**Meeting between Federal Reserve Board Staff**
**And Representatives of The Clearing House**
**September 6, 2012**

**Participants:** Jordan Bleicher, Anna Lee Hewko, Pam Nardolilli, Steven Spurry and Mark Van Der Weide (Federal Reserve Board)

Edward J. Berliner (Bank of America); John K. Hardage (BB&T); Carl V. Howard and Evan Picoult (Citi); Thomas G. Young (Goldman Sachs); Robin A. Doyle (JP Morgan Chase); Steven A. Simonte (Morgan Stanley); Michael Kadish (RBS); Kenneth J. Sax (State Street); Andrea R. Tokheim (Sullivan & Cromwell); Joseph J. Rice (Wells Fargo); and Paul Saltzman, Daniel J. McCardel, David J. Wagner and Sujit Chakravorti (The Clearing House)

**Summary:** Staff of the Federal Reserve Board met with representatives of The Clearing House to discuss The Clearing House's July 2012 study of single counterparty credit limits proposed by the Federal Reserve Board under section 165(e) of the Dodd-Frank Wall Street Reform and Consumer Protection Act. The discussion focused on: the use of models in calculating credit exposures; the proposed requirement that purchasers of certain credit and equity hedges "risk shift" exposure to the relevant protection provider for purposes of calculating compliance with credit limits; the proposed treatment of exposures to sovereigns and central counterparties; the proposed treatment of exposures arising from certain securities lending arrangements; and the impact of the proposed requirement on a range of market participants.


# Single Counterparty Credit Limits: The Clearing House Industry Study

July 2012

# Contents

# 1. EXECUTIVE SUMMARY

## INTRODUCTION AND STUDY OBJECTIVES

As noted in comments submitted on April 27, 2012[1], in the absence of published official sector analysis, The Clearing House (TCH) undertook a study to assess the impact on the financial sector and financial product end-users (including businesses and consumers) of the Federal Reserve Board's (FRB) proposed rules (Proposed SCCL Rules) for implementing Section 165 (e) of the Dodd-Frank Wall Street Reform and Consumer Protection Act (DFA). Section 165(e) establishes requirements for Single Counterparty Credit Limits (SCCL) for bank holding companies (BHCs) with total assets in excess of $50 billion and all non-bank financial covered companies[2] that are designated as systemically important by the Financial Stability Oversight Council (FSOC). ***TCH and its member firms support the concept of SCCL, and current risk management practices at major banking organizations take into account similar counterparty concentration limits.***

The Proposed SCCL Rules introduce a two-tier approach that would require banks to limit their net aggregate credit exposure to single counterparties. The first tier is the statutorily required 25% limit. The second is a 10% limit applied to the exposures of the largest firms ("major covered companies") to other major covered company counterparties[3] imposed at the discretion of the Federal Reserve. The net aggregate credit exposures that are subject to these limits include all extensions of credit arising from loans, deposits, lines of credit, repurchase and reverse repurchase agreements, securities lending transactions, guarantees, acceptances and letters of credit, derivatives transactions conducted with a counterparty, securities held by the covered company that are issued by a counterparty and other similar transactions identified by the Federal Reserve.

In commenting on the Proposed SCCL Rules, TCH and several covered companies[4] expressed their concern that multiple elements of the SCCL measurement methodologies contained in the Proposed SCCL Rules significantly overstate actual economic risk when compared to other more risk-sensitive and widely accepted methodologies. As such, the industry and a number of covered companies suggested alternative

---

1 The Clearing House Association along with American Bankers Association, the Financial Services Forum, the Financial Services Roundtable and Securities Industry and Financial Markets Association, Comment letter on Enhanced Prudential Standards and Early Remediation Regulations under Dodd-Frank 165/166, April 27, 2012 ("Comment Letter").

2 The definition of a "covered company" includes nonbank financial companies and bank holding companies as well as any foreign bank or company that is a bank holding company with $50 billion or more in total consolidated assets.

3 The definition of a "major counterparty" includes any major covered company, as well as any foreign banking organization that is or is treated as a bank holding company and that has total consolidated assets of $500 billion or more.

4 For example, see: JP Morgan Chase & Co, Comment letter on "Enhanced Prudential Standards and Early Remediation Requirements for Covered Companies", April 30, 2012; Goldman Sachs, Comment letter on "Enhanced Prudential Standards and Early Remediation Requirements for Covered Companies", April 30, 2012.

measurement methodologies that would achieve more accurate and policy-consistent approaches to implementing Section 165(e) as discussed in the written comment letter.

The industry and several covered companies also noted that the flawed methodology and other components of the Proposed SCCL Rules are likely to significantly reduce the liquidity of derivatives and securities lending markets, potentially impairing the risk management capabilities of many financial and non-financial firms. In turn, the resulting constraints on market liquidity would be expected to reduce the availability and increase the cost of credit for consumers, small businesses, and corporations.

With this in mind, the objectives of this TCH study were to:

- Quantify the single counterparty credit exposures of large covered companies using the measurement methodology prescribed by the Proposed SCCL Rule;
- Quantify the single counterparty credit exposures of large covered companies using more risk sensitive and generally accepted measurement methodologies, including the widely-used internal model methodology (IMM), which has been developed under regulatory supervision and used for both Basel II and Basel III capital purposes;
- Assess the main drivers of the resulting excess credit exposures to single counterparty limits identified under both approaches and determine their relative impact on net aggregate counterparty credit exposures;
- Conduct a qualitative assessment of the potential impact of the Proposed SCCL Rules on financial markets, including potential rebalancing responses by institutions that are affected by the limit excesses as exposures are estimated under the proposed measurement methodologies and the potential resulting impacts on end users; and
- Identify the key differences between the Proposed SCCL Rules and European large exposure regulations.[5]

The TCH study utilized data collected from thirteen BHCs (Participating Banks). The Participating Banks included six large U.S BHCs and the U.S. operations of two large foreign banking organizations. Additionally, three of the largest U.S. custody BHCs that serve as agents for the securities lending markets and two regional BHCs participated. Given the presence of the Participating Banks in all of the primary credit markets and the data employed, TCH believes this study's results are representative of the impacts of the Proposed SCCL Rules on the U.S. financial markets.

[5] The European large exposures rules, prescribed by the Capital Requirements Directive, provide guidelines to all European Union banks for monitoring and controlling their large exposures to counterparties on a consolidated basis. Similar to the Proposed SCCL Rules, the European large exposures rules require banks to avoid undue concentration of risks to single counterparties.

## STUDY CONCLUSIONS

*Primary policy-related conclusions*

The main conclusions of the TCH study are:

1. The measurement methodologies proposed for estimating SCCL exposures significantly overstate actual risk relative to the use of more accurate and generally accepted single counterparty credit risk measurement techniques that reflect the true economic risk of such exposures;

2. If the Proposed SCCL Rules were implemented as proposed, large U.S. BHCs would be forced to substantially reduce their credit intermediation and market making activities in order to reduce their exposure within limits. Market participants could be significantly negatively affected by any resulting lower liquidity in the derivatives and securities lending markets. Affected participants in the derivatives markets would include regional and community financial institutions, corporate debt issuers, government sponsored entities, pension funds, and other institutional investors. In addition, there is significant likelihood that these impacts on financial institutions and institutional investors will ultimately filter through the financial markets affecting the costs and availability of many types of fixed-rate loans and financial services provided to consumers, small businesses, and public sector entities. Affected participants in the securities lending markets would include beneficial owners of securities, such as pension funds, mutual funds, insurance companies and other institutional investors. Moreover, reduced liquidity in the securities lending market arising from the Proposed SCCL Rules could impact the timely settlement of securities transactions in instances where banks and securities firms use borrowed securities in support of trade settlement;

3. Inclusion of exposures to CCPs in the proposed limits framework could unduly restrict the activities of covered companies to centrally clear OTC derivatives transactions. Such limitations would substantially impede and contradict other statutory and regulatory requirements and industry initiatives to move significant portions of current and future OTC derivatives exposures to CCPs;

4. The methods proposed for estimating SCCL exposures differ significantly from methods used in other countries and jurisdictions, thus introducing the potential for institutions not subject to similar restrictions to gain a competitive advantage over banks subject to the proposed rules;[6] and

5. If modified as suggested in the TCH comment letter, the Proposed SCCL Rules would impose limits on large U.S. BHCs' credit exposures that more accurately and meaningfully reflect the risk of

[6] For example, E.U. banking organizations would not be subject to most of the highly constraining provisions of the Proposed SCCL Rules. They would: a) not be subject to the lower 10% threshold applied to the largest banks; b) not face limits on exposures to CCPs; c) not be subject to a notional risk shifting requirement; and d) be allowed to use the IMM permitted for regulatory capital computations to measure their counterparty exposures for derivatives and securities lending activities.

single counterparty credit exposures. Such modifications would materially curtail the unnecessary rebalancing of Bank portfolios and avoid the potential harmful affects to the real economy that could result from the proposed rules, while remaining consistent with the objective of effectively constraining undue credit concentrations as identified in Sections 165(e) of the DFA.[7] They would also promote more consistency between banks' internal risk management practices and supervisory requirements.

*Quantitative results of the assessment of the proposed SCCL measurement approach*

The quantitative analysis presented in this report identifies the significant number and magnitude of the SCCL limit excesses that would be calculated under the Proposed SCCL Rules. If, however, certain aspects of the proposed rules were modified to reflect more accurately the true credit exposures of banking organizations, these excesses would be significantly reduced with substantially less impact on financial markets and real economic activity. The quantitative elements of this TCH study resulted in the following empirical findings and key observations:

1. **Overstatement of derivatives counterparty exposure:** The Proposed SCCL measurement approach for derivative counterparty exposures, the Current Exposure Method (CEM), results in a substantial overstatement of single counterparty credit exposures across Participating Banks. The overstatement arises primarily from the differences between CEM and more risk-sensitive methodologies that are commonly used by banks, generally accepted in the academic literature[8], reviewed by regulators for capital adequacy, and recently adopted by the OCC for use in calculating legal lending limits for banks and thrifts. In particular, across the Participating Banks *the overstatement of exposures under the CEM was approximately 12 times the exposures calculated using the more accurate and risk-sensitive IMM approach permitted under existing advanced approach regulatory capital rules.* TCH understands that the Basel Committee is undertaking work to revise the CEM; the results from this study demonstrate the critical need for regulators to address the deficiencies of the CEM as a derivatives exposure measure.

   The source of this overstatement lies with CEM's inadequate recognition of the single counterparty credit risk mitigation benefits of: a) legally enforceable bi-lateral netting agreements, b) the use of collateral in securing the daily marked-to-market current credit exposures of derivatives; and c) the diversification that exists in many portfolios of derivatives contracts.[9] For example, the CEM

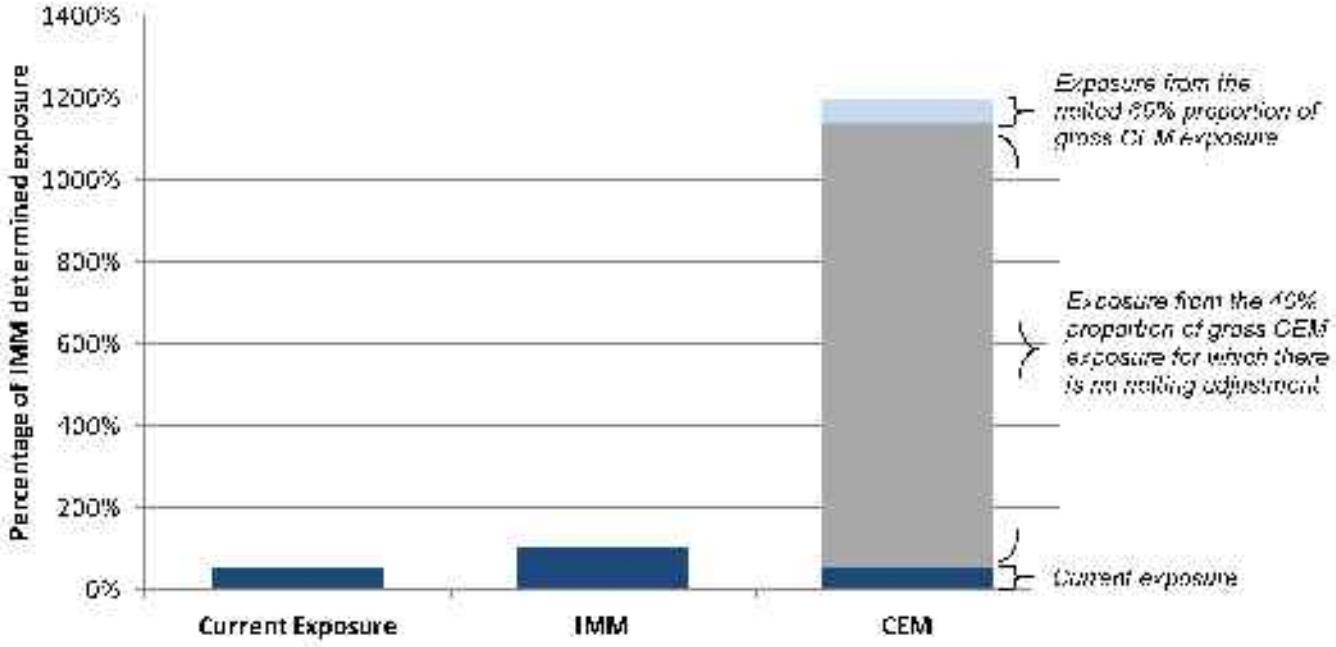
[7] The SCCL proposed rules apply only to U.S. Bank Holding Companies that are "covered companies", and not to Foreign Banking Organizations.

[8] Numerous academic publications describe counterparty credit risk measurement techniques that are in line with the internal models banks use for capital adequacy and risk management purposes. Authors of some of these publications include Eduardo Canabarro, Darrell Duffie, Evan Picoult and Michael Pykhtin. See appendix 8.2 for a representative list of references.

[9] As noted in the TCH comment letter, CEM offers limited recognition of the risk mitigating effects of netting and collateral arrangements that typically exist for derivative transactions, which results in a substantial overstatement of actual exposure compared to more sophisticated internal model estimates permitted for regulatory capital and

requires that the risk of 40% of any portfolio of derivative contracts be measured based only on their notional values, without the benefits of these well-established, risk-reducing sound practices. Chart 1 compares the aggregate CEM exposure for 5 Participating Banks relative to IMM estimates and current exposure, and highlights the significant impact of the restriction on netting embedded in the CEM. The limitations of CEM are discussed further in section 5.4.

***Chart 1: CEM Exposure Estimates Relative to Current Exposure and IMM*** [10]




Recognizing the more accurate exposure estimates resulting from the IMM, the banking regulatory agencies have proposed the use of IMM as the base upon which to calculate a banking organization's derivative counterparty exposures under Basel III, albeit with modifications to make the measure more reflective of stressed market conditions. In recognition of this change in international standards and their adoption in the U.S., TCH's comment letter to the SCCL NPR proposed the use of a stressed IMM measure for complying with the DFA's SCCL requirement that is consistent with this Basel III approach and the OCC Lending Limits Interim Final Rule. Since covered U.S. banks are still developing such stressed Basel III IMM measures, this study was unable to fully quantify and assess the differences between the Proposed SCCL Rules CEM

---

risk management purposes (subject to supervisory approval). Internal models also employ a more rigorous and comprehensive estimation of the potential future exposure of derivative exposures compared to CEM.

[10] Based on data reported by 5 Participating Banks as of the date of study data collected. In this chart, current exposure depicted in the first column represents the greater of zero or the mark-to-market value of counterparty exposure, inclusive of legally enforceable netting and the adjusted market value of currently held collateral (but not future variation margin). Appendix 8.6 describes the CEM approach depicted in the third column of the chart.

approach and stressed IMM Basel III approach. However, we believe that the Proposed SCCL rules would still significantly overstate exposure relative to stressed IMM measurement approaches.

2. **Summary of limit excesses/overages:** Across Participating Banks, the Proposed SCCL measurement approach would result in a significant number and amount of credit exposures exceeding the proposed limits. Specifically, for the 13 Participating Banks the study found that:

   a. There are 100 incidents of counterparty exposures in excess of the proposed limits;

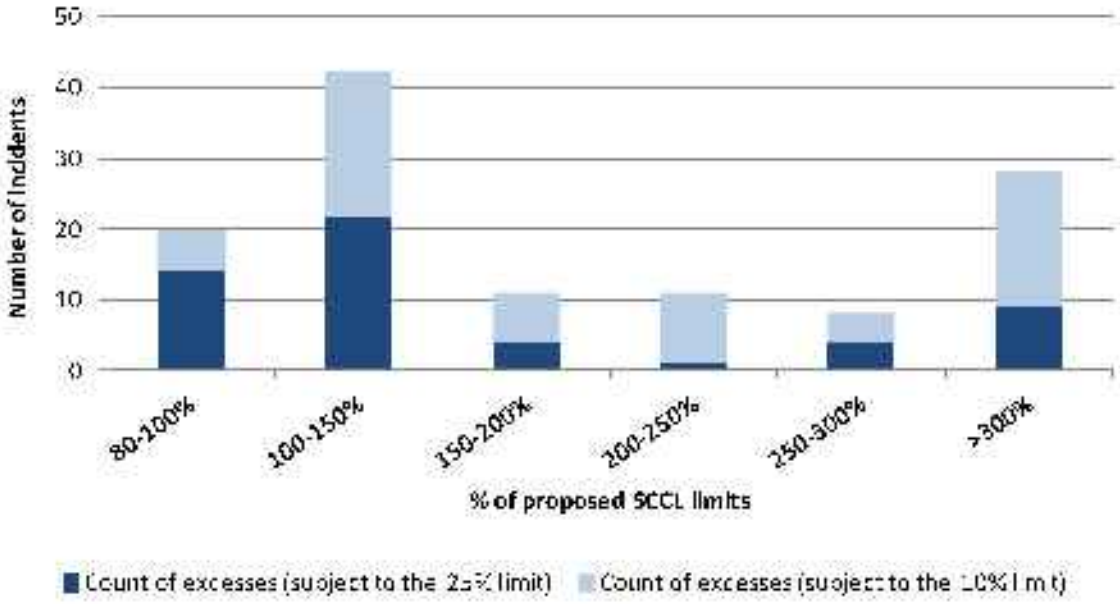
   b. These incidents involve 29 unique counterparties, 9 of which are Central Counterparties or non-US sovereigns;

   c. The distribution of the excess incidents has a wide range (Chart 2) with more than 40 of the incidents comprising exposures between 100% and 150% of the proposed limits, 27 incidents with over 300% of the proposed limits and an average estimated level for all 100 excess exposure incidents of 248% of the proposed limits;

   d. Assuming that covered companies manage their credit exposures to be 80% of the proposed limits, which is not unlikely to be the prudent risk management practice given the fluctuations in derivatives markets activity, the number of excess exposure incidents rises to 120; and

   e. The aggregate dollar amount of the 100 limit excesses, as calculated by the Proposed SCCL Rules is nearly $1.3 trillion.

***Chart 2: Distribution of limit excess incidents as % of proposed limits***




3. **Effect of the 10% limit on limit excesses:** If only the 25% limit were applied to all counterparties, the number of excess exposure incidents across the Participating Banks would decline from 100 to 63. The aggregate estimated exposure in excess of the 25% limit, as measured under the Proposed SCCL Rules, would amount to $665 billion or roughly 51% of the excesses identified under the full application of both the discretionally prescribed 10% and the statutorily required 25% limits.

4. **Significant drivers of limit excesses:** The critical drivers of the exposure excesses resulting from the Proposed SCCL Rules include: a) the proposed use of the CEM for calculating derivatives counterparty exposures, b) the requirement to "risk shift" exposure to protection providers, and c) subjecting CCPs and non-US sovereigns to the SCCL Proposed Rules. This study quantified the incremental contribution of each of these significant drivers to the aggregate excess counterparty credit exposures under the Proposed SCCL Rules relative to a baseline reflecting current industry single counterparty credit risk measurement practices. Using this industry baseline, *the proposed 10% and 25% limits would result in 13 total limit excesses across the Participating Banks affecting 9 unique counterparties. The total amount in excess of the proposed limits for these 13 incidents is estimated at $26 billion.*

   a. ***Impact of CEM**:* Using the Proposed SCCL Rules' CEM measure for derivatives exposure instead of those computed using more advanced risk management measurement methodologies such as the IMM results in the number of limit excess incidents increasing from 13 to 45. The number of unique counterparties that would be affected increases to 16 as

opposed to 9 unique counterparties under the IMM baseline. The aggregate amount of the 45 limit excesses in dollar terms is estimated to be $309 billion or roughly 12 times the $26 billion in excess limit exposures estimated using the industry baseline.

b. ***Impact of required protection provider risk-shifting:*** The SCCL proposal requiring banks to "risk shift" the full notional derivative exposure from the obligor to the protection provider on a notional basis (i.e. the "substitution requirement") incorporates the highly unlikely event of the simultaneous default of the protection provider and all of the issuers in a diversified set of reference assets with no recovery or collection of variation margin. TCH study data shows that exposures to protection providers are underpinned by diversified portfolios of reference assets, indicating that the simultaneous default assumptions inherent in the proposed full notional "substitution requirement" measurement approach are highly conservative.

