



Basel III

How have banks adjusted to increase CET1 ratios?

Oda Bjerketvedt and Tonje Arneberg-Bauer

Supervisor: Francisco Santos

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Abstract

In 2010 the Basel Committee finalised the global framework called Basel III, which will have a significant impact on the global banking sector. A large part of the framework focuses on capital adequacy, where the Common Equity Tier 1 (CET1) ratio is essential. Through an analysis of four banks from the United Kingdom – HSBC, Barclays, Lloyds Banking Group and Standard Chartered – this thesis aim to examine how these banks have adjusted to the new CET1 requirements.

In the EU the Basel III framework will be implemented through the capital requirements directive (CRD IV), and in 2012 our sample banks estimated their CET1 ratios assuming fully implemented CRD IV. We project the CET1 ratios for previous years and find that they have increased this ratio, especially from 2006. This thesis shows that adjustments have been made in both the numerator (CET1) and the denominator, risk weighted assets (RWA). CET1 has strengthened due to better quality and increased quantity of equity. However, the main driver behind the increase in the ratios has been a reduction of risk weighted assets. In general, the average riskiness of asset portfolios has been reduced through management actions on the balance sheet.

We also find that the impact of Basel III on our sample banks is heterogeneous because of banks' differences regarding business structures and international exposure. The banks will also face different CET1 requirements after the transitional period. We project the 2019 final CET1 ratio requirement for each bank, and they all face a shortfall given a reasonable set of assumptions. This implies that the banks' management still have to increase their CET1 ratios.

Preface

This thesis is the final part of the Master of Science in Economics and Business Administration, with a major/main profile in Financial Economics. The thesis is written at The Norwegian School of Economics, fall 2013. Through courses and the ongoing debate of Basel III we both gained a special interest for this new framework, which made this a natural topic for our thesis.

Writing this thesis have been challenging due to the complexity of the Basel framework. Still, the work has been interesting and educative as we have gained detailed knowledge about a difficult subject that can be relevant in future job situations. Being two persons writing this thesis has been a major advantage, especially when it comes to the interpretation of the framework and it has also been essential for the range of our analysis.

We wish to thank our supervisor Francisco Santos for his guiding and feedback during the process. In addition we want to thank those who have read and commented on our thesis.

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Tonje Arneberg-Bauer

Oda Bjerketvedt

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1. Introduction

1.1 Theme

In the 1970's financial markets saw the need for international banking supervision, and the Basel Committee on Banking Supervision (BCBS)¹ was established in 1974. The Basel Committee introduced the first Basel framework in 1988 called the Basel Capital Accord (Basel I). Since then financial markets have changed, becoming more interlinked and banks more securitised. As new challenges emerged due to increased complexity and risk factors, the regulation had to change as well which resulted in a new framework called Basel II. This framework was much more comprehensive, but as the financial crisis (2007-2009) revealed, the banking sector was not able to absorb losses, and problems in the financial sector had a large impact on the real economy. The Basel Committee then began to improve Basel II by focusing more on risk management and strengthening banks' transparency and disclosures. In 2010 this resulted in a third framework; Basel III. This new framework seeks to redress the weaknesses of the earlier framework by increasing the attention to both capital and liquidity of banks. The requirements to quality and quantity of capital have been strengthened, especially for Common Equity Tier 1 (CET1).

In this thesis we look at the UK banking sector which by assets is the second largest in the world, and UK banks have large international impact. In the EU, Basel III will be implemented through the capital requirements directive (CRD IV), but UK banks will face tougher regulations as national banking authorities will impose even stricter capital requirements.

1.1.1 Research question

It is now about three years since the Basel III framework was launched and the gradual phase-in of the new requirements have started. This means that banks have had time to adapt to the new regulations and hopefully strengthened their resilience. UK banks have reported CET1 ratios in 2012 under the assumption of fully implemented CRD IV rules. We would like to see how they have managed to reach these ratios despite the economic downturn. To do this we implement the new requirements for previous years and get an overview of how

¹ Abbreviations are found in Appendix 11.1

the banks were situated and how they have adjusted. Our focus will be on changes in the numerator, CET1, and the denominator, RWA. By doing this we will seek to answer:

“How have banks adjusted to increase CET1 ratios?”

1.1.2 Delimitations

This thesis is limited to the calculation of capital requirements related to the CET1 ratio. The thesis will not cover other parts of the new framework; i.e. calculation of additional capital, liquidity requirements or leverage ratio.

1.2 Previous research

The Basel Committee conducts several studies on how the new framework will be implemented, how it will affect banks and how far banks have come in the implementation. The last progress report was published September 2013; “Progress report on implementation of the Basel regulatory framework” which examines whether capital standards are implemented into national law or regulation to the agreed timeframes (BCBS, 2013g). The Basel Committee has also conducted periodically monitoring studies where they review the implications of Basel III for financial markets, and the last results were reported 25 September 2013 (BCBS, 2013b). These studies are called Quantitative Impact Studies (QIS) (BCBS, 2013f).

The European Banking Authority (EBA) conducted in 2011 an EU-wide stress test where all participating banks were stressed against a stronger capital benchmark of 5% Core Tier 1 (EBA, 2011). They have also conducted studies on how banks will be affected of the Basel III rules through monitoring exercises, which has been performed semi-annually since June 2011. The EBA monitoring exercises look at a large sample of banks and they only report the average changes (EBA, 2013).

At NHH there are some master theses written on Basel III; Dirdal and Heiberg (2011) conducted a detailed analysis of DnB NOR under Basel III rules, Andreasen and Gulestø (2011) wrote about how Basel III would affect Norwegian banks, and how the banks would adjust to the new rules. However, none of these master theses analysed the CET1 ratio in details, nor did they look at adjustments made in the years prior to the introduction of Basel III, and they only analysed Norwegian banks. Since we will do a more detailed analysis of

the CET1 ratio and focus more on large international banks, our thesis will be a good supplement to previous theses.

1.3 Structure of thesis

In **chapter 2** we present the theoretical framework, starting with an introduction of the Bank for International Settlements (BIS), the Basel Committee on Banking Supervision (BCBS) and the different Basel frameworks. Further, a short introduction of the UK banking sector and its regulation is presented. Details about our sample banks and the selected years are found in **chapter 3**.

The analysis is presented in chapter 4-9, starting with the calculation of Common Equity Tier 1 and Risk Weighted Assets in **chapter 4** and **chapter 5**. In **Chapter 6** are the calculations of the CET1 ratio. To analyse changes in the numerator, our sample banks' equity are analysed in **chapter 7**, while **chapter 8** address changes in the denominator, RWA. To get an overview of how the sample banks are situated today, the required CET1 ratio and the corresponding shortfall is estimated in **chapter 9**.

In the last part, **chapter 10**, main findings from the analysis is summarised into the conclusion to answer the research question; *“How have banks adjusted to increase CET1 ratios”*.

2. Theory

2.1 Bank for International Settlements (BIS)

The Bank for International Settlements, BIS, has head office in Basel, Switzerland, and was established on 17 May 1930; making BIS the world's oldest international financial organisation. Originally, BIS was established to deal with the issue of reparation payments imposed to Germany after the First World War (BIS, b). Today, BIS act as a bank for central banks by helping them pursuit monetary and financial stability and foster international cooperation in those areas. BIS does not provide financial services to private individuals or corporate entities; only central banks and international organisations.

According to their webpage, BIS emphasises some key points on how to pursue their mission:

- *promoting discussion and facilitating collaboration among central banks;*
- *supporting dialogue with other authorities that are responsible for promoting financial stability;*
- *conducting research on policy issues confronting central banks and financial supervisory authorities;*
- *acting as a prime counterparty for central banks in their financial transactions; and*
- *servng as an agent or trustee in connection with international financial operations.*

(BIS, a)

2.2 Basel Committee on Banking Supervision (BCBS)

The Basel Committee is a committee on banking regulations and supervisory practices located at the Bank for International Settlements. Turmoil in the international currency and banking market promoted a need for international banking supervision, and at the end of 1974 the Basel Committee on Banking Supervision was established. It was the failure of Bankhaus Herstatt in Germany, and later also the Franklin National Bank in USA, which eventually led the central-bank Governors of the Group of Ten (G10) to meet in February 1975. Since that day the list of members has increased and each country is represented by the central bank or by other formal authority for banking supervision.

The Basel Committee, today led by Mr Stefan Ingves, has a goal of enhancing financial stability through regulation and supervision of banks worldwide. This committee provides a forum for cooperation on banking supervisory matters and is the primary global-standard setter for regulation of banks.

The Basel committee formulate supervisory standards and guidelines for best practices, and a key objective has been to reduce differences in international supervisory coverage, making sure all international banks are supervised. This can remove competitive inequality due to differences in national capital requirements and make sure that the supervision is adequate. However, they do not have any authority or legal force over its members, but they expect country members to implement the standards in a way consistent with their national system.

In the 1980s the committee emphasised topics on capital adequacy, and they were concerned that the capital ratios for many international banks were aggravated in a time with increasingly international risk. A consultative work between the Basel Committee and The Group of Ten Governors resulted in a capital measurement system, referred to as the Basel Capital Accord or Basel I, which was released to banks in July 1988.

After several years of changes and improvement, based on consultative work with banks and industry groups the New Capital Framework, also referred to as Basel II, was released on 26 June 2004. However, the financial crisis (2007-2009) revealed several weaknesses of the regulation and supervision of international banks, and the Basel Committee has since then been working towards strengthening the supervision and risk management of the banking sector, culminating in a new capital framework; Basel III (BCBS, 2013a).

Below we will discuss the contents and structures of Basel I, II and III.

2.3 Basel I

The Basel I framework was meant for member states and other developed markets, it was not intended for emerging market economies. The main scope on risk was credit risk and the standard proposed was just a minimum capital requirement, central banks could be more conservative in their banking regulations (Balin, Bryan J., 2008).

As mentioned above the main focus was credit risk which is the risk associated with the counterparty (borrower) being unable to meet the arranged agreement; failure to repay a loan

or another obligation (Norges Bank, 2013). To prevent banks to be severely affected by default from its customers the framework in Basel I required capital reserves to cover potential losses. Shortly, Basel I “required”;

$$\frac{\text{Capital Base}}{\text{Weighted risk assets}} \geq 8 \%$$

The document “International convergence of capital measurement and capital standards” published by the Basel Committee on Banking Supervision in July 1988 is the original text of the Basel Capital Accord. The document is divided into four pillars; the first two describe the constituents of capital, hence the numerator, and the structure of the risk weights – the denominator. Pillar three describes the target standard ratio and pillar four deals with transitional and implementing arrangements.

The following description of the Basel Capital Accord is obtained from the original text from the Basel Committee:

2.3.1 Pillar 1: The constituents of capital – divided into two tiers

a) Core capital (basic equity) – tier 1

Key element capital should be equity capital and disclosed reserves (retained earnings or other surplus). But for supervisory purposes 50% of the capital base can consist of other elements of capital, called tier 2.

b) Supplementary capital – tier 2

- i. Undisclosed reserves
- ii. Revaluation reserves – especially relevant for banks whose balance sheets include amounts of equity held in historic cost.
- iii. General provisions/general loan-loss reserves
- iv. Hybrid debt capital instruments – instruments which combine characteristics of equity capital and of debt.
- v. Subordinated term debt – maximum of 50% of tier 1 elements.

c) Deductions from capital

- i. From tier 1; Goodwill
- ii. From total capital: Investments in subsidiaries engaged in banking and financial activities which are not consolidated in national systems.

(BCBS, 1988)

2.3.2 Pillar 2: The structure of risk weights

In the denominator, risk weighted assets, capital are related to different categories of assets and are weighted according to broad categories of relative riskiness. The framework of weights has been kept simple, only five weights are used; 0, 10, 20, 50 and 100%.

Simplified list over risk weights by category from the Basel Capital Accord:

Risk weight	Descriptions
0%	<ul style="list-style-type: none"> • Cash • Government debt and deposits in central banks • Other claims on OECD central governments and central banks.
0, 10, 20 or 50%	<ul style="list-style-type: none"> • Committee agreed that the weights for domestic public-sector entities (PSEs) should be 0, 10, 20 or 50%, decided on national discretion, but that PSEs in foreign countries within the OECD should attract a standard 20% weight.
20%	<ul style="list-style-type: none"> • Claims on multilateral development banks and claims guaranteed by securities issued by such banks. • Claims on banks and loans guaranteed by banks incorporated in the OECD. • Claims on banks and loans guaranteed by banks incorporated outside the OECD with a residual maturity of up to one year. • Claims on and loans guaranteed by non-domestic OECD PSEs. • Cash items in process of collection.
50%	<ul style="list-style-type: none"> • Loans fully secured by mortgage on residual property that is or will be occupied by the borrower or that is rented.
100%	<ul style="list-style-type: none"> • Claims on the private sector and commercial companies owned by the public sector (to avoid competitive inequality). • Claims on banks incorporated outside the OECD with a residual maturity of over one year. • Claims on central governments outside the OECD, unless denominated in national currency. • Premises, plant and equipment and other fixed assets. • Real estate and other investments. • Capital instruments issued by other banks • All other assets

Table 1: Simplified list over risk weights from Basel I (BCBS, 1988)

2.3.3 Pillar 3: A target standard ratio

The target standard ratio of capital to weighted risk assets should be set at 8%. Since the supplementary capital can only pose 50% of the capital base the core capital element will be at least 4%.

2.3.4 Pillar 4: Transitional and implementing arrangements

1. Transition

The transitional period was from July 1988 to the end of 1992.

2. Implementation

Each authority could decide in which way they would introduce and apply the recommendations, but the arrangements was to be implemented as soon as possible.

(BCBS, 1988)

2.3.5 Criticism

Even though Basel I was a step in the right direction there were also important failures. In Basel I the primarily focus, concerning risk, was credit risk, which is indeed the main risk incurred by banks. However, banks also face other types of risks which created a loophole concerning risk shifting. The capital requirements did not include market risk, and banks could shift their risk from priced credit risk to un-priced market risk, until the Market Risk Amendment of 1996 imposed a capital charge for market risk exposure (Alen, 2003).

Banks also found ways to “work around” the system by taking on more risk without having to increase their capital requirements. One strategy, called “Cherry-picking”, was to splice their least risky bank loans and securitise them. Money gained from selling these securitised loans in the market could be added to the banks’ reserves, and they would then be able to give out more loans. Another method was to swap long-term debt holdings for short-run debt. Because short-run debt had a risk weight of 20% while the long-term debt carried a 100% risk weight, banks could reduce their risk on paper, but in reality the risk was the same.

Another source for criticism, warned against in the framework, was that emerging market economies adopted the framework because it was seen as a sign of regulation and financial stability. Due to the definition in the Framework that government debt and national currency was viewed as low risk, emerging market economies could reduce their risk by shifting bank and sovereign debt holdings from OECD sources to domestic sources. However, in many

emerging markets the government debt was risky and the currencies fluctuated, causing regulators to underestimate the risk in these markets (Balin, Bryan J., 2008).

There was also criticism towards the risk weights used on borrowers. An enterprise with rating AAA has a much lower credit risk than companies with lower credit rating, but Basel I failed to differentiate between high quality and low quality commercial credit, which meant that loan to different companies with different credit ratings received the same risk weight under Basel I (Aamo, 2002) (Alen, 2003).

2.4 Basel II

Introduction of a new framework stems from mentioned weaknesses in Basel I and in response to the banking crisis in the 1990s. In June 1999, the Basel Committee sent out a proposal called “A new capital adequacy framework”, which was a consultative paper. After years of consultative work between the Committee and its member states a revised framework was published in June 2004; Basel II (BCBS, 2004).

Basel II expanded its technical scope, adapted to the fact that banks had become more securitised, took into account other risk factors such as market risk, operational risk and interest rate risk, and emphasised market discipline by focusing more on surveillance and regulation (Balin, Bryan J., 2008).

One of the major changes was that the framework would include any holding company within a banking group to make sure banks could not transfer risk. The entire risk of the banking group would now be captured. It would also apply to all international active banks within a banking group.

The framework was divided into three pillars; Minimum capital requirements, Supervisory review and Market discipline.

2.4.1 Pillar 1: Minimum Capital Requirements

As in Basel I the capital ratio was calculated by using the definition of regulatory capital and risk weighted assets. The ratio had to be more than 8%, and tier 2 was limited to 100% of tier 1, which meant that tier 1 had to be at least 4%. Few changes were made regarding the constituents of capital, but for the calculation of risk weighted assets there were several

changes. Before, only credit risk was accounted for while in Basel II both market risk and operational risk was included. To summarise the changes:

$$\frac{\text{Capital Base}}{\text{Weighted risk assets}} \geq 8\% \rightarrow \frac{\text{Capital Base}}{\text{Credit risk} + \text{Operational risk} + \text{Market risk}} \geq 8\%$$

(BCBS, 2004)

Credit risk

The Committee would then allow banks to choose between two broad methodologies for calculating their capital requirements for credit risk; a standardised approach and the banks internal rating systems for credit risk (IRB) (BCBS, 2004).

Standardised Approach

The Standardised Approach is supported by external credit assessments, which means that claims are assigned a risk weight in accordance with the credit rating by an authorised credit institution, i.e. Standard & Poor's credit rating. A large part of the Revised Framework sets out revisions regarding risk weighting. The examples below are obtained from the Revised Framework from June 2004, and are just some of the risk weights detailed in Basel II.

Claims on sovereigns and their central banks:

Credit Assessment	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
Risk Weight	0%	20%	50%	100%	150%	100%

Claims on Corporates:

Credit Assessment	AAA to AA-	A+ to A-	BBB + to BB-	Below BB-	Unrated
Risk Weight	20%	50%	100%	150%	100%

For claims on banks national supervisors can choose between two risk weighting options, but they can only apply one option to all banks in their jurisdiction. In the first option banks are assigned a risk weight one step below that assigned to claims on the sovereign government in that country. But if the sovereigns' rating is below BB+ or is unrated, risk will be capped at 100%. The second option uses the external credit assessment of the bank itself.

