In December 2010, the Basel Committee on Banking Supervision (BCBS) published its reforms on capital and liquidity rules to address problems, which arose during the financial crisis. This whitepaper summarizes the changes.
1. Introduction

In December 2010, the Basel Committee on Banking Supervision (BCBS) published its reforms on capital and liquidity rules to address problems, which arose during the financial crisis. One of the main reasons the crisis became so severe was that the banking sectors of many countries had built up excessive on and off balance sheet leverage. This was accompanied by the wearing down of quantity and quality of capital. Therefore the banking system was unable to absorb the resulting losses. The objective of the BCBS to strengthen the regulatory capital framework resulted in the Basel III framework. The framework consists of two separate policy documents (BCBS 2010a) and (BCBS2010b) wherein capital and liquidity standards are set out.

Basel III strengthens the Basel II framework rather than replaces it. Whereas Basel II focused on the asset side of the balance sheet, Basel III mostly addresses the liabilities, i.e. capital and liquidity. The new framework will (a) impose higher capital ratios, including a new ratio focusing on common equity, (b) increase capital charges for many activities, particularly involving counterparty risk and (c) narrow the scope of what constitutes Tier 1 (T1) and Tier 2 (T2) capital.

The Basel framework (continues to) consists of three pillars:

- **Pillar 1** is the part of the new Basel Accord, which sets out the calculations of regulatory capital requirements for credit, market and operational risk.

- **Pillar 2** is the part of the new Basel Accord, which sets out the process by which a bank should review its overall capital adequacy and the process under which the supervisors evaluate how well financial institutions are assessing their risks and take appropriate actions in response to the assessments.

- **Pillar 3** is the part of the new Basel Accord, which sets out the disclosure requirements for banks to publish certain details of their risks, capital and risk management, with the aim of strengthening market discipline. This is intended to improve effective risk management by allowing for comparison of the performance across sectors through these disclosure requirements.

This whitepaper addresses the changes of Basel III concerning Pillar 1 and Pillar 2 and the impact hereof. The remainder of the article is structured as follows: Section 2 discusses the new capital requirements. Subsequently the most important changes with respect to risk coverage are discussed in section 3. Sections 4 and 5 set out the metrics concerning leverage and liquidity respectively. The impact the changes are explained in section 6. For some comments on the legal authority of the framework, please refer to section 7. The time horizon is shortly illustrated in section 8. For suggestions and criticisms about the new Basel framework refer to section 9. The bibliography completes this exposition.
2. Capital

Capital serves as a buffer to absorb unexpected losses and to fund ongoing activities of the firm.

Banks are required by their regulators to hold minimum amounts of capital. Capital ratio’s depend on two things; the capital buffer and risk weighted assets.

To improve the quality, consistency and transparency of the capital base the following changes are proposed under the new Basel III framework:

- Increase of requirements on minimum Tier 1 (T1) capital.
- Increase in the standards for instruments to qualify as T1 capital.
- Harmonisation of Tier 2 (T2) capital instruments and the elimination of Tier 3 (T3) capital.
- Revision of appropriate capital deductions such as minority interests and deferred tax assets.

The new minimum capital ratio’s are displayed in Figure 1. These are percentages of total risk-weighted assets.

Figure 1. Capital requirements
The minimum requirement for common equity will be raised from the current 2% level to 4.5%. The T1 capital requirement will increase from 4% to 6%. The capital conservation buffer above the regulatory minimum requirement must be calibrated at 2.5% and be met with common equity. A countercyclical buffer within a range of 0-2.5% of common equity or other fully loss-absorbing capital is implemented according to national circumstances. This buffer is to be implemented by the national supervisor (for example DNB in the Netherlands) when there is excessive credit growth in the economy. These buffers are designed to restrict the bank’s ability to distribute its earnings until the buffers are rebuilt. Also, these buffers are not strictly additional minimum capital requirements and may be drawn down during periods of stress.

Linked to the discussions on crisis management is the question of how to handle the “Too Big to Fail” problem. Systematically important financial institutions (SIFIs) are global financial services firms - almost exclusively banks - so big that governments believe they will be forced to rescue these institutions rather than risk lasting damage to the world financial system. SIFIs should have loss absorbing capacity beyond the standards announced. The additional loss absorbency requirements are to be met with a progressive Common Equity Tier 1 (CET1) capital requirement ranging from 1% to 2.5%, depending on a bank’s systemic importance. For banks facing the highest SIB (systemically important bank) surcharge, an additional loss absorbency of 1% could be applied as a disincentive to increase materially their global systemic importance in the future.

