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Basel IV: Calculating EAD according to the new standardised approach for counterparty credit risk (SA-CCR)

We give you an overview of the latest Basel proposals.

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Preface

In 2014, the Basel Committee published its final paper (BCBS 279) on the new standardised approach for calculating the EAD of counterparty credit risk exposures (SA-CCR). The SA-CCR has been developed in order to provide the banking sector with an improved standardised approach. Following the Committee's advise, the European Commission implemented SA-CCR requirements in the CRR II draft and replaced the current exposure method (CEM) and standardised method (SM). The SA-CCR will be used not only for the calculation of risk weighted assets but also within various other regulatory frameworks.

The SA-CCR is a marked improvement over the widely used current exposure method (or mark to market method) in terms of risk sensitivity. It explicitly accounts for margin agreements and hedging benefits within netting sets. However, this comes at the cost of increased data requirements and increased complexity of calculations. The more complex a derivative contract, the more likely it is that current regulatory reporting databases will not be able to provide all the necessary information to calculate EADs according to SA-CCR. On the other hand, increased risk sensitivity allows banks to reduce risk weighted assets by making use of netting and collateral agreements.

In sum, the SA-CCR will present a huge challenge to all banks. While smaller banks will have to cope with the increased data and computational requirements, large banks that currently use regulatory approved internal model methods (IMM) will likely see a large increase in capital requirements due to the application of capital floors.

This brochure is designed to provide you with an overview over the design and implications of the SA-CCR to prepare for its implementation.

Kind regards,

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SA-CCR as part of the Basel IV package

Banks play a major role in the global economy. Sound risk management is therefore fundamental to ensure their safety and survival. During the recent financial crisis (2007–2009), banks suffered significant losses due to failures in risk management practices, insufficient capital to cover losses and inadequate liquidity reserves. In response to this, many new regulatory requirements were imposed with the objective of addressing these shortfalls. Over the last two years, the Basel Committee has continued to publish a number of consultation and discussion papers on how to further improve banking regulation. While not official, the banking sector coined these new capital requirements “Basel IV”.

“Basel IV” will fundamentally change the calculation of risk weighted assets and capital ratios of all banks independent of size and complexity of banks’ business model. Besides others the new **standardised approach for counterparty credit risk (SA-CCR)** constitutes a part in the upcoming Basel IV package.

Fig. 1 Areas of revision by the BCBS

Capital requirements		Credit risk	Securitisation	Counterparty credit risk	Market risk	Operational risk	CVA risk	Step-in risk
Capital floors (BCBS 306, BCBS 362)	Interest rate risk in the banking book (BCBS 368)	SA for credit risk (BCBS 347)	Revisions to the securitisation framework (BCBS 374)	SA counterparty credit risk (BCBS 279)	Fundamental review of the trading book (BCBS 352)	Revisions to operational risk (BCBS 355)	Review of the CVA risk framework (BCBS 325)	Step-in risk (BCBS 349)

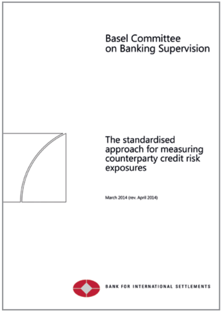
SA-CCR rules will become a binding requirement for the European banking sector

The SA-CCR has been implemented almost two years after publication in the CRR II draft. After consideration of SA-CCR rules in supervisory quantitative impact studies, the European Commission decided to make the new approach a binding requirement for European banks. As proposed by the Basel Committee, the current exposure method and the standardised method have been replaced by SA-CCR. However, the CRR amendment is in line with proportionality considerations as proposed by the European Banking Authority (EBA). As a result, CRR II proposes three non-internal model approaches, based on materiality thresholds:

Fig. 2 Thresholds according to CRR II

	Size of gross on- and off-balance sheet derivative business (relative)		Size of gross on- and off-balance sheet derivative business (absolute)	
Full SA-CCR (BCBS 279)	> 10% of total assets	or	> 150m EUR	Full SA-CCR refers to the apporoach proposed by the Basel Committee (BCBS 279)
Simplified SA-CCR (CRR II)	≤ 10% of total assets	and	≤ 150m EUR	Less granular requirements in comparison to Full SA-CCR
Original Exposure Method (CRR II)	≤ 5% of total assets	and	≤ 20m EUR	A revision of the current Original Exposure Method

