculating the leverage ratio 1 (Shareholders Equity to Total Assets). This indicates that Minority interests, in some cases reduce the Tier 1 capital but do not influence the leverage ratio 1, although there is a significant difference of Shareholders Equity excluding Minorities, especially for Austrian Banks.

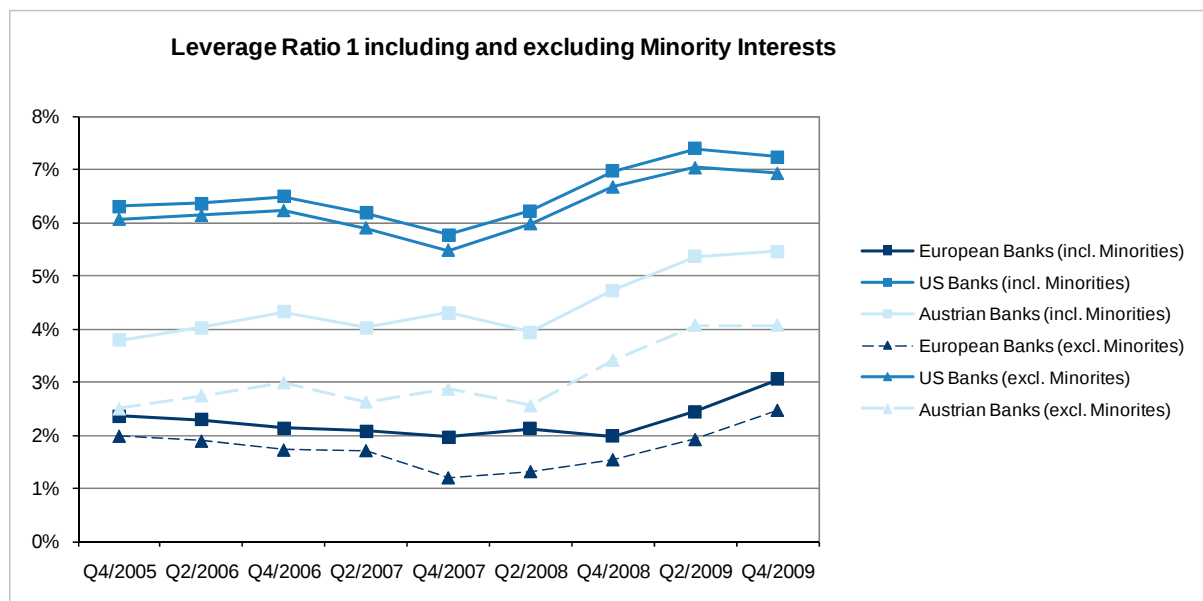
Preference shares are not relevant for Austrian banks, but are still essential for European banks with a portion of 17% of total Tier 1 capital in Q4/2009. For the US banks, the importance of including preference shares in the total Tier 1 capital increased over time from 1% in Q4/2005 to 7% in Q4/2009 as a fraction of Tier 1 capital.



**Figure 19: Spread between Tier 1 Ratio and Core Tier 1 Ratio (Q4/2005-Q4/2009)**  
Source: Own calculations

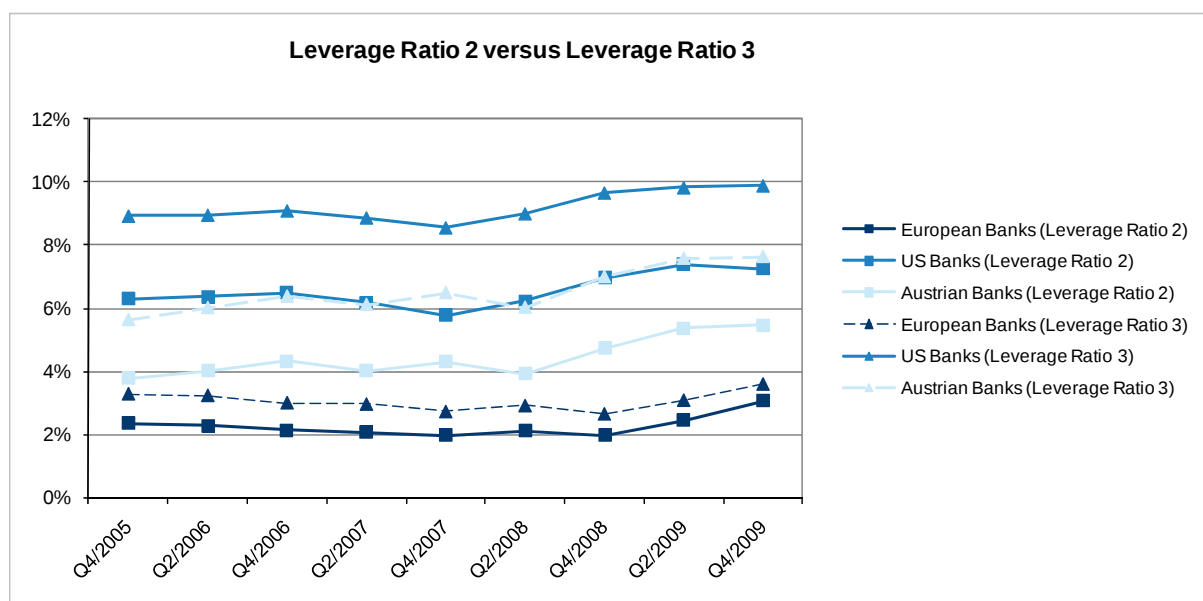
For comparison reasons, I calculated the relevance of goodwill in the Tier 1 capital, which is actually included in the Tier 1 calculations under Basel II. The calculations are documented in USD with the relevant exchange rates in Appendix 15. In detail, 30% of the Tier 1 capital is attributable to goodwill and other intangibles for the

European Banks in Q4/2009. Goodwill in the United States is most relevant with a fraction of 47% of total Tier 1 capital. In Austria goodwill and other intangibles did not play an important role in the past.



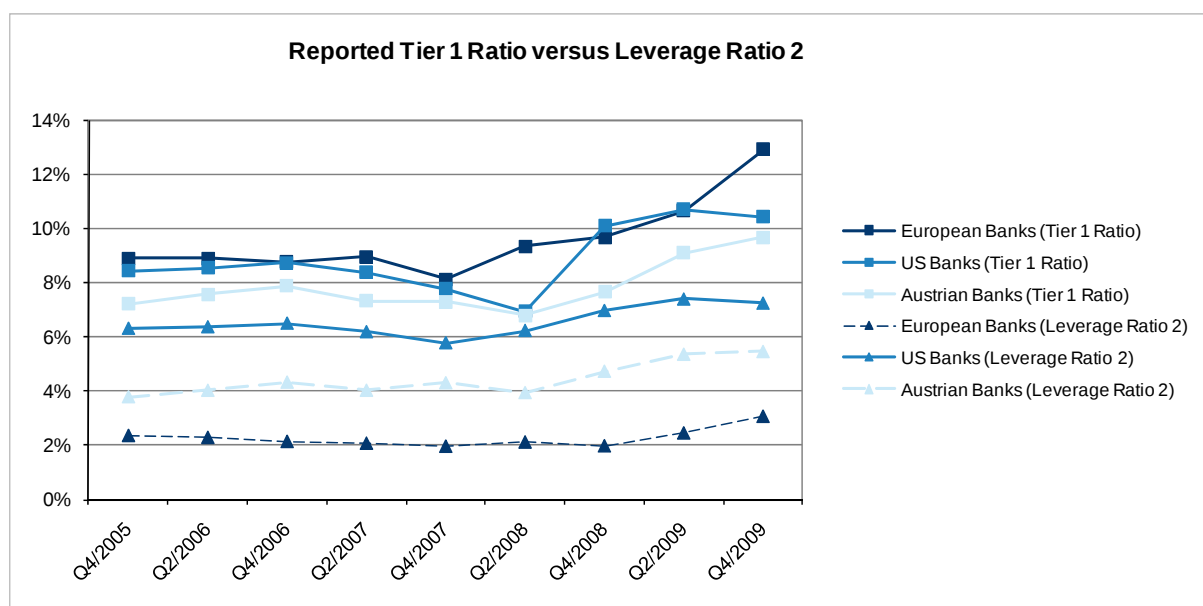
**Figure 20: Leverage Ratio 1 including and excluding Minority Interests (Q4/2005-Q4/2009)**  
Source: Own calculations

Figure 21 illustrates the comparison the calculated Leverage Ratio 2 to the Leverage Ratio 3. The results could be compared to the CAR and Tier 1 ratio. Again the results show that the two measures correspond to each other and change simultaneously.



**Figure 21: Leverage Ratio 2 versus Leverage Ratio 3 (Q4/2005-Q4/2009)**  
Source: Own calculations

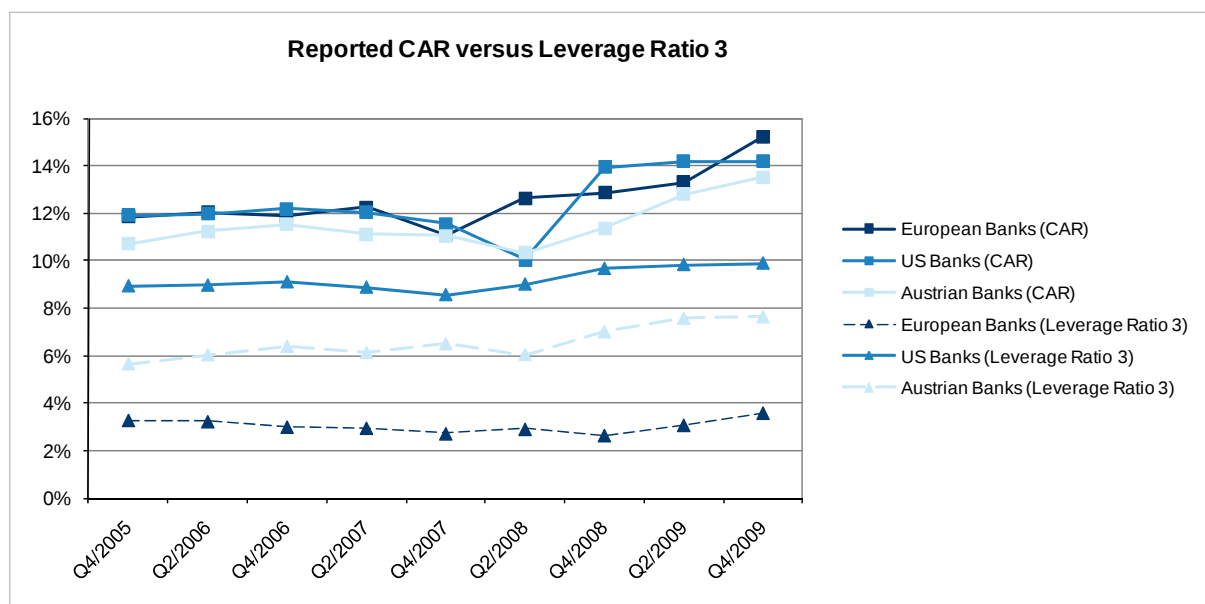
The compare the calculated Leverage Ratio 2 (Tier 1 capital to total assets) with the reported Tier 1 Ratio (Tier 1 capital to risk-weighted assets) the calculations show complete different findings for the European, US and Austrian Banks. The difference between the reported Tier 1 ratio and the Leverage Ratio 2 is the highest for European banks by roughly more than 6%, while the difference of Austrian Banks is slightly more than 2% and for US Banks around 2%. This is again an interesting point because the difference between the total assets and the risk-weighted Assets of the analysed European Banks were significantly higher than for US banks. The graph also shows that the calculated leverage ratios were less volatile than the reported Tier 1 ratios and increased less over time. As Appendix 15 states, the risk-weighted Assets for European Banks are around 25% of total assets, while the number was 66% for US Banks and 55% for Austrian Banks in Q4/2009. Compared to Q4/2005 these fractions did not change moderately.



**Figure 22: Reported Tier 1 Ratio versus Leverage Ratio 2 (Q4/2005-Q4/2009)**  
Source: Own calculations

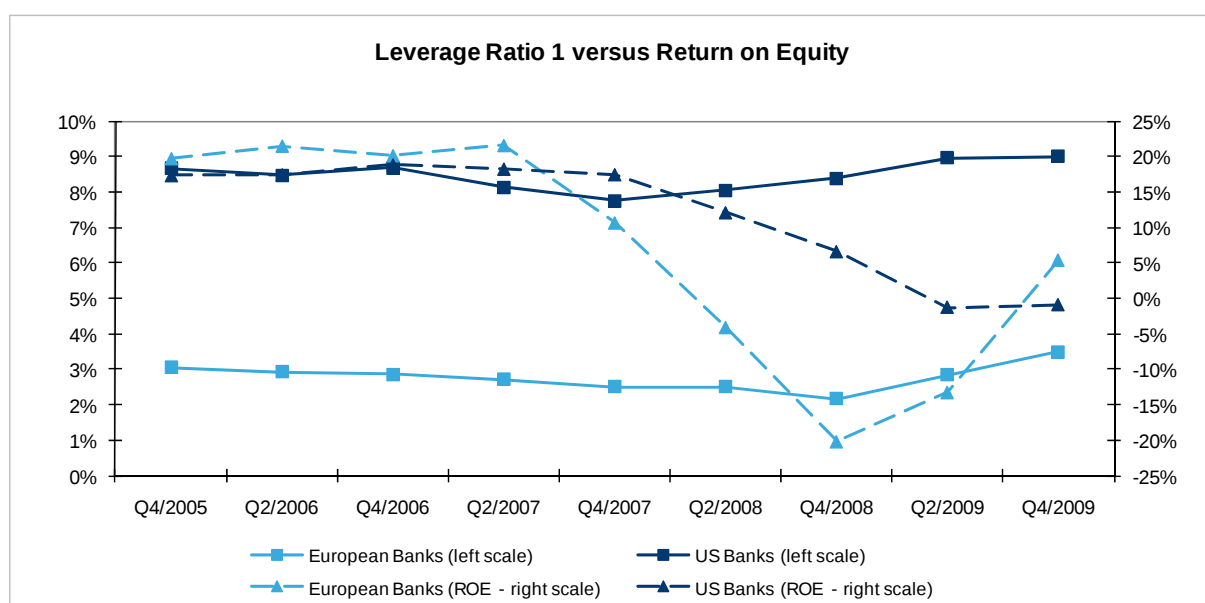
The above figures show a comparison of the Total Capital ratios. Figure 23 states the difference between the reported CAR (Total Capital to risk-weighted assets) and the Leverage Ratio 3 (Total Capital to Total Assets). The results indicate that the difference of the two ratios rose on average by roughly 3% and show the relevance

of the calculation method. Especially European Banks are, according to the US view, of a Leverage ratio undercapitalized with a mean Leverage Ratio under 4%.



**Figure 23: Reported CAR versus Leverage Ratio 3 (Q4/2005-Q4/2009)**  
Source: Own calculations

Figure 24 shows the considerable difference of the return situation of the global banks to the calculated ratio of Shareholders Equity to Total Assets. While the leverage ratio 1 (left scale) stood relatively constant for US and European Banks, the return on equity dramatically declined during the financial crisis.



**Figure 24: Leverage Ratio 1 versus Return on Equity (Q4/2005-Q4/2009)**  
Source: Own calculations

The overall results exhibit that the leverage ratio is not a good indicator for the profit and the liquidity of a commercial bank. The results show that hybrid and innovative capital, goodwill and other intangibles play an important role in the banking system. Furthermore, the reported Tier 1 and Total Capital ratios as well as the leverage ratios increased during the financial crisis. On the one hand, this could be a result of Basel II regulation, but on the other hand could also be due to capital injections during the crisis. The return measures such as return on equity and return on capital decreased after Q4/2007, while the capital ratios increased. The current approach that higher riskiness of bank's assets requires more capital does have some drawbacks.

### 4.3. Further discussions of a new Leverage ratio

Hildebrand (2008) pointed out that the leverage ratio should be implemented as a independent measure of capital adequacy and banks should meet a minimum requirement for both measures.<sup>168</sup>

The problem of this approach is that the independence, as documented above, is not as much as it should be for a second backstop measure of a Basel III regulation. The second problem of setting minimum requirements for a leverage ratio is that the differences among the global banks are much higher than for the current ratios. Such a minimum level of a leverage ratio could be changed by the national supervisor, but the differences of the European Banks to the US Banks are enormous.

Furthermore Hildebrand argued that two capital ratios are much more difficult to arbitrage.<sup>169</sup> When both measures are pro-cyclical and change in the same direction over time, i.e. are highly correlated, this is not true.

Hildebrand added that leverage ratios help the banking system in greater stress scenarios due to a smaller buffer to absorb negative stress tests in a financial

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<sup>168</sup> See Hildebrand (2008), p. 8.

<sup>169</sup> See Hildebrand (2008), p. 10.

crisis.<sup>170</sup> This is consistent with my analysis as shown above. The difference between the leverage ratios and the reported ratios is large and some banks are significant under the minimum buffer levels. The minimum Canadian Leverage Ratio (Total Capital to Total Assets) must be at least 5%. In my analysis the average of the Leverage Ratio for four out of five European Banks was below 5%, while all US Banks are above this level.

In the Turner Review (2009), named after the chairman of the Financial Services Authority Adair Turner, the arguments for using a leverage ratio are mainly based on experiences of the financial crisis. In a systemic crisis, when low-risk assets of all banks become high-risky and illiquid in short-term, a back-stop control measure related to the gross scale of the balance sheet position could be used. This would be a constraint on excessive balance sheet growth. The second argument used is to implement a leverage ratio beside the risk-based system on internal models. Local Supervisory Authorities have to judge the internal models used by banks and have to balance pros and cons of the usage, but a backstop measure is simply the same in all banks.<sup>171</sup>

As described above, a leverage ratio could reduce regulatory arbitrage by using structured products to upgrade the credit rating and lower capital requirements. The problem might be that such a ratio could also be mitigated in other ways, for example shorten the balance sheet assets through selling off.

Some negative aspects are also discussed by Hildebrand:<sup>172</sup>

- There are incentives to increase off-balance-sheet exposures and raise the bank's risk.
- As mentioned above, a leverage ratio could strengthen a financial cycle. In a downturn cycle, banks could cut down the lending to meet the requirements for a leverage ratio. This problem could become even greater if all financial institutions cut down the lending and the financial market is highly dependent on the banking system.

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<sup>170</sup> See Hildebrand (2008), p. 10.

<sup>171</sup> See Financial Services Authority (2009), p. 67.

<sup>172</sup> See Hildebrand (2008), p. 10f.

- The third disadvantage is associated with the banks' profitability. Due to higher capital requirements, the costs for bearing a larger share of their potential losses are higher and could be transferred to the customers in a way. Furthermore higher capital holdings reduce their tax shield and diminish a bank's market value because the advantage of debt over equity could be less useful.

Moreover a leverage ratio does not distinguish between the riskiness of the bank's assets and reduce the incentives of growth through decrease of lending activities. Other problems are associated with the definition of the calculation and accounting adjustments.

## 5. Conclusio

The results of the analysis between Q4/2005 and Q4/2009 show that among the Top European, US and Austrian Banks the reported Tier 1 ratios were relatively stable and above 6% but increased after Basel II implementation and after the crisis. The reason for this could be, on the one hand, the more stringent capital requirements of Basel II and, on the other hand, capital injections of the national government, by issuing new shares during the crisis or by selling assets and reducing the total assets and consequently risk-weighted assets. Furthermore the reported Total Capital ratios changed, in comparison to the Tier 1 ratios on a parallel level, which was on average 2% higher than the Tier 1 ratios. The findings indicated that Total Capital ratios (Capital Adequacy Ratios) rose during the financial crisis, which is consistent with the analysis of Goodhart (2005). Goodhart (2005) found out that the CAR for the Internal Rating Based Approach is higher during a recession.

The globalization of banks made it necessary to implement global homogeneous regulatory standards. Especially in the last few years, the banks' balance sheets skyrocketed and the total assets exceeded the national GDP of most of global banks. Austria is an example for a 'bank-driven' economy, in which only six banks play a central role. Compared to the Switzerland, which has two systemic banks, this is quite a high number. The first consideration is that a leverage ratio is easy to implement on an international basis because the risk-weights disappear. This could reduce incentives for excess leverage if negative aspects are neglected. The second consideration is a more difficult one. Many limitations and regulatory questions are related to the introduction of a new leverage ratio. Some of the problems are the effectiveness of that ratio on a cross-border basis and regulatory arbitrage. The other problems are linked to the calculation method. There are some open questions regarding off-balance sheet exposures in the trading book and the definition of the capital. For the calibration of the leverage ratio it is important to constrain banks during the economic cycle. Some of the ideas are mentioned above. For calculation it is important to implement derivatives netting and off-balance-sheet exposures in a way. Emphasis of the analysis should be given to the interest rate and currency

swaps, which are, according to ISDA Market Survey, the most important derivatives outstanding.

Especially the definition of capital is tricky and hard to implement consistently. The best example of how important the definition is for calculation, is given by Shin (2008). Shin took Northern Rock as an example and computed the leverage ratio based on common equity, total equity and shareholders' equity. He showed that the common equity plus preferred shares is the best way to calculate the leverage ratio. In my analysis I took the common equity plus reserves as Core Tier 1 capital. The differences between the Core Tier 1 capital (excluding Minority Interests, Goodwill, hybrid Tier 1 capital, preference shares and innovative Tier 1 capital) and the reported Tier 1 capital varied considerably for the analyzed banks among the countries and among the time series. The spreads fluctuated between 1% and 6% and were highly volatile. For European Banks, Minorities and preference shares play an important role whereas for US Banks the most important indicator for Tier 1 capital is goodwill and other intangibles. Comparing to the top Austrian Banks, Minority interests play a major role for the calculations of Tier 1 capital.

The differences between the ratios Shareholders Equity to Total assets (Leverage Ratio 1) and Tier 1 capital to Total assets (Leverage Ratio 2) were also various among the countries. While the gap for US Banks was roughly 2% on average between Q4/2005 and Q4/2009, for European Banks the difference was less than 1%. Austrian Banks were in between of these analyzed banks. This means that the differences between Shareholders Equity and Tier 1 capital were the highest in the US.

The findings were almost the same for the differences between the Tier 1 to Total assets ratio (Leverage Ratio 2) and Total Capital to Total assets ratio (Leverage Ratio 3). The gap between the two ratios was around 2% for US and Austrian Banks, whereas the differences for European Banks displayed a maximum of 1%. This indicates that the Tier 2 capital plays a higher role for the US banks than for the European Banks, except for Austrian Banks. The Tier 2 capital, relatively to Total assets, was higher in the US among the time series, which might emphasize the importance of the Tier 2 capital.

The analysis of a comparison between the Leverage Ratios 2 and 3 to the risk-weighted back-stops reported Tier 1 ratio and Total Capital ratio indicated an opposing image. The gap between the reported ratios to the leverage ratios was significantly higher for the European Banks than for Austrian and US Banks. The differences were on average at around 8-9% in Europe and only around 3-4% in the US and Austria. This indicates that, on the basis of a leverage ratio, European Banks are quite undercapitalized (the capital is too low relatively to Assets) and the calculated leverage ratios are below 4% on average. The reason for that is mainly due to lower risk-weighted assets, relatively to Total assets, in European Banks in comparison to US and Austrian Banks. This is consistent with the results of the regression analysis. I analyzed the asset growth relative to leverage growth and found out that there is a significant relationship in European Banks. This means that, in case of European Banks, an increase of the balance sheet indicates a rise in Leverage. Another indication is that European Banks are targeting leverage. Therefore for European Banks such a leverage back-stop might be a better indicator than for US banks because the analyzed banks display low risk-weighted assets, but report increasing Capital ratios, despite of the financial crisis. Another interesting point is that the leverage ratios vary less volatile than the reported capital ratios and have not significantly increased after Basel II implementation, which is not surprising in the manner that the focus of Basel II has been on the risk-weights of the assets. Furthermore this is an indication that the total capital of the banks does not change quickly, relatively to total assets but changes more considerable relatively to risk-weighted assets. This is a plausible argument for the usage of a leverage ratio.

Generally, for most of the banks, the Total assets rose from Q4/2007 but decreased at the end of 2008 due to the financial crisis.

A comparison between the return on equity and return on capital relatively to Leverage Ratio 1 and 3 showed that the leverage ratios are no valid indicators of the return on the ownership interest of a stock. Although the ratios changed relatively little during the period, the return measures for US and European Banks fell dramatically. Further analysis is needed what was the reason for the changes. It

could also be due to 'expensive' leverage. The negative return figures indicated a net loss.

Further work needs to be done on liquidity, especially regarding the interbank funding market. Short-term liquidity is very important and structured short-term vehicles, which are globally linked to each other, could force the market as a whole into troubles. As mentioned the spreads of overnight Asset-Backed Commercial Papers rose dramatically during the financial crisis and furthermore the spreads for credit default swaps of government bonds. Especially the situation for government bonds changed quickly in a negative way so that some countries might not be able to repay their coupons, which used to be regarded as the safest investment in business sciences.

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# Appendix

## Appendix 1: Basel II Development in Detail

| Month      | Year        | Item                                                                                                                                                                                                                                                                                          |
|------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| December   | 1987        | Consultative Document<br>(Proposals for International Convergence of capital measurement and standards)                                                                                                                                                                                       |
| July       | 1988        | <b>Basel I – Basel Capital Accord</b>                                                                                                                                                                                                                                                         |
| November   | 1991        | <b>Amendment of the Basel capital accord</b><br>(Inclusion of general provisions/general loan-loss reserves in capital)                                                                                                                                                                       |
| <b>End</b> | <b>1992</b> | <b>Entry into force of Basel I</b>                                                                                                                                                                                                                                                            |
| April      | 1993        | Supervisory Treatment of Market Risks                                                                                                                                                                                                                                                         |
| July       | 1994        | <b>Amendment to the Basel Capital Accord of July 1988</b><br>(Redefinition for the risk-weighting applicable to banks' claims)                                                                                                                                                                |
| December   | 1994        | <b>Amendment to the Basel Capital Accord of July 1988</b><br>(Recognition of Collateral)                                                                                                                                                                                                      |
| April      | 1998        | <b>Amendment to the Basel Capital Accord of July 1988</b><br>(Reduction of risk-weight for claims on regulated securities firms)                                                                                                                                                              |
| April      | 1999a       | BCBS Working Paper No 1<br>(Capital Requirements and Bank Behaviour: The Impact of the Basel Accord)                                                                                                                                                                                          |
| June       | 1999b       | BCBS Working Paper No 2<br>(Supervisory Lessons to be drawn from the Asian Crisis)                                                                                                                                                                                                            |
| June       | 1999b       | First consultative paper on revising the Capital Accord (Basel II)                                                                                                                                                                                                                            |
| January    | 2001        | Second consultative paper on revising the Capital Accord (Basel II)                                                                                                                                                                                                                           |
| April      | 2003        | Third consultative paper on revising the Capital Accord (Basel II)                                                                                                                                                                                                                            |
| August     | 2003        | BCBS Working Paper No 12<br>(Markets for Bank Subordinated Debt and Equity in Member Countries)                                                                                                                                                                                               |
| April      | 2004        | BCBS Working Paper No 13<br>(Bank Failures in Mature Economies)                                                                                                                                                                                                                               |
| November   | 2005        | <b>Amendment to the Basel Capital Accord of July 1988</b><br>(Incorporation of market risk) (as of January 1996 and September 1997)                                                                                                                                                           |
| June       | 2006        | <b>Basel II – International Convergence of Capital Measurement and Capital Standards: A Revised Framework – Comprehensive Version</b><br>(incl. Basel I Accord of July 1988, Amendment of November 2005 and Application of Basel II Trading Activities & Double Default Effect of April 2005) |
| <b>End</b> | <b>2006</b> | <b>Entry into force of Basel II</b>                                                                                                                                                                                                                                                           |

Source: The Basel Committee on Banking Supervision

## Appendix 2: Austrian Banking Sector

|                      | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001  |
|----------------------|------|------|------|------|------|------|-------|
| Number of banks      | 5727 | 5713 | 5686 | 5547 | 5527 | 5479 | 5453  |
| Total Assets in € bn | 391  | 412  | 434  | 479  | 523  | 562  | 583   |
|                      | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008  |
| Number of banks      | 5368 | 5297 | 5242 | 5197 | 5150 | 5156 | 5118  |
| Total Assets in € bn | 572  | 603  | 649  | 718  | 787  | 886  | 1.047 |

## Appendix 3: US Commercial Banks in History

| US Commercial Banks |            |                      |      |        |           |
|---------------------|------------|----------------------|------|--------|-----------|
|                     | # of banks | Total Assets in \$bn |      |        |           |
| 1896                | 11.474     | 6.167                |      |        |           |
| 1897                | 11.438     | 6.475                |      |        |           |
| 1898                | 11.530     | 7.170                |      |        |           |
| 1899                | 11.835     | 8.489                |      |        |           |
| 1900                | 12.427     | 9.059                |      |        |           |
| 1901                | 13.424     | 10.572               |      |        |           |
| 1902                | 14.488     | 11.427               |      |        |           |
| 1903                | 15.814     | 12.190               |      |        |           |
| 1904                | 17.037     | 13.035               |      |        |           |
| 1905                | 18.152     | 14.542               |      |        |           |
| 1906                | 19.786     | 15.601               |      |        |           |
| 1907                | 21.361     | 16.862               |      |        |           |
| 1908                | 22.531     | 16.664               |      |        |           |
| 1909                | 23.098     | 18.145               |      |        |           |
| 1910                | 24.514     | 19.324               |      |        |           |
| 1911                | 25.183     | 20.320               |      |        |           |
| 1912                | 25.844     | 21.495               |      |        |           |
| 1913                | 26.664     | 22.056               |      |        |           |
| 1914                | 25.510     | 23.155               |      |        |           |
| 1915                | 25.875     | 24.106               |      |        |           |
| 1916                | 26.217     | 28.217               |      |        |           |
| 1917                | 26.831     | 32.802               |      |        |           |
| 1918                | 27.457     | 36.352               |      |        |           |
| 1919                | 27.859     | 42.462               |      |        |           |
| 1920                | 29.087     | 47.509               |      |        |           |
| 1921                | 29.788     | 43.669               |      |        |           |
| 1922                | 29.458     | 44.106               |      |        |           |
| 1923                | 28.877     | 47.332               |      |        |           |
| 1924                | 28.185     | 50.136               |      |        |           |
| 1925                | 27.638     | 54.401               |      |        |           |
| 1926                | 26.751     | 56.781               |      |        |           |
| 1927                | 25.800     | 58.973               |      |        |           |
| 1928                | 24.968     | 61.563               |      |        |           |
| 1929                | 24.026     | 62.442               |      |        |           |
| 1930                | 22.172     | 64.125               | 1983 | 14.469 | 2.342.101 |
| 1931                | 19.375     | 59.017               | 1984 | 14.496 | 2.508.871 |
| 1932                | 17.802     | 46.304               | 1985 | 14.417 | 2.730.672 |
| 1933                | 14.440     | 40.511               | 1986 | 14.210 | 2.940.699 |
| 1934                | 14.146     | 46.448               | 1987 | 13.723 | 2.999.949 |
| 1935                | 14.125     | 50.926               | 1988 | 13.137 | 3.130.796 |

|      |        |           |      |        |            |
|------|--------|-----------|------|--------|------------|
| 1936 | 13.973 | 56.210    | 1989 | 12.715 | 3.299.362  |
| 1937 | 13.797 | 54.212    | 1990 | 12.347 | 3.389.490  |
| 1938 | 13.661 | 56.800    | 1991 | 11.927 | 3.430.682  |
| 1939 | 13.538 | 63.147    | 1992 | 11.467 | 3.506.171  |
| 1940 | 13.442 | 70.720    | 1993 | 10.961 | 3.707.088  |
| 1941 | 13.431 | 76.827    | 1994 | 10.453 | 4.012.107  |
| 1942 | 13.347 | 95.459    | 1995 | 9.943  | 4.315.175  |
| 1943 | 13.274 | 112.246   | 1996 | 9.530  | 4.582.165  |
| 1944 | 13.268 | 134.613   | 1997 | 9.144  | 5.018.532  |
| 1945 | 13.302 | 157.582   | 1998 | 8.777  | 5.442.604  |
| 1946 | 13.359 | 147.365   | 1999 | 8.582  | 5.735.135  |
| 1947 | 13.403 | 152.773   | 2000 | 8.315  | 6.245.560  |
| 1948 | 13.419 | 152.163   | 2001 | 8.082  | 6.552.294  |
| 1949 | 13.436 | 155.319   | 2002 | 7.888  | 7.076.912  |
| 1950 | 13.446 | 166.792   | 2003 | 7.770  | 7.601.545  |
| 1951 | 13.455 | 177.449   | 2004 | 7.631  | 8.415.615  |
| 1952 | 13.439 | 186.682   | 2005 | 7.526  | 9.040.294  |
| 1953 | 13.432 | 191.062   | 2006 | 7.401  | 10.091.541 |
| 1954 | 13.323 | 200.589   | 2007 | 7.283  | 11.176.051 |
| 1955 | 13.237 | 209.145   | 2008 | 7.086  | 12.308.857 |
| 1956 | 13.218 | 216.146   | 2009 | 6.839  | 11.846.114 |
| 1957 | 13.165 | 221.534   |      |        |            |
| 1958 | 13.124 | 237.474   |      |        |            |
| 1959 | 13.114 | 243.422   |      |        |            |
| 1960 | 13.126 | 256.322   |      |        |            |
| 1961 | 13.115 | 277.374   |      |        |            |
| 1962 | 13.124 | 295.983   |      |        |            |
| 1963 | 13.291 | 311.790   |      |        |            |
| 1964 | 13.493 | 345.130   |      |        |            |
| 1965 | 13.544 | 375.394   |      |        |            |
| 1966 | 13.538 | 402.899   |      |        |            |
| 1967 | 13.514 | 450.647   |      |        |            |
| 1968 | 13.487 | 500.160   |      |        |            |
| 1969 | 13.473 | 524.645   |      |        |            |
| 1970 | 13.511 | 570.158   |      |        |            |
| 1971 | 13.612 | 633.573   |      |        |            |
| 1972 | 13.733 | 730.902   |      |        |            |
| 1973 | 13.976 | 824.960   |      |        |            |
| 1974 | 14.230 | 1.037.197 |      |        |            |
| 1975 | 14.384 | 1.086.674 |      |        |            |
| 1976 | 14.410 | 1.182.412 |      |        |            |
| 1977 | 14.411 | 1.339.376 |      |        |            |
| 1978 | 14.391 | 1.507.936 |      |        |            |
| 1979 | 14.364 | 1.691.789 |      |        |            |
| 1980 | 14.434 | 1.855.687 |      |        |            |
| 1981 | 14.414 | 2.028.982 |      |        |            |
| 1982 | 14.451 | 2.193.339 |      |        |            |