   Adding the impacts of this risk-shifting measurement approach to those identified for the CEM approach discussed above increases the number of excess exposure incidents resulting from the proposed SCCL Rules to 70 from 45. The number of unique counterparties affected increases to 20 from 16 and the aggregate amount of total limit excesses increases to $987 billion. *Thus, the combination of both the CEM and substitution requirement of the proposed SCCL Rules results in estimated exposure excesses to the 10% and 25% limits that are roughly 38 times those estimated employing the industry baseline.*

c. ***Inclusion of CCPs and non-US sovereigns*:** Exposures to non-U.S. sovereigns arise substantially from the substitution of exposures to the collateral issuer in situations where eligible collateral is used as a risk mitigant. Exposures to CCPs result from the use of the CEM, which as noted above, does not reflect the extensive margining practices in place with CCPs. Subjecting CCPs and high quality non-US sovereigns to the 25% limit results in a further 30 limit excesses affecting 9 unique counterparties, and an increase in limit excesses of $308 billion.

   Combining the impact of these elements of the Proposed SCCL Rules with the use of CEM and required protection provider risk-shifting described above results in the number of incidents of SCCL exposure excesses across Participating Banks increasing from 70 to 100. These 100 incidents are more than seven times the number of incidents under the baseline estimates. These incidents would affect 29 unique counterparties, and result in a total estimated limit overage of nearly $1.3 trillion, or approximately 50 times that measured under the baseline estimates used in this study.

Further discussion of these drivers and their contribution to the aggregate SCCL impact under the Proposed SCCL Rules, the limitations of the CEM approach, and the diversification of reference

assets underlying aggregate protection provider exposure are discussed in detail in section 5.3 to 5.5 of this study.

*Discussion of potential market impacts – Derivatives*

The TCH study also frames relevant considerations in assessing the possible market impacts of the Proposed SCCL Rules. Given that measurement approaches to derivatives and securities lending exposures are the main drivers of the limit overages that would occur under the Proposed SCCL Rules, this study:

- Estimated the amount by which banks would be expected to reduce these activities by the Federal Reserve's target SCCL implementation date of late 2013;
- Reviewed the capacity and feasibility of mechanisms to reduce or rebalance counterparty exposures that exceed proposed SCCL limits; and
- Reviewed the market participants, end-users and consumers that could potentially be impacted by a reduction in large U.S. BHCs' derivatives activity arising from the Proposed SCCL Rules limits.

This component of the study highlights the significant potential consequences of applying the limits as currently proposed and offers the following key observations:

1. ***Required reduction in derivatives activity***

   The significant overstatement of exposures relative to true economic risks under the Proposed SCCL Rules measurement approaches is estimated to require Participating Banks to reduce the notional amount of their existing derivatives outstanding by $30 to $75 trillion. ***This amounts to between 10% and 25% of the total notional amount of derivatives outstanding for all U.S. BHCs. It also amounts to between 41% and 102% of the average annual notional amount of total derivatives transactions conducted by U.S. BHCs between 2002 and 2011, and between 1.6 and 3.8 times the average annual net increase in the notional amount of derivatives outstanding at U.S. BHCs over this period.*** The actual amount of required reductions within the $30 to $75 trillion range depends on the assumptions made regarding which exposures banks would be expected to prioritize when bringing their exposures within the proposed limits. Such a significant reduction could have serious destabilizing consequences for market liquidity and the availability of credit as well as for the availability of derivative products for risk management purposes.

2. ***Availability of mechanisms to reduce or rebalance derivatives exposure***

   This study reviewed alternative mechanisms that BHCs could be expected to employ to bring their derivatives exposures within the proposed limits by the end of 2013. Anti-trust considerations limited the ability of this private sector study to quantify the feasibility and capacity of these alternative approaches. Nevertheless, this study concludes that ***the run-off of existing positions combined with available migration to CCPs (if permitted), as well as industry efforts to restructure and rebalance exposures or enter into broader portfolio compression exercises, could be insufficient to bring U.S. covered companies into compliance by the deadline***, if the exposure limits are calculated according to the Proposed SCCL Rules. The analysis and considerations underlying this conclusion are presented in Section 6.

3. ***Nature of reductions in large U.S. BHCs' derivatives activity***

   If unable to reduce excess exposures through the transition to CCPs or rebalancing exercises, U.S. BHCs would be expected to dramatically reduce overall derivatives activity on a volume-driven notionals outstanding basis, rather than on an economic risk basis. Institutions could, therefore, face serious constraints on their capacity to accept new non-clearable business from end-users. If CCPs are not exempted from the proposed rules, it is expected that U.S. banks would also be restricted in their ability to accept clearable transactions.

4. ***Universe of alternative derivatives providers***

   In light of the above, this study asked Participating Banks to provide observations on the consumers, end-users or products that would be affected if demand exceeded supply as a result of the Proposed SCCL Rules. Quantitatively estimating the extent of this impact was beyond the timeframe of this study, and ultimately would be dependent not only on which large U.S. banks are constrained, but also on the extent to which alternative providers could increase their own market-making activity to partially or fully offset the reduced capacity of large U.S. BHCs. Alternative providers could include large foreign banks that are already major derivatives market-makers, smaller U.S., European or Asian banking organizations, and non-bank providers such as hedge funds.

   However, given the significant infrastructure investments and risk management expertise required for many of these institutions to expand their derivatives businesses, along with end-users' counterparty credit quality requirements, it is viewed as unlikely that the universe of new or smaller derivatives market-makers could expand enough, or at a rapid enough pace, to replace the shortfall in supply. An alternative expected consequence is that derivatives activities could become more concentrated in large foreign banking organizations that are already major derivatives market-makers and that will not be subject to the same types of restrictions as U.S.-based institutions. In

order to do so, foreign dealers would need to be able and willing to scale their own operations to gain market share and do so within their own capital and large exposure limits.

5. ***Potential impacts on derivatives market participants and end-users/consumers***

   Participating Banks noted that to the extent that the Proposed SCCL Rules drive an imbalance in overall market liquidity and product availability, a wide range of customers could be affected, including:

   a. *Corporate borrowers* that may be unable to get sufficient bank credit because banks will not be able to effectively hedge in the credit derivatives markets the resulting exposures that arise in the normal course of business. This would affect the costs and availability of credit raised through new bond issues, the syndicated loan market and other lending markets;

   b. *Regional and community banks* that would face higher costs or lower availability in customized interest rate derivatives products, which they use to hedge their risks and the fixed-rate loan products they offer to their retail, small business and corporate customers;

   c. *Pension funds, insurance companies and Government Sponsored Entities' (GSEs)* that use non-clearable interest rate and equity derivatives products to manage the complex and long-dated risk profiles of their assets and liabilities;

   d. Institutional investors, such as *pension funds, insurance companies and other asset managers*, that use non-clearable credit derivatives (particularly indices and non-investment-grade single-name CDS) to hedge the credit risk in their asset holdings; and

   e. *Corporate users* of commodity and foreign exchange derivatives as hedging tools because U.S. banks will be constrained in their ability to manage their risks in the inter-bank market.

*Discussion of potential market impacts - securities lending*

With regard to securities lending, this study's findings are consistent with those presented in the RMA's Committee on Securities Lending comment letter. That assessment found that the level of securities on loan that are indemnified by participating agent banks would be expected to be reduced by as much as 30% to 50% from current levels in order to bring these agent banks within the proposed limits.

Limit overages associated with securities lending activity are driven by both general counterparty risk from the indemnification of borrowers, and by the substitution of exposures to non-U.S. sovereigns as collateral issuers. Participating Banks noted that agent banks, as facilitators between the demand from borrowing financial institutions (primarily banks and securities firms), and the supply from the beneficial owners lending securities (primarily institutional investors), have limited options to rebalance their counterparties or

to provide agent lending services without the indemnification of borrowers, given lender requirements and expectations for such indemnifications.

To comply with the Proposed SCCL Rules, U.S. banks would likely have to reduce access to securities lending services for both borrowers and lenders and/or to introduce more restrictive limits on the acceptance of non-U.S. sovereign collateral. Further, the willingness of alternative providers – such as smaller banks, non-banks or direct lending on the part of beneficial owners – to expand their securities lending activities is unclear. If such alternative providers do not step in to fill the capacity (e.g., due to technological and risk management infrastructure concerns), the volume of existing securities on loan via U.S. agent banks could be reduced. As a result:

- Institutional investors, including pension funds, mutual funds and insurance companies, could lose a portion of the income they generate from securities lending activities, reducing American investors' returns in these funds; and
- Although a comprehensive assessment was not conducted, one important potential impact of constrained liquidity in the securities lending markets is possible delays in trade settlements in instances where banks and securities firms need to use borrowed securities.

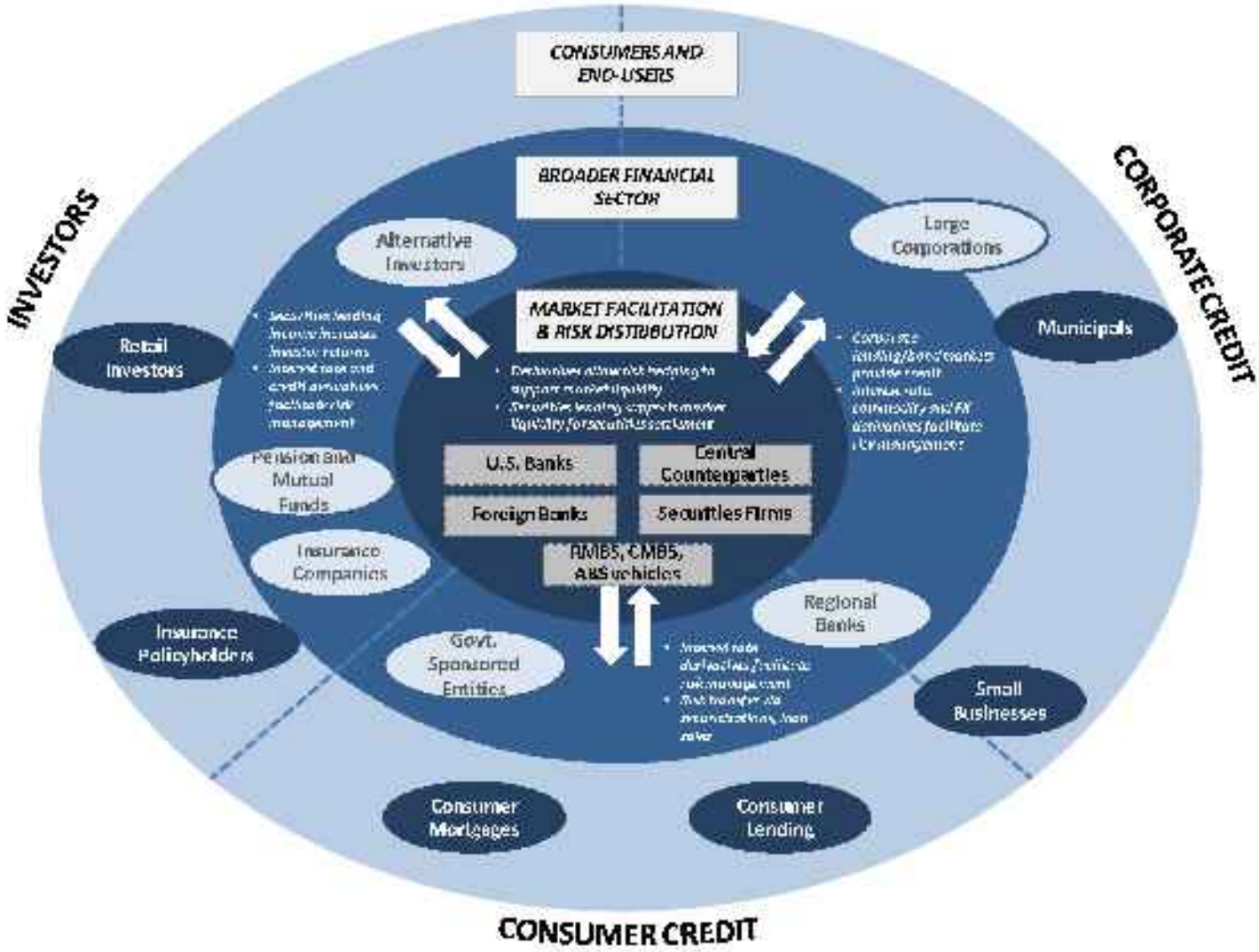
*Summary range of market participants potential market impacts*

In summary, the qualitative assessment of the potential effects of the Proposed SCCL Rules highlights the important role played by large U.S. BHCs in the derivatives and securities lending markets and in the provision of financial products and services to consumers and corporations, including small businesses.

***The range of financial markets and products that could be negatively affected by adoption of the Proposed SCCL Rules in their current form is broad, with complex interdependencies between cash and derivatives markets and financial institutions and their wholesale and retail customers. While consumers may not be direct participants in the derivatives or securities lending markets, these markets are used by many financial intermediaries that provide retail financial products and services. As a result, constraining these markets could consequently have significant impacts on consumers and small businesses.***

Chart 3 illustrates the interdependencies that exist within financial markets and the channels through which the ultimate impact of the Proposed SCCL Rules may be felt. Derivatives and securities dealers, including U.S. and foreign banking organizations, securities firms, CCPs, and standardized securitization vehicles, provide risk management capabilities not only to each other, but also to other intermediaries in the financial markets. These intermediaries include large and small corporations, community and regional banks, GSEs, insurance companies, and pension funds, which utilize derivatives to manage interest rate, commodity, foreign exchange and credit risks and engage in securities lending activities to promote orderly settlement of financial transactions. Ultimately, potentially higher costs or reduced availability of these derivatives products and securities lending services will affect these entities' own customers.

***Chart 3: Potential Market Participants Impacted by the Proposed SCCL Rules***



# 2. STUDY HIGHLIGHTS

This section summarizes the highlights from subsequent study sections.

**RESULTS OF QUANTITATIVE ANALYSIS OF PARTICIPANT EXPOSURES**

Section 5.1: SCCL Exposure Estimates Using Generally Accepted Measurement Approaches ("Baseline")

- Generally accepted measurement approaches employed by Participating Banks include the use of internal models for measuring counterparty potential future exposure (as permitted for regulatory capital purposes, subject to supervisory approval), no risk-shifting of credit exposure to the protection provider in the measure of primary counterparty exposure, and the use of alternative methods with internally developed limits for managing exposures to CCPs and high quality non-U.S. sovereigns.

- The use of these generally accepted approaches for exposure measurement purposes results in 13 limit excess incidents across the Participating Banks, with a total overage of $26 billion under the proposed 10% and 25% counterparty limits.

Section 5.2: Exposure Estimates, Limit Excesses and Overages under the Proposed SCCL Rules

- The Proposed SCCL Rules use measurement approaches that result in more than seven times the number of incidents of limit excesses, and approximately 50 times the amount of overages than under the baseline (generally accepted measurement methodologies).

- As calculated according to the Proposed SCCL Rules, there are 100 incidents of excess exposures across all 13 Participating Banks. The total overage, calculated per the Proposed SCCL Rules, is nearly $1.3 trillion.

- These 100 incidents of excess exposures are to 29 unique counterparties, including Central Counterparties (CCPs) and non-US sovereigns.

- An additional 20 limit excesses would arise if exposures were managed to 80% of the proposed limits.

- Exposure levels are greater than twice the limit for approximately half of the limit excesses, as calculated under the Proposed SCCL Rules.

- The 10% limit, which goes beyond the statutory 25% requirement, is responsible for 37 of the 100 limit excess incidents and just under half of the initial $1.3 trillion in overages.

Section 5.3: Key Drivers of Limit Excesses

- The major drivers of total aggregate exposures estimated using the Proposed SCCL Rules' measurement approaches are:
  - Use of the CEM approach (38%).
  - Protection provider risk-shifting (39%).

- The use of CEM instead of IMM measurement approaches increases the total amount of limit excesses to $309 billion, roughly 12 times that of the $26 billion baseline overage.
  - An additional 32 limit excess incidents across the Participating Banks occur with the use of CEM.

- The risk-shifting requirement of the Proposed SCCL Rules, when combined with the use of CEM, increases the total amount of limit excesses to $987 billion or roughly 38 times that of the $26 billion baseline overage.
  - An additional 25 limit excess incidents occur under this substitution requirement.
  - As written, the Proposed SCCL Rules impose a "double count" of exposures in the case of credit derivative protection provider exposures - once in the calculation of exposures under the CEM methodology and again under the risk shifting requirement. For major derivatives dealers such double counting of exposure can be a significant contributor to the number and amount of limit excesses under the Proposed SCCL Rules.

- The inclusion of CCPs and high quality non-U.S. sovereigns within the aggregate limit framework together with the Proposed SCCL Rules' substitution requirement and use of CEM increases the aggregate amount of limit overages to $1,295 billion or roughly 50 times the baseline overage.
  - An additional 30 limit excess incidents occur with the inclusion of these requirements.

- Approximately two-thirds of all the limit excess incidents estimated using the proposed SCCL Rule measurement approaches could not be addressed without reducing Participating Banks' derivatives exposures to the counterparties that exceed the proposed limits.

Section 5.4: Limitations of CEM in Measuring Single Counterparty Credit Exposures

- CEM is a significant driver of limit excesses because it fails to take fully into account the benefits of legally enforceable netting arrangements, variation margin and portfolio diversification.

- The 40/60 netting mix assumption required by CEM limits any netting benefit to only 60% of the gross Potential Future Exposure. The OCC points out that the average netting benefit for U.S. banks has improved from 50.6% in the first quarter of 1998 to 92.2% in the fourth quarter of 2011.

- Key points from comparison of CEM to alternative measures include:
  - Replacing CEM with the more risk-sensitive IMM would reduce derivatives counterparty exposures, on average, to only 9% of those calculated under CEM. This implicitly suggests that the actual netting mix within large and well balanced netting sets is even lower than 5/95. Using a 5/95 netting mix assumption would reduce average counterparty exposures to 25% of those calculated under the prescribed CEM methodology.
  - Estimates from 2 Participating Banks suggest that using 'risk bucketing' of notionals prior to the application of Potential Future Exposure (PFE) add-on factors would reduce exposures to 55%-75% of the amount calculated under CEM.
  - Using an alternative stressed exposure measure, 2 Participating Banks found that based on the stress scenario prescribed under the Comprehensive Capital Analysis and Review (CCAR) exercise, average counterparty exposures would be just 30% of those calculated under CEM.

Section 5.5: Protection Provider Reference Asset Composition

- The distribution of reference assets for the limit excess incidents demonstrates significant diversification of the underlying reference assets. A diversified portfolio has a significantly lower risk profile than that suggested by the notional-based approach under the Proposed SCCL Rules.

## ASSESSMENT OF POTENTIAL MARKET IMPACTS OF THE PROPOSED RULES

Section 6.1: Derivatives Exposures – Potential Market Responses and Impacts

- Total estimated derivatives notionals outstanding with constrained counterparties ($140 trillion) represent:
  - 53% of the total notional derivatives outstanding for the Participating Banks.
  - 22% of global derivatives notionals outstanding.

- Estimated credit derivatives notionals outstanding with constrained counterparties ($12 trillion) is:
  - 67% of the total credit derivatives outstanding for the Participating Banks.
  - 41% of global notional credit derivatives outstanding.

- The estimated required reduction or rebalancing in outstanding OTC derivatives notionals to bring constrained counterparties within limits as calculated under the Proposed SCCL Rules could be in the range of $30-$75 trillion, which is approximately 40% to 102% of the $74 trillion average annual notional value of derivatives transactions conducted by US BHCs from 2002-2011.