Tier 1 capital is intended to ensure that each bank remains a “going-concern”. It is the highest quality form of a bank’s capital as it can be used to write off losses. It is composed of core capital, which consists primarily of common equity (common stock and retained earnings) and some equity-like debt instruments, which are both subordinated and discretionary (discretionary dividends are those paid, not by contractual obligation, but at the discretion of the issuer of the underlying instruments). Under Basel III, innovative hybrid capital instruments with step-up clauses are being phased out. Not included (i.e. deductions) in common equity are among others goodwill, minority interest, deferred tax assets, provisioning shortfalls, bank investments in its own shares and bank investments in other banks, financial institutions and insurance companies (to avoid double counting of equity).

The exclusion of goodwill is important, as it can’t be included in capital available to absorb losses. The mixing of intangibles with actual capital is not admissible. The exclusion of minorities is sensible because minority interests can support the risks in the subsidiary to which they relate but are not available to support risks in the group as a whole. In view of this, Basel III sets out specific criteria for the inclusion of minority interest in CET1, T1 or T2 capital and how it must be calculated. The exclusion of deferred tax assets is also sensible for banks likely to get in trouble,
although it is clearly discriminatory against banks that are well run with reliable future income.

Tier 2 capital is intended to protect depositors in the event of insolvency, and is thus re-categorised as a “gone-concern” reserve. Given the Basel III focus on incentives to redeem only dated subordinated debt remains eligible as T2 capital. As mentioned before, Tier 3 capital is to be completely abolished. T3 capital is short-term subordinated debt and was used under Basel II to support market risk from trading activities.

Many banks will need to issue common equity to meet the new regulatory minimums. Recently, regulators, banks and investors are focusing more and more on contingent convertible (CoCo) instruments and their possible role in a bank’s capital structure. The BCBS has expressed concern that earlier “hybrid” securities did not provide enough capital support in times of stress. As a result the BCBS requires internationally active banks to include in all non-common instruments, intended to qualify as additional T1 or T2 capital, a provision that converts the instruments to common equity in the event the bank is deemed non-viable or requires capital injection. This is the so-called Non-Viability Contingent Capital (NVCC) provision. In other words, the instrument will convert to common equity, or be written off, when the bank is at the verge of becoming a “gone-concern”. The BCBS is requiring these low trigger conversions to ensure that, in the event of another banking crisis, holders of investment in the banks rather than taxpayers, bear the financial burden. As a result, many more CoCo issuances may occur over short to medium-term horizon as banks seek to replace non-qualifying instruments.
3. Risk coverage

Counterparty credit risk

In addition to Basel II revisions concerning market risk capital charges (effective from end-2010), Basel III includes a number of measures to enhance coverage of counter-party exposure. These are intended to address perceived deficiencies in Basel II during periods of acute market volatility. These measures include:

- Capital requirements must be determined using “stressed” inputs when calculating counter-party credit risk.
- Banks must implement a new capital charge - credit value adjustment (CVA) - to cover the risk of mark-to-market losses on the expected counterparty risk to OTC derivatives. This is additional to the default risk capital charge.
- Banks must implement a new capital charge for wrong-way risk. Wrong-way risk is the risk that arises when the (credit) exposure at default is positively (adversely) correlated with the probability of default (i.e. the credit quality of the counterparty). In other words, when default risk and credit exposure increase together. This will be achieved by adjusting the multiplier applied to the exposure amount identified as wrong way risk.
- Apply a multiplier of 1.25 to the asset value correlation (AVC) of exposures to regulated financial firms with assets of at least $25 bn., since AVC’s were 25% higher during the crisis for financial versus non-financial firms.
- Banks will be required to apply tougher (longer) margining periods (potential losses may occur over a longer specified period of time) to determine capital requirements when they have large and illiquid derivative exposures to a counterparty.
- Lower risk weightings (even zero weights) for counter-party risk exposure may be applied if they deal with centralized exchanges that meet certain criteria. This is meant to create an incentive to use centralized exchanges and will create more reliable traded price data and improvements in modeling.
4. Capital leverage ratio

The newly introduced leverage ratio is intended to serve as a simple non-risk based metric to supplement risk-based requirements. This leverage ratio is calculated as

\[
\frac{\text{Tier 1 capital}}{\text{Exposure measure}} \geq 3\%
\]

The leverage ratio will initially be a Pillar 2 supervisory monitoring tool, with Pillar 3 disclosure and eventual migration to Pillar 1 taking place as outlined in the timetable in section 8.