Motivation and context – objectives of SA-CCR


Basel Committee
on Banking Supervision

The standardised approach for measuring counterparty credit risk exposures

March 2014 (rev. April 2014)

BANK FOR INTERNATIONAL SETTLEMENTS

Published 31st March 2014
www.bis.org/
publ/bcbs279.pdf

The Basel Committee published the final SA-CCR document in March 2014. The document, also known as BCBS 279 among the stakeholders of the supervisory environment, presents the Basel Committee's formulation for its standardised approach for measuring exposure at default (EAD) for counterparty credit risk (CCR). According to the Committee, both current non-internal model approaches, the current exposure method (CEM) and the standardised method (SM) are to be replaced because of identified shortcomings. Accordingly, the SA-CCR has been developed by the Committee in order to provide the banking sector with an improved standardised approach.

Main objectives of the SA-CCR are to devise an approach that ...

- is suitable to be applied to a wide variety of derivatives transactions (margined and unmargined, as well as bilateral and centrally cleared),
- is capable of being implemented simply and easily,
- addresses known deficiencies of the CEM and the SM,
- draws on prudential approaches already available in the Basel framework,
- minimises discretion used by national authorities and banks,
- improves the risk sensitivity of the capital framework without creating undue complexity.

Criticism of CEM and SM

The currently available methods for determining the Exposure at Default, i.e. the popular current exposure method (CEM) and the less popular standardised method (SM), will both be relaced by SA-CCR. Especially the replacement of the popular CEM will affect the majority of the banking industry. The Basel Committee pursued numerous objectives in formulating the SA-CCR. One of the main objectives was to meet several shortcomings, which CEM and SM have been criticised for. The following pages will present the main aspects of SA-CCR, and in addition how the new methodology will meet the shortcomings of CEM and SM. In summary the main criticisms are the following:

Fig. 3 Criticism of current approaches

Criticisms CEM

- No differentiation between margined and unmargined transactions
- Supervisory add-on factor does not sufficiently capture the level of volatilities as observed over recent stress periods
- Recognition of netting benefits is too simplistic and not reflective of economically meaningful relationships between derivatives positions

Criticisms SM

- No differentiation between margined and unmargined transactions
- Does not sufficiently capture levels of volatilities observed over stress periods
- Definition of “hedging set” leads to operational complexity
- Relationship between current exposure and potential future exposure (PFE) is misrepresented
- Use of internal methods for computing delta equivalents (non-linear trades)

Introducing the “Full SA-CCR”

Structure of "Full SA-CCR"

SA-CCR represents the Basel Committee's formulation for its standardised approach for measuring exposure at default (EAD) for counterparty credit risk (CCR). The EAD itself is the assessment base in measuring counterparty credit risk of derivatives within the Basel Committee's regulatory capital framework. After the implementation of SA-CCR requirements in the CRR II draft, all European banks will be required to calculate the EAD according to SA-CCR rules. Since the EAD constitutes the key parameter within counterparty credit risk requirements for supervisory purposes, it is important to develop an understanding on how the "new-SA-CCR-EAD" needs to be calculated.

Fig. 4 Structure of the "Full SA-CCR"

Structure of EAD according to "Full SA-CCR"

$$EAD_{SA-CCR} = alpha \ x \ (Replacement \ Cost + Multiplier \ x \ Add\text{-}On)$$

alpha	RC	Multiplier	Add-On
		PFE add-on	

Similar to CEM, the EAD according to SA-CCR consists of both, the replacement cost- and PFE-components. Nevertheless, both components are calculated almost completely different within SA-CCR. The PFE portion consists of a multiplier that allows for the partial recognition of excess collateral and an aggregate add-on, which is derived from add-ons developed for different asset classes. In addition, the supervisory alpha-parameter with a fixed value of 1.4 is applied to increase the overall amount "RC + PFE" by 40%. The value of 1.4 is carried over from the alpha value set by the Basel Committee for the internal model method (IMM) as well as the beta-parameter within the current SM.

Margined vs. unmargined transactions

The RC component intends to capture the loss that would occur if a counterparty were to default and were closed out of its transactions. However, the RC component can be calculated differently within SA-CCR. There are two formulations of replacement costs (RC) depending on whether the trades with a counterparty are subject to a margin agreement related to the exchange of variation margin. Where such a margin agreement exists, the formulation could apply both to bilateral transactions and central clearing relationships. The formulation also addresses the various arrangements that a bank may have to post and/or receive collateral that may be referred to as initial margin.

