EXPOSURE-AT-DEFAULT MODELS FOR COUNTERPARTY CREDIT RISK UNDER BASEL FRAMEWORKS
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<td>Basel Committee of Banking Supervisory</td>
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<td>CCF</td>
<td>Credit Conversion Factor</td>
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<td>CE</td>
<td>Current Exposure</td>
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<td>EAD</td>
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<td>IMM</td>
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<td>IRB</td>
<td>Internal Ratings Based approach</td>
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<td>MTA</td>
<td>Minimum Transfer Amount</td>
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<td>MtM</td>
<td>Mark-to-Market</td>
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<td>NGR</td>
<td>Net current replacement cost to gross replacement cost</td>
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<td>NRP</td>
<td>Net Risk Position</td>
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<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<td>OEM</td>
<td>Original Exposure Method</td>
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<td>OTC</td>
<td>Over-the-Counter</td>
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<td>PFE</td>
<td>Potential Future Exposure</td>
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<td>SM</td>
<td>Standardized Method</td>
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<td>VaR</td>
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1 Introduction

The financial crisis of 2007 has proven to be worst since the 1930s. It has again proven the importance of risk management in banking. The Basel Committee on Banking Supervision published the Basle Capital Accord in 1988 that was designed to force banks to pay for the risk they undertake into their banking and trading books. It was initially designed for the G-10 countries and for Spain but later spread all over the world as a standard. Later many other countries have become members of the committee. The first accord, informally called Basel I, was heavily criticized for treating banks unfairly and therefore the Basel Committee released a new framework in 2004 which was revised in 2005. This new revised version of Basel accord took into account several other risks that were not incorporated in the Basel I. Partly because of the financial crisis the Basel Committee has drafted a new framework that is bound to be in effect from the beginning of 2011. The new framework pursues to overcome the inherent weaknesses of the risk measures used in the Basel II.

This study explains the main points of the Basel accords and takes a view on the difference between each of their implications on economic and regulatory capital and explains in detail the Exposure-at-Default models that they enforce. This is done through reviewing the literature on the subject.
2 COUNTERPARTY CREDIT RISK

Counterparty Credit Risk exists in Over-the-Counter (OTC) derivatives trading. It realizes when a counterparty defaults while having open derivatives in favor of the surviving counterparty. The surviving counterparty is forced to replace the contract with a new counterparty suffering a loss that is exactly the positive market value of the original contract. Counterparty credit risk is bilateral; as the future value of a derivative is unknown it is unclear which counterparty is in-the-money at the time of default. The actual exposure is also unknown. While with regular lending the loan amount is fixed and the exposure is then quite well known. The exposure of derivatives is affected by the market rates and therefore the exposure becomes a genuine stochastic variable which is dependent on the underlying pricing model and future market rates. (Gregory, 2010:9-10)

3 ECONOMIC CAPITAL AND REGULATORY CAPITAL

Economic capital can be defined as the capital that shareholders should invest in a company to limit the probability of default to a given confidence level over a given time horizon. Economic capital represents the emerging best practice for measuring and reporting all kinds of risks across a financial organization. As its name says, economic capital measures risk in terms of economic realities instead of regulatory or accounting rules. The measurement process involves converting a risk distribution into the amount of capital that is required to support the risk. This is done by targeting the institution’s financial strength, for example its credit rating. The risks in question entail credit, market and operational risks that are well defined from a regulatory point of view, and also others like insurance, liquidity, reputational and strategic or business risk. These risks can be modeled in detail and aggregated. The next step involves the determination of the probability of default, the solvency standard that is acceptable for the institution. The mapping from risk to capital often utilizes external benchmarks for credit risk, external credit ratings. (Embrechts, Frey & McNeil, 2005:18)
Regulatory capital entails the capital to secure the overall solvency of the banking system in order to avoid financial crisis spill over to the real economy. (Embrechts et al. 2005:18)