- No single exposure reduction or rebalancing mechanism (buying credit protection, CCP migration if exempted, portfolio compression, tear-ups, etc.) appears to be sufficient on a stand-alone basis to achieve this required reduction.
    - There are limited available providers of credit protection at the necessary scale that are not already subject to limit constraints.
    - Even if CCPs are exempted and U.S. BHCs ceased all new non-clearable business, run-off of existing portfolios would be insufficient to bring counterparty exposures within limits.
    - Portfolio compression and tear-up exercises face multiple practical barriers and coordination challenges given the required scale, and incentives may not be aligned between U.S. BHCs and foreign banking organizations.

- There could be significant challenges associated with rebalancing exposures to non-constrained counterparties given currently available market capacity. Assuming no entry of alternative providers, the total theoretically achievable reduction through such rebalancing was estimated at only 20%-30% of derivatives overages before all limits are utilized, absent additional compression effects.

- Significant retrenchment of existing dealers in the OTC derivatives market (especially acute in the interest rate and credit derivatives markets) would be necessary if the Proposed SCCL Rules were implemented without modification.

- A large proportion of lost capacity may flow to non-U.S. banking organizations and other U.S. firms (such as regional banks). We have not studied whether these firms will be able or willing to scale to the necessary activity levels, particularly in the short time-frame available, or that they could or would be willing to scale the appropriate risk-management expertise along with credit, operational legal, and documentation systems infrastructure in such a short period of time.

- Affected market participants include end-users of derivatives, such as regional and community banks, corporates, GSEs, pension funds and other institutional investors. In turn, there could be knock-on effects on consumer borrowers and investors that rely on these market participants.

Section 6.2: Securities Lending Exposures (including non-US Sovereigns) – Potential Market Responses and Impacts

- Study data corroborates the RMA Committee on Securities Lending's estimated reduction in securities on loan indemnified by U.S. agent banks of approximately 30%-50%, required to bring constrained counterparties within limits.

- Limited capacity for agent banks to reduce their SCCL counterparty exposures through credit derivative hedging, rebalancing with non-constrained counterparties, or requiring higher collateral levels.

- Significant retrenchment of securities lending services to both borrowers and lenders of securities. U.S. firms could also be forced to place more restrictive limits on the acceptance of non-U.S. sovereign collateral.

- Lost capacity may flow to non-U.S. banking organizations and other market participants, if these firms are able to scale to the necessary activity levels.

- Potentially affected market participants include lost returns to beneficial owners (lenders) of securities (pension funds and other institutional investors) as well as possible impacts on supply to borrowers of securities (central banks, securities firms).

# 3. STUDY OVERVIEW

## 3.1 Background

DFA Section 165(e) established SCCL requirements for BHCs with total assets in excess of $50 billion and all FSOC-designated covered companies. Specifically, Section 165(e) limits covered companies from having credit exposures to a single counterparty that exceed 25% of their capital stock and surplus. For the purpose of this calculation, capital stock and surplus is comprised of total regulatory capital and excess loan loss reserves. Section 165(e) requires the FRB to prescribe such limits by regulation. In advancing a notice of proposed rulemaking (NPR) on such regulations in December 2011, in addition to imposing the 25% limit for all covered companies, the FRB discretionarily proposed a more restrictive SCCL restriction of 10%[11] of capital stock and surplus for BHCs and foreign banking organizations with $500 billion or more in total consolidated assets (designated as "major covered companies").

## 3.2 Objectives

In response to the NPR, TCH undertook a study with the assistance of a third party to understand the consequences of the Proposed SCCL Rules on large U.S banks. The specific objectives of this study were to:

- Quantify the single counterparty exposures of large covered companies using the measurement methodologies in the Proposed SCCL Rules;
- Assess the main drivers of the resulting excess credit exposures and determine their relative impact;
- Quantify the exposures resulting from the same portfolios using more accurate and generally accepted measurement methodologies as alternatives to those contained in the Proposed SCCL Rules, including the widely-used IMM, which has been developed under regulatory supervision and is widely used to assess internal and both Basel II and Basel III regulatory capital requirements;
- Conduct a qualitative assessment of the potential impact of the Proposed SCCL Rules on the financial markets, including potential responses by affected institutions and the resulting impacts on end users; and

[11] The Comment Letter describes the industry's concerns with the arbitrarily determined 10% limit.

- Identify the differences between the Proposed SCCL Rules and European large exposure regulations[12] with respect to the Proposed SCCL measurement approach proposed by each and the application of certain exemptions.

## 3.3 Participating Banks

A majority of the ten largest U.S BHCs participated in the TCH study. The thirteen Participating Banks included six major BHCs that collectively account for more than 95% of the outstanding derivative notionals at U.S. BHCs. Participants also included the U.S. operations of two large foreign banks. This study also included data from three of the largest U.S. custody banks that serve as agents for the securities lending market and two large regional banks.

Given the composition of the Participating Banks, TCH believes the results from this study are representative of the potential impacts of the Proposed SCCL Rules on covered companies and the possible effects on the derivatives and securities lending markets. TCH does not believe that additional information from other institutions would materially change the findings of this study.

## 3.4 Approach

In order to assess the impact of the Proposed SCCL Rules, Participating Banks provided comprehensive quantitative data on their single counterparty credit exposures in a structured format. The data was then analyzed on a confidential basis. Additionally, Participating Banks engaged in qualitative discussions on the potential consequences of the Proposed SCCL Rules on the financial markets and their end-users.

Participating Banks provided exposure estimates under the Proposed SCCL Rules as of a recent month-end. These estimates were provided for all unique counterparties with exposures exceeding either the 25% or 10% limit, as applicable, and all counterparties with greater than 80% utilization against these limits or their top 20 counterparties, whichever was greater. The 80% utilization limit reflects the expectation that covered companies are expected to manage their exposures to levels that are below the mandated limits in light of the market variability of derivatives and certain other exposures. Unlike loan exposures, which are fixed, derivatives exposures fluctuate with markets, making a 20% 'management threshold' reasonable in order to ensure compliance with the limits and flexibility in day-to-day operations. Consequently, it is reasonable to expect that counterparties with exposures at or above such 'management thresholds' may also be treated as constrained. The data

[12] The European large exposures rules, prescribed by the Capital Requirements Directive provide guidelines to all European Union banks for monitoring and controlling their large exposures to counterparties on a consolidated basis. Similar to the Proposed SCCL rules, the European large exposures rules requires banks to avoid undue concentration of risks to single counterparties.

collected from Participating Banks was then used to estimate the limit excesses banks would experience under the Proposed SCCL Rules.

Participating Banks provided estimates for all major components of the exposure calculation under the Proposed SCCL Rules. These components are discussed in greater detail in Section 4. Participating Banks also provided estimates of exposures calculated using IMM and other generally accepted industry assumptions and practices. The data provided by Participating Banks was used to understand the primary drivers of limit excesses and their contribution to the overall limit excesses.

Additionally, confidential discussions were held with individual Participating Banks to understand anticipated changes in their behavior in response to the Proposed SCCL Rules and possible changes in overall market liquidity, as well as the potential impact on end-users. These discussions focused on: 1) alternatives to reduce or re-balance banks' exposures to constrained counterparties under the Proposed SCCL Rules, 2) the capacity of other market participants who are not constrained by the Proposed SCCL Rules to meet market demand, and 3) the overall impact of diminished market liquidity on end-users such as corporations, institutional investors, consumers and small businesses.

***All exposure and other contextual data were aggregated and the results were presented on a name-blind basis. Banks were responsible for their own estimates. Although limited reviews of submissions were conducted for consistency in application of the Proposed SCCL Rules, the data submitted was not formally verified or audited.***

Finally, to supplement this study, key legislative provisions of DFA Section 165(e) were compared to the European large exposures rules. The comparative analysis highlights differences in limit amounts, calculation methodologies, and exemptions between the two regimes.

# 4. OVERVIEW OF THE SCCL MEASUREMENT APPROACH AND STUDY DATA COMPILED

The Proposed SCCL Rules introduce a two-tier limit structure requiring covered companies to limit their net aggregate single counterparty credit exposures to 10% or 25% of capital, depending upon the size of the covered company and of the counterparty.

The Proposed SCCL Rules outline the calculation of a covered company's net aggregate credit exposure to each counterparty. This is the sum of:

- **Direct exposures** to a counterparty through any counterparty risk arising from traded product transactions (i.e., derivatives, securities financing transactions) and exposures arising from extensions of credit and investments in securities issued by a counterparty. The covered company may account for some risk mitigants (collateral, guarantees and CDS, where applicable) when calculating its direct exposure.

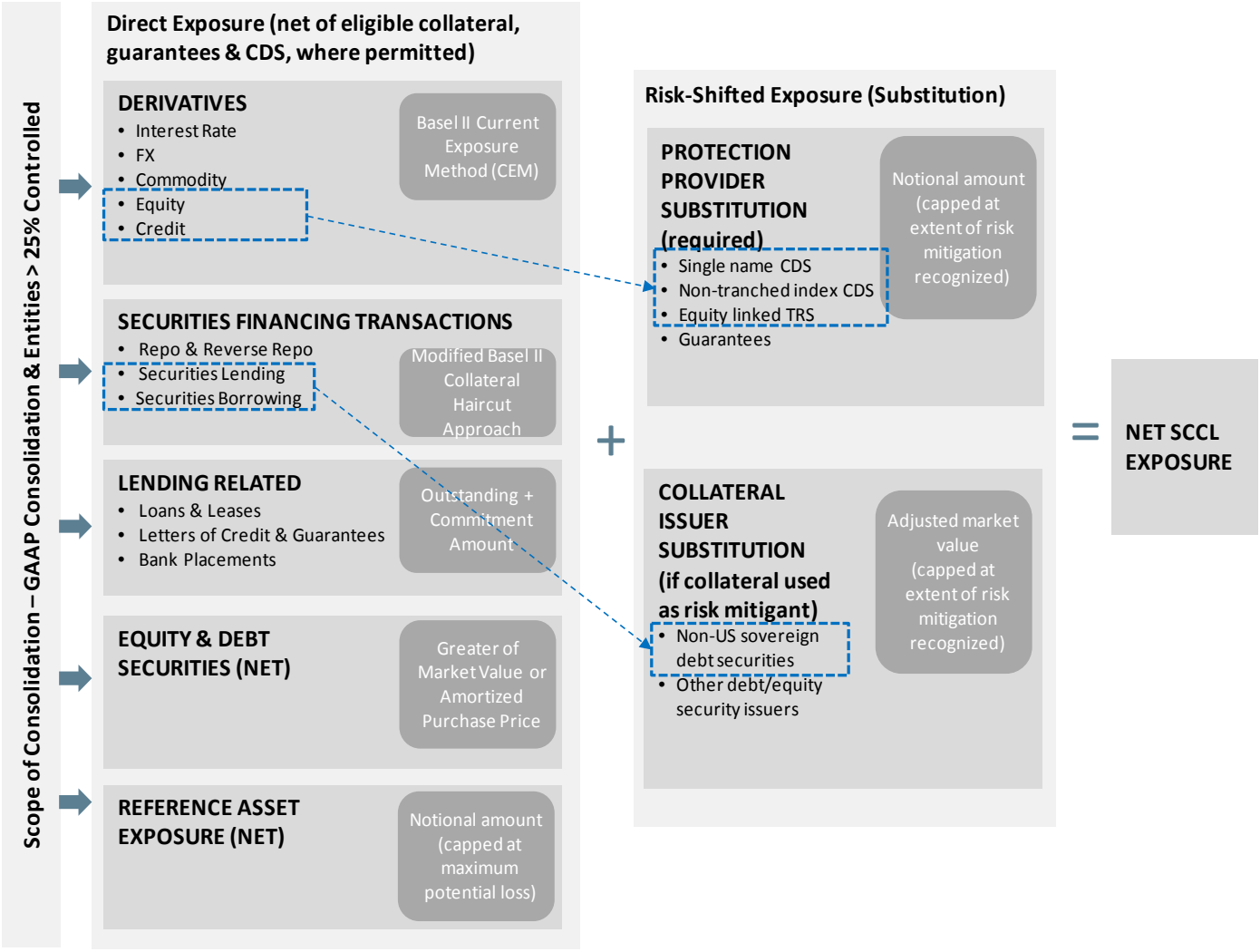
- **Indirect Exposures** to a counterparty based on the risk shifting provisions of the Proposed SCCL Rules, which require a covered company to calculate its exposure to a protection provider (from whom it has bought protection) and the collateral issuer (for collateral recognized as a risk mitigant).

As proposed, covered companies are required to calculate their single counterparty credit exposures on a consolidated basis to include exposures to subsidiaries[13] of a covered company as well.

Chart 4 provides an overview of the Proposed SCCL measurement approach. Exposures for all loans and securities are estimated using generally accepted measurement methodologies such as book or market value. All derivatives exposures are estimated using the Basel II Current Exposure Method. In addition, for credit derivatives and some types of equity derivatives, a risk shifting (or substitution) methodology is required whereby the exposure to the counterparty is substituted by the exposure to the underlying reference asset. This risk-shifted exposure is estimated using notional values. Exposures arising from securities financing transactions (SFTs) are estimated using a modified Basel II haircut approach. SFTs are also subject to a collateral issuer substitution requirement, whereby exposures to the collateral issuer are estimated at the adjusted market value of such collateral.

[13] Subsidiary of a specified company means a company that is directly or indirectly controlled by the specified company.

## *Chart 4: Overview of SCCL Measurement Approach*




*SCCL proposed methodology for exposure measurement purposes.*

*For banks that are active in the capital markets, significant exposure from risk-shifting arises from credit derivatives trading and recognition of securities lending collateral. This exposure is not exclusive to these products. Exposure may also arise from risk-shifting for other collateralized or guaranteed exposures.*

Participating Banks were asked to provide extensive data based on the Proposed SCCL Rules' measurement approach. A formal template was used to facilitate the collection of this data and to ensure consistency of data collection across all Participating Banks.

- **Primary exposure data** included Participating Banks' calculation of their exposures to various counterparties categorized by different product types (i.e., derivatives, securities financing transactions, lending exposure, protection provider exposure, etc). The Participating Banks' exposure estimates were based on the methodology required by the Proposed SCCL Rules.

- **Contextual data** included information on the impact of alternative exposure measurement methods on limit excesses, data on underlying reference assets for exposures shifted to protection providers, and other pertinent information.

*Appendix 8.3 provides a detailed description of the data requested from Participating Banks.*

Assumptions and approximations were made by Participating Banks in providing data for this study, given limitations in existing calculation capabilities relative to the requirements contained in the Proposed SCCL Rules. Key interpretive assumptions made in this study include:

- Protection provider risk-shifting was not capped at the amount of protection required to hedge the net exposure to the reference asset. It was also assumed that exposures to protection providers allowed netting within reference assets, for each netting set with the protection provider;[14]

- Substitution of exposures to non-U.S. sovereign collateral assumes that the election is made to continue to net the collateral for the counterparty exposure calculation of securities financing and derivatives exposures, i.e., all exposures related to accepted collateral is shifted to the issuer;

- Collateral haircuts identified in the Proposed SCCL Rules were not fully applied by all Participating Banks, which results in some underestimation of these exposures; and

- The 25% voting and total equity prongs of the control definition were not applied by a majority of Participating Banks given constraints in deriving these estimates, which results in some underestimation of these exposures.

[14] Though this approach is not explicitly discussed in the NPR, it was believed to be a reasonable interpretation for the purposes of estimating the exposures to the protection providers.

*Appendix 8.4 provides a detailed discussion on the key assumptions and approximations made by the Participating Banks, including an indication, where feasible, of the direction and materiality of any over/understatement.*

# 5. RESULTS OF QUANTITATIVE ANALYSIS OF PARTICIPANT EXPOSURES

This section presents detailed discussions of the analyses conducted and key empirical findings and observations from this study's quantitative analysis. Specifically:

- **Section 5.1** quantifies the effect of imposing the 25% and 10% limits of the Proposed SCCL Rules based on existing exposure measurement approaches used by Participating Banks and recommendations of the TCH comment letter;
- **Section 5.2** highlights the limit excesses that Participating Banks would reach under the measurement approaches of the Proposed SCCL Rules and the distribution of such excesses;
- **Section 5.3** identifies the primary drivers of these excesses and their contribution to the overall limit excesses resulting from the Proposed SCCL Rules. The principal drivers are the CEM measurement methodology used to estimate derivatives exposures and the estimated exposures arising from the risk-shifting requirement contained in the Proposed SCCL Rules. The section also details the differences in limit excesses, the unique counterparties to which Participating Banks are constrained and the resulting total overages that occur when comparing the proposed measurement methodologies with more risk-sensitive exposure measurement methodologies; and
- **Section 5.4** contains a discussion on the limitations of the CEM methodology, and the protection provider approaches required by the Proposed SCCL Rules.

## 5.1 SCCL Exposure Estimates Using Generally Accepted Measurement Approaches ("Baseline")

***Highlights***

- *Generally accepted measurement approaches employed by Participating Banks include the use of internal models for measuring counterparty potential future exposure (as permitted for regulatory capital purposes, subject to supervisory approval), no risk-shifting of credit exposure to the protection provider in the measure of primary counterparty exposure, and the use of alternative methods with internally developed limits for managing exposures to CCPs and high quality non-U.S. sovereigns.*
- *The use of these generally accepted approaches for exposure measurement purposes results in 13 limit excess incidents across the Participating Banks, with a total overage of $26 billion under the proposed 10% and 25% counterparty limits.*

Consistent with the objectives of the study, significant focus was given to quantitatively contrasting the single counterparty exposures estimated using the measurement methodologies and approaches advanced in the Proposed SCCL Rules and more risk-sensitive and generally accepted approaches used currently by financial institutions and regulators to measure, monitor, control and allocate capital to counterparty credit risk exposures. Specifically, the following current practices of Participating Banks used to measure counterparty credit exposures were employed to benchmark both the qualitative and quantitative impacts of the Proposed SCCL Rules.

- The use of internal models employed by banking organizations, for capital purposes, subject to supervisory review under the IMM approach of Basel II;

- No risk-shifting of notional credit exposure to a protection provider when credit or equity protection has been purchased, or to an issuer of collateral when collateral has been received and applied to reduce exposure. These approaches to measuring counterparty risk are generally substituted using more risk sensitive approaches for addressing wrong-way risks and other double default issues;

- Exclusion of CCPs from the aggregate limits framework given the risk mitigating effects of daily margining and other aspects of central clearing. Rather, Participating Banks use internally developed limits to specific CCPs based on risk assessments of the particular CCP. Such limits are based on exposure measures that give appropriate credit to margining and netting arrangements. Further, these limits are consistent with the risk mitigating efforts of the industry and Participating Banks to move certain derivative transactions to central counterparties as required by Title VII of the Dodd-Frank Act;

- The exclusion of high quality non-U.S. sovereigns from aggregate counterparty limits in cases where collateral issued by the entity is used as collateral in mitigating credit risk to a counterparty.

This set of existing practice exposure measurement approaches approximates the recommendations made in TCH's comment letter to the NPR. Using such practices and approaches as a baseline, existing exposures of the Participating Banks were aggregated and compared with exposures estimated using the measurement approaches required in the Proposed SCCL Rules.

**Baseline estimates of single counterparty exposures**

Based on the above set of counterparty exposure estimation approaches and data submitted from Participating Banks, there were only 13 incidents when the Participating Banks exceeded the limits under both the 10% and 25% proposed SCCL limits. These incidents represented exposures to 9 unique counterparties with a total estimated exposure in excess of the proposed 10% or 25% limits of approximately $26 billion. The average limit overage was 145% of the prescribed limit.

Assuming Participating Banks were subject to only the statutory required 25% SCCL, only 8 incidents in excess of the limit were identified. These incidents represented exposures to 8 unique counterparties with a total estimated exposure in excess of the proposed 25% limits of approximately $19 billion. The average limit overage was 169% of the prescribed limit.

Basel III approaches for estimating counterparty credit risk exposures entail revisions to the IMM models currently used by banking organizations under Basel II. These revisions include extensions of the margin periods of risk and the use of stressed inputs that are consistent with an institution's derivatives and repo-style positions and subject to supervisory approval and review. The U.S. implementation of these Basel III revisions was recently issued for comment in a Notice of Proposed Rulemaking on June 7, 2012.[15] Due to the timing of this study and uncertainties surrounding the U.S. banking agencies' approach to implementing Basel III, the specific impact of the Basel III IMM revisions could not be fully assessed. However, Participating Banks believe that the Proposed SCCL Rules would still significantly overstate risk exposure relative to a stressed IMM measure.

[15] "Advanced Approaches Risk-based Capital Rule; Market Risk Capital Rule" Notice of Proposed Rulemaking, June 7, 2012.