Claims on Banks:

Option 1

Credit Assessment of Sovereign	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
Risk Weight under Option 1	20%	50%	100%	100%	150%	100%

Option 2

Credit Assessment of Banks	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
Risk Weight under option 2	20%	50%	50%	100%	150%	50%
Risk Weight for short-term claims under option 2	20%	20%	20%	50%	150%	20%

(BCBS, 2004)

Internal Ratings-Based Approaches (IRB)

There are two different approaches of IRB; Foundation IRB and Advanced IRB. The two methods are not very different and Basel II encourages banks to use either IRB method instead of the Standardised approach. Banks that have received supervisory approval can use the Advanced IRB which means they can develop their own model for estimating risk components in determining the capital requirement. However, not all banks can use the Advanced IRB; some are required to use provided assumptions (from regulators) on one or more of the risk components; the probability of default, loss given default, the exposure at default and effective maturity (Balin, Bryan J., 2008) (BCBS, 2004).

Operational Risk

Operational risk is defined as the probability of losses caused by operational failures such as defects in internal controls or IT-systems or mistakes made by people in the organisation (Norges Bank, 2013).

Basel II presents three methods for calculating the reserves needed to be secured against operational risk; The Basic Indicator Approach, the Standardised Approach and Advanced Measurement Approaches (AMA). International active banks, banks with significant exposure to operational risk and sophisticated banks are expected to use the more advanced methods which are more appropriate to those banks' risk profiles.

When using the Basic Indicator Approach banks must hold capital for operational risk equal to 15% of their average gross income over the last three years. In the Standardised Approach banks' activities are divided into different business lines, and within each business line gross income is a good indicator of the exposure to operational risk. The capital against operational risk is calculated for each business line by multiplying gross income by a specific factor for that business line. The third, and most advanced method (AMA), encourages banks to develop their own calculations for the capital requirement. Use of AMA requires regulators' approval of the results, and the method is an attempt to urge market discipline and self-surveillance into the banking sector (Balin, Bryan J., 2008) (BCBS, 2004).

Market Risk

Market risk is risk related to movements in asset prices such as stocks or interests. (Norges Bank). In Basel II they have kept the basic structure of the 1996 Market Risk Amendment regarding the treatment of market risk, but in Basel II this is referred to as trading book issues; "A trading book consists of positions in financial instruments and commodities held either with trading intent or in order to hedge other elements of the trading book" (BCBS, 2004).

There are two main components of market risk; interest risk and volatility risk, and according to Balin (2008) Basel II makes a distinction between fixed income and other products such as equity, commodities and foreign exchange vehicles.

For calculation of the risk related to fixed income assets Basel II recommends Value at Risk (VaR), where banks themselves develop their own calculation, which then have to be approved by regulators. However, some banks do not want to or cannot use VaR models. These banks can then use an alternative method which separates between the two risk factors. For interest rate risk the assets are weighted in accordance with their maturity, where long term maturity receives a higher risk weight. The volatility risk assets are weighted in accordance with external credit risk rating. For the calculation of the total amount of reserves needed to protect against market risk, the value of each fixed income asset is multiplied against both risk weightings and then summarised.

Basel II presents different methodologies for all other market-based assets, but since they are very comprehensive we will not discuss them in detail. Primarily there are three main

methodologies; The Simplified Approach, Scenario Analysis and Internal Model Approach (IMA) (Balin, Bryan J., 2008).

2.4.2 Pillar 2: Supervisory Review Process

This process is intended to ensure that banks have adequate capital and that they develop and use better risk management techniques. To ensure all of the above, regulators are given more power to review a bank and intervene when felt necessary. There are four key principles of supervisory review identified by the committee in the Reviewed Framework:

- 1. Banks should have a process for assessing their overall capital adequacy in relation to their risk profile and strategy for maintaining their capital levels.*
- 2. Supervisors should review and evaluate banks' internal capital adequacy assessments and strategies, as well as their ability to monitor and ensure their compliance with regulatory capital ratios. Supervisors should take appropriate supervisory action if they are not satisfied with the result of this process.*
- 3. Supervisors should expect banks to operate above the minimum regulatory capital ratios and should have the ability to require banks to hold capital in excess of the minimum.*
- 4. Supervisors should seek to intervene at an early stage to prevent capital from falling below the minimum levels required to support the risk characteristics of a particular bank and should require rapid remedial action if capital is not maintained or restored.*

(BCBS, 2004)

2.4.3 Pillar 3: Market Discipline

The purpose of Pillar 3 is to complement Pillar 1 and 2, and the Committee aims to encourage market discipline by developing several disclosure requirements. In that way there is more transparency, and shareholders can have more power to enforce discipline in risk-taking and reserve-holdings.

2.4.4 Criticism

The financial crisis (2007-2009) revealed several weaknesses of Basel II of the banking sector; the banking sector was not able to absorb losses, and problems in the financial sector had a large impact on the real economy. Some of the main areas of criticism towards Basel II relates to implementation in emerging markets and procyclicality.

Procyclicality

In Basel II, banks could use credit ratings based on internal models, which some critics have characterised as short-time models, hence the internal based ratings were in alliance with the economic cycle. In an economic upturn the credit ratings would be higher than in a recession, which would give the banks lower capital requirements, and therefore opportunity to increase their lending. When a downturn hits the economy the credit ratings go down and banks need more capital which will reduce their lending, hence acting procyclical. Another source for procyclicality is due to the fact that an economic upturn leads to increased income and reduced default rates, giving banks opportunity to increase lending further (Øverli, 2002).

Emerging markets

As in Basel I, the committee stated that Basel II was not tailored for emerging market economies. But large international banks and credit rating agencies all viewed the Basel framework as a sign of financial and regulatory stability, forcing banks in emerging market to adopt the recommendations. One of the problems was related to the high technicality in Basel II, and the lack of skilled workers in these countries. Basel II also relied upon rating agencies to value risk but not all banks in emerging countries could afford to have their debt rated by known credit agencies, and there was also a lack of knowledge of emerging economies in these agencies, causing unfavourable ratings (Balin, Bryan J., 2008).

2.5 Basel III

With Basel III, the Committee wants to improve risk management and strengthen banks' transparency and disclosures. They want to raise the quality, consistency and transparency of the capital base, reduce procyclicality by promoting countercyclical buffers and address systemic risk (BCBS, 2011b). Basel III focuses more on systemic risk rather than the individual risk of each bank. The financial crisis taught us that even though banks might look solid, it means nothing when there are large macroeconomic imbalances (Gullbrandsen, 2010).

In 2009 The Basel Committee introduced two consultative proposals to create a more resilient financial sector. The first document called "Strengthening the Resilience of the Banking Sector" covers the proposals regarding the improvement and expansion of the

capital adequacy framework. The other document “International Framework for liquidity risk measurement, standards and monitoring”, introduces two liquidity standards.

In the following we will explain the new capital requirements where the Basel Committee presents different buffers and a leverage ratio, before discussing the new global liquidity standard.

2.5.1 New Capital Requirements

Basel III includes, as Basel II, specific minimums level for the different types of capital included in the total capital. As with Basel II the requirement is still 8% of the risk weighted assets (RWA) for the total capital, but the constituents of capital are stricter and lead towards a larger amount of high-quality capital.

Tier 1 capital

Tier 1 capital is capital that relates to the on-going operations and consists of common equity tier 1 (CET1) and additional tier 1. CET1 consists of the highest quality of capital and includes Accumulated Equity Issue Proceeds and Accumulated Retained Earnings (BCBS, 2011). The Additional Tier 1 includes hybrid capital, which is considered to be the second highest-quality capital. As to the increased focus on higher-quality capital the Basel III-framework demands that the CET1 and Tier 1 capital should represent respectively 4.5% and 6.0% of the RWA. Compared to the former requirements of 2.0% and 4.0% this represents a clear shift from Basel II towards higher quality capital (BCBS, 2011b).

Tier 2 capital

Tier 2 capital consists of gone concern capital, and includes among others subordinated debt. Tier 2 is capital that secures the depositors and senior creditors from losses if a bank or institution fail (European Commission, 2013). Tier 2 capital is prioritised before Tier 1 capital, which means that it takes losses after Tier 1.

Overview over the requirements for the total capital adequacy:

$$\text{Common equity adequacy} = \frac{CET1}{RWA} \geq 4,5\%$$

$$\text{Tier 1 capital adequacy} = \frac{CET1 + \text{Additional Tier 1}}{RWA} \geq 6,0\%$$

$$\text{Total Capital adequacy} = \frac{\text{Tier 1} + \text{Tier 2}}{RWA} \geq 8,0\%$$

(BCBS, 2011b)

2.5.2 Changes in RWA from Basel II to Basel III

Counterparty Credit Risk

Counterparty credit risk (CCR) has received increased attention in Basel III, and the management and capitalisation of this type of risk has been strengthened to make sure that all material risk is included in the framework (BCBS, 2011). If a counterparty experiences a deterioration of their credit rating there will be an additional capital charge, or if there is exposure to large financial institutions the risk weight will increase. This also imposes an increased capital requirement for Over-The-Counter derivatives exposure and thereby giving incentives for clearing these instruments through central counterparties (Accenture, 2012).

Securitisation Positions

There is a change related to the treatment of securitisation positions that under Basel II was deducted 50% from Core Tier 1 and 50% from Tier 1. Under Basel III these exposures have to be risk weighted with 1250% (multiplied with 12,5) (EBA, 2013).

Threshold Rule

Basel III includes a change in the treatment of unconsolidated investment and deferred tax asset that affects both CET1 and RWA, noted the threshold effect. The new requirement states that deferred tax assets and unconsolidated significant investments in other financial institutions that in aggregate exceed the institutions CET1 shall be deducted. The amount below the threshold is assigned a risk weight of 250% (European Commission, 2013).

2.5.3 Capital Buffers

In addition to the level of 8% capital adequacy, Pillar 1 is extended with two capital buffers that increase the requirement for Common Equity Tier 1 capital above the 4.5% minimum level. The common purpose of the buffers is to increase the ability of the banking system to absorb losses and to reduce the impact of financial and economic shocks (Finanstilsynet, 2013). When banks do not have an adequate level of CET1 to cover the minimum level of the capital requirements and buffers, there will be limitations on capital distributions.

Capital conservation buffer

The capital conservation buffer aims to cover losses and secure that the capital does not fall below the requirements when the economy is facing a downturn. The conservation buffer is a permanent buffer that can be drawn down when facing periods of stress. In this way the buffer is supposed to strengthen the banking sectors resilience when facing a downturn. This buffer is set to be 2.5% CET1 of risk weighted assets, in addition to the Total Capital requirements of 4.5% CET1.

As mentioned, if a capital buffer is depleted, limitation on capital distribution will be imposed. This is to ensure rebuilding of capital and to make sure that banks do not set shareholders interest above depositors. As illustrated in the table below the minimum level of capital conservation decreases with the level of CET1 (BCBS, 2011b).

Individual bank minimum capital conservation standards	
Common Equity Tier 1 Ratio	Minim Capital Conservation Ratios (expressed as a percentage of earnings)
4.5%-5.125%	100%
>5.125%-5.75%	80%
>5.75%-6.375%	60%
>6.375%-7.0%	40%
>7.0%	0%

Table 2: *Capital conservation buffer; Minimum capital conservation standards* (BCBS, 2011b)

This implies that if a bank faces a total of 6.0% CET1 they cannot pay out more than 40% of the earnings. The restricted distribution of capital includes dividends, share buybacks, discretionary bonus payments and discretionary payments on other Tier 1 capital instruments.

Summarised this implies a total requirement for CET1 of 7.0% and Tier 1 capital of 8.5%. The Basel Committee has proposed a gradually phase-in of the conservation buffer, starting at a level of 0.625% January 2016 and reaching the final level of 2.5% January 2019 (BCBS, 2011b).

The countercyclical buffer (CCB)

In addition to the capital conservation buffer, a countercyclical buffer is launched with Basel III. The purpose of the CCB is to reduce pro-cyclicality within the banking sector and avoid critical and large losses after periods of strong credit growth and thereby protecting the banking sector and the real economy, making the banking sector work as a shock-absorber instead of a transmitter of risk (BCBS, 2011b).

As opposed to the conservation buffer, the countercyclical buffer will vary relative to the economic situation; high in “good times” and zero in “bad times”. The CCB is country-specific and the National authorities are responsible for setting the rate between 0% and 2.5% of RWA, reflecting the situation in the different jurisdictions. The buffer shall consist of common equity or other fully loss absorbing capital. Together with the conservation buffer the total requirement for Tier 1 and CET1 capital can increase up to 11% and 9.5% during economic “booms”.

The countercyclical buffer is supposed to apply when the systemic risk in the economy increases, which can be measured by high asset prices and especially high increase in credit growth. The national authorities are responsible for setting the different indicators to measure the systemic risk. The buffer will apply to all banks operating in the specific country – both domestic and foreign. Banks who operates internationally will have to weigh the average of the different national buffers, reflecting their global portfolio of credit exposure across these jurisdictions (BCBS, 2011b).

When target level of the CCB is depleted, similar limitations on capital distributions as to the conservation buffer becomes binding. As expressed by the Bank of International Settlement the minimum capital conservation ratio decreases with the CET1 ratio.

Individual bank minimum capital conservation standards, when a bank is subject to a 2.5% countercyclical requirement

Common Equity Tier 1 Ratio (including other fully loss absorbing capital)	Minimum Capital Conservation Ratios (expressed as a percentage of earnings)
4.5% - 5.75%	100%
>5.75% - 7.0%	80%
>7.0% - 8.25%	60%
>8.25% - 9.5%	40%
> 9.5%	0%

Table 3: Countercyclical buffer: Minimum capital conservation standards (BCBS, 2011b)

Extension of the conservation buffer: Systemic risk and systemically important banks

The Basel III-framework also addresses the need for systemically important banks to have a higher loss absorbing capital than the minimum level presented by the capital requirements and the two already discussed buffers. The interconnectedness between these banks can increase the imbalances in the financial system when a crisis hits the economy, hence a tighter regulation is justified (BCBS, 2011b). In addition, several banks that were considered to be “too big to fail” received governmental help during the financial crisis (2007-2009), which might lead to expectations of similar help in the future. There is a risk of this leading towards a moral hazard problem creating incentives for excessive risk taking and growth through cheap financing, which makes it even more important with stricter regulation of these banks (Borchgrevink, 2011). This additional capital requirement will be mandatory for international banks that are considered to have a fundamental impact on the global financial system. National authorities are encouraged to implement similar requirements for domestic systemically important banks (BCBS, 2012). The requirement is an expansion of the conservation buffer and has to consist of CET1, and will thereby increase the total requirement for systemically important banks.

Global Systemically Important Banks (G-SIBs)

The Bank for International settlement finalised their design of this extension of the conservation buffer in July 2013 for Global Systemically Important Banks (G-SIBs). To measure how global systemically important a bank is, several indicators are used: “*size of banks, their interconnectedness, the lack of readily available substitutes or financial*

institution infrastructure for the services they provide, their global (cross-jurisdictional) activity and their complexity” (BCBS, 2013e). By these measurements banks are placed in different “buckets” indicating their minimum level of additional loss absorbing capital (1.0% - 3.5% CET1). No banks are currently in Bucket 5, but the Bank for International Settlement points out the importance of always having an “empty bucket” as an incentive for banks to not increase their systemic importance. If this bucket becomes populated, a Bucket 6 with a higher requirement will be effective.

Bucket	Score Range*	Higher loss absorbency requirement (common equity as a percentage of risk weighted assets)
5	D-E	3.5%
4	C-D	2.5%
3	B-C	2.0%
2	A-B	1.5%
1	Cutoff point - A	1.0%

* All score ranges are equal in size. Scores equal to one of the boundaries are assigned to the higher bucket.

Table 4: *G-SIBs; Buckets* (BCBS, 2013e)

Domestic Systemically Important Banks (D-SIBs)

The buffer for systemically important banks can also be applied for banks that are not considered to be G-SIBs. The Basel framework addresses the importance of a stricter regulation of such banks, also at domestic level. National financial regulators have the authority of deciding the classification of a systemically important bank. EU have in their capital requirement directive (CRD IV) presented a CET1 requirement for other systemically important institutions to be 1% within July 2015 and 2% within July 2016, which is optional for Member States to implement (European Commission, 2013).

Systemic Risk Buffer

The EU also launches the possibility for Member States to implement a systemic risk buffer for the financial sector or specific parts of it. According to the European Commission the buffer is intended to prevent “*long-term non-cyclical systemic or macro prudential risk*” that can cause major problems to a Member State’s real economy and financial system. This buffer must consist of CET1 and can be set at national discretion up to 3% from 1 Jan 2014. From Jan 2015 a possible increase to 3%-5% is possible, after a notification to the Commission. If a level above 5% is desired in a Member State, authorisation from the commission is mandatory (European Commission, 2013).

2.5.4 Leverage Ratio

In addition to the risk-based capital requirements, Basel III introduces a leverage ratio as an off-balance safeguard. The objective is to prevent a build-up of leverage which was one of the underlying reasons for the 2007-2009 financial crises. The Basel Committee points out that during the financial crisis many banks built up large amount of leverage while still having significant risk based capital ratios. The leverage ratio will therefore represent a simple and transparent measure of risk to protect against errors in measurement and model risk (BCBS, 2011b).

The calculation of the leverage ratio is undertaking a testing period (2013-2017) and will be migrated into Pillar 1 on 1 January 2018, after the disclosure starts Jan 2015. In this period a minimum leverage ratio of 3% is to be tested (BCBS, 2013d).

$$\text{Leverage Ratio} = \frac{\text{Tier 1}}{\text{Total Exposure}} \geq 3\%$$

The total exposure is to be measured as the monthly average leverage ratio over the quarter. In general the exposure follows the accounting principles. For the off-balance items a 10% credit risk adjustment applies for undrawn credit facilities and 100% for the other off-balance-sheet items (BCBS, 2011b).

2.5.5 Two new liquidity standards: LCR and NSFR

Basel III introduces two new liquidity standards to increase the resilience of the banking sector. During the financial crisis several banks had problems dealing with their liquidity management, even though they had adequate capital levels. Both of these standards consist of internationally harmonised parameters, but some of the parameters open for national-adjustments to reflect different jurisdiction-specific conditions (BCBS, 2013c).