4 **Basel I Accord**

In 1988 the Basel Committee of Banking Supervisory (BCBS) published the Basle Capital Accord, as it was formerly known, named International Convergence of Capital Measurement and Capital Standards, known informally as Basel I. It was designed to establish minimum levels of capital for internationally active banks in G-10 countries and in Spain. They stressed the opportunity of national authorities to adopt arrangements that set capital levels higher. (BCBS, 1988)

Basel I’s main focus was on credit risk and it does not mandate capital to guard against risks from a nation’s currency fluctuations, interest rate changes and general macroeconomic downturns. They were left out because of the great variability of these risks across countries. Banks had a chance to choose between two different methodologies in assessing their capital requirements. The first one was a current exposure method and the second one was the Original Exposure Method (OEM) and it was intended for banks that are not able to value their transactions mark-to-market. This is however so rare that this methodology is not presented in detail. (BCBS, 1988)

Basel I was divided into four “pillars”. First was The Constituents of Capital and it defined what types of capital are counted as bank’s reserves and how much it should hold these reserves. It is divided into two tiers. Tier 1 holds disclosed cash reserves and banks stock and preferred shares. Tier 2 can include for example reserves created to cover potential loan losses and holdings of subordinated debt. According to Basle Accord banks must hold the same quantity of capital of Tier 1 and Tier 2. (BCBS, 1988)

The second “pillar” of Basel I is Risk Weighting. It is a system to risk-weight bank’s assets. There are five categories which encompass all assets on a bank’s balance sheet. The first category of products are characterized as riskless with a
risk weight of 0% and they are cash held by bank, sovereign debt held and funded in domestic currency, all OECD debt, and other claims on OECD central governments. The second category has a 20% risk weight and includes multilateral development bank debt, bank debt created by banks incorporated in the OECD, non-OECD bank debt with a maturity of less than one year, cash items in collection, and loans guaranteed by OECD public sector entities. The next category has a risk weight of 50% and includes only residential mortgages. The fourth category is characterized as high risk and is risk weighted at 100% of assets value. It includes bank’s claims on the private sector, non-OECD bank debt with a maturity of more than one year, claims on non-OECD dollar-denominated debt or Eurobonds, equity assets held by the bank, and all other assets. The fifth category includes claims on domestic public sector entities and can be weighted at 0%, 10%, 20% or 50% according to the central bank’s decision. (BCBS, 1988)

The third “pillar” is called a Target Standard Ratio. According to it 8% of a bank’s risk-weighted assets must be covered by Tier 1 and Tier 2 capital reserves. Tier 1 capital must on top of this cover 4% of a bank’s risk-weighted assets. This ratio is seen as “minimally adequate” to protect against credit risk in deposit insurance-backed international banks in all Basel Committee member states. (BCBS, 1988)

The fourth and last “pillar” is Transitional and Implementing Agreements. It is an agreement of the Basel Committee banks to create surveillance and enforcement mechanisms to ensure that the Basel Accords are being followed. A time period of four years were given to adapt the standards of the accord. (BCBS, 1988)

5 BASEL II ACCORD

Basel Committee released a new accord in 2004 and it was revised in 2005. It is called International Convergence of Capital Measurement and Capital Standards: A Revised Framework, informally known as Basel II. This revised framework pursued to answer to the criticism that was mentioned against Basel I. Basel II preserved the “pillar” structure but greatly expanded it to cover new approaches to credit risk and taking into account market, operational and interest rate risks. It
also took into account the loop-holes that allowed banks to create riskier loanbooks during Basel I. (BCBS, 2005)

The Minimum Capital Requirements “pillar” expanded to include also the holding companies of internationally active banks. This eliminated the chance for banks to transfer assets to their subsidiaries to mask the risk. (BCBS, 2005)