5. Liquidity metrics

Liquidity coverage ratio

The liquidity coverage ratio is designed to ensure that a bank maintains an adequate level of unencumbered assets that can meet its liquidity needs for a 30-day period under a severe stress scenario.

\[
\text{LCR} = \frac{\text{High Quality Assets (stock highly liquid assets)}}{\text{Net cash flow over a 30-day stress period}} \geq 100\%
\]

This means that the value of the assets and the outflows refer to those that would arise with a major financial shock, a deposit run-off and a 3-notch downgrade in the credit rating. High quality assets include those that can easily be converted into cash in stressed markets.

Net stable funding ratio

The net stable funding ratio is designed to ensure that a bank holds an amount of long-term funding at least equal to its long-term assets, such as lending.

\[
\text{NSFR} = \frac{\text{Available Stable Funding}}{\text{Required Stable funding}} \geq 100\%
\]

This measure depends on the ability of firms and supervisors to model investor behaviour, which is “stable” or “unstable” in a crisis situation.
6. Impact of changes

The results of the impact study done by the as well as the impact hereof, are discussed below. The estimates assume full implementation of the final Basel III package, based on data as of 31 December 2009. Cooperating banks are split in two groups: Group 1 banks are those that have Tier 1 capital in excess of 3 billion euro, are well diversified, and are internationally active. All other banks are considered to be Group 2 banks. Note that banks which are likely to fall short on the required ratio’s will not participate in the sample, leading to optimistic results.

Capital

Capital ratio’s are presented in Table 1. The ratio’s are first calculated under prevailing rules and subsequently under the Basel III accord, leading to a reduction in the capital ratio’s.

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (ratio’s %)</th>
<th>Group 2 (ratio’s %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CET1 (7%)</td>
<td>10.7 → 4.9</td>
<td>11. → 7.1</td>
</tr>
<tr>
<td>T1 (8.5%-12%)</td>
<td>10.3 → 5.6</td>
<td>10.3 → 7.6</td>
</tr>
<tr>
<td>Total capital (10.5%-13%)</td>
<td>14.0 → 8.1</td>
<td>13.1 → 10.3</td>
</tr>
</tbody>
</table>

Table 1. Actual capital ratio’s for Group 1 and Group 2 banks up to 31 December 2009. In between brackets displayed are the required ratio’s according to the new Basel accords.

The change in the definition of capital (e.g. deductions) would on average reduce the CET1 capital of Group 1 and Group 2 banks by 42.1% and 33.4% respectively.

Due to the tighter capital requirements, cost of funding may increase reducing profitability and return on equity. In the same light, increasing the capital base (building buffers) might reduce dividends paid resulting in loss of interest by investors in bank debt and equity. Additionally the changed capital structure may lead firms to withdraw from certain entities and buyout minority interest positions.

Changes in risk-weighted assets

Risk-weighted assets (RWA) increase, as displayed in Table 2, due to charges against counterparty credit risk, securitisations and those coming from the new definition of capital.

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (increase)</th>
<th>Group 2 (increase)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RWA’s</td>
<td>+24.5%</td>
<td>+4.1%</td>
</tr>
</tbody>
</table>

Table 2. Estimated impact CEBS on RWA’s for Group 1 and Group 2 banks up to 31 December 2009.

Because of the increase in RWA’s it will be tougher to meet the higher capital ratio’s, as RWA’s constitute the denominator of capital ratio.
Leverage ratio
Results of calculated leverage ratio’s from the study by (CEBS 2010) are outlined in Table 3. The introduced leverage ratio might lead to a decreasing demand for lending driving the price for it up.