Liquidity Coverage Ratio (LCR)

The LCR was developed to ensure resilience of banks short-term liquidity management. The main target of this standard is to enquire banks to have an *adequate stock of unencumbered high quality liquid assets (HQLA)* to cover its liquidity needs for a 30-days period of liquidity stress. HQLA consists of cash, or assets that easily can be converted into cash without any loss (or little loss) of value in private markets during times of stress. HQLA are divided into Level 1 and Level 2 assets. Level 1 consists of the highest quality and liquidity, and includes “*cash, central bank reserves, and certain marketable securities backed by*

sovereigns and central banks” (BCBS, 2013c). Level 2 assets are divided into Level 2A and Level 2B, where Level 2A can consist of “*covered bonds, certain government securities and corporate debt securities*” and Level 2B includes “*lower rated corporate bonds, residential mortgage backed securities and equities that meets certain conditions*” (BCBS, 2013c).

The amount of the different levels of assets is regulated by the framework and requires a maximum of 40% Level 2 assets, with a 15% haircut of Level 2B assets. This implies that HQLA must have to consist of minimum 60% Level 1 asset.

$$\frac{HQLA}{Total\ Net\ cash\ flow\ over\ the\ next\ 30\ days} > 100\%$$

The stock of HQLA has to cover the total net cash flow over a 30 day-stress scenario. The total net cash flow then equals the expected cash outflow less the expected cash inflow, with a restriction that aggregated cash inflow can't be greater than 75% of the aggregated cash outflow. This ensures a minimum level of HQLA at all times.

Net Stable Funding Ratio (NSFR)

The NSFR aims to ensure that financial institutions have an acceptable level of more stable assets to cover their liquidity over medium and long term periods (1 year). The aim of this ratio is to “ensure a sustainable maturity structure of assets and liabilities”, and thereby reducing the “over-reliance on short-term wholesale funding during times of buoyant market liquidity” (BCBS, 2011b).

$$\frac{Stable\ Funding}{Required\ Stable\ Funding} \geq 100\%$$

Stable funding is the total of a bank's equity, stable deposits with over a one-year horizon, debt with at least a one year horizon and deposit from customers which is expected to remain in the institution during a stress scenario. Each of these items is weighted with a specific stable financing factor, according to how stable they are (the higher weight, the more stable) (Lie, Solli, & Christensen, 2012). The required stable funding (denominator) is the sum of the different assets and off-balance items each weighted for a specific stable financing factor. The higher the weight, the less liquid is the asset. The process of finalising this ratio is still ongoing. An observation period is to be carried out to address if there are any unintended consequences with the implementation. The NSFR is planned to be finalised and become a minimum standard by 1 January 2018 (BCBS, 2013c).

2.5.6 The Capital Requirement Directive (CRD IV)

The implementing of Basel III into European law is through the Capital Requirements Directive, “CRD IV”. This directive contains two legal instruments; a directive and a regulation (CRR). The CRR has immediate effect on the member states and covers the capital, liquidity, leverage and the counterparty credit risk and works as a single rule book. The directive has to be implemented into national law in the Member States, and includes the capital buffers, corporate governance, sanctions and prudential supervision (European Commission, 2013)

2.6 The UK banking sector

The UK banking sector is of great importance for the UK economy as it contributed with 7.9% of the UK GDP and employed more than one million people in 2012. The total bank assets counted for over 460% of the UK GDP in 2011 which makes it the second largest banking sector in the world (EBF, 2012) (TheCityUK, 2012).

2.6.1 Regulators of the financial sector

The Bank of England is the central bank in the UK and responsible for the “*key post-trade financial market infrastructures, including securities settlement systems, central counterparties, and recognised payment systems*” (Bank of England, 2013b). The Financial Policy Committee (FPC) and the Prudential Regulation Authority (PRA) was established in April 2013 after a split of the former Financial Services Authority. The FPC is an independent organisation and is objected to take part in the achievement of the Bank of England’s objective of financial stability through reducing or removing systemic risks (Bank of England, 2013b).

The PRA is a direct part of the Bank of England, and among other it is responsible for the regulation and supervision of the UK banks. Its objective is to ensure stability in the UK financial system, which includes making sure that banks have adequate capital and liquidity. The PRA sets out the regulations and undertake supervision of the risk of the firms and if necessary require actions to reduce them (Bank of England, 2013a). The supervision and regulation is built upon three characteristics:

- Judgement-based approach: The PRA will give judgement on to what extent firms are safe and meet their requirements as of today.

- Forward-looking approach: Firms will also be assessed against future risk that can arise. The PRA can intervene at an early stage if considered necessary.
- Focused approach: The PRA will have a main focus on the firms that contains the greatest risk to the stability.

(Bank of England, 2013a)

2.6.2 Additional UK regulation

UK banks will have to follow CRD IV but in addition there will be some national adjustments, and there is still uncertainty regarding the total requirement of the capital buffers since not all of them are finalised by the UK Regulators.

The national adjustments relate to the so called Pillar 2 requirements which may increase the total level of CET1 our sample banks need to hold. These additional requirements will be based on the banks individual strength. In the UK, these Pillar 2 capital requirements are divided into Pillar 2A and Pillar 2B. Pillar 2A is capital that must be hold if the banks risk is not fully covered by other regulation. Today this requirement can be met by any capital, but after a consulting period the PRA requires 56% to be CET1 from January 1 2015. This will further increase the total required level of CET1 above the one required in the CRD IV legislation (PRA, 2013).

The Pillar 2B is capital that should cover the risks that a firm can face over a forward-looking horizon provided to individual stress-testing and is often called the PRA Buffer. This buffer is firm-specific and will be added to the other requirements when these do not cover the capital adequacy under stress sufficiently, and is therefore a net amount. The current proposal is that the PRA-buffer has to consist of CET1 capital and may therefore increase the total amount of CET1 the sample banks need to hold (PRA, 2013).

If the PRA buffer is not met by the bank, it can expect enhanced supervisory action and will have to prepare a “capital restoration plan”, but contrary to the CRD IV buffers no limitation of capital distribution will be imposed (PRA, 2013).

3. Sample banks and selected years

The purpose of this thesis is to take a closer look at the European banking sector in line with the new Basel III. The criteria used when choosing the sample banks were as follows:

- European banks from the same country which faces similar regulations and reporting-requirements.
- Large international banks; The Basel framework is primarily designed for such banks.
- Different banks in terms of business segments and degree of internationalisation to cover different impacts of Basel III.
- Sufficient information available.

After looking at several European banks and their reporting, the UK was chosen. Their reporting was overall at a more detailed level regarding the capital adequacy, which was an important criterion to get sufficient details to perform the necessary calculations.

We choose to look at a smaller sample and perform a detailed analysis on a fewer banks rather than a general analysis on many banks. The sample consists of some of the UK's biggest banks; HSBC, Barclays, Lloyds Banking Group and Standard Chartered. The size of our sample is limited to four banks mainly due to time restrictions. All banks are among the world's fifty biggest banks and have international presence, but still with differences regarding business segments and the degree of international presence. We choose four of the five biggest UK banks, where the third, Royal Bank of Scotland (RBS) is excluded. This is because RBS, as HSBC and Barclays, is among the 15 largest banks in the world, and we wanted to include some smaller banks (on a world basis). Hence, both Lloyds Banking Group (LBG) and Standard Chartered are included in our sample.

In the next chapter we briefly introduce the banks in our sample.

3.1.1 Sample banks

HSBC

HSBC is the largest bank in the UK and the second largest bank in the world (Global Finance, 2013). The bank was established in 1864 and is one of the largest international banks with operations in 87 countries. HSBC is structured in four business lines;

Commercial Banking, Global Banking and Markets, Private Banking and Retail Banking and Wealth Management (HSBC, 2013a). HSBC is the largest bank in our sample with a total asset value of US \$m 2,692,538 as of 31.12.1.

Barclays

Barclays had assets value of US \$m 2,351,777 31.12.12, and thereby follows HSBC as the second largest bank in the UK and is the eighth largest bank in the world (Global Finance, 2013). They operate in over 50 countries where they provide services in personal banking, credit cards, corporate and investment banking and wealth and investments (Barclays, 2013). In our sample Barclays is the bank with the largest share within Investment Banking, which counts for around 70 per cent of total assets.

Lloyds Banking Group (LBG)

Lloyds Banking Group (LBG) is the fourth largest bank in the UK and the 22nd largest bank in the world with assets of US \$m 1,458,974 as of 31.12.12 (Global Finance, 2013). The Group consists of Lloyds Bank, Bank of Scotland, Halifax and TSB which together have more than 30 million customers in the UK. LBG primarily operates in the UK with a focus on retail and commercial banking. LBG is the bank with the largest share of retail banking in our sample (LBG, 2013).

Standard Chartered

Standard Chartered is the smallest bank in the sample with a total asset value of US \$m 636,518 by 31.12.2012. They are the fifth largest bank in the UK and the 45th largest bank in the world (Global Finance, 2013). In our sample Standard Chartered has the lowest presence in the UK as they are primarily focused on Asia, Africa and the Middle East where 90 per cent of their income stems from. They aim to be the world's best international bank, and operate across 68 markets with a focus on basic banking, divided into Wholesale and Commercial Banking (Standard Chartered, 2013).

2012	Asset value (US \$m)	World ranking
HSBC	2,692,538	2
Barclays	2,351,777	8
LBG	1,458,974	22
Standard Chartered	636,518	45

Table 5: Summary of key information about our sample banks

3.1.2 Selected years for analysis

This thesis aims to analyse the changes done by banks due to Basel III. The new regulation was launched in 2010 which make the period 2009 to 2012 a natural focus for the analysis, as these years will give an overview of how the sample banks were situated prior to the announcement of Basel III and how they have adapted in the following years. The half-year statement for 2013 is also included as the latest update on their capital adequacy.

The main reason for the new regulation was the lack of resilience in the banking sector. Hence, we want to supplement the analysis with earlier years to see how the banks would have been situated if Basel III was the applicable regulation at that time. 2000 is chosen as the earliest year and in addition 2006 is included to look closer at the situation prior to the Financial Crisis (2007-2009).

For Standard Chartered the earliest available annual report is the one of 2001, and is therefore the year used in the analysis as the earliest estimated year. Lloyds Banking Group was formed on 19 January 2009, when Lloyds TSB Group acquired HBOS. This restricts the information availability for some of our comparisons².

3.1.3 Sources of information

We use data based on public secondary data collected from financial reports published by our sample banks. This is relied upon as a legitimate source of information. All of our sample banks are public listed companies and required to publish annual reports of their financial situation. From 2008, banks have been required to give additional statements regarding their capital adequacy, called Pillar 3 disclosures. All these reports and documents are collected from the companies' webpages.

² The data from 2000 and 2006 are based on annual reports from Lloyds TBS Group.

4. Calculation of Common Equity Tier 1

As stated in previous sections, CET1 capital is essential in the new framework, and will replace the Core Tier 1 from Basel II. Low CET1 ratios will lead to stricter dividend policy and regulators might initiate other actions against banks that do not have adequate ratios. Because of the importance related to CET1 our calculations are very thorough and detailed.

4.1 Method

For 2012 and 2013 banks have in their Pillar 3 reports estimated CET1 and CET1 ratios assuming fully implemented CRD IV rules (as applicable from 2019). The calculations under are based on these reports and the Basel III workbook published by the Basel Committee. However, there exist some differences between CRD IV and the Basel III framework and since CRD IV is the legal framework for UK banks, we have followed their guidelines when differences occur. Our calculations are done for the years; 2000, 2006 and 2009-2012. The calculation for 2012 is conducted to see whether our calculations are comparable to the calculations done by the sample banks.

Common equity tier 1 US\$m	REF:	2012	2011	2010	2009	2006	2000
Called up share capital	1	9 238	8 934	8 843	8 705	5 786	4 634
Share premium	2	8 679	7 052	7 049	7 008	7 789	3 305
Retained earnings	3	120 347	111 868	99 105	88 737	65 397	26 234
Accumulated other comprehensive income	4	29 722	23 615	25 414	16 593	29 380	11 397
Minority interest (amount allowed in consolidated CET 1)	5	2 049	1 815	1 808	1 719	1 709	818
CET 1 before regulatory adjustments		170 035	153 284	142 219	122 762	110 061	46 388
Regulatory adjustments							
Goodwill and intangible assets	6	-25 733	-27 419	-28 001	-28 680	-35 786	-15 089
Fair value reserves related to gains or losses on cash flow hedges	7	-13	95	285	26	101	-
Negative amounts resulting from from the calculation of exp. loss amounts	8	-6 168	-5 692	-6 200	-6 750	-9 016	-3 850
Defined benefit pension fund assets	9	-2 617	-2 237	-	-	-	-
Direct and indirect holdings by an institution of own CET 1 instruments	10	-1 322	-844	-1 089	-1 089	-1 089	-673
Reciprocal cross holdings (material holdings)	11	-9 436	-7 496	-7 470	-6 034	-3 779	-736
Deferred tax assets that rely on future profitability excluding temporary differences	12	-617	-1 328	-348	-407	-	-
Gains or losses on liabilities at fair value resulting from own credit	13	112	-3 608	-889	-1 050	-	-
Additional value adjustments	14	-2 092	-1 886	-1 750	-1 510	-1 354	-571
Total regulatory adjustments		-47 886	-50 415	-45 461	-45 494	-50 923	-20 919
Common Equity Tier 1		122 149	102 869	96 758	77 268	59 138	25 469

Table 6: CET1 calculations for HSBC

Table 6 shows the calculation for HSBC and the exact same calculations have been done for the three other banks which can be found in appendix 11.2. Calculated CET1 for all banks are summarised in table 8.

In the explanations to each line in the calculation we have some places cited paragraphs from the revised Basel III framework as of 2011.

1. Called up share capital

For all banks this is extracted directly from the annual reports under changes in equity.

2. Share premium

Share premium is found in all our sample banks' annual reports under "Changes in equity". For HSBC and Standard Chartered there has been an adjustment for preference share premium which is not eligible CET1 capital and was found in the Pillar 3 reports. For 2006 and 2000 we cannot find any adjustment or information relating to preference share premium, hence this is assumed to be zero.

3. Retained earnings

For all banks this is extracted directly from the annual reports under changes in equity.

4. Accumulated other comprehensive income (and other reserves)

Called up share capital, share premium and retained earnings are deducted from total equity and the remaining is added as accumulated other comprehensive income. This is then adjusted for other equity instruments classified as Tier 1 capital, and equal to the calculation done under Basel II. However, only HSBC has other equity instruments to be deducted.

5. Non-controlling interest

The calculation of minority interests allowed under Basel III is very similar to the calculation under Basel II, but with one adjustment; excess non-controlling interests are to be deducted. The set-up used for this calculation is the same as HSBC used in their Pillar 3 report from 2012:

Total non-controlling interest
Less: Other Tier 1 capital - preference shares
Less: Other Tier 1 capital - reserve capital instruments
Less: transitional impact (excess)
Less: Non-controlling Tier 2 capital
Other regulatory adjustments
= Minority interest allowed in CET1

LBG has no specific note on the minority interests and in their calculation of fully loaded CRD IV they do not allow for minority interests to be added to CET1. In their Pillar 3 report from 2012 they claim; “Non-controlling interests are no longer eligible for inclusion”. This is therefore assumed to be zero for all relevant years.

For HSBC we calculated the preference shares by summarising all non-cumulative preferred securities issued by subsidiaries under the note “Non-controlling interests”, and for Barclays we can find the value directly in the note for non-controlling interests. Standard Chartered has no information on preference shares, but they have Tier 1 capital included in non-controlling interest which we have deducted under the line “Other Tier 1 capital – reserve capital instruments”. For the year 2000 we did not find any information of preference shares or reserve capital instruments, and as a precautionary estimate this is assumed it to be zero for all banks.

The transitional impact from Basel II to Basel III is excess minority interest and how to calculate this can be found in the Basel III framework paragraph 62. The information necessary for this calculation is not available; hence our calculation of excess minority interest is just a simplification where we assumed excess to be the same fraction of total non-controlling interest as in 2012. This method is used for all banks, and the excess minority interests for 2012 are found in the Pillar 3 reports.

Other deductions are made in relation with the Basel II deductions, which are extracted from annual reports and pillar 3 reports.

6. Intangible assets and goodwill

“Goodwill and other intangibles (except mortgage servicing rights)

67. Goodwill and all other intangibles must be deducted in the calculation of Common Equity Tier 1, including any goodwill included in the valuation of significant investments in the capital of banking, financial and insurance entities that are outside the scope of regulatory consolidation...” (BCBS, 2011b)

Intangibles are to be deducted net of deferred tax, but there are no specifications for deferred tax liabilities related to goodwill and intangible assets, hence we cannot calculate net of tax. However, paragraph 49 (xv) in the Basel II framework states that Goodwill should be deducted from capital, and we can therefore use the same values that were deducted under Basel II rules for all banks.

7. Cash flow hedging reserve

“Cash flow hedge reserve

71. The amount of the cash flow hedge reserve that relates to the hedging of items that are not fair valued on the balance sheet (including projected cash flows) should be derecognised in the calculation of Common Equity Tier 1. This means that positive amounts should be deducted and negative amounts should be added back.” (BCBS, 2011b)

Cash flow hedging reserves are collected directly from changes in equity in the annual reports.

8. Shortfall of provisions to expected losses

“Shortfall of the stock of provisions to expected losses

73. The deduction from capital in respect of a shortfall of the stock of provisions to expected losses under the IRB approach should be made in the calculation of Common Equity Tier 1. The full amount is to be deducted and should not be reduced by any tax effects that could be expected to occur if provisions were to rise to the level of expected losses.” (BCBS, 2011b)

Under Basel II 50% of excess of expected losses over impairment allowances are deducted from Core Tier 1. Under Basel III 100% are to be deducted from CET1. We use the numbers from Basel II multiplied with two and make sure this is gross of tax.