New approaches to credit risk were incorporated to Basel II. Banks had a chance to choose between three different methodologies in assessing their capital requirements. First the standardized approach, which weights the risk according to the credit rating assigned to a debt by an external credit rating agency. Second was a current exposure method that was also in use during Basel I. The last methodology is an Internal Rating Based (IRB) approach. A bank can apply for this and is assessed by qualitative and quantitative requirements. IRB approaches allowed banks to estimate the needed parameters for capital requirements by themselves. It splits into two types. In Foundation IRB the bank is allowed to assess its counterparties’ probability of default. In this model loss given default was still given by the regulator. In the Advanced IRB method all model parameters can be estimated on a condition that the regulatory minimums are filled. (BCBS, 2005)

The Current Exposure Method relies on the Value-at-Risk methodology. Its characteristics are discussed in the next chapters. The standardized method was an option for banks that did not qualify to use the internal model but still wanted a more risk-sensitive model than the current exposure method. The qualitative and quantitative requirements set for banks wanting to use the internal model method included that banks must be able to recognize, measure, control and validate the counterparty credit risk they create. The model itself must be validated by a third-party, stress-tested with even intervals and adjusted accordingly. The same risk model must also be applied in other areas such as internal risk management and the calculation of economic capital. IRB methods were strongly incentivized by regulators by forcing banks to scale up their risk weighted reserves by 6% if they use the standardized method. The IRB methods also give significant benefits for bankers and regulators which translate into better profitability of banks. (BCBS, 2005)
The first “pillar” of the Basel II accord includes also quantifying of the reserves needed to be held by banks due to market risk. Market risk was not part of Basel I. Market risk is the risk of loss due to the fluctuation of asset prices. Against market risk (interest rate and volatility risk) of fixed income assets Basel II proposed Value-at-Risk method alongside with IRB methods where banks are allowed to develop their own models. Basel II distinct between fixed income and other products such as equity, commodity and foreign exchange assets. (BCBS, 2005)

While other “pillars” of Basel accords had also some changes done, their implication to the general topic is less significant, and therefore are left out from the scope.

6 BASEL III ACCORD

Basel Committee released in 2010 a consultative document of Basel III which is named as Strengthening the resilience of the banking sector – Consultative Document, on which they have asked for opinions from banks. Basel III tries to correct the shortcomings of VaR. Its main purpose is to raise capital reserves against counterparty credit risk, reduce pro-cyclicality and provide incentives to move over-the-counter derivatives to central counterparties in an attempt to reduce systemic risk across financial system. These actions require more capital from banks and therefore increase the confidence levels applied by banks in their economic capital models. The Basel III accord is going to add stressed VaR and incremental risk on top of the VaR calculated during Basel II. Stressed VaR is calculated from a period that has experienced stress which typically means the last financial crisis and it directly increases the risk weightings of Counterparty Credit Risk for banks using an internal model. Basel III suggests also lengthening the margin period at risk from previous 10 days to 20 days for Expected Potential Exposure on OTC derivatives. Incremental risk is calculated using banking book methodology under 1 year horizon with 99.97% confidence level. (BCBS, 2010; Clark, 2010)
7 Exposure-at-Default Models

7.1 Exposure-at-Default Models in Basel Accord

Exposure-at-default (EAD) is one of the most interesting and most difficult parameters to estimate in counterparty credit risk. As mentioned in the previous chapters Basel I offered only the non-internal Current Exposure Method (CEM) for estimating this but Basel II introduced also the Standardized Method (SM) and an Internal Model Method (IMM). (BCBS, 1988; BCBS, 2005)

Current Exposure Method relies on the VaR methodology and its characteristics are discussed first (Gregory, 2010:314).