Fig. 5 Replacement Cost component

Unmargined Transactions	RC = MAX [CMV - NICA; 0]	
Margined Transactions	RC = MAX [CMV – VM – NICA; TH + MTA – NICA; 0]	

Where a supervisory eligible netting agreement is in place, the RC component is calculated at the netting set level. The RC component for unmargined transactions is calculated as the greater of (i) the current market value of the derivative contracts (CMV) less net independent collateral amount (NICA; the sum of the volatility-adjusted value of collateral received or posted other than Variation Margin) held by the bank (if any), and (ii) zero.

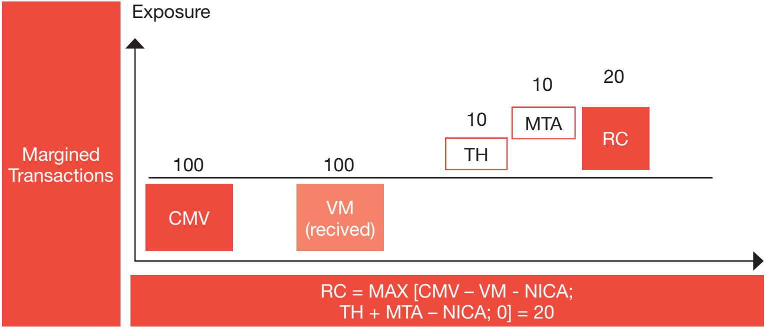
The RC component for margined trades is based on the RC formula for unmargined transactions. In addition, elements used in standardised collateral agreements (i.e. Thresholds (TH), Minimum Transfer Amounts (MTA) and Variation Margins are included in the calculation. For both margined and unmargined transactions the RC amount implies that today's exposure to the counterparty cannot be less than zero.

See how the RC formula for margined transactions is applied

Example for margined transactions

In contrast to unmargined transactions, margined transactions are defined as those, where variation margin (VM) is exchanged. For margined transactions the collateral amount, which changes in response to the value of the transactions it secures, is considered in the calculation of the RC component. The TH – as well as the MTA – amount are generally agreed between two counterparties to avoid the transfer of small amounts. Hence, both parameter reflect a materiality threshold. TH describes the positive threshold before the counterparty must deliver additional collateral. Together with the TH amount, the MTA amount is the minimum transfer amount applicable to the counterparty. NICA takes into account the differential of independent collateral amount (ICA) posted by the bank minus ICA received by the bank from the counterparty. The following example depicts the calculation of the RC component for margined trades.

Fig. 6 Example for margined transactions



- The derivative's current market value (CMV) amounts to EUR 100; Received VM amount (since start date of transaction) add up to EUR 100; there is no NICA in place
- Threshold (TH) and Minimum Transfer Amount (MTA) add up to EUR 20 (EUR 10 each)
- Since "TH + MTA – NICA" represent the largest exposure that would not trigger a VM call, a VM call occurs in this example whenever the current market value exceeds the amount of EUR 20.
- **The RC component amounts to EUR 20** in our example, since "TH + MTA" represent the maximum part in our formulation

General steps to calculate the PFE

Analogue to the CEM, the overall PFE add-on represents a potential increase in exposure in the future. While the RC component is calculated at the netting set level, the PFE add-on's are calculated for supervisory given asset classes within a considered netting set and then aggregated to the total PFE add-on for the same netting set. Supervisory asset classes within "Full SA-CCR" contain: interest rate, foreign exchange, credit, equity, commodity and other risks. Banks are required to assign their derivative transactions to asset classes based on a so called "primary risk factor".

In addition, the SA-CCR allows for hedging within given asset classes. For this purpose every single transaction of a considered netting set has to be assigned to a supervisory hedging set based on fixed supervisory requirements.