9. Defined benefit pension fund assets

“Defined benefit pension fund assets and liabilities

76. Defined benefit pension fund liabilities, as included on the balance sheet, must be fully recognised in the calculation of Common Equity Tier 1 (ie Common Equity Tier 1 cannot be increased through derecognising these liabilities)...” (BCBS, 2011b)

Numbers are found in the annual reports under the notes relating to pensions, and to calculate net pension assets we have used this setup:

Fair value of plan assets
- Present value of obligations
- Unrecognised actuarial gains
+ Unrecognised prior service cost
= Net pension assets

If net pension fund assets are negative, this will not be added to CET1 but the defined benefit pension adjustment will be zero.

10. Investments in own shares (treasury stock)

“Investments in own shares (treasury stock)

78. All of a bank’s investments in its own common shares, whether held directly or indirectly, will be deducted in the calculation of Common Equity Tier 1 (unless already derecognised under the relevant accounting standards). In addition, any own stock which the bank could be contractually obliged to purchase should be deducted in the calculation of Common Equity Tier 1...” (BCBS, 2011b)

Neither in the annual reports, the pillar 3 reports nor statements to shareholders are there reported information on investments in own shares. We then used the database “Orbis” to find own ownership, and used the last reported percentage for each year. The ownership percentages are very small, especially for Standard Chartered and LBG. These two banks did not have any deductions related to investment in own shares in their Pillar 3 report, and we will not make any deductions either. For HSBC and Barclays small values were deducted from CET1 in 2012, and for previous years an estimate based on the changes in their own ownership has been made.

11. Reciprocal cross holdings in the capital of banking, financial and insurance entities (Unconsolidated investments)

“79. Reciprocal cross holdings of capital that are designed to artificially inflate the capital position of banks will be deducted in full. Banks must apply a “corresponding deduction approach” to such investments in the capital of other banks, other financial institutions and insurance entities. This means the deduction should be applied to the same component of capital for which the capital would qualify if it was issued by the bank itself.” (BCBS, 2011b)

Paragraph 79 is the main rule, but further down in the Basel III framework, in paragraph 87, some threshold deductions are specified:

Instead of a full deduction, the following items may each receive limited recognition when calculating Common Equity Tier 1, with recognition capped at 10% of the bank’s common equity (after the application of all regulatory adjustments).

- Significant investments in the common shares of unconsolidated financial institutions.
- Mortgage servicing rights
- DTAs that arise from temporary differences.

Barclays and Standard Chartered

Under Basel II both banks deducted 50% of material holdings from Tier 1 and 50% from Tier 2 capital, where material holdings are unconsolidated investments in financial companies. Under Basel III unconsolidated investments will only be deducted if the total (100%) exceeds the threshold of 10% of CET1, before this deduction is made. The amount not exceeding the threshold will be risk weighted.

HSBC and LBG

Under Basel II, HSBC and LBG have deducted unconsolidated investments from both Tier 1 Capital and Tier 2 Capital, but not 50% from each. According to HSBC's Pillar 3 report 2012 some of their unconsolidated investments are deducted from Total Capital, but no other information relating to this is available. HSBC has deducted 50,3% of total unconsolidated investments from CET1 under fully implemented CRD IV rules in 2012 as significant investments (ownership above 10%). The same percentage will be used for the other relevant years, and the same method has been used in the calculation for LBG. The residual amount of total unconsolidated investments that are not deducted will be risk weighted.

12. Deferred tax

“Deferred tax assets

69. Deferred tax assets (DTAs) that rely on future profitability of the bank to be realized are to be deducted in the calculation of Common Equity Tier 1. Deferred tax assets may be netted with associated deferred tax liabilities (DTLs) only if the DTAs and DTLs relate to taxes levied by the same taxation authority and offsetting is permitted by the relevant taxation authority...” (BCBS, 2011b)

Under the notes related to tax or deferred tax there are some specifications of DTAs that rely on future profitability (tax losses carried forward), but the values are not the exact values deducted from CET1 in the Pillar 3 reports. Given that banks do not have more detailed information of their DTAs that rely on future profitability, the values they have specified in their annual reports are deducted from CET1.

13. Own credit-spread

Cumulative gains and losses due to changes in own credit risk on fair valued financial liabilities is to be deducted from CET1. This rule ensures that an increase in credit risk of a bank does not lead to a reduction in the value of its liabilities, and thereby an increase in

common equity. The adjustment of own credit from Basel II rules to Basel III rules is the debit valuation adjustment (DVA);

“An adjustment made by an entity to the valuation of OTC derivative liabilities to reflect within fair value the entity’s own credit risk” (BCBS, 2011a)

The deduction requires deducting the spread premium over the risk free rate for derivative liabilities. In effect, this would require banks to value their derivatives for CET1 purposes as if they were risk free and deduct the unrealised gains both at inception of the derivative and afterwards, when the creditworthiness of the bank deteriorates (BCBS, 2011b). This is not possible for us to calculate exactly.

DVAs can be netted against own credit, but since both LBG and Standard Chartered have their DVA under additional value adjustments, we will do the same for HSBC and Barclays. Hence the adjustment for own credit will be the same as under Basel II for all banks, and additional value adjustments will contain DVAs for all sample banks.

14. Additional value adjustments

Additional valuation adjustments, referred to as prudent valuation adjustments or PVAs, are related to fair value calculations; *“Where the accounting fair value calculated under IFRSs is higher than the valuation amount resulting from the application of the prudential adjustments, this would result in an additional valuation adjustment or PVA deduction from CET1 capital.”* (HSBC, 2013b)

Same as for the DVAs we will not try to calculate this, but we assume that total additional value adjustments (PVAs and DVAs) will be a constant fraction of CET1 before regulatory adjustments. By using 2012 CET1 numbers we find that additional value adjustments only accounts for a small fraction of CET1, hence this will not have a major effect on the calculated CET1.

4.2 Findings

CET1 capital 2012	HSBC US \$m	Barclays £m	LBG £m	Standard Chartered US \$m
Reported CET1	122 503	39 769	26 224 ³	33 988 ³
Calculated CET1	122 149	39 521	26 190	33 959

Table 7: CET1 capital 2012

The reported CET1 values are very close to the values from our calculations, and the difference is less than 1% for each banks. The small differences can be an indication of the accuracy in our CET1 estimates for previous years, and we believe that further calculations based on these estimates will be relatively valid. However, we will emphasise that the calculations for year 2000 are based on less available information than the other years. The annual reports and other financial documents were much less extensive; hence the calculations for 2000 are based on more assumptions than for other years.

The values of CET1 are shown in table 8, which show an increasing trend. For 2012 and 2013 we use reported values on CET1 from the Pillar 3 reports (but including securitisation positions for LBG and Standard Chartered), and for the previous years we will use the CET1 from our calculations.

CET1 capital	2013	2012	2011	2010	2009	2006	2000
HSBC US\$m	125 425	122 503	102 869	96 758	77 268	59 138	25 469
Barclays £m	38 059	39 769	38 908	38 817	35 184	14 649	8 669
LBG £m	28 729	26 224	26 408	28 560	26 242	8 207	6 687
Standard Chartered US\$m	35 256	33 988	30 232	27 932	17 837	10 066	5 096

Table 8: Sample banks' CET1 capital

Before the fully implemented CET1 ratios can be calculated, risk weighted assets has to be estimated based on fully implemented CRD IV rules. These calculations will be presented in the next chapter.

³ Under CRD IV securitisation positions will be risk weighted. However, LBG and Standard Chartered deducted their securitisation positions from CET1, while we have added them back and risk weighted them (see chapter 5). For LBG the reported CET1 was £ 25 858m but we added back securitisations positions of £ 366m. The reported CET1 for Standard Chartered was US\$ 33 752m but we added back securitisation positions of US\$ 236m, hence the value of US\$ 33 988m.

5. Calculation of Risk Weighted Assets

The implementation of Basel III through CRD IV implies several adjustments in the calculation of RWA. For half-year 2013 and full-year 2012, our sample banks had to some extent, reported their estimated RWA assuming fully implemented CRD IV rules. However, calculating the accurate and comparable numbers for previous years is complicated. Most large banks use Internal Rate Based (IRB) methods which we do not have info to replicate.

In this chapter we calculate RWA assuming fully implemented CRD IV rules for years previous to 2012. The effect on RWA due to Basel III will be analysed to see if our sample banks have adjusted to these changes. The estimates retrieved from these calculations will be further used in chapter 6.

5.1 Method

To get an estimate of the Basel III RWA previous to 2012 (when not reported) the different effects are analysed by best effort. There is a difference of how detailed the increases in RWA due to Basel III are reported, but when applicable these adjustments have been used to identify similar deduction for previous years. The calculation from Basel II RWA to Basel III RWA will be structured like table 9⁴, which shows the calculation for HSBC. Calculations for the other three banks are similar and can be found in appendix 11.3.

HSBC US \$m	Reported numbers									
	2013 %		2012 %		2011 %		2010 %		2009 %	
Reported Basel II	1 104 764		1 123 943		1 209 514		1 103 113		1 133 168	
Definition of capital calculated										
1. Securitisation Positions (50/50)	43 843	4,0 %	44 906	4,0 %	30 175,00	2,5 %	36 675,00	3,3 %	39 475,00	3,5 %
2. Threshold	36 775	3,3 %	45 940	4,1 %	39 343	3,3 %	40 140	3,6 %	41 640	3,7 %
3. Other; moved to deduction DTA	-8 187	-0,7 %	-8 976	-0,8 %	-9 659	-0,8 %	-8 810	-0,8 %	-9 050	-0,8 %
4. CVA	38 339	3,5 %	60 360	5,4 %	64 955	5,4 %	59 241	5,4 %	60 855	5,4 %
5. AVC	25 769	2,3 %	25 682	2,3 %	27 637	2,3 %	25 206	2,3 %	25 893	2,3 %
Basel III	1 241 303	12,4 %	1 291 855	14,9 %	1 361 965	13 %	1 255 565	14 %	1 291 982	14 %

Table 9: Calculation of Basel III RWA; HSBC

1. Securitisation positions

This effect relates to securitisation positions previously deducted 50% from Core Tier 1 and 50% from Tier 1, but under Basel III this have to be risk weighted with 1250%. The numbers are extracted from the Pillar 3 reports.

⁴ Calculations for 2000 and 2006 are based on same percentages as 2009. See appendix 11.3.

2. The threshold effect

The threshold effect relates to unconsolidated investments in financial entities and Deferred Tax Assets (DTAs) that arise from temporary differences. The Basel III framework requires that the amount that does not exceed the 10% threshold is risk weighted with 250%. Unconsolidated investments that are not deducted from CET1 in chapter 4 are risk weighted. The DTAs have been estimated based on the DTA added to RWA in 2012, and then adjusted for year-to-year change in total deferred tax assets.

3. Other effects

Other effects of Basel III are related to items previously risk weighted under Basel II but that now will be deducted from CET1 and thereby reducing RWA. The “other” effect is based on the percentages deducted from RWA in 2012 and 2013, were the IRB methods have been used.

4-5. Counterparty Credit Risk (CCR)

As previously stated, Basel III has increased the risk weighting of Counterparty Credit Risk (CCR). There is a new capital charge for credit value adjustments (CVA) and a larger charge on credit risk due to higher assets value correlation (AVC) against the exposure to large financial institutions. It is not possible to calculate an accurate value due to the IRB-methods used for this, and the lack of information regarding different risk-factors and credit rating of exposure.

HSBC is the only bank that has specified the “other” effect. For the three other banks, the CCR and the “other”-effect is difficult to calculate and have been merged in our calculation. In our sample the CCR will have a bigger effect than the “other” adjustment and the net effect of these two have been an increase in RWA. The percentage increase in RWA due to these items in 2012 will be used on previous years.

5.1.1 The European Banking Authority (EBA) exercise

In September 2013 the European Banking Authority (EBA) presented their results from the monitoring exercise of the implications of Basel III based on data from December 2012. Table 10 shows the different impacts on the total RWA displayed for two different groups; Group 1 and Group 2 banks. Group 1 banks are defined as “banks with Tier 1 capital over €3bn and are international active” (EBA, 2013) and all of the banks in our sample fall into

this category. This EBA exercise is based on a sample of 170 banks, and the results only show average changes in RWA (EBA, 2013).

EBA	Group 1 banks	Group 2 Banks
Total increase Basel II to Basel III	12,8 %	10,2%
of which; Definition of capital		
50/50: Securitisation Positions	2,8 %	4,7%
threshold	3,4 %	2,3%
other	-1,0 %	-0,5%
Counterparty credit risk		
CVA	6,0 %	2,9%
AVC	1,6 %	0,8%

Table 10: Increase in RWA at a general level in 2012 presented by EBA (EBA, 2013)

We could have used these percentage changes in our calculation of RWA, but because of differences between the sample banks, they will not be representative and show the different impacts of Basel III. Our sample banks are different regarding business segments and international exposure, and Basel III will affect them differently.

Findings

Calculated increases from Basel II RWA to Basel III RWA are presented in table 11. The new framework leads to increased RWA, but the impact is different for each bank. HSBC and Barclays have significantly larger increases compared to LBG and Standard Chartered, but for all sample banks the impact is declining from 2009 to 2013. This decline can indicate that our sample banks have done some adjustments to reduce the impact of Basel III on RWA.

	2013	2012	2011	2010	2009	2006	2000
HSBC	12,4 %	14,9 %	12,6 %	13,8 %	14,0 %	14,0 %	14,0 %
Barclays	21,8 %	21,0 %	25,4 %	29,7 %	33,3 %	33,3 %	33,3 %
LBG	4,3 %	5,0 %	4,7 %	4,6 %	4,9 %	4,9 %	4,9 %
Standard Chartered	2,9 %	5,5 %	5,7 %	6,1 %	6,6 %	6,6 %	6,6 %

Table 11: Percentage increase in RWA due to Basel III

The detailed findings for each bank will be further discussed in the following sections. And the calculations are in appendix 11.3

HSBC

The increases in RWA are largely driven by the increase in Counterparty Credit Risk (includes both CVA and AVC) which in 2013 accounts for almost 50% of the increase (2012: 52%). This is as expected because HSBC is a large international bank with a

significant exposure to corporate and investment banking where CCR is high. The increases are quite stable and no significant adjustments in RWA can be found.

Barclays

Barclays has the largest percentage increases in RWA for all years, and the increases are primarily driven by CCR which in 2013 accounted for 64% of the total increase. This large increase due to CCR has to be viewed in context with Barclays' large share in investment banking.

The percentage increase has gone down from 33,3% in 2009 to 21% in 2012. This is primarily driven by a reduction in securitisation positions, which in 2009 accounted for an increase in RWA of 18,3% but in 2012 only lead to an increase of 7,8%. This can indicate that Barclays have adjusted their securitisation positions as a result of the implementation of Basel III.

LBG

The increases in RWA for LBG are not large compared to HSBC and Barclays. LBG is primarily a retail bank, and retail banks normally have lower exposure to securitisation positions and counterparty credit risk (Harle, et al., 2010). Over these years LBG have reduced their securitisation positions which in 2009 counted for an increase of 2.9% compared to 1.5% in 2012. This can indicate that LBG have adjusted their securitisation positions to reduce the Basel III effect on RWA. But the main driver of the increase in RWA is the threshold effect of unconsolidated investments.

Standard Chartered

Standard Chartered also has a smaller increase in RWA than HSBC and Barclays, and the increases have been smaller each year. The reduction in unconsolidated investments is the main driver for this reduced effect of Basel III; in 2009 unconsolidated investments lead to an increase in RWA of 2,1% (32% of the total increase) and in 2012 the increase was only 1,1% (20% of the total increase). Still, the biggest impact on RWA in 2012 is the CCR which can be due to their large international exposure.

As seen for all sample banks the effect of Basel III will increase RWA because the new requirements lead to stricter risk management, especially related to CCR, securitisation positions and unconsolidated investments. The increases are biggest for HSBC and Barclays,

which are the largest banks in our sample and have large investment banking segments and securitisation positions.

The downward trend, seen for all sample banks can be an indication that they have made some adjustments to reduce the impact on RWA. Especially for Barclays there is a significant reduction in securitisation positions.

Compared to the EBA monitoring exercise we find some difference; Standard Chartered and LBG have a lower increase than the average increase of 12,8% presented by EBA, whereas Barclays have significantly higher increases.

The estimates of RWA assuming fully implemented CRD IV (table 12) are the values that will be used in chapter 6. However, we will not be able to conduct more detailed analyses of the Basel III RWA because of insufficient information.

RWA Basel III	2013	2012	2011	2010	2009	2006	2000
HSBC US \$m	1 241 303	1 291 855	1 361 965	1 255 565	1 291 982	1 070 234	437 461
Barclays £m	471 530	468 000	490 242	516 396	510 178	397 091	196 043
LBG £m	301 006	325 672	368 656	424 929	517 263	163 621	98 565
Standard Chartered US \$m	333 181	318 389	285 985	259 911	228 043	163 571	73 919

Table 12: Basel III RWA

5.2 Weaknesses

For 2012 and half-year 2013 we use our sample banks' reported estimates, but this may not be accurate as they in many cases are based upon the banks interpretations of the framework. The main uncertainty relates to CCR and the "other" effects which depend on IRB-methods. For the estimates of 2000 and 2006 there is not sufficient information to calculate securitisation positions and threshold effects for all of our sample banks.

Alternative approaches have been considered. One alternative was to use the average increase from the EBA monitoring exercises but since these are average numbers and our banks are quite different this is not considered a more precise measurement. The other alternative was to use Basel II numbers, but since it is clear that the RWA will increase for all banks under the new regulation this is also not an optimal solution.

6. Calculation of ratios

Calculations in this chapter are based on our previous estimates of CET1 and RWA. In addition to calculation of CET1 ratios, we compare CET1 to equity and assets, and RWA to assets, which will be basis for our analysis of numerator and denominator.