7.2 Value-at-Risk

Value-at-Risk (VaR) is probably the most widely used risk measure in financial institutions. The VaR measures the severity of risk of holding a portfolio of risky assets over a time period $\Delta$. When using the maximum possible loss over the time period the maximum lost would be infinity. This approach would also neglect any probability information in the loss distribution. The idea of VaR is to introduce a confidence level into the equation and define the maximum loss which is not exceeded with a given high probability. Given some confidence level $\alpha \in (0, 1)$ the VaR of a portfolio of risky assets is given by the smallest number $l$ such that the probability that the loss $L$ is no larger than $(1 - \alpha)$. This is presented in formula 1.

$$\text{VaR}_\alpha = \inf \{ l \in \mathbb{R} : P(L > l) \leq 1 - \alpha \} = \inf \{ l \in \mathbb{R} : F_L(l) \geq \alpha \} \quad (1)$$

VaR is therefore a quartile of the loss distribution. Typically $\alpha$ is 0.95 or 0.99; in market risk management the time horizon $\Delta$ is usually 1 or 10 days and in credit risk management and operational risk management it is usually one year. (Embrechts et al., 2005:37-38)

VaR has been criticized as a risk measure also because it does not give any information about the severity of losses occurring with probability less than $1 - \alpha$ and because it violates the property of subadditivity. This means that if we have two loss distributions $F_{L_1}$ and $F_{L_2}$ for two portfolios and we denote the overall loss...
Exposure-at-Default Models

distribution of the merged portfolio $L = L_1 + L_2$ by $F_L$, we do not necessarily have that $q_a(F_L) \leq q_a(F_{L_1}) + q_a(F_{L_2})$, so that the VaR of the merged portfolio is not necessarily bounded above by the sum of the VaRs of the individual portfolios. This contradicts the notion that there should be a diversification benefit with merging portfolios. The aggregated VaR numbers from different business units may also not bound the overall risk of an entire organization. (Embrechts et al., 2005:37,40)

The estimation of loss distribution is subject to estimation error and model risk. VaR numbers get often a very literal interpretation which, because of the aforementioned reasons, might be very dangerous. Model risk is inherent to the risk management models that are used. Model risk realizes when the models are misspecified to the application they are used or some of the underlying assumptions are not met in practice. Because models are estimations of the real world it is safe to say that any risk management model carries some model risk. Determining economic capital might require VaR estimation at a very high confidence level and it makes the model subject to model risk. VaR neglects the subject of market liquidity. A market is determined liquid if an investor can buy or sell a large amount of security in a short amount of time without affecting its price much. Illiquidity of markets is often regarded as the most important source of model risk. Modeling of the effects of market illiquidity is very difficult. The change from liquid to illiquid market is considered as part of market risk. (Embrechts et al., 2005:40-41)
7.3 **CURRENT EXPOSURE METHOD**

Current Exposure Method relies on the VaR methodology and it is built up from two components: the Current Exposure (CE) which is the current mark-to-market (MtM) value and a Potential Future Exposure (PFE) that is the maximum amount of exposure expected to occur on a future date with a high degree of statistical confidence (Gregory, 2010:314). MtM defines what could be potentially lost today in respects to a specific counterparty (Gregory, 2010:22). The EAD is computed as follows in the CEM:

\[ EAD = CE + PFE \]  

(2)

When there is a Collateral agreement with a counterparty the EAD is formatted as presented in formula 3.

\[ EAD = (CE + PFE) - Collateral \]  

(3)

(Gregory, 2010:314)

Collateral deduction in the CEM is possible now by Basel II but it was not possible during Basel I. Non-cash collateral is subject to a type-dependant haircut. Collateral agreements require counterparties to periodically mark to market their positions and to provide collateral, transfer ownership of assets to each other as exposure exceed pre-established thresholds. (BCBS, 1988; BCBS, 2005)

The PFE is derived by multiplying the notional values of the contracts with a fixed percentage which is a Credit Conversion Factor (CCF). These are presented in Table 1. The CCF is dependent on the asset class and on the remaining maturity of the contract.