## 5.2 Exposure Estimates, Limit Excesses and Overages under the Proposed SCCL Rules

***Highlights***

- *The Proposed SCCL Rules use measurement approaches that result in more than seven times the number of incidents of limit excesses, and approximately 50 times the amount of overages than under the baseline (generally accepted measurement methodologies).*
- *As calculated according to the Proposed SCCL Rules, there are 100 incidents of excess exposures across all 13 Participating Banks. The total overage, calculated per the Proposed SCCL Rules, is nearly $1.3 trillion.*
- *These 100 incidents of excess exposures are to 29 unique counterparties, including Central Counterparties (CCPs) and non-US sovereigns.*
- *An additional 20 limit excesses would arise if exposures were managed to 80% of the proposed limits.*
- *Exposure levels are greater than twice the limit for approximately half of the limit excesses, as calculated under the Proposed SCCL Rules.*
- *The 10% limit, which goes beyond the statutory 25% requirement, is responsible for 37 of the 100 limit excess incidents and just under half of the initial $1.3 trillion in overages.*
- *63 limit excesses would arise if only the 25% limit were applied to all counterparties*

Calculated according to the methodology in the Proposed SCCL Rules, there were 100 incidents where the 13 Participating Banks exceeded the proposed limits, more than seven times the 13 incidents using existing and generally accepted approaches used for estimating single counterparty exposures that were identified in Section 5.1. These incidents represented exposures to 29 unique counterparties with a total estimated exposure in excess of the Proposed SCCL Rules limits of approximately $1.3 trillion. This amounts to roughly 50 times the exposure in excess of the Proposed SCCL Rules limits under the baseline approaches identified in Section 5.1. The average limit overage was 248% of the prescribed limit. The 29 unique counterparties included U.S. and foreign banks that have greater than $500 billion in assets, as well as smaller U.S. and foreign banks, CCPs and non-U.S. sovereigns. Table 1 shows the distribution of limit excesses based on the Proposed SCCL Rules calculations.

### *Table 1: Distribution of limit excesses*

| PERCENTAGE OF LIMIT | COUNT OF EXCESSES (SUBJECT TO THE 25% LIMIT) | COUNT OF EXCESSES (SUBJECT TO THE 10% LIMIT) | TOTAL EXCESSES |
|---|---|---|---|
| >300% | 9 | 19 | 28 |
| 250-300% | 4 | 4 | 8 |
| 200-250% | [illegible] | 10 | 11 |
| 150-200% | 4 | 7 | 11 |
| 100-150% | 22 | 20 | 42 |
| **Total Overage Incidents** | **40** | **60** | **100** |
| 80-100% | 14 | 6 | 20 |
| **Total Incidents above 80% management threshold** | **54** | **66** | **120** |

Highlight *63 limit excesses that would occur even if all counterparties were subject to the 25% limit. Note that for exposures to major counterparties that are subject to the 10% limit, an overage of greater than 250% would remain an overage if the 25% limit were applied instead.*

Impact of the 10% limit for major covered companies

This study found that imposing a 10% counterparty exposure limit for major covered companies resulted in a significant number of estimated limit excesses. If only the 25% limit were applied to all counterparties instead, the number of estimated limit excesses would decline from 100 to 63, with unique counterparties declining from 29 to 25.[16] The aggregate dollar overages resulting from the 63 limit excesses is estimated to be $665 billion, only half of the $1.3 trillion estimated when the lower 10% limit is also in effect. Therefore, ***the 10% limit contained in the Proposed SCCL Rules, which goes beyond the statutory 25% requirement, is responsible for just under half of the initial $1.3 trillion of estimated overages.*** For these 63 limit excesses, the average counterparty exposure is nearly twice (195%) the limit. Importantly, the aggregate dollar overages of $665 billion under the

[16] The dotted boxes in table 1 signify the excesses that would occur even if all counterparties were subject to the 25% limit. For example, if the major counterparties that are currently subject to the 10% limit under the Proposed SCCL Rules were instead subject to the 25% limit, there would still be an estimated 23 (19+4) limit excesses for those counterparties.

Proposed SCCL Rules' measurement approaches represents roughly 35 times the aggregate exposures estimated under the more accurate and generally accepted measurement methodologies identified in Section 5.1 of $19 billion.

Table 1 also shows the number of excess limit incidents as calculated under the Proposed SCCL Rules using the assumption that institutions would be expected to manage their single-counterparty exposures to 80% of the limits instead of 100%, for the reasons discussed earlier. In this case, the number of total excess incidents would rise to 120 from 100.

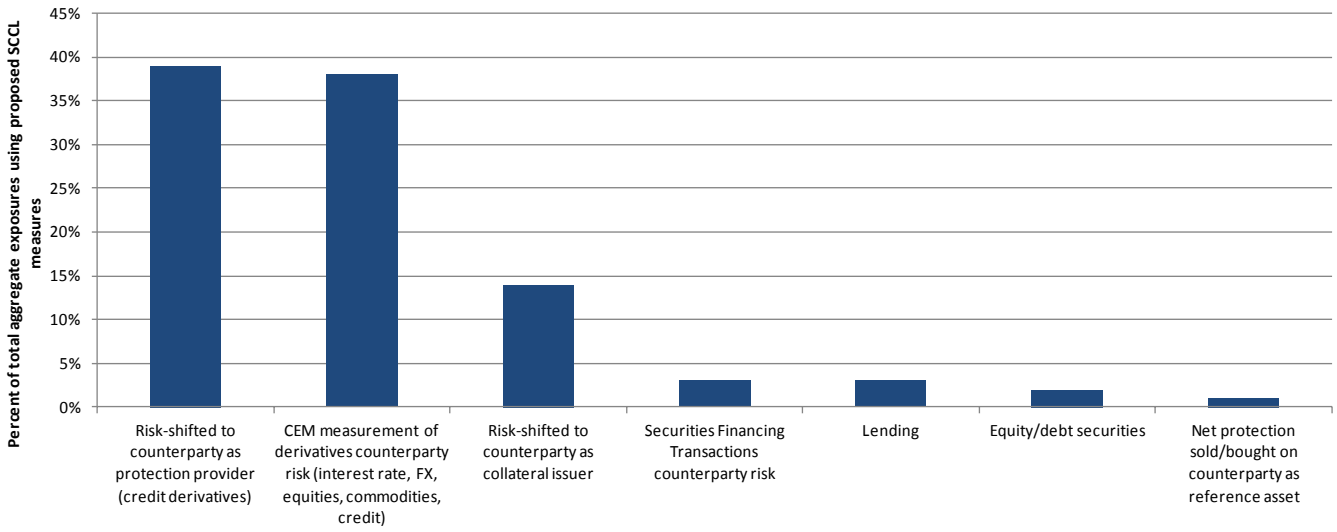
## 5.3 Key Drivers of Limit Excesses

***Highlights***

- *The major drivers of total aggregate exposures estimated using the Proposed SCCL Rules' measurement approaches are:*
  - *Use of the CEM approach (38%).*
  - *Protection provider risk-shifting (39%).*
- *The use of CEM instead of IMM measurement approaches increases the total amount of limit excesses to $309 billion, roughly 12 times that of the $26 billion baseline overage.*
  - *An additional 32 limit excess incidents across the Participating Banks occur with the use of CEM.*
- *The risk-shifting requirement of the Proposed SCCL Rules, when combined with the use of CEM, increases the total amount of limit excesses to $987 billion or roughly 38 times that of the $26 billion baseline overage.*
  - *An additional 25 limit excess incidents occur under this substitution requirement.*
  - *As written, the Proposed SCCL Rules impose a "double count" of exposures in the case of credit derivative protection provider exposures - once in the calculation of exposures under the CEM methodology and again under the risk shifting requirement. For major derivatives dealers such double counting of exposure can be a significant contributor to the number and amount limit excesses under the Proposed SCCL Rules.*
- *The inclusion of CCPs and high quality non-U.S. sovereigns within the aggregate limit framework together with the Proposed SCCL Rules' substitution requirement and use of CEM increases the aggregate amount of limit overages to $1,295 billion or roughly 50 times the baseline overage.*
  - *An additional 30 limit excess incidents occur with the inclusion of these requirements.*
- *Approximately two-thirds of all the limit excess incidents estimated using the proposed SCCL Rule measurement approaches could not be addressed without reducing firms' derivatives exposures to the counterparties that exceed the proposed limits.*

Chart 5 presents the contribution of the key exposure estimation methodologies and approaches required by the Proposed SCCL Rules to the total aggregated estimated exposures for the 100 excess incidents identified in Table 1. Chart 5 represents total exposure, not overages and the dollar amount of the 100 incidents of limit overages is a subset of this total aggregated exposure.

***Chart 5: Aggregate Exposure By Type For All Limit Excess Incidents, Computed Using Proposed Rules***




Under the Proposed SCCL Rules, the use of CEM for estimating derivatives counterparty exposures (38%) and the required protection provider risk-shifting (39%) are the overwhelming drivers of the total exposure to constrained counterparties.

Because banks have the ability to reduce overages estimated by the proposed approaches through their choice of specific exposure classes, in some cases the limit excesses driven by derivatives exposures cannot be attributed to a particular asset class or type (e.g. interest rate, foreign exchange, equity, credit, commodities). However, the study did ascertain that *approximately two-thirds of all the limit excess incidents estimated could not be addressed without reducing banks' derivatives exposures to the counterparties that exceed the proposed limits.* Estimates of required reductions in exposures in the context of potential market impacts can be found in Section 6.

Incremental impact of critical drivers of the Proposed SCCL Rules

To more fully understand the differences between the currently employed and generally accepted single counterparty exposure measurements discussed in Section 5.1 and the approaches advanced in the Proposed SCCL Rules, the TCH study conducted an incremental analysis of exposure measures. This analysis progressively substituted the most impactful elements of the Proposed SCCL Rule measurement approach for generally accepted measurement methodologies and calculated the differences in limit exception incidents and the dollar amount of exposures in excess of the limits. This incremental analysis is summarized in Table 2.

*Table 2: Incremental Impacts of Proposed SCCL Rules Exposure Measurement Methodologies*

| CRITICAL DRIVERS | INCREMENTAL ALTERNATIVE MEASURES |
|---|---|
| **Use of CEM for derivatives exposure measurement** | To measure the impact of CEM, exposure measures computed using the IMM approach recognized under Basel II for capital adequacy purposes is replaced by the CEM methodology for calculating derivative counterparty exposure. For this exposure measure, the requirement to risk shift to protection providers is not applied, with the corresponding adjustment that hedges on that counterparty are not recognized. Lastly, CCPs and high quality non-U.S. sovereigns are excluded. |
| **Risk-shifting of exposure to protection provider** | To measure the incremental impact of the risk-shifting requirement, in addition to using the CEM for exposure measurement purposes, the "risk shifting" or substitution requirement is also included. The CEM also includes the potential future exposure to the protection provider. However, CCPs and high quality non-U.S. sovereigns as large counterparties subject to the limits are excluded. |
| **Inclusion of CCPs and high quality non-U.S. Sovereigns in the limits framework** | Under this measure, both the CCPs and high quality non-U.S. sovereigns (with S&P ratings of AA- or higher) are subject to the large exposure limits. This exposure measure also assumes CEM is used for exposure measurement purposes and the 'risk-shifting" requirement is maintained. |

Table 3 presents the results of these alternative calculations and the associated changes in various limit overage metrics in comparison to the baseline estimates computed using the more accurate generally accepted methodologies employed by the industry. Table 3 provides the results for the following metrics for each exposure measure.

- **Limit excess incidents:** The total number of limit excesses aggregated across all Participating Banks under the alternative methods of the scenario.
- **Unique affected counterparties:** The number of unique counterparties against which Participating Banks are constrained due to limit excesses, without double-counting instances where multiple banks may have limit excesses to the same counterparty.
- **Total limit overage:** The aggregate dollar amount of limit overages, calculated as the sum of the dollar amount of the exposures over the prescribed SCCL limits.
- **Total limit overage (as a % of baseline):** The limit overages for each of the alternative measurement methods, expressed as a percentage of the baseline dollar overage as it is calculated under the Proposed SCCL Rules.
- **Total exposure (as a % of total limits):** The aggregate dollar exposure expressed as a percentage of total limits, summed across the relevant limit excesses for each alternative

measurement method. This is calculated as the sum of the exposures associated with the limit excesses divided by the sum of the Proposed SCCL limits for those limit excesses.

Table 3 presents the above metrics for each exposure measure in two groupings: 1) under the Proposed SCCL Rules where counterparties are subject to either the 10% or the 25% limit, and 2) assuming that all counterparties are subject to just the 25% limit.

Charts 6 and 7 present a graphical view of the results in Table 3. Note that the results for each exposure measure represent an incremental cumulative progression. The charts present the incremental increase in limit excess incidents and the unique number of counterparties that are impacted under each measure. The results are presented in terms of the number of limit excess incidences and dollar exposure limit excesses expressed as a percent of baseline impact.

Table 3 and Charts 6 and 7 demonstrate the significant overstatement of counterparty exposures under the Proposed SCCL Rules relative to the baseline impact of generally accepted single counterparty credit measurement methodologies. In particular, the incremental analysis provides the following observations.

- Use of the CEM is the most significant driver of limit excesses; replacing the IMM with a CEM measure increases aggregate amount of exposure overages by roughly 11 times those computed using generally accepted measurement methodologies. It results in 32 additional incidents of limit excesses based on the Proposed Rules. The source of this mis-estimation bias is discussed more fully in Section 5.4.

- The protection provider risk-shifting requirement is the second most impactful element of the Proposed SCCL exposure measurement approaches. Inclusion of this requirement increases aggregate exposure overages by a further $678 bn and introduces 25 additional incidents of limit excesses under the proposed rules. The source of this mis-estimation bias is discussed in more detail in Section 5.5. Importantly, these results include a "double-counting" of derivative protection provider exposure that is embedded in the Proposed SCCL Rules. The proposed methodology requires that single name CDS be included in calculating CEM exposure and that, under the risk shifting requirement, the same contracts be recognized again as an exposure to the protection provider counterparty. Based on estimates from four Participating Banks, if the rules explicitly allowed a firm to remove from the CEM calculation those contracts that are risk shifted to the protection provider, there would be 15 incremental incidents of limit excesses instead of 25, and incremental overages would be approximately $452bn instead of $678bn.

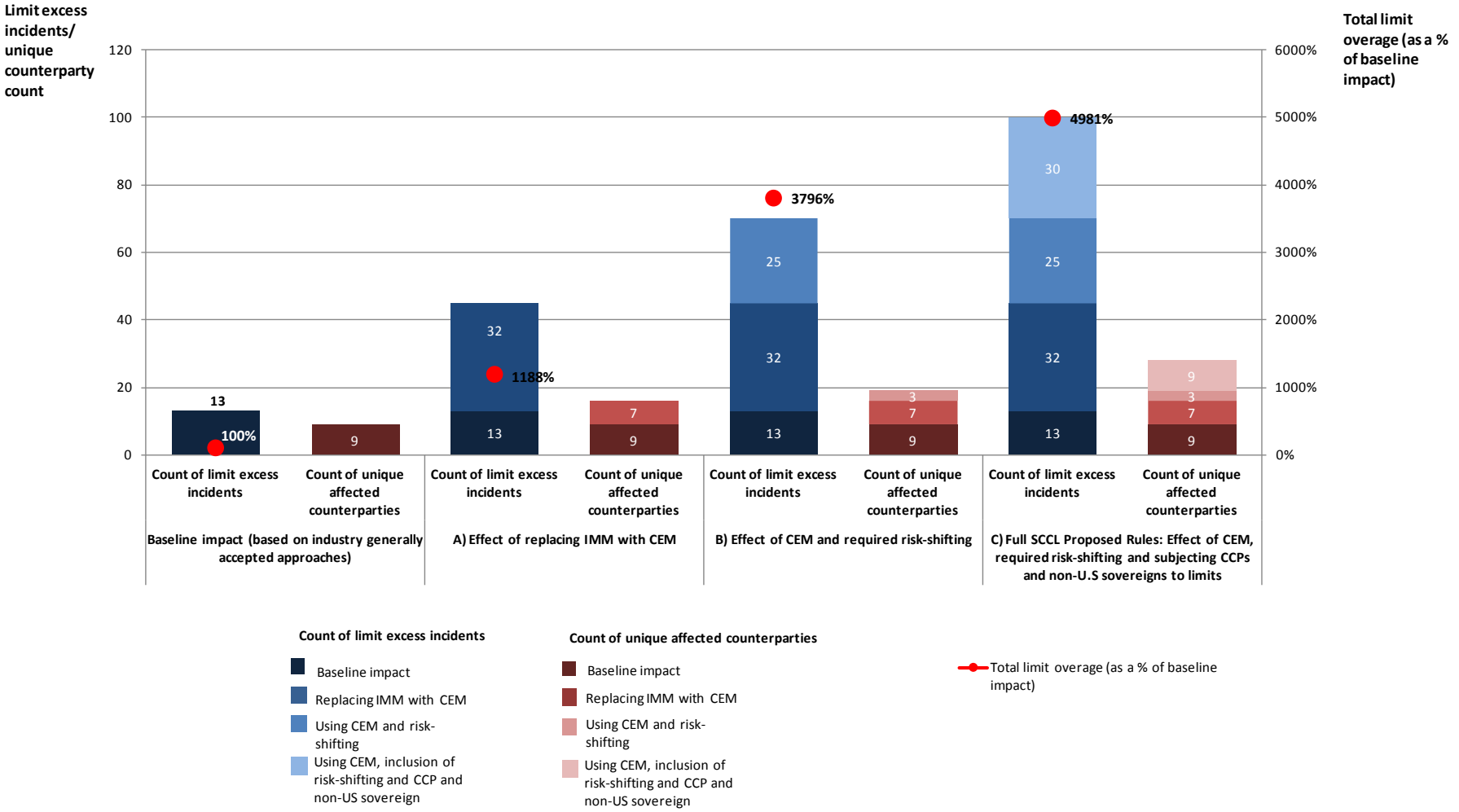
- The third most significant driver of limit excesses and their estimated aggregate exposures is the inclusion of CCPs and non-US sovereigns under the large exposure limits framework. The

requirement would increase overages by 30 incidents and increase the aggregate amount of dollar exposures in excess of proposed limits by over 1.3 times the overages without this requirement.