#### Appendix 4: US Asset-backed Commercial Paper Outstanding

|                           | <b>Asset-backed Commercial<br/>Paper Outstanding</b> |
|---------------------------|------------------------------------------------------|
| <b>Unit:</b>              | <b>Currency</b>                                      |
| <b>Multiplier:</b>        | <b>1000000</b>                                       |
| <b>Currency:</b>          | <b>USD</b>                                           |
| <b>Unique Identifier:</b> | <b>CP/OUTST/<br/>DTBSPCKA_N.WW</b>                   |
| <b>Time Period</b>        | <b>NSA</b>                                           |
| 2007-01-01                | 1.122.309                                            |
| 2007-01-10                | 1.119.006                                            |
| 2007-01-17                | 1.102.012                                            |
| 2007-01-24                | 1.097.524                                            |
| 2007-01-31                | 1.088.758                                            |
| 2007-02-07                | 1.095.575                                            |
| 2007-02-14                | 1.107.033                                            |
| 2007-02-21                | 1.100.377                                            |
| 2007-02-28                | 1.094.437                                            |
| 2007-03-07                | 1.099.810                                            |
| 2007-03-14                | 1.105.178                                            |
| 2007-03-21                | 1.097.843                                            |
| 2007-03-28                | 1.102.374                                            |
| 2007-04-04                | 1.103.111                                            |
| 2007-04-11                | 1.113.277                                            |
| 2007-04-18                | 1.097.692                                            |
| 2007-04-25                | 1.108.422                                            |
| 2007-05-02                | 1.128.105                                            |
| 2007-05-09                | 1.143.204                                            |
| 2007-05-16                | 1.150.712                                            |
| 2007-05-23                | 1.142.159                                            |
| 2007-05-30                | 1.144.758                                            |
| 2007-06-06                | 1.164.958                                            |
| 2007-06-13                | 1.167.613                                            |
| 2007-06-20                | 1.166.009                                            |
| 2007-06-27                | 1.173.194                                            |
| 2007-07-04                | 1.178.807                                            |
| 2007-07-11                | 1.188.699                                            |
| 2007-07-18                | 1.180.510                                            |
| 2007-07-25                | 1.190.747                                            |
| 2007-08-01                | 1.201.396                                            |
| 2007-08-08                | 1.213.717                                            |
| 2007-08-15                | 1.163.827                                            |
| 2007-08-22                | 1.091.767                                            |
| 2007-08-29                | 1.013.950                                            |
| 2007-09-05                | 988.215                                              |
| 2007-09-12                | 974.042                                              |
| 2007-09-19                | 958.340                                              |
| 2007-09-26                | 953.990                                              |
| 2007-10-03                | 956.765                                              |
| 2007-10-10                | 951.455                                              |
| 2007-10-17                | 929.795                                              |
| 2007-10-24                | 928.900                                              |
| 2007-10-31                | 920.905                                              |

|            |         |
|------------|---------|
| 2007-11-07 | 904.798 |
| 2007-11-14 | 899.630 |
| 2007-11-21 | 874.294 |
| 2007-11-28 | 866.176 |
| 2007-12-05 | 857.361 |
| 2007-12-12 | 855.481 |
| 2007-12-31 | 832.916 |
| 2007-12-26 | 831.770 |

#### Appendix 6: Spreads of Overnight Asset-Backed Commercial Papers (AA rated)

| date       | Spreads |            |       |            |       |
|------------|---------|------------|-------|------------|-------|
| 2007-01-01 | 0,17    |            |       |            |       |
| 2007-01-02 | 0,04    |            |       |            |       |
| 2007-01-03 | 0,00    |            |       |            |       |
| 2007-01-04 | 0,03    |            |       |            |       |
| 2007-01-05 | 0,05    |            |       |            |       |
| 2007-01-08 | 0,04    |            |       |            |       |
| 2007-01-09 | 0,01    |            |       |            |       |
| 2007-01-10 | -0,01   |            |       |            |       |
| 2007-01-11 | -0,02   |            |       |            |       |
| 2007-01-12 | 0,04    |            |       |            |       |
| 2007-01-15 | 0,04    |            |       |            |       |
| 2007-01-16 | -0,02   |            |       |            |       |
| 2007-01-17 | -0,01   |            |       |            |       |
| 2007-01-18 | 0,02    |            |       |            |       |
| 2007-01-19 | 0,00    |            |       |            |       |
| 2007-01-22 | -0,01   |            |       |            |       |
| 2007-01-23 | -0,01   |            |       |            |       |
| 2007-01-24 | -0,01   | 2007-04-12 | 0,05  | 2007-06-29 | -0,01 |
| 2007-01-25 | -0,05   | 2007-04-13 | 0,07  | 2007-07-02 | -0,01 |
| 2007-01-26 | -0,01   | 2007-04-16 | -0,03 | 2007-07-03 | 0,05  |
| 2007-01-29 | 0,03    | 2007-04-17 | 0,04  | 2007-07-04 | 0,04  |
| 2007-01-30 | 0,03    | 2007-04-18 | 0,05  | 2007-07-05 | 0,03  |
| 2007-01-31 | -0,07   | 2007-04-19 | 0,03  | 2007-07-06 | 0,04  |
| 2007-02-01 | -0,03   | 2007-04-20 | 0,00  | 2007-07-09 | 0,04  |
| 2007-02-02 | 0,02    | 2007-04-23 | 0,03  | 2007-07-10 | 0,03  |
| 2007-02-05 | -0,01   | 2007-04-24 | 0,06  | 2007-07-11 | 0,03  |
| 2007-02-06 | 0,02    | 2007-04-25 | 0,08  | 2007-07-12 | 0,07  |
| 2007-02-07 | 0,03    | 2007-04-26 | 0,08  | 2007-07-13 | 0,02  |
| 2007-02-08 | 0,01    | 2007-04-27 | 0,07  | 2007-07-16 | -0,05 |
| 2007-02-09 | 0,01    | 2007-04-30 | -0,03 | 2007-07-17 | -0,01 |
| 2007-02-12 | -0,01   | 2007-05-01 | 0,00  | 2007-07-18 | 0,01  |
| 2007-02-13 | 0,06    | 2007-05-02 | 0,05  | 2007-07-19 | 0,03  |
| 2007-02-14 | 0,00    | 2007-05-03 | 0,03  | 2007-07-20 | 0,03  |
| 2007-02-15 | -0,02   | 2007-05-04 | 0,02  | 2007-07-23 | 0,02  |
| 2007-02-16 | 0,06    | 2007-05-07 | 0,02  | 2007-07-24 | 0,08  |
| 2007-02-19 | 0,04    | 2007-05-08 | 0,04  | 2007-07-25 | 0,02  |
| 2007-02-20 | -0,02   | 2007-05-09 | 0,04  | 2007-07-26 | 0,10  |
| 2007-02-21 | 0,02    | 2007-05-10 | 0,02  | 2007-07-27 | 0,14  |
| 2007-02-22 | 0,01    | 2007-05-11 | 0,05  | 2007-07-30 | 0,07  |
| 2007-02-23 | 0,05    | 2007-05-14 | 0,01  | 2007-07-31 | 0,08  |
| 2007-02-26 | 0,03    | 2007-05-15 | -0,02 | 2007-08-01 | 0,04  |
| 2007-02-27 | 0,07    | 2007-05-16 | 0,02  | 2007-08-02 | 0,12  |
| 2007-02-28 | -0,11   | 2007-05-17 | 0,02  | 2007-08-03 | 0,13  |
| 2007-03-01 | -0,03   | 2007-05-18 | 0,02  | 2007-08-06 | 0,13  |

|            |       |            |      |            |      |
|------------|-------|------------|------|------------|------|
| 2007-03-02 | 0,07  | 2007-05-21 | 0,02 | 2007-08-07 | 0,49 |
| 2007-03-05 | 0,00  | 2007-05-22 | 0,03 | 2007-08-08 | 0,87 |
| 2007-03-06 | 0,05  | 2007-05-23 | 0,02 | 2007-08-09 | 0,09 |
| 2007-03-07 | 0,03  | 2007-05-24 | 0,03 | 2007-08-10 | 0,78 |
| 2007-03-08 | 0,03  | 2007-05-25 | 0,01 | 2007-08-13 | 0,70 |
| 2007-03-09 | 0,03  | 2007-05-28 | 0,01 | 2007-08-14 | 1,26 |
| 2007-03-12 | 0,05  | 2007-05-29 | 0,04 | 2007-08-15 | 1,21 |
| 2007-03-13 | 0,11  | 2007-05-30 | 0,07 | 2007-08-16 | 0,99 |
| 2007-03-14 | 0,00  | 2007-05-31 | 0,00 | 2007-08-17 | 1,06 |
| 2007-03-15 | -0,02 | 2007-06-01 | 0,04 | 2007-08-20 | 0,92 |
| 2007-03-16 | 0,02  | 2007-06-04 | 0,03 | 2007-08-21 | 1,00 |
| 2007-03-19 | 0,01  | 2007-06-05 | 0,09 | 2007-08-22 | 0,98 |
| 2007-03-20 | 0,01  | 2007-06-06 | 0,03 | 2007-08-23 | 0,82 |
| 2007-03-21 | 0,00  | 2007-06-07 | 0,03 | 2007-08-24 | 0,61 |
| 2007-03-22 | 0,00  | 2007-06-08 | 0,02 | 2007-08-27 | 0,64 |
| 2007-03-23 | 0,03  | 2007-06-11 | 0,03 | 2007-08-28 | 0,64 |
| 2007-03-26 | 0,02  | 2007-06-12 | 0,06 | 2007-08-29 | 0,98 |
| 2007-03-27 | 0,07  | 2007-06-13 | 0,08 | 2007-08-30 | 0,98 |
| 2007-03-28 | 0,16  | 2007-06-14 | 0,00 | 2007-08-31 | 0,94 |
| 2007-03-29 | 0,05  | 2007-06-15 | 0,01 | 2007-09-03 | 0,92 |
| 2007-03-30 | -0,02 | 2007-06-18 | 0,03 | 2007-09-04 | 0,61 |
| 2007-04-02 | 0,04  | 2007-06-19 | 0,07 | 2007-09-05 | 0,53 |
| 2007-04-03 | 0,09  | 2007-06-20 | 0,00 | 2007-09-06 | 0,69 |
| 2007-04-04 | 0,17  | 2007-06-21 | 0,03 | 2007-09-07 | 0,74 |
| 2007-04-05 | 0,03  | 2007-06-22 | 0,08 | 2007-09-10 | 0,47 |
| 2007-04-06 | 0,02  | 2007-06-25 | 0,05 | 2007-09-11 | 0,41 |
| 2007-04-09 | 0,03  | 2007-06-26 | 0,12 | 2007-09-12 | 0,27 |
| 2007-04-10 | 0,04  | 2007-06-27 | 0,15 | 2007-09-13 | 0,59 |
| 2007-04-11 | 0,05  | 2007-06-28 | 0,09 | 2007-09-14 | 0,22 |
| 2007-09-17 | -0,22 | 2007-12-04 | 0,51 |            |      |
| 2007-09-18 | 0,16  | 2007-12-05 | 0,62 |            |      |
| 2007-09-19 | 0,33  | 2007-12-06 | 0,46 |            |      |
| 2007-09-20 | 0,29  | 2007-12-07 | 0,41 |            |      |
| 2007-09-21 | 0,32  | 2007-12-10 | 0,28 |            |      |
| 2007-09-24 | 0,38  | 2007-12-11 | 0,41 |            |      |
| 2007-09-25 | 0,50  | 2007-12-12 | 0,46 |            |      |
| 2007-09-26 | 0,69  | 2007-12-13 | 0,51 |            |      |
| 2007-09-27 | 0,30  | 2007-12-14 | 0,54 |            |      |
| 2007-09-28 | 0,61  | 2007-12-17 | 0,44 |            |      |
| 2007-10-01 | 0,22  | 2007-12-18 | 0,55 |            |      |
| 2007-10-02 | 0,34  | 2007-12-19 | 0,78 |            |      |
| 2007-10-03 | 0,42  | 2007-12-20 | 0,39 |            |      |
| 2007-10-04 | 0,36  | 2007-12-21 | 0,48 |            |      |
| 2007-10-05 | 0,36  | 2007-12-24 | 0,71 |            |      |
| 2007-10-08 | 0,38  | 2007-12-25 | 0,87 |            |      |
| 2007-10-09 | 0,20  | 2007-12-26 | 0,53 |            |      |
| 2007-10-10 | 0,57  | 2007-12-27 | 0,69 |            |      |
| 2007-10-11 | 0,39  |            |      |            |      |
| 2007-10-12 | 0,33  |            |      |            |      |
| 2007-10-15 | 0,24  |            |      |            |      |
| 2007-10-16 | 0,31  |            |      |            |      |
| 2007-10-17 | 0,26  |            |      |            |      |
| 2007-10-18 | 0,26  |            |      |            |      |
| 2007-10-19 | 0,18  |            |      |            |      |
| 2007-10-22 | 0,22  |            |      |            |      |
| 2007-10-23 | 0,24  |            |      |            |      |

|            |       |
|------------|-------|
| 2007-10-24 | 0,19  |
| 2007-10-25 | 0,09  |
| 2007-10-26 | 0,23  |
| 2007-10-29 | 0,19  |
| 2007-10-30 | -0,02 |
| 2007-10-31 | 0,17  |
| 2007-11-01 | 0,23  |
| 2007-11-02 | 0,50  |
| 2007-11-05 | 0,50  |
| 2007-11-06 | 0,57  |
| 2007-11-07 | 0,39  |
| 2007-11-08 | 0,20  |
| 2007-11-09 | 0,36  |
| 2007-11-12 | 0,50  |
| 2007-11-13 | 0,49  |
| 2007-11-14 | 0,32  |
| 2007-11-15 | 0,40  |
| 2007-11-16 | 0,45  |
| 2007-11-19 | 0,45  |
| 2007-11-20 | 0,45  |
| 2007-11-21 | 0,50  |
| 2007-11-22 | 0,52  |
| 2007-11-23 | 0,46  |
| 2007-11-26 | 0,41  |
| 2007-11-27 | 0,62  |
| 2007-11-28 | 0,53  |
| 2007-11-29 | 0,45  |
| 2007-11-30 | 0,33  |
| 2007-12-03 | 0,48  |

Appendix 7: ISDA Market Survey, Notional amounts outstanding at year-end, all surveyed contracts, 1987-present

|             | Total IR and<br>currency<br>outstandings | Total credit<br>default swap<br>outstandings | Total equity<br>derivative<br>outstandings |
|-------------|------------------------------------------|----------------------------------------------|--------------------------------------------|
| <b>1987</b> | \$ 865,60                                |                                              |                                            |
| <b>1988</b> | 1.654,30                                 |                                              |                                            |
| <b>1989</b> | 2.474,70                                 |                                              |                                            |
| <b>1990</b> | 3.450,30                                 |                                              |                                            |
| <b>1991</b> | 4.449,50                                 |                                              |                                            |
| <b>1992</b> | 5.345,70                                 |                                              |                                            |
| <b>1993</b> | 8.474,50                                 |                                              |                                            |
| <b>1994</b> | 11.303,20                                |                                              |                                            |
| <b>1995</b> | 17.712,60                                |                                              |                                            |
| <b>1996</b> | 25.453,10                                |                                              |                                            |
| <b>1997</b> | 29.035,00                                |                                              |                                            |

|             |            |           |          |
|-------------|------------|-----------|----------|
| <b>1998</b> | 50.997,00  |           |          |
| <b>1999</b> | 58.265,00  |           |          |
| <b>2000</b> | 63.009,00  |           |          |
| <b>2001</b> | 69.207,30  | 918,87    |          |
| <b>2002</b> | 101.318,49 | 2.191,57  | 2.455,29 |
| <b>2003</b> | 142.306,92 | 3.779,40  | 3.444,08 |
| <b>2004</b> | 183.583,27 | 8.422,26  | 4.151,29 |
| <b>2005</b> | 213.194,58 | 17.096,14 | 5.553,97 |
| <b>2006</b> | 285.728,14 | 34.422,80 | 7.178,48 |
| <b>2007</b> | 382.302,71 | 62.173,20 | 9.995,71 |
| <b>2008</b> | 403.072,81 | 38.563,82 | 8.733,03 |

#### Appendix 8: The liquidity index from 01-01-1997 to 30-06-2009 (monthly basis)

(This data is released in April and October in the Bank of England's Financial Stability Report. Simple, unweighted mean of the liquidity measures, normalised on the period 1999-2004. Data shown are an exponentially weighted moving average. The indicator is more reliable after 1997 as it is based on a greater number of underlying measures. Liquidity measures incorporate bid-ask spreads, return to volume ratio, and the Liquidity premia. This single index summarises all these measures. The index combines three key market measures -- the gaps between bid and offer prices on bonds, currencies and stocks, the ratio of market returns to trading volumes, and spreads in the credit market.)

|                   |         |
|-------------------|---------|
| UKBOEFML<br>Index |         |
| Period            | PX_LAST |
| 01.01.1997        | -0,411  |
| 31.01.1997        | -0,015  |
| 28.02.1997        | 0,081   |
| 31.03.1997        | 0,093   |
| 30.04.1997        | 0,152   |
| 30.05.1997        | 0,117   |
| 30.06.1997        | 0,103   |
| 31.07.1997        | 0,102   |
| 29.08.1997        | 0,042   |
| 30.09.1997        | -0,067  |
| 31.10.1997        | -0,255  |
| 28.11.1997        | -0,365  |
| 31.12.1997        | -0,488  |
| 30.01.1998        | -0,082  |
| 27.02.1998        | 0,061   |
| 31.03.1998        | 0,085   |
| 30.04.1998        | -0,025  |
| 29.05.1998        | 0,025   |
| 30.06.1998        | -0,151  |
| 31.07.1998        | -0,158  |
| 31.08.1998        | -0,303  |
| 30.09.1998        | -0,557  |
| 30.10.1998        | -0,916  |
| 30.11.1998        | -0,845  |
| 31.12.1998        | -0,957  |
| 29.01.1999        | -0,584  |
| 26.02.1999        | -0,428  |

|            |        |
|------------|--------|
| 31.03.1999 | -0,308 |
| 30.04.1999 | -0,263 |
| 31.05.1999 | -0,276 |
| 30.06.1999 | -0,426 |
| 30.07.1999 | -0,36  |
| 31.08.1999 | -0,373 |
| 30.09.1999 | -0,491 |
| 29.10.1999 | -0,912 |
| 30.11.1999 | -0,778 |
| 31.12.1999 | -0,749 |
| 31.01.2000 | -0,456 |
| 29.02.2000 | -0,307 |
| 31.03.2000 | -0,22  |
| 28.04.2000 | -0,325 |
| 31.05.2000 | -0,555 |
| 30.06.2000 | -0,609 |
| 31.07.2000 | -0,569 |
| 31.08.2000 | -0,528 |
| 29.09.2000 | -0,568 |
| 31.10.2000 | -0,537 |
| 30.11.2000 | -0,547 |
| 29.12.2000 | -0,705 |
| 31.01.2001 | -0,367 |
| 28.02.2001 | -0,243 |
| 30.03.2001 | -0,255 |
| 30.04.2001 | -0,266 |
| 31.05.2001 | -0,212 |
| 29.06.2001 | -0,336 |
| 31.07.2001 | -0,166 |
| 31.08.2001 | -0,056 |
| 28.09.2001 | -0,115 |
| 31.10.2001 | -0,112 |
| 30.11.2001 | -0,143 |
| 31.12.2001 | -0,328 |
| 31.01.2002 | -0,149 |
| 28.02.2002 | -0,088 |
| 29.03.2002 | -0,063 |
| 30.04.2002 | 0,059  |
| 31.05.2002 | 0,096  |
| 28.06.2002 | 0,234  |
| 31.07.2002 | 0,338  |
| 30.08.2002 | 0,259  |
| 30.09.2002 | 0,277  |
| 31.10.2002 | 0,252  |
| 29.11.2002 | 0,14   |
| 31.12.2002 | 0,127  |
| 31.01.2003 | 0,233  |
| 28.02.2003 | 0,279  |
| 31.03.2003 | 0,291  |
| 30.04.2003 | 0,283  |
| 30.05.2003 | 0,311  |
| 30.06.2003 | 0,213  |

|            |        |
|------------|--------|
| 31.07.2003 | 0,358  |
| 29.08.2003 | 0,471  |
| 30.09.2003 | 0,486  |
| 31.10.2003 | 0,524  |
| 28.11.2003 | 0,58   |
| 31.12.2003 | 0,518  |
| 30.01.2004 | 0,582  |
| 27.02.2004 | 0,645  |
| 31.03.2004 | 0,619  |
| 30.04.2004 | 0,629  |
| 31.05.2004 | 0,65   |
| 30.06.2004 | 0,616  |
| 30.07.2004 | 0,598  |
| 31.08.2004 | 0,551  |
| 30.09.2004 | 0,634  |
| 29.10.2004 | 0,702  |
| 30.11.2004 | 0,718  |
| 31.12.2004 | 0,668  |
| 31.01.2005 | 0,759  |
| 28.02.2005 | 0,8    |
| 31.03.2005 | 0,816  |
| 29.04.2005 | 0,688  |
| 31.05.2005 | 0,619  |
| 30.06.2005 | 0,589  |
| 29.07.2005 | 0,629  |
| 31.08.2005 | 0,69   |
| 30.09.2005 | 0,657  |
| 31.10.2005 | 0,689  |
| 30.11.2005 | 0,646  |
| 30.12.2005 | 0,604  |
| 31.01.2006 | 0,755  |
| 28.02.2006 | 0,821  |
| 31.03.2006 | 0,769  |
| 28.04.2006 | 0,75   |
| 31.05.2006 | 0,666  |
| 30.06.2006 | 0,661  |
| 31.07.2006 | 0,623  |
| 31.08.2006 | 0,7    |
| 29.09.2006 | 0,693  |
| 31.10.2006 | 0,773  |
| 30.11.2006 | 0,742  |
| 29.12.2006 | 0,717  |
| 31.01.2007 | 0,861  |
| 28.02.2007 | 0,86   |
| 30.03.2007 | 0,888  |
| 30.04.2007 | 0,822  |
| 31.05.2007 | 0,803  |
| 29.06.2007 | 0,724  |
| 31.07.2007 | 0,701  |
| 31.08.2007 | -0,027 |
| 28.09.2007 | -0,248 |
| 31.10.2007 | -0,006 |

|            |        |
|------------|--------|
| 30.11.2007 | -0,256 |
| 31.12.2007 | -0,609 |
| 31.01.2008 | -0,188 |
| 29.02.2008 | -0,253 |
| 31.03.2008 | -0,886 |
| 30.04.2008 | -1,101 |
| 30.05.2008 | -0,91  |
| 30.06.2008 | -0,67  |
| 31.07.2008 | -0,598 |
| 29.08.2008 | -0,748 |
| 30.09.2008 | -1,295 |
| 31.10.2008 | -2,962 |
| 28.11.2008 | -3,638 |
| 31.12.2008 | -3,905 |
| 30.01.2009 | -3,538 |
| 27.02.2009 | -3,511 |
| 31.03.2009 | -4,02  |
| 30.04.2009 | -4,198 |
| 29.05.2009 | -3,549 |
| 30.06.2009 | -3,219 |

## Appendix 9: Development of the S&P 500 and the VIX Index (normalized) from Jan 1997 to Jan 2009

The Chicago Board Options Exchange  
 SPX Volatility Index  
 UKBOEFML Index

| Period     | PX_LAST | PX_LAST    | PX_LAST |
|------------|---------|------------|---------|
| 31.01.1996 | -0,174  | 31.10.2002 | 0,252   |
| 29.02.1996 | -0,123  | 29.11.2002 | 0,14    |
| 29.03.1996 | -0,157  | 31.12.2002 | 0,127   |
| 30.04.1996 | -0,132  | 31.01.2003 | 0,233   |
| 31.05.1996 | -0,206  | 28.02.2003 | 0,279   |
| 28.06.1996 | -0,203  | 31.03.2003 | 0,291   |
| 31.07.1996 | -0,223  | 30.04.2003 | 0,283   |
| 30.08.1996 | -0,316  | 30.05.2003 | 0,311   |
| 30.09.1996 | -0,347  | 30.06.2003 | 0,213   |
| 31.10.1996 | -0,211  | 31.07.2003 | 0,358   |
| 29.11.1996 | -0,271  | 29.08.2003 | 0,471   |
| 01.01.1997 | -0,411  | 30.09.2003 | 0,486   |
| 31.01.1997 | -0,015  | 31.10.2003 | 0,524   |
| 28.02.1997 | 0,081   | 28.11.2003 | 0,58    |
| 31.03.1997 | 0,093   | 31.12.2003 | 0,518   |
| 30.04.1997 | 0,152   | 30.01.2004 | 0,582   |
| 30.05.1997 | 0,117   | 27.02.2004 | 0,645   |
| 30.06.1997 | 0,103   | 31.03.2004 | 0,619   |
| 31.07.1997 | 0,102   | 30.04.2004 | 0,629   |
| 29.08.1997 | 0,042   | 31.05.2004 | 0,65    |
| 30.09.1997 | -0,067  | 30.06.2004 | 0,616   |
| 31.10.1997 | -0,255  | 30.07.2004 | 0,598   |
| 28.11.1997 | -0,365  | 31.08.2004 | 0,551   |
| 31.12.1997 | -0,488  | 30.09.2004 | 0,634   |
| 30.01.1998 | -0,082  | 29.10.2004 | 0,702   |
| 27.02.1998 | 0,061   | 30.11.2004 | 0,718   |
| 31.03.1998 | 0,085   | 31.12.2004 | 0,668   |
| 30.04.1998 | -0,025  | 31.01.2005 | 0,759   |
| 29.05.1998 | 0,025   | 28.02.2005 | 0,8     |
| 30.06.1998 | -0,151  | 31.03.2005 | 0,816   |
| 31.07.1998 | -0,158  | 29.04.2005 | 0,688   |
| 31.08.1998 | -0,303  | 31.05.2005 | 0,619   |
| 30.09.1998 | -0,557  | 30.06.2005 | 0,589   |
| 30.10.1998 | -0,916  | 29.07.2005 | 0,629   |
| 30.11.1998 | -0,845  | 31.08.2005 | 0,69    |
| 31.12.1998 | -0,957  | 30.09.2005 | 0,657   |
| 29.01.1999 | -0,584  | 31.10.2005 | 0,689   |
| 26.02.1999 | -0,428  | 30.11.2005 | 0,646   |
| 31.03.1999 | -0,308  | 30.12.2005 | 0,604   |
| 30.04.1999 | -0,263  | 31.01.2006 | 0,755   |
| 31.05.1999 | -0,276  | 28.02.2006 | 0,821   |
| 30.06.1999 | -0,426  | 31.03.2006 | 0,769   |
| 30.07.1999 | -0,36   | 28.04.2006 | 0,75    |
| 31.08.1999 | -0,373  | 31.05.2006 | 0,666   |
| 30.09.1999 | -0,491  | 30.06.2006 | 0,661   |
| 29.10.1999 | -0,912  | 31.07.2006 | 0,623   |
| 30.11.1999 | -0,778  | 31.08.2006 | 0,7     |
| 31.12.1999 | -0,749  | 29.09.2006 | 0,693   |
| 31.01.2000 | -0,456  | 31.10.2006 | 0,773   |
| 29.02.2000 | -0,307  | 30.11.2006 | 0,742   |
| 31.03.2000 | -0,22   | 29.12.2006 | 0,717   |
| 28.04.2000 | -0,325  | 31.01.2007 | 0,861   |
| 31.05.2000 | -0,555  | 28.02.2007 | 0,86    |
| 30.06.2000 | -0,609  | 30.03.2007 | 0,888   |
| 31.07.2000 | -0,569  | 30.04.2007 | 0,822   |
| 31.08.2000 | -0,528  | 31.05.2007 | 0,803   |
| 29.09.2000 | -0,568  | 29.06.2007 | 0,724   |
| 31.10.2000 | -0,537  | 31.07.2007 | 0,701   |
| 30.11.2000 | -0,547  | 31.08.2007 | -0,027  |
| 29.12.2000 | -0,705  | 28.09.2007 | -0,248  |
| 31.01.2001 | -0,367  | 31.10.2007 | -0,006  |
| 28.02.2001 | -0,243  | 30.11.2007 | -0,256  |
| 30.03.2001 | -0,255  | 31.12.2007 | -0,609  |
| 30.04.2001 | -0,266  | 31.01.2008 | -0,188  |
| 31.05.2001 | -0,212  | 29.02.2008 | -0,253  |
| 29.06.2001 | -0,336  | 31.03.2008 | -0,886  |
| 31.07.2001 | -0,166  | 30.04.2008 | -1,101  |
| 31.08.2001 | -0,056  | 30.05.2008 | -0,91   |
| 28.09.2001 | -0,115  | 30.06.2008 | -0,67   |
| 31.10.2001 | -0,112  | 31.07.2008 | -0,598  |
| 30.11.2001 | -0,143  | 29.08.2008 | -0,748  |