### Table 1 – CEM Credit Conversion Factors (Gregory, 2010:315)

<table>
<thead>
<tr>
<th>Remaining maturity</th>
<th>Interest rates</th>
<th>FX and gold</th>
<th>Equities</th>
<th>Precious metals excl. Gold</th>
<th>Other commodities</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 year</td>
<td>0.0%</td>
<td>1.0%</td>
<td>6.0%</td>
<td>7.0%</td>
<td>10.0%</td>
</tr>
<tr>
<td>1 - 5 years</td>
<td>0.5%</td>
<td>5.0%</td>
<td>8.0%</td>
<td>7.0%</td>
<td>12.0%</td>
</tr>
<tr>
<td>&gt; 5 years</td>
<td>1.5%</td>
<td>7.5%</td>
<td>10.0%</td>
<td>8.0%</td>
<td>15.0%</td>
</tr>
</tbody>
</table>

Banks using the CEM are permitted to fully net the CE of transactions covered by a master agreement. However 40% of the PFE will always remain, even though
trades might perfectly offset each other. The PFE can be computed according to the following formula:

$$PFE = 0.4 \times \sum_i Add - on_i + 0.6 \times NGR \times \sum_i Add - on_i$$  \hspace{1cm} (4)$$

Where $NGR$ is the ratio of net replacement cost to gross replacement cost of transactions subject to netting agreement. In other words net MtM divided by the gross MtM value of the transactions. Add-on in the formula 4 is as follows:

$$Add - on = \text{Notional principle amount} \times CCF.$$  \hspace{1cm} (5)$$

(Fleck and Schmidt, 2005:233)

### 7.4 Standardized Method

The Standardized method was given to banks, which are not qualified to compute their derivatives exposure according to the internal model, but want a more risk-sensitive model than CEM. The exposure is calculated according to the following formula:

$$EAD = \beta \times \max [CE; \sum_j NRP_j \times CCF_j]$$  \hspace{1cm} (6)$$

where $CE$ is the MtM value after netting and collateral reduction, NRPs are the absolute values of the net risk positions in the hedging sets and CCFs are the credit conversion factors applied on these open positions. The factor $\beta$ regulators fixed to 1.4 and it serves as an extra reserve for potential downturns in the economy and also capturing model risk. (Fleck and Schmidt, 2005:239)

Regarding margined trades, the SM neglects future exchange of collateral and only takes into account the current amount of collateral posted or held in the CE and in the size of the NRPs. The NRPs can be seen as risk buckets, which are divided by maturity, currency and reference rates, depending on the instrument. (Fleck and Schmidt, 2005:239-240)

Once all of the transactions have been mapped, the absolute sums of the buckets will be multiplied by their respective CCFs and added up to give the Net Risk Position. The CCFs for SM are presented in Table 2. The CCFs for SM are somewhat smaller than in the CEM approach, but they cannot be compared as they rely on different methodologies. The CCFs in the SM use the modified
Exposure-at-Default Models

duration to account for the residual transaction tenor, whereas the CEM has separate maturity-dependant CCF percentage. (Rahoitustarkastus, 2006:59-60)

Table 2 – SM Credit conversion factors (Rahoitustarkastus, 2006:59-60)

<table>
<thead>
<tr>
<th>Asset class</th>
<th>CCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest rate</td>
<td>0.2% for interest rate derivatives</td>
</tr>
<tr>
<td></td>
<td>0.3% for credit derivatives</td>
</tr>
<tr>
<td></td>
<td>0.6% for debt instruments</td>
</tr>
<tr>
<td>Exchange rate</td>
<td>2.5%</td>
</tr>
<tr>
<td>Electricity</td>
<td>4.0%</td>
</tr>
<tr>
<td>Gold</td>
<td>5.0%</td>
</tr>
<tr>
<td>Equity</td>
<td>7.0%</td>
</tr>
<tr>
<td>Precious metal excl. Gold</td>
<td>8.5%</td>
</tr>
<tr>
<td>Other commodities</td>
<td>10.0%</td>
</tr>
<tr>
<td>Other derivatives</td>
<td>10.0%</td>
</tr>
</tbody>
</table>

The SM incorporates many of the key features offered by the Internal Model Method (IMM) approach, still operating in an add-on environment. Completely netting perfectly offsetting transactions is one these features.