According to SA-CCR requirements PFE add-on's have to be calculated for each asset class using asset-class-specific formulas. These asset-class-specific formulas are then used to apply a couple of adjustments to transactions in each asset class. However, although the add-on formulas are asset class – specific, they have a number of features in common. To determine the PFE add-on's, transactions in each asset class are subject to adjustments in the following general steps:

Fig. 7 General steps to calculate the PFE

Overview of Hedging Set concept

Hedging of derivative transactions, i.e. entering into the opposite position to a derivative transaction (long vs. short), is common practice to decrease risk. Since the risk of a hedged derivative transaction is compensated by an offsetting trade, the risk a derivative is normally comprised with, is eliminated. The effects of hedging mechanisms have been incorporated within the development of SA-CCR requirements in such a way that the calculation of asset class add-on's hinges on the key concept of a supervisory "hedging set". A "hedging set" under the SA-CCR is a set of transactions within a single netting set within which partial or full offsetting is recognised for the purpose of calculating the PFE add-on. The methodologies for "building" hedging sets according to SA-CCR requirements in the CRR II draft are summarised in the table below.

Tab. 1 The concept of Hedging Sets

Asset Class	Hedging Set	Offset
Interest Rate	Given Maturity Buckets (MB) per Currency 1. (MB < 1 year) 2. (1 year ≤ MB ≤ 5 years) 3. (MB > 5 years)	Full within same MB Partially across different MBs
Foreign Exchange	Currency pair	Full
Equity	Entity	Full, if same Entity Partially across different Entities
Credit	Entity	Full, if same Entity Partially across different Entities
Commodity	Categories of commodity derivatives (Energy, Metal, Agricultural and Other)	Full, if same commodity type Partially across commodity types
Other Risks	Transactions mapped to the other risks category shall be assigned to the same hedging set only where their primary risk driver is identical	

Consequence: The add-on will vary based on the number of hedging sets that are available within an asset class

Supervisory parameters according to SA-CCR

Different supervisory parameters need to be applied within the scope of the PFE calculation. The table below includes the supervisory factors, correlations and supervisory option volatilities for each asset class and subclass. While the asset-class-specific SF-parameters as well as the option volatilities apply to all transactions of a netting set, the correlations only apply to the PFE add-on's for equity, credit and commodity derivatives.

Tab. 2 Supervisory parameters

Asset Class	Sub Class	Supervisory Factor (SF)	Correlation	Supervisory Option Volatility
Interest Rate	–	0.50%	N/A	50%
Foreign Exchange	–	4.00%	N/A	15%
Credit, Single Name	AAA	0.38%	50%	100%
	AA	0.38%	50%	100%
	A	0.42%	50%	100%
	BBB	0.54%	50%	100%
	BB	1.06%	50%	100%
	B	1.60%	50%	100%
	CCC	6.00%	50%	100%
Credit Index	IG	0.38%	80%	80%
	SG	1.06%	80%	80%
Equity, Single Name		32%	50%	120%
Equity, Index		20%	80%	75%
Commodity	Electricity	40%	40%	150%
	Oil/Gas	18%	40%	70%
	Metals	18%	40%	70%
	Agricultural	18%	40%	70%
	Other	18%	40%	70%
Other Risks		8%	N/A	150%

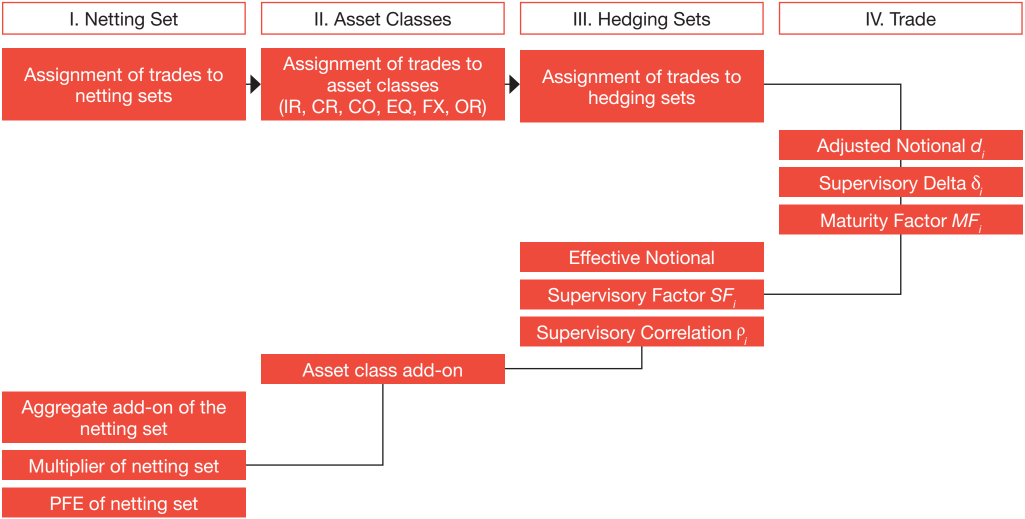
PFE calculation on four stages ...