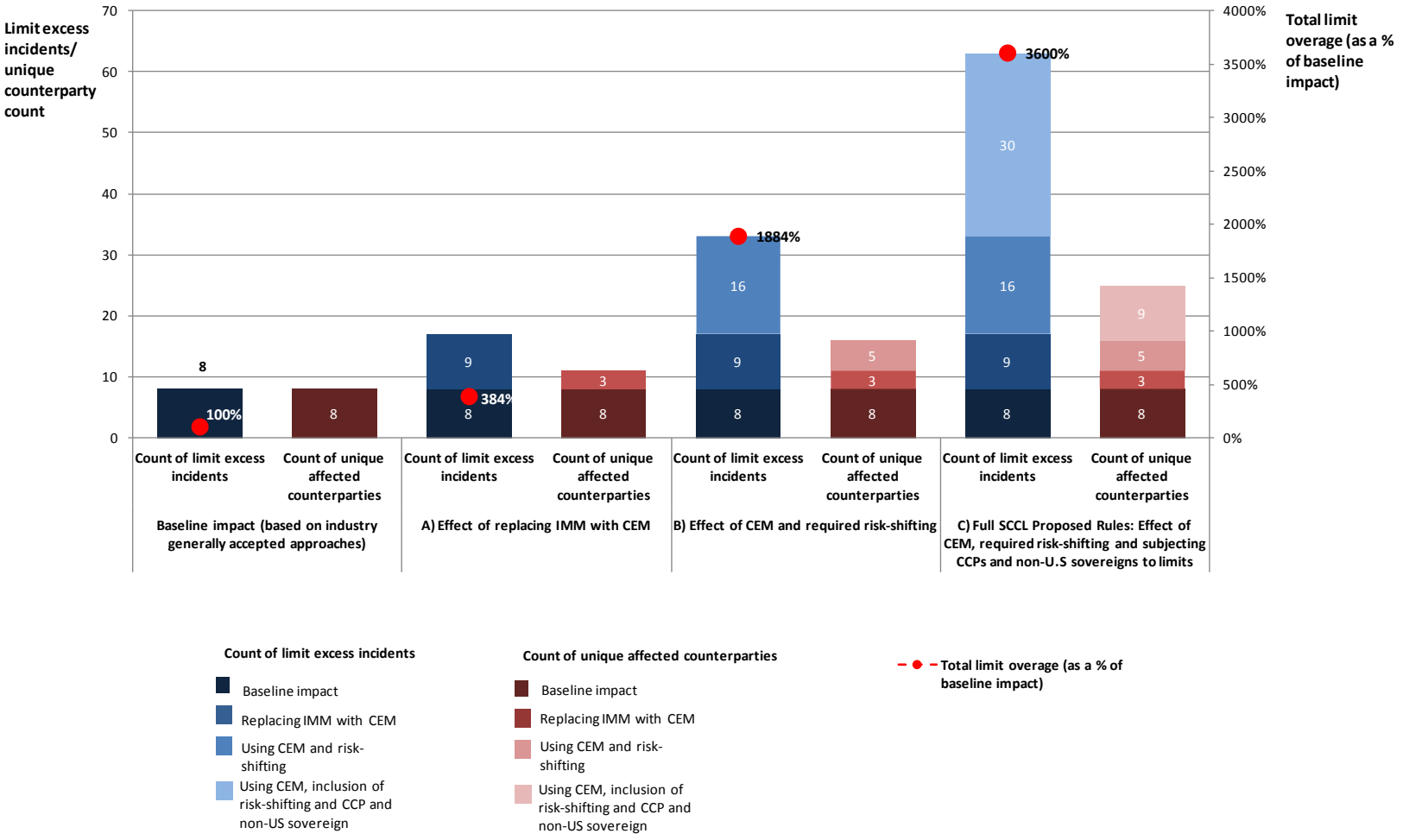
## *Table 3: Alternative Exposure Measurement Methodologies - Limit Overage Metrics*

| | Limit overage metrics *(based on the 10% or 25% limit, as applicable)* | | | | | Limit overage metrics *(all counterparties are subject to 25% limit)* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Limit exceed incidents | Unique affected counterparties | Total limit overage | Total limit overage (as a % of baseline) | Total exposure (as a % of total limits) | Limit exceed incidents | Unique affected counterparties | Total limit overage | Total limit overage (as a % of baseline) | Total exposure (as a % of total limits) |
| **Baseline impact (based on industry recommendations):** Use IMM for exposure measurement, no required protection provider risk shifting and exempt CCPs and high-quality non-U.S. sovereigns | 13 | 9 | $26 bn | 100% | 145% | 8 | 8 | $19 bn | 100% | 169% |
| **Effect of replacing IMM with CEM:** Use CEM for derivative exposure measurement, exclude protection provider risk shifting and exempt CCPs and high-quality non-U.S. sovereigns | 45 | 16 | $309 bn | 1188% | 170% | 17 | 11 | $73 bn | 384% | 142% |
| **Effect of using CEM and required risk-shifting:** Replace IMM with CEM, require protection provider risk shifting and exempt CCPs and high-quality non-U.S. sovereigns | 70 | 20 | $987 bn | 3796% | 213% | 33 | 16 | $358 bn | 1884% | 173% |
| **Effect of full Proposed SCCL Rules (i.e., impact of using CEM, required risk-shifting as well as subjecting CCPs and high quality non-US sovereigns to SCCL limits):** Replace IMM with CEM, require protection provider risk shifting and include CCPs and high-quality non-U.S. sovereigns. This scenario highlights the limit excesses and associated overage metrics that would be experienced by Participating Firms, based on the Proposed SCCL Rules | 100 | 29 | $1,295 bn | 4981% | 196% | 63 | 25 | $665 bn | 3500% | 169% |

## *Chart 6: Alternative Exposure Measurement Methodologies - Distribution of Limit Overages*



## *Chart 7: Alternative Exposure Measurement Methodologies - Distribution of Limit Overages (with all counterparties subject to 25% limit)*



## 5.4 Limitations of CEM in Measuring Single Counterparty Credit Exposures

***Highlights***

- *CEM is a significant driver of limit excesses because it fails to take fully into account the benefits of legally enforceable netting arrangements, variation margin and portfolio diversification.*
- *The 40/60 netting mix assumption required by CEM limits any netting benefit to only 60% of the gross Potential Future Exposure (PFE). The OCC points out that the average netting benefit for U.S. banks has improved from 50.6% in the first quarter of 1998 to 92.2% in the fourth quarter of 2011.*
- *Key points from comparison of CEM to alternative measures include:*
  - *Replacing CEM with the more risk-sensitive IMM would reduce derivatives counterparty exposures, on average, to only 9% of those calculated under CEM. This implicitly suggests that the actual netting mix within large and well balanced netting sets is even lower than 5/95. Using a 5/95 netting mix assumption would reduce average counterparty exposures to 25% of those calculated under the prescribed CEM methodology.*
  - *Estimates from 2 firms suggest that using 'risk bucketing' of notionals prior to the application of PFE add-on factors would reduce exposures to 55%-75% of the amount calculated under CEM.*
  - *Using an alternative stressed exposure measure, 2 firms found that based on the stress scenario prescribed under the Comprehensive Capital Analysis and Review (CCAR) exercise, average counterparty exposures would be just 30% of those calculated under CEM.*

As demonstrated in Chart 5 and Table 3, the use of the CEM methodology is a critical driver of limit breaches under the Proposed SCCL Rules. Since its introduction in the 1990s within the Basel I capital rules, the CEM has been identified as a relatively crude methodology for estimating derivative exposures. Recognizing the need for more accurate exposure measures market participants developed internal modeling capabilities to estimate important elements of the counterparty credit risk exposure embedded in derivatives transactions – especially with regard to the estimation of potential future exposures of such transactions. In reaction to enhancements in both academic and institutional risk management spheres of endeavors, supervisors adopted an IMM approach in its Advanced Basel II capital requirements in December, 2007.[17] Table 4 identifies some of the primary differences between the IMM and CEM exposure estimation approaches.

[17] Risk-Based Capital Standards: Advanced Capital Adequacy Framework – Final Rule, December 2007.

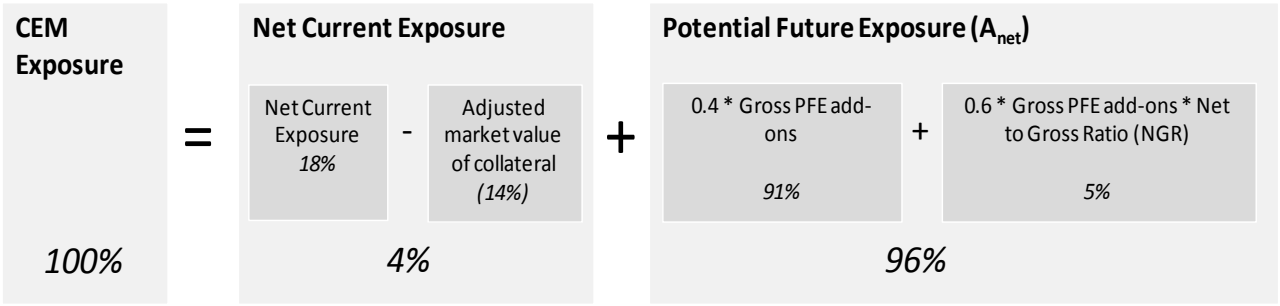
### *Table 4: Summary of Primary Differences between IMM and CEM Approaches to measuring derivative counterparty exposures*

| METHODOLOGY COMPONENTS | INTERNAL MODELS METHODOLOGY | CURRENT EXPOSURE METHODOLOGY |
|---|---|---|
| **Overall Approach** | • Uses a simulation approach to model how counterparty exposure will change over multiple future time periods. Counterparty exposure is calculated as Effective Expected Positive Exposure (EEPE), multiplied by 1.4. The definition of EEPE and the 1.4 multiplier are set by regulatory capital rules. | • Counterparty exposure is calculated as current exposure plus a formulaic add-on representing potential future exposure. |
| **Calculation granularity** | • Calculation is undertaken at a transaction level, and aggregated within a counterparty netting set | • Calculation is typically undertaken at a product level, and aggregated within a counterparty netting set |
| **Estimation of potential future changes in derivative values (potential future exposure)** | • Banks utilize stochastic risk factor models (e.g. market prices, rates, volatilities, correlations etc) and product valuation models to estimate potential change in derivative values over a range of potential adverse risk factor movements<br>• Approach naturally reflects diversification and offsets between positions | • Gross potential future exposure is based on regulatory multipliers to notional values, specified by product and maturity (or other factor)<br>• No benefit given for diversification or offset between positions |
| **Recognition of netting** | • Simulates future netted values based on contractual terms and conditions, subject to legal enforceability | • Simplistic estimation of netting benefit based on extrapolation from the ratio of current net to gross exposure; maximum benefit limited to 60% of gross add-ons |
| **Recognition of margin (collateral)** | • Simulates future margin, subject to contractual terms and conditions, legal enforceability and a regulator-specified margin period of risk | • Only recognizes current margin received, no consideration of future variation margin |
| **Risk sensitivity** | • Calculation is sensitive to changes in product values and market risk factors<br>• Under Basel III, the estimation of potential future exposure is calibrated to a stressed historical period, not current market conditions | • Not risk sensitive; CEM exposure is primarily driven by changes in notional volumes |

Chart 8 below illustrates the calculation of the CEM counterparty exposures as the sum of a derivative transaction's current exposure plus potential future exposure. Under the CEM, PFE is estimated using a highly simplified method for recognizing the effect of netting in measuring counterparty exposures. This simplified method essentially measures counterparty exposure based on a 40% proportion of the gross exposure, and a 60% proportion of approximated net exposures. The approximated net exposures are extrapolated from the ratio of net to gross current exposure.

In the context of the TCH study, across the Participating Banks the estimate of the PFE component of CEM constitutes 96% of the estimated exposures using this methodology. In turn, 91% of exposures using CEM is driven by the 40% multiplier applied to gross notionals regardless of any netting arrangements. The analysis depicted in Chart 8 was performed using additional data on the CEM calculation components provided by five Participating Banks with large derivatives portfolios and represents an analysis of total exposure to all counterparties associated with limit excesses for those five banks. The following discussions explore the effect that the various assumptions embedded in the CEM exposure estimation methodology have on the estimated exposures of Participating Banks.

***Chart 8: Breakdown of the CEM formula component contributions for limit excess incidents***




Netting Mix

The 40/60[18] netting mix assumption required by CEM[19] limits any netting benefit to only 60% of the gross Potential Future Exposure.[20] This formula was originally calibrated in the 1990s, when qualified master netting agreements were new, and has since become outdated as the benefits of netting agreements have been tested in financial markets and recognized by banks and regulators alike. As the Office of the Comptroller of the Currency's (OCC) "Quarterly Report on Bank Trading and Derivatives Activities" notes, the dynamics of netting benefits have evolved considerably since the CEM formula was originally

[18] 40/60 mix indicates the recognition of netting benefits for only 60% of the gross Potential Future Exposure (PFE).
[19] Appendix 8.5 provides more details on the CEM formula as prescribed in the U.S. Basel II Final Rule.
[20] Potential Future Exposure (PFE) refers to the potential increase in exposure that could result from changes in derivative values due to adverse movements in market prices, risk factors, etc.

calibrated. Indeed, the OCC points out that the average netting benefit for U.S. banks has improved from 50.6% in the first quarter of 1998 to 92.2% in the fourth quarter of 2011.[21] Moreover, data submitted by Participating Banks regarding the actual amount of netting reflected in their internal model measurement of derivatives exposures suggest that the actual netting mix within most large dealer institutions is in the range of 5/95. Based on the study data, the average and median Net to Gross Ratios for the large and well balanced netting sets associated with limit excesses are estimated at 3.5% and 2.1% respectively, which translates to a netting benefit (in current exposure terms[22]) of greater than 95%.

Comparison to risk-based portfolio netting (based on TriOptima style netting)

To further illustrate the implications of the simplified netting assumptions required by the CEM calculation, the TCH study conducted further analysis. Under CEM, two perfectly offsetting trades would receive an exposure charge that is based on 40% of the gross notional of the two trades, even though the net economic risk of these offsetting positions is zero. Large netting sets, containing thousands of trades, would typically have numerous instances of such offsetting trades. The CEM methodology also offers limited recognition for collateral held against such exposures. Under normal business practices, derivative transactions are marked to market daily with the exchange of collateral among counterparties to meet variations in current exposures. Such variation margining controls exposures on an ongoing basis and limits potential future exposure. Under the CEM there is no recognition of such variation margining.

In light of the issues surrounding the recognition of netting within the CEM, two Participating Banks with large derivatives portfolios undertook an analysis to quantify the extent to which typical large inter-dealer netting sets contain such offsetting positions on a portfolio basis. The analysis considered the extent to which trades within a sample of netting sets naturally offset within 'risk buckets', in order to calculate a 'net notional' position within each risk bucket. For example, interest rate notionals were netted within currency and maturity buckets, and CDS notionals were netted for reference obligation/index and maturity buckets. The banks then calculated their CEM exposures using the resulting net notionals for each risk bucket rather than the gross notionals required by the Proposed SCCL Rules.

The 'risk bucketing' approach is similar to the approach taken in multilateral compression exercises (e.g., TriOptima), although this exercise was done on a bilateral basis. The approach is also similar to the 'supervisory hedging set concept' used under the International BCBS and European Capital Requirements Directive (CRD) standardized approach to counterparty exposure measurement.[23]

The two banks found that the 'risk bucketing' analysis significantly reduced exposures relative to the CEM, thus highlighting the extent to which the CEM is risk-insensitive to the dynamics of netting. For the samples

[21] Office of the Comptroller of the Currency, "Quarterly Report on Bank Trading and Derivatives."
[22] In this context, Current Exposure is the greater of zero or the net mark-to-market of all derivative contracts in the netting set.
[23] Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework – Comprehensive Version, June 2006.

considered by the two banks, the resulting CEM exposures using the net notionals were, on average, 55%-75% of the CEM using the gross notionals per the Proposed SCCL Rules; reductions were similar for both interest rate and credit derivatives. In effect, this analysis identified the illogical consequence that portfolios with different gross notionals but the same economic exposures could have significantly different counterparty exposures under CEM. The analysis also showed that the CEM overstatement is particularly acute for interbank portfolios, which are characterized by a high number of transactions but low net risk (rather than the standard bank portfolios for which CEM was designed, which are characterized by long positions held to maturity).

It should be noted that this exercise was undertaken to demonstrate the limitations of CEM. It was not intended as a proposed alternative measurement approach. Although it is conceptually similar to portfolio compression, it does not represent an estimate of potential compression capacity given other practical and risk management constraints that limit the capacity of covered companies to participate in compression exercises (see discussion in Section 6). This analysis also did not address the other areas where CEM overstates exposures, such as CEM's inability to capture portfolio effects in the underlying risk drivers of exposures and its failure to fully recognize variation margin.

Table 5 presents a summary of the analyses undertaken to assess the affects of the CEM's assumptions on bilateral netting on its use in measuring counterparty exposures of derivatives transactions. The table demonstrates that CEM results in dramatically higher exposures than:

- Exposures calculated using banks' Basel II IMM estimates, as permitted for regulatory capital purposes, that are consistent with the metrics used to risk manage their exposures. The wide range of outcomes under IMM ranging from 5% to 20% of the CEM calculations highlights the difficulties in applying the CEM methodology to interbank portfolios. The IMM estimates implicitly suggest that the actual netting mix within large and well balanced netting sets is even lower than 5/95 (i.e., the actual amount of enforceable netting benefit is more than 95% of the transactions in a netting set).

- Stressed Exposures under the Federal Reserve's shock scenario as prescribed in the 2012 Comprehensive Capital Analysis and Review (CCAR) exercise.

- CEM exposures with 'risk bucketing' of notionals prior to the application of PFE add-on factors.

***Table 5: Comparison of exposure estimates based on alternative methodologies***

| METHOD | AVERAGE PERCENTAGE OF EXPOSURE CALCULATED USING CEM |
|---|---|
| CEM with risk bucketing (and 40/60 netting) | Approximately 55%-75%[24] |
| Stress exposure under FRB CCAR scenario | Ranges from 10%-50% by counterparty, average approximately 30%[25] |
| Basel II IMM estimate[26] | Ranges from 5%-20% by counterparty, average 9% |
| CEM with 5/95 netting mix | Ranges from 10-70% by counterparty, approximately average 25% |

*Please refer to appendix 8.5 for additional examples highlighting the limitations of the CEM.*

## 5.5 Protection Provider Reference Asset Composition

***Highlights***

- *The distribution of reference assets for the limit excess incidents demonstrates significant diversification of the underlying reference assets. A diversified portfolio has a significantly lower risk profile than that suggested by the notional-based approach under the Proposed SCCL Rules.*

The Proposed SCCL Rules require banks to consider protection provider exposures on a notional basis, even though a loss of this magnitude could only be realized if both the protection provider and all underlying reference assets defaulted simultaneously, with no variation margin received prior to the default or no recovery after the default. Study data suggest significant diversification of the underlying reference assets for typical aggregate exposures to protection providers, which has the effect of reducing the risk profile of the portfolio.

This analysis was performed using additional data provided by four Participating Banks with large derivatives portfolios.

[24] Results based on estimates provided by 2 Participating Banks only.
[25] Results based on estimates provided by 2 Participating Banks only. Represents stress exposure under the Federal Reserve's CCAR 2012 trading book shocks, assuming an instantaneous shock and no remargining.
[26] IMM estimates are calculated as Effective EPE * 1.4 alpha multiplier, or comparable measure.

***Table 6: Distribution by reference asset sectors***

| UNDERLYING REFERENCE ASSET SECTOR | NOTIONAL RISK-SHIFTED (% OF TOTAL) |
|---|---|
| Banks | 11% |
| Non-bank financial institutions (NBFIs) | 7% |
| Sovereigns | 18% |
| Corporates/others | 64% |
| **Total** | **100%** |

Table 7 provides a measure of the concentration of banks to a single protection provider and reference asset. For example, in 64% of limit excess incidents, the single largest reference asset accounts for less than 5% of the total notional that is risk-shifted to the protection provider. The table also indicates the proportion of the total notional that is risk-shifted to the protection provider associated with the various concentration bands (i.e., <5%, 5-10% and 10-20%). For example, the total notional associated with 64% of the incidents where the single largest reference asset is less than 5% of the total notional risk-shifted is 71% of the aggregate notional risk shifted to the protection provider across all limit excess incidents.

***Table 7: Largest reference asset***

| LARGEST REFERENCE ASSET AS % OF RISK-SHIFTED NOTIONAL | LIMIT EXCESS INCIDENTS (% OF TOTAL) | NOTIONAL RISK SHIFTED (% OF TOTAL) |
|---|---|---|
| <5% | 64% | 71% |
| 5-10% | 26% | 22% |
| 10-20% | 10% | 7% |
| **Total** | **100%** | **100%** |

# 6. ASSESSMENT OF POTENTIAL MARKET IMPACTS

This section assesses the potential changes in market conditions if the Proposed SCCL Rules are implemented as written, including changes in market making activities, overall market liquidity, and the supply and demand conditions faced by financial market end-users. If the Proposed SCCL Rules become effective as of October 1, 2013 as proposed,[27] the short implementation timeframe would magnify the potential for dislocations in the marketplace.

In bringing their SCCL exposures into compliance with the Proposed SCCL Rules, covered companies will have to choose among potential reductions in different types of credit, including direct loan exposures. However, given the magnitude of derivatives-related and securities financing exposures relative to lending and other drivers of limit excesses, in a majority of cases, a significant reduction in both these exposures would be necessary to bring overall exposures within the required limits. Roughly two-thirds of all the limit excess incidents estimated by this study could not be addressed without reducing covered companies' derivatives exposures to constrained counterparties.

To assess these potential impacts, this study adopted a framework based on the following questions for Participating Banks:

- ***Rebalancing of outstanding activity:***
  - Can covered companies reduce their exposures by additional hedging, rebalancing from constrained to non-constrained counterparties, or other methods?
  - What capacity exists in the market for such options and methods to absorb the estimated limit excesses?
  - What operational or market impediments to these options exist?
- ***Changing the balance in market supply/demand:***
  - If activity must be reduced to meet exposure limits, what reduction actions are feasible?
  - Can new providers supplement market supply?
- ***End-user impacts:***
  - Which end-users and consumers are most likely to be affected by the changing balance in market supply/demand?
  - What are the consequences and alternatives for these end-users if product availability decreases with a potential impact on prices?

The remainder of this section uses this framework to assess potential changes in marketplace conditions for derivatives exposure and securities financing transactions.