7.5 **INTERNAL MODEL METHOD**

A bank can apply for permission from local market regulators for the use of an internal approach for computing the distribution of exposure at future time points using their own models. The IMM is the most risk-sensitive approach for EAD calculation available under the Basel II framework. (Gregory, 2010:319)

The IMM utilizes, as with the rest of the approaches, bundling of transactions for counterparties with legally enforceable netting agreements. The exposure at default in IMM is

\[ EAD = \alpha \times \text{Effective EPE} \]  

(7)

where \( \alpha \) is a multiplier set by regulators to 1.4 and Effective Expected Positive Exposure (EEPE or Effective EPE) is an internal models output supplemented by regulatory prescribed roll-over adjustment. It is the average \( EE(t) \) for \( t \) in a certain interval. The \( \alpha \) is used to account for correlations between market and
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credit risk, credit portfolio assumptions, concentration risk and model risk. (Fleck and Schmidt, 2005:241-242)

A bank has three options to account for margined exposures. It can calculate the EPE without collateral adjustment. It can also use a short-cut method, where the EPE is the sum of the threshold amount, MTA and the change in the expected exposure under margin period of risk. This can be formulated as follows:

$$Eff.\ EPE_{Margin} = \min [\text{Threshold} + MTA + \Delta EE_s ; Eff.\ EPE_{NoMargin}]$$  \hspace{1cm} (8)

(BCBS, 2005; Fleck and Schmidt, 2005:240-257)

A Minimum Transfer Amount (MTA) is the smallest amount of collateral that can be transferred. It is used to avoid the workload associated with a frequent transfer of insignificant amounts of collateral. (Gregory, 2010:68)

A threshold is a level of exposure below which collateral will not be called. The threshold therefore represents an amount of uncollateralized exposure. (Gregory, 2010:66)

If the threshold is set to a high level, the short-cut method can produce a larger exposure than the un-margined EPE. If this happens, banks are allowed to use the model that gives the lower EAD amount. (BCBS, 2005)

The third option for banks is to simultaneously simulate the collateral with the exposure. This however needs the approval of the local Financial Supervision Authority (FSA). (BCBS, 2005)

If the FSA finds flaws in the model that a bank uses, it can revoke the internal modeling license until the model has been re-calibrated (Rahoitustarkastus, 2006:66-81).

The Effective EPE in the EAD formula 8 is calculated as the 1-year time weighted average of the Effective Expected Exposure (EEE or Effective EE) profile where

$$\sum(t_k - t_{k-1}) = 1$$  \hspace{1cm} (9)

and

$$Effective\ EPE = \sum_{k=1}^{\min(1\ year;maturity)} Effective\ EE_k * (t_k - t_{k-1})$$  \hspace{1cm} (10)
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where

\[ Effective\ EE_k = \max\{Effective\ EE_{k-1}; EE_k\}. \]

(11)

(Fleck and Schmidt, 2005:244-245)

EE is the best estimate of the present value of the positive exposure that is likely to materialize. It is the average exposure on a future date. The Effective EPE will always lie between the EPE and the EE. The earlier the EE peaks, the closer the Effective EPE will lie to the peak of EE; otherwise it will be closer to EPE. This is illustrated in Picture 1. Basel III accord would if realized introduce stressed EPE which means that the time period of the time-weighting in formula 10 would then be the last financial crisis. (BCBS, 2005:9-10,26-27)

![Effective EE and Effective EPE](image)

Picture 1 – EPE and Effective EPE. (Rahoitustarkastus, 2006:68)

IMM has many advantages over non-internal methods. It takes, for instance, an average of the exposure and doesn’t assume that all deals have identical maturity. It takes into account that the underlying market factors from which the values of derivatives originate do not correlate perfectly, creating diversification benefits. It also takes into account trades in opposite directions eliminating double-counting problem. (BCBS, 2005)
8 CONCLUSIONS

This literature study explained the implications of Basel accords to Counterparty Credit Risk Exposure-at-Default calculations and to the weights of regulatory and economic capital.