## VIX Index

| Date       | PX_LAST | disc. Return | normalized |
|------------|---------|--------------|------------|
| 01.01.1997 | 20,92   | 0,01051625   | 100        |
| 02.01.1997 | 21,14   | -0,09508042  | 90,4919584 |
| 03.01.1997 | 19,13   | 0            | 90,4919584 |
| 04.01.1997 | 19,13   | 0            | 90,4919584 |
| 05.01.1997 | 19,13   | 0,03972818   | 94,0870388 |
| 06.01.1997 | 19,89   | -0,02714932  | 91,5326395 |
| 07.01.1997 | 19,35   | 0,04599483   | 95,7426679 |
| 08.01.1997 | 20,24   | 0,03310277   | 98,9120151 |
| 09.01.1997 | 20,91   | -0,06121473  | 92,8571429 |
| 10.01.1997 | 19,63   | 0            | 92,8571429 |
| 11.01.1997 | 19,63   | 0            | 92,8571429 |
| 12.01.1997 | 19,63   | 0,01069791   | 93,8505203 |
| 13.01.1997 | 19,84   | -0,02872984  | 91,15421   |
| 14.01.1997 | 19,27   | 0,00674624   | 91,769158  |
| 15.01.1997 | 19,4    | 0,01082474   | 92,7625355 |
| 16.01.1997 | 19,61   | -0,0499745   | 88,1267739 |
| 17.01.1997 | 18,63   | 0            | 88,1267739 |
| 18.01.1997 | 18,63   | 0            | 88,1267739 |
| 19.01.1997 | 18,63   | -0,00161031  | 87,9848628 |
| 20.01.1997 | 18,6    | -0,04247312  | 84,2478713 |
| 21.01.1997 | 17,81   | -0,04042673  | 80,8420057 |
| 22.01.1997 | 17,09   | 0,08074898   | 87,3699149 |
| 23.01.1997 | 18,47   | 0,04656199   | 91,4380322 |
| 24.01.1997 | 19,33   | 0            | 91,4380322 |
| 25.01.1997 | 19,33   | 0            | 91,4380322 |
| 26.01.1997 | 19,33   | 0,04293844   | 95,3642384 |
| 27.01.1997 | 20,16   | 0,02876984   | 98,1078524 |
| 28.01.1997 | 20,74   | -0,02459016  | 95,6953642 |
| 29.01.1997 | 20,23   | -0,03756797  | 92,1002838 |
| 30.01.1997 | 19,47   | 0,06933744   | 98,4862819 |
| 31.01.1997 | 20,82   | 0            | 98,4862819 |
| 01.02.1997 | 20,82   | 0            | 98,4862819 |
| 02.02.1997 | 20,82   | -0,05955812  | 92,6206244 |
| 03.02.1997 | 19,58   | -0,00766088  | 91,9110691 |
| 04.02.1997 | 19,43   | 0,08389089   | 99,6215705 |
| 05.02.1997 | 21,06   | -0,04273504  | 95,3642384 |
| 06.02.1997 | 20,16   | -0,0625      | 89,4039735 |
| 07.02.1997 | 18,9    | 0            | 89,4039735 |
| 08.02.1997 | 18,9    | 0            | 89,4039735 |
| 09.02.1997 | 18,9    | 0,09259259   | 97,6821192 |
| 10.02.1997 | 20,65   | -0,03292978  | 94,4654683 |
| 11.02.1997 | 19,97   | -0,02453681  | 92,1475875 |
| 12.02.1997 | 19,48   | -0,01283368  | 90,9649953 |
| 13.02.1997 | 19,23   | -0,0026001   | 90,7284768 |
| 14.02.1997 | 19,18   | 0            | 90,7284768 |
| 15.02.1997 | 19,18   | 0            | 90,7284768 |
| 16.02.1997 | 19,18   | 0            | 90,7284768 |
| 17.02.1997 | 19,18   | 0,02711157   | 93,1882687 |
| 18.02.1997 | 19,7    | 0,04619289   | 97,4929044 |
| 19.02.1997 | 20,61   | 0,03881611   | 101,2772   |
| 20.02.1997 | 21,41   | -0,04016815  | 97,2090823 |
| 21.02.1997 | 20,55   | 0            | 97,2090823 |
| 22.02.1997 | 20,55   | 0            | 97,2090823 |
| 23.02.1997 | 20,55   | -0,03454988  | 93,8505203 |
| 24.02.1997 | 19,84   | 0,00705645   | 94,512772  |
| 25.02.1997 | 19,98   | 0,03803804   | 98,1078524 |
| 26.02.1997 | 20,74   | 0,01639344   | 99,7161779 |
| 27.02.1997 | 21,08   | 0,00094877   | 99,8107852 |
| 28.02.1997 | 21,1    | 0            | 99,8107852 |
| 01.03.1997 | 21,1    | 0            | 99,8107852 |
| 02.03.1997 | 21,1    | -0,00995261  | 98,8174078 |
| 03.03.1997 | 20,89   | -0,01292484  | 97,5402081 |
| 04.03.1997 | 20,62   | -0,05480116  | 92,1948912 |
| 05.03.1997 | 19,49   | 0,05079528   | 96,8779565 |
| 06.03.1997 | 20,48   | -0,05664063  | 91,3907285 |
| 07.03.1997 | 19,32   | 0            | 91,3907285 |
| 08.03.1997 | 19,32   | 0            | 91,3907285 |
| 09.03.1997 | 19,32   | -0,01656315  | 89,8770104 |
| 10.03.1997 | 19      | 0,01315789   | 91,0596026 |
| 11.03.1997 | 19,25   | 0,0187013    | 92,7625355 |
| 12.03.1997 | 19,61   | 0,00917899   | 93,6140019 |
| 13.03.1997 | 19,79   | 0,00101061   | 93,7086093 |
| 14.03.1997 | 19,81   | 0            | 93,7086093 |

Appendix 10: 5y CDS Spreads Austria, Greece, Ireland, Portugal (01-01-2008 to 23-04-2010)

|            | BFV EUR Germany<br>Sovereign 10 Year | BFV EUR Greece<br>Sovereign 10 Year | BFV EUR Spain<br>Sovereign 10 Year | BFV EUR Ireland<br>Sovereign 10 Year | BFV EUR Italy<br>Sovereign 10 Year | BFV EUR Portugal<br>Sovereign 10 Year |
|------------|--------------------------------------|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|---------------------------------------|
|            | C91010Y Index                        | C90410Y Index                       | C90210Y Index                      | C91810Y Index                        | C90510Y Index                      | C91710Y Index                         |
| Date       | PX_LAST                              | PX_LAST                             | PX_LAST                            | PX_LAST                              | PX_LAST                            | PX_LAST                               |
| 31.12.2007 | 4,3317                               | 4,6662                              | 4,4434                             | 4,4277                               | 4,5829                             | 4,5555                                |
| 01.01.2008 | 4,3309                               | 4,6656                              | 4,4431                             | 4,4284                               | 4,58                               | 4,5557                                |
| 02.01.2008 | 4,2021                               | 4,5257                              | 4,3093                             | 4,3165                               | 4,4604                             | 4,4347                                |
| 03.01.2008 | 4,1857                               | 4,5192                              | 4,319                              | 4,3187                               | 4,4432                             | 4,4367                                |
| 04.01.2008 | 4,1273                               | 4,4613                              | 4,2794                             | 4,2399                               | 4,3947                             | 4,3966                                |
| 07.01.2008 | 4,1196                               | 4,4541                              | 4,2834                             | 4,326                                | 4,4028                             | 4,3954                                |
| 08.01.2008 | 4,1477                               | 4,4999                              | 4,3166                             | 4,3521                               | 4,4256                             | 4,4238                                |
| 09.01.2008 | 4,0838                               | 4,4559                              | 4,2805                             | 4,2859                               | 4,375                              | 4,3752                                |
| 10.01.2008 | 4,084                                | 4,4652                              | 4,2936                             | 4,2381                               | 4,3977                             | 4,3875                                |
| 11.01.2008 | 4,0821                               | 4,4568                              | 4,2915                             | 4,2444                               | 4,3933                             | 4,3798                                |
| 14.01.2008 | 4,0496                               | 4,4196                              | 4,2523                             | 4,1984                               | 4,3447                             | 4,3331                                |
| 15.01.2008 | 4,0197                               | 4,3886                              | 4,2277                             | 4,1875                               | 4,3178                             | 4,3085                                |
| 16.01.2008 | 3,9739                               | 4,3435                              | 4,1935                             | 4,149                                | 4,2766                             | 4,2674                                |
| 17.01.2008 | 3,9671                               | 4,3264                              | 4,182                              | 4,1523                               | 4,2602                             | 4,2516                                |
| 18.01.2008 | 3,9682                               | 4,3243                              | 4,1774                             | 4,1427                               | 4,2599                             | 4,2507                                |
| 21.01.2008 | 3,9128                               | 4,2706                              | 4,1359                             | 4,08                                 | 4,2121                             | 4,2034                                |
| 22.01.2008 | 3,989                                | 4,3926                              | 4,2225                             | 4,2058                               | 4,3063                             | 4,2907                                |
| 23.01.2008 | 3,8864                               | 4,3113                              | 4,1284                             | 4,0946                               | 4,2201                             | 4,1969                                |
| 24.01.2008 | 3,9954                               | 4,416                               | 4,2351                             | 4,2441                               | 4,3369                             | 4,3111                                |
| 25.01.2008 | 3,975                                | 4,4233                              | 4,2179                             | 4,2161                               | 4,3184                             | 4,3031                                |
| 28.01.2008 | 3,9461                               | 4,378                               | 4,1885                             | 4,1671                               | 4,2671                             | 4,2621                                |
| 29.01.2008 | 3,9927                               | 4,4154                              | 4,2379                             | 4,2128                               | 4,3127                             | 4,3032                                |
| 30.01.2008 | 4,0163                               | 4,44                                | 4,2625                             | 4,2336                               | 4,3324                             | 4,3269                                |
| 31.01.2008 | 3,929                                | 4,3544                              | 4,1779                             | 4,1301                               | 4,2401                             | 4,2375                                |
| 01.02.2008 | 3,918                                | 4,315                               | 4,1565                             | 4,1066                               | 4,2146                             | 4,2152                                |
| 04.02.2008 | 3,932                                | 4,3315                              | 4,1668                             | 4,1224                               | 4,2308                             | 4,2209                                |
| 05.02.2008 | 3,8464                               | 4,256                               | 4,0838                             | 4,0271                               | 4,1572                             | 4,1464                                |
| 06.02.2008 | 3,8954                               | 4,2986                              | 4,1368                             | 4,0709                               | 4,2093                             | 4,199                                 |
| 07.02.2008 | 3,8778                               | 4,2798                              | 4,1152                             | 4,0357                               | 4,2111                             | 4,1864                                |
| 08.02.2008 | 3,8648                               | 4,2674                              | 4,0944                             | 4,0355                               | 4,1879                             | 4,1638                                |
| 11.02.2008 | 3,8606                               | 4,2806                              | 4,0966                             | 4,0451                               | 4,1979                             | 4,1704                                |
| 12.02.2008 | 3,9466                               | 4,3802                              | 4,1865                             | 4,1671                               | 4,2804                             | 4,2591                                |
| 13.02.2008 | 3,9584                               | 4,3939                              | 4,19                               | 4,1522                               | 4,2854                             | 4,2641                                |
| 14.02.2008 | 4,0099                               | 4,4311                              | 4,2243                             | 4,202                                | 4,3285                             | 4,3121                                |
| 15.02.2008 | 3,9609                               | 4,4018                              | 4,1752                             | 4,2659                               | 4,2988                             | 4,2802                                |
| 18.02.2008 | 4,1034                               | 4,4577                              | 4,2285                             | 4,2144                               | 4,3468                             | 4,3325                                |
| 19.02.2008 | 4,0425                               | 4,4353                              | 4,209                              | 4,209                                | 4,3311                             | 4,3209                                |
| 20.02.2008 | 4,0535                               | 4,4728                              | 4,2511                             | 4,2427                               | 4,3692                             | 4,3602                                |
| 21.02.2008 | 4,0434                               | 4,4694                              | 4,2464                             | 4,2563                               | 4,3644                             | 4,3573                                |
| 22.02.2008 | 4,0319                               | 4,4712                              | 4,2447                             | 4,2457                               | 4,3638                             | 4,3569                                |
| 25.02.2008 | 4,0656                               | 4,5242                              | 4,2881                             | 4,2658                               | 4,4156                             | 4,3983                                |
| 26.02.2008 | 4,1038                               | 4,5595                              | 4,3214                             | 4,2958                               | 4,4449                             | 4,44                                  |
| 27.02.2008 | 4,0886                               | 4,5708                              | 4,3329                             | 4,3125                               | 4,4572                             | 4,4519                                |
| 28.02.2008 | 4,0011                               | 4,4785                              | 4,227                              | 4,2179                               | 4,3711                             | 4,3652                                |
| 29.02.2008 | 3,8918                               | 4,3992                              | 4,1251                             | 4,1165                               | 4,2719                             | 4,272                                 |
| 03.03.2008 | 3,862                                | 4,3763                              | 4,1139                             | 4,1057                               | 4,2697                             | 4,2587                                |
| 04.03.2008 | 3,8089                               | 4,3671                              | 4,1055                             | 4,1039                               | 4,2658                             | 4,2529                                |
| 05.03.2008 | 3,8647                               | 4,4713                              | 4,1965                             | 4,2289                               | 4,3775                             | 4,3539                                |
| 06.03.2008 | 3,8138                               | 4,454                               | 4,15                               | 4,1622                               | 4,3504                             | 4,3431                                |
| 07.03.2008 | 3,793                                | 4,5043                              | 4,1815                             | 4,1606                               | 4,3709                             | 4,361                                 |
| 10.03.2008 | 3,737                                | 4,4389                              | 4,1258                             | 4,1188                               | 4,3233                             | 4,3111                                |
| 11.03.2008 | 3,7938                               | 4,4778                              | 4,1681                             | 4,1341                               | 4,3357                             | 4,3298                                |
| 12.03.2008 | 3,7751                               | 4,4631                              | 4,1465                             | 4,1224                               | 4,3078                             | 4,3023                                |
| 13.03.2008 | 3,7662                               | 4,4893                              | 4,1494                             | 4,1356                               | 4,3288                             | 4,3059                                |
| 14.03.2008 | 3,7419                               | 4,4182                              | 4,1215                             | 4,1427                               | 4,301                              | 4,2824                                |
| 17.03.2008 | 3,7028                               | 4,4232                              | 4,1021                             | 4,1028                               | 4,2875                             | 4,2785                                |
| 18.03.2008 | 3,7748                               | 4,4635                              | 4,166                              | 4,1628                               | 4,3208                             | 4,327                                 |
| 19.03.2008 | 3,7189                               | 4,3745                              | 4,0829                             | 4,1024                               | 4,2733                             | 4,2578                                |
| 20.03.2008 | 3,7527                               | 4,3975                              | 4,1197                             | 4,1654                               | 4,2567                             | 4,2672                                |
| 21.03.2008 | 3,7628                               | 4,4022                              | 4,1258                             | 4,179                                | 4,2551                             | 4,2792                                |
| 24.03.2008 | 3,7625                               | 4,4079                              | 4,1263                             | 4,1876                               | 4,2505                             | 4,2867                                |
| 25.03.2008 | 3,8873                               | 4,5349                              | 4,2356                             | 4,2547                               | 4,3637                             | 4,3784                                |
| 26.03.2008 | 3,882                                | 4,5003                              | 4,2533                             | 4,263                                | 4,3717                             | 4,3892                                |
| 27.03.2008 | 3,9353                               | 4,5437                              | 4,2914                             | 4,2833                               | 4,4079                             | 4,4224                                |
| 28.03.2008 | 3,9532                               | 4,5327                              | 4,2847                             | 4,2898                               | 4,4075                             | 4,4256                                |
| 31.03.2008 | 3,9086                               | 4,4952                              | 4,2501                             | 4,2564                               | 4,3686                             | 4,3818                                |
| 01.04.2008 | 3,973                                | 4,536                               | 4,2909                             | 4,3149                               | 4,388                              | 4,4148                                |
| 02.04.2008 | 3,9914                               | 4,5407                              | 4,2886                             | 4,3179                               | 4,3861                             | 4,4054                                |
| 03.04.2008 | 3,9888                               | 4,5474                              | 4,3029                             | 4,3464                               | 4,404                              | 4,4218                                |
| 04.04.2008 | 3,9357                               | 4,5076                              | 4,2667                             | 4,3184                               | 4,3652                             | 4,3815                                |
| 07.04.2008 | 3,9681                               | 4,5054                              | 4,2754                             | 4,2829                               | 4,4253                             | 4,3815                                |

|            |        |        |        |        |        |        |
|------------|--------|--------|--------|--------|--------|--------|
| 08.04.2008 | 3,9677 | 4,5202 | 4,2856 | 4,3081 | 4,4559 | 4,4041 |
| 09.04.2008 | 3,9553 | 4,5166 | 4,273  | 4,2908 | 4,4406 | 4,3958 |
| 10.04.2008 | 3,9327 | 4,5027 | 4,2543 | 4,276  | 4,4329 | 4,3919 |
| 11.04.2008 | 3,8668 | 4,4295 | 4,1772 | 4,2102 | 4,3528 | 4,3205 |
| 14.04.2008 | 3,8674 | 4,4352 | 4,1782 | 4,1066 | 4,3784 | 4,3294 |
| 15.04.2008 | 3,9235 | 4,5004 | 4,2359 | 4,1656 | 4,4394 | 4,3909 |
| 16.04.2008 | 4,0003 | 4,5754 | 4,3116 | 4,3096 | 4,5139 | 4,4596 |
| 17.04.2008 | 4,0311 | 4,6002 | 4,3544 | 4,3738 | 4,5387 | 4,5015 |
| 18.04.2008 | 4,0808 | 4,6266 | 4,4054 | 4,4213 | 4,5551 | 4,5399 |
| 21.04.2008 | 4,0654 | 4,539  | 4,3745 | 4,3612 | 4,5393 | 4,5155 |
| 22.04.2008 | 4,1387 | 4,6144 | 4,443  | 4,4158 | 4,5792 | 4,5895 |
| 23.04.2008 | 4,1393 | 4,6904 | 4,437  | 4,4908 | 4,5766 | 4,5899 |
| 24.04.2008 | 4,1711 | 4,7256 | 4,4744 | 4,5263 | 4,6062 | 4,6315 |
| 25.04.2008 | 4,1642 | 4,7098 | 4,4551 | 4,4802 | 4,5804 | 4,614  |
| 28.04.2008 | 4,19   | 4,7242 | 4,4714 | 4,4963 | 4,5977 | 4,6278 |
| 29.04.2008 | 4,1343 | 4,701  | 4,4141 | 4,454  | 4,5424 | 4,5693 |
| 30.04.2008 | 4,1212 | 4,6684 | 4,4039 | 4,4366 | 4,5111 | 4,5447 |
| 01.05.2008 | 4,1158 | 4,6534 | 4,3947 | 4,4379 | 4,5118 | 4,5397 |
| 02.05.2008 | 4,1562 | 4,6719 | 4,4301 | 4,4555 | 4,5652 | 4,5541 |
| 05.05.2008 | 4,1187 | 4,6381 | 4,3919 | 4,416  | 4,5266 | 4,5175 |
| 06.05.2008 | 4,0996 | 4,5287 | 4,3648 | 4,3545 | 4,5134 | 4,4886 |
| 07.05.2008 | 4,1352 | 4,5559 | 4,396  | 4,3948 | 4,5343 | 4,5143 |
| 08.05.2008 | 4,027  | 4,4689 | 4,3026 | 4,3144 | 4,4717 | 4,4199 |
| 09.05.2008 | 3,9492 | 4,4292 | 4,2579 | 4,2591 | 4,4337 | 4,3816 |
| 12.05.2008 | 3,9656 | 4,5053 | 4,2802 | 4,268  | 4,4835 | 4,4511 |
| 13.05.2008 | 4,1194 | 4,5871 | 4,3674 | 4,3445 | 4,5325 | 4,5134 |
| 14.05.2008 | 4,1889 | 4,6526 | 4,4138 | 4,4224 | 4,5896 | 4,5691 |
| 15.05.2008 | 4,2331 | 4,7088 | 4,4366 | 4,4341 | 4,6164 | 4,5859 |
| 16.05.2008 | 4,1947 | 4,6534 | 4,396  | 4,3865 | 4,571  | 4,5294 |
| 19.05.2008 | 4,2339 | 4,6979 | 4,4438 | 4,4535 | 4,6136 | 4,5748 |
| 20.05.2008 | 4,203  | 4,6763 | 4,4167 | 4,4177 | 4,5967 | 4,545  |
| 21.05.2008 | 4,2753 | 4,7351 | 4,4781 | 4,486  | 4,6604 | 4,6007 |
| 22.05.2008 | 4,3084 | 4,7555 | 4,509  | 4,5183 | 4,6402 | 4,6246 |
| 23.05.2008 | 4,275  | 4,7403 | 4,4829 | 4,4935 | 4,6285 | 4,6222 |
| 26.05.2008 | 4,2685 | 4,7761 | 4,4912 | 4,5065 | 4,6485 | 4,6392 |
| 27.05.2008 | 4,2901 | 4,7973 | 4,5098 | 4,534  | 4,6744 | 4,6494 |
| 28.05.2008 | 4,3358 | 4,8341 | 4,5319 | 4,5787 | 4,7383 | 4,6704 |
| 29.05.2008 | 4,4169 | 4,9082 | 4,6128 | 4,6595 | 4,8256 | 4,7579 |
| 30.05.2008 | 4,3927 | 4,8876 | 4,5841 | 4,6267 | 4,7981 | 4,7331 |
| 02.06.2008 | 4,3343 | 4,8417 | 4,5359 | 4,5765 | 4,7575 | 4,6931 |
| 03.06.2008 | 4,4133 | 4,9112 | 4,6204 | 4,6488 | 4,8259 | 4,765  |
| 04.06.2008 | 4,3704 | 4,8792 | 4,5794 | 4,6125 | 4,7868 | 4,7262 |
| 05.06.2008 | 4,4525 | 4,9549 | 4,6627 | 4,6954 | 4,861  | 4,7994 |
| 06.06.2008 | 4,3874 | 4,9239 | 4,6276 | 4,6509 | 4,8538 | 4,7713 |
| 09.06.2008 | 4,4479 | 5,0292 | 4,7271 | 4,7451 | 4,961  | 4,8631 |
| 10.06.2008 | 4,4787 | 5,0759 | 4,7496 | 4,7822 | 5,0004 | 4,8958 |
| 11.06.2008 | 4,5106 | 5,0906 | 4,7809 | 4,8146 | 5,0067 | 4,9201 |
| 12.06.2008 | 4,5517 | 5,1425 | 4,8275 | 4,8624 | 5,0508 | 4,9664 |
| 13.06.2008 | 4,596  | 5,189  | 4,8689 | 4,9116 | 5,1067 | 5,0052 |
| 16.06.2008 | 4,5894 | 5,1884 | 4,854  | 4,9113 | 5,1044 | 4,9975 |
| 17.06.2008 | 4,5662 | 5,1665 | 4,8387 | 4,887  | 5,0747 | 4,9754 |
| 18.06.2008 | 4,5692 | 5,1507 | 4,8283 | 4,8848 | 5,0563 | 4,9646 |
| 19.06.2008 | 4,6286 | 5,2108 | 4,8773 | 4,9223 | 5,1045 | 5,0159 |
| 20.06.2008 | 4,5778 | 5,1659 | 4,8295 | 4,8496 | 5,069  | 4,9727 |
| 23.06.2008 | 4,549  | 5,152  | 4,8158 | 4,8279 | 5,0626 | 4,9526 |
| 24.06.2008 | 4,5529 | 5,1851 | 4,8143 | 4,8413 | 5,0798 | 4,9611 |
| 25.06.2008 | 4,5648 | 5,1957 | 4,8255 | 4,891  | 5,0801 | 4,9706 |
| 26.06.2008 | 4,479  | 5,1248 | 4,7365 | 4,8051 | 5,0102 | 4,8867 |
| 27.06.2008 | 4,4787 | 5,1341 | 4,7503 | 4,8178 | 5,0361 | 4,9162 |
| 30.06.2008 | 4,5717 | 5,2251 | 4,8417 | 4,9269 | 5,1138 | 5,0119 |
| 01.07.2008 | 4,56   | 5,2159 | 4,834  | 4,9115 | 5,0926 | 5,0004 |
| 02.07.2008 | 4,6047 | 5,2525 | 4,8655 | 4,9465 | 5,1133 | 5,0244 |
| 03.07.2008 | 4,5121 | 5,161  | 4,784  | 4,8374 | 5,017  | 4,9391 |
| 04.07.2008 | 4,4586 | 5,1078 | 4,7255 | 4,7788 | 4,9614 | 4,8803 |
| 07.07.2008 | 4,3918 | 5,0625 | 4,6655 | 4,7194 | 4,9019 | 4,824  |
| 08.07.2008 | 4,3794 | 4,9854 | 4,6597 | 4,7148 | 4,8954 | 4,8404 |
| 09.07.2008 | 4,3799 | 4,9852 | 4,6523 | 4,7063 | 4,8807 | 4,8318 |
| 10.07.2008 | 4,3642 | 4,9742 | 4,6406 | 4,6905 | 4,8733 | 4,8103 |
| 11.07.2008 | 4,3888 | 4,9923 | 4,6761 | 4,7164 | 4,8943 | 4,8153 |
| 14.07.2008 | 4,3641 | 4,963  | 4,6477 | 4,6957 | 4,8758 | 4,7918 |
| 15.07.2008 | 4,3511 | 4,9625 | 4,6511 | 4,6912 | 4,8879 | 4,7777 |
| 16.07.2008 | 4,3619 | 4,9761 | 4,6649 | 4,7032 | 4,8894 | 4,8023 |
| 17.07.2008 | 4,413  | 5,025  | 4,7212 | 4,752  | 4,9316 | 4,8557 |
| 18.07.2008 | 4,5367 | 5,1415 | 4,8423 | 4,8771 | 5,0413 | 4,9712 |
| 21.07.2008 | 4,5874 | 5,1975 | 4,8986 | 4,9267 | 5,0776 | 5,0133 |

|            |        |        |        |        |        |        |
|------------|--------|--------|--------|--------|--------|--------|
| 22.07.2008 | 4,593  | 5,2039 | 4,8868 | 4,9201 | 5,0725 | 5,0179 |
| 23.07.2008 | 4,6181 | 5,2202 | 4,8945 | 4,9296 | 5,0801 | 5,0243 |
| 24.07.2008 | 4,5273 | 5,1394 | 4,8093 | 4,8293 | 5,0016 | 4,9417 |
| 25.07.2008 | 4,5616 | 5,1695 | 4,8486 | 4,8691 | 5,0447 | 4,9784 |
| 28.07.2008 | 4,4877 | 5,0919 | 4,7698 | 4,7961 | 4,9662 | 4,9029 |
| 29.07.2008 | 4,4375 | 5,0492 | 4,7218 | 4,7527 | 4,942  | 4,8588 |
| 30.07.2008 | 4,3909 | 4,9935 | 4,6714 | 4,699  | 4,8846 | 4,8091 |
| 31.07.2008 | 4,33   | 4,933  | 4,6165 | 4,648  | 4,824  | 4,7475 |
| 01.08.2008 | 4,3147 | 4,9298 | 4,6138 | 4,6449 | 4,8188 | 4,7385 |
| 04.08.2008 | 4,2967 | 4,9421 | 4,6032 | 4,6263 | 4,8061 | 4,7246 |
| 05.08.2008 | 4,2754 | 4,918  | 4,5807 | 4,607  | 4,7757 | 4,7014 |
| 06.08.2008 | 4,3015 | 4,9329 | 4,6063 | 4,6265 | 4,7874 | 4,7263 |
| 07.08.2008 | 4,2217 | 4,8562 | 4,525  | 4,5591 | 4,7085 | 4,6491 |
| 08.08.2008 | 4,219  | 4,856  | 4,5198 | 4,55   | 4,6996 | 4,6545 |
| 11.08.2008 | 4,2315 | 4,8683 | 4,5311 | 4,5619 | 4,7152 | 4,6711 |
| 12.08.2008 | 4,1942 | 4,832  | 4,4924 | 4,5213 | 4,6931 | 4,635  |
| 13.08.2008 | 4,1748 | 4,8181 | 4,4751 | 4,506  | 4,6866 | 4,6235 |
| 14.08.2008 | 4,1767 | 4,8037 | 4,4748 | 4,5076 | 4,6831 | 4,6174 |
| 15.08.2008 | 4,15   | 4,7738 | 4,442  | 4,4713 | 4,655  | 4,5838 |
| 18.08.2008 | 4,1265 | 4,7558 | 4,4248 | 4,4538 | 4,6414 | 4,569  |
| 19.08.2008 | 4,1466 | 4,7724 | 4,4554 | 4,4786 | 4,6719 | 4,5891 |
| 20.08.2008 | 4,1026 | 4,7438 | 4,4452 | 4,4379 | 4,6291 | 4,5557 |
| 21.08.2008 | 4,1538 | 4,7897 | 4,4946 | 4,4887 | 4,6691 | 4,6015 |
| 22.08.2008 | 4,1969 | 4,8386 | 4,5383 | 4,532  | 4,7104 | 4,6419 |
| 25.08.2008 | 4,1044 | 4,7836 | 4,4479 | 4,4419 | 4,7425 | 4,5576 |
| 26.08.2008 | 4,0935 | 4,7809 | 4,4428 | 4,4348 | 4,6758 | 4,5529 |
| 27.08.2008 | 4,1565 | 4,8379 | 4,5042 | 4,5005 | 4,7411 | 4,6151 |
| 28.08.2008 | 4,1416 | 4,8406 | 4,5062 | 4,5082 | 4,7366 | 4,6188 |
| 29.08.2008 | 4,1396 | 4,8421 | 4,5071 | 4,5079 | 4,7337 | 4,6143 |
| 01.09.2008 | 4,0911 | 4,784  | 4,4595 | 4,4594 | 4,6839 | 4,5636 |
| 02.09.2008 | 4,1088 | 4,7792 | 4,4773 | 4,4799 | 4,6891 | 4,5835 |
| 03.09.2008 | 4,1111 | 4,7829 | 4,478  | 4,4752 | 4,6893 | 4,576  |
| 04.09.2008 | 4,045  | 4,7294 | 4,4142 | 4,4179 | 4,6313 | 4,5293 |
| 05.09.2008 | 3,9788 | 4,6883 | 4,3803 | 4,3646 | 4,6025 | 4,4932 |
| 08.09.2008 | 4,0427 | 4,7548 | 4,4496 | 4,4248 | 4,6624 | 4,5539 |
| 09.09.2008 | 4,0214 | 4,7545 | 4,4301 | 4,4082 | 4,6506 | 4,5434 |
| 10.09.2008 | 4,0421 | 4,777  | 4,441  | 4,4299 | 4,6606 | 4,5459 |
| 11.09.2008 | 4,0611 | 4,7789 | 4,4653 | 4,4558 | 4,6788 | 4,5724 |
| 12.09.2008 | 4,1724 | 4,8633 | 4,5568 | 4,5475 | 4,76   | 4,6427 |
| 15.09.2008 | 4,0368 | 4,7974 | 4,4667 | 4,4354 | 4,6892 | 4,5569 |
| 16.09.2008 | 3,9828 | 4,7718 | 4,4469 | 4,4133 | 4,6658 | 4,5261 |
| 17.09.2008 | 4,0122 | 4,7909 | 4,4857 | 4,4419 | 4,6974 | 4,5437 |
| 18.09.2008 | 4,0325 | 4,8526 | 4,5455 | 4,4797 | 4,7745 | 4,6341 |
| 19.09.2008 | 4,1995 | 4,9699 | 4,6629 | 4,6321 | 4,852  | 4,7433 |
| 22.09.2008 | 4,2526 | 4,9534 | 4,6989 | 4,6814 | 4,8617 | 4,7635 |
| 23.09.2008 | 4,2324 | 4,947  | 4,6791 | 4,6554 | 4,8504 | 4,7392 |
| 24.09.2008 | 4,16   | 4,8863 | 4,6009 | 4,5792 | 4,7754 | 4,664  |
| 25.09.2008 | 4,2223 | 4,9474 | 4,6552 | 4,6284 | 4,8297 | 4,7161 |
| 26.09.2008 | 4,1598 | 4,8995 | 4,5954 | 4,5802 | 4,8004 | 4,6626 |
| 29.09.2008 | 3,9748 | 4,828  | 4,4966 | 4,4592 | 4,7824 | 4,6027 |
| 30.09.2008 | 4,0065 | 4,8756 | 4,5424 | 4,5525 | 4,8173 | 4,6498 |
| 01.10.2008 | 3,9854 | 4,8453 | 4,5002 | 4,5475 | 4,7508 | 4,6121 |
| 02.10.2008 | 3,9299 | 4,7708 | 4,4444 | 4,4784 | 4,6783 | 4,5389 |
| 03.10.2008 | 3,917  | 4,7369 | 4,4297 | 4,4663 | 4,6526 | 4,5105 |
| 06.10.2008 | 3,752  | 4,6012 | 4,2694 | 4,3054 | 4,5124 | 4,3551 |
| 07.10.2008 | 3,7439 | 4,609  | 4,2712 | 4,3062 | 4,5141 | 4,3535 |
| 08.10.2008 | 3,7993 | 4,6878 | 4,3513 | 4,3543 | 4,5888 | 4,4364 |
| 09.10.2008 | 3,8777 | 4,7776 | 4,4314 | 4,4487 | 4,6644 | 4,5185 |
| 10.10.2008 | 3,9906 | 4,9266 | 4,5689 | 4,5856 | 4,8018 | 4,6421 |
| 13.10.2008 | 4,0698 | 4,9542 | 4,6428 | 4,6929 | 4,804  | 4,6797 |
| 14.10.2008 | 4,1215 | 4,9236 | 4,6255 | 4,6831 | 4,7675 | 4,6324 |
| 15.10.2008 | 4,1342 | 4,8998 | 4,583  | 4,6754 | 4,7328 | 4,5727 |
| 16.10.2008 | 4,0847 | 4,8541 | 4,5372 | 4,6304 | 4,6986 | 4,5318 |
| 17.10.2008 | 4,0328 | 4,7864 | 4,4917 | 4,5701 | 4,6702 | 4,4964 |
| 20.10.2008 | 4,0295 | 4,7786 | 4,4843 | 4,5741 | 4,6527 | 4,4867 |
| 21.10.2008 | 3,9633 | 4,7326 | 4,399  | 4,5108 | 4,6204 | 4,4372 |
| 22.10.2008 | 3,8322 | 4,6654 | 4,2985 | 4,4346 | 4,5399 | 4,3504 |
| 23.10.2008 | 3,802  | 4,7465 | 4,3023 | 4,4539 | 4,5553 | 4,373  |
| 24.10.2008 | 3,7777 | 4,767  | 4,3295 | 4,4755 | 4,5725 | 4,3986 |
| 27.10.2008 | 3,7904 | 4,7889 | 4,3554 | 4,5404 | 4,6204 | 4,4387 |
| 28.10.2008 | 3,787  | 4,8461 | 4,3425 | 4,5722 | 4,659  | 4,4337 |
| 29.10.2008 | 3,8279 | 5,0605 | 4,3998 | 4,6182 | 4,8035 | 4,5554 |
| 30.10.2008 | 3,8149 | 5,1422 | 4,408  | 4,6611 | 4,8875 | 4,6007 |
| 31.10.2008 | 3,9459 | 5,37   | 4,5708 | 4,8364 | 5,0452 | 4,7708 |
| 03.11.2008 | 3,8908 | 5,3853 | 4,5047 | 4,8276 | 4,9266 | 4,7104 |