CET1 ratio	2013	2012	2011	2010	2009	2006	2000	Increase
HSBC	10,1%	9,5%	7,6%	7,7%	6,0%	5,5%	5,8%	73,6%
Barclays	8,1%	8,5%	7,9%	7,5%	6,9%	3,7%	4,4%	82,5%
LBG	9,5%	8,1%	7,2%	6,7%	5,1%	5,0%	6,8%	40,7%
Standard Chartered	10,6%	10,7%	10,6%	10,8%	7,8%	6,2%	6,9%	53,5%
Average	9,6%	9,2%	8,3%	8,2%	6,4%	5,1%	6,0%	60,1%

Table 13: CET1 ratios

The CET1 ratios have gone up, and the sample banks have been able to adjust to stricter requirements. From 2000 the average increase has been 60,1%, but if we look at the average increase from 2006 the increase has been even higher due to lower capital ratios just before the financial crisis.

CET1 to equity	2013	2012	2011	2010	2009	2006	2000	Increase
HSBC	68,8%	66,9%	61,9%	62,5%	57,0%	51,5%	48,2%	42,8%
Barclays	63,3%	63,2%	59,7%	62,3%	60,2%	53,5%	36,9%	71,5%
LBG	65,8%	58,7%	56,7%	60,9%	59,5%	71,3%	68,7%	-4,2%
Standard Chartered	77,7%	73,8%	73,1%	71,9%	63,9%	57,9%	67,0%	16,1%
Average	68,9%	65,6%	62,8%	64,4%	60,1%	58,5%	55,2%	24,9%

Table 14: CET1 to equity

CET1 capital compared to equity can be an indication of the quality of equity. CET1 is the bank's core capital and only consists of the highest quality capital. Except for LBG all banks have increased the quality of their equity, and on average CET1 to equity has increased 24,9%. In the next chapter, we analyse in more detail changes in equity.

CET1 to assets	2013	2012	2011	2010	2009	2006	2000	Increase
HSBC	4,7%	4,5%	4,0%	3,9%	3,3%	3,2%	3,8%	25,4%
Barclays	2,5%	2,7%	2,5%	2,6%	2,6%	1,5%	2,7%	-9,4%
LBG	3,3%	2,8%	2,7%	2,9%	2,6%	2,4%	3,1%	6,8%
Standard Chartered	5,4%	5,3%	5,1%	5,4%	4,1%	3,8%	4,7%	14,5%
Average	4,0%	3,8%	3,6%	3,7%	3,1%	2,7%	3,6%	11,1%

Table 15: CET1 to total assets

By comparing CET1 to total assets the increase is not nearly as large as the average increase in the CET1 ratio. This can indicate that the numerator, CET1, has not been the biggest driver in the increase of CET1 ratios.

RWA to assets	2013	2012	2011	2010	2009	2006	2000	Increase
HSBC	46,9%	48,0%	53,3%	51,1%	54,6%	57,5%	64,9%	-27,7%
Barclays	30,8%	31,4%	31,4%	34,7%	37,0%	39,8%	62,0%	-50,4%
LBG	34,3%	35,2%	38,0%	42,9%	50,4%	47,6%	45,2%	-24,1%
Standard Chartered	51,3%	50,0%	48,3%	50,2%	52,2%	61,5%	68,7%	-25,4%
Average	40,8%	41,2%	42,7%	44,7%	48,6%	51,6%	60,2%	-32,2%

Table 16: RWA to total assets

Except for LBG all banks have increased their total assets, but as a percentage of total assets the RWA has been reduced; on average 32,2%. This means that our sample banks have reduced the riskiness of their assets. Banks can reduce the riskiness of their assets by taking one or more of the following actions:

- Change the balance sheet structure or the riskiness within each class of assets
- Reduce their exposure to GIIPS or other highly risk weighted assets
- Change the maturity of their assets
- Change their business structure; some businesses are more affected by Basel III than others.

The increase in CET1 ratios is primarily due to a reduction of RWA, which is in context with the results from the EBA monitoring exercise from September 2013; they did not find significant increases in CET1 in percentage terms but a notable decrease of RWA (EBA, 2013). The findings from this exercise are in figure 1.

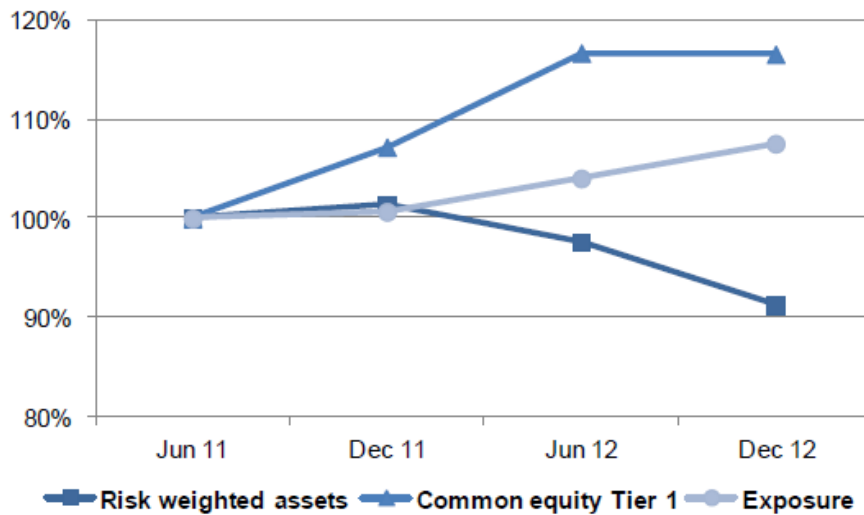


Figure 1: Development of CET1, RWA and exposure. Extracted from the Basel III monitoring exercise (EBA, 2013)

Findings

The sample banks have increased their CET1 ratios and the main driver has been a reduction of the denominator, RWA. In the next two chapters we analyse the constituents of equity and assets to find the underlying reasons for increases in the quality of equity and the reduction of RWA.

7. Analysis of Equity

In the previous chapter we found that CET1 compared to equity increased. CET1 over equity was on average for the sample banks 55,2% in 2000 and 65,6% in 2012. Except for LBG all sample banks have increased the quality of their equity. Of the constituents of equity only called up share capital, share premium and retained earnings can be added directly to CET1 without any noteworthy adjustments or deductions, and CET1 primarily consists of these elements. In this section we look at the composition of equity, to understand how CET1 is changing.

For analysis purposes equity has been divided into six categories and the allocations of of equity for each bank are presented in figure 2.

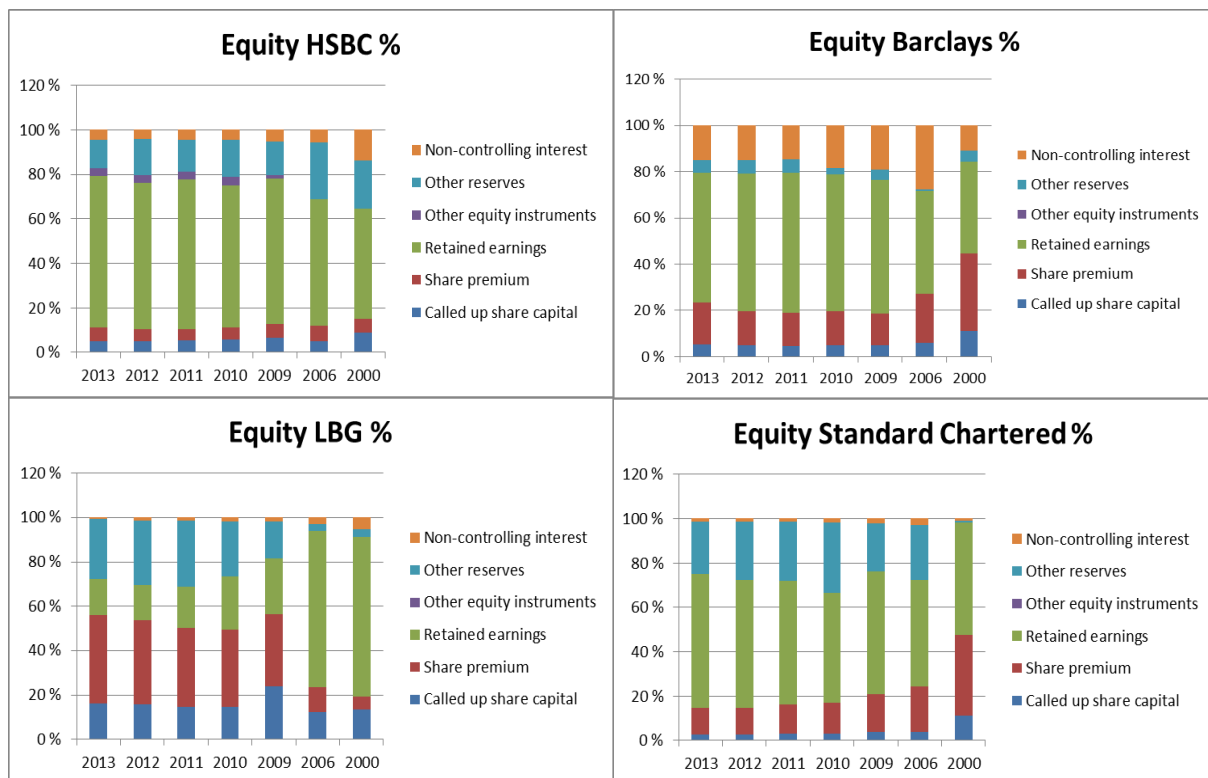


Figure 2: Composition of equity

Share premium and called up share capital

For both HSBC and Barclays share premium and called up share capital has been relatively stable over the last years and there have not been any large increases. LBG had a large increase in called up share capital and share premium from 2006 to 2009, which was mainly due to the issuance of new shares related to the acquisition of HBOS in 2009. Standard Chartered issued shares in august 2009 which increased share capital by US\$ 65m. They also

conducted a 1-for-8 rights issue in 2010, but the increase relating to this is presented under merger reserves.

Retained earnings

In the last years LBG had negative earnings leading to a reduction in retained earnings and a payout ratio of zero from 2009. In 2012 retained earnings accounted for only 16% of LBG's total equity. HSBC, Barclays and Standard Chartered have all increased their retained earnings which has been the main driver for increases in total equity. Retained earnings accounted for 66%, 60% and 58% of equity for HSBC, Barclays and Standard Chartered in 2012. These three banks have managed this by generating positive profits and for HSBC and Barclays payout ratios have been reduced. Standard Chartered has not reduced payout ratios, but since the ratios have been relatively low they have managed to increase retained earnings.

Payout ratios	2012	2011	2010	2009	2006
HSBC	55,4%	42,4%	46,6%	100,0%	62,3%
Barclays	19,0%	22,0%	19,0%	2,9%	43,1%
LBG	0,0%	0,0%	0,0%	0,0%	68,7%
Standard Chartered	28,8%	23,8%	17,2%	21,9%	22,0%

Table 17: Payout ratios

Other reserves

For HSBC the decrease primarily relates to a reduction of foreign exchange reserves, but the effect on equity has not been significant as this is a small fraction of other reserves. For HSBC other reserves accounted for 16% of equity, while for Barclays other reserves only accounted for 6% in 2012 and there has not been any large changes related to this post.

LBG has increased other reserves from 3% in 2006 to 29% in 2012 which is mainly due to the increase in merger reserves related to the acquisition of HBOS in 2009. There is also a large increase in capital redemption reserves from 2009-2010. However this amount is transferred from share capital following the cancellation of the deferred shares related to the merger, which does not increase total equity.

Standard Chartered increased merger reserves over 5 billion due to a 1-for-8 rights issue. Except for this, there have not been any large changes and other reserves constituted 26% of total equity in 2012, which is close to the 2006 fraction of 25%.

Findings

HSBC and Barclays have increased the quality of their equity over the relevant years which are mainly due to increases in retained earnings and reduced payout ratios. They have also reduced non-controlling interests, which are bigger than for the other two banks. The reason for this reduction can be that only a small fraction of minority interests are allowed in CET1, and one way to increase CET1 can be to buy out minority stakes.

LBG had already in year 2000 a high quality on their equity with CET1 accounting for 68,7%. This was primarily because of a high share of retained earnings; 71% and 72% in 2006 and 2000 respectively. After several years with losses, retained earnings decreased leading to lower CET1 compared to equity. But because their equity is mostly composed by called up share capital, share premium and other reserves, mainly merger reserves, LBG still manage to have a high quality on their equity.

Despite Standard Chartered's high share of other reserves they managed to have the highest fraction of CET1 to equity in 2012, which relate to merger reserves' large fraction of other reserves.

Except for LBG, CET1 has increased for all banks, which is mainly through improved quality of equity. This means that the increase in the numerator in the CET1 ratio can be explained by increased retained earnings. In the next chapter we look into the reduction of the denominator, RWA.

8. Analysis of Assets

In the calculations from chapter 6 we could see that CET1 ratios on average had increased 60% from 2000 to 2012, but CET1 capital to assets has only increased 11,1% on average. When comparing RWA to assets we find that the Basel III RWA has decreased 32% to assets over the same period. This indicates that the increases in CET1 ratios are primarily due to reductions of RWA, which can indicate that banks have changed their asset composition, lowering risk. A detailed analysis of our sample banks' assets might find the adjustments they have made to accomplish this. The analyses of assets will be done by looking at:

- Balance sheet structure of assets
- Exposure to Greece, Ireland, Italy, Portugal and Spain (GIIPS)
- Maturity of assets
- Assets by business
 - Have they changed the type of business segment they operate in?
 - RWA by business.

These analyses are conducted based on Basel II RWA because we do not have detailed information of the Basel III RWA. However, the negative trend in RWA/assets are the same for both which can be seen in figure 3.

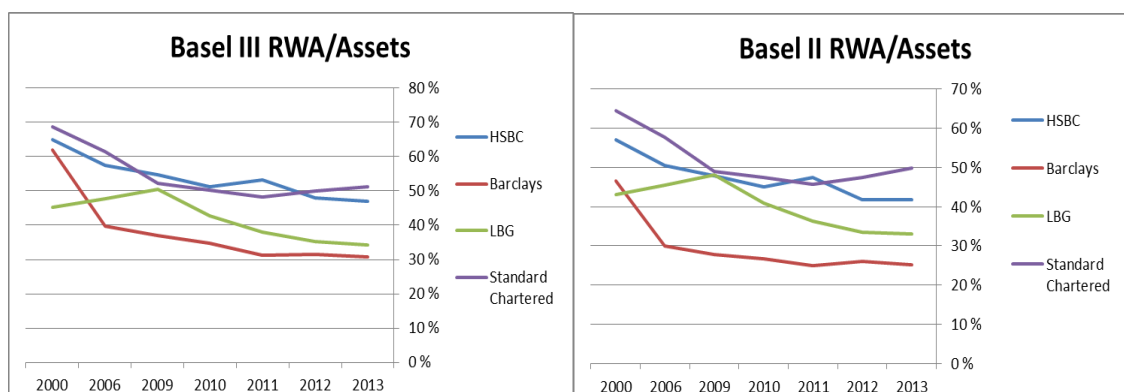


Figure 3: Movement of RWA compared to assets

8.1 Balance sheet assets

Balance sheet restructuring can be used to improve the quality of capital and to reduce the capital needs arising from Basel III's deductions and higher risk weighted assets (Harle, et al., 2010).

For analysis purposes we have divided assets into seven groups, and the allocations of assets are presented in figure 4.

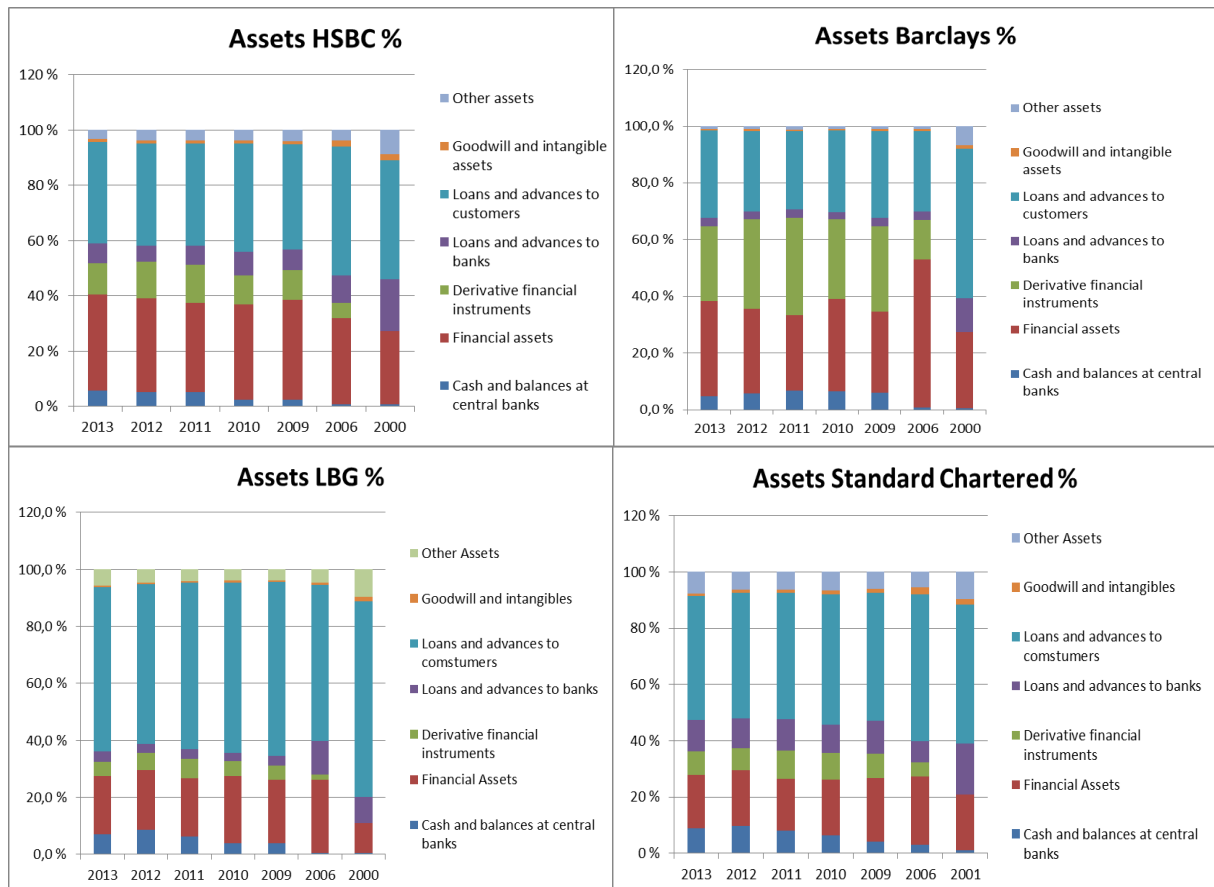


Figure 4: Composition of assets

The biggest increase for all sample banks is in “Cash and balances at central banks”. For 2000 and 2006 this was close to zero for all banks while in 2012 this constituted over 5% of total assets for all banks. This is mainly due to the western central banks trying to improve the money markets after the financial crisis. Cash and balances at central banks have a zero risk weight; hence the increase in this asset has reduced RWA to assets (BCBS, 2004).