The balance between regulatory capital and economic capital in Basel accords is changing in every revision. Maximizing shareholder value is the main aim of every business and economic capital approach is targeted for preserving the value. Regulatory capital takes banks’ societal responsibility in consideration and therefore after financial crisis the Basel Committee is putting more weight on that. The new Basel III accord stresses more regulatory capital than its predecessor and concerns have been raised that would the cost of capital be too much for the world that is trying to get back on the path of economical growth. It has been estimated that the capital charge on banks would rise up to 15% to 20% if the Basel III accord is implemented as is now presented (BCBS Comments, 2010).

Because Basel I only covers credit risk and it is targeted only for G-10 countries it has been criticized of being too narrow in its scope to serve its purposes in ensuring financial stability. It is said in the accord that it is meant for the use Basel Committee countries. However what happened was that large international banks started to demand other countries too to follow the accord although it was never meant for them. Another criticism against Basel I was that its incentives for limiting risk were wrong. Banks have found ways of adding more risk to their loanbooks that was intended by the accord. One other source of criticism comes from Basel I’s incentives to favor domestic debt holdings over OECD. In countries with high domestic currency fluctuation and sovereign default risk, this added more risk to loanbooks. A lot of criticism was heard against the way risk weights were calculated based on the counterparty type instead of some economic meter.

Basel II was in effect during the financial crisis that started in 2007. None of its risk measures prevented it to happen and therefore another accord is on its way. One of the main criticisms against Basel II is that it allows banks to use the current exposure method which may fail to capture the true risk in portfolios. The
complex structured assets produced such risks that the VaR based risk management tools made risk managers to miss huge specific risks. Using VaR in risk management entails great risks inherent to it, which in part was the reason for the economical downfall in 2008. (Whalen, 2007)

The main source of criticism against the new suggested framework, Basel III, is that it lacks economic reasoning while adding stressed VaR and incremental risk on top of the previous risk figures. The lower volatilities of the current environment are already included in the stressed volatilities and therefore adding stressed VaR and the normal VaR represents double counting. The new proposition claims that a bond in the banking book has less risk than the same bond in the trading book. This lacks reason. The time of the new accords implementation is critical because it raises the capital demand of banks which directly influences the profitability. This can directly affect borrowers and hinder the much needed economic growth. (BCBS Comments, 2010)

Table 3 summarizes the models presented in Basel accords.

<table>
<thead>
<tr>
<th>Name of the model</th>
<th>Products allowed</th>
<th>Risk horizon</th>
<th>Confidence level</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Exposure Method (OEM)</td>
<td>Only interest rate and foreign exchange derivatives</td>
<td>-</td>
<td>-</td>
<td>Add-ons applied to deal notional values only (No MtM valuation required)</td>
</tr>
<tr>
<td>Current Exposure Method (CEM)</td>
<td>All</td>
<td>6 Months</td>
<td>95 %</td>
<td>Current Exposure (MtM value) and Potential Exposure (Aggregated add-on)</td>
</tr>
<tr>
<td>Standardized Method (SM)</td>
<td>All</td>
<td>1 Year</td>
<td>50 %</td>
<td>Market value or Net Risk Positions times β (1.4) Add-ons calibrated to EPE</td>
</tr>
<tr>
<td>Internal Model Method (IMM)</td>
<td>All</td>
<td>1 Year</td>
<td>50 %</td>
<td>Effective Expected Positive Exposure (EPE) times α (1.4)</td>
</tr>
</tbody>
</table>
9 REFERENCES


Clark, J (2010): Basel reforms include surprise requirements for counterparty risk. risk-magazine.net.


Gregory, J (2010): *Counterparty credit risk*. West Sussex: John Wiley & Sons Ltd.