[27] Per section 252.91 (a)(2) of the Proposed SCCL Rules

## 6.1 Derivatives Exposures

***Highlights***

- *Total estimated derivatives notionals outstanding with constrained counterparties ($140 trillion) represent:*
  - *53% of the total notional derivatives outstanding for the Participating Banks.*
  - *22% of global derivatives notionals outstanding.*
- *Estimated credit derivatives notionals outstanding with constrained counterparties ($12 trillion) is:*
  - *67% of the total credit derivatives outstanding for the Participating Banks.*
  - *41% of global notional credit derivatives outstanding.*
- *The estimated required reduction or rebalancing in outstanding OTC derivatives notionals to bring constrained counterparties within limits as calculated under the Proposed SCCL Rules could be in the range of $30-$75 trillion, which is approximately 40% to 102% of the $74 trillion average annual notional value of derivatives transactions conducted by US BHCs from 2002-2011.*
- *No single exposure reduction or rebalancing mechanism (buying credit protection, CCP migration if exempted, portfolio compression, tear-ups, etc.) appears to be sufficient on a stand-alone basis to achieve this required reduction.*
  - *There are limited available providers of credit protection at the necessary scale that are not already subject to limit constraints*
  - *Even if CCPs are exempted and U.S. BHCs ceased all new non-clearable business, run-off of existing portfolios would be insufficient to bring counterparty exposures within limits*
  - *Portfolio compression and tear-up exercises face multiple practical barriers and coordination challenges given the required scale, and incentives may not be aligned between U.S. BHCs and foreign banking organizations*
- *There could be significant challenges associated with rebalancing exposures to non-constrained counterparties given currently available market capacity. Assuming no entry of alternative providers, the total theoretically achievable reduction through such rebalancing was estimated at only 20%-30% of derivatives overages before all limits are utilized, absent additional compression effects.*
- *Significant retrenchment of existing dealers in the OTC derivatives market (especially acute in the interest rate and credit derivatives markets) would be necessary if the Proposed SCCL Rules were implemented without modification.*
- *A large proportion of lost capacity may flow to non-U.S. banking organizations and other U.S. firms (such as regional banks), but we have not studied whether these firms will be able or willing to scale to the necessary activity levels, particularly in the short time-frame available, or that they could or would be willing to scale the appropriate risk-management expertise along with credit, operational, legal, and documentation systems infrastructure in such a short period of time.*
- *Affected market participants include end-users of derivatives, such as regional and community banks, corporates, GSEs, pension funds and other institutional investors. In turn, there could be knock-on effects on consumer borrowers and investors that rely on these market participants.*

For covered companies to bring their exposures within the prescribed limits as they are calculated under the Proposed SCCL Rules, they would need to: 1) rebalance their derivatives activities among counterparties by moving exposures from constrained counterparties to non-constrained ones, if such counterparties are available; and/or 2) reduce overall derivatives product offerings.

To provide some context for the scale of rebalancing or exposure reduction needed, and given that both the CEM and protection provider risk-shifting exposure are driven by notional values, this study attempts to estimate the magnitude of rebalancing and the reduction needed in notional terms.

Table 8 provides insights into what types of derivative products might be most affected by the required reductions stemming from the Proposed SCCL Rules. Columns 2 and 3 illustrate that the notional amount of derivatives associated with counterparties that incurred limit excesses under the Proposed SCCL Rules is distributed primarily in interest rate contracts (84%) and credit derivatives (9%). This reflects the overall derivatives product distribution of the Participating Banks (columns 4 and 5), and the global derivatives market (columns 6 and 7).

***Table 8: SCCL Study Over the Counter (OTC) derivatives notional outstanding compared to U.S. and Global OTC outstandings*** [28]

| DERIVATIVE TYPE | NOTIONAL OUTSTANDING WITH CONSTRAINED COUNTERPARTIES | | TOTAL OTC OUTSTANDINGS FOR PARTICIPATING BANKS AS OF 12/31/11 [29] | | GLOBAL OTC MARKET OUTSTANDINGS AS OF 12/31/11 [30] | |
|---|---|---|---|---|---|---|
| | $ in trillions [Column 2] | % of total outstandings [31] [Column 3] | $ in trillions [Column 4] | % of total outstandings [Column 5] | $ in trillions [Column 6] | % of total outstandings [Column 7] |
| Interest Rate | 117 | 84% | 215 | 81% | 504 | 78% |
| FX | 9 | 6% | 27 | 10% | 63 | 10% |
| Equities | 1 | 1% | 2 | 1% | 6 | 1% |
| Commodities | 0.5 | 0% | 2 | 1% | 3 | 0% |
| Credit | 12 | 9% | 18 | 7% | 29 | 4% |
| Unallocated | – | – | – | – | 43 | 7% |
| **Total** | **140** | **100%** | **265** | **100%** | **648** | **100%** |
| **Memo: inter-dealer eliminations** [32] | **22** | **16%** | **22** | **8%** | **>200** [33] | **31%** |

Estimating the notional activity that needs to be reduced or shifted, if possible, requires: 1) a number of assumptions regarding the types of derivatives products that are likely to be reduced, 2) an assumption regarding the extent to which netting sets retain similar net-to-gross ratios after these exposures are reduced, and 3) a quantification of the relative reduction in exposures risk-shifted to protection providers through a reduction in credit derivative notionals. As is clear from Table 8, affected covered companies would likely have to focus principally on reducing interest rate and credit derivatives outstandings. Other derivative types could contribute to reducing exposures, but are significantly less material for meeting the limits under the Proposed SCCL Rules. Using some simplifying assumptions, this study estimated the

[28] The comparison is based on total notionals which is not representative of the actual credit exposure that firms use as a measure of risk.
[29] Source: FR Y-9C filings as of 12/31/2011, less estimated inter-dealer eliminations. Excludes exchange-traded contracts. Inter-dealer eliminations have been estimated using study data.
[30] Source: BIS Semiannual OTC derivatives statistics as of 12/31/2011.
[31] Indicates the proportion of individual product classes to total outstandings for each category (i.e., notionals outstanding with constrained counterparties, total OTC outstandings for participating banks and global OTC market outstandings).
[32] Notes the amount of inter-dealer eliminations that are already included in the above totals.
[33] BIS data is reported net of inter-dealer eliminations. Estimated based on BIS disclosed methodology.

order of magnitude of the required reduction or rebalancing for each counterparty with limit excesses under two scenarios:

- Scenario 1 assumed a reduction in credit derivative notionals outstanding first, followed by a reduction in interest rate derivative notionals, and then other derivative types, if required. This is because CEM imposes the highest charges for credit derivatives, and because interest rate derivatives make up the largest notional amount of exposure.

- Scenario 2 assumed an equally proportional reduction across all derivative types.

The analysis conducted using these scenarios indicated that the estimated required reduction or rebalancing in outstanding OTC derivative notionals could be in the range of $30-$75 trillion, with the lower estimate associated with Scenario 1 and the higher estimate associated with Scenario 2. Relative to the notional amounts summarized in section 5.2, this estimated required reduction range is equivalent to roughly 20%-50% of the total outstanding notionals exceeding the proposed counterparty limits, 10%-25% of the outstanding notionals for all U.S. BHCs, and 5%-10% of the global derivatives market. Importantly, when compared to average annual growth and annual replacement of maturing derivatives contracts from 2002 through 2011 of approximately $74 trillion, the estimated required reduction range amounts to roughly 40% to 102% of estimated annual average "market demand".

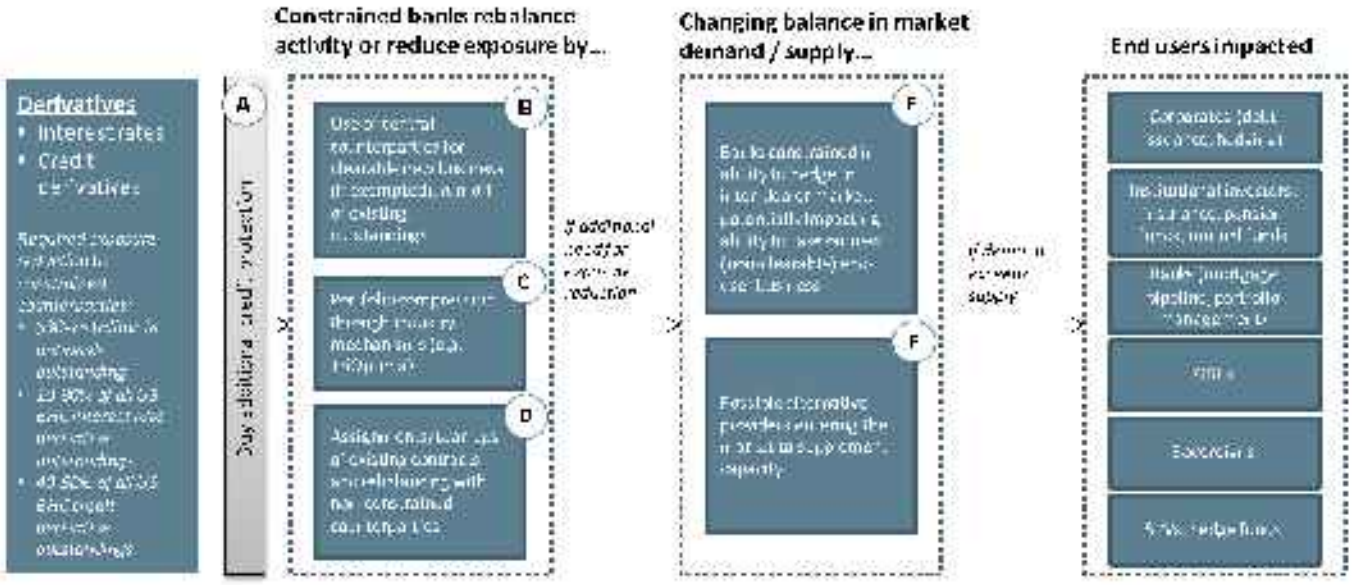
The $30-$75 trillion estimated required reduction in notional values includes approximately $10-$20 trillion in reductions of outstanding derivative notionals with CCPs. These estimates also include a required reduction or rebalancing for credit derivatives in the range of $8-$12 trillion. This represents approximately 35%-50% of the total outstanding derivative notionals for all U.S. BHCs and an estimated 265% to 398% of the average annual growth and annual replacement of maturing credit derivative contracts from 2002 through 2011 of $3 trillion.[34] These estimates assume that banks manage their exposures to be just within the Proposed SCCL limits. In reality, banks would manage to a lower 'management threshold' and the required reduction/rebalancing would, therefore, be larger than the above estimates.

Chart 9 presents a schematic for describing the potential impact considerations for the derivatives markets of alternative approaches to bringing exposures within the limits required by the Proposed SCCL Rule. Chart 9 is a simplified, qualitative representation of a very complex set of market dynamics. However, it does provide a useful framework for discussing the questions posed. The remainder of this section discusses the factors to be considered and the contextual information regarding the capacity or impact of each component in this framework. The insights presented were summarized from discussions with Participating Banks and a careful review of comment letters. As a result, they represent the aggregation of views of Participating Banks rather than an independent analysis.

[34] Per the OCC's quarterly derivatives report as of 12/31/2011, the total notional for outstanding credit derivatives at U.S. BHCs was $22bn.

***Chart 9 and the components within it are presented to facilitate a balanced discussion of impact considerations. The diagram is not meant to suggest that all of these components have sufficient capacity to absorb the excesses or are commercially viable. In fact, in many cases, the subsequent discussion of these components highlights the potential lack of capacity, commercial viability or practical barriers to possible rebalancing activities.***

***Chart 9: Derivatives Exposures – Potential Market Change Framework***




## REBALANCING OF OUTSTANDING ACTIVITY

### *A. Buy Additional Credit Protection*

As a first theoretical option, covered companies could buy additional credit protection from non-constrained counterparties to reduce their derivatives. Participating Banks noted that, while in theory this is possible, it is unlikely to be a practical or adequate solution because:

- There is likely to be insufficient capacity among non-constrained existing credit protection providers to supply the quantity of required protection, particularly in the short implementation period proposed.
- The purchased protection would likely give rise to significant short market risk positions, as the market values of the new derivatives would be set at levels that would not match many of the positions that the original derivatives had offset. As a result, efforts to reduce counterparty credit risk to comply with the Proposed SCCL Rules would raise market risk profiles, which in

turn would require an increase in counterparty credit exposures necessary to mitigate or hedge this increased market risk.

***B. Transition to CCPs and portfolio run-off***

A second element in considering changes in marketplace dynamics is how inter-dealer outstandings might change given the migration to a central clearing model. Notwithstanding any constraints that would be imposed by the Proposed SCCL Rules, over the long-run a significant proportion of new derivatives business is expected to be clearable. Estimates from the banks interviewed suggested a fairly high proportion of new business will be clearable in interest rate derivatives, and a significant proportion in credit derivatives as well. However, it is important to note that there are numerous products offered today by banks that are not expected to be clearable, and the transition to a steady-state of central clearing for OTC derivatives is still in its early stages.

Even if all new business were currently clearable, existing outstanding OTC transactions would take several years to run-off and be replaced by clearable transactions. Based on FR Y-9C maturity data for the large U.S. derivatives dealers, on a run-off basis, and assuming no new business, CEM exposures could be reduced by approximately 10% in the first year for interest rate derivatives, and between 20% and 25% in the first year for credit derivatives, with smaller reductions in subsequent years. Even if banks restricted all new business to only clearable products, and ceased trading in non-clearable products (see later discussion of potential end-user impacts), portfolio run-off rates may not be sufficient to address the reduction in exposures needed to bring banks within the Proposed SCCL Rules limits in the required timeframe.

A further unquantified factor is the extent to which existing outstanding contracts are eligible for clearing and could be migrated to CCPs in a scenario where CCPs are exempted from the limits under the final SCCL Rules.

***C. Portfolio compression***

Portfolio compression enables dealers with substantial derivatives activity to terminate and replace swaps contracts before they expire. Portfolio compression reduces counterparty exposures, enabling participating dealers to eliminate trades in cases where the risks offset one another according to the parameters agreed by each participant. Portfolio compression requires acceptance of some market risk by the banks participating in the compression exercise, as trades are generally offset within defined 'risk buckets' and not within precise contractual terms. To minimize such risk, the risk buckets are, by current practice, typically set fairly tight. Industry portfolio compression services such as TriOptima typically conduct compression transactions among multiple institutions to enhance the economics and efficiency of the compression exercise but the net result reduces bilateral exposures among the Participating Banks. Such

compression exercises have been executed for a number of years and a February 2012 ISDA study[35] estimated that portfolio compression activities had reduced outstanding interest rate derivative notionals by 30% since 2003, although this is not necessarily an indicator of potential future benefits of such exercises since much of the easily "compressible" transactions have already been eliminated. Moreover, it is important to note that there is not a one-to-one relationship in the reduction of notionals and the reduction in actual economic counterparty exposures.

Also, in the context of the Proposed SCCL Rules, portfolio compression might theoretically reduce gross notionals and therefore CEM exposures, but not protection provider exposures arising from risk-shifting. Discussions with Participating Banks noted the following challenges related to portfolio compression:

- **Netting benefits:** While portfolio compression might be effective in reducing gross notionals and CEM exposures, banks already have netting agreements in place and incorporate them in their internal exposure and capital calculations. As a result, actual economic counterparty exposures are already mitigated and it is not clear what the value added of such an exercise would be from a true credit risk reduction perspective. Participating Banks viewed compression exercises as an expensive approach to meeting a flawed calculation methodology rather than as a way of reducing true exposures.

- **Market risk:** To be effective on the required scale, the portfolio compression parameters necessary would likely require looser 'risk bucketing,' causing banks to take on greater market risk than is reflected in current netting agreements. The net result would be to incur additional costs, and potentially assume additional market risk to rebalance positions to meet limits.

- **Participation by non-US banks:** Since foreign banks are not subject to the Proposed SCCL Rules, they would not face the same incentives as U.S. banks, and might therefore be unlikely to participate in portfolio compression exercises; this would limit the potential participants in multilateral compression exercises and thus the potential reductions in exposures.

### *D. Assignments/tear-ups of existing contracts and rebalancing with non-constrained counterparties*

Banks could also tear-up or re-assign contracts on a bilateral basis, with the goal of redistributing their exposures to non-constrained counterparties. Discussions with Participating Banks highlighted the following challenges to this alternative:

- The volume of transactions required and the manual nature of the process would make such an exercise difficult and costly to conduct on the required scale;

[35] ISDA Study, Interest Rate Swaps Compression: A Progress Report, February, 2012.

- Banks would most likely have to assume more market risk for trades that cannot be quickly rebalanced with alternative counterparties;
- The scale and timing would create the potential for substantial market disruptions; and
- Unlike portfolio compression, assignments require a new counterparty to replace the canceled trades, and there would most likely be only a limited number of such existing counterparties that are not already constrained themselves.
- Similarly to the above discussion on portfolio compression, tear-up incentives may not be aligned between U.S. banks and foreign bank or non-bank counterparties that are not subject to the same SCCL constraints.

**Theoretical Capacity for Rebalancing**

Notwithstanding the uncertainties identified, this study attempted to assess, on a theoretical basis, the capacity of the market to absorb such rebalancing. Specifically, this study considered the extent to which derivatives exposures could be rebalanced with non-CCP counterparties and how much of the limit excesses estimated under the Proposed SCCL Rules could be reduced by reallocation to non-constrained counterparties. This analysis is intended only to answer the question of whether the financial system has sufficient capacity to support current U.S. bank derivatives exposures in aggregate, as measured under the Proposed SCCL Rules. It does not consider the ability or willingness of non-constrained counterparties to scale their infrastructure to increase activity, or to increase their risk appetite regarding derivatives markets.

The analysis reallocated limit excesses estimated under the Proposed SCCL Rules for each firm to its non-constrained counterparties considering the following:

- The remaining capacity that could be used for existing counterparties below the SCCL limits, for which data was submitted in this study; and
- How much additional rebalancing could be performed with additional counterparties not identified in a given firm's specific data submissions (which indicated that such counterparties were known to be below the limit), but to which another firm may have reported derivatives exposures, indicating viability as a derivatives counterparty.

The analysis made the following assumptions regarding exposure rebalancing and the range of derivatives- counterparties:

- **Amount of exposure rebalanced:** As identified in section 5.2, exposures are primarily driven by either: 1) the [0.4* $A_{gross}$* PFE add-on] term in the CEM formula, which is volume driven

and which does not take full account of netting and collateral; or 2) the notional exposure to a counterparty as a protection provider. Given the volume-driven nature of these calculations, and assuming that covered companies need to maintain the same transactions (regardless of counterparty) to hedge their overall market risk exposures, the analysis used the simple assumption that the aggregate amount of notional activity, and therefore total SCCL dollar exposures, would be maintained in the system overall and simply be shifted between banks. In practice, some degree of notional compression might be expected as a natural efficiency from such a tear-up process.

- **Range of counterparties:** As part of this study, Participating Banks provided exposure estimates for a range of derivatives counterparties that are at or above 80% of the limit. The aggregate list of derivatives counterparties across all banks was assumed to be the initial list of potential derivatives counterparties available to all institutions for rebalancing. The aggregate list was cross-referenced to the list of G16 dealers, as well as derivatives activity for the 28 Global Systemically Important Banks (G-SIBs) and top 50 global banks by assets, and is considered to be a representative list of existing derivatives counterparties.

- **Non-constrained counterparty capacity:** Where Participating Banks did not include an exposure estimate for a counterparty in the aggregate list of counterparties, it was assumed that these banks had zero exposure to these counterparties before the theoretical rebalancing exercise. This constitutes an additional conservative assumption. Available capacity then depended on whether the counterparty was a G16 dealer.[36] It was assumed that banks' activity with G16 dealer counterparties could be scaled up to utilize any remaining capacity relative to the 10% limit. Non-G16 dealers were assumed to also increase their capacity and therefore covered companies were assumed to rebalance exposures to these non-G16 dealer counterparties up to the lower of: 1) the approximate average exposure to the smallest of the existing G16 dealers, or 2) the 10% limit for each firm.

The resulting estimates showed that rebalancing under these generally conservative assumptions, would likely be insufficient to offset the total overages resulting from Participating Banks' derivatives exposures as calculated under the Proposed SCCL Rules. As a pure indicator of counterparty capacity, assuming no entry of alternative providers, the total theoretically achievable reduction was estimated at only 20%-30% of derivatives overages (not total overages), as calculated according to the Proposed SCCL Rules and not considering any resulting notional compression effects. Notwithstanding the other assumptions in this estimate, the range is dependent on the 'management threshold' (i.e. utilization level) that banks would use relative to the actual 10% and 25% limits.