Financial assets

All banks have had relatively stable fraction of financial assets over the relevant period. HSBC and Barclays have the highest share of financial assets; in 2012 they had 34% and 29,8% respectively, while LBG and Standard Chartered have 20,8% and 20% in 2012.

Derivative financial instruments

All banks have zero derivatives in year 2000, but this can be due to a classification difference, meaning that derivatives might have been classified as financial assets. In 2012 Barclays have the highest share of 31,5% while HSBC, LBG and Standard Chartered have much lower shares with 13%, 6,1% and 8% respectively.

Loans and advances to banks

All banks have reduced this from year 2000, and Standard Chartered have the highest share in 2012 with 11% while Barclays has the lowest share with only 3%.

Loans and advances to customers

From year 2000 all banks have reduced their share of loans and advances to customers, and in 2012 Barclays had the lowest share with 28,6% and LBG had the highest share with 55,9%. This underpins the difference between these two banks; Barclays focuses on commercial banking while LBG is more retail focused.

Goodwill and intangible assets

We wanted to look more closely at this because they have to deduct intangible assets from CET1 capital. However none of the banks have very high values on intangibles and there have not been any large changes.

Other assets

There has not been any large changes related this for any of the banks in our sample.

Findings

HSBC and Barclays have a much higher share of financial assets and derivatives than the two other banks, where Barclays has the biggest share of derivatives. LBG and Standard Chartered have a much higher share of loans and advances to customers. This corresponds to the fact that both LBG and Standard Chartered are more retail focused than HSBC and Barclays.

Barclays has the lowest share of RWA to assets with 31,4% in 2012. They have worked hard to reduce RWA and this ratio has decreased with over 50% from 2000. Standard Chartered is the bank with the highest RWA/assets ratio, where RWA accounted for 50% of their assets in 2012, and they have not been able to reduce as much as Barclays.

Based on the analysis of the balance sheet structure we cannot find any indications of how they have adjusted their assets to reduce RWA or why Barclays manage to have very low RWA compared to assets. The reduction in RWA can be due to changes on a more detailed level. For example, they can have changed their lending policies, which might change the composition of “Loans and advances to customers”. Banks might be stricter regarding whom to lend money and there can also be changes related to what type of businesses that gets loan; Small start-up firms can have a higher risk weight than middle-sized firms. We would, if possible, done a more detailed analysis but information regarding loans to businesses is not sufficient. The same can be applied for financial assets and derivatives; they can have changed the compositions of these assets but this is not visible on the balance sheet, and public information is not sufficient for us to make a more detailed analysis on the balance sheet structure.

The next analysis will be on their exposure to countries with low credit rating, which gets a high risk weight.

8.2 Exposure to GIIPS

We calculate the net exposures to Greece, Ireland, Italy, Portugal and Spain (GIIPS). Banks monitor this closely because of the volatility in the Eurozone, and the increased credit and market risk related to exposures in these countries.

From 2010 and 2011 our sample banks reported exposures to GIIPS in their annual reports. Barclays and LBG have the highest reported exposures to these countries, but there is a clear downward trend. HSBC and Standard Chartered do not have any reported

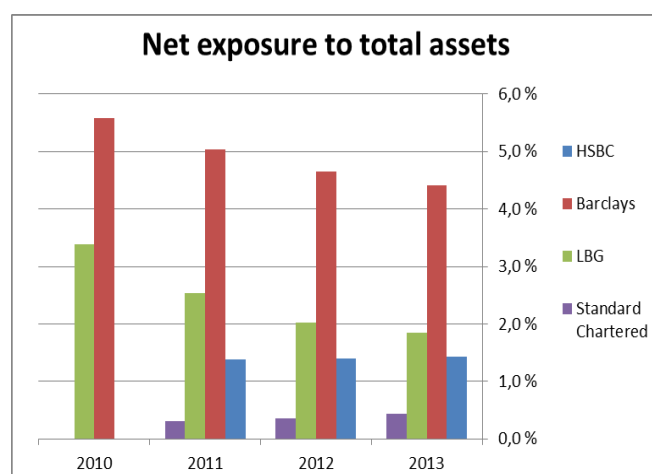


Figure 5: Net exposure to GIIPS as a fraction of total assets

values for 2010 and they have a much lower exposure compared to total assets than the two other banks.

Reducing exposure to these countries will help reduce RWA. But the exposures are a small fraction of total assets, and can therefore only explain some of the reduction in RWA for Barclays and LBG.

Next we look closer at the maturity structure of assets, as a reduction in maturity can reduce RWA.

8.3 Maturity of assets

Assets and liabilities have different maturities and empirical evidence indicate that long-term credits are riskier than short-term credits (BCBS, 2005). As mentioned in section 2.4.1, banks have to take into account the effective maturity of assets when using IRB approaches. Because longer terms are associated with higher risk, the capital requirements increase with maturity. Maturity adjustments can also be interpreted as additional capital required related to downgrades (BCBS, 2005).

In addition, maturity structure is important in the calculation of Net Stable Funding Ratio (NSFR). We mentioned that the aim of this ratio is to “ensure a sustainable maturity structure of assets and liabilities”. However, this ratio will not be finalised before 1 January 2018, and maturity structure will be much more relevant in the following years. Still, we examine our sample banks’ maturity structure and see if they have taken any actions to change this already, as that helps reduce their RWA. In our sample banks’ annual reports we find information of their maturity structures, and this analysis is based on their reported values.

HSBC has divided their maturities into several categories but we cannot see large changes from 2011 to 2013. By looking at maturities divided into only two categories we see some changes from 2006 (figure 6). These changes could appear because financial assets are included under the category “due after more than one year”. Hence, it might be that

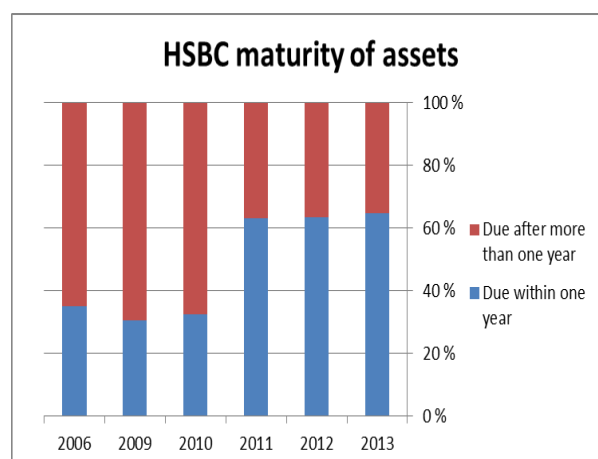


Figure 6: The maturity of HSBC's assets

the proportion of financial assets or the classification of financial assets has changed, not the maturity in its self. In the last year's most of their assets had a short term maturity. In 2012 63% of their assets were due within one year.

Barclays and Standard Chartered also have a high share of short-term assets; in 2012 Barclays had 75% and Standard Chartered had 56% of their assets due within one year. This allocation has been relatively stable for both banks, and the maturity of their assets can be found in appendix 11.4.

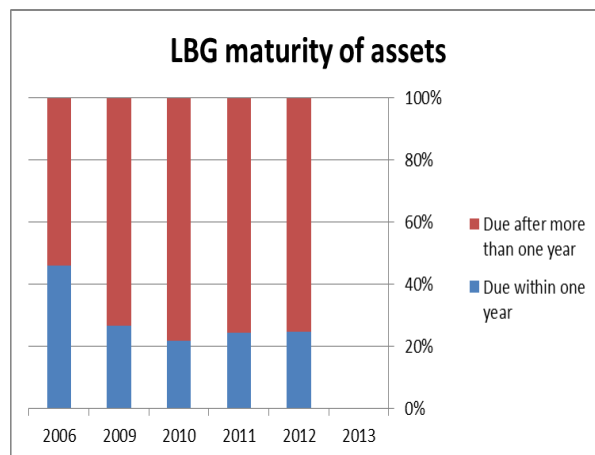


Figure 7: The maturity of LBG's assets

LBG did not report their maturity structure for 2013, and contrary to the other banks a large share of their assets are due after more than

one year, 75% in 2012. For LBG there has been an increase in assets due over 5 years, but assets due within one year has been relatively stable, especially after 2009 as can be seen in figure 7.

Findings

Our analysis does not show any large changes, which means that the reductions in RWA are not due to changes in maturity structures. Possible reasons for these small changes might be that maturity structures have little effect on RWA, and because it takes time to change them. We believe that there will be changes, especially for LBG, in the future and in relation to the introduction of NSFR, where maturity structures, for both assets and liabilities, are essential.

In the next sections we analyse both assets and RWA by business to see if the sample banks have made some changes related to their business structure.

8.4 Assets by business

Basel III will have different impacts on various business segments, where the main business segments are retail, corporate and investments banking. Retail banking will be affected least while investment banking will be highly affected, especially related to trading businesses. Within the trading business there are mainly three activities that will be affected; OTC derivatives, cash trading and securitisations. Securitisations have been covered in previous

Basel rules, but in Basel III there is a technical change; Under Basel II securitisations were deducted 50/50 under Tier 1 and Tier 2 capital. Securitisation positions will now be added to RWA with a risk weight of 1250%, which will increase capital requirements (Harle, et al., 2010).

The compositions of assets by different businesses as found in the annual reports:

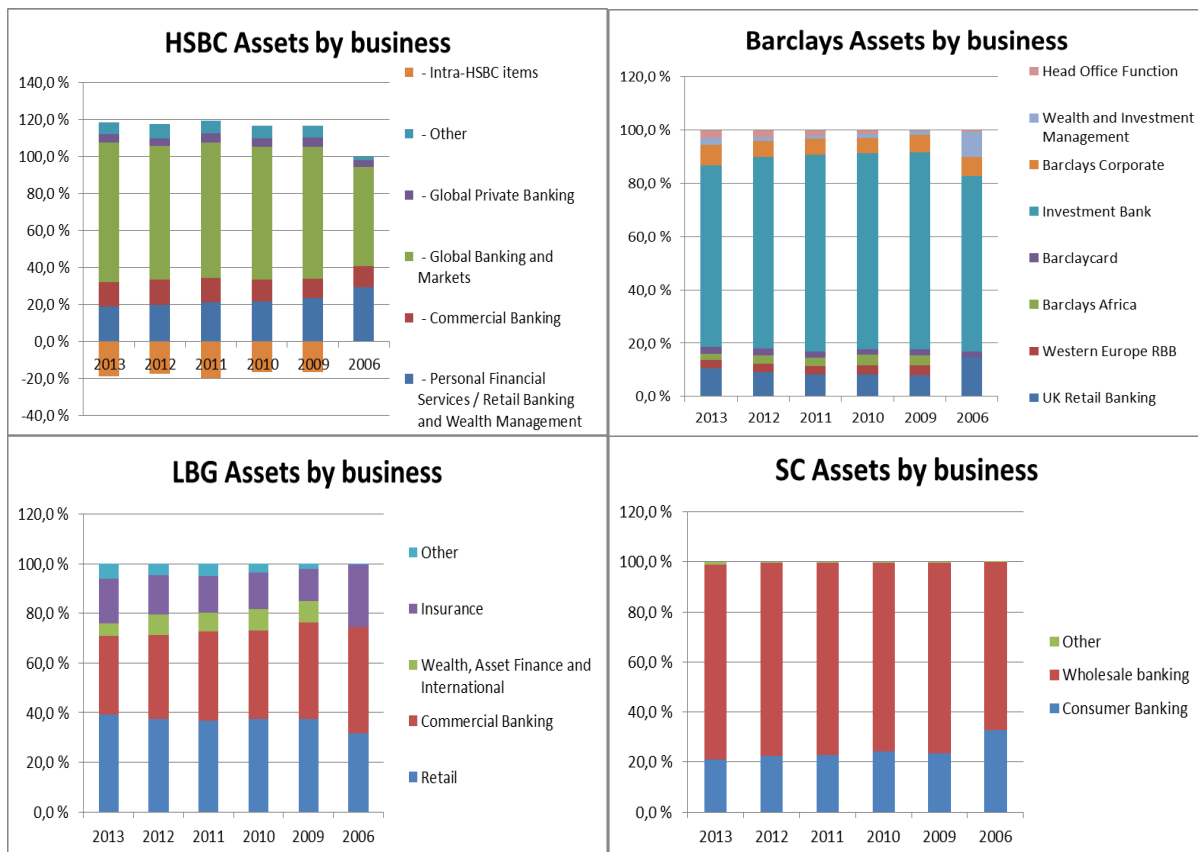


Figure 8: The composition of assets for each bank

HSBC's largest business is global banking while investment banking is the main business for Barclays. For LBG commercial and retail banking are the largest businesses. Standard Chartered has divided their assets into only two categories with a main focus on wholesale banking.

To further analyse assets by business we divided the different businesses into broader segments; Retail, Corporate and Other, which demonstrates that LBG is the biggest retail bank while the other three banks have a larger corporate focus.

Findings

We cannot find any large changes in our sample banks' share of assets attributable to different businesses; hence we cannot see that they have changed business focus to adapt to the new framework. However, as seen in section 5.1 the different increases in RWA due to the new rules are related to the type of businesses each bank is involved in. HSBC and Barclays have their biggest businesses within corporate and investment banking and they also have the highest increase in RWA.

The retail segment will be less affected than the other segments regarding stricter risk weighting, which can explain the low increase from Basel II RWA to Basel III RWA for LBG. Standard Chartered also have a very low increase in RWA due to the new requirements, which could be explained by their corporate segment containing less investment banking than for HSBC and Barclays. Within investment banking several core businesses will be affected, in particular trading and securitisation businesses (Harle, et al., 2010).

None of the sample banks have changed their business focus noteworthy over the last years. This means that they have not, seemingly, changed their business focus to affect RWAs.

8.5 RWA by business

In addition to the analysis of assets by business we will also look at RWA by business. We have tried to calculate the riskiness of assets attributable to different businesses, where the calculations can be found in appendix 11.5. In this analysis our calculations are based on RWA under Basel II rules, and each bank has to some extent reported total assets and RWA for each business. By dividing RWA for a business by the amount of assets attributable to that business segment we can get a measure (ratio) of how risky the assets of each segment are. Risk ratio:

$$\frac{RWA \text{ allocated to business } X}{Assets \text{ allocated to business } X}$$

Information on RWA by business was only sufficient as of 2010, and this analysis was not possible to conduct for previous years. Some types of businesses have higher risk weight than other, for example commercial banking which has a higher risk ratio than retail banking.

For HSBC there were no large changes regarding the allocation of assets to different businesses which can mean that they have reduced the riskiness within each business segment. In 2012 HSBC had 30% of their RWA allocated to commercial banking, while only 12% of total assets were allocated to same segment. The risk ratio to commercial banking was 112,7% in 2010, but reduced to 109% in 2012, as shown in table 18, and in appendix 11.5 for the other banks. This indicates that they have reduced the riskiness of commercial banking. To decrease the riskiness within different business segments, HSBC has sold shares in subsidiaries, for example in Ping An⁵, which reduced their credit risk.

Riskiness of assets	2012			2011			2010		
	Assets	RWA	RWA/Assets	Assets	RWA	RWA/Assets	Assets	RWA	RWA/Assets
HSBC									
- Personal Financial Services / Retail Banking and Wealth Management	536 244	276 600	52 %	540 548	351 200	65 %	527 698	357 000	68 %
- Commercial Banking	363 659	397 000	109 %	334 966	382 900	114 %	296 797	334 400	112,7 %
- Global Banking and Markets	1 942 470	403 100	21 %	1 877 627	423 000	23 %	1 758 315	353 200	20 %
- Global Private Banking	118 440	21 700	18 %	119 839	22 500	19 %	116 846	24 900	21 %
- Other	201 741	25 500	13 %	180 126	29 900	17 %	161 458	33 600	21 %
- Intra-HSBC items	-470 016	-	0 %	-497 527		0 %	-406 425		0 %
Total	2 692 538	1 123 900	42 %	2 555 579	1 209 500	47 %	2 454 689	1 103 100	45 %

Table 18: Riskiness of assets for HSBC

LBG has also reduced the risk ratio attributable to commercial banking from 63% in 2010 to 53% in 2012. LBG has taken several actions to reduce the riskiness of their assets and in the interim report from 2013 they state to have reduced non-core assets, core lending and improved the credit quality of their retail assets.

For Barclays their most risky business segment is Barclaycard where RWA constituted 105% of the assets to this segment. In 2012 they have reduced the riskiness of this segment, to a ratio of 97%. Barclays has a large share of their total RWA attributable to Investment Bank; 46% in 2012. But when comparing to total assets allocated to this segment, these assets seem to have a relatively low risk; with a risk ratio of only 17%. Barclay's management states in the 2012 annual report that they will have a focus on reducing RWA to assets, and they have reduced credit risk within corporate banking and started an exit from non-core international portfolios.

Findings

This analysis shows that the sample banks have reduced the riskiness of their assets within each business segment by taking on management actions to reduce non-core assets and credit risk. The changes are done within the different business segments, not by changing their business structures.

⁵ Ping An Insurance (Group) Company of China, Ltd

9. How are the banks situated today?

To get an overview of how our sample banks are situated today, we estimate required 2019 CET1 ratio. We analyse capital shortfall to this requirement by quantifying necessary increase in CET1 or reduction in RWA. We also estimate our sample banks' future CET1 ratios for comparison to end point requirement.