|            |        |        |        |        |        |        |
|------------|--------|--------|--------|--------|--------|--------|
| 04.11.2008 | 3,864  | 5,2003 | 4,4827 | 4,8119 | 4,7697 | 4,6858 |
| 05.11.2008 | 3,8257 | 5,2279 | 4,4192 | 4,7397 | 4,6797 | 4,6118 |
| 06.11.2008 | 3,7606 | 5,0827 | 4,2854 | 4,6581 | 4,5772 | 4,5315 |
| 07.11.2008 | 3,7355 | 5,1223 | 4,1922 | 4,6016 | 4,5165 | 4,4023 |
| 10.11.2008 | 3,7393 | 5,0238 | 4,1744 | 4,5129 | 4,5043 | 4,3879 |
| 11.11.2008 | 3,7294 | 5,03   | 4,1516 | 4,5135 | 4,5312 | 4,376  |
| 12.11.2008 | 3,6848 | 5,03   | 4,1101 | 4,4957 | 4,566  | 4,3723 |
| 13.11.2008 | 3,6974 | 5,0876 | 4,12   | 4,4977 | 4,6023 | 4,3802 |
| 14.11.2008 | 3,6592 | 5,0282 | 4,0702 | 4,4584 | 4,5322 | 4,331  |
| 17.11.2008 | 3,6492 | 4,9365 | 4,0668 | 4,4633 | 4,5928 | 4,3424 |
| 18.11.2008 | 3,6406 | 4,9536 | 4,0441 | 4,4652 | 4,5578 | 4,3147 |
| 19.11.2008 | 3,5463 | 4,8704 | 3,9485 | 4,355  | 4,4546 | 4,2229 |
| 20.11.2008 | 3,4067 | 4,7455 | 3,8336 | 4,2529 | 4,3493 | 4,083  |
| 21.11.2008 | 3,4025 | 4,7649 | 3,8525 | 4,2558 | 4,3583 | 4,0985 |
| 24.11.2008 | 3,4411 | 4,7979 | 3,9329 | 4,3042 | 4,3888 | 4,141  |
| 25.11.2008 | 3,3688 | 4,7209 | 3,8867 | 4,2524 | 4,3381 | 4,0701 |
| 26.11.2008 | 3,3049 | 4,6717 | 3,8406 | 4,1999 | 4,2926 | 4,0058 |
| 27.11.2008 | 3,3169 | 4,7251 | 3,8722 | 4,1959 | 4,3488 | 4,0216 |
| 28.11.2008 | 3,2761 | 4,6965 | 3,8558 | 4,1875 | 4,3668 | 3,992  |
| 01.12.2008 | 3,1832 | 4,6097 | 3,814  | 4,1649 | 4,3376 | 3,9426 |
| 02.12.2008 | 3,0661 | 4,4957 | 3,702  | 4,1088 | 4,2221 | 3,82   |
| 03.12.2008 | 3,055  | 4,4682 | 3,6722 | 4,1194 | 4,2073 | 3,7956 |
| 04.12.2008 | 3,1211 | 4,6087 | 3,7941 | 4,2074 | 4,3538 | 3,9324 |
| 05.12.2008 | 3,0666 | 4,5564 | 3,7695 | 4,1464 | 4,3614 | 3,9145 |
| 08.12.2008 | 3,1608 | 4,6519 | 3,8672 | 4,3657 | 4,4478 | 4,0471 |
| 09.12.2008 | 3,2844 | 4,7388 | 3,9738 | 4,491  | 4,4989 | 4,1533 |
| 10.12.2008 | 3,2427 | 4,7302 | 3,9409 | 4,4616 | 4,4111 | 4,1096 |
| 11.12.2008 | 3,2459 | 4,8716 | 3,9253 | 4,4453 | 4,4212 | 4,0905 |
| 12.12.2008 | 3,3261 | 5,1353 | 4,0005 | 4,5151 | 4,538  | 4,163  |
| 15.12.2008 | 3,2256 | 5,2008 | 3,9317 | 4,5445 | 4,5034 | 4,1234 |
| 16.12.2008 | 3,1626 | 5,147  | 3,8894 | 4,4062 | 4,4121 | 4,0512 |
| 17.12.2008 | 3,0173 | 5,1073 | 3,7457 | 4,3067 | 4,2936 | 3,9032 |
| 18.12.2008 | 3,0119 | 5,1139 | 3,7337 | 4,3145 | 4,2831 | 3,8904 |
| 19.12.2008 | 3,0492 | 5,1545 | 3,7636 | 4,344  | 4,3247 | 3,9327 |
| 22.12.2008 | 2,9962 | 5,1201 | 3,7319 | 4,3161 | 4,2904 | 3,9246 |
| 23.12.2008 | 3,0112 | 5,1103 | 3,7603 | 4,3327 | 4,2823 | 3,9435 |
| 24.12.2008 | 2,9993 | 5,1103 | 3,7482 | 4,3142 | 4,2741 | 3,9358 |
| 25.12.2008 | 2,9984 | 5,1094 | 3,7398 | 4,3188 | 4,2759 | 3,931  |
| 26.12.2008 | 2,9985 | 5,1095 | 3,8395 | 4,3195 | 4,2757 | 3,9311 |
| 29.12.2008 | 2,9846 | 5,0878 | 3,81   | 4,3014 | 4,302  | 3,9034 |
| 30.12.2008 | 3,0134 | 5,0969 | 3,8591 | 4,3423 | 4,3445 | 4,007  |
| 31.12.2008 | 3,0187 | 5,0951 | 3,846  | 4,3497 | 4,3433 | 4,01   |
| 01.01.2009 | 3,0178 | 5,0941 | 3,8461 | 4,3504 | 4,343  | 4,0185 |
| 02.01.2009 | 3,0311 | 5,0914 | 3,8297 | 4,3179 | 4,2895 | 4,0071 |
| 05.01.2009 | 3,0946 | 5,0808 | 3,8864 | 4,3376 | 4,2816 | 3,9664 |
| 06.01.2009 | 3,2183 | 5,223  | 4,0149 | 4,55   | 4,4115 | 4,1045 |
| 07.01.2009 | 3,2448 | 5,1655 | 4,0165 | 4,6199 | 4,377  | 4,1507 |
| 08.01.2009 | 3,2015 | 5,1064 | 3,9646 | 4,6115 | 4,3205 | 4,1525 |
| 09.01.2009 | 3,0957 | 5,117  | 3,8936 | 4,5424 | 4,2934 | 4,1142 |
| 12.01.2009 | 3,0662 | 5,2695 | 3,9546 | 4,5203 | 4,3535 | 4,0464 |
| 13.01.2009 | 3,0657 | 5,3485 | 4,0408 | 4,5871 | 4,3906 | 4,1456 |
| 14.01.2009 | 3,0053 | 5,3194 | 4,0067 | 4,6556 | 4,38   | 4,1366 |
| 15.01.2009 | 2,9609 | 5,3288 | 4,0931 | 4,6312 | 4,3885 | 4,2233 |
| 16.01.2009 | 3,02   | 5,4764 | 4,2048 | 4,8065 | 4,4238 | 4,2369 |
| 19.01.2009 | 3,09   | 5,5658 | 4,2373 | 5,0623 | 4,4379 | 4,2825 |
| 20.01.2009 | 3,1277 | 5,7693 | 4,289  | 5,3103 | 4,5222 | 4,272  |
| 21.01.2009 | 3,0478 | 5,7898 | 4,2781 | 5,5236 | 4,5302 | 4,389  |
| 22.01.2009 | 3,1631 | 5,9415 | 4,3398 | 5,678  | 4,5937 | 4,5579 |
| 23.01.2009 | 3,2953 | 6,0886 | 4,4389 | 5,8165 | 4,7479 | 4,6719 |
| 26.01.2009 | 3,4155 | 6,0222 | 4,5463 | 5,9878 | 4,8493 | 4,7266 |
| 27.01.2009 | 3,3354 | 5,8411 | 4,4515 | 5,8444 | 4,7127 | 4,6684 |
| 28.01.2009 | 3,3089 | 5,8114 | 4,4171 | 5,707  | 4,6288 | 4,569  |
| 29.01.2009 | 3,304  | 5,4561 | 4,3866 | 5,4925 | 4,513  | 4,4831 |
| 30.01.2009 | 3,3316 | 5,5343 | 4,4217 | 5,4251 | 4,5559 | 4,5504 |
| 02.02.2009 | 3,331  | 5,5795 | 4,4154 | 5,4973 | 4,4915 | 4,5462 |
| 03.02.2009 | 3,3712 | 5,5181 | 4,4011 | 5,4365 | 4,4651 | 4,5306 |
| 04.02.2009 | 3,4269 | 5,3905 | 4,3602 | 5,3715 | 4,3978 | 4,5186 |
| 05.02.2009 | 3,4063 | 5,4212 | 4,3128 | 5,369  | 4,4333 | 4,4971 |
| 06.02.2009 | 3,4262 | 5,4815 | 4,3177 | 5,3716 | 4,4315 | 4,575  |
| 09.02.2009 | 3,4653 | 5,472  | 4,285  | 5,3908 | 4,4403 | 4,5169 |
| 10.02.2009 | 3,4252 | 5,471  | 4,2465 | 5,3834 | 4,4376 | 4,4879 |
| 11.02.2009 | 3,2504 | 5,3912 | 4,1362 | 5,2734 | 4,403  | 4,4484 |
| 12.02.2009 | 3,1531 | 5,5213 | 4,1112 | 5,304  | 4,3856 | 4,4407 |
| 13.02.2009 | 3,1855 | 5,6406 | 4,1535 | 5,4631 | 4,46   | 4,5106 |
| 16.02.2009 | 3,1143 | 5,7479 | 4,1628 | 5,5746 | 4,4869 | 4,6333 |

|            |        |        |        |        |        |        |
|------------|--------|--------|--------|--------|--------|--------|
| 17.02.2009 | 3,0516 | 5,743  | 4,1264 | 5,5585 | 4,4506 | 4,6143 |
| 18.02.2009 | 3,0544 | 5,6751 | 4,0735 | 5,5315 | 4,4101 | 4,5894 |
| 19.02.2009 | 3,1433 | 5,617  | 4,1629 | 5,5322 | 4,3975 | 4,57   |
| 20.02.2009 | 3,0945 | 5,5237 | 4,0918 | 5,4787 | 4,3674 | 4,5084 |
| 23.02.2009 | 3,0722 | 5,4245 | 4,0419 | 5,3497 | 4,323  | 4,4522 |
| 24.02.2009 | 3,0612 | 5,4629 | 4,0612 | 5,4139 | 4,3982 | 4,5278 |
| 25.02.2009 | 3,0599 | 5,4684 | 4,0526 | 5,4514 | 4,433  | 4,5133 |
| 26.02.2009 | 3,2037 | 5,5769 | 4,1743 | 5,5133 | 4,5541 | 4,5779 |
| 27.02.2009 | 3,1534 | 5,5769 | 4,1357 | 5,519  | 4,5224 | 4,5725 |
| 02.03.2009 | 3,1036 | 5,5419 | 4,0992 | 5,4938 | 4,4936 | 4,5252 |
| 03.03.2009 | 3,1291 | 5,6902 | 4,1174 | 5,5221 | 4,4995 | 4,5641 |
| 04.03.2009 | 3,1827 | 5,7598 | 4,1175 | 5,6335 | 4,5259 | 4,5571 |
| 05.03.2009 | 3,0783 | 5,6678 | 3,9782 | 5,5955 | 4,4233 | 4,4892 |
| 06.03.2009 | 2,9624 | 5,6224 | 3,9069 | 5,5724 | 4,3809 | 4,4325 |
| 09.03.2009 | 2,9884 | 5,6584 | 3,9031 | 5,6144 | 4,3775 | 4,4622 |
| 10.03.2009 | 3,0549 | 5,6963 | 3,9533 | 5,6605 | 4,4144 | 4,5202 |
| 11.03.2009 | 3,1221 | 5,7117 | 3,9709 | 5,6201 | 4,4465 | 4,5289 |
| 12.03.2009 | 3,0561 | 5,6776 | 3,9347 | 5,6833 | 4,4365 | 4,4724 |
| 13.03.2009 | 3,1065 | 5,7079 | 3,9788 | 5,7334 | 4,4395 | 4,5068 |
| 16.03.2009 | 3,1974 | 5,7732 | 4,0457 | 5,8166 | 4,4515 | 4,4902 |
| 17.03.2009 | 3,2317 | 5,7202 | 4,0885 | 5,83   | 4,4459 | 4,4763 |
| 18.03.2009 | 3,2606 | 5,7191 | 4,1207 | 5,8787 | 4,4563 | 4,6856 |
| 19.03.2009 | 3,0883 | 5,5284 | 4,0027 | 5,8775 | 4,3115 | 4,5689 |
| 20.03.2009 | 3,0433 | 5,2743 | 3,939  | 5,8639 | 4,2281 | 4,5091 |
| 23.03.2009 | 3,086  | 5,2875 | 3,9614 | 5,6526 | 4,293  | 4,5325 |
| 24.03.2009 | 3,2163 | 5,3895 | 4,0749 | 5,684  | 4,3989 | 4,5738 |
| 25.03.2009 | 3,194  | 5,3814 | 4,0261 | 5,4359 | 4,329  | 4,5271 |
| 26.03.2009 | 3,1944 | 5,281  | 3,9859 | 5,3909 | 4,3254 | 4,5754 |
| 27.03.2009 | 3,1215 | 5,2703 | 3,9428 | 5,2529 | 4,3112 | 4,5043 |
| 30.03.2009 | 3,0703 | 5,355  | 3,9642 | 5,3595 | 4,3928 | 4,5503 |
| 31.03.2009 | 3,0334 | 5,3509 | 3,9657 | 5,4225 | 4,3804 | 4,5551 |
| 01.04.2009 | 3,0146 | 5,3038 | 3,9548 | 5,429  | 4,3246 | 4,5563 |
| 02.04.2009 | 3,1477 | 5,3544 | 4,0263 | 5,3295 | 4,391  | 4,6129 |
| 03.04.2009 | 3,2174 | 5,3325 | 4,0356 | 5,3046 | 4,3891 | 4,6285 |
| 06.04.2009 | 3,2213 | 5,2948 | 3,9857 | 5,1696 | 4,3995 | 4,5979 |
| 07.04.2009 | 3,2419 | 5,3258 | 4,0529 | 5,2221 | 4,4547 | 4,5941 |
| 08.04.2009 | 3,2292 | 5,2949 | 4,0558 | 5,2806 | 4,4435 | 4,6014 |
| 09.04.2009 | 3,2985 | 5,333  | 4,1039 | 5,3514 | 4,4598 | 4,6566 |
| 10.04.2009 | 3,2919 | 5,3237 | 4,086  | 5,3478 | 4,4367 | 4,6566 |
| 13.04.2009 | 3,2952 | 5,3349 | 4,086  | 5,3469 | 4,4306 | 4,6629 |
| 14.04.2009 | 3,2475 | 5,2754 | 4,0324 | 5,307  | 4,4042 | 4,6069 |
| 15.04.2009 | 3,1868 | 5,245  | 3,984  | 5,272  | 4,3449 | 4,571  |
| 16.04.2009 | 3,2134 | 5,2426 | 3,9965 | 5,3151 | 4,3302 | 4,5874 |
| 17.04.2009 | 3,3133 | 5,3218 | 4,076  | 5,3151 | 4,3767 | 4,5524 |
| 20.04.2009 | 3,1906 | 5,1702 | 3,9454 | 5,2845 | 4,3127 | 4,5852 |
| 21.04.2009 | 3,1682 | 5,1764 | 3,9329 | 5,2552 | 4,3363 | 4,4554 |
| 22.04.2009 | 3,2432 | 5,1916 | 3,9634 | 5,2587 | 4,3358 | 4,5682 |
| 23.04.2009 | 3,2979 | 5,1313 | 3,9815 | 5,2716 | 4,3194 | 4,5427 |
| 24.04.2009 | 3,2415 | 5,1059 | 3,9524 | 5,1491 | 4,3016 | 4,4657 |
| 27.04.2009 | 3,2099 | 5,0854 | 3,9139 | 5,1316 | 4,2767 | 4,4217 |
| 28.04.2009 | 3,208  | 5,1169 | 3,9275 | 5,1383 | 4,2975 | 4,4301 |
| 29.04.2009 | 3,1988 | 5,1065 | 3,881  | 5,15   | 4,2869 | 4,4043 |
| 30.04.2009 | 3,244  | 5,1067 | 3,9013 | 5,1004 | 4,2961 | 4,4021 |
| 01.05.2009 | 3,2369 | 5,1027 | 3,8955 | 5,1041 | 4,2928 | 4,39   |
| 04.05.2009 | 3,2968 | 5,1355 | 3,93   | 5,1273 | 4,2887 | 4,3243 |
| 05.05.2009 | 3,2496 | 5,0221 | 3,8741 | 5,0914 | 4,2048 | 4,2505 |
| 06.05.2009 | 3,2725 | 4,9615 | 3,8988 | 5,0512 | 4,2237 | 4,2326 |
| 07.05.2009 | 3,4224 | 4,8937 | 3,9963 | 5,0387 | 4,2619 | 4,2872 |
| 08.05.2009 | 3,4669 | 4,8065 | 3,9912 | 5,0266 | 4,2608 | 4,2928 |
| 11.05.2009 | 3,4123 | 4,7571 | 3,9554 | 5,0543 | 4,2347 | 4,1737 |
| 12.05.2009 | 3,4519 | 4,8437 | 3,9925 | 5,086  | 4,3161 | 4,2014 |
| 13.05.2009 | 3,3742 | 4,8399 | 3,9382 | 5,0741 | 4,2957 | 4,1788 |
| 14.05.2009 | 3,3554 | 4,8801 | 3,9682 | 5,0788 | 4,2904 | 4,215  |
| 15.05.2009 | 3,4224 | 4,8643 | 4,0208 | 5,1139 | 4,2813 | 4,2124 |
| 18.05.2009 | 3,3967 | 4,8316 | 3,9871 | 5,099  | 4,2583 | 4,1647 |
| 19.05.2009 | 3,4917 | 4,8692 | 4,0878 | 5,1505 | 4,2947 | 4,217  |
| 20.05.2009 | 3,4703 | 4,8209 | 4,0595 | 5,1861 | 4,2635 | 4,2001 |
| 21.05.2009 | 3,3891 | 4,8043 | 4,0498 | 5,1408 | 4,2702 | 4,2277 |
| 22.05.2009 | 3,5189 | 4,7379 | 4,1571 | 5,2097 | 4,3315 | 4,2763 |
| 25.05.2009 | 3,5946 | 4,7979 | 4,2374 | 5,3049 | 4,3937 | 4,2836 |
| 26.05.2009 | 3,589  | 4,8118 | 4,2348 | 5,3121 | 4,3956 | 4,3284 |
| 27.05.2009 | 3,6113 | 4,8267 | 4,2452 | 5,372  | 4,4165 | 4,4287 |
| 28.05.2009 | 3,6249 | 4,8676 | 4,2772 | 5,364  | 4,4801 | 4,392  |
| 29.05.2009 | 3,5978 | 4,8615 | 4,2701 | 5,4207 | 4,4332 | 4,3905 |
| 01.06.2009 | 3,6431 | 4,8943 | 4,3084 | 5,4581 | 4,4637 | 4,3914 |

|            |        |        |        |        |        |        |
|------------|--------|--------|--------|--------|--------|--------|
| 02.06.2009 | 3,6423 | 4,9859 | 4,2884 | 5,4063 | 4,488  | 4,4363 |
| 03.06.2009 | 3,571  | 4,9402 | 4,2423 | 5,4099 | 4,4433 | 4,4201 |
| 04.06.2009 | 3,6406 | 5,0467 | 4,3418 | 5,603  | 4,561  | 4,528  |
| 05.06.2009 | 3,7304 | 5,1482 | 4,3721 | 5,6795 | 4,601  | 4,5857 |
| 08.06.2009 | 3,6625 | 5,1099 | 4,2806 | 5,6373 | 4,5785 | 4,5251 |
| 09.06.2009 | 3,6225 | 5,2176 | 4,252  | 5,625  | 4,5814 | 4,5405 |
| 10.06.2009 | 3,6592 | 5,3281 | 4,2783 | 5,6386 | 4,6117 | 4,5268 |
| 11.06.2009 | 3,7028 | 5,3114 | 4,3171 | 5,6635 | 4,6398 | 4,5541 |
| 12.06.2009 | 3,6242 | 5,262  | 4,2772 | 5,6013 | 4,5846 | 4,538  |
| 15.06.2009 | 3,5279 | 5,1622 | 4,1799 | 5,5676 | 4,506  | 4,5078 |
| 16.06.2009 | 3,5374 | 5,2044 | 4,2159 | 5,4786 | 4,5421 | 4,4868 |
| 17.06.2009 | 3,4931 | 5,1755 | 4,1948 | 5,4642 | 4,5091 | 4,4424 |
| 18.06.2009 | 3,5434 | 5,2222 | 4,2144 | 5,4775 | 4,5302 | 4,4907 |
| 19.06.2009 | 3,514  | 5,1689 | 4,1847 | 5,6239 | 4,5043 | 4,4669 |
| 22.06.2009 | 3,4644 | 5,1219 | 4,1446 | 5,649  | 4,4937 | 4,4622 |
| 23.06.2009 | 3,4788 | 5,1342 | 4,1427 | 5,7252 | 4,5269 | 4,5093 |
| 24.06.2009 | 3,4759 | 5,1092 | 4,1101 | 5,6905 | 4,4904 | 4,4829 |
| 25.06.2009 | 3,4495 | 5,0439 | 4,0861 | 5,6858 | 4,4606 | 4,4539 |
| 26.06.2009 | 3,4174 | 5,0069 | 4,0616 | 5,6292 | 4,4286 | 4,4327 |
| 29.06.2009 | 3,3874 | 4,9369 | 4,0328 | 5,5875 | 4,3494 | 4,4068 |
| 30.06.2009 | 3,4023 | 4,9405 | 4,0437 | 5,5758 | 4,3567 | 4,4153 |
| 01.07.2009 | 3,4367 | 4,9551 | 4,0692 | 5,6212 | 4,3665 | 4,4314 |
| 02.07.2009 | 3,3545 | 4,8866 | 3,9769 | 5,7605 | 4,3059 | 4,3654 |
| 03.07.2009 | 3,3554 | 4,8807 | 3,9901 | 5,6897 | 4,3036 | 4,3718 |
| 06.07.2009 | 3,3172 | 4,8349 | 3,9618 | 5,6721 | 4,3087 | 4,3422 |
| 07.07.2009 | 3,3383 | 4,8707 | 3,9832 | 5,4285 | 4,3499 | 4,3381 |
| 08.07.2009 | 3,3151 | 4,9218 | 4,0085 | 5,467  | 4,374  | 4,364  |
| 09.07.2009 | 3,3107 | 4,9178 | 4,0034 | 5,4813 | 4,3868 | 4,331  |
| 10.07.2009 | 3,2804 | 4,8975 | 3,9643 | 5,4426 | 4,3786 | 4,2783 |
| 13.07.2009 | 3,2767 | 4,9326 | 3,9834 | 5,3661 | 4,3616 | 4,3023 |
| 14.07.2009 | 3,3168 | 4,9589 | 4,0223 | 5,3349 | 4,3755 | 4,3306 |
| 15.07.2009 | 3,3815 | 5,0241 | 4,0419 | 5,32   | 4,3769 | 4,3468 |
| 16.07.2009 | 3,3523 | 4,9353 | 4,0037 | 5,3567 | 4,321  | 4,3098 |
| 17.07.2009 | 3,4155 | 4,9698 | 4,0583 | 5,4144 | 4,3177 | 4,3318 |
| 20.07.2009 | 3,433  | 4,9297 | 3,9904 | 5,3401 | 4,2499 | 4,2675 |
| 21.07.2009 | 3,3859 | 4,8054 | 3,9317 | 5,3416 | 4,2065 | 4,2114 |
| 22.07.2009 | 3,3984 | 4,8228 | 3,9355 | 5,2814 | 4,202  | 4,1925 |
| 23.07.2009 | 3,477  | 4,9097 | 3,9735 | 5,2739 | 4,2498 | 4,2351 |
| 24.07.2009 | 3,5113 | 4,9222 | 3,9713 | 5,2041 | 4,2623 | 4,2079 |
| 27.07.2009 | 3,5242 | 4,9202 | 3,9929 | 5,1972 | 4,2471 | 4,1908 |
| 28.07.2009 | 3,4728 | 4,7807 | 3,9452 | 5,1314 | 4,1839 | 4,1357 |
| 29.07.2009 | 3,454  | 4,7245 | 3,9313 | 5,0643 | 4,1503 | 4,0761 |
| 30.07.2009 | 3,4812 | 4,7098 | 3,9297 | 5,0512 | 4,1515 | 4,066  |
| 31.07.2009 | 3,3463 | 4,5855 | 3,8031 | 4,9322 | 4,0555 | 3,9636 |
| 03.08.2009 | 3,3909 | 4,6255 | 3,8504 | 4,97   | 4,0695 | 4,0048 |
| 04.08.2009 | 3,3909 | 4,6199 | 3,8598 | 4,9413 | 4,0562 | 3,9962 |
| 05.08.2009 | 3,3866 | 4,5029 | 3,8576 | 4,9132 | 4,0429 | 3,9783 |
| 06.08.2009 | 3,3909 | 4,5017 | 3,8629 | 4,9243 | 4,0444 | 3,9998 |
| 07.08.2009 | 3,5253 | 4,5873 | 3,943  | 5,0012 | 4,1037 | 4,0811 |
| 10.08.2009 | 3,512  | 4,5495 | 3,8872 | 4,8937 | 4,046  | 4,0311 |
| 11.08.2009 | 3,5037 | 4,5259 | 3,8778 | 4,8854 | 4,0789 | 4,0407 |
| 12.08.2009 | 3,497  | 4,5565 | 3,8957 | 4,9648 | 4,0981 | 4,059  |
| 13.08.2009 | 3,4681 | 4,536  | 3,8658 | 4,9161 | 4,1023 | 4,0443 |
| 14.08.2009 | 3,3608 | 4,4616 | 3,7864 | 4,8289 | 4,0407 | 3,968  |
| 17.08.2009 | 3,3227 | 4,4483 | 3,779  | 4,8138 | 4,0153 | 3,9443 |
| 18.08.2009 | 3,3373 | 4,4441 | 3,7761 | 4,8156 | 4,0105 | 3,9362 |
| 19.08.2009 | 3,2804 | 4,4372 | 3,7415 | 4,7752 | 3,9993 | 3,9117 |
| 20.08.2009 | 3,3037 | 4,4389 | 3,7497 | 4,7874 | 3,9941 | 3,9267 |
| 21.08.2009 | 3,3545 | 4,466  | 3,7865 | 4,8057 | 3,9918 | 3,9326 |
| 24.08.2009 | 3,3486 | 4,4999 | 3,8219 | 4,8158 | 4,0234 | 3,9605 |
| 25.08.2009 | 3,3137 | 4,4377 | 3,7815 | 4,7272 | 3,9595 | 3,9012 |
| 26.08.2009 | 3,3005 | 4,4328 | 3,7596 | 4,7933 | 3,953  | 3,9053 |
| 27.08.2009 | 3,2993 | 4,4179 | 3,7479 | 4,7693 | 3,9434 | 3,892  |
| 28.08.2009 | 3,3188 | 4,4627 | 3,7809 | 4,7926 | 3,9722 | 3,9221 |
| 31.08.2009 | 3,3369 | 4,4855 | 3,799  | 4,8446 | 3,9978 | 3,9412 |
| 01.09.2009 | 3,3362 | 4,5796 | 3,8661 | 4,9282 | 4,0269 | 3,9993 |
| 02.09.2009 | 3,3054 | 4,5639 | 3,8571 | 4,9248 | 4,0277 | 4,0228 |
| 03.09.2009 | 3,3179 | 4,6323 | 3,9108 | 4,9636 | 4,0602 | 4,0493 |
| 04.09.2009 | 3,3091 | 4,611  | 3,8866 | 4,9322 | 4,0528 | 4,0246 |
| 07.09.2009 | 3,2966 | 4,6356 | 3,9205 | 4,9622 | 4,0564 | 4,0257 |
| 08.09.2009 | 3,3424 | 4,6405 | 3,9497 | 5,0026 | 4,0751 | 4,0328 |
| 09.09.2009 | 3,4276 | 4,6295 | 3,9699 | 5,0565 | 4,0789 | 4,0322 |
| 10.09.2009 | 3,3761 | 4,5719 | 3,8731 | 4,9787 | 4,0322 | 3,9684 |
| 11.09.2009 | 3,313  | 4,4841 | 3,8038 | 4,8887 | 3,9605 | 3,909  |
| 14.09.2009 | 3,3338 | 4,5061 | 3,8528 | 4,9423 | 3,9805 | 3,9273 |