The calculation of a netting set's PFE add-on is executed within the following four stages:

I netting set,
II asset classes,
III hedging sets and
IV trade.

The figure on the right hand side displays the comprehensive calculation process that has to be performed to calculate the PFE add-on. This calculation process is characterised by a breaking down in the first part and a consequent aggregation in the second part over the four stages. Accordingly, the first as well as the last step of the PFE add-on calculation occur at the netting set stage.

Fig. 8 Calculation of PFE add-ons



The "Simplified SA-CCR" and "OEM" in Detail

The "Simplified SA-CCR" – simplicity vs. risk-sensitivity

"Already today SA-CCR experts predict that the simplicity of the "Simplified SA-CCR" is at the costs of higher capital requirements due to conservative supervisory parameters".

Fig. 9 Simplifications of "Simplified SA-CCR"

1. Reduced consideration of collateral
2. Reduced possibilities for hedging
3. Supervisory prescribed maturity factors
4. Supervisory prescribed delta factors (+/- 1)
5. Multiplier set to 1

In line with proportionality considerations, the European Commission will provide its banks with a small derivative business size with a so-called "Simplified SA-CCR". Compared to the "Full SA-CCR" the simplified approach is based on a less granular set of calculation requirements. However, already today SA-CCR experts predict that the simplifications of the lighter version of "Full SA-CCR" are at the costs of higher capital requirements due to conservative supervisory parameters.

The "Simplified SA-CCR"

The "Simplified SA-CCR" represents a lighter version of "Full SA-CCR". Besides highly conservative supervisory parameters and less possibilities for hedging effects, the main differences of the "Simplified SA-CCR" are highlighted within the calculation methodology. See the relevant formulations here:

Fig. 10 Structure of EAD according to "Simplified SA-CCR"

Structure of EAD according to "Simplified SA-CCR"

$$EAD_{Simplified\ SA-CCR} = 1.4 * (Replacement\ Cost + \underbrace{Multiplier \times Add\text{-}On}_{\text{Potential Future Exposure (PFE)}})$$

Fig. 11 Replacement Costs under "Simplified SA-CCR"

Unmargined Transactions "Simplified SA-CCR"	RC = MAX [CMV; 0]	• Other than "Full SA-CCR", the RC component for netting sets not subject to margin agreements does not consider any types of collateral • The RC component is calculated as the greater of (i) the current market value of the derivative contracts (CMV), and (ii) zero.
Margined Transactions "Simplified SA-CCR"	RC = TH + MTA	• For netting sets of transactions that are exchange-traded, centrally cleared or subject to margin agreements • The RC component is calculated as the sum of (i) the threshold and (ii) the Minimum Transfer Amount applicable to the netting set

The revised Original Exposure Method (OEM)

Besides “Full SA-CCR” and “Simplified SA-CCR” the “Revised Original Exposure Method” represents the third non-internal model approach within CRR II. However, the Original Exposure Method (OEM) is not entirely new. Even though neither developed nor introduced by the Basel Committee, this approach was introduced on European level by the Commission in order to provide smaller banks with a less-sophisticated calculation method. In the course of amending the CRR, the OEM has been revised by the Commission. The key aspects of the revised OEM are stated on the following page …

Fig. 12 Key aspects of "Revised Original Exposure Method"

Calculation of Exposure at Default (EAD)	EAD = 1.4 * (RC + PFE)	• The supervisory alpha-parameter with a fixed value of 1.4 is applied to increase the overall amount "RC + PFE" by 40%.
Unmargined Transactions "Revised OEM"	RC = MAX [CMV; 0]	• Other than "Full SA-CCR", the RC component for netting sets not subject to margin agreements does not consider any types of collateral • The RC component is calculated as the greater of (i) the current market value of the derivative contracts (CMV), and (ii) zero.
Margined Transactions "Revised OEM"	RC = TH + MTA	• For netting sets of transactions that are exchange-traded, centrally cleared or subject to margin agreements. • The RC component is calculated as the sum of (i) the threshold and (ii) the Minimum Transfer Amount applicable to the netting set
PFE component	PFE = 0.42 * PFE of netting set	• The PFE of a single transaction is its notional multiplied by the product of supervisory given percentages multiplied by the transactions' residual maturity • The sum of transaction-related PFE's form the PFE on netting set level. Netting set level PFE's shall be multiplied by 0.42