9.1 Estimated Requirements

As stated in the theory section 2.5 there are several requirements that affect the target CET1 ratio. The minimum level of 4.5% of CET1 to RWA will increase with the capital buffers. All of the sample banks will have to meet the capital conservation buffer at 2.5%, the countercyclical buffer which will vary in the range of 0% - 2.5% and the systemic risk buffer which is not finalised by UK regulators but will be somewhere in the range of 0% - 3%. There will also be two additional buffers that vary between our sample banks; the G-SIB buffer and the Pillar 2 requirements.

The G-SIB buffer will be mandatory for banks that are considered globally important. The updated list of Global Systemic Important Banks was published by the Financial Stability Board November 2013 giving the following implication for the sample banks:

- HSBC is placed in bucket 4 and assigned a G-SIB Buffer of 2.5%
- Barclays is placed in bucket 3 and assigned a G-SIB Buffer of 2.0%
- Standard Chartered is placed in bucket 1 and assigned a G-SIB Buffer of 1.0%
- LBG is not considered a G-SIB.

(FSB, 2013)

HSBC is subject to the largest G-SIB buffer, which affects the total level of required CET1. LBG is not on the list, but can potentially be considered a domestic important bank and thereby receive an additional capital requirement, but this is not covered in this calculation.

The additional level of CET1 required by the regulators due to Pillar 2, as discussed in the theory chapter 2.6, is individual for each bank. Since the required CET1 for this buffer is not public as of today, this is noted with an "X" in figure 9 and not assigned a specific percentage in the calculation. This can potentially increase the requirement for some or all of the sample banks.

Total requirements are presented in figure 9 with the potential maximum and minimum level.

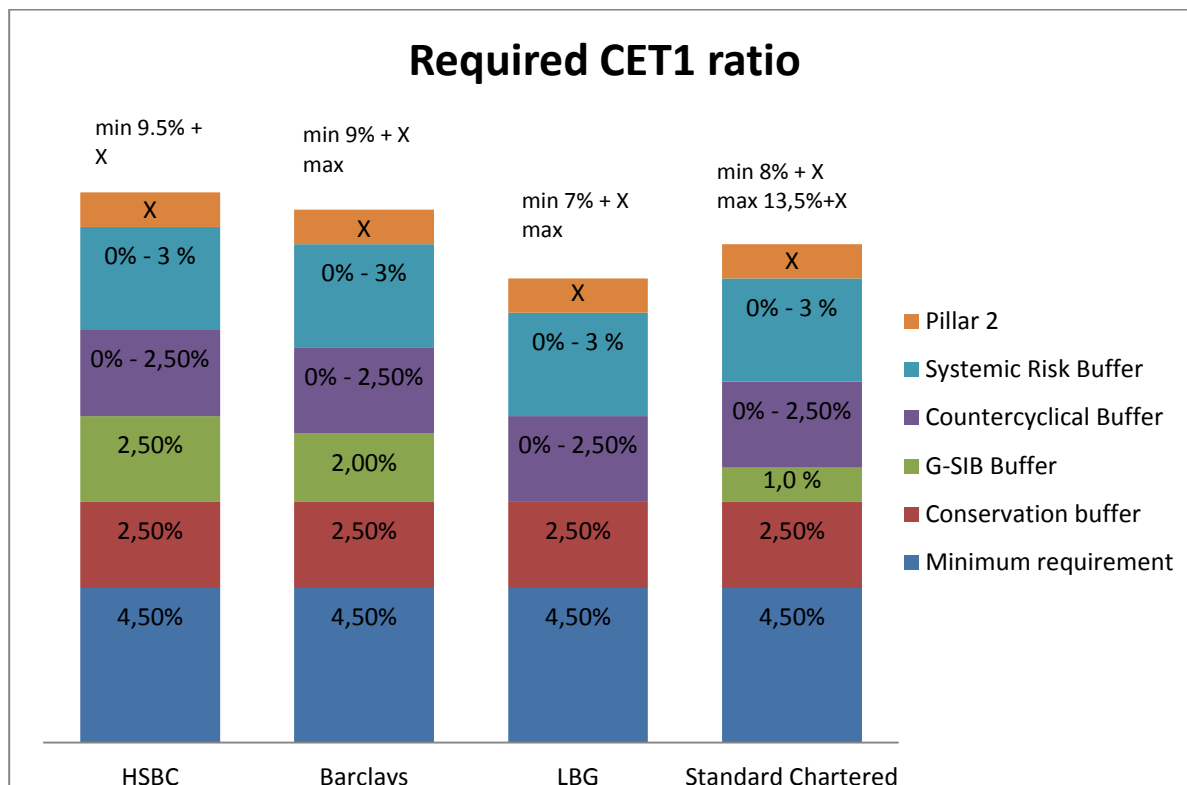


Figure 9: Required CET1 ratios

9.2 Shortfall Calculation

To analyse the shortfall, potential end-point requirements are compared to the banks CET1 ratios as of 2012. Further, the different requirements will be divided into two groups; established requirements and non-established requirements. Established requirements will include the minimum requirement (4,5%), the capital conservation buffer (2,5%) and the individual G-SIB buffer, which are all finalised by UK regulators. The non-established requirements will include the countercyclical buffer and the systematic risk buffer, where the levels are not known as of November 2013. Pillar 2 requirements will be excluded from this calculation because we have no information about the range.

Except for Barclays that face a shortfall of 0,5%, all of the banks have sufficient CET1 ratios to cover the established requirements shown in table 19. LBG and Standard Chartered have additional CET1 to cover other requirements, whereas HSBC barely meet their established requirement.

	HSBC	Barclays	LBG	Standard Chartered
1.CET1 ratio 2012	9,5 %	8,5 %	8,1 %	10,7 %
2.Established requirements	9,50 %	9,00 %	7,00 %	8,00 %
3.Shortfall to established requirements	0,00 %	-0,50 %	1,10 %	2,70 %
4.Maximum requirements	15,00 %	14,50 %	12,50 %	13,50 %
5.Shortfall to maximum requirements	-5,50 %	-6,00 %	-4,40 %	-2,80 %

Table 19: Shortfall to CET1 requirements for all banks

The maximum requirements include both the established and the non-established requirements. If all of these buffers are at its maximum level for all sample banks the estimated shortfall would significantly increase as stated in line 5 in table 19.

9.3 How to meet the end-point requirement?

To quantify the shortfall based on the potential end-point, the necessary increase in the CET1 ratio is analysed. To increase the CET1 ratio banks could increase their CET1 capital and/or reduce the level of RWA. For exemplification of the potential end-point requirement the maximum requirement is used as a worst case scenario.

Table 20 illustrate the necessary increase in CET1 and the reduction in RWA to meet the target CET1 ratio. The CET1 value is calculated by taking the level of RWA as a constant and assuming the increase does not affect RWA. The necessary reduction in RWA is based on the similar assumption of a constant CET1.

2012	HSBC	Barclays	LBG	Standard Chartered
Necessary increase (%) in CET1	58 %	71 %	55 %	26 %
Necessary reduction (%) in RWA	37 %	41 %	36 %	21 %

Table 20: Necessary changes in CET1 and RWA to meet maximum CET1 ratio.

The minimum necessary increase in CET1 and reduction in RWA gives an indication of the magnitude of actions that the sample banks have to undertake to fulfil the target ratio. As discussed earlier the CET1 can be increased by e.g. retaining earnings, issue shares or decreasing the items that have to be deducted from CET1. RWA can be reduced in two ways; either by reducing total assets and maintain the average riskiness of these, or adjusting the average risk weight of the asset portfolio. These options can also be combined, and in the next section we look at necessary growth in CET1 ratios.

CET1 ratios in 2019

We estimate our sample banks' CET1 ratios based on previous growth and compare to the maximum 2019 requirement. Average growth in CET1 ratios necessary to achieve the 2019 requirement⁶ are shown in table 21 column 2. We also estimate future CET1 ratios based on average growth as of 2011 and 2012, shown in table 21 column 3. Basel III was introduced in 2010; hence we use the average growth after this as an estimate for future growth.

CET1 ratio	Average growth necessary to reach maximum CET1 ratio	Average growth 2011 and 2012
HSBC	7,9 %	11,8 %
Barclays	9,3 %	6,3 %
LBG	7,5 %	9,8 %
Standard Chartered	4,0 %	-0,5 %

Table 21: CET1 ratio: Average growth necessary and average growth 2011 and 2012

Barclays and Standard Chartered face a shortfall if they do not increase the growth rate of their CET1 ratio. On the other hand, HSBC and LBG had a large increase over the last two years, and will meet the requirement by a comfortable margin if they maintain same growth rate. The estimated CET1 ratios for 2019 compared to the maximum requirements for each bank are shown in figure 10.

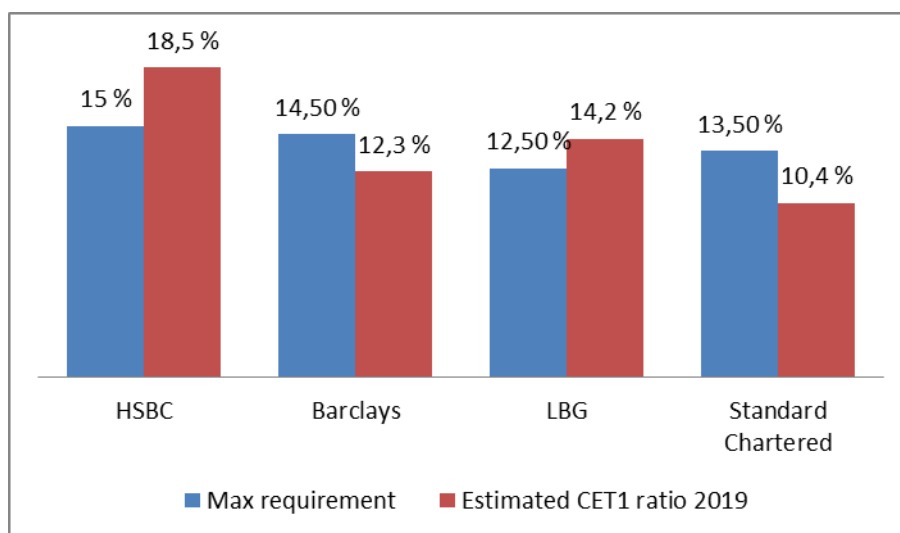


Figure 10: CET1 ratios 2019 compared to maximum requirement.

⁶ Achieved 1 January 2019.

9.4 Findings

The CET1 ratios have increased over the last years but all our sample banks fall short of the maximum end-point requirement (with CET1 ratios as of today). Although all sample banks are under UK regulation, they face different requirements reflecting global importance. The calculations show that Standard Chartered is relatively well prepared for the requirements, whereas the other three banks have a larger shortfall which indicates that they have to undertake several actions in the forthcoming years. It is therefore expected that they will continue to retain earnings, issue new shares and/or take actions to reduce the riskiness of their assets because they may be imposed restrictions on capital distributions if they do not reach an adequate CET1 ratio. HSBC and LBG will reach the maximum 2019 requirement if they maintain same growth in CET1 as of 2011 and 2012. For Barclays and Standard Chartered, growth in CET1 ratios has to increase towards 2019 to reach the maximum requirement.

9.5 Weaknesses

Finalisation of the target requirements is still on-going which leads to uncertainty in the estimated shortfall. The countercyclical buffer depends on the buffer that applies in the jurisdictions banks have exposure to. Regarding the systemic risk buffer, information is not available. In addition, the Pillar 2 requirements are not included in our calculation because the accurate level is not available, and the list of Domestic Systemically Important Banks (D-SIB) is not published by UK regulators. The requirement of LBG is most likely underestimated compared the other banks, as their lower level of mandatory requirement may lead to a higher Pillar 2 requirement.

This thesis covers the CET1 requirements and thereby excludes calculations of the additional Tier 1 and total capital. Additional requirements to the Tier 1 capital and the total capital may also increase the total capital shortfall the banks face.

10. Conclusion

We will now discuss main findings which can contribute to answer our research question; *“How have banks adjusted to increase CET1 ratios?”* Primarily we wanted to examine if the adjustments were made in numerator or denominator.

10.1 Main findings

We started our thesis by estimating CET1 and RWA assuming fully implemented CRD IV for the years 2000, 2006 and 2009-2012, and find that all banks have increased CET1 ratios.

Analysis shows that our sample banks have adjusted both numerator and denominator in the CET1 ratio, but the main driver has been a reduction of denominator, RWA. CET1 has increased due to improved quality of equity, but to a large extent none of the banks have managed this by obtaining new capital from shareholders. Except for LBG, which has had negative profits over the last years, the sample banks have increased retained earnings. Especially HSBC and Barclays have managed this by reducing payout ratios. Increasing equity through retained earnings has improved the quality of equity.

When calculating RWA we find that Basel III has different impacts on our sample banks. The implementation of Basel III increase all sample banks' RWA, especially due to counterparty credit risk (CCR) and securitisation positions. HSBC and Barclays face the largest increases due to their business structure; they are both large investment banks and have high international exposure.

The reduction in RWA is analysed by looking into the balance sheet structure of assets, exposure to GIIPS, maturity of assets, assets by business and riskiness of assets.

Through the analysis of the balance sheet we cannot find any indications of how they have adjusted their assets to reduce RWA. Regarding the exposure to GIIPS we find a downward trend and because such exposures have a high risk weight, reducing these will decrease RWA. Still, these exposures are relatively small for our sample banks; hence they cannot explain much of the reduction. Further, we find no significant changes in maturity structure of assets or in the allocation of assets to business. However, when we look at average risk in each business segment we find a reduction of riskiness. This analysis shows that our sample

banks have reduced RWA through changes within each business segment, not by changing their business structures.

Shortly; Increases in CET1 ratios are mainly due to reduced riskiness of asset portfolios, which has reduced RWA.

We also calculate required CET1 ratios each sample bank will face in 2019, and they all face a capital shortfall as of today. This means that there are still management actions that have to take place in the next few years in order to further increase CET1 ratios. By assuming same average growth in CET1 ratios as of 2011-2012 for future years, we find that Barclays and Standard Chartered will not meet their final requirements in 2019.

10.2 Delimitations

Values for our calculations are based on banks' annual reports and Pillar 3 documents, which sometimes have been insufficient. To a large extent the reporting consists of aggregate sizes, which makes it difficult to extract the correct values needed for our calculations. In addition, banks use IRB-methods to calculate risk weighted assets, which is not available. Values from 2012 and 2013 are based on our sample banks interpretation of a preliminary framework, and may therefore be incorrect. We have tried to implement Basel III to our sample banks by best effort, but misinterpretations could have occurred because of the complexity.

10.3 Further research

This thesis is limited to a sample of four banks, and one subject of interest could be to undertake a closer analysis of the changes in CET1 and RWA due to Basel III on a larger sample. By looking at a larger sample it can be possible to analyse the various effects Basel III will have on the different business structures.

Another interesting topic would be to look at their lending portfolio. We found that the sample banks have changed their composition of assets within different asset categories. However, it could be interesting to look at banks' lending policies and if the implementation of Basel III will affect different types of costumers.

In this thesis we have only analysed UK banks, which overall show better CET1 ratios than the “average bank” from the EBA monitoring exercise. The economic situation within the EU differs and especially the southern European banks struggle. It could be interesting to analyse how these banks are situated today regarding the new framework, and if they will be able to implement Basel III within the established timeline. One could also take an even broader perspective and undertake a comparison between US banks and European banks. US banks have an extended phase-in arrangement, and are not under the same regulations as the European banks. These differences might affect the competitiveness of the banks.