|            |        |        |        |        |        |        |
|------------|--------|--------|--------|--------|--------|--------|
| 15.09.2009 | 3,371  | 4,4988 | 3,8698 | 4,9393 | 3,983  | 3,9421 |
| 16.09.2009 | 3,4205 | 4,5324 | 3,8828 | 4,9359 | 3,9923 | 3,9684 |
| 17.09.2009 | 3,4366 | 4,522  | 3,8871 | 4,9129 | 3,9982 | 3,9801 |
| 18.09.2009 | 3,4511 | 4,5381 | 3,8957 | 4,8941 | 3,998  | 3,9771 |
| 21.09.2009 | 3,4542 | 4,5583 | 3,9095 | 4,9205 | 4,0099 | 4,0005 |
| 22.09.2009 | 3,468  | 4,5633 | 3,8989 | 4,8907 | 4,0186 | 3,9985 |
| 23.09.2009 | 3,4431 | 4,502  | 3,8606 | 4,8119 | 4,0135 | 3,9755 |
| 24.09.2009 | 3,3783 | 4,4685 | 3,7961 | 4,7739 | 3,9624 | 3,9166 |
| 25.09.2009 | 3,3436 | 4,4624 | 3,7933 | 4,7446 | 3,9396 | 3,8944 |
| 28.09.2009 | 3,3295 | 4,4572 | 3,7854 | 4,7422 | 3,9321 | 3,8844 |
| 29.09.2009 | 3,3183 | 4,4547 | 3,7959 | 4,7226 | 3,932  | 3,8769 |
| 30.09.2009 | 3,2963 | 4,4904 | 3,8041 | 4,726  | 3,9387 | 3,8874 |
| 01.10.2009 | 3,2588 | 4,5589 | 3,8128 | 4,8429 | 3,9615 | 3,9343 |
| 02.10.2009 | 3,2188 | 4,5132 | 3,7848 | 4,8438 | 3,9032 | 3,8811 |
| 05.10.2009 | 3,2141 | 4,4692 | 3,7643 | 4,874  | 3,8875 | 3,8503 |
| 06.10.2009 | 3,248  | 4,4931 | 3,7932 | 4,8552 | 3,9021 | 3,8535 |
| 07.10.2009 | 3,2138 | 4,4659 | 3,7618 | 4,779  | 3,8614 | 3,8252 |
| 08.10.2009 | 3,2066 | 4,4651 | 3,7472 | 4,7454 | 3,846  | 3,8186 |
| 09.10.2009 | 3,3109 | 4,5437 | 3,8243 | 4,8168 | 3,9168 | 3,8996 |
| 12.10.2009 | 3,2677 | 4,5155 | 3,7917 | 4,7998 | 3,8967 | 3,8724 |
| 13.10.2009 | 3,2415 | 4,5299 | 3,8011 | 4,7967 | 3,9122 | 3,8753 |
| 14.10.2009 | 3,2931 | 4,5827 | 3,8393 | 4,8373 | 3,9648 | 3,9094 |
| 15.10.2009 | 3,3471 | 4,6413 | 3,8853 | 4,8869 | 4,0225 | 3,9565 |
| 16.10.2009 | 3,3423 | 4,6394 | 3,8671 | 4,8597 | 3,9992 | 3,9326 |
| 19.10.2009 | 3,3771 | 4,6551 | 3,8815 | 4,8979 | 4,0011 | 3,9373 |
| 20.10.2009 | 3,3278 | 4,6014 | 3,8372 | 4,8225 | 3,95   | 3,8828 |
| 21.10.2009 | 3,4049 | 4,705  | 3,8857 | 4,8481 | 3,9995 | 3,9165 |
| 22.10.2009 | 3,3788 | 4,6643 | 3,8518 | 4,8355 | 3,9734 | 3,8913 |
| 23.10.2009 | 3,4161 | 4,7237 | 3,8776 | 4,8739 | 4,0077 | 3,94   |
| 26.10.2009 | 3,4234 | 4,734  | 3,8758 | 4,8567 | 4,0204 | 3,9452 |
| 27.10.2009 | 3,3424 | 4,6749 | 3,8155 | 4,793  | 3,9436 | 3,8773 |
| 28.10.2009 | 3,3424 | 4,6632 | 3,8151 | 4,79   | 3,9387 | 3,8615 |
| 29.10.2009 | 3,4014 | 4,7517 | 3,8786 | 4,8447 | 3,9993 | 3,9265 |
| 30.10.2009 | 3,3066 | 4,6817 | 3,8072 | 4,7665 | 3,93   | 3,8557 |
| 02.11.2009 | 3,3029 | 4,7097 | 3,8018 | 4,7649 | 3,9094 | 3,8233 |
| 03.11.2009 | 3,3325 | 4,7695 | 3,8316 | 4,757  | 3,9326 | 3,841  |
| 04.11.2009 | 3,3889 | 4,8032 | 3,8725 | 4,824  | 3,9623 | 3,8753 |
| 05.11.2009 | 3,435  | 4,8506 | 3,9009 | 4,8323 | 3,9888 | 3,9042 |
| 06.11.2009 | 3,4375 | 4,8601 | 3,9036 | 4,8346 | 3,9871 | 3,9177 |
| 09.11.2009 | 3,3943 | 4,7993 | 3,8564 | 4,789  | 3,9376 | 3,8668 |
| 10.11.2009 | 3,3581 | 4,7635 | 3,8278 | 4,7721 | 3,9036 | 3,8292 |
| 11.11.2009 | 3,3415 | 4,6648 | 3,8266 | 4,7592 | 3,9035 | 3,8198 |
| 12.11.2009 | 3,3616 | 4,69   | 3,8517 | 4,7532 | 3,9225 | 3,84   |
| 13.11.2009 | 3,393  | 4,7703 | 3,9031 | 4,8301 | 3,9757 | 3,8847 |
| 16.11.2009 | 3,3254 | 4,8182 | 3,8621 | 4,8474 | 3,9384 | 3,8661 |
| 17.11.2009 | 3,2779 | 4,7192 | 3,8006 | 4,6917 | 3,8816 | 3,8072 |
| 18.11.2009 | 3,3003 | 4,7734 | 3,8285 | 4,735  | 3,9153 | 3,8293 |
| 19.11.2009 | 3,284  | 4,8782 | 3,837  | 4,798  | 3,9306 | 3,8556 |
| 20.11.2009 | 3,2781 | 4,9041 | 3,8522 | 4,7748 | 3,9386 | 3,8774 |
| 23.11.2009 | 3,2958 | 4,9244 | 3,8624 | 4,762  | 3,935  | 3,8834 |
| 24.11.2009 | 3,2764 | 4,9682 | 3,8365 | 4,7864 | 3,921  | 3,8614 |
| 25.11.2009 | 3,272  | 5,0193 | 3,837  | 4,8768 | 3,9312 | 3,8771 |
| 26.11.2009 | 3,1735 | 4,9208 | 3,7775 | 4,916  | 3,9244 | 3,8525 |
| 27.11.2009 | 3,198  | 5,1955 | 3,8133 | 4,9495 | 3,9298 | 3,8791 |
| 30.11.2009 | 3,175  | 5,1811 | 3,7834 | 4,8982 | 3,8988 | 3,8335 |
| 01.12.2009 | 3,1582 | 5,0744 | 3,7578 | 4,8345 | 3,859  | 3,7903 |
| 02.12.2009 | 3,1858 | 5,0859 | 3,7903 | 4,8454 | 3,8744 | 3,813  |
| 03.12.2009 | 3,1914 | 5,1099 | 3,7822 | 4,8401 | 3,8767 | 3,8053 |
| 04.12.2009 | 3,2545 | 5,2185 | 3,8121 | 4,885  | 3,8862 | 3,8357 |
| 07.12.2009 | 3,2101 | 5,3305 | 3,7918 | 4,8776 | 3,842  | 3,8387 |
| 08.12.2009 | 3,1582 | 5,637  | 3,7937 | 4,9029 | 3,8532 | 3,8624 |
| 09.12.2009 | 3,1546 | 5,8113 | 3,8647 | 5,0913 | 3,898  | 3,9828 |
| 10.12.2009 | 3,1937 | 5,8104 | 3,9003 | 5,0212 | 3,9163 | 4      |
| 11.12.2009 | 3,2402 | 5,682  | 3,89   | 4,9465 | 3,9224 | 3,993  |
| 14.12.2009 | 3,2095 | 5,7381 | 3,8468 | 4,8755 | 3,8914 | 3,9432 |
| 15.12.2009 | 3,2553 | 6,0152 | 3,8853 | 4,9338 | 3,9174 | 3,9921 |
| 16.12.2009 | 3,2207 | 5,7255 | 3,8424 | 4,8188 | 3,877  | 3,9481 |
| 17.12.2009 | 3,1732 | 5,8544 | 3,8485 | 4,8143 | 3,855  | 3,9509 |
| 18.12.2009 | 3,1592 | 5,9158 | 3,8887 | 4,8149 | 3,8516 | 4,0019 |
| 21.12.2009 | 3,21   | 6,1399 | 3,979  | 4,8691 | 3,8959 | 4,091  |
| 22.12.2009 | 3,2868 | 5,9673 | 3,9858 | 4,8601 | 3,8978 | 4,0843 |
| 23.12.2009 | 3,3065 | 5,9704 | 3,9771 | 4,8618 | 3,9045 | 4,0915 |
| 24.12.2009 | 3,3217 | 6,0044 | 4,0052 | 4,8927 | 3,9388 | 4,1124 |
| 25.12.2009 | 3,3153 | 5,998  | 4,0035 | 4,8907 | 3,9381 | 4,1136 |
| 28.12.2009 | 3,3517 | 5,9946 | 3,9978 | 4,9211 | 3,962  | 4,1246 |

|            |        |        |        |        |        |        |
|------------|--------|--------|--------|--------|--------|--------|
| 29.12.2009 | 3,3722 | 5,974  | 4,0082 | 4,913  | 4,0053 | 4,1268 |
| 30.12.2009 | 3,3908 | 5,8355 | 4,0303 | 4,9072 | 4,0397 | 4,173  |
| 31.12.2009 | 3,3758 | 5,7623 | 4,0222 | 4,916  | 4,0211 | 4,1701 |
| 01.01.2010 | 3,3761 | 5,7626 | 4,0226 | 4,911  | 4,0224 | 4,1772 |
| 04.01.2010 | 3,382  | 5,6442 | 4,01   | 4,8278 | 3,9789 | 4,1626 |
| 05.01.2010 | 3,3856 | 5,5685 | 4,024  | 4,859  | 3,9865 | 4,1462 |
| 06.01.2010 | 3,3963 | 5,549  | 4,0511 | 4,9596 | 3,9958 | 4,1618 |
| 07.01.2010 | 3,3871 | 5,5567 | 4,038  | 4,8918 | 3,9765 | 4,1394 |
| 08.01.2010 | 3,4037 | 5,4498 | 4,0144 | 4,8429 | 3,9699 | 4,1115 |
| 11.01.2010 | 3,3663 | 5,3786 | 4,0141 | 4,7875 | 3,945  | 4,1172 |
| 12.01.2010 | 3,3298 | 5,5022 | 4,0016 | 4,7741 | 3,9417 | 4,1046 |
| 13.01.2010 | 3,3342 | 5,7558 | 4,0153 | 4,8639 | 3,9756 | 4,1741 |
| 14.01.2010 | 3,3281 | 5,9959 | 4,054  | 4,9205 | 3,9815 | 4,2812 |
| 15.01.2010 | 3,307  | 5,9798 | 4,0402 | 4,8906 | 3,9693 | 4,3101 |
| 18.01.2010 | 3,2824 | 5,9667 | 4,0424 | 4,8891 | 3,9671 | 4,3128 |
| 19.01.2010 | 3,3178 | 6,0613 | 4,0888 | 4,8298 | 3,9725 | 4,3247 |
| 20.01.2010 | 3,2658 | 6,11   | 4,0739 | 4,8171 | 3,9896 | 4,3804 |
| 21.01.2010 | 3,2726 | 6,3645 | 4,1006 | 4,7796 | 4,012  | 4,3765 |
| 22.01.2010 | 3,2529 | 6,4727 | 4,1059 | 4,7954 | 4,0026 | 4,409  |
| 25.01.2010 | 3,2582 | 6,6117 | 4,0385 | 4,7136 | 3,9749 | 4,3137 |
| 26.01.2010 | 3,2462 | 6,6288 | 4,0113 | 4,6977 | 3,948  | 4,2488 |
| 27.01.2010 | 3,2404 | 6,6226 | 4,0699 | 4,7284 | 4,0056 | 4,3628 |
| 28.01.2010 | 3,2368 | 6,874  | 4,1528 | 4,8424 | 4,0741 | 4,5144 |
| 29.01.2010 | 3,2328 | 7,069  | 4,1028 | 4,8468 | 4,0517 | 4,541  |
| 01.02.2010 | 3,2179 | 6,9153 | 4,0154 | 4,807  | 3,9835 | 4,512  |
| 02.02.2010 | 3,2071 | 6,8561 | 4,0337 | 4,8009 | 3,9852 | 4,5976 |
| 03.02.2010 | 3,235  | 6,9434 | 4,0853 | 4,8307 | 4,0067 | 4,7934 |
| 04.02.2010 | 3,1782 | 6,8726 | 4,1042 | 4,8266 | 3,9918 | 4,8402 |
| 05.02.2010 | 3,1389 | 6,8407 | 4,1119 | 4,8651 | 3,9907 | 4,82   |
| 08.02.2010 | 3,1527 | 6,9889 | 4,1185 | 4,9213 | 4,0284 | 4,8856 |
| 09.02.2010 | 3,1618 | 6,8171 | 4,0571 | 4,8421 | 3,9794 | 4,7133 |
| 10.02.2010 | 3,1959 | 6,1137 | 3,9782 | 4,721  | 3,9637 | 4,6542 |
| 11.02.2010 | 3,2354 | 6,1088 | 3,9888 | 4,6608 | 3,9802 | 4,5574 |
| 12.02.2010 | 3,1946 | 6,0818 | 3,9779 | 4,6638 | 3,9941 | 4,5441 |
| 15.02.2010 | 3,2273 | 6,1463 | 4,0243 | 4,7136 | 4,0082 | 4,5615 |
| 16.02.2010 | 3,2299 | 6,4344 | 4,0104 | 4,7551 | 4,0059 | 4,5826 |
| 17.02.2010 | 3,2234 | 6,3689 | 3,9945 | 4,7454 | 3,9959 | 4,5165 |
| 18.02.2010 | 3,2687 | 6,5792 | 4,0161 | 4,7793 | 4,0099 | 4,5418 |
| 19.02.2010 | 3,2988 | 6,5041 | 4,0106 | 4,7889 | 4,0301 | 4,5425 |
| 22.02.2010 | 3,2916 | 6,3747 | 3,9894 | 4,7364 | 4,0301 | 4,5123 |
| 23.02.2010 | 3,1938 | 6,3517 | 3,9107 | 4,6139 | 3,9731 | 4,4318 |
| 24.02.2010 | 3,1629 | 6,4308 | 3,892  | 4,6586 | 3,9557 | 4,4191 |
| 25.02.2010 | 3,1378 | 6,5569 | 3,8974 | 4,6827 | 3,977  | 4,4196 |
| 26.02.2010 | 3,1299 | 6,6587 | 3,8538 | 4,6318 | 3,9265 | 4,3505 |
| 01.03.2010 | 3,1356 | 6,5668 | 3,8173 | 4,5587 | 3,906  | 4,2273 |
| 02.03.2010 | 3,1569 | 6,3903 | 3,8605 | 4,5498 | 3,9062 | 4,2002 |
| 03.03.2010 | 3,1718 | 6,2629 | 3,8689 | 4,5558 | 3,9046 | 4,2004 |
| 04.03.2010 | 3,1469 | 6,1786 | 3,8678 | 4,536  | 3,8963 | 4,2024 |
| 05.03.2010 | 3,18   | 6,2116 | 3,8591 | 4,5393 | 3,8958 | 4,2151 |
| 08.03.2010 | 3,1928 | 6,2214 | 3,8463 | 4,5296 | 3,8863 | 4,2087 |
| 09.03.2010 | 3,1545 | 6,1075 | 3,831  | 4,5066 | 3,8552 | 4,2066 |
| 10.03.2010 | 3,1836 | 5,9926 | 3,8446 | 4,4785 | 3,8585 | 4,1969 |
| 11.03.2010 | 3,1966 | 6,1762 | 3,8672 | 4,4918 | 3,8796 | 4,2459 |
| 12.03.2010 | 3,1986 | 6,0752 | 3,867  | 4,4563 | 3,8861 | 4,2364 |
| 15.03.2010 | 3,1852 | 6,0411 | 3,8701 | 4,4588 | 3,8784 | 4,2594 |
| 16.03.2010 | 3,1682 | 5,9045 | 3,8535 | 4,433  | 3,863  | 4,2408 |
| 17.03.2010 | 3,1452 | 5,8474 | 3,844  | 4,4626 | 3,8461 | 4,2438 |
| 18.03.2010 | 3,1565 | 6,0493 | 3,8633 | 4,4936 | 3,8762 | 4,2676 |
| 19.03.2010 | 3,1418 | 6,2098 | 3,8766 | 4,5233 | 3,8915 | 4,2993 |
| 22.03.2010 | 3,1043 | 6,3421 | 3,847  | 4,5141 | 3,8728 | 4,3091 |
| 23.03.2010 | 3,092  | 6,1991 | 3,8204 | 4,4798 | 3,8484 | 4,286  |
| 24.03.2010 | 3,1142 | 6,2208 | 3,8252 | 4,5588 | 3,8589 | 4,3178 |
| 25.03.2010 | 3,1685 | 6,1005 | 3,852  | 4,5739 | 3,8665 | 4,3436 |
| 26.03.2010 | 3,1869 | 5,9408 | 3,8356 | 4,5492 | 3,8635 | 4,2743 |
| 29.03.2010 | 3,1746 | 6,0716 | 3,8224 | 4,5072 | 3,8622 | 4,2452 |
| 30.03.2010 | 3,1668 | 6,2678 | 3,8332 | 4,507  | 3,8599 | 4,2601 |
| 31.03.2010 | 3,1437 | 6,387  | 3,8211 | 4,4819 | 3,8375 | 4,2288 |
| 01.04.2010 | 3,1386 | 6,4625 | 3,8096 | 4,4544 | 3,8099 | 4,1827 |
| 02.04.2010 | 3,1387 | 6,4627 | 3,8073 | 4,4479 | 3,8067 | 4,1763 |
| 05.04.2010 | 3,1417 | 6,4662 | 3,8099 | 4,4472 | 3,8088 | 4,1786 |
| 06.04.2010 | 3,178  | 7,223  | 3,8799 | 4,5134 | 3,875  | 4,2617 |
| 07.04.2010 | 3,1622 | 7,3018 | 3,8844 | 4,5083 | 3,8678 | 4,2652 |
| 08.04.2010 | 3,1347 | 7,4377 | 3,8613 | 4,5203 | 3,856  | 4,3572 |
| 09.04.2010 | 3,1972 | 7,1035 | 3,8801 | 4,535  | 3,8673 | 4,3551 |
| 12.04.2010 | 3,2137 | 6,8151 | 3,8554 | 4,5091 | 3,8589 | 4,3409 |

|            |        |        |        |        |        |        |
|------------|--------|--------|--------|--------|--------|--------|
| 13.04.2010 | 3,1641 | 6,7983 | 3,859  | 4,5228 | 3,8612 | 4,3459 |
| 14.04.2010 | 3,159  | 7,1088 | 3,8676 | 4,5379 | 3,8675 | 4,4152 |
| 15.04.2010 | 3,1529 | 7,105  | 3,8764 | 4,5554 | 3,8817 | 4,4036 |
| 16.04.2010 | 3,106  | 7,1302 | 3,868  | 4,5617 | 3,8822 | 4,3834 |
| 19.04.2010 | 3,1006 | 7,1631 | 3,8362 | 4,5652 | 3,8849 | 4,441  |
| 20.04.2010 | 3,1264 | 7,1585 | 3,8551 | 4,5431 | 3,8853 | 4,4653 |
| 21.04.2010 | 3,1087 | 7,2387 | 3,8637 | 4,5377 | 3,8839 | 4,4574 |

## Appendix 11: Regression Statistics of Top 5 European Banks and all Banks

| Regression Statistics (Top 5 European Banks) |              |                |             |             |                |             |             |             |
|----------------------------------------------|--------------|----------------|-------------|-------------|----------------|-------------|-------------|-------------|
| Multiple R                                   | 0,776974293  |                |             |             |                |             |             |             |
| R Square                                     | 0,603689052  |                |             |             |                |             |             |             |
| Adjusted R Square                            | 0,592977945  |                |             |             |                |             |             |             |
| Standard Error                               | 0,121458481  |                |             |             |                |             |             |             |
| Observations                                 | 39           |                |             |             |                |             |             |             |
|                                              |              |                |             |             |                |             |             |             |
| ANOVA                                        |              |                |             |             |                |             |             |             |
|                                              | df           | SS             | MS          | F           | Significance F |             |             |             |
| Regression                                   | 1            | 0,831447138    | 0,831447138 | 56,36103423 | 6,04123E-09    |             |             |             |
| Residual                                     | 37           | 0,545830014    | 0,014752163 |             |                |             |             |             |
| Total                                        | 38           | 1,377277151    |             |             |                |             |             |             |
|                                              |              |                |             |             |                |             |             |             |
|                                              | Coefficients | Standard Error | t Stat      | P-value     | Lower 95%      | Upper 95%   | Lower 99.0% | Upper 99.0% |
| Intercept                                    | 0,051697646  | 0,019449082    | 2,658102158 | 0,011537519 | 0,012290064    | 0,091105228 | -0,00111456 | 0,104509852 |
| X                                            | 0,800774915  | 0,106664766    | 7,507398632 | 6,04123E-09 | 0,584651573    | 1,016898258 | 0,511136481 | 1,09041335  |

| Regression Statistics (Top 5 US, European and Austrian Banks) |              |                |             |             |                |             |             |             |
|---------------------------------------------------------------|--------------|----------------|-------------|-------------|----------------|-------------|-------------|-------------|
| Multiple R                                                    | 0,410844312  |                |             |             |                |             |             |             |
| R Square                                                      | 0,168793049  |                |             |             |                |             |             |             |
| Adjusted R Square                                             | 0,161688716  |                |             |             |                |             |             |             |
| Standard Error                                                | 0,180950727  |                |             |             |                |             |             |             |
| Observations                                                  | 119          |                |             |             |                |             |             |             |
|                                                               |              |                |             |             |                |             |             |             |
| ANOVA                                                         |              |                |             |             |                |             |             |             |
|                                                               | df           | SS             | MS          | F           | Significance F |             |             |             |
| Regression                                                    | 1            | 0,777950411    | 0,777950411 | 23,7591693  | 3,46573E-06    |             |             |             |
| Residual                                                      | 117          | 3,830950357    | 0,032743165 |             |                |             |             |             |
| Total                                                         | 118          | 4,608900768    |             |             |                |             |             |             |
|                                                               |              |                |             |             |                |             |             |             |
|                                                               | Coefficients | Standard Error | t Stat      | P-value     | Lower 95%      | Upper 95%   | Lower 99.0% | Upper 99.0% |
| Intercept                                                     | 0,072213582  | 0,016626627    | 4,343248956 | 3,00382E-05 | 0,039285419    | 0,105141745 | 0,02867669  | 0,115750473 |
| X                                                             | 0,555874602  | 0,11404105     | 4,874337832 | 3,46573E-06 | 0,330022287    | 0,781726918 | 0,257257646 | 0,854491559 |

## Appendix 12: Overview over US Banks (currency in million)

| USD Bank of America                                    | Q4/2005   | Q2/2006   | Q4/2006   | Q2/2007   | Q4/2007   | Q2/2008   | Q4/2008   | Q2/2009   | Q4/2009   |
|--------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Total Assets</b>                                    | 1.190.270 | 1.445.193 | 1.459.737 | 1.534.359 | 1.715.746 | 1.716.875 | 1.817.943 | 2.420.317 | 2.223.299 |
| <b>Risk-weighted assets</b>                            | 890.189   | 1.019.893 | 1.054.091 | 1.115.268 | 1.213.430 | 2.461.286 | 1.320.824 | 1.599.569 | 1.542.517 |
| <b>Total Shareholders equity (incl. Minorities)</b>    | 101.533   | 127.841   | 135.272   | 135.751   | 146.803   | 162.691   | 171.661   | 242.867   | 226.077   |
| <b>Shareholders' funds (excl. Minorities)</b>          | 101.533   | 127.841   | 135.272   | 135.751   | 146.803   | 162.691   | 169.992   | 240.985   | 225.495   |
| <b>Common equity</b>                                   | 101.262   | 127.570   | 132.421   | 132.900   | 142.394   | 138.540   | 139.351   | 196.492   | 194.236   |
| <b>Minority Interest</b>                               | 0         | 0         | 0         | 0         | 0         | 0         | 1.669     | 1.882     | 582       |
| <b>Tier 1 capital</b>                                  | 74.375    | 84.978    | 91.064    | 94.979    | 83.372    | 101.541   | 120.814   | 190.874   | 160.388   |
| <b>Hybrid Tier 1 (esp. trust preferred securities)</b> | 12.446    | 12.446    | 15.942    | 16.884    | 16.863    | 16.873    | 18.105    | 19.947    | 17.964    |
| <b>Preference shares</b>                               | 271       | 271       | 2.851     | 2.851     | 4.409     | 24.151    | 37.701    | 58.660    | 21.448    |
| <b>Innovative Tier 1</b>                               | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         |
| <b>Core Tier 1 capital</b>                             | 61.658    | 72.261    | 72.271    | 75.244    | 62.100    | 60.517    | 63.339    | 110.385   | 120.394   |
| <b>Tier 1 capital (excl. Minority Interest)</b>        | 74.375    | 84.978    | 91.064    | 94.979    | 83.372    | 101.541   | 119.145   | 188.992   | 159.806   |
| <b>Tier 2 capital</b>                                  | 25.526    | 29.760    | 34.162    | 40.080    | 50.348    | 53.548    | 50.847    | 34.827    | 65.689    |
| <b>Total Capital (after supervisory deductions)</b>    | 99.901    | 114.738   | 125.226   | 135.059   | 133.720   | 155.089   | 171.661   | 225.701   | 226.077   |
| <b>Goodwill &amp; other intangibles</b>                |           |           |           |           |           |           |           |           | 94.613    |
| Tier 1 ratio                                           | 8,35%     | 8,33%     | 8,64%     | 8,52%     | 6,87%     | 4,13%     | 9,15%     | 11,93%    | 10,40%    |
| CAR                                                    | 11,22%    | 11,25%    | 11,88%    | 12,11%    | 11,02%    | 6,30%     | 13,00%    | 14,11%    | 14,66%    |
| Core Tier 1 ratio                                      | 6,93%     | 7,09%     | 6,86%     | 6,75%     | 5,12%     | 2,46%     | 4,80%     | 6,90%     | 7,81%     |
| Shareholders Equity to Total Assets (LR1)              | 8,53%     | 8,85%     | 9,27%     | 8,85%     | 8,56%     | 9,48%     | 9,44%     | 10,03%    | 10,17%    |
| Tier 1 capital to Total Assets (LR2)                   | 6,25%     | 5,88%     | 6,24%     | 6,19%     | 4,86%     | 5,91%     | 6,65%     | 7,89%     | 7,21%     |
| Tier 1 capital (excl. Minorities) to Total Assets      | 6,25%     | 5,88%     | 6,24%     | 6,19%     | 4,86%     | 5,91%     | 6,55%     | 7,81%     | 7,19%     |
| Shareholders Equity to RWA                             | 11,41%    | 12,53%    | 12,83%    | 12,17%    | 12,10%    | 6,61%     | 13,00%    | 15,18%    | 14,66%    |
| Total capital to Total Assets (LR3)                    | 8,39%     | 7,94%     | 8,58%     | 8,80%     | 7,79%     | 9,03%     | 9,44%     | 9,33%     | 10,17%    |
| Core Tier 1 capital to Total Assets                    | 5,18%     | 5,00%     | 4,95%     | 4,90%     | 3,62%     | 3,52%     | 3,48%     | 4,56%     | 5,42%     |
| Tier 1 Leverage ratio                                  | 5,91%     | 6,13%     | 6,36%     | 6,33%     | 5,04%     | 6,09%     | 6,44%     | 8,21%     | 6,91%     |
| Return on Assets                                       | 1,37%     | 1,33%     | 1,54%     | 1,45%     | 0,94%     | 0,50%     | 0,14%     | 0,18%     | -0,11%    |
| Return on Capital                                      | 3,16%     | 2,81%     | 3,21%     | 2,95%     | 1,94%     | 1,06%     | 0,47%     | 0,70%     | 0,65%     |
| Return on Equity                                       | 16,35%    | 15,68%    | 18,08%    | 16,59%    | 10,81%    | 6,02%     | 1,81%     | 2,12%     | -1,32%    |
| Share Price                                            | 46,15     | 48,1      | 53,39     | 48,89     | 41,26     | 23,87     | 14,08     | 13,2      | 15,06     |

| USD JP Morgan Chase & Co                               | Q4/2005   | Q2/2006   | Q4/2006   | Q2/2007   | Q4/2007   | Q2/2008   | Q4/2008   | Q2/2009   | Q4/2009   |
|--------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Total Assets</b>                                    | 1.198.942 | 1.328.001 | 1.351.520 | 1.458.042 | 1.562.147 | 1.775.670 | 2.175.052 | 2.026.642 | 2.031.989 |
| <b>Risk-weighted assets</b>                            | 850.643   | 884.228   | 935.909   | 1.016.031 | 1.051.879 | 1.079.199 | 1.244.659 | 1.260.237 | 1.198.080 |
| <b>Total Shareholders equity (incl. Minorities)</b>    | 107.211   | 110.684   | 115.790   | 119.211   | 123.221   | 133.176   | 166.884   | 154.766   | 165.365   |
| <b>Shareholders' funds (excl. Minorities)</b>          | 94.551    | 98.024    | 102.820   | 106.241   | 108.216   | 118.171   | 149.627   | 137.594   | 145.830   |
| <b>Common equity</b>                                   | 107.072   | 110.684   | 115.790   | 119.211   | 123.221   | 127.176   | 134.945   | 146.614   | 157.213   |
| <b>Minority Interest</b>                               | 12.660    | 12.660    | 12.970    | 12.970    | 15.005    | 15.005    | 17.257    | 17.172    | 19.535    |
| <b>Tier 1 capital</b>                                  | 72.474    | 74.983    | 81.055    | 85.096    | 88.746    | 98.775    | 136.104   | 122.174   | 132.971   |
| <b>Hybrid Tier 1 (esp. trust preferred securities)</b> | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         |
| <b>Preference shares</b>                               | 0         | 0         | 0         | 0         | 0         | 0         | 31.939    | 8.152     | 8.152     |
| <b>Innovative Tier 1</b>                               | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         |
| <b>Core Tier 1 capital</b>                             | 59.814    | 62.323    | 68.085    | 72.126    | 73.741    | 83.770    | 86.908    | 96.850    | 105.284   |
| <b>Tier 1 capital (excl. Minority Interest)</b>        | 59.814    | 62.323    | 68.085    | 72.126    | 73.741    | 83.770    | 118.847   | 105.002   | 113.436   |
| <b>Tier 2 capital</b>                                  | 29.963    | 31.300    | 34.210    | 37.180    | 43.496    | 46.237    | 48.616    | 45.593    | 44.103    |
| <b>Total Capital (after supervisory deductions)</b>    | 102.437   | 106.283   | 115.265   | 122.276   | 132.242   | 145.012   | 184.720   | 167.767   | 177.074   |
| <b>Goodwill &amp; other intangibles</b>                |           |           |           |           |           |           |           |           | 68.509    |
| Tier 1 ratio                                           | 8,52%     | 8,48%     | 8,66%     | 8,38%     | 8,44%     | 9,15%     | 10,94%    | 9,69%     | 11,10%    |
| CAR                                                    | 12,04%    | 12,02%    | 12,32%    | 12,03%    | 12,57%    | 13,44%    | 14,84%    | 13,31%    | 14,78%    |
| Core Tier 1 ratio                                      | 7,03%     | 7,05%     | 7,27%     | 7,10%     | 7,01%     | 7,76%     | 6,98%     | 7,69%     | 8,79%     |
| Shareholders Equity to Total Assets (LR1)              | 8,94%     | 8,33%     | 8,57%     | 8,18%     | 7,89%     | 7,50%     | 7,67%     | 7,64%     | 8,14%     |
| Tier 1 capital to Total Assets (LR2)                   | 6,04%     | 5,65%     | 6,00%     | 5,84%     | 5,68%     | 5,56%     | 6,26%     | 6,03%     | 6,54%     |
| Tier 1 capital (excl. Minorities) to Total Assets      | 4,99%     | 4,69%     | 5,04%     | 4,95%     | 4,72%     | 4,72%     | 5,46%     | 5,18%     | 5,58%     |
| Shareholders Equity to RWA                             | 12,60%    | 12,52%    | 12,37%    | 11,73%    | 11,71%    | 12,34%    | 13,41%    | 12,28%    | 13,80%    |
| Total capital to Total Assets (LR3)                    | 8,54%     | 8,00%     | 8,53%     | 8,39%     | 8,47%     | 8,17%     | 8,49%     | 8,28%     | 8,71%     |
| Core Tier 1 capital to Total Assets                    | 4,99%     | 4,69%     | 5,04%     | 4,95%     | 4,72%     | 4,72%     | 4,00%     | 4,78%     | 5,18%     |
| Tier 1 Leverage ratio                                  | 6,29%     | 5,85%     | 6,19%     | 6,18%     | 6,02%     | 6,43%     | 6,92%     | 6,20%     | 6,88%     |
| Return on Assets                                       | 0,63%     | 0,72%     | 0,95%     | 1,13%     | 1,21%     | 1,05%     | 0,66%     | 0,26%     | 0,18%     |
| Return on Capital                                      | 1,44%     | 1,68%     | 2,19%     | 2,67%     | 2,73%     | 2,51%     | 1,48%     | 0,74%     | 0,71%     |
| Return on Equity                                       | 8,40%     | 7,98%     | 10,96%    | 12,96%    | 14,65%    | 12,86%    | 8,63%     | 3,82%     | 2,48%     |
| Share Price                                            | 35,32     | 39,69     | 42        | 48,3      | 48,45     | 43,65     | 34,31     | 31,53     | 34,11     |

| USD Citigroup Inc                                      | Q4/2005   | Q2/2006   | Q4/2006   | Q2/2007   | Q4/2007   | Q2/2008   | Q4/2008   | Q2/2009   | Q4/2009   |
|--------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Total Assets</b>                                    | 1,494.037 | 1,626.551 | 1,884.318 | 2,220.715 | 2,187.480 | 2,100.385 | 1,938.470 | 1,848.533 | 1,856.646 |
| <b>Risk-weighted assets</b>                            | 885.472   | 1,057.872 | 1,057.872 | 1,168.380 | 1,253.321 | 1,223.313 | 996.247   | 995.414   | 1,088.526 |
| <b>Total Shareholders equity (incl. Minorities)</b>    | 112.537   | 115.428   | 119.783   | 127.603   | 113.447   | 136.405   | 141.630   | 152.302   | 152.700   |
| <b>Shareholders' funds (excl. Minorities)</b>          | 112.025   | 114.321   | 118.783   | 127.203   | 109.370   | 134.749   | 140.362   | 151.220   | 150.825   |
| <b>Common equity</b>                                   | 111.412   | 114.428   | 118.783   | 127.154   | 113.447   | 108.981   | 70.966    | 78.001    | 152.388   |
| <b>Minority Interest</b>                               | 512       | 1,107     | 1,107     | 3,889     | 4,077     | 1,656     | 1,268     | 1,082     | 1,875     |
| <b>Tier 1 capital</b>                                  | 77.824    | 90.899    | 90.899    | 92.435    | 89.226    | 106.915   | 118.758   | 126.778   | 127.034   |
| <b>Hybrid Tier 1 (esp. trust preferred securities)</b> | 6.264     | 9.579     | 9.579     | 10.095    | 23.594    | 23.658    | 23.899    | 24.034    | 20.352    |
| <b>Preference shares</b>                               | 1.125     | 1,000     | 1,000     | 400       | 0         | 27.424    | 70.664    | 74.301    | 312       |
| <b>Innovative Tier 1</b>                               | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         |
| <b>Core Tier 1 capital</b>                             | 69.923    | 79.213    | 79.213    | 78.051    | 61.555    | 54.177    | 22.927    | 27.361    | 104.495   |
| <b>Tier 1 capital (excl. Minority Interest)</b>        | 77.312    | 89.792    | 89.792    | 88.546    | 85.149    | 105.259   | 117.490   | 125.696   | 125.159   |
| <b>Tier 2 capital</b>                                  | 28.578    | 32.361    | 32.361    | 38.815    | 44.895    | 43.426    | 37.640    | 38.646    | 38.949    |
| <b>Total Capital (after supervisory deductions)</b>    | 106.402   | 123.260   | 123.260   | 131.250   | 134.121   | 150.341   | 156.398   | 165.424   | 165.983   |
| <b>Goodwill &amp; other intangibles</b>                |           |           |           |           |           |           |           |           | 40.636    |
| Tier 1 ratio                                           | 8,79%     | 8,59%     | 8,59%     | 7,91%     | 7,12%     | 8,74%     | 11,92%    | 12,74%    | 11,67%    |
| CAR                                                    | 12,02%    | 11,65%    | 11,65%    | 11,23%    | 10,70%    | 12,29%    | 15,70%    | 16,62%    | 15,25%    |
| Core Tier 1 ratio                                      | 7,90%     | 7,49%     | 7,49%     | 6,68%     | 4,91%     | 4,43%     | 2,30%     | 2,75%     | 9,60%     |
| Shareholders Equity to Total Assets (LR1)              | 7,53%     | 7,10%     | 6,36%     | 5,75%     | 5,19%     | 6,49%     | 7,31%     | 8,24%     | 8,22%     |
| Tier 1 capital to Total Assets (LR2)                   | 5,21%     | 5,59%     | 4,82%     | 4,16%     | 4,08%     | 5,09%     | 6,13%     | 6,86%     | 6,84%     |
| Tier 1 capital (excl. Minorities) to Total Assets      | 5,17%     | 5,52%     | 4,77%     | 3,99%     | 3,89%     | 5,01%     | 6,06%     | 6,80%     | 6,74%     |
| Shareholders Equity to RWA                             | 12,71%    | 10,91%    | 11,32%    | 10,92%    | 9,05%     | 11,15%    | 14,22%    | 15,30%    | 14,03%    |
| Total capital to Total Assets (LR3)                    | 7,12%     | 7,58%     | 6,54%     | 5,91%     | 6,13%     | 7,16%     | 8,07%     | 8,95%     | 8,94%     |
| Core Tier 1 capital to Total Assets                    | 4,68%     | 4,87%     | 4,20%     | 3,51%     | 2,81%     | 2,58%     | 1,18%     | 1,48%     | 5,63%     |
| Tier 1 Leverage ratio                                  | 5,35%     | 5,19%     | 5,16%     | 4,37%     | 4,03%     | 5,04%     | 6,08%     | 6,92%     | 6,89%     |
| Return on Assets                                       | 1,43%     | 1,57%     | 1,57%     | 1,27%     | 1,13%     | 0,18%     | -0,73%    | -1,43%    | -0,92%    |
| Return on Capital                                      | 2,98%     | 3,09%     | 3,13%     | 2,45%     | 2,13%     | 0,36%     | -1,29%    | -2,65%    | -1,49%    |
| Return on Equity                                       | 20,16%    | 21,52%    | 22,01%    | 18,66%    | 18,06%    | 3,08%     | -13,28%   | -31,90%   | -19,48%   |
| Share Price                                            | 48,53     | 48,25     | 55,7      | 51,29     | 29,44     | 16,76     | 6,71      | 2,97      | 3,31      |