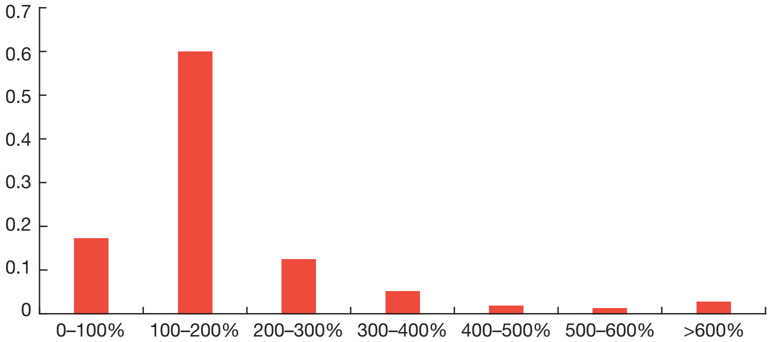
Challenges & Impacts

SA-CCR will create a huge impact on EAD

The SA-CCR introduces a significant change in methodology from the current exposure method (CEM) and the standardised method (SM). All affected groups, besides the banking sector software providers, consultancy firms and the banking authorities itself, will need time to implement the arising changes in their reality. In order to estimate the impacts of the new SA-CRR requirements, PwC drew up sample accounts on real portfolios, to investigate the quantitative effects as well as operational impacts on existing processes and controls. The chart on the right hand side shows the impact of SA-CCR on the EAD parameter in comparison to the CEM (in %).

In particular the sample accounts laid open, that to some extend the amount of EAD as well as risk weighted assets (RWA) increased disproportionately under SA-CCR requirements, especially in those cases where netting agreements haven't been in place. In addition, the trial calculations highlighted that it will take a lot of time and effort to prepare a bank's systems for the upcoming SA-CCR data requirements. In summary, the lack of netting agreements and data availability were both identified as main drivers for the EAD increase.

Fig. 13 SA-CCR impact on EAD[1]

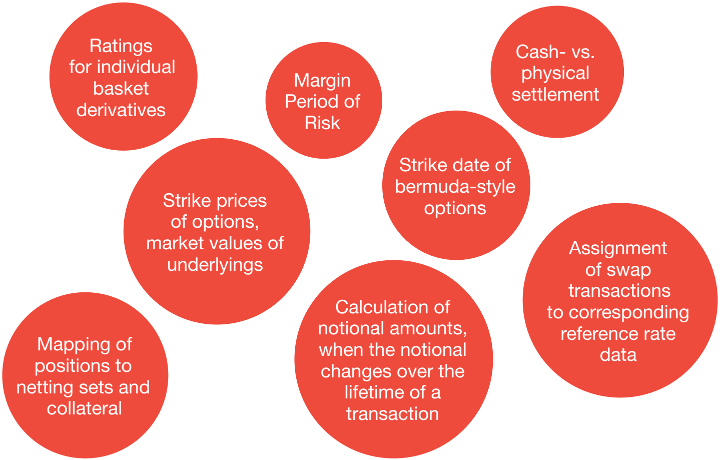


[1] Real Portfolio consisting of more than 5.000 derivative transactions

Data availability

SA-CCR introduces a significant change in methodology for calculating the EAD of derivative portfolios. The SA-CCR methodology does not only require a high degree of quantitative know-how, it also demands various new input parameters. Trial calculations have highlighted the challenges in regard to data availability, that the banking sector will face to meet SA-CCR requirements. Especially the fact that regulatory reporting systems provide only a small portion of the required data, represented a substantial challenge for the test calculations. Even though the precise date for the introduction of the SA-CCR is still uncertain for European banks, a preparation at an early stage is indispensable. Banks should use the remaining time to run trial calculations and to participate in the Basel III monitoring exercise. This will also assure that uncertainties can be addressed at an early stage.