11. Appendix

11.1 Abbreviations

AVC	Asset Value Correlation
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
CCB	Countercyclical Buffer
CCR	Counterparty Credit Risk
CET1	Common Equity Tier 1 capital
CET1 ratio	CET1/RWA
CRD IV	EU Capital Requirement Directive for Basel III
CRR	Capital Requirement Regulation
CVA	Credit Value Adjustments
DTA	Deferred Tax Assets
DVA	Debit Valuation Adjustments
D-SIB	Domestic Systemically Important Bank
EBA	European Banking Authority
G-SIB	Global Systemically Important Bank
GIIPS	Greece, Ireland, Italy, Portugal, Spain
IRB	Internal Rate Based (method used by banks to calculate RWA)
LBG	Lloyds Banking Group Plc.
LCR	Liquidity Coverage Ratio
OTC	Over The Counter (derivatives)
NSFR	Net Stable Funding Ratio
PRA	Prudential Regulation Authority
PVA	Prudent Valuation Adjustments
RWA	Risk Weighted Assets

11.2 Calculation of CET1

Barclays

Common equity tier 1 £m	REF:	2012	2011	2010	2009	2006	2000
Called up share capital	1	3 061	3 050	3 045	2 853	1 634	1 662
Share premium	2	9 416	9 330	9 294	7 951	5 818	4 950
Retained earnings	3	37 465	39 372	36 765	33 845	12 169	5 844
Accumulated other comprehensive income	4	3 644	3 837	1 754	2 628	390	731
Minority interest (amount allowed in consolidated CET 1)	5	1 541	1 729	1 817	1 264	2 990	108
CET 1 before regulatory adjustments		55 127	57 318	52 675	48 541	23 001	13 295
Regulatory adjustments							
Goodwill and intangible assets	6	-7 622	-7 560	-8 326	-8 345	-7 307	-4 269
Fair value reserves related to gains or losses on cash flow hedges	7	-2 099	-1 442	-152	-252	230	
Negative amounts resulting from from the calculation of exp. loss amounts	8	-1 648	-1 270	-336	-50		
Defined benefit pension fund assets	9	-2 050	-1 482	-	-	-	-
Direct and indirect holdings by an institution of own CET 1 instruments	10	-187	-173	-135	-147	-212	-5
Reciprocal cross holdings (material holdings)	11	-	-794	-1 337	-1 901	-454	-
Deferred tax assets that rely on future profitability excluding temporary differences	12	-1 346	-1 493	-1 558	-1 038	-1	-
Gains or losses on liabilities at fair value resulting from own credit	13	804	-2 680	-621	-340	-	-
Additional value adjustments	14	-1 458	-1 516	-1 393	-1 284	-608	-352
Total regulatory adjustments		-15 606	-18 410	-13 858	-13 357	-8 352	-4 626
Common Equity Tier 1		39 521	38 908	38 817	35 184	14 649	8 669

LBG

Common equity tier 1 £m	REF:	2012	2011	2010	2009	2006	2000
Called up share capital	1	7 042	6 881	6 815	10 472	1 429	1 396
Share premium	2	16 872	16 541	16 291	14 472	1 266	595
Retained earnings	3	7 183	8 680	11 380	11 117	8 105	7 403
Accumulated other comprehensive income	4	12 902	13 818	11 575	7 217	355	-
Minority interest (amount allowed in consolidated CET 1)	5	-	-	-	-	-	-
CET 1 before regulatory adjustments		43 999	45 920	46 061	43 278	11 155	9 394
Regulatory adjustments							
Goodwill and intangible assets	6	-4 107	-4 326	-4 406	-5 779	-2 515	-2 599
Fair value reserves related to gains or losses on cash flow hedges	7	-350	-325	391	305	-12	
Negative amounts resulting from from the calculation of exp. loss amounts	8	-1 272	-1 440	-	-		
Defined benefit pension fund assets	9	-1 748	-1 131	-479	-	-	-
Direct and indirect holdings by an institution of own CET 1 instruments	10	-	-	-	-		-28
Reciprocal cross holdings (material holdings)	11	-5 066	-5 899	-6 034	-5 267		
Deferred tax assets that rely on future profitability excluding temporary differences	12	-5 107	-5 862	-6 572	-5 925	-326	-
Gains or losses on liabilities at fair value resulting from own credit	13	217	-136	-8	-		
Additional value adjustments	14	-376	-392	-394	-370	-95	-80
Total regulatory adjustments		-17 809	-19 512	-17 501	-17 036	-2 948	-2 707
Common Equity Tier 1		26 190	26 408	28 560	26 242	8 207	6 687

Standard Chartered

Common equity tier 1 US\$m	REF:	2012	2011	2010	2009	2006	2000
Called up share capital	1	1 207	1 193	1 174	1 013	692	861
Share premium	2	3 981	3 938	3 892	3 334	3 539	2 761
Retained earnings	3	26 561	23 167	19 260	15 460	8 316	3 850
Accumulated other comprehensive income	4	12 118	10 922	12 392	6 039	4 306	66
Minority interest (amount allowed in consolidated CET 1)	5	104	84	79	31	-	-
CET 1 before regulatory adjustments		43 971	39 304	36 797	25 877	16 853	7 538
Regulatory adjustments							
Goodwill and intangible assets	6	-7 312	-7 061	-6 980	-6 620	-6 146	-2 269
Fair value reserves related to gains or losses on cash flow hedges	7	-81	13	-57	-15	-51	-
Negative amounts resulting from from the calculation of exp. loss amounts	8	-1 932	-1 404	-1 328	-1 004	-442	-
Defined benefit pension fund assets	9	-	-	-	-	-	-
Direct and indirect holdings by an institution of own CET 1 instruments	10	-	-	-	-	-	-
Reciprocal cross holdings (material holdings)	11	-	-	-	-	-	-
Deferred tax assets that rely on future profitability excluding temporary differences	12	-477	-433	-324	-277	-68	-137
Gains or losses on liabilities at fair value resulting from own credit	13	-	-	-	-	-	-
Additional value adjustments	14	-210	-188	-176	-124	-80	-36
Total regulatory adjustments		-10 012	-9 073	-8 865	-8 040	-6 787	-2 442
Common Equity Tier 1		33 959	30 232	27 932	17 837	10 066	5 096

11.3 Calculation of RWA

This section shows the detailed calculation of RWA and the assumption that have been made. There are differences regarding the details in the reported changes for the banks, which affect the calculation and problems regarding this is discussed for the banks. The calculation of the threshold effects includes both DTA and unconsolidated investments, and the two effects are specified for each bank.

HSBC

Calculation of RWA

HSBC has a detailed explanation about the increase in RWA due to Basel III and the previous numbers are calculated based on this as our own calculations of effect 1 and 2 show similar numbers as the ones reported. For the effect 3-5 the percentage increase of 2012 is used as a best estimate.

	HSBC 2013 %	HSBC 2012 %	2011	2010	2009	2006	2000
Reported Basel II	1 104 764	1 123 943	1 209 514	1 103 113	1 133 168	938 678	383 687
Definition of capital calculated							
1. 50/50	43 843 4,0 %	44 906 4,0 %	30 175,00 2 %	36 675,00 3 %	39 475,00 3 %		
2. Threshold	36 775 3,3 %	45 940 4,1 %	39 343 3 %	40 140 4 %	41 640 4 %	19 884	1 818
3. Other; moved to deduction DTA	-8 187 -0,7 %	-8 976 -0,8 %	-9 659 -1 %	-8 810 -1 %	-9 050 -1 %		
4. CVA	38 339 3,5 %	60 360 5,4 %	64 955 5 %	59 241 5 %	60 855 5 %		
5. AVC	25 769 2,3 %	25 682 2,3 %	27 637 2 %	25 206 2 %	25 893 2 %		
Basel III	1 241 303 12,4 %	1 291 855 14,9 %	1 361 965 13 %	1 255 565 14 %	1 291 982 14 %	1 070 234	437 460,9

Threshold calculations (2)

The amount of unconsolidated investments that is not deducted in Basel III calculations of CET1 is risk weighted with 250% The amount of DTA is found by taking the balance value and adjusting it for the deduction for tax losses carried forward as shown in the table below.

HSBC	2013	2012	2011	2010	2009	2006	2000
Total unconsolidated investments	13344	18757	14901	14848	11994	7512	1463
Deductions related to sign inv under Basel III	6 042	9 436	7 496	7 470	6 034	3 779	736
Percentage of total unc. inv deducted	45 %	50 %					
Amount assigned a risk-weight of 250%	7302	9 321	7 405	7 378	5 960	3 733	727
DTA temporary diff below threshold	6816	6 953	6 398	663	8 213	3 241	-
Risk-weighted value below threshold	18255	23 303	18 512	18 446	14 901	9 332	1 818
DTA temporary diff below threshold	18 520	22 638	20 831	21 693	26 740	10 552	0
% unconsolidated	50 %	51 %	47 %	46 %	36 %	47 %	100 %
%DTA	50 %	49 %	53 %	54 %	64 %	53 %	0 %
Total Threshold	36 775	45 940	39 343	40 140	41 640	19 884	1 818
Deferred Tax assets	2013	2012	2011	2010	2009	2006	2000
Balance value DTA	7 205	7 570	7 726	7 011	8 620	3 241	
Deducted	-389	-617	-1 328	-348	-407	-	-
After deductions of tax losses carried forward	6 816	6 953	6 398	6 663	8 213	3 241	0
			92 %	104 %	123 %	39 %	
RW value	18 520	22 638	20 831	21 693	26 740	10 552	

Barclays

Calculation of RWA

Barclays have given detailed information about their change, and we find the similar amounts of securitisation positions and the threshold in our calculation. The other effect is also here based on the level in 2012.

Barclays	2013 %		2012 %		2011 %		2010 %		2009 %		2006	2000
Risk-weighted Basel II reported	387 230		386 858		390 999		398 031		382 653		297 833	147 040
50/50: Securitisation positions	19 000	4,9 %	30 150	7,8 %	39 425	10,1 %	59 000	14,8 %	69 975	18,3 %		
Threshold	10 975	2,8 %	5 380	1,4 %	13 718	3,5 %	12 436	3,1 %	12 434	3,2 %		-
Other: counterparty credit risk, reductions due to deductions and other	54 325	14,0 %	45 612	11,8 %	46 100	11,8 %	46 929	11,8 %	45 116	11,8 %		
Basel III calculated	471 530	21,8 %	468 000	21,0 %	490 242	25,4 %	516 396	29,7 %	510 178	33,3 %	397 091	196 043

Threshold calculation (2)

Unconsolidated investments are adjusted for the deduction made in CET1. DTA that relates to temporary differences does not exceed the threshold and the amount is risk weighted.

Barclays	2013	2012	2011	2010	2009
Total unconsolidated investments	950	482	4764	5352	5610
Deductions related to sign inv under Basel	0	0	793,8	1336,6	1901,4
Amount assigned a risk-weight of 250%	950	482	3 970	4 015	3 709
Risk-weighted value unconsolidatet inv.	2375	1 205	9 926	10 039	9 272
DTA temporary diff below threshold	3 440	1 670	1 517	959	1 265
Risk Weighted value DTA temporary diff.	8 600	4 175	3 793	2 398	3 163
Total RWA increase	10 975	5 380	13 718	12 436	12 434

LBG

Calculation of RWA

LBG have not specified what the increase in RWA results from. We have therefore used estimates on the subjects we have knowledge about and tried to give an estimate on the residual post related to the difference. The reported number for RWA in 2012 and 2013 does not include the securitisation charge, as LBG has chosen to apply this by deduction. In this thesis we have chosen to follow the Basel III/CRD IV requirements and use the risk weighting alternative. Therefore the reported numbers in 2012 and 2013 will differ from our calculations as stated in the analysis.

Lloyds £m	2013 %	2012 %	2011 %	2010 %	2009 %	2006	2000
Risk-weighted Basel II reported	288 730	310 299	352 341	406 372	493 307	156 043	94 000
50/50: Securitisation positions	1 400 0,5 %	4 575 1,5 %	3 825 1,1 %	5 350 1,3 %	11 125 2,3 %		
Threshold	7 585 2,6 %	7 880 2,5 %	9 176 2,6 %	9 385 2,3 %	8 192 1,7 %		
Other: Counterparty credit risk, reduction due to deductions and other	3 291 1,1 %	2 918 0,9 %	3 313 0,9 %	3 821 0,9 %	4 639 0,9 %		
Basel III calculated	301 006 4,3 %	325 672 5,0 %	368 656 4,6 %	424 929 4,6 %	517 263 4,9 %	163 621	98 565
Basel III reported (note)	299 606	321 097 3,5 %					
Diff relates to 50/50 treatment of bank	1 400	4 575					

Threshold (2)

Lloyds have reported material holdings (deducted 50% CT1 and Tier1) and unconsolidated investment separate (Tier 2). The total number includes some instruments which qualify for a deduction in Tier 2. To reflect this we use the percentage number deducted in CT1 and Tier 2 and use the residual amount as the risk weighted value. For DTA almost the entire amount relates to tax losses carried forward and deducted in CET1. The residual amount is insignificant and not included.

	2013	2012	2011	2010	2009
100% of material holdings from tier 1 and tie	8 546	92	188	138	
Unc. investements (Tier 2 Basel II)		11 033	12 767	13 112	11 566
Total unconsolidated investments	8 546	11 125	12 955	13 250	11 566
Deductions under Basel III in CET1	3 820	5 066	5 899	6 034	5 267
% of total unc- investments deducted	45 %	45,5 %			
Deducted in Tier 1/total cap	1 692	2 907	3 385	3 462	3 022
% deducted in total cap	20 %	26 %			
Amount to RWA	3 034	3 152	3 670	3 754	3 277
Charge in RWA	7 585	7 880	9 176	9 385	8 192

Standard Chartered

Calculation of RWA

For Standard Chartered the details about the difference are only found in 2013, where it's specified the amount of deferred tax assets and significant investments. For the other effects, we only have the residual amount as a measure.

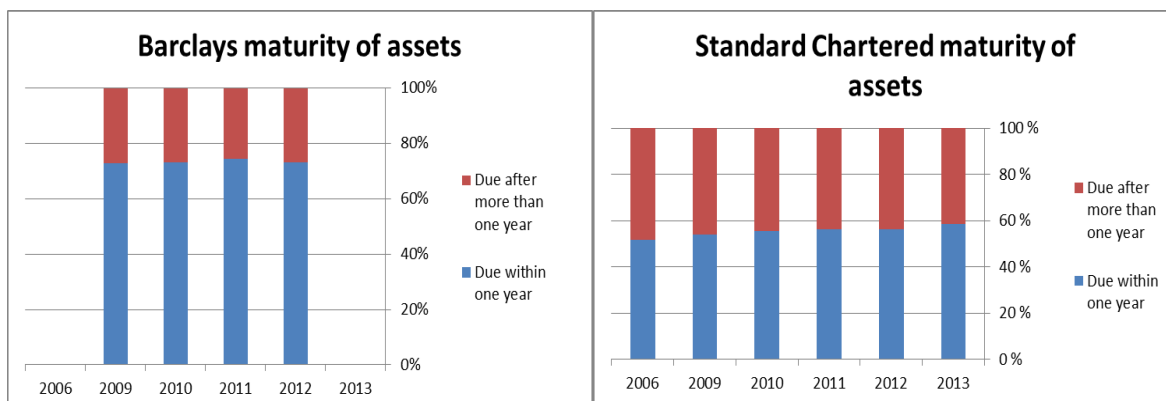
Standard Chartered	2013 %	2012 %	2011 %	2010 %	2009 %	2006	2000
Risk-weighted Basel II reported	323 776	301 861	270 510	245 077	213 923	153 443	69 342
50/50: Securitisation positions	2 775 0,9 %	2 950 1,0 %	2 650 1,0 %	3 300 1,3 %	2 425 1,1 %		
Threshold	3 622 1,1 %	3 295 1,1 %	3 610 1,3 %	3 185 1,3 %	4 408 2,1 %		
Other: counterparty credit risk, reductions due to deductions and other	3 008 0,9 %	10 283 3,4 %	9 215 3,4 %	8 349 3,4 %	7 287 3,4 %		
Basel III calculated	333 181 2,9 %	318 389 5,5 %	285 985 5,7 %	259 911 6,1 %	228 043 6,6 %	163 571	73 919
Basel III reported by bank	330 406	315 439 4,5 %					
Diff. relating to 50/50 treatment of bank	2 775	2 950					

Threshold

For unconsolidated investments the total amount is risk weighted with 250% since it does not exceed the threshold of CET1. DTA is estimated based on the reported capital charge in 2013 and the level of balance value and deduction the earlier year.

Standard Chartered	2013	2012	2011	2010	2009	2006	2000
Total unconsolidated investments	1004	1104	1042	652	474	229	22
Deductions related to sign inv under Basel III	0	0	0	0	0	0	0
Amount assigned a risk-weight of 250%	1004	1 104	1 042	652	474	229	22
Risk-weighted value unconsolidatet inv.	2510	2 760	2 605	1 630	1 185	573	55
DTA temporary diff below threshold	444,8	214	402	622	1 289	538	-
Risk Weighted value DTA temporary diff.	1 112	535	1 005	1 555	3 223	1 345	-
Total RWA increase	3 622	3 295	3 610	3 185	4 408	1 918	55

11.4 Maturity of assets



11.5 The riskiness of assets

Riskiness of assets	2012			2011			2010		
	Assets	RWA	RWA/Assets	Assets	RWA	RWA/Assets	Assets	RWA	RWA/Assets
HSBC									
- Personal Financial Services / Retail Banking and Wealth Management	536 244	276 600	52 %	540 548	351 200	65 %	527 698	357 000	68 %
- Commercial Banking	363 659	397 000	109 %	334 966	382 900	114 %	296 797	334 400	112,7 %
- Global Banking and Markets	1 942 470	403 100	21 %	1 877 627	423 000	23 %	1 758 315	353 200	20 %
- Global Private Banking	118 440	21 700	18 %	119 839	22 500	19 %	116 846	24 900	21 %
- Other	201 741	25 500	13 %	180 126	29 900	17 %	161 458	33 600	21 %
- Intra-HSBC items	-470 016	-	0 %	-497 527	-	0 %	-406 425	-	0 %
Total	2 692 538	1 123 900	42 %	2 555 579	1 209 500	47 %	2 454 689	1 103 100	45 %
Barclays									
UK Retail Banking (UKRBB)	136 665	38 783	28 %	127 845	33 956	27 %	121 590	35 274	29 %
Western Europe Retail Banking (Europe RBB)	47 128	17 112	36 %	51 310	17 436	34 %	53 609	17 269	32 %
Barclays Africa (Africa RBB)	44 798	27 008	60 %	48 243	30 289	63 %	57 760	38 401	66 %
Barclaycard	37 511	36 464	97 %	33 838	34 186	101 %	30 324	31 913	105 %
Investment Bank (Barclays Capital)	1 074 805	178 019	17 %	1 158 350	186 700	16 %	1 094 799	191 275	17 %
Barclays Corporate (Corporate Banking)	86 255	67 973	79 %	91 190	72 842	80 %	88 239	70 796	80 %
Wealth and Investment Management	23 716	15 833	67 %	20 866	13 076	63 %	17 849	12 472	70 %
Head Office Functions and Other Operations	39 443	5 666	14 %	31 885	2 514	8 %	25 475	631	2 %
Total	1 490 321	386 858	26 %	1 563 527	390 999	25 %	1 489 645	398 031	27 %
LBG									
Retail	346 030	95 470	28 %	356 295	103 237	29 %	370 708	109 254	29 %
Commercial Banking	314 090	165 209	53 %	350 711	189 200	54 %	355 582	222 716	63 %
Wealth, Asset Finance and International	76 449	36 167	47 %	73 345	47 278	64 %	85 158	58 714	69 %
Insurance	143 851	13 453	9 %	140 754	12 626	9 %	144 540	15 688	11 %
Other	44 132	-	0 %	49 441	-	0 %	35 586	-	0 %
Total	924 552	310 299	34 %	970 546	352 341	36 %	991 574	406 372	41 %
Standard Chartered									
Consumer Banking	143 250	80 889	56 %	135 154	71 970	53 %	125 589	67 551	54 %
Wholesale banking	491 409	220 972	45 %	455 562	198 540	44 %	389 197	177 526	46 %
Other	1 859	-	0 %	1 970	-	0 %	1 756	-	0 %
Total	636 518	301 861	47 %	592 686	270 510	46 %	516 542	245 077	47 %

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