| USD Wells Fargo & Co                                   | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008   | Q4/2008   | Q2/2009   | Q4/2009   |
|--------------------------------------------------------|---------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|
| <b>Total Assets</b>                                    | 468.481 | 491.456 | 482.585 | 539.865 | 575.442 | 609.074   | 1,309.639 | 1,284.176 | 1,243.646 |
| <b>Risk-weighted assets</b>                            | 384.021 | 399.340 | 411.200 | 448.097 | 483.146 | 1,031.326 | 1,101.437 | 1,047.700 | 1,013.600 |
| <b>Total Shareholders equity (incl. Minorities)</b>    | 40.660  | 41.894  | 45.876  | 47.239  | 47.628  | 47.964    | 99.084    | 121.382   | 114.400   |
| <b>Shareholders' funds (excl. Minorities)</b>          | 40.660  | 41.894  | 45.876  | 46.602  | 47.178  | 47.241    | 95.884    | 114.623   | 111.800   |
| <b>Common equity</b>                                   | 40.335  | 41.932  | 45.492  | 46.664  | 47.178  | 47.241    | 67.752    | 83.126    | 103.301   |
| <b>Minority Interest</b>                               | 0       | 0       | 0       | 0       | 0       | 0         | 3.200     | 6.759     | 2.600     |
| <b>Tier 1 capital</b>                                  | 31.724  | 33.344  | 36.808  | 38.325  | 39.211  | 42.471    | 86.397    | 102.721   | 93.795    |
| <b>Hybrid Tier 1 (esp. trust preferred securities)</b> | 0       | 0       | 0       | 0       | 0       | 0         | 0         | 0         | 0         |
| <b>Preference shares</b>                               | 325     | 548     | 384     | 637     | 450     | 723       | 30.800    | 31.497    | 8.100     |
| <b>Innovative Tier 1</b>                               | 0       | 0       | 0       | 0       | 0       | 0         | 0         | 0         | 0         |
| <b>Core Tier 1 capital</b>                             | 31.399  | 32.796  | 36.424  | 37.688  | 38.761  | 41.748    | 52.397    | 64.465    | 83.095    |
| <b>Tier 1 capital (excl. Minority Interest)</b>        | 31.724  | 33.344  | 36.808  | 38.325  | 39.211  | 42.471    | 83.197    | 95.962    | 91.195    |
| <b>Tier 2 capital</b>                                  | 13.143  | 13.858  | 14.619  | 14.130  | 15.311  | 15.438    | 43.921    | 42.263    | 40.602    |
| <b>Total Capital (after supervisory deductions)</b>    | 44.867  | 47.202  | 51.427  | 52.455  | 54.522  | 57.909    | 130.318   | 144.984   | 134.397   |
| <b>Goodwill &amp; other intangibles</b>                |         |         |         |         |         |           |           |           | 37.700    |
| Tier 1 ratio                                           | 8,26%   | 8,35%   | 8,95%   | 8,55%   | 8,12%   | 4,12%     | 7,84%     | 9,80%     | 9,25%     |
| CAR                                                    | 11,68%  | 11,82%  | 12,51%  | 11,71%  | 11,28%  | 5,62%     | 11,83%    | 13,84%    | 13,26%    |
| Core Tier 1 ratio                                      | 8,18%   | 8,21%   | 8,86%   | 8,41%   | 8,02%   | 4,05%     | 4,76%     | 6,15%     | 8,20%     |
| Shareholders Equity to Total Assets (LR1)              | 8,68%   | 8,52%   | 9,51%   | 8,75%   | 8,28%   | 7,87%     | 7,57%     | 9,45%     | 9,20%     |
| Tier 1 capital to Total Assets (LR2)                   | 6,77%   | 6,78%   | 7,63%   | 7,10%   | 6,81%   | 6,97%     | 6,60%     | 8,00%     | 7,54%     |
| Tier 1 capital (excl. Minorities) to Total Assets      | 6,77%   | 6,78%   | 7,63%   | 7,10%   | 6,81%   | 6,97%     | 6,35%     | 7,47%     | 7,33%     |
| Shareholders Equity to RWA                             | 10,59%  | 10,49%  | 11,16%  | 10,54%  | 9,86%   | 4,65%     | 9,00%     | 11,59%    | 11,29%    |
| Total capital to Total Assets (LR3)                    | 9,58%   | 9,60%   | 10,66%  | 9,72%   | 9,47%   | 9,51%     | 9,95%     | 11,29%    | 10,81%    |
| Core Tier 1 capital to Total Assets                    | 6,70%   | 6,67%   | 7,55%   | 6,98%   | 6,74%   | 6,85%     | 4,00%     | 5,02%     | 6,68%     |
| Tier 1 Leverage ratio                                  | 6,99%   | 6,99%   | 7,89%   | 7,89%   | 7,04%   | 7,35%     | 14,52%    | 8,32%     | 7,87%     |
| Return on Assets                                       | 1,71%   | 1,69%   | 1,71%   | 1,76%   | 1,71%   | 1,52%     | 1,27%     | 0,30%     | 0,43%     |
| Return on Capital                                      | 5,39%   | 5,53%   | 5,74%   | 5,85%   | 5,54%   | 4,66%     | 3,47%     | 0,84%     | 1,68%     |
| Return on Equity                                       | 19,51%  | 19,61%  | 19,72%  | 19,77%  | 20,09%  | 17,39%    | 15,52%    | 4,95%     | 6,21%     |
| Share Price                                            | 31,415  | 33,54   | 35,56   | 35,17   | 30,19   | 23,75     | 29,48     | 24,26     | 26,99     |

| USD US Bancorp                                         | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
|--------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>Total Assets</b>                                    | 209.465 | 213.405 | 219.232 | 222.530 | 237.615 | 246.538 | 265.912 | 265.560 | 281.176 |
| <b>Risk-weighted assets</b>                            | 184.448 | 190.023 | 194.659 | 197.762 | 212.592 | 220.016 | 230.627 | 231.821 | 235.233 |
| <b>Total Shareholders equity (incl. Minorities)</b>    | 20.086  | 20.415  | 21.197  | 20.330  | 21.046  | 21.828  | 26.300  | 24.886  | 25.963  |
| <b>Shareholders' funds (excl. Minorities)</b>          | 19.871  | 20.200  | 20.502  | 19.635  | 20.351  | 21.133  | 25.607  | 24.194  | 25.271  |
| <b>Common equity</b>                                   | 20.086  | 19.415  | 20.197  | 19.330  | 20.046  | 20.328  | 18.369  | 22.671  | 24.463  |
| <b>Minority Interest</b>                               | 215     | 215     | 695     | 695     | 695     | 695     | 693     | 692     | 692     |
| <b>Tier 1 capital</b>                                  | 15.145  | 16.841  | 17.036  | 16.876  | 17.539  | 18.624  | 24.426  | 21.710  | 22.610  |
| <b>Hybrid Tier 1 (esp. trust preferred securities)</b> | 3.057   | 3.057   | 3.639   | 3.639   | 4.024   | 4.024   | 4.024   | 4.024   | 4.524   |
| <b>Preference shares</b>                               | 0       | 1.000   | 1.000   | 1.000   | 1.000   | 1.500   | 7.931   | 1.500   | 1.500   |
| <b>Innovative Tier 1</b>                               | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| <b>Core Tier 1 capital</b>                             | 11.873  | 12.569  | 11.702  | 11.542  | 11.820  | 12.405  | 11.778  | 15.494  | 15.894  |
| <b>Tier 1 capital (excl. Minority Interest)</b>        | 14.930  | 16.626  | 16.341  | 16.181  | 16.844  | 17.929  | 23.733  | 21.018  | 21.918  |
| <b>Tier 2 capital</b>                                  | 7.911   | 8.055   | 7.459   | 8.833   | 8.386   | 8.878   | 8.471   | 8.329   | 7.848   |
| <b>Total Capital (after supervisory deductions)</b>    | 23.056  | 24.896  | 24.495  | 25.709  | 25.925  | 27.502  | 32.897  | 30.039  | 30.458  |
| <b>Goodwill &amp; other intangibles</b>                |         |         |         |         |         |         |         |         | 10.139  |
| Tier 1 ratio                                           | 8,21%   | 8,86%   | 8,75%   | 8,53%   | 8,25%   | 8,46%   | 10,59%  | 9,36%   | 9,61%   |
| CAR                                                    | 12,50%  | 13,10%  | 12,58%  | 13,00%  | 12,19%  | 12,50%  | 14,26%  | 12,96%  | 12,95%  |
| Core Tier 1 ratio                                      | 6,44%   | 6,61%   | 6,01%   | 5,84%   | 5,56%   | 5,64%   | 5,11%   | 6,68%   | 6,76%   |
| Shareholders Equity to Total Assets (LR1)              | 9,59%   | 9,57%   | 9,67%   | 9,14%   | 8,86%   | 8,85%   | 9,89%   | 9,37%   | 9,23%   |
| Tier 1 capital to Total Assets (LR2)                   | 7,23%   | 7,89%   | 7,77%   | 7,58%   | 7,38%   | 7,55%   | 9,19%   | 8,18%   | 8,04%   |
| Tier 1 capital (excl. Minorities) to Total Assets      | 7,13%   | 7,79%   | 7,45%   | 7,27%   | 7,09%   | 7,27%   | 8,93%   | 7,91%   | 7,80%   |
| Shareholders Equity to RWA                             | 10,89%  | 10,74%  | 10,89%  | 10,28%  | 9,90%   | 9,92%   | 11,40%  | 10,74%  | 11,04%  |
| Total capital to Total Assets (LR3)                    | 11,01%  | 11,67%  | 11,17%  | 11,55%  | 10,91%  | 11,16%  | 12,37%  | 11,31%  | 10,83%  |
| Core Tier 1 capital to Total Assets                    | 5,67%   | 5,89%   | 5,34%   | 5,19%   | 4,97%   | 5,03%   | 4,43%   | 5,83%   | 5,65%   |
| Tier 1 Leverage ratio                                  | 7,60%   | 8,20%   | 8,20%   | 8,20%   | 7,90%   | 7,90%   | 9,80%   | 8,40%   | 8,50%   |
| Return on Assets                                       | 2,19%   | 2,22%   | 2,22%   | 2,19%   | 2,12%   | 1,87%   | 1,71%   | 1,11%   | 0,63%   |
| Return on Capital                                      | 6,20%   | 6,20%   | 5,89%   | 5,83%   | 5,31%   | 4,74%   | 4,17%   | 3,04%   | 1,98%   |
| Return on Equity                                       | 22,36%  | 22,66%  | 23,57%  | 23,35%  | 23,86%  | 21,19%  | 20,24%  | 14,60%  | 7,48%   |
| Share Price                                            | 29,89   | 30,88   | 36,19   | 32,95   | 31,74   | 27,89   | 25,01   | 17,92   | 22,51   |

### Appendix 13: Overview over European Banks (currency in million)

| GBP Royal Bank of Scotland Group                    | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007   | Q4/2007   | Q2/2008   | Q4/2008   | Q2/2009   | Q4/2009   |
|-----------------------------------------------------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Total Assets</b>                                 | 776.827 | 839.339 | 871.432 | 1.011.266 | 1.655.130 | 1.730.705 | 2.218.693 | 1.644.400 | 1.522.481 |
| <b>Risk-weighted assets</b>                         | 371.000 | 385.500 | 400.300 | 419.700   | 609.000   | 643.700   | 695.800   | 655.200   | 541.000   |
| <b>Total Shareholders equity (incl. Minorities)</b> | 35.435  | 37.375  | 40.227  | 41.544    | 53.038    | 61.637    | 58.879    | 55.666    | 77.736    |
| <b>Shareholders' funds (excl. Minorities)</b>       | 33.326  | 33.189  | 34.964  | 36.630    | 14.650    | 19.581    | 37.260    | 39.240    | 60.841    |
| <b>Minority Interest</b>                            | 2.109   | 4.186   | 5.263   | 4.914     | 38.388    | 42.056    | 21.619    | 16.426    | 16.895    |
| <b>Tier 1 capital</b>                               | 28.218  | 29.124  | 30.041  | 31.151    | 44.367    | 58.495    | 69.847    | 60.887    | 76.421    |
| <b>Preference shares</b>                            | 10.022  | 9.892   | 9.760   | 10.166    | 14.704    | 16.200    | 16.655    | 11.207    | 11.265    |
| <b>Hybrid Tier 1 (esp. Innovative Tier 1)</b>       | 5.746   | 5.148   | 4.900   | 4.264     | 6.919     | 6.814     | 7.383     | 3.586     | 5.213     |
| <b>Core Tier 1 capital</b>                          | 10.341  | 9.898   | 10.118  | 11.807    | -15.644   | -6.575    | 24.190    | 29.668    | 43.048    |
| <b>Tier 1 capital (excl. Minority Interest)</b>     | 26.109  | 24.938  | 24.778  | 26.237    | 5.979     | 16.439    | 48.228    | 44.461    | 59.526    |
| <b>Tier 2 capital</b>                               | 22.437  | 26.674  | 27.491  | 26.955    | 33.693    | 30.335    | 32.223    | 21.078    | 15.389    |
| <b>Total Capital (after supervisory deduction)</b>  | 43.373  | 45.687  | 46.949  | 52.303    | 67.974    | 84.888    | 98.175    | 77.661    | 87.245    |
| <b>Goodwill &amp; other intangibles</b>             |         |         |         |           |           |           |           |           | 17.847    |
| Tier 1 ratio                                        | 7,61%   | 7,55%   | 7,50%   | 7,42%     | 7,29%     | 9,09%     | 10,04%    | 9,29%     | 14,13%    |
| CAR                                                 | 11,69%  | 11,85%  | 11,73%  | 12,46%    | 11,16%    | 13,19%    | 14,11%    | 11,85%    | 16,13%    |
| Core Tier 1 ratio                                   | 2,79%   | 2,57%   | 2,53%   | 2,81%     | 0,00%     | 0,00%     | 3,48%     | 4,53%     | 7,96%     |
| Shareholders Equity to Total Assets (LR1)           | 4,56%   | 4,45%   | 4,62%   | 4,11%     | 3,20%     | 3,56%     | 2,65%     | 3,39%     | 5,11%     |
| Tier 1 capital to Total Assets (LR2)                | 3,63%   | 3,47%   | 3,45%   | 3,08%     | 2,68%     | 3,38%     | 3,15%     | 3,70%     | 5,02%     |
| Tier 1 capital (excl. Minorities) to Total Assets   | 3,36%   | 2,97%   | 2,84%   | 2,59%     | 0,36%     | 0,95%     | 2,17%     | 2,70%     | 3,91%     |
| Shareholders Equity to RWA                          | 9,55%   | 9,70%   | 10,05%  | 9,90%     | 8,71%     | 9,58%     | 8,46%     | 8,50%     | 14,37%    |
| Total capital to Total Assets (LR3)                 | 5,58%   | 5,44%   | 5,39%   | 5,17%     | 4,11%     | 4,90%     | 4,42%     | 4,72%     | 5,73%     |
| Core Tier 1 capital to Total Assets                 | 1,33%   | 1,18%   | 1,16%   | 1,17%     | 0,00%     | 0,00%     | 1,09%     | 1,80%     | 2,83%     |
| Return on Assets                                    | 0,77%   | 0,72%   | 0,73%   | 0,71%     | 0,54%     | 0,20%     | -1,15%    | -1,33%    | -0,18%    |
| Return on Capital                                   | 1,92%   | 2,30%   | 1,93%   | 2,38%     | 1,46%     | 0,79%     | -4,92%    | -5,63%    | -0,38%    |
| Return on Equity                                    | 15,24%  | 16,23%  | 15,89%  | 16,70%    | 15,66%    | 5,66%     | -43,44%   | -41,81%   | -5,28%    |
| Share Price                                         | 4,899   | 4,963   | 5,563   | 5,301     | 3,718     | 2,098     | 0,494     | 0,386     | 0,292     |

| EUR Deutsche Bank AG                                | Q4/2005 | Q2/2006   | Q4/2006   | Q2/2007   | Q4/2007   | Q2/2008   | Q4/2008   | Q2/2009   | Q4/2009   |
|-----------------------------------------------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Total Assets</b>                                 | 992.161 | 1.058.293 | 1.584.493 | 1.901.181 | 1.925.003 | 1.990.740 | 2.202.423 | 1.732.873 | 1.500.664 |
| <b>Risk-weighted assets</b>                         | 251.202 | 262.564   | 275.459   | 307.777   | 328.818   | 304.923   | 307.732   | 295.096   | 273.476   |
| <b>Total Shareholders equity (incl. Minorities)</b> | 29.936  | 29.064    | 33.383    | 37.004    | 37.044    | 31.894    | 31.914    | 34.327    | 37.969    |
| <b>Shareholders' funds (excl. Minorities)</b>       | 29.314  | 28.372    | 32.666    | 36.287    | 35.622    | 30.116    | 30.703    | 33.214    | 36.647    |
| <b>Minority Interest</b>                            | 622     | 692       | 717       | 717       | 1.422     | 1.778     | 1.211     | 1.113     | 1.322     |
| <b>Tier 1 capital</b>                               | 21.898  | 22.802    | 23.539    | 25.992    | 28.320    | 28.327    | 31.094    | 32.509    | 34.406    |
| <b>Preference shares</b>                            | 3.587   | 4.107     | 4.496     | 4.434     | 5.602     | 7.141     | 9.622     | 9.503     | 10.616    |
| <b>Hybrid Tier 1 (esp. Innovative Tier 1)</b>       | 0       | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         |
| <b>Core Tier 1 capital</b>                          | 17.689  | 18.003    | 18.326    | 20.841    | 21.296    | 19.408    | 20.261    | 21.893    | 22.468    |
| <b>Tier 1 capital (excl. Minority Interest)</b>     | 21.276  | 22.110    | 22.822    | 25.275    | 26.898    | 26.549    | 29.883    | 31.396    | 33.084    |
| <b>Tier 2 capital</b>                               | 11.988  | 10.951    | 10.770    | 10.366    | 9.729     | 8.669     | 6.302     | 4.243     | 3.523     |
| <b>Total Capital (after supervisory deduction)</b>  | 33.886  | 33.753    | 34.309    | 36.358    | 38.049    | 36.996    | 37.396    | 36.752    | 37.929    |
| <b>Goodwill &amp; other intangibles</b>             |         |           |           |           |           |           |           |           | 10.169    |
| Tier 1 ratio                                        | 8,72%   | 8,68%     | 8,55%     | 8,45%     | 8,61%     | 9,29%     | 10,10%    | 11,02%    | 12,58%    |
| CAR                                                 | 13,49%  | 12,86%    | 12,46%    | 11,81%    | 11,57%    | 12,13%    | 12,15%    | 12,45%    | 13,87%    |
| Core Tier 1 ratio                                   | 7,04%   | 6,86%     | 6,65%     | 6,77%     | 6,48%     | 6,36%     | 6,58%     | 7,42%     | 8,22%     |
| Shareholders Equity to Total Assets (LR1)           | 3,02%   | 2,75%     | 2,11%     | 1,95%     | 1,92%     | 1,60%     | 1,45%     | 1,98%     | 2,53%     |
| Tier 1 capital to Total Assets (LR2)                | 2,21%   | 2,15%     | 1,49%     | 1,37%     | 1,47%     | 1,42%     | 1,41%     | 1,88%     | 2,29%     |
| Tier 1 capital (excl. Minorities) to Total Assets   | 2,14%   | 2,09%     | 1,44%     | 1,33%     | 1,40%     | 1,33%     | 1,36%     | 1,81%     | 2,20%     |
| Shareholders Equity to RWA                          | 11,92%  | 11,07%    | 12,12%    | 12,02%    | 11,27%    | 10,46%    | 10,37%    | 11,63%    | 13,88%    |
| Total capital to Total Assets (LR3)                 | 3,42%   | 3,19%     | 2,17%     | 1,91%     | 1,98%     | 1,86%     | 1,70%     | 2,12%     | 2,53%     |
| Core Tier 1 capital to Total Assets                 | 1,78%   | 1,70%     | 1,16%     | 1,10%     | 1,11%     | 0,97%     | 0,92%     | 1,26%     | 1,50%     |
| Return on Assets                                    | 0,39%   | 0,44%     | 0,57%     | 0,46%     | 0,41%     | 0,16%     | -0,18%    | -0,11%    | 0,27%     |
| Return on Capital                                   | 1,17%   | 1,24%     | 1,65%     | 1,45%     | 1,61%     | 0,64%     | -1,09%    | -0,63%    | 1,71%     |
| Return on Equity                                    | 12,64%  | 14,46%    | 19,08%    | 19,95%    | 18,54%    | 9,07%     | -11,32%   | -6,27%    | 14,77%    |
| Share Price                                         | 81,9    | 87,97     | 101,72    | 107,09    | 89,47     | 54,43     | 27,83     | 43,19     | 49,42     |

| EUR Credit Agricole                                 | Q4/2005   | Q2/2006   | Q4/2006   | Q2/2007   | Q4/2007   | Q2/2008   | Q4/2008   | Q2/2009   | Q4/2009   |
|-----------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Total Assets</b>                                 | 1.061.443 | 1.177.650 | 1.260.533 | 1.391.850 | 1.414.223 | 1.464.822 | 1.653.220 | 1.605.364 | 1.557.342 |
| <b>Risk-weighted assets</b>                         | 248.500   | 251.200   | 263.600   | 307.900   | 345.100   | 320.600   | 356.500   | 324.600   | 326.400   |
| <b>Total Shareholders equity (incl. Minorities)</b> | 30.682    | 32.338    | 34.300    | 41.900    | 40.691    | 36.138    | 47.336    | 49.620    | 51.964    |
| <b>Shareholders' funds (excl. Minorities)</b>       | 26.456    | 28.157    | 29.530    | 36.589    | 34.908    | 30.893    | 43.236    | 43.707    | 47.264    |
| <b>Minority Interest</b>                            | 4.226     | 4.181     | 4.770     | 5.311     | 5.783     | 5.245     | 4.100     | 5.913     | 4.700     |
| <b>Tier 1 capital</b>                               | 20.700    | 22.300    | 21.600    | 27.300    | 28.000    | 28.400    | 30.700    | 29.900    | 31.000    |
| <b>Preference shares</b>                            | 3.038     | 2.911     | 2.900     | 2.800     | 2.700     | 2.600     | 2.773     | 2.750     | 2.723     |
| <b>Hybrid Tier 1 (esp. Innovative Tier 1)</b>       | 0         | 0         | 0         | 0         | 0         | 0         | 11.800    | 12.600    | 11.200    |
| <b>Core Tier 1 capital</b>                          | 13.436    | 15.208    | 13.930    | 19.189    | 19.517    | 20.555    | 12.027    | 8.637     | 12.377    |
| <b>Tier 1 capital (excl. Minority Interest)</b>     | 16.474    | 18.119    | 16.830    | 21.989    | 22.217    | 23.155    | 26.600    | 23.987    | 26.300    |
| <b>Tier 2 capital</b>                               | 16.500    | 17.900    | 18.800    | 17.200    | 16.000    | 10.200    | 19.200    | 11.000    | 10.700    |
| <b>Total Capital (after supervisory deduction)</b>  | 21.100    | 23.900    | 23.100    | 30.100    | 29.700    | 30.700    | 33.400    | 32.500    | 31.800    |
| <b>Goodwill &amp; other intangibles</b>             |           |           |           |           |           |           |           |           | 21.125    |
| Tier 1 ratio                                        | 8,33%     | 8,88%     | 8,19%     | 8,87%     | 8,11%     | 8,86%     | 8,61%     | 9,21%     | 9,50%     |
| CAR                                                 | 8,49%     | 9,51%     | 8,76%     | 9,78%     | 8,61%     | 9,58%     | 9,37%     | 10,01%    | 9,74%     |
| Core Tier 1 ratio                                   | 5,41%     | 6,05%     | 5,28%     | 6,23%     | 5,66%     | 6,41%     | 3,37%     | 2,66%     | 3,79%     |
| Shareholders Equity to Total Assets (LR1)           | 2,89%     | 2,75%     | 2,72%     | 3,01%     | 2,88%     | 2,47%     | 2,86%     | 3,09%     | 3,34%     |
| Tier 1 capital to Total Assets (LR2)                | 1,95%     | 1,89%     | 1,71%     | 1,96%     | 1,98%     | 1,94%     | 1,86%     | 1,86%     | 1,99%     |
| Tier 1 capital (excl. Minorities) to Total Assets   | 1,55%     | 1,54%     | 1,34%     | 1,58%     | 1,57%     | 1,58%     | 1,61%     | 1,49%     | 1,69%     |
| Shareholders Equity to RWA                          | 12,35%    | 12,87%    | 13,01%    | 13,61%    | 11,79%    | 11,27%    | 13,28%    | 15,29%    | 15,92%    |
| Total capital to Total Assets (LR3)                 | 1,99%     | 2,03%     | 1,83%     | 2,16%     | 2,10%     | 2,10%     | 2,02%     | 2,02%     | 2,04%     |
| Core Tier 1 capital to Total Assets                 | 1,27%     | 1,29%     | 1,11%     | 1,38%     | 1,38%     | 1,40%     | 0,73%     | 0,54%     | 0,79%     |
| Return on Assets                                    | 0,41%     | 0,42%     | 0,42%     | 0,48%     | 0,30%     | 0,07%     | 0,07%     | 0,03%     | 0,07%     |
| Return on Capital                                   | 1,52%     | 1,79%     | 1,69%     | 1,77%     | 1,17%     | 0,36%     | 0,29%     | 0,14%     | 0,24%     |
| Return on Equity                                    | 13,99%    | 15,63%    | 14,96%    | 16,70%    | 10,67%    | 2,73%     | 2,48%     | 1,15%     | 2,58%     |
| Share Price                                         | 24,1583   | 27,009    | 28,9246   | 27,8579   | 21,2879   | 12,98     | 8         | 8,876     | 12,36     |

| GBP Barclays PLC                                    | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007   | Q4/2007   | Q2/2008   | Q4/2008   | Q2/2009   | Q4/2009   |
|-----------------------------------------------------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Total Assets</b>                                 | 924.357 | 986.124 | 996.787 | 1.158.262 | 1.227.361 | 1.365.654 | 2.052.980 | 1.545.338 | 1.378.929 |
| <b>Risk-weighted assets</b>                         | 269.148 | 290.924 | 297.833 | 318.043   | 353.476   | 352.739   | 433.302   | 406.054   | 382.653   |
| <b>Total Shareholders equity (incl. Minorities)</b> | 24.430  | 25.539  | 27.390  | 28.721    | 32.476    | 32.822    | 36.618    | 48.687    | 47.277    |
| <b>Shareholders' funds (excl. Minorities)</b>       | 17.426  | 17.988  | 19.799  | 20.973    | 23.291    | 22.289    | 25.825    | 37.699    | 36.076    |
| <b>Minority Interest</b>                            | 7.004   | 7.551   | 7.591   | 7.748     | 9.185     | 10.533    | 10.793    | 10.988    | 11.201    |
| <b>Tier 1 capital</b>                               | 18.895  | 21.017  | 23.005  | 24.469    | 27.408    | 27.700    | 37.250    | 42.625    | 49.637    |
| <b>Preference shares</b>                            | 2.977   | 3.435   | 3.414   | 3.431     | 4.744     | 5.050     | 5.900     | 5.850     | 6.256     |
| <b>Hybrid Tier 1 (esp. Innovative Tier 1)</b>       | 0       | 0       | 0       | 0         | 0         | 0         | 0         | 0         | 0         |
| <b>Core Tier 1 capital</b>                          | 8.914   | 10.031  | 12.000  | 13.290    | 13.479    | 12.117    | 20.557    | 25.787    | 32.180    |
| <b>Tier 1 capital (excl. Minority Interest)</b>     | 11.891  | 13.466  | 15.414  | 16.721    | 18.223    | 17.167    | 26.457    | 31.637    | 38.436    |
| <b>Tier 2 capital</b>                               | 13.350  | 14.642  | 14.036  | 15.206    | 17.123    | 17.469    | 22.333    | 17.897    | 14.703    |
| <b>Total Capital (after supervisory deduction)</b>  | 30.502  | 33.715  | 34.711  | 37.452    | 42.642    | 44.452    | 58.727    | 58.720    | 63.460    |
| <b>Goodwill &amp; other intangibles</b>             |         |         |         |           |           |           |           |           | 8.795     |
| Tier 1 ratio                                        | 7,02%   | 7,22%   | 7,72%   | 7,69%     | 7,75%     | 7,85%     | 8,60%     | 10,50%    | 12,97%    |
| CAR                                                 | 11,33%  | 11,59%  | 11,65%  | 11,78%    | 12,06%    | 12,60%    | 13,55%    | 14,46%    | 16,58%    |
| Core Tier 1 ratio                                   | 3,31%   | 3,45%   | 4,03%   | 4,18%     | 3,81%     | 3,44%     | 4,74%     | 6,35%     | 8,41%     |
| Shareholders Equity to Total Assets (LR1)           | 2,64%   | 2,59%   | 2,75%   | 2,48%     | 2,65%     | 2,40%     | 1,78%     | 3,15%     | 3,43%     |
| Tier 1 capital to Total Assets (LR2)                | 2,04%   | 2,13%   | 2,31%   | 2,11%     | 2,23%     | 2,03%     | 1,81%     | 2,76%     | 3,60%     |
| Tier 1 capital (excl. Minorities) to Total Assets   | 1,29%   | 1,37%   | 1,55%   | 1,44%     | 1,48%     | 1,26%     | 1,29%     | 2,05%     | 2,79%     |
| Shareholders Equity to RWA                          | 9,08%   | 8,78%   | 9,20%   | 9,03%     | 9,19%     | 9,30%     | 8,45%     | 11,99%    | 12,36%    |
| Total capital to Total Assets (LR3)                 | 3,30%   | 3,42%   | 3,48%   | 3,23%     | 3,47%     | 3,25%     | 2,86%     | 3,80%     | 4,60%     |
| Core Tier 1 capital to Total Assets                 | 0,96%   | 1,02%   | 1,20%   | 1,15%     | 1,10%     | 0,89%     | 1,00%     | 1,67%     | 2,33%     |
| Return on Assets                                    | 0,47%   | 0,43%   | 0,48%   | 0,46%     | 0,40%     | 0,28%     | 0,23%     | 0,27%     | 0,55%     |
| Return on Capital                                   | 1,25%   | 1,26%   | 1,47%   | 1,38%     | 1,27%     | 1,02%     | 0,98%     | 1,01%     | 2,02%     |
| Return on Equity                                    | 20,71%  | 22,96%  | 24,56%  | 25,14%    | 20,50%    | 16,19%    | 12,61%    | 13,16%    | 22,39%    |
| Share Price                                         | 42,08   | 45,78   | 58,14   | 55,79     | 40,37     | 23,15     | 9,8       | 18,44     | 17,6      |

| CHF UBS                                             | Q4/2005   | Q2/2006   | Q4/2006   | Q2/2007   | Q4/2007   | Q2/2008   | Q4/2008   | Q2/2009   | Q4/2009   |
|-----------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Total Assets</b>                                 | 2.060.250 | 2.176.675 | 2.346.362 | 2.539.741 | 2.272.579 | 2.077.635 | 2.014.815 | 1.599.873 | 1.340.538 |
| <b>Risk-weighted assets</b>                         | 310.409   | 315.924   | 341.892   | 378.430   | 372.298   | 323.177   | 302.273   | 247.976   | 206.525   |
| <b>Total Shareholders equity (incl. Minorities)</b> | 44.130    | 45.465    | 49.686    | 51.259    | 42.170    | 52.294    | 40.533    | 41.556    | 41.013    |
| <b>Shareholders' funds (excl. Minorities)</b>       | 36.511    | 39.404    | 42.735    | 45.120    | 35.219    | 44.283    | 32.531    | 33.545    | 33.393    |
| <b>Minority Interest</b>                            | 7.619     | 6.061     | 6.951     | 6.139     | 6.951     | 8.011     | 8.002     | 8.011     | 7.620     |
| <b>Tier 1 capital</b>                               | 39.943    | 38.402    | 40.528    | 46.636    | 32.811    | 37.500    | 33.154    | 32.640    | 31.798    |
| <b>Preference shares</b>                            | 4.975     | 5.604     | 5.633     | 5.685     | 6.381     | 7.543     | 7.381     | 7.528     | 7.254     |
| <b>Hybrid Tier 1 (esp. Innovative Tier 1)</b>       | 5.438     | 5.697     | 5.583     | 5.619     | 0         | 0         | 0         | 0         | 0         |
| <b>Core Tier 1 capital</b>                          | 21.911    | 21.040    | 22.361    | 29.193    | 19.479    | 21.946    | 17.771    | 17.101    | 16.924    |
| <b>Tier 1 capital (excl. Minority Interest)</b>     | 32.324    | 32.341    | 33.577    | 40.497    | 25.860    | 29.489    | 25.152    | 24.629    | 24.178    |
| <b>Tier 2 capital</b>                               | 3.974     | 6.928     | 9.836     | 12.059    | 11.696    | 13.170    | 12.213    | 11.231    | 9.143     |
| <b>Total Capital (after supervisory deduction)</b>  | 43.917    | 45.330    | 50.364    | 58.695    | 44.507    | 50.670    | 45.367    | 43.871    | 40.941    |
| <b>Goodwill &amp; other intangibles</b>             |           |           |           |           |           |           |           |           | 11.008    |
| Tier 1 ratio                                        | 12,87%    | 12,16%    | 11,85%    | 12,32%    | 8,81%     | 11,60%    | 10,97%    | 13,16%    | 15,40%    |
| CAR                                                 | 14,15%    | 14,35%    | 14,73%    | 15,51%    | 11,95%    | 15,68%    | 15,01%    | 17,69%    | 19,82%    |
| Core Tier 1 ratio                                   | 7,06%     | 6,66%     | 6,54%     | 7,71%     | 5,23%     | 6,79%     | 5,88%     | 6,90%     | 8,19%     |
| Shareholders Equity to Total Assets (LR1)           | 2,14%     | 2,09%     | 2,12%     | 2,02%     | 1,86%     | 2,52%     | 2,01%     | 2,60%     | 3,06%     |
| Tier 1 capital to Total Assets (LR2)                | 1,94%     | 1,76%     | 1,73%     | 1,84%     | 1,44%     | 1,80%     | 1,65%     | 2,04%     | 2,37%     |
| Tier 1 capital (excl. Minorities) to Total Assets   | 1,57%     | 1,49%     | 1,43%     | 1,59%     | 1,14%     | 1,42%     | 1,25%     | 1,54%     | 1,80%     |
| Shareholders Equity to RWA                          | 14,22%    | 14,39%    | 14,53%    | 13,55%    | 11,33%    | 16,18%    | 13,41%    | 16,76%    | 19,86%    |
| Total capital to Total Assets (LR3)                 | 2,13%     | 2,08%     | 2,15%     | 2,31%     | 1,96%     | 2,44%     | 2,25%     | 2,74%     | 3,05%     |
| Core Tier 1 capital to Total Assets                 | 1,06%     | 0,97%     | 0,95%     | 1,15%     | 0,86%     | 1,06%     | 0,88%     | 1,07%     | 1,26%     |
| Return on Assets                                    | 0,74%     | 0,75%     | 0,55%     | 0,60%     | -0,22%    | -1,12%    | -0,99%    | -0,69%    | -0,16%    |
| Return on Capital                                   | 1,61%     | 1,73%     | 1,16%     | 1,44%     | -0,44%    | -2,67%    | -2,72%    | -1,78%    | -0,42%    |
| Return on Equity                                    | 35,99%    | 38,12%    | 26,16%    | 29,33%    | -12,12%   | -54,09%   | -61,35%   | -32,52%   | -7,44%    |
| Share Price                                         | 55,63     | 59,59     | 65,86     | 65,46     | 46,6      | 21,44     | 14,84     | 13,29     | 16,05     |