[36] G16 dealers are the largest sixteen derivative dealers globally. The G-16 dealers include: Bank of America, Barclays Capital, BNP Paribas, Citigroup, Credit Agricole, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC Group, J.P. Morgan, Morgan Stanley, Nomura, The Royal Bank of Scotland Group, Societe Generale, UBS AG and Wells Fargo Bank.

## IMPACT ON MARKET SUPPLY/DEMAND

### *E. Potential market response to constraints*

The limited ability to reduce exposures and to expand market capacity through rebalancing or the compression of existing portfolios, along with the expected long lead-times entailed in the market transition to CCPs, suggests that the implementation of the Proposed SCCL Rules could require significant retrenchment of existing dealers in the OTC derivatives markets. Participating Banks suggested that their responses might include:

- In the initial months following the release of the final rule, there could be an immediate loss of liquidity in the derivatives markets as covered companies seek to bring their exposures within limits. This contraction would be expected to be especially acute in the interest rate and credit derivatives markets given their size and contribution to CEM exposures. Other derivatives markets in foreign exchange, commodities and equities could also be affected, since covered companies might to limit new activity in these businesses to avoid increasing their counterparty exposures;

- Limiting acceptance of new non-clearable business from end-users until a non-constrained counterparty or end-user to hedge the trade could be found;

- If CCPs were excluded from exposure limits, offering mostly clearable products to customers, with prior agreement from CCPs and counterparties that most business must be centrally cleared;

- If CCPs are not exempted, a potentially significant reduction in the acceptance of clearable business;

- Derivatives markets would likely unwind to a subset of current product offerings with potential consequences for end-user availability and pricing; and

- U.S. covered companies could try to extract the value in their existing derivatives franchises by selling businesses to non-US buyers who are less constrained by their respective large exposure regime.

### *F. Alternative providers*

Due to the counterparty credit quality constraints of many institutional end-users of derivatives, Participating Banks do not expect that hedge funds or other non-bank participants could supply all of the necessary capacity. For example, most state and corporate pension funds, endowments and trusts, and

corporate pension funds across a wide range of industries, restrict their investments and derivatives counterparties to highly-rated entities. In the case of some public state and local institutional investors, such requirements are statutory. These restrictions could prevent hedge funds and other non-bank institutions from meeting sufficient market demand to absorb the required reduction in industry notionals outstanding.

Rather, it would be expected that the bulk of reductions in notional values outstanding would flow to other financial institutions. Since the top five U.S. BHCs at which many of the excesses under the Proposed SCCL Rules occur hold 95.7% of total notional derivatives outstandings held by all U.S. commercial banks (or roughly $276 trillion)[37] much of the lost capacity would be expected to flow to other regulated U.S. banks and non-U.S. banking organizations.

The estimated required reduction in notionals would amount to between 3 and 7 times the current outstandings at all other U.S. banks. We have not studied whether large US regional banks could or would be willing to absorb the necessary volume by investing in both the risk management expertise and necessary infrastructure, particularly given the short implementation window. This study has not collected information from those institutions.

## END-USER AND CONSUMER IMPACTS

### *Interest rate derivatives*

The loss of existing capacity, and the inability of the market to quickly absorb it, have the potential to both reduce supply and therefore increase the cost of interest rate derivative transactions that are integral tools in the risk management of many financial and non-financial organizations. It would be expected that the most affected end-users could be those that require, for risk management purposes, more bespoke interest rate products with optionality that is not reflected in standardized centrally cleared products. Constrained dealers would be unable to hedge such OTC derivatives positions in the inter-dealer market. Moreover, if CCPs are not exempted, even those counterparties whose demands could be met with standardized clearable products might find their access restricted under the Proposed SCCL Rules. Specific end-users that could be affected include:

- **Regional and community financial institutions, and consumer/small business financing:** Most regional and community banking organizations as well as large and small credit unions hedge their interest rate risks either directly or indirectly with products that can ultimately be traced back to dealer banks. This, in turn, enables these smaller institutions to provide fixed rate products to businesses of various sizes and consumers including fixed-rate residential mortgages and fixed rate consumer and small business loans. Residential mortgage originations, securitization pipelines and holdings of retained mortgages and

[37] OCC and call report data (for the year ended December 31, 2011).

mortgage securities of these institutions could be affected by limits on these institutions' risk management opportunities. Ultimately consumers and small businesses may face higher costs or reduced availability for a wide array of fixed-rate loan products.

For example, a Homeowner desires to take out a mortgage loan from a Bank. Bank would need to hedge the interest rate risk of the mortgage in accordance with standard risk management. Under the SCCL proposed rules, Bank could be constrained in its ability to purchase interest rate derivatives to hedge its exposure to Homeowner. Limited access to interest rate derivatives hedging would force Bank and other large banks—which originate most mortgages in the United States today—to reflect the price of the un-hedged risk in the mortgage loan to the homeowner or not make the loan at all.

- **Corporate debt issuances:** Corporate borrowers and their debt underwriters often use bespoke interest rate and FX products to hedge their debt issuances and thus may face higher debt issuance costs.

  For example, a Company may wish to raise funds for expansion through the debt markets, but because investor demand of Company's debt is greater in Europe than in the United States, Company may choose to issue debt in that market. Since Company needs U.S. dollars, however, to purchase land and materials for its expansion, Company is exposed to Euro-U.S. Dollar foreign exchange risk unless Company can execute a foreign exchange swap at the time of issuing its bonds in Europe. If U.S. Banks are constrained from executing the swap with Company due to their inability to hedge their risks in the interbank market, Company will be forced to purchase foreign exchange protection from a more limited group of hedge providers (possibly at a higher price), choose not to hedge and accept Euro interest rate and currency risk, or choose to borrow from saturated U.S. investors through a more expensive offering.

- **Government Sponsored Entities (GSEs):** GSEs use bespoke, non-clearable interest rate products to hedge their sizeable portfolios and pipelines given the complex optionality within these portfolios.

- **Pension funds and other institutional investors:** Pension funds use non-clearable long-dated swaps and inflation/options products to hedge their long-term liabilities and manage the duration of their asset portfolios.

- **Special Purpose Entities:** Special purpose entities such as credit card and mortgage securitizations use interest rate products to hedge the fixed rate notes issued to investors.

***Credit derivatives***

As with interest rate derivatives, end-users most potentially affected by the changes in marketplace dynamics and reduced market liquidity are those that use both non-clearable and clearable credit derivatives. These include:

- **Bond issuance, credit lines and loans made to corporations and government borrowers:** Institutions constrained by the Proposed SCCL Rules would be limited in extending credit to some corporates if the exposures could not be hedged in the bespoke credit derivative markets. The impact would be particularly significant on those corporations whose single name credit derivatives are not traded on a cleared basis. The availability or unavailability of clearing in single name credit derivatives will directly affect the cost of credit to those corporations since such instruments are used by financial institutions to hedge their portfolio exposures and securities underwriting activities. The impact on smaller corporations, where the availability of credit derivatives has a significant impact on both the availability of credit and the cost of borrowing, would be even larger. The net result could be reduced credit availability or a rise in borrowing costs for many large and small corporations.

  For example, Large US Company (Company) may ask Large US Bank (Bank) for a $500 million five-year loan but for prudent risk management purposes Bank decides it should only have $200 million of exposure to Company. Bank would try to purchase $300 million of credit protection in the market but because the SCCL proposed rules will restrict Bank's ability to purchase credit protection from other banks, the $500 million loan will be more expensive for Company or Bank will shrink it to a $200 million loan.

- **Pension funds and other institutional investors:** The Proposed SCCL Rules would likely result in the decline of the non-cleared CDS market. If non-US banks could not replace the capacity currently provided by U.S. covered companies, credit derivative coverage could be limited to a finite set of predominantly investment-grade clearable names globally. Index tranches could become difficult for banks to hedge if too few underlying names are clearable. Institutional investors such as pension funds and insurance companies use index products to hedge their bond portfolios.

## 6.2 Non-U.S. Sovereigns and Securities Lending Exposures

***Highlights***

- *Study data corroborates the RMA Committee on Securities Lending's estimated reduction in securities on loan indemnified by U.S. agent banks of approximately 30%-50%, required to bring constrained counterparties within limits.*
- *Limited capacity for agent banks to reduce their SCCL counterparty exposures through credit derivative hedging, rebalancing with non-constrained counterparties, or requiring higher collateral levels.*
- *Significant retrenchment of securities lending services to both borrowers and lenders of securities. U.S. firms could also be forced to place more restrictive limits on the acceptance of non-U.S. sovereign collateral.*
- *Lost capacity may flow to non-U.S. banking organizations and to other market participants, if these firms are able to scale to the necessary activity levels.*
- *Potentially affected market participants include lost returns to beneficial owners (lenders) of securities (pension funds and other institutional investors) as well as possible impacts on supply to borrowers of securities (central banks, securities firms).*

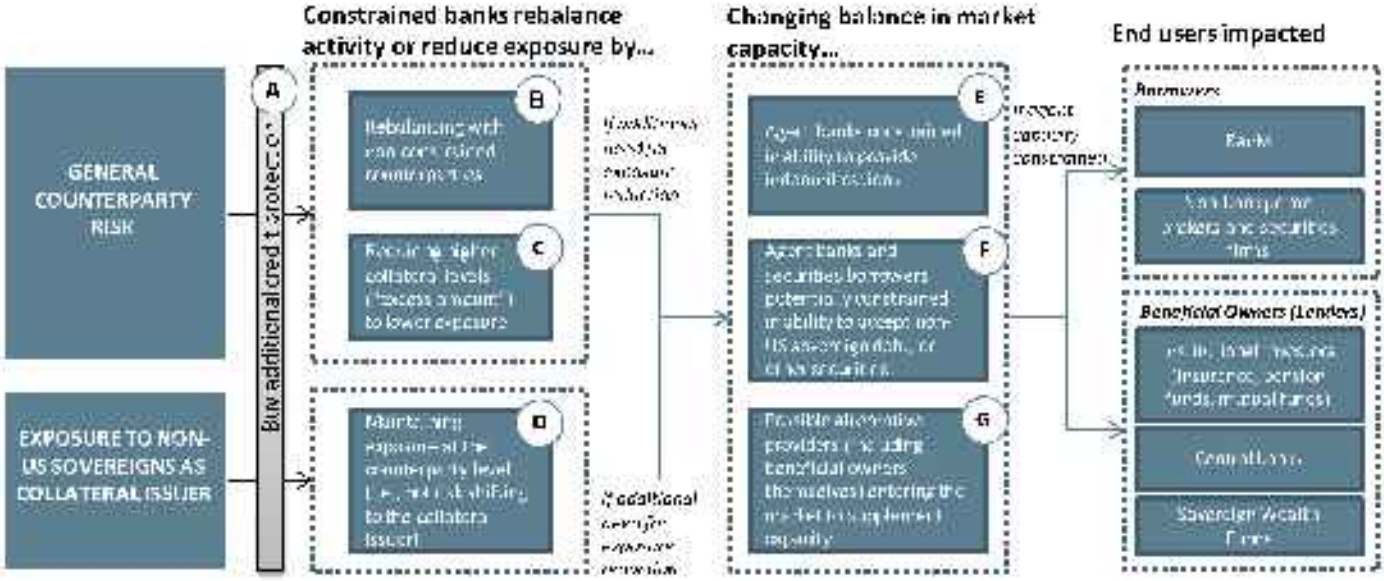
In addition to derivatives, this study also identified that Participating Banks have significant credit exposure from securities lending activities under the Proposed SCCL Rules, arising from 1) general counterparty exposure to banks as securities borrowers, 2) exposure to non-U.S. sovereigns arising from the need to risk shift the exposure to the collateral issuer when recognizing collateral as a risk mitigant to transactional counterparty exposure.

Consideration of market impacts for securities lending adopts a similar framework as applied for derivatives considering 1) Rebalancing activity or reducing exposure, 2) Changing balance in market demand/ supply, and 3) End-user impacts. In terms of providing context for the necessary reduction in activity to bring banks within limits, this study data is consistent with the possible impact noted in the RMA Committee on Securities Lending comment letter, which estimated that securities on loan indemnified by the participating U.S. agent banks would have to decrease by as much as 30%-50%.

In the securities lending market, demand comes from borrowers and supply comes from beneficial owners. Agent banks provide the infrastructure to connect this supply and demand. The limits in the Proposed SCCL Rules could constrain the ability of agent banks to support this market. Chart 10 presents a schematic for describing the potential impact considerations for the securities lending market of alternative approaches to bringing exposures within the limits required by the Proposed SCCL Rules. Similar to the impact considerations for the derivatives market, these factors were summarized from individual discussions with banks and review of comment letters, and therefore represent the views of Participating Banks rather than an independent analysis.

***Chart 10 and the components within it are presented to facilitate a balanced discussion of impact considerations. The diagram is not meant to suggest that all of these components have sufficient capacity to absorb the excesses or are commercially viable. In fact, in many cases, the subsequent discussion of these components highlights the potential lack of capacity, commercial viability or practical barriers to possible rebalancing activities.***

***Chart 10: SFT Exposures –Potential Market Change Framework***




## REBALANCING OF OUTSTANDING ACTIVITY

### *A. Buy Additional Credit Protection*

Similar to derivatives, as a first option, banks could buy additional credit protection to reduce their exposures. Banks noted that this is unlikely to be a viable solution given the following circumstances:

- There is insufficient capacity among non-constrained bank counterparties to provide protection, as eligible credit derivative providers tend to also be borrowers.
- Furthermore, the cost of such protection would likely be greater than current securities lending margins.

### *B. Rebalancing with non-constrained counterparties*

Agent bank exposures to borrowing banks are primarily a function of borrower demand and the willingness of the agent bank to accept the credit risk of the borrower. Agent banks' ability to select between borrower

counterparties is therefore limited to a degree by the balance of supply and demand. In addition, if large borrower banks are constrained themselves in their ability to borrow securities, it is possible that some securities business may move to non-bank prime brokers and securities firms. Agent banks may not have the risk appetite to indemnify this risk.

### *C. Requiring higher margin levels to lower exposure*

Banks could theoretically require higher collateral levels that are closer to the levels of the s.165 haircuts to offset exposure. While some offset might be possible, the substantial increases in collateral haircuts necessary to bring counterparties within limits are not considered economically viable given the low margins in the securities lending business, and would likely be non-competitive versus foreign banks. In addition, securities borrowers could face higher capital charges if margin increases occur. Furthermore, increasing collateral levels is unlikely to materially affect limit excesses resulting from substitution of non-U.S. sovereign collateral issuers.

### *D. Maintaining exposure at the counterparty level*

For non-U.S. sovereign exposure arising from substitution, agent banks could not take the option of risk shifting to the collateral issuer, and instead incur the exposure to the counterparty providing the non-U.S. sovereign collateral. However, in a majority of cases this counterparty is a bank that would be constrained without the benefit of applying collateral within the calculation of SCCL counterparty exposure. Consequently, not substituting would simply shift the limit overage from one counterparty to another in many cases.

## CHANGING BALANCE IN MARKET SUPPLY/DEMAND

As noted above, given limited options to rebalance or hedge counterparty exposures, covered companies could have to consider reducing borrower indemnifications and/or provide more restrictive limits on non-U.S. sovereign collateral, which would have both operational and market impacts. Individual discussions with agent banks indicated that in order to reduce their exposure to within limits, one or more of the following actions could be required to minimize the market disruption.

### *E. Agent banks may be constrained in their ability to offer indemnifications*

If agent banks ceased indemnifying counterparties and allowed beneficial owners to take the direct credit risk of the borrower, agent banks' exposure would naturally be reduced. However, beneficial owners may not have the risk appetite or credit risk management infrastructure to take this risk. In fact, many institutional investors stipulate an indemnification requirement in their investment guidelines. A significant proportion of lenders are also required to obtain agent bank indemnifications. Additionally, some U.S. state pension funds are required to secure indemnifications and U.S. law requires certain ERISA plans involving foreign borrowers or foreign collateral to obtain indemnifications from a U.S. bank.

### *F. Potential constraints in U.S. agent bank ability to accept certain securities*

To reduce exposure, covered companies could restrict the acceptance of certain securities, in particular non-U.S. sovereign bonds (frequently used as collateral in Europe and Japan) given the Proposed SCCL Rules' constraints on exposures to non-U.S. sovereign counterparties. Covered companies would have to introduce new standards, with more complex concentration sub-limits and constraints, relative to current agreements that permit a range of securities and collateral that meets acceptable risk criteria.

### *G. Possible alternative providers entering the market to supplement capacity*

Large European banks that are already active in the securities lending markets could further expand their businesses to supplement market capacity to the extent that U.S. covered companies are constrained. Further, some smaller foreign banks and U.S. banks could invest to build their securities lending infrastructure, although there is uncertainty as to the speed with which such banks could respond and the volume in which they would respond relative to the SCCL proposed timeframe. In particular, the technological, capital, credit risk management, trading and reporting infrastructure needs would be challenging to develop in a short timeframe.

Beneficial owners could consider lending directly to borrowers. However, even if they have the risk appetite to do so, they would need to invest to build the necessary operational infrastructure and risk management capabilities.

## END-USER AND CONSUMER IMPACTS

These changes in market conditions could result in lost income to lenders (beneficial owners) and reduced availability of securities for borrowers:

- **Beneficial owners:** Institutional investors, including pension funds, mutual funds and insurance companies, as well as central banks, could lose a proportion of their income stream from lending out securities if they are not able to find alternative foreign agent banks. The RMA Committee on Securities Lending estimates the lost income to beneficial owners at $3-$5 billion.[39] Some beneficial owners might withdraw from the securities lending markets if agent banks are required to impose greater constraints on acceptance of securities from lenders. Reduction in institutional investors' income could ultimately impact returns for retail investors and insurance policyholders.

- **Securities borrowers:** Although this study did not conduct a comprehensive assessment of the impact on the overall securities markets, one important impact of potential constrained

[38] RMA Committee on Securities Lending, Comment letter on Issues Concerning Application of Proposed Rulemaking's Single-Counterparty Credit Limits to Agency Securities Lending and Related Transactions, April 30, 2012.

liquidity in the securities lending markets is its impact on timely trade settlements in those instances where banks and securities firms use borrowed securities to avoid fails in support of trade settlement for their own portfolios and those of client investors and other market participants.

- **Securities investors and issuers (including consumer financing):** A shift in overall securities lending market dynamics could impact securities issuers, to the extent that demand for these securities is reduced by agent lender constraints and related shifts in borrower preferences given borrowing costs. Impacted securities lending markets include both fixed income and equity securities.

  For example, government and other sovereign debt markets could be impacted if constrained agent lenders might use available indemnification capacity on higher-spread trades, which do not involve treasuries. This may dampen market desires for treasuries when overall demand for treasuries lags.

  A second example could be consumers facing higher costs for auto loans, credit card debt, student loans and non-conforming residential mortgages because many of these loans depend on private label asset-backed securitization (ABS) to distribute the risk from a lending bank's balance sheet to the portfolio of a fixed income investor. As a result of the SCCL proposed rules, many fixed income investors of ABS assets may not be able to obtain repo securities from bank lenders, thereby shrinking investment demand for ABS and potentially negatively impacting the availability and cost of consumer lending.

# 7. COMPARISON WITH EUROPEAN LARGE EXPOSURE RULES

This section provides a comparison of the major legislative components of Dodd Frank Section 165(e) and the European large exposure rules. Summarized below are the key features of how the E.U. rule differs from the Proposed SCCL Rules:

- Banks are not subject to a lower 10% threshold.
- Banks may exceed the prescribed exposures limits, but are then subject to increasingly higher capital requirements.
- All high quality sovereigns are exempt from the large exposure limits, and there is no limit for exposures to CCPs.
- There is no notional risk shifting requirement. Risk mitigation is consistent with the approaches of the Basel II capital framework.
- Banks are permitted to use Basel II internal methodologies to measure their large exposures, which include the use of IMM for derivatives and a VAR based approach for repos and securities lending transactions.