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (ratio’s %)</th>
<th>Group 2 (ratio’s %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weighted average leverage ( ≥3%)</td>
<td>2,5</td>
<td>3,5</td>
</tr>
</tbody>
</table>

Table 3. Estimated impact CEBS on leverage ratio’s for Group 1 and Group 2 banks up to 31 December 2009. In between brackets displayed are the required ratio’s according to the new Basel accords

Liquidity
Liquidity ratio’s calculated under the Basel III framework is outlined in Table 4 below. These liquidity standards should reduce the impact of a bankrun and therefore improve the stability of the financial sector. On the other hand, this is costly and might negatively impact profitability. Additionally demand for long-term funding will increase.

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (ratio’s %)</th>
<th>Group 2 (ratio’s %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCR (≥ 100% )</td>
<td>67</td>
<td>87</td>
</tr>
<tr>
<td>NSFR (≥ 100% )</td>
<td>91</td>
<td>94</td>
</tr>
</tbody>
</table>

Table 4. Estimated impact CEBS on liquidity ratio’s for Group 1 and Group 2 banks up to 31 December 2009. In between brackets displayed are the required ratio’s according to the new Basel accords

Above results are slightly outdated, but the tendency is consistent with most literature on the impact of the Basel III framework. In summary, the proposed capital and liquidity requirements might increase the cost of funding and accordingly reduce capacity of banking activities. In addition, weaker banks might be unable to meet the new Basel III criteria reducing competition. These negative effects can be compensated by the positive effect of reducing the risk on an individual banking failure reducing the risk of another banking crisis.
7. Legal authority

Although the Basel Committee formulates international supervisory standards and guidelines it has no legal authority. Within the European Union, the passing of Basel banking standards into legislation has until this time been achieved through the means of directives, which in turn were implemented through national measures. The Capital Requirements Directive (CRD) that implemented Basel II throughout the EU came into force on 1 January 2007. The legal framework has since been regularly updated to reflect revisions to Basel II by series of amendments, which are sequentially numbered for ease of reference. The CRD IV implements certain Basel III proposals, particularly those concerning the capital conservation and counter-cyclical buffers. However, the most significant part of Basel III/CRD IV is implemented by direct regulation, without the need to be written into national law. This is done in order to “maximize harmonization”. This is designed to prevent EU member states of adding EU legislation.

8. Time horizon

The transitional arrangement (displayed in Figure 2) for implementing the new standards will help to ensure that the banking sector can meet the higher capital standards through reasonable earnings retention and capital raising, whilst still supporting lending to the economy.

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<tbody>
<tr>
<td>Supervisory monitoring</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Common Equity Capital Ratio</td>
<td>3.5%</td>
<td>4.0%</td>
<td>4.5%</td>
<td>4.5%</td>
<td>4.5%</td>
<td>4.5%</td>
<td>4.5%</td>
<td>4.5%</td>
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<tr>
<td>Capital Conservation Buffer</td>
<td>0.625%</td>
<td>1.25%</td>
<td>1.875%</td>
<td>2.50%</td>
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<tr>
<td>Minimum common equity plus capital conservation buffer</td>
<td>3.5%</td>
<td>4.0%</td>
<td>4.5%</td>
<td>5.125%</td>
<td>5.75%</td>
<td>6.375%</td>
<td>7.0%</td>
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<tr>
<td>Phase-in of deductions from CET1 (including amounts exceeding the limit for DTA, MSRs and financials)</td>
<td></td>
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<tr>
<td>Minimum Tier 1 Capital</td>
<td>4.5%</td>
<td>5.5%</td>
<td>6.0%</td>
<td>6.0%</td>
<td>6.0%</td>
<td>6.0%</td>
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<tr>
<td>Minimum Total Capital</td>
<td>8.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td></td>
</tr>
<tr>
<td>Minimum Total Capital plus conservation buffer</td>
<td>8.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td></td>
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<tr>
<td>Capital instruments that no longer qualify as non-core Tier 1 capital or Tier 2 capital Phased out over 10 year horizon beginning 2019</td>
<td></td>
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</table>

Figure 2. Phase in timetable
9. Discussion

All the changes introduced by the Basel III framework emphasize higher capital requirements for banks over the coming years. There is also the possibility of an increase of the firm’s risk-weighted assets, depending on the firm’s circumstances. The combination of additional capital requirements and higher charges will probably cause some negative impact on return on equity. Additionally, debt-like hybrid instruments that previously enabled banks to respond to capital demands on a relatively cheap basis will generally be no longer available. Raising capital through issuing common equity is in general the most expensive form for a bank. This will crowd out weaker banks, leading to a reduction in the number of competitors.