## Appendix 14: Overview over Austrian Banks (currency in million)

| EUR ÖVAG                                            | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
|-----------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>Total Assets</b>                                 | 54.800  | 61.204  | 67.429  | 76.875  | 78.641  | 97.709  | 52.924  | 52.688  | 48.116  |
| <b>Risk-weighted assets</b>                         | 26.283  | 30.089  | 33.894  | 39.020  | 38.502  | 42.702  | 33.263  | 30.405  | 27.255  |
| <b>Total Shareholders equity (incl. Minorities)</b> | 2.238   | 2.943   | 2.845   | 3.040   | 2.947   | 2.986   | 2.224   | 3.060   | 2.121   |
| <b>Shareholders' funds (excl. Minorities)</b>       | 1.350   | 1.433   | 1.516   | 1.455   | 1.347   | 1.560   | 1.231   | 2.108   | 1.178   |
| <b>Minority Interest</b>                            | 888     | 1.128   | 1.329   | 1.455   | 1.600   | 1.425   | 993     | 952     | 943     |
| <b>Tier 1 capital</b>                               | 1.972   | 2.318   | 2.664   | 2.665   | 2.767   | 3.200   | 2.515   | 3.259   | 2.714   |
| <b>Preference shares</b>                            | 19      | 19      | 19      | 19      | 19      | 19      | 19      | 19      | 19      |
| <b>Hybrid Tier 1 (esp. Innovative Tier 1)</b>       | 430     | 427     | 424     | 422     | 422     | 422     | 355     | 351     | 353     |
| <b>Core Tier 1 capital</b>                          | 635     | 744     | 892     | 769     | 725     | 1.333   | 1.147   | 1.936   | 1.399   |
| <b>Tier 1 capital (excl. Minority Interest)</b>     | 1.084   | 1.190   | 1.335   | 1.210   | 1.167   | 1.775   | 1.522   | 2.307   | 1.771   |
| <b>Tier 2 capital</b>                               | 841     | 1.190   | 1.538   | 1.708   | 1.568   | 1.339   | 895     | 787     | 938     |
| <b>Total Capital (after supervisory deduction)</b>  | 2.813   | 3.508   | 4.202   | 4.382   | 4.335   | 4.539   | 3.424   | 4.071   | 3.682   |
| <b>Goodwill &amp; other intangibles</b>             |         |         |         |         |         |         |         |         | 34      |
| Tier 1 ratio                                        | 7,50%   | 7,70%   | 7,86%   | 6,83%   | 7,19%   | 7,49%   | 7,56%   | 10,72%  | 9,96%   |
| CAR                                                 | 10,70%  | 11,66%  | 12,40%  | 11,23%  | 11,26%  | 10,63%  | 10,29%  | 13,39%  | 13,51%  |
| Core Tier 1 ratio                                   | 2,41%   | 2,47%   | 2,63%   | 1,97%   | 1,88%   | 3,12%   | 3,45%   | 6,37%   | 5,13%   |
| Shareholders Equity to Total Assets (LR1)           | 4,08%   | 4,81%   | 4,22%   | 3,95%   | 3,75%   | 3,06%   | 4,20%   | 5,81%   | 4,41%   |
| Tier 1 capital to Total Assets (LR2)                | 3,60%   | 3,79%   | 3,95%   | 3,47%   | 3,52%   | 3,28%   | 4,75%   | 6,19%   | 5,64%   |
| Tier 1 capital (excl. Minorities) to Total Assets   | 1,98%   | 1,94%   | 1,98%   | 1,57%   | 1,48%   | 1,82%   | 2,88%   | 4,38%   | 3,68%   |
| Shareholders Equity to RWA                          | 8,52%   | 9,78%   | 8,39%   | 7,79%   | 7,66%   | 6,99%   | 6,69%   | 10,07%  | 7,78%   |
| Total capital to Total Assets (LR3)                 | 5,13%   | 5,73%   | 6,23%   | 5,70%   | 5,51%   | 4,65%   | 6,47%   | 7,73%   | 7,65%   |
| Core Tier 1 capital to Total Assets                 | 1,16%   | 1,22%   | 1,32%   | 1,00%   | 0,92%   | 1,36%   | 2,17%   | 3,68%   | 2,91%   |
| EUR Hypo Group                                      | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| <b>Total Assets</b>                                 | 24.230  | 27.412  | 30.595  | 37.756  | 37.939  | 41.212  | 43.336  | 41.712  | 41.079  |
| <b>Risk-weighted assets</b>                         | 17.760  | 19.885  | 22.010  | 25.534  | 28.247  | 32.678  | 32.832  | 31.279  | 27.908  |
| <b>Total Shareholders equity (incl. Minorities)</b> | 983     | 1.115   | 1.247   | 1.302   | 1.659   | 1.748   | 2.530   | 2.406   | 1.990   |
| <b>Shareholders' funds (excl. Minorities)</b>       | 660     | 755     | 850     | 709     | 1.155   | 1.016   | 2.021   | 1.891   | 1.466   |
| <b>Minority Interest</b>                            | 323     | 360     | 397     | 593     | 505     | 732     | 509     | 514     | 525     |
| <b>Tier 1 capital</b>                               | 914     | 1.046   | 1.178   | 1.514   | 1.769   | 1.898   | 2.747   | 2.550   | 2.018   |
| <b>Preference shares</b>                            | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| <b>Hybrid Tier 1 (esp. Innovative Tier 1)</b>       | 227     | 226     | 224     | 204     | 206     | 201     | 117     | 119     | 130     |
| <b>Core Tier 1 capital</b>                          | 364     | 461     | 557     | 717     | 1.059   | 965     | 2.120   | 1.916   | 1.364   |
| <b>Tier 1 capital (excl. Minority Interest)</b>     | 591     | 686     | 781     | 921     | 1.265   | 1.166   | 2.237   | 2.035   | 1.494   |
| <b>Tier 2 capital</b>                               | 557     | 684     | 812     | 993     | 1.107   | 1.415   | 1.430   | 1.427   | 996     |
| <b>Total Capital (after supervisory deduction)</b>  | 1.471   | 1.731   | 1.990   | 2.507   | 2.876   | 3.313   | 4.176   | 3.977   | 3.014   |
| <b>Goodwill &amp; other intangibles</b>             |         |         |         |         |         |         |         |         | 45      |
| Tier 1 ratio                                        | 5,15%   | 5,26%   | 5,35%   | 5,93%   | 6,26%   | 5,81%   | 8,37%   | 8,15%   | 7,23%   |
| CAR                                                 | 8,28%   | 8,70%   | 9,04%   | 9,82%   | 10,18%  | 10,14%  | 12,72%  | 12,72%  | 10,80%  |
| Core Tier 1 ratio                                   | 2,05%   | 2,32%   | 2,53%   | 2,81%   | 3,75%   | 2,95%   | 6,46%   | 6,13%   | 4,89%   |
| Shareholders Equity to Total Assets (LR1)           | 4,05%   | 4,07%   | 4,08%   | 3,45%   | 4,37%   | 4,24%   | 5,84%   | 5,77%   | 4,84%   |
| Tier 1 capital to Total Assets (LR2)                | 3,77%   | 3,82%   | 3,85%   | 4,01%   | 4,66%   | 4,61%   | 6,34%   | 6,11%   | 4,91%   |
| Tier 1 capital (excl. Minorities) to Total Assets   | 2,44%   | 2,50%   | 2,55%   | 2,44%   | 3,33%   | 2,83%   | 5,16%   | 4,88%   | 3,64%   |
| Shareholders Equity to RWA                          | 5,53%   | 5,61%   | 5,67%   | 5,10%   | 5,87%   | 5,35%   | 7,71%   | 7,69%   | 7,13%   |
| Total capital to Total Assets (LR3)                 | 6,07%   | 6,31%   | 6,50%   | 6,64%   | 7,58%   | 8,04%   | 9,64%   | 9,54%   | 7,34%   |
| Core Tier 1 capital to Total Assets                 | 1,50%   | 1,68%   | 1,82%   | 1,90%   | 2,79%   | 2,34%   | 4,89%   | 4,59%   | 3,32%   |
| EUR Erste Group                                     | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| <b>Total Assets</b>                                 | 152.660 | 160.249 | 181.703 | 197.323 | 200.519 | 214.158 | 201.411 | 204.167 | 201.710 |
| <b>Risk-weighted assets</b>                         | 75.078  | 79.247  | 94.129  | 92.660  | 95.091  | 102.331 | 103.663 | 107.834 | 106.383 |
| <b>Total Shareholders equity (incl. Minorities)</b> | 6.461   | 9.037   | 10.904  | 11.368  | 8.452   | 12.046  | 11.095  | 13.293  | 16.123  |
| <b>Shareholders' funds (excl. Minorities)</b>       | 4.129   | 6.865   | 7.979   | 8.387   | 5.501   | 8.911   | 8.079   | 10.098  | 12.709  |
| <b>Minority Interest</b>                            | 2.332   | 2.172   | 2.925   | 2.981   | 2.951   | 3.135   | 3.016   | 3.195   | 3.414   |
| <b>Tier 1 capital</b>                               | 5.112   | 7.757   | 6.185   | 5.901   | 6.674   | 7.090   | 7.448   | 9.038   | 11.450  |
| <b>Preference shares</b>                            | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| <b>Hybrid Tier 1 (esp. Innovative Tier 1)</b>       | 900     | 900     | 1.250   | 1.250   | 1.248   | 1.248   | 1.256   | 1.256   | 1.174   |
| <b>Core Tier 1 capital</b>                          | 1.880   | 4.685   | 2.010   | 1.670   | 2.475   | 2.707   | 3.176   | 4.587   | 6.862   |
| <b>Tier 1 capital (excl. Minority Interest)</b>     | 2.780   | 5.585   | 3.260   | 2.920   | 3.723   | 3.955   | 4.432   | 5.843   | 8.036   |
| <b>Tier 2 capital</b>                               | 3.381   | 3.245   | 3.820   | 4.226   | 3.820   | 4.279   | 4.335   | 4.312   | 4.326   |
| <b>Total Capital (after supervisory deduction)</b>  | 8.611   | 11.104  | 10.111  | 10.202  | 10.825  | 11.764  | 12.185  | 13.730  | 16.182  |
| <b>Goodwill &amp; other intangibles</b>             |         |         |         |         |         |         |         |         | 498     |
| Tier 1 ratio                                        | 6,81%   | 9,79%   | 6,57%   | 6,37%   | 7,02%   | 6,93%   | 7,18%   | 8,38%   | 10,76%  |
| CAR                                                 | 11,47%  | 14,01%  | 10,74%  | 11,01%  | 11,38%  | 11,50%  | 11,75%  | 12,73%  | 15,21%  |
| Core Tier 1 ratio                                   | 2,50%   | 5,91%   | 2,14%   | 1,80%   | 2,60%   | 2,65%   | 3,06%   | 4,25%   | 6,45%   |
| Shareholders Equity to Total Assets (LR1)           | 4,23%   | 5,64%   | 6,00%   | 5,76%   | 4,22%   | 5,62%   | 5,51%   | 6,51%   | 7,99%   |
| Tier 1 capital to Total Assets (LR2)                | 3,35%   | 4,84%   | 3,40%   | 2,99%   | 3,33%   | 3,31%   | 3,70%   | 4,43%   | 5,68%   |
| Tier 1 capital (excl. Minorities) to Total Assets   | 1,82%   | 3,49%   | 1,79%   | 1,48%   | 1,86%   | 1,85%   | 2,20%   | 2,86%   | 3,98%   |
| Shareholders Equity to RWA                          | 8,61%   | 11,40%  | 11,58%  | 12,27%  | 8,89%   | 11,77%  | 10,70%  | 12,33%  | 15,16%  |
| Total capital to Total Assets (LR3)                 | 5,64%   | 6,93%   | 5,56%   | 5,17%   | 5,40%   | 5,49%   | 6,05%   | 6,72%   | 8,02%   |
| Core Tier 1 capital to Total Assets                 | 1,23%   | 2,92%   | 1,11%   | 0,85%   | 1,23%   | 1,26%   | 1,58%   | 2,25%   | 3,40%   |

| EUR RZB                                           | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
|---------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Total Assets                                      | 93.863  | 103.189 | 115.629 | 126.057 | 137.402 | 159.161 | 156.921 | 155.938 | 147.938 |
| Risk-weighted assets                              | 47.968  | 54.981  | 70.656  | 79.286  | 93.638  | 98.090  | 89.040  | 80.716  | 74.990  |
| Total Shareholders equity (incl. Minorities)      | 4.950   | 5.217   | 6.637   | 7.246   | 8.422   | 8.933   | 8.587   | 9.997   | 10.308  |
| Shareholders' funds (excl. Minorities)            | 3.520   | 3.697   | 4.743   | 5.150   | 5.667   | 5.935   | 5.912   | 7.496   | 7.735   |
| Minority Interest                                 | 1.430   | 1.520   | 1.894   | 2.096   | 2.755   | 2.998   | 2.675   | 2.501   | 2.573   |
| Tier 1 capital                                    | 3.982   | 3.955   | 5.652   | 5.662   | 7.341   | 7.153   | 7.471   | 8.760   | 8.813   |
| Preference shares                                 | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Hybrid Tier 1 (esp. Innovative Tier 1)            | 819     | 809     | 819     | 809     | 819     | 809     | 1.075   | 809     | 819     |
| Core Tier 1 capital                               | 1.733   | 1.626   | 2.939   | 2.757   | 3.767   | 3.346   | 3.721   | 5.450   | 5.421   |
| Tier 1 capital (excl. Minority Interest)          | 2.552   | 2.435   | 3.758   | 3.566   | 4.586   | 4.155   | 4.796   | 6.259   | 6.240   |
| Tier 2 capital                                    | 1.306   | 1.710   | 1.723   | 2.104   | 2.722   | 3.072   | 3.603   | 3.583   | 3.718   |
| Total Capital (after supervisory deduction)       | 5.199   | 5.851   | 7.614   | 8.035   | 10.508  | 10.466  | 11.362  | 12.659  | 12.823  |
| Goodwill & other intangibles                      |         |         |         |         |         |         |         |         | 383     |
| Tier 1 ratio                                      | 8,30%   | 7,19%   | 8,00%   | 7,14%   | 7,84%   | 7,29%   | 8,39%   | 10,85%  | 11,75%  |
| CAR                                               | 10,84%  | 10,64%  | 10,78%  | 10,13%  | 11,22%  | 10,67%  | 12,76%  | 15,68%  | 17,10%  |
| Core Tier 1 ratio                                 | 3,61%   | 2,96%   | 4,16%   | 3,48%   | 4,02%   | 3,41%   | 4,18%   | 6,75%   | 7,23%   |
| Shareholders Equity to Total Assets (LR1)         | 5,27%   | 5,06%   | 5,74%   | 5,75%   | 6,13%   | 5,61%   | 5,47%   | 6,41%   | 6,97%   |
| Tier 1 capital to Total Assets (LR2)              | 4,24%   | 3,83%   | 4,89%   | 4,49%   | 5,34%   | 4,49%   | 4,76%   | 5,62%   | 5,96%   |
| Tier 1 capital (excl. Minorities) to Total Assets |         |         |         |         |         |         |         |         |         |
| Assets                                            | 2,72%   | 2,36%   | 3,25%   | 2,83%   | 3,34%   | 2,61%   | 3,06%   | 4,01%   | 4,22%   |
| Shareholders Equity to RWA                        | 10,32%  | 9,49%   | 9,39%   | 9,14%   | 8,99%   | 9,11%   | 9,64%   | 12,39%  | 13,75%  |
| Total capital to Total Assets (LR3)               | 5,54%   | 5,67%   | 6,58%   | 6,37%   | 7,65%   | 6,58%   | 7,24%   | 8,12%   | 8,67%   |
| Core Tier 1 capital to Total Assets               | 1,85%   | 1,58%   | 2,54%   | 2,19%   | 2,74%   | 2,10%   | 2,37%   | 3,49%   | 3,66%   |
| EUR UniCredit Bank Austria                        | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Total Assets                                      | 158.879 | 160.626 | 154.255 | 203.049 | 209.170 | 228.631 | 222.152 | 207.648 | 194.459 |
| Risk-weighted assets                              | 75.263  | 77.751  | 73.136  | 100.739 | 117.993 | 139.925 | 133.239 | 127.073 | 114.386 |
| Total Shareholders equity (incl. Minorities)      | 7.521   | 8.196   | 10.140  | 14.310  | 15.333  | 15.986  | 14.237  | 14.133  | 14.388  |
| Shareholders' funds (excl. Minorities)            | 6.871   | 7.576   | 9.927   | 13.633  | 14.675  | 15.305  | 13.504  | 13.613  | 13.849  |
| Minority Interest                                 | 650     | 620     | 213     | 677     | 658     | 681     | 733     | 520     | 539     |
| Tier 1 capital                                    | 6.236   | 6.120   | 8.501   | 10.436  | 9.678   | 9.079   | 9.081   | 9.254   | 9.923   |
| Preference shares                                 | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Hybrid Tier 1 (esp. Innovative Tier 1)            | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Core Tier 1 capital                               | 5.586   | 5.500   | 8.288   | 9.759   | 9.020   | 8.398   | 8.348   | 8.734   | 9.384   |
| Tier 1 capital (excl. Minority Interest)          | 5.586   | 5.500   | 8.288   | 9.759   | 9.020   | 8.398   | 8.348   | 8.734   | 9.384   |
| Tier 2 capital                                    | 3.646   | 3.345   | 3.158   | 4.214   | 12.559  | 2.925   | 2.870   | 2.510   | 2.468   |
| Total Capital (after supervisory deduction)       | 9.152   | 8.691   | 10.773  | 13.548  | 13.165  | 12.244  | 12.390  | 12.014  | 12.634  |
| Goodwill & other intangibles                      |         |         |         |         |         |         |         |         | 579     |
| Tier 1 ratio                                      | 8,29%   | 7,87%   | 11,62%  | 10,36%  | 8,20%   | 6,49%   | 6,82%   | 7,28%   | 8,68%   |
| CAR                                               | 12,16%  | 11,18%  | 14,73%  | 13,45%  | 11,16%  | 8,75%   | 9,30%   | 9,45%   | 11,05%  |
| Core Tier 1 ratio                                 | 7,42%   | 7,07%   | 11,33%  | 9,69%   | 7,64%   | 6,00%   | 6,27%   | 6,87%   | 8,20%   |
| Shareholders Equity to Total Assets (LR1)         | 4,73%   | 5,10%   | 6,57%   | 7,05%   | 7,33%   | 6,99%   | 6,41%   | 6,81%   | 7,40%   |
| Tier 1 capital to Total Assets (LR2)              | 3,92%   | 3,81%   | 5,51%   | 5,14%   | 4,63%   | 3,97%   | 4,09%   | 4,46%   | 5,10%   |
| Tier 1 capital (excl. Minorities) to Total Assets |         |         |         |         |         |         |         |         |         |
| Assets                                            | 3,52%   | 3,42%   | 5,37%   | 4,81%   | 4,31%   | 3,67%   | 3,76%   | 4,21%   | 4,83%   |
| Shareholders Equity to RWA                        | 9,99%   | 10,54%  | 13,86%  | 14,21%  | 12,99%  | 11,42%  | 10,69%  | 11,12%  | 12,58%  |
| Total capital to Total Assets (LR3)               | 5,76%   | 5,41%   | 6,98%   | 6,67%   | 6,29%   | 5,36%   | 5,58%   | 5,79%   | 6,50%   |
| Core Tier 1 capital to Total Assets               | 3,52%   | 3,42%   | 5,37%   | 4,81%   | 4,31%   | 3,67%   | 3,76%   | 4,21%   | 4,83%   |

## Appendix 15: Comparison of the Figures between Q4/2005 and Q4/2009 in USD

| in USD         |              |                      |                          |                              |            |                  |                                            |                |               |                                 |                                   |                                     |
|----------------|--------------|----------------------|--------------------------|------------------------------|------------|------------------|--------------------------------------------|----------------|---------------|---------------------------------|-----------------------------------|-------------------------------------|
|                | Total Assets | Risk-Weighted Assets | RWA in % of Total Assets | Goodwill & other intangibles | Minorities | preferred shares | other hybrid instruments-innovative Tier 1 | Tier 1 Capital | Total Capital | Goodwill in % of Tier 1 Capital | Minorities in % of Tier 1 Capital | Pref. Shares in % of Tier 1 Capital |
| Q4/2009        |              |                      |                          |                              |            |                  |                                            |                |               |                                 |                                   |                                     |
| European Banks | 10.294.968   | 2.529.703            | 25%                      | 97.886                       | 125.162    | 54.010           | 24.354                                     | 325.132        | 379.388       | 30%                             | 38%                               | 17%                                 |
| US Banks       | 7.636.756    | 5.077.956            | 66%                      | 251.597                      | 25.284     | 39.512           | 42.840                                     | 536.798        | 733.989       | 47%                             | 5%                                | 7%                                  |
| Austrian Banks | 907.661      | 502.948              | 55%                      | 2.206                        | 7.994      | 28               | 3.549                                      | 50.046         | 69.275        | 4%                              | 16%                               | 0,1%                                |
| Q4/2005        |              |                      |                          |                              |            |                  |                                            |                |               |                                 |                                   |                                     |
| European Banks | 6.903.811    | 1.923.973            | 28%                      | -                            | 27.161     | 28.802           | 14.018                                     | 161.428        | 225.036       | -                               | 17%                               | 18%                                 |
| US Banks       | 4.561.195    | 3.194.773            | 70%                      | -                            | 13.387     | 1.721            | 21.767                                     | 271.542        | 376.663       | -                               | 5%                                | 1%                                  |
| Austrian Banks | 568.849      | 284.585              | 50%                      | -                            | 6.603      | 23               | 2.790                                      | 21.391         | 31.994        | -                               | 31%                               | 0,1%                                |
| EUR/USD        |              | GBP/USD              |                          | CHF/USD                      |            |                  |                                            |                |               |                                 |                                   |                                     |
| 2009-12-31     |              | 1,43322              |                          | 1,59257                      |            | 0,96340          |                                            |                |               |                                 |                                   |                                     |
| 2005-12-31     |              | 1,17426              |                          | 1,72039                      |            | 0,75993          |                                            |                |               |                                 |                                   |                                     |

Source: OANDA Currency Converter

## Appendix 16: Overview calculated Ratios

| Q4/2005 - Q4/2009            |        | Tier 1 RATIO |         |         |         |         |         |         |         |         |
|------------------------------|--------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|
| European Banks               |        | Q4/2005      | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Royal Bank of Scotland Group | 8,88%  | 7,61%        | 7,55%   | 7,50%   | 7,42%   | 7,29%   | 9,09%   | 10,04%  | 9,29%   | 14,13%  |
| Deutsche Bank AG             | 9,56%  | 8,72%        | 8,68%   | 8,55%   | 8,45%   | 8,61%   | 9,29%   | 10,10%  | 11,02%  | 12,58%  |
| Credit Agricole              | 8,73%  | 8,33%        | 8,88%   | 8,19%   | 8,87%   | 8,11%   | 8,86%   | 8,61%   | 9,21%   | 9,50%   |
| Barclays PLC                 | 8,59%  | 7,02%        | 7,22%   | 7,72%   | 7,69%   | 7,75%   | 7,85%   | 8,60%   | 10,50%  | 12,97%  |
| UBS                          | 12,13% | 12,87%       | 12,16%  | 11,85%  | 12,32%  | 8,81%   | 11,60%  | 10,97%  | 13,16%  | 15,40%  |
|                              | Mean   | 8,91%        | 8,90%   | 8,76%   | 8,95%   | 8,12%   | 9,34%   | 9,66%   | 10,64%  | 12,91%  |
| US Banks                     |        | Q4/2005      | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Bank of America              | 8,48%  | 8,35%        | 8,33%   | 8,64%   | 8,52%   | 6,87%   | 4,13%   | 9,15%   | 11,93%  | 10,40%  |
| JP Morgan Chase & Co         | 9,26%  | 8,52%        | 8,48%   | 8,66%   | 8,38%   | 8,44%   | 9,15%   | 10,94%  | 9,69%   | 11,10%  |
| Citigroup Inc                | 9,56%  | 8,79%        | 8,59%   | 8,59%   | 7,91%   | 7,12%   | 8,74%   | 11,92%  | 12,74%  | 11,67%  |
| Wells Fargo & Co             | 8,14%  | 8,26%        | 8,35%   | 8,95%   | 8,55%   | 8,12%   | 4,12%   | 7,84%   | 9,80%   | 9,25%   |
| US Bancorp                   | 8,96%  | 8,21%        | 8,86%   | 8,75%   | 8,53%   | 8,25%   | 8,46%   | 10,59%  | 9,36%   | 9,61%   |
|                              | Mean   | 8,43%        | 8,52%   | 8,72%   | 8,38%   | 7,76%   | 6,92%   | 10,09%  | 10,71%  | 10,41%  |
| Austrian Banks               |        | Q4/2005      | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| ÖVAG                         | 8,09%  | 7,50%        | 7,70%   | 7,86%   | 6,83%   | 7,19%   | 7,49%   | 7,56%   | 10,72%  | 9,96%   |
| Hypo Group                   | 6,39%  | 5,15%        | 5,26%   | 5,35%   | 5,93%   | 6,26%   | 5,81%   | 8,37%   | 8,15%   | 7,23%   |
| Erste Group                  | 7,76%  | 6,81%        | 9,79%   | 6,57%   | 6,37%   | 7,02%   | 6,93%   | 7,18%   | 8,38%   | 10,76%  |
| RZB                          | 8,53%  | 8,30%        | 7,19%   | 8,00%   | 7,14%   | 7,84%   | 7,29%   | 8,39%   | 10,85%  | 11,75%  |
| UniCredit Bank Austria       | 8,40%  | 8,29%        | 7,87%   | 11,62%  | 10,36%  | 8,20%   | 6,49%   | 6,82%   | 7,28%   | 8,68%   |
|                              | Mean   | 7,21%        | 7,56%   | 7,88%   | 7,33%   | 7,30%   | 6,80%   | 7,66%   | 9,08%   | 9,68%   |

| Q4/2005 - Q4/2009            |        | CAR     |         |         |         |         |         |         |         |         |
|------------------------------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| European Banks               |        | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Royal Bank of Scotland Group | 12,69% | 11,69%  | 11,85%  | 11,73%  | 12,46%  | 11,16%  | 13,19%  | 14,11%  | 11,85%  | 16,13%  |
| Deutsche Bank AG             | 12,53% | 13,49%  | 12,86%  | 12,46%  | 11,81%  | 11,57%  | 12,13%  | 12,15%  | 12,45%  | 13,87%  |
| Credit Agricole              | 9,32%  | 8,49%   | 9,51%   | 8,76%   | 9,78%   | 8,61%   | 9,58%   | 9,37%   | 10,01%  | 9,74%   |
| Barclays PLC                 | 12,85% | 11,33%  | 11,59%  | 11,65%  | 11,78%  | 12,06%  | 12,60%  | 13,55%  | 14,46%  | 16,58%  |
| UBS                          | 15,43% | 14,15%  | 14,35%  | 14,73%  | 15,51%  | 11,95%  | 15,68%  | 15,01%  | 17,69%  | 19,82%  |
|                              | Mean   | 11,83%  | 12,03%  | 11,87%  | 12,27%  | 11,07%  | 12,64%  | 12,84%  | 13,29%  | 15,23%  |
| US Banks                     |        | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Bank of America              | 11,73% | 11,22%  | 11,25%  | 11,88%  | 12,11%  | 11,02%  | 6,30%   | 13,00%  | 14,11%  | 14,66%  |
| JP Morgan Chase & Co         | 13,04% | 12,04%  | 12,02%  | 12,32%  | 12,03%  | 12,57%  | 13,44%  | 14,84%  | 13,31%  | 14,78%  |
| Citigroup Inc                | 13,01% | 12,02%  | 11,65%  | 11,65%  | 11,23%  | 10,70%  | 12,29%  | 15,70%  | 16,62%  | 15,25%  |
| Wells Fargo & Co             | 11,51% | 11,68%  | 11,82%  | 12,51%  | 11,71%  | 11,28%  | 5,62%   | 11,83%  | 13,84%  | 13,26%  |
| US Bancorp                   | 12,89% | 12,50%  | 13,10%  | 12,58%  | 13,00%  | 12,19%  | 12,50%  | 14,26%  | 12,96%  | 12,95%  |
|                              | Mean   | 11,89%  | 11,97%  | 12,19%  | 12,02%  | 11,55%  | 10,03%  | 13,93%  | 14,17%  | 14,18%  |
| Austrian Banks               |        | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| ÖVAG                         | 11,67% | 10,70%  | 11,66%  | 12,40%  | 11,23%  | 11,26%  | 10,63%  | 10,29%  | 13,39%  | 13,51%  |
| Hypo Group                   | 10,27% | 8,28%   | 8,70%   | 9,04%   | 9,82%   | 10,18%  | 10,14%  | 12,72%  | 12,72%  | 10,80%  |
| Erste Group                  | 12,20% | 11,47%  | 14,01%  | 10,74%  | 11,01%  | 11,38%  | 11,50%  | 11,75%  | 12,73%  | 15,21%  |
| RZB                          | 12,20% | 10,84%  | 10,64%  | 10,78%  | 10,13%  | 11,22%  | 10,67%  | 12,76%  | 15,68%  | 17,10%  |
| UniCredit Bank Austria       | 11,25% | 12,16%  | 11,18%  | 14,73%  | 13,45%  | 11,16%  | 8,75%   | 9,30%   | 9,45%   | 11,05%  |
|                              | Mean   | 10,69%  | 11,24%  | 11,54%  | 11,13%  | 11,04%  | 10,34%  | 11,37%  | 12,80%  | 13,53%  |

