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New Regulations and Collateral Requirements – Implications for the OTC Derivatives Market

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EXECUTIVE SUMMARY

The paper provides a snapshot of the changing collateral space and how this will impact the regulatory push to move over-the-counter (OTC) derivatives to CCPs. With continued quantitative easing (QE) by some central banks, price signals from the repo market indicate a shortage of good collateral. This paper focuses on the collateral demand in the OTC derivatives market as they move to central counterparties (CCPs) and suggests alternatives on how to reduce risk in this market.

The proposed regulations skirt the fundamental risk within the OTC derivatives market that resides in a bank—derivative liabilities (after netting). This is the cost to taxpayers from a large bank's failure due to its derivative positions. The proposed regulations do not address this risk directly. If every user of OTC derivatives posted their share of collateral (i.e. initial and variation margin), there would be no derivative liabilities on banks' books. But regulators have exempted several users of OTC derivatives, including sovereigns, quasi-sovereigns, multilateral institutions, and end-users such as airlines etc. So the sizable under-collateralization in this market is not fully addressed. As regulations do not force "every user to clear", a suggested alternative is to place a levy on the user or its bank (that may not want to let go the business) with the primary objective that derivative liabilities are minimized.

There needs to be justification for creating new systemically important financial institutions (SIFIs) like CCPs, since it is not (yet) clear if SIFIs can be unwound. The proposed regulations disregard the existing netting bundles prevalent in this market which then leads to sizable collateral requirements—although many academic/consulting papers use simulations to show otherwise. Furthermore, some key exempted users (like the sovereigns) will keep afloat the sovereign/bank nexus that sow the seeds of moral hazard for a taxpayer bailout of CCPs. Some recent initiatives on the CCP resolution/recovery front may offset the likely burden on taxpayers, but has drawbacks too. Yet, under the rubric of transparency, a piecemeal compromise has taken off without global consensus on several key issues.

With some central banks silo-ing good collateral and custodian held collateral not available in bulk, the only likely players in the financial system to bridge the demand and supply would be the 10-15 banks active in the global derivatives market. In general, central banks, sovereign wealth funds, and long-term asset managers desire good collateral that is low volatility, but not necessarily highly liquid. These entities should be net providers of liquidity in the financial system. On the other side are banks/hedge funds/mutual funds that need to constantly reshuffle liquid/good collateral within their portfolios. Thus the ensuing collateral transformation - via the 10-15 large banks - may bridge collateral shortages but will also increase interconnectedness of the financial system (and CCPs were supposed to break the interconnectedness). Recently, the U.S. Fed has acknowledged a collateral shortage and has started a "reverse repo" program to alleviate collateral constraints.

In summary, the proposed route of removing OTC derivatives from banks books creates new SIFIs, destroys the economics of netting on the books of the banks, silo(s) collateral and decreases collateral velocity, and increases the interconnectedness of the financial system. Alternately, if *every* user of OTC derivatives contributed their share of margin(s) when using OTC derivatives (relative to the proposed bifurcated "clearing" and "non-cleared" worlds including legacy trades that will not clear), the risk from derivatives at SIFIs would be eliminated. There would be no need for CCPs.

New Regulations and Collateral Requirements – Implications for the OTC Derivatives Market

A. Introduction

As part of the extensive regulatory reform proposals, the new rules will warrant significant increase in the use of collateral across the financial system. Estimates by markets and research/policy institutions suggest that the Dodd Frank Act, Basel III and EMIR may warrant between US\$2–\$4 trillion in additional unencumbered collateral that will span margins for OTC derivatives at CCPs, liquidity ratio(s) under Basel III, and related needs stemming from parallel developments under EMIR and Solvency II. At the same time, due to the recent crisis and QE-type efforts in the United States (U.S.) and Europe, significant amounts of collateral have been drained out of the financial system and silo-ed