The bubbles stated here represent only a small selection of challenging input parameters within SA-CCR calculations:



The interaction of SA-CCR and other supervisory requirements

Since derivative exposures are not only considered within the regulatory counterparty credit risk framework, but also within various other regulatory areas and frameworks, SA-CCR requirements tangent a large number of process-related and technical interfaces. As a consequence, various departments and systems of a bank are affected by SA-CCR requirements.

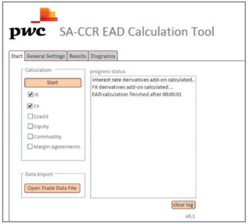
The Basel Committee recognises that SA-CCR introduces a significant change in methodology from the currently available approaches (CEM and SM). Not only jurisdictions may need time to implement these changes in their respective capital frameworks. In particular banks may need time to develop operational capabilities in order to employ the SA-CCR requirements. It is out of question, that a preparation at an early stage ought to be realised.

Fig. 14 Interaction of SA-CCR and other requirements

Topics, that are mainly affected by SA-CCR requirements.

The solution: PwC's SA-CCR tool

PwC’s tool to calculate EAD according to SA-CCR



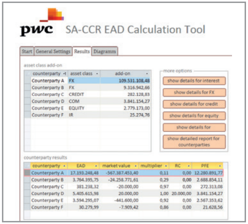
In order to be prepared for the upcoming impact of the SA-CCR implementation, efficient and integrated IT solutions are the sine qua non. Only if a bank is capable to adapt the upcoming supervisory requirements according to SA-CCR to its current reality, it can better respond to incorporated future challenges. In particular the fact that SA-CCR requirements tangent a large number of process-related and technical interfaces, various departments and systems of a bank are affected. PwC provides the solution: Meet PwC’s “SA-CCR EAD Calculation Tool”.

PwC’s Access-based “SA-CCR EAD Calculation Tool” was exclusively developed to cater to our clients’ needs needs and to support them with regards to the implementation and realisation of supervisory SA-CCR requirements. Our SA-CCR tool is flexible and dynamically at use and ensures the calculation of the EAD parameter according to “Full SA-CCR” as well as to the “Simplified SA-CCR” based on a systematic and organised manner with full respect to the upcoming SA-CCR requirements, based on the rules which have been implemented into CRR II.

We would be pleased to introduce you to the SA-CCR EAD Calculation Tool and to present its variety of useful applications and functions in a personal face-to-face meeting.

PwC's "SA-CCR EAD Calculation Tool" represents not only a pure calculation tool, but also a tool for analysis- and reporting purposes. Functions such as a flexible calculation of results for one or multiple asset classes or the application to analyse the impact of margin agreements ensure a precise analysis. Besides others, PwC's SA-CCR EAD Calculation Tool provides the following applications:

- Detailed add-on results for asset classes and counterparties
- Calculation details available on demand
- Detailed report per counterparty available
- Aggregated data on counterparty level
- Easy data import via input file selection
- …



The amount of detailed requirements of the SA-CCR represents a huge challenge. But identified challenges can be turned into advantages.

Be at the forefront and determine all upcoming challenges for your bank.

Use PwC's SA-CCR EAD Calculation Tool to perform test calculations at an early stage. This is the first step to estimate the impacts of SA-CCR requirements on your businesses.

Our Services

Our Expertise

Whether regarding the Basel Committee, EU-regulation or national legislation – we use our established know-how of the analysis and implementation of new supervisory regulation to provide our clients with high-quality services. Embedded into the **international PwC network**, we have access to the extensive knowledge of our experts around the world.

PwC's Basel IV Initiative was established to support you in all aspects of getting compliant with the new regulatory requriements of the **SA-CCR** – accomplishing a prestudy as a first step, supporting you at quantitative impact studies (QIS) up to the implementation at all business units and areas of the bank.

PwC can draw on long lasting experience of implementing new regulatory requirements by supporting a number of banks in completing quantitative impact studies prior to the implementation of **Basel II and Basel III** and by the functional and technical implementation of the final regulations. The PwC-tools used during the QIS are flexible and will be updated automatically in case of new consultations by the Basel Committee.

About us

PwC helps organisations and individuals create the value they're looking for. We're a network of firms in 157 countries with more than 195,000 people who are committed to delivering quality in assurance, tax and advisory services. Tell us what matters to you and find out more by visiting us at www.pwc.com. Learn more about PwC by following us online: @PwC_LLP, YouTube, LinkedIn, Facebook and Google+.

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