| Q4/2005 - Q4/2009            |       | Core Tier 1 ratio |         |         |         |         |         |         |         |         |
|------------------------------|-------|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| European Banks               |       | Q4/2005           | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Royal Bank of Scotland Group | 2,96% | 2,79%             | 2,57%   | 2,53%   | 2,81%   | 0,00%   | 0,00%   | 3,48%   | 4,53%   | 7,96%   |
| Deutsche Bank AG             | 6,93% | 7,04%             | 6,86%   | 6,65%   | 6,77%   | 6,48%   | 6,36%   | 6,58%   | 7,42%   | 8,22%   |
| Credit Agricole              | 4,99% | 5,41%             | 6,05%   | 5,28%   | 6,23%   | 5,66%   | 6,41%   | 3,37%   | 2,66%   | 3,79%   |
| Barclays PLC                 | 4,64% | 3,31%             | 3,45%   | 4,03%   | 4,18%   | 3,81%   | 3,44%   | 4,74%   | 6,35%   | 8,41%   |
| UBS                          | 6,77% | 7,06%             | 6,66%   | 6,54%   | 7,71%   | 5,23%   | 6,79%   | 5,88%   | 6,90%   | 8,19%   |
|                              | Mean  | 5,12%             | 5,12%   | 5,01%   | 5,54%   | 4,24%   | 4,60%   | 4,81%   | 5,57%   | 7,31%   |
| US Banks                     |       | Q4/2005           | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Bank of America              | 6,08% | 6,93%             | 7,09%   | 6,86%   | 6,75%   | 5,12%   | 2,46%   | 4,80%   | 6,90%   | 7,81%   |
| JP Morgan Chase & Co         | 7,41% | 7,03%             | 7,05%   | 7,27%   | 7,10%   | 7,01%   | 7,76%   | 6,98%   | 7,69%   | 8,79%   |
| Citigroup Inc                | 5,95% | 7,90%             | 7,49%   | 7,49%   | 6,68%   | 4,91%   | 4,43%   | 2,30%   | 2,75%   | 9,60%   |
| Wells Fargo & Co             | 7,20% | 8,18%             | 8,21%   | 8,86%   | 8,41%   | 8,02%   | 4,05%   | 4,76%   | 6,15%   | 8,20%   |
| US Bancorp                   | 6,07% | 6,44%             | 6,61%   | 6,01%   | 5,84%   | 5,56%   | 5,64%   | 5,11%   | 6,68%   | 6,76%   |
|                              | Mean  | 7,29%             | 7,29%   | 7,30%   | 6,95%   | 6,12%   | 4,87%   | 4,79%   | 6,03%   | 8,23%   |
| Austrian Banks               |       | Q4/2005           | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| ÖVAG                         | 3,27% | 2,41%             | 2,47%   | 2,63%   | 1,97%   | 1,88%   | 3,12%   | 3,45%   | 6,37%   | 5,13%   |
| Hypo Group                   | 3,76% | 2,05%             | 2,32%   | 2,53%   | 2,81%   | 3,75%   | 2,95%   | 6,46%   | 6,13%   | 4,89%   |
| Erste Group                  | 3,49% | 2,50%             | 5,91%   | 2,14%   | 1,80%   | 2,60%   | 2,65%   | 3,06%   | 4,25%   | 6,45%   |
| RZB                          | 4,42% | 3,61%             | 2,96%   | 4,16%   | 3,48%   | 4,02%   | 3,41%   | 4,18%   | 6,75%   | 7,23%   |
| UniCredit Bank Austria       | 7,83% | 7,42%             | 7,07%   | 11,33%  | 9,69%   | 7,64%   | 6,00%   | 6,27%   | 6,87%   | 8,20%   |
|                              | Mean  | 3,60%             | 4,15%   | 4,56%   | 3,95%   | 3,98%   | 3,63%   | 4,68%   | 6,07%   | 6,38%   |

| Q4/2005 - Q4/2009            |       | Leverage Ratio 1 (Shareholders Equity/Total Assets) |         |         |         |         |         |         |         |         |
|------------------------------|-------|-----------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| European Banks               |       | Q4/2005                                             | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Royal Bank of Scotland Group | 3,96% | 4,56%                                               | 4,45%   | 4,62%   | 4,11%   | 3,20%   | 3,56%   | 2,65%   | 3,39%   | 5,11%   |
| Deutsche Bank AG             | 2,14% | 3,02%                                               | 2,75%   | 2,11%   | 1,95%   | 1,92%   | 1,60%   | 1,45%   | 1,98%   | 2,53%   |
| Credit Agricole              | 2,89% | 2,89%                                               | 2,75%   | 2,72%   | 3,01%   | 2,88%   | 2,47%   | 2,86%   | 3,09%   | 3,34%   |
| Barclays PLC                 | 2,65% | 2,64%                                               | 2,59%   | 2,75%   | 2,48%   | 2,65%   | 2,40%   | 1,78%   | 3,15%   | 3,43%   |
| UBS                          | 2,27% | 2,14%                                               | 2,09%   | 2,12%   | 2,02%   | 1,86%   | 2,52%   | 2,01%   | 2,60%   | 3,06%   |
|                              | Mean  | 3,05%                                               | 2,92%   | 2,86%   | 2,71%   | 2,50%   | 2,51%   | 2,15%   | 2,84%   | 3,49%   |
| US Banks                     |       | Q4/2005                                             | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Bank of America              | 9,24% | 8,53%                                               | 8,85%   | 9,27%   | 8,85%   | 8,56%   | 9,48%   | 9,44%   | 10,03%  | 10,17%  |
| JP Morgan Chase & Co         | 8,10% | 8,94%                                               | 8,33%   | 8,57%   | 8,18%   | 7,59%   | 7,50%   | 7,67%   | 7,64%   | 8,14%   |
| Citigroup Inc                | 6,91% | 7,53%                                               | 7,10%   | 6,36%   | 5,75%   | 5,19%   | 6,49%   | 7,31%   | 8,24%   | 8,22%   |
| Wells Fargo & Co             | 8,65% | 8,68%                                               | 8,52%   | 9,51%   | 8,75%   | 8,28%   | 7,87%   | 7,57%   | 9,45%   | 9,20%   |
| US Bancorp                   | 9,35% | 9,59%                                               | 9,57%   | 9,67%   | 9,14%   | 8,86%   | 8,85%   | 9,89%   | 9,37%   | 9,23%   |
|                              | Mean  | 8,65%                                               | 8,47%   | 8,67%   | 8,13%   | 7,75%   | 8,04%   | 8,38%   | 8,95%   | 8,99%   |
| Austrian Banks               |       | Q4/2005                                             | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| ÖVAG                         | 4,25% | 4,08%                                               | 4,81%   | 4,22%   | 3,95%   | 3,75%   | 3,06%   | 4,20%   | 5,81%   | 4,41%   |
| Hypo Group                   | 4,52% | 4,05%                                               | 4,07%   | 4,08%   | 3,45%   | 4,37%   | 4,24%   | 5,84%   | 5,77%   | 4,84%   |
| Erste Group                  | 5,72% | 4,23%                                               | 5,64%   | 6,00%   | 5,76%   | 4,22%   | 5,62%   | 5,51%   | 6,51%   | 7,99%   |
| RZB                          | 5,82% | 5,27%                                               | 5,06%   | 5,74%   | 5,75%   | 6,13%   | 5,61%   | 5,47%   | 6,41%   | 6,97%   |
| UniCredit Bank Austria       | 6,49% | 4,73%                                               | 5,10%   | 6,57%   | 7,05%   | 7,33%   | 6,99%   | 6,41%   | 6,81%   | 7,40%   |
|                              | Mean  | 4,48%                                               | 4,93%   | 5,32%   | 5,19%   | 5,16%   | 5,11%   | 5,49%   | 6,26%   | 6,32%   |

| Q4/2005 - Q4/2009            |       | Leverage Ratio 2 (Tier 1 Capital/Total Assets) |         |         |         |         |         |         |         |         |
|------------------------------|-------|------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| European Banks               |       | Q4/2005                                        | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Royal Bank of Scotland Group | 3,51% | 3,63%                                          | 3,47%   | 3,45%   | 3,08%   | 2,68%   | 3,38%   | 3,15%   | 3,70%   | 5,02%   |
| Deutsche Bank AG             | 1,74% | 2,21%                                          | 2,15%   | 1,49%   | 1,37%   | 1,47%   | 1,42%   | 1,41%   | 1,88%   | 2,29%   |
| Credit Agricole              | 1,91% | 1,95%                                          | 1,89%   | 1,71%   | 1,96%   | 1,98%   | 1,94%   | 1,86%   | 1,86%   | 1,99%   |
| Barclays PLC                 | 2,34% | 2,04%                                          | 2,13%   | 2,31%   | 2,11%   | 2,23%   | 2,03%   | 1,81%   | 2,76%   | 3,60%   |
| UBS                          | 1,84% | 1,94%                                          | 1,76%   | 1,73%   | 1,84%   | 1,44%   | 1,80%   | 1,65%   | 2,04%   | 2,37%   |
| Mean                         |       | 2,35%                                          | 2,28%   | 2,14%   | 2,07%   | 1,96%   | 2,11%   | 1,98%   | 2,45%   | 3,05%   |
| US Banks                     |       | Q4/2005                                        | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Bank of America              | 6,34% | 6,25%                                          | 5,88%   | 6,24%   | 6,19%   | 4,86%   | 5,91%   | 6,65%   | 7,89%   | 7,21%   |
| JP Morgan Chase & Co         | 5,96% | 6,04%                                          | 5,65%   | 6,00%   | 5,84%   | 5,68%   | 5,56%   | 6,26%   | 6,03%   | 6,54%   |
| Citigroup Inc                | 5,42% | 5,21%                                          | 5,59%   | 4,82%   | 4,16%   | 4,08%   | 5,09%   | 6,13%   | 6,86%   | 6,84%   |
| Wells Fargo & Co             | 7,13% | 6,77%                                          | 6,78%   | 7,63%   | 7,10%   | 6,81%   | 6,97%   | 6,60%   | 8,00%   | 7,54%   |
| US Bancorp                   | 7,87% | 7,23%                                          | 7,89%   | 7,77%   | 7,58%   | 7,38%   | 7,55%   | 9,19%   | 8,18%   | 8,04%   |
| Mean                         |       | 6,30%                                          | 6,36%   | 6,49%   | 6,17%   | 5,76%   | 6,22%   | 6,96%   | 7,39%   | 7,24%   |
| Austrian Banks               |       | Q4/2005                                        | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| ÖVAG                         | 4,24% | 3,60%                                          | 3,79%   | 3,95%   | 3,47%   | 3,52%   | 3,28%   | 4,75%   | 6,19%   | 5,64%   |
| Hypo Group                   | 4,68% | 3,77%                                          | 3,82%   | 3,85%   | 4,01%   | 4,66%   | 4,61%   | 6,34%   | 6,11%   | 4,91%   |
| Erste Group                  | 3,89% | 3,35%                                          | 4,84%   | 3,40%   | 2,99%   | 3,33%   | 3,31%   | 3,70%   | 4,43%   | 5,68%   |
| RZB                          | 4,85% | 4,24%                                          | 3,83%   | 4,89%   | 4,49%   | 5,34%   | 4,49%   | 4,76%   | 5,62%   | 5,96%   |
| UniCredit Bank Austria       | 4,51% | 3,92%                                          | 3,81%   | 5,51%   | 5,14%   | 4,63%   | 3,97%   | 4,09%   | 4,46%   | 5,10%   |
| Mean                         |       | 3,78%                                          | 4,02%   | 4,32%   | 4,02%   | 4,30%   | 3,93%   | 4,73%   | 5,36%   | 5,46%   |

| Q4/2005 - Q4/2009            |       | Tier 1 Capital excluding Minorities to Total Assets |         |         |         |         |         |         |         |         |
|------------------------------|-------|-----------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| European Banks               |       | Q4/2005                                             | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Royal Bank of Scotland Group | 2,43% | 3,36%                                               | 2,97%   | 2,84%   | 2,59%   | 0,36%   | 0,95%   | 2,17%   | 2,70%   | 3,91%   |
| Deutsche Bank AG             | 1,68% | 2,14%                                               | 2,09%   | 1,44%   | 1,33%   | 1,40%   | 1,33%   | 1,36%   | 1,81%   | 2,20%   |
| Credit Agricole              | 1,55% | 1,55%                                               | 1,54%   | 1,34%   | 1,58%   | 1,57%   | 1,58%   | 1,61%   | 1,49%   | 1,69%   |
| Barclays PLC                 | 1,61% | 1,29%                                               | 1,37%   | 1,55%   | 1,44%   | 1,48%   | 1,26%   | 1,29%   | 2,05%   | 2,79%   |
| UBS                          | 1,47% | 1,57%                                               | 1,49%   | 1,43%   | 1,59%   | 1,14%   | 1,42%   | 1,25%   | 1,54%   | 1,80%   |
|                              | Mean  | 1,98%                                               | 1,89%   | 1,72%   | 1,71%   | 1,19%   | 1,31%   | 1,54%   | 1,92%   | 2,48%   |
| US Banks                     |       | Q4/2005                                             | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Bank of America              | 6,32% | 6,25%                                               | 5,88%   | 6,24%   | 6,19%   | 4,86%   | 5,91%   | 6,55%   | 7,81%   | 7,19%   |
| JP Morgan Chase & Co         | 5,04% | 4,99%                                               | 4,69%   | 5,04%   | 4,95%   | 4,72%   | 4,72%   | 5,46%   | 5,18%   | 5,58%   |
| Citigroup Inc                | 5,33% | 5,17%                                               | 5,52%   | 4,77%   | 3,99%   | 3,89%   | 5,01%   | 6,06%   | 6,80%   | 6,74%   |
| Wells Fargo & Co             | 7,03% | 6,77%                                               | 6,78%   | 7,63%   | 7,10%   | 6,81%   | 6,97%   | 6,35%   | 7,47%   | 7,33%   |
| US Bancorp                   | 7,63% | 7,13%                                               | 7,79%   | 7,45%   | 7,27%   | 7,09%   | 7,27%   | 8,93%   | 7,91%   | 7,80%   |
|                              | Mean  | 6,06%                                               | 6,13%   | 6,22%   | 5,90%   | 5,48%   | 5,98%   | 6,67%   | 7,04%   | 6,93%   |
| Austrian Banks               |       | Q4/2005                                             | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| ÖVAG                         | 2,41% | 1,98%                                               | 1,94%   | 1,98%   | 1,57%   | 1,48%   | 1,82%   | 2,88%   | 4,38%   | 3,68%   |
| Hypo Group                   | 3,31% | 2,44%                                               | 2,50%   | 2,55%   | 2,44%   | 3,33%   | 2,83%   | 5,16%   | 4,88%   | 3,64%   |
| Erste Group                  | 2,37% | 1,82%                                               | 3,49%   | 1,79%   | 1,48%   | 1,86%   | 1,85%   | 2,20%   | 2,86%   | 3,98%   |
| RZB                          | 3,15% | 2,72%                                               | 2,36%   | 3,25%   | 2,83%   | 3,34%   | 2,61%   | 3,06%   | 4,01%   | 4,22%   |
| UniCredit Bank Austria       | 4,21% | 3,52%                                               | 3,42%   | 5,37%   | 4,81%   | 4,31%   | 3,67%   | 3,76%   | 4,21%   | 4,83%   |
|                              | Mean  | 2,49%                                               | 2,74%   | 2,99%   | 2,63%   | 2,86%   | 2,56%   | 3,41%   | 4,07%   | 4,07%   |

| Q4/2005 - Q4/2009            |       | Core Tier 1 Capital to Total Assets |         |         |         |         |         |         |         |         |
|------------------------------|-------|-------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| European Banks               |       | Q4/2005                             | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Royal Bank of Scotland Group | 1,17% | 1,33%                               | 1,18%   | 1,16%   | 1,17%   | 0,00%   | 0,00%   | 1,09%   | 1,80%   | 2,83%   |
| Deutsche Bank AG             | 1,28% | 1,78%                               | 1,70%   | 1,16%   | 1,10%   | 1,11%   | 0,97%   | 0,92%   | 1,26%   | 1,50%   |
| Credit Agricole              | 1,10% | 1,27%                               | 1,29%   | 1,11%   | 1,38%   | 1,38%   | 1,40%   | 0,73%   | 0,54%   | 0,79%   |
| Barclays PLC                 | 1,26% | 0,96%                               | 1,02%   | 1,20%   | 1,15%   | 1,10%   | 0,89%   | 1,00%   | 1,67%   | 2,33%   |
| UBS                          | 1,03% | 1,06%                               | 0,97%   | 0,95%   | 1,15%   | 0,86%   | 1,06%   | 0,88%   | 1,07%   | 1,26%   |
|                              | Mean  | 1,28%                               | 1,23%   | 1,12%   | 1,19%   | 0,89%   | 0,86%   | 0,92%   | 1,27%   | 1,74%   |
| US Banks                     |       | Q4/2005                             | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Bank of America              | 4,52% | 5,18%                               | 5,00%   | 4,95%   | 4,90%   | 3,62%   | 3,52%   | 3,48%   | 4,56%   | 5,42%   |
| JP Morgan Chase & Co         | 4,78% | 4,99%                               | 4,69%   | 5,04%   | 4,95%   | 4,72%   | 4,72%   | 4,00%   | 4,78%   | 5,18%   |
| Citigroup Inc                | 3,44% | 4,68%                               | 4,87%   | 4,20%   | 3,51%   | 2,81%   | 2,58%   | 1,18%   | 1,48%   | 5,63%   |
| Wells Fargo & Co             | 6,36% | 6,70%                               | 6,67%   | 7,55%   | 6,98%   | 6,74%   | 6,85%   | 4,00%   | 5,02%   | 6,68%   |
| US Bancorp                   | 5,33% | 5,67%                               | 5,89%   | 5,34%   | 5,19%   | 4,97%   | 5,03%   | 4,43%   | 5,83%   | 5,65%   |
|                              | Mean  | 5,44%                               | 5,43%   | 5,42%   | 5,11%   | 4,57%   | 4,54%   | 3,42%   | 4,33%   | 5,71%   |
| Austrian Banks               |       | Q4/2005                             | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| ÖVAG                         | 1,75% | 1,16%                               | 1,22%   | 1,32%   | 1,00%   | 0,92%   | 1,36%   | 2,17%   | 3,68%   | 2,91%   |
| Hypo Group                   | 2,76% | 1,50%                               | 1,68%   | 1,82%   | 1,90%   | 2,79%   | 2,34%   | 4,89%   | 4,59%   | 3,32%   |
| Erste Group                  | 1,76% | 1,23%                               | 2,92%   | 1,11%   | 0,85%   | 1,23%   | 1,26%   | 1,58%   | 2,25%   | 3,40%   |
| RZB                          | 2,50% | 1,85%                               | 1,58%   | 2,54%   | 2,19%   | 2,74%   | 2,10%   | 2,37%   | 3,49%   | 3,66%   |
| UniCredit Bank Austria       | 4,21% | 3,52%                               | 3,42%   | 5,37%   | 4,81%   | 4,31%   | 3,67%   | 3,76%   | 4,21%   | 4,83%   |
|                              | Mean  | 1,85%                               | 2,16%   | 2,43%   | 2,15%   | 2,40%   | 2,15%   | 2,95%   | 3,64%   | 3,62%   |

| Q4/2005 - Q4/2009            |        | Leverage Ratio 3 (Total Capital/Total Assets) |         |         |         |         |         |         |         |         |
|------------------------------|--------|-----------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| European Banks               |        | Q4/2005                                       | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Royal Bank of Scotland Group | 5,05%  | 5,58%                                         | 5,44%   | 5,39%   | 5,17%   | 4,11%   | 4,90%   | 4,42%   | 4,72%   | 5,73%   |
| Deutsche Bank AG             | 2,32%  | 3,42%                                         | 3,19%   | 2,17%   | 1,91%   | 1,98%   | 1,86%   | 1,70%   | 2,12%   | 2,53%   |
| Credit Agricole              | 2,03%  | 1,99%                                         | 2,03%   | 1,83%   | 2,16%   | 2,10%   | 2,10%   | 2,02%   | 2,02%   | 2,04%   |
| Barclays PLC                 | 3,49%  | 3,30%                                         | 3,42%   | 3,48%   | 3,23%   | 3,47%   | 3,25%   | 2,86%   | 3,80%   | 4,60%   |
| UBS                          | 2,35%  | 2,13%                                         | 2,08%   | 2,15%   | 2,31%   | 1,96%   | 2,44%   | 2,25%   | 2,74%   | 3,05%   |
|                              | Mean   | 3,28%                                         | 3,23%   | 3,00%   | 2,96%   | 2,72%   | 2,91%   | 2,65%   | 3,08%   | 3,59%   |
| US Banks                     |        | Q4/2005                                       | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Bank of America              | 8,83%  | 8,39%                                         | 7,94%   | 8,58%   | 8,80%   | 7,79%   | 9,03%   | 9,44%   | 9,33%   | 10,17%  |
| JP Morgan Chase & Co         | 8,40%  | 8,54%                                         | 8,00%   | 8,53%   | 8,39%   | 8,47%   | 8,17%   | 8,49%   | 8,28%   | 8,71%   |
| Citigroup Inc                | 7,38%  | 7,12%                                         | 7,58%   | 6,54%   | 5,91%   | 6,13%   | 7,16%   | 8,07%   | 8,95%   | 8,94%   |
| Wells Fargo & Co             | 10,06% | 9,58%                                         | 9,60%   | 10,66%  | 9,72%   | 9,47%   | 9,51%   | 9,95%   | 11,29%  | 10,81%  |
| US Bancorp                   | 11,33% | 11,01%                                        | 11,67%  | 11,17%  | 11,55%  | 10,91%  | 11,16%  | 12,37%  | 11,31%  | 10,83%  |
|                              | Mean   | 8,93%                                         | 8,96%   | 9,10%   | 8,87%   | 8,56%   | 9,00%   | 9,67%   | 9,83%   | 9,89%   |
| Austrian Banks               |        | Q4/2005                                       | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| ÖVAG                         | 6,09%  | 5,13%                                         | 5,73%   | 6,23%   | 5,70%   | 5,51%   | 4,65%   | 6,47%   | 7,73%   | 7,65%   |
| Hypo Group                   | 7,52%  | 6,07%                                         | 6,31%   | 6,50%   | 6,64%   | 7,58%   | 8,04%   | 9,64%   | 9,54%   | 7,34%   |
| Erste Group                  | 6,11%  | 5,64%                                         | 6,93%   | 5,56%   | 5,17%   | 5,40%   | 5,49%   | 6,05%   | 6,72%   | 8,02%   |
| RZB                          | 6,94%  | 5,54%                                         | 5,67%   | 6,58%   | 6,37%   | 7,65%   | 6,58%   | 7,24%   | 8,12%   | 8,67%   |
| UniCredit Bank Austria       | 6,04%  | 5,76%                                         | 5,41%   | 6,98%   | 6,67%   | 6,29%   | 5,36%   | 5,58%   | 5,79%   | 6,50%   |
|                              | Mean   | 5,63%                                         | 6,01%   | 6,37%   | 6,11%   | 6,49%   | 6,02%   | 6,99%   | 7,58%   | 7,64%   |

| Q4/2005 - Q4/2009            |  | ROE     |         |         |         |         |         |         |         |         |
|------------------------------|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| European Banks               |  | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
| Royal Bank of Scotland Group |  | 15,24%  | 16,23%  | 15,89%  | 16,70%  | 15,66%  | 5,66%   | -43,44% | -41,81% | -5,28%  |
| Deutsche Bank AG             |  | 12,64%  | 14,46%  | 19,08%  | 19,95%  | 18,54%  | 9,07%   | -11,32% | -6,27%  | 14,77%  |
| Credit Agricole              |  | 13,99%  | 15,63%  | 14,96%  | 16,70%  | 10,67%  | 2,73%   | 2,48%   | 1,15%   | 2,58%   |
| Barclays PLC                 |  | 20,71%  | 22,96%  | 24,56%  | 25,14%  | 20,50%  | 16,19%  | 12,61%  | 13,16%  | 22,39%  |
| UBS                          |  | 35,99%  | 38,12%  | 26,16%  | 29,33%  | -12,12% | -54,09% | -61,35% | -32,52% | -7,44%  |
| mean                         |  | 19,71%  | 21,48%  | 20,13%  | 21,56%  | 10,65%  | -4,09%  | -20,20% | -13,26% | 5,40%   |

| US Banks             |  | Q4/2005 | Q2/2006 | Q4/2006 | Q2/2007 | Q4/2007 | Q2/2008 | Q4/2008 | Q2/2009 | Q4/2009 |
|----------------------|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Bank of America      |  | 16,35%  | 15,68%  | 18,08%  | 16,59%  | 10,81%  | 6,02%   | 1,81%   | 2,12%   | -1,32%  |
| JP Morgan Chase & Co |  | 8,40%   | 7,98%   | 10,96%  | 12,96%  | 14,65%  | 12,86%  | 8,63%   | 3,82%   | 2,48%   |
| Citigroup Inc        |  | 20,16%  | 21,52%  | 22,01%  | 18,66%  | 18,06%  | 3,08%   | -13,28% | -31,90% | -19,48% |
| Wells Fargo & Co     |  | 19,51%  | 19,61%  | 19,72%  | 19,77%  | 20,09%  | 17,39%  | 15,52%  | 4,95%   | 6,21%   |
| US Bancorp           |  | 22,36%  | 22,66%  | 23,57%  | 23,35%  | 23,86%  | 21,19%  | 20,24%  | 14,60%  | 7,48%   |
| mean                 |  | 17,36%  | 17,49%  | 18,87%  | 18,26%  | 17,49%  | 12,11%  | 6,59%   | -1,28%  | -0,93%  |

# Abstract

## English Version:

This master thesis examines the role of leverage in commercial banks. Under Basel I and II, banks have to fulfil minimum capital requirements for taking certain risk. This became evident under the first pillar of the Basel II framework. For calculating certain capital ratios, the Basel Committee set different types of capital and divided it into Tiers. The minimum capital is specified as a percentage of the risk-weighted assets of a bank. Moreover, this risk-weighted approach got criticized during the recent financial crisis. A lot of banks reported high capital ratios, but went into trouble and some of them into bankruptcy. This could be seen as a regulatory failure. In the end of the last year the Basel Committee on Banking Supervision published consultative documents to strengthen the liquidity of the global banking sector which was widely named 'Basel III'. One of the big topics was the introduction of a leverage ratio which is already applied in some countries. In this paper I discuss different types of leverage ratios and compare such naïve ratios to the risk-weighted ratios. Furthermore I look deeper into the definition of bank's capital. For the analysis, I examine five global banks in the US and in Europe and compare them to each other and to the biggest Austrian banks. Furthermore, empirical research is also done on the relationship between leverage growth and asset growth. Are those leverage ratios a good predictor of bank failure over time and do simpler ratios outperform the complex ratios?

### German Version:

Diese Magisterarbeit beschäftigt sich mit dem Thema „Leverage in Banken“. Unter den Basler Akkord von 1988 und den überarbeiteten Vorschriften 2006 (Basel II) mussten Banken bisher bestimmte Mindestkapitalanforderungen für die eingegangenen Risiken erfüllen. Unter der ersten Säule, der drei Säulen von Basel II, wurden die Bestimmungen zu den Mindestkapitalanforderungen für Banken umgesetzt. Der Basler Ausschuss für Banken teilte für die Berechnungen das Eigenkapital in sogenannte „Tiers“, je nach Haftungsqualität. Das Eigenkapital wurde dabei in Relation zu den risikogewichteten Aktiva gestellt. Der risikogewichtete Ansatz wurde jedoch in Folge der aktuellen Finanzkrise von vielen Experten kritisiert. Einige Banken veröffentlichten hohe Kernkapitalquoten, obwohl die kurzfristige Liquidität oft fehlte. Ende des letzten Jahres veröffentlichte der Basler Ausschuss für Banken zwei Konsultationspapiere um den Bankensektor global zu verändern und der aktuellen Entwicklung entgegenzuwirken. Diese Vorschläge, die unter Basel III angeführt wurden, beinhalteten unter anderem eine Einführung eines Leverage Ratios. Die Berechnungen sollen vor allem, entgegengesetzt dem risikogewichteten Ansatz, keine Gewichtungen der Risiken beinhalten, um mögliches Hedging der eingegangenen Risiken zu vermeiden. In der vorliegenden Arbeit werden dabei verschiedene Berechnungsmöglichkeiten eines Leverage Ratios analysiert und mit den bisherigen Kapitalquoten verglichen. Um die Analysen durchzuführen, wurden fünf weltweit führende Großbanken in Amerika und Europa miteinander verglichen und den großen österreichischen Banken entgegengestellt. Die Fragen, die sich dabei stellen sind, ob ein Leverage Ratio tatsächlich ein guter Indikator für die finanzielle Situation der Bank ist und ob ein solches Verhältnis zwischen Eigenkapital zu den Aktiva die tatsächliche Entwicklung einer Bank besser spiegelt, als die bisher verwendeten risikogewichteten Berechnungen?

# Curriculum Vitae

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| <b>Work Experience</b> |                                                                                         |
|------------------------|-----------------------------------------------------------------------------------------|
| Date (from – to)       | September 2010 - current                                                                |
| Company                | BAWAG PSK                                                                               |
| Field of competence    | Credit Risk Management                                                                  |
| profession             | Trainee                                                                                 |
|                        |                                                                                         |
| Date (from – to)       | July 2009 – August 2010                                                                 |
| Company                | Ithuba Capital AG                                                                       |
| Field of competence    | Asset Management, Advisory, Fund Analysis, Risk Reporting, Quantitative Equity Research |
| profession             | Analyst                                                                                 |
|                        |                                                                                         |
| Date (from – to)       | June 2008 – October 2008                                                                |
| Company                | Financial Market Authority                                                              |
| Field of competence    | Actuarial Issues and Models (Project Solvency II)                                       |
| profession             | Internship                                                                              |
|                        |                                                                                         |
| Date (from – to)       | January 2007 – April 2007                                                               |
| Company                | CB Richard Ellis GmbH                                                                   |
| Field of competence    | Real Estate Investment, Valuation and Research                                          |
| profession             | Internship                                                                              |

|                                        |                                                                      |
|----------------------------------------|----------------------------------------------------------------------|
| <b>Education</b>                       |                                                                      |
| Date (from – to)                       | 2007 – 2010E                                                         |
| Institution                            | University of Vienna                                                 |
| Field of Specialization                | Investment Analysis and Corporate Finance                            |
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| Date (from – to)                       | 2007 – 2009                                                          |
| Institution                            | University of Applied Sciences Wiener Neustadt                       |
| Field of Specialization                | Investment Consultancy and Corporate Finance                         |
| Qualification                          | Master of Arts in Business (MA)                                      |
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| Date (from – to)                       | 2004 – 2007                                                          |
| Institution                            | University of Applied Sciences Wiener Neustadt                       |
| Field of Specialization                | Real Estate Management, Investment Consultancy and Corporate Finance |
| Qualification                          | Bachelor of Arts in Business (BA)                                    |
|                                        |                                                                      |
| Date (from – to)                       | 1999 – 2003                                                          |
| Institution                            | Commercial Highschool Gmünd (BHAK)                                   |
| Qualification                          | Higher School Certificate (Matura)                                   |
|                                        |                                                                      |
| <b>Languages</b>                       |                                                                      |
| German                                 | Native                                                               |
| English                                | Fluent                                                               |
| Spanish                                | Basic                                                                |
| Italian                                | Basic                                                                |
| Czech                                  | Basic                                                                |
|                                        |                                                                      |
| <b>Other Skills and Qualifications</b> |                                                                      |
|                                        | Matlab, R, SPSS                                                      |
|                                        | Bloomberg                                                            |
|                                        | MS Office Package                                                    |
|                                        | Qualified SAP Certified User                                         |
|                                        | MS Navision                                                          |