These main differences between the U.S. and E.U. frameworks are presented in the table below:

## *Table 9: Comparison of the U.S. and E.U. counterparty limits framework*

| LEGISLATION COMPONENTS | PRESCRIBED BY DFA, SECTION 165(E) *(APPLICABLE TO ALL U.S. COVERED COMPANIES)* | PRESCRIBED BY THE CAPITAL REQUIREMENTS DIRECTIVE *(APPLICABLE TO E.U. BANKS)* |
|---|---|---|
| **Limit threshold** | The Proposed SCCL Rules prescribe limits of:<br>• 10% for major covered companies to other major covered companies or foreign banking organizations with more than $500 billion in assets, and<br>• 25% for all other covered companies. | The CRD prescribes a limit 25% for all covered companies. |
| **In event of a limit excess** | Limit excesses are restricted under the Proposed SCCL Rules. Due to the volatile nature of these exposures, covered companies would need to manage their exposures to limits below the regulatory prescribed limits to ensure compliance with the regulation. | Banks are not restricted to breach the prescribed limits. Exposure associated with the limit excesses would be subject to higher capital requirements. |
| **Exempted exposure** | U.S. Government or U.S. Government guaranteed debt is excluded from the exposure limits prescribed in the Proposed SCCL Rules. | The CRD requirements exempt exposures to central governments and central banks that are assigned a 0% risk weight, as well as to central counterparties. Additionally, banks may apply for waivers to exclude certain other counterparties from the prescribed limits. |
| **Exposure measurement methodology – derivative exposure** | Covered companies are required to use the current exposure methodology (as prescribed in the Basel II Final Rule) to calculate exposures for their derivatives portfolio. | Banks can elect to use any of the following methods for exposure measurement purposes:<br>• Current Exposure Method (CEM)<br>• Basel II Standardized Approach<br>• Internal Models Method (IMM), subject to approval |
| **Exposure measurement methodology - securities financing transactions** | Covered companies are required to use the collateral haircut approach (with adjustment to the haircuts based on the Proposed SCCL Rules) to calculate the exposure for their SFT portfolios. The regulation also restricts the type of collateral that may be considered eligible collateral (e.g., ABS) for exposure measurement purposes. | Banks can elect to use any of the following methods for exposure measurement purposes:<br>• Basel II Standardized Approach<br>• Internal Models Method (IMM), subject to approval |
| **Exposure measurement methodology – lending exposures** | Exposure is calculated as the total commitment. | Banks may use the Basel II measure of exposure at default (EAD) to estimate their lending exposure. |
| **Risk-shifting requirement** | The proposed regulation requires the exposure associated with instruments used to hedge and reduce credit risk to be shifted to the counterparty as collateral issuer or protection provider. | No risk shifting requirement. |

# 8. APPENDIX

## 8.1 List of Acronyms

## 8.2 List of references on Counterparty Credit Risk Measurement Techniques

Below is a sample list of references for academic publications that describe counterparty credit risk measurement techniques that are in line with the internal models banks use for capital adequacy and risk management purposes.


- BCBS (2006), International Convergence of Capital Measurement and Capital Standards, A revised Framework- Comprehensive Version; Basel Committee on Banking Supervision. *Available at www.bis.org.*
- Canabarro, Eduardo (2010), Counterparty Credit Risk.
- Canabarro, E. and D. Duffie (2003), Measuring and Marking Counterparty Risk.
- Canabarro, E., E. Picoult, and T. Wilde (2003), Analyzing Counterparty Risk.
- Duffie, D. and K.J. Singleton (2003), Credit Risk: Pricing, Measurement and Management.
- Duffee, G. R. (1996b), On Measuring Credit Risks of Derivatives Instruments.
- Fleck, M. and A. Schmidt (2005), Analysis of Basel II Treatment of Counterparty Risk.
- Gibson, M.S. (2005), Measuring Counterparty Credit Risk Exposure to a Margined Counterparty, in M. Pykhtin (ed.), *Counterparty Credit Risk Modeling*.
- Gregory, Jon, Counterparty Credit Risk, The New Challenge for Global Financial Markets. June 2011.
- Hillie, C.T., J.Ring and H. Shimanmoto (2005), Modelling Counterparty Credit Exposure for Credit Default Swaps, in M. Pykhtin (ed.), *Counterparty Credit Risk Modelling*.
- Picoult, E. (2005), Calculating and Hedging Exposure, Credit Value Adjustment and Economic Capital for Counterparty Credit Risk, in M. Pykhtin (ed.), *Counterparty Credit Risk Modelling,*.
- Pykhtin, Michael (2005), *Counterparty Credit Risk Modeling*.
- Wilde, T. (2001), *ISDA's Response to the Basel Committee on Banking Supervision's Consultation on the New Capital Accord,* May, Annex 1.
- Wilde, T. (2005), Analytic Methods for Portfolio Counterparty Risk, in M. Pykhtin (Ed.), Counterparty Credit Risk Modelling.

## 8.3 Supporting Data collected from Participating Banks

The table below highlights the data points collected from Participating Banks.

| DATA POINT | DESCRIPTION |
|---|---|
| ***Derivative exposures*** | |
| Gross Notionals | Aggregate gross notional dollar amounts for each derivative product type (i.e., interest rate, FX, commodities, equities, credit). |
| CEM exposure calculation components | Breakdown of CEM exposure calculation components pursuant to Basel II and the Proposed SCCL rules– Current Exposure, "Agross" and "Anet". In cases where multiple netting sets existed with the counterparty, aggregate dollar values for these netting sets were collected. |
| Eligible collateral | Basel II eligible collateral used to mitigate derivatives exposure using Basel II haircuts. |
| Adjustments to haircuts | Adjustment to derivatives collateral value using s.165 haircuts instead of Basel II haircuts. |
| Net derivative exposure | Net derivatives exposure, calculated using the Basel II Current Exposure Methodology (CEM) before any adjustment for single name CDS. |
| Derivative exposure that must be risk-shifted to protection provider | The amount of CEM counterparty exposure that is risk shifted to a protection provider. |
| Central Counterparty Exposure | Non-segregated initial and excess variation margin posted plus notional guaranty fund exposure. |
| ***Securities Financing Transactions*** | |
| Reverse Repo/Securities Borrow exposure | Exposure to reverse repo and securities borrowed, which equals cash plus the market value of securities transferred, less securities received after Basel II haircuts. |
| Repo/Securities Lent exposure | Exposure to repo and securities lent, which equals the market value of securities transferred plus Basel II add-ons (haircut multiplied by market value), less cash and securities received after Basel II haircuts. |
| Adjustment for haircuts (based on the Proposed SCCL Rules) | Adjustment to exposure using s.165 haircuts instead of using Basel II haircuts. |
| Net SFT exposure | Net Basel II SFT exposure (approximately equal to Basel II EAD under the collateral haircut approach, plus the add-back of ineligible collateral under the Proposed SCCL Rules (e.g., ABS or MBS). |

| DATA POINT | DESCRIPTION |
|---|---|
| ***Other exposures*** | |
| Lending Exposure | Lending related exposure (Loans, Leases, Letters of Credit and Guarantees, Bank placements) that includes outstandings plus commitments except where an unused portion of a collateral exemption is used. |
| Exposures with issuer risk | Equity & Debt Securities (AFS / HTM / Trading) exposure that may have been reduced by short sales was measured as the higher of the purchase price (HTM) or fair value (AFS and trading). |
| Protection provided on reference asset | Exposure to reference assets on contracts as the protection provider. This refers to all protection sold where the counterparty is a reference asset (notional or maximum potential loss). |
| ***Risk-Shifting*** | |
| Protection bought on reference asset | Notional bought protection on a counterparty used to offset exposure. |
| Exposure to Counterparty as protection provider (on bought protection for other counterparties) | Total notional amount of single name protection bought from a counterparty on other reference assets. |
| Net Guarantee Risk Shifting | Net guarantee risk shifting included guarantees provided by the counterparty on other names, less guarantees that mitigated counterparty exposure. |
| Exposure to counterparty as collateral issuer (non-U.S. sovereign only) | Exposure to counterparty as collateral issuer (non-U.S. sovereign only) that included debt or equity securities of the counterparty held as collateral, where they were used to reduce credit exposure to other counterparties. |
| ***Internally Modeled Exposure Estimates*** | |
| Internally modeled estimate for derivative exposure | Firm's own estimate of derivative counterparty exposure using Basel II IMM EAD approach (i.e., Effective EPE * 1.4 alpha multiplier, or comparable measure). |
| Internally modeled estimate for SFT exposure | Firm's own estimate of SFT counterparty exposure using Basel II EAD approach (i.e., Effective EPE * 1.4 alpha multiplier, or comparable measure e.g., Simple VaR). |
| ***Reference Asset Composition*** | |
| Notional breakout | Notional breakout of the reference assets (for bought protection) by issuer type (banks, non-bank financials, sovereigns and corporates/other). |
| Notional amount | Notional amount of the largest reference asset exposure. |
| Number of reference names | Breakout of reference names where the bank has bought protection for each issuer type (banks, non-bank financials, sovereigns and corporates/other). |

## 8.4 Supporting Study Assumptions

Listed below are some of the major assumptions used by banks in compiling exposure estimates. This list is not the totality of the assumptions applied, but represents key areas of rule interpretation.

| ASSUMPTIONS AND APPROXIMATIONS | SCCL NPR SECTION REFERENCE | IMPACT / MATERIALITY |
|---|---|---|
| 1. **Overall calculation:** Banks have adopted the baseline rules as proposed in the NPR, and not any alternative methodologies that the Federal Reserve is seeking feedback on through the questions in the NPR. For example, exposure to counterparties as a reference asset is treated on a net notional basis (gross protection sold less eligible purchased protection shifted), rather than the alternative net mark-to-market approach suggested as a possible alternative methodology in question 56. | | Exposure is calculated correctly per the Proposed SCCL Rules.<br><br>***Impact: N/A*** |
| 2. **CEM calculations for derivatives:** In baseline results, the Proposed SCCL Rules were applied as written and 'double-counts' derivative protection provider exposure, i.e. requires that single name CDS are included in calculating CEM exposure and are also recognized as exposure to the counterparty as protection provider under the risk shifting requirement. | **Section 252.94 (10)** (implicit from omission of any language to permit such an exclusion). | Exposure is calculated correctly per the Proposed SCCL Rules.<br><br>Although the rule does not provide for an adjustment to eliminate the overlap between the CEM and risk-shifted exposures, given that it is not clear that this 'double-counting' was intended, this study's analysis of measurement alternatives has estimated the impact of the 'double count' adjustment.<br><br>***Impact: N/A*** |

| ASSUMPTIONS AND APPROXIMATIONS | SCCL NPR SECTION REFERENCE | IMPACT / MATERIALITY |
|---|---|---|
| 3. **Protection provider risk-shifting**: Protection provider notional exposure calculations include netting of same reference names within netting sets. Given time and system constraints, protection provider exposure represents the aggregate notional for all net bought protection, i.e. is not capped at the maximum potential risk shift to the counterparty (based on underlying reference name exposure). To effectively implement the 'maximum risk shift' cap would necessitate banks calculating their exposure to all reference assets underlying the total exposure for a given protection provider. | **Section 252.95 (d)** (However there are no specific instructions on netting same reference names within netting sets). | Protection provider exposure could be overstated for some counterparties.<br>It was not feasible to quantify extent of any overstatement, but not viewed as sufficiently material to impact overall study conclusions.<br>***Impact: Possible overstatement of exposure*** ↑ |
| **4. Collateral issuer substitution:** Recognition of exposure to non-U.S. sovereigns as collateral issuers assumes that the election is made to continue to net the collateral for the counterparty exposure calculation of securities financing and derivatives exposures, i.e. all exposure related to collateral accepted is shifted to the issuer. Substitution of non-sovereign collateral (e.g. corporate/financial institution securities) has been included by a few banks with the ability to do so. | **Section 252.94**<br>(Guidance on substitution for non-sovereign collateral is included in the preamble for this section) | Exposure to non-U.S. sovereigns could be overstated, given banks have not been able to systematically analyze where they may not need the option of risk-shifting to the collateral issuer. However, banks generally noted that in the majority of cases the bulk of non-U.S. sovereign collateral is in respect of securities financing transactions with global banks, and this risk-shifting would be necessary to avoid experiencing a limit excess against these banks as counterparties.<br>***Impact: Possible overstatement of exposure*** ↑ |
| 5. **Collateral haircuts**: SFT and derivative haircuts are generally based on Basel II definitions, not the revised s.165 standards. Some, but not all banks adjusted for s.165 ineligible collateral (ABS). | **Section 252.95, Table 2** | Exposure is likely understated, as s.165 haircuts are viewed as generally higher than Basel II haircuts.<br>***Impact: Possible understatement of exposure*** ↓ |
| **6. Eligible Collateral:** Agencies were treated as eligible collateral for the purpose of calculating net credit exposure to counterparties. | **Section 252.92 (q)** | If agencies were to be termed as ineligible collateral, SCCL exposure estimate would be potentially significantly understated in this study.<br>***Impact: Possible understatement of exposure*** ↓ |
| 7. **Securities valuation**: Purchase price adjustment for AFS/trading securities has not been applied; calculations were performed using market values. | **Section 252.94 (a) (2)** | To the extent amortized purchase price is higher than market values, SCCL exposure estimates are understated. This is not viewed as material in the context of this exercise.<br>***Impact: Possible understatement of exposure*** ↓ |

| ASSUMPTIONS AND APPROXIMATIONS | SCCL NPR SECTION REFERENCE | IMPACT / MATERIALITY |
|---|---|---|
| **8. Issuer risk exposure for consolidated structured securities:** Given the Proposed SCCL Rules definition of counterparty, AFS/HTM structured securities (e.g., credit card securitizations) that are consolidated by sponsoring banks should be considered as counterparty exposure to the consolidating bank. For example, if Bank A consolidates a structured vehicle on to its balance sheet, Bank B would be required to include any securities holdings issued by that structured vehicle in the calculation of Bank B's total exposure to Bank A. Not all banks were able to fully apply this standard. | **Section 252.92 (k) (2)** | To the extent some banks did not consider consolidated structured securities as exposure to the consolidating bank, SCCL exposure estimates are understated.<br>***Impact: Possible understatement of exposure*** |
| **9. Definition of sovereigns:** It is unclear if the definition of sovereign, which includes its 'instrumentalities' would include foreign banks that are majority-owned by a foreign government (e.g. RBS). Instead, such foreign banks have been treated as a separate major counterparty for all but one firm. | **Section 252.92 (k) (5)** | If government-owned banks were included in the definition of sovereign exposure study results could change (bank exposure would be removed, but sovereign exposure would increase), but this would not be material to overall study findings.<br>***Impact: N/A*** |
| **10. Definition of control:** The extended 'definition of control' in the Proposed SCCL Rules require exposures arising from non-consolidated entities where banks have >25% ownership/voting interest included in banks' exposure aggregation or their counterparty definition. This extended 'definition of control' has generally not been applied given risk system constraints. | **Section 252.92 (i)** | Exposure estimates are understated. It is not feasible to quantify extent of understatement.<br>***Impact: Possible understatement of exposure*** |

## 8.5 Example of limitations of applying CEM and risk shifting for a derivative portfolio

One firm conducted a comparative analysis of using the CEM methodology as articulated under the 165(e) requirements with other alternative approaches that may be used for exposure measurement purposes. The alternative exposure measurement approaches considered for this analysis included using the Firm's internal models (an IMM model and a historical VaR model) as well as a stressed exposure measure under different stress conditions. This comparative analysis was undertaken using a case study for a range of hypothetical scenarios (varying in complexity) to demonstrate the impact of using these alternative approaches.

Under the first scenario, Bank A is assumed to have two exactly equal and offsetting $5 billion, 5-year equity swaps with Bank B where both parties have executed an ISDA master agreement with enforceable netting. Thereby, both the Bank and the counterparty would have riskless offsetting swap positions. Assuming shares of the underlying reference entity increases by 10%, Bank A would owe $500 million to Bank B (10% of $5 billion) and similarly Bank B would owe $500 million to Bank A. The table below illustrates the exposure calculation under all alternative approaches.

| USING DF 165(E) EXPOSURE | IMM, HISTORICAL VAR OR STRESS TEST EXPOSURE |
|---|---|
| $400 million[39] | $0 |
| Assuming a zero MTM on the exposure, the CEM calculation would be 40% of the potential future exposure for both trades. Using the 10% add-on factor for equities and a total notional of $10 billion, the PFE would be calculated as $1 billion. The CEM calculation would then result in a $400 million exposure (40% * $1 billion). | Under each of the above approaches, the equal and offsetting positions would result in zero risk under any market scenarios. |

The firm conducted additional analysis on a second scenario that illustrates the combined effect of the CEM and the requirement to risk-shift to the protection provider.

Under scenario 2, Bank A purchases $10million of CDS protection on 100 separate reference names from Bank B amounting to a total notional of $1billion and sells $10million of CDS protection on the same 100 reference names to its clients. For this scenario, 5-year CDS trades are assumed to be quoted at 100 bps and daily re-margining with 0 threshold.

[39] The estimated exposure does not include the exposure that may arise from the risk-shifting requirement under the Proposed SCCL Rules. It is only a simplified example used to depict the limitations of using the CEM methodology as required under the Proposed SCCL rules.

| USING DF 165(E) EXPOSURE | IMM EXPOSURE | HISTORICAL VAR EXPOSURE | STRESS TEST EXPOSURE |
|---|---|---|---|
| $1.02 billion | $21 million | $26 million | $80 million |
| Under this scenario, Bank A's total exposure would be the sum of the exposure arising from the CDS risk shifting (100% of the notional, $1billion) and the exposure on the sold protection calculated using CEM (40% of the PFE, the PFE being calculated using a 5% add-on factor on a notional of $1 billion). | Since the exposure would be subject to daily re-margining, the exposure is estimated using a Monte-Carlo simulation based on potential changes in MTM over a 2-week liquidation horizon. | This estimate is based on a 99%, 10 day VaR calculation using historical data for 4 years. | The stressed exposure was calculated assuming doubling of credit spreads on all reference names and a simultaneous default of Bank B along with three of the underlying reference names. |

## 8.6 CEM formula

Based on the U.S Basel II Final Rule requirements, exposure is calculated at the netting set level using the CEM formula as follows:

Exposure = Current exposure – Adjusted value of eligible collateral + 0.4 * $A_{gross}$ + 0.6* NGR * $A_{gross}$ where:

- Current Exposure is the greater of zero or the net mark-to-market of all derivative contracts in the netting set.
- Adjusted value of eligible collateral is the value of collateral net of supervisory haircuts.
- $A_{gross}$ is the gross sum, across all transactions in the netting set, of the transaction notional multiplied by the appropriate PFE conversion factor specified in the Basel II Final Rule (shown below).
- NGR is the net to gross ratio implied in the computation of adjusted market value.

**PFE Conversion Factor Matrix for OTC Derivative Contracts**

| REMAINING MATURITY | INTEREST RATE | FX AND GOLD | CREDIT (INVESTMENT GRADE REFERENCE OBLIGOR) | CREDIT (NON-INVESTMENT GRADE REFERENCE OBLIGOR) | EQUITY | PRECIOUS METALS (EXCEPT GOLD) | OTHER |
|---|---|---|---|---|---|---|---|
| *1 yr or less* | 0.00 | 0.01 | 0.05 | 0.10 | 0.06 | 0.07 | 0.10 |
| *1 to 5 years* | 0.005 | 0.05 | 0.05 | 0.10 | 0.08 | 0.07 | 0.10 |
| *Over 5 years* | 0.015 | 0.075 | 0.05 | 0.10 | 0.10 | 0.08 | 0.15 |

[1] For an OTC derivative contract with multiple exchanges of principal, the conversion factor is multiplied by the number of remaining payments in the derivative contract.

[2] For an OTC derivative contract that is structured such that on specified dates any outstanding exposure is settled and the terms are reset so that the market value of the contract is zero, the remaining maturity equals the time until the next reset date. For an interest rate derivative contract with a remaining maturity of greater than one year that meets these criteria, the minimum conversion factor is 0.005.

[3] A Bank must use the column labeled "Credit (investment-grade reference obligor)" for a credit derivative whose reference obligor has an outstanding unsecured long-term debt security without credit enhancement that has a long-term applicable external rating of at least investment grade. A Bank must use the column labeled "Credit (non-investment-grade reference obligor)" for all other credit derivatives.

## 8.7 TCH Contacts

Paul Saltzman, President of The Clearing House Association and Executive Vice President and General Counsel of The Clearing House Payments Company
212-613-0138
paul.saltzman@theclearinghouse.org

Bob Chakravorti, Senior Vice President and Chief Economist
212-613-0143
bob.chakravorti@theclearinghouse.org

Dan McCardell, Senior Vice President and Head of Regulatory Affairs
212-613-0164
dan.mccardell@theclearinghouse.org

David Wagner, Senior Vice President, Finance Affairs
212-613-9883
david.wagner@theclearinghouse.org

Rodney Abele, Vice President, Government Affairs & Legislative Counsel
202-649-4608
rodney.abele@theclearinghouse.org

Erica Hurtt, Vice President, Communications (Media Contact)
202-649-4603
erica.hurtt@theclearinghouse.org