Due to the resulting increase in demand for common equity, expected is an increase in the supply of contingent convertible (CoCo) instruments. Because of the equity-like behaviour of these CoCos, supervisors have reasons to treat them as core T1 capital. As these instruments only become common equity after passing a particular margin, which is for a lot of banks very unlikely to happen in the near future, it might be inappropriate to treat them as core T1 capital.

Adopting the countercyclical capital buffer proposal to ensure the leverage ratio will not be compromised in crisis situations seems very important: in good times, dividends, share buyback policies and bonuses will be restrained as necessary to build back buffers used up in bad times. On the other hand, because credit lags the cycle, the identification of a ‘bubble’ (leading to provisioning to offset it) could easily occur at a time when the economy is already beginning to turn down, exacerbating the cycle. This could be a reason for the countercyclical buffer to perform poorly.

Another concern is that Basel III does not deal with the most fundamental regulatory problem identified: that the ‘promises’ that make up any financial system, are not treated equally, transforming risk buckets. For example, the CDS contract makes it possible to reduce risky debt to some combination of the lower bank risk weight and a small weight that applies to moving the risk outside of the bank sector.

In addition, there is (still) a massive incentive in financial markets to transform risk in credit to avoid capital charges and reduce tax burdens for clients, thereby maximizing returns for themselves and their customers. This will probably continue despite the proposed reforms.
### Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subordinated debt</td>
<td>Subordinated debt is debt that ranks lower than ordinary depositors of the bank.</td>
</tr>
<tr>
<td>Hybrid capital instruments</td>
<td>Hybrids are instruments that have some characteristics of both debt and equity. Provided these are close to equity in nature, in that they are able to take losses on the face value without triggering a liquidation of the bank.</td>
</tr>
<tr>
<td>Step-up clauses</td>
<td>A Step-up Security is a hybrid debt instrument that pays a fixed interest rate or margin up until a specified date (the step-up date). If, beyond the specified date, the security has not yet been redeemed by the issuer, the distribution payment may step-up to a higher rate (this step-up rate is fixed prior to the issue of the security). A single security can have more than one step-up date during the life of that security.</td>
</tr>
<tr>
<td>Minority interest</td>
<td>Minority interest in business is an accounting concept that refers to the portion of a subsidiary corporation’s stock that is not owned by the parent corporation.</td>
</tr>
<tr>
<td>Deferred tax assets</td>
<td>An asset on a company’s balance sheet that may be used to reduce any subsequent period’s income tax expense. Deferred tax assets can arise due to net loss carryovers, which are only recorded as assets if it is deemed more likely than not that the asset will be used in future fiscal periods.</td>
</tr>
<tr>
<td>Subsidiary</td>
<td>A company whose voting stock is more than 50% controlled by another company, usually referred to as the parent company or holding company.</td>
</tr>
<tr>
<td>Counterparty credit risk</td>
<td>The risk that a borrower will default on any type of debt by failing to make payments, which it is obligated to do.</td>
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<tr>
<td>Mark-to-market loss</td>
<td>A loss generated through an accounting entry rather than the actual sale of a security. Mark-to-market losses can occur when financial instruments held are valued at the current market value.</td>
</tr>
</tbody>
</table>
OTC derivatives  An over-the-counter (OTC) security is traded in some context other than on a formal exchange such as the NYSE, TSX, AMEX, etc. The phrase “over-the-counter” can be used to refer to stocks that trade via a dealer network as opposed to on a centralized exchange.

Centralized exchanges  All orders are routed to one central exchange with no other competing market.

References


CEBS (2010), ‘Results of the comprehensive quantitative impact study’.
RiskQuest is an Amsterdam based consultancy firm specialised in risk models for the financial sector. The importance of these models in measuring risk has strongly increased, supported by external regulations such as Basel II/III and Solvency II.

Advanced risk models form the basis of our service offer. These models may be employed in a frontoffice environment (acceptance, valuation & pricing) or in a mid-office context (risk management and measurement).

The business areas that we cover are lending, financial markets and insurance. In relation to the models, we provide advice on: Strategic issues; Model development; Model validation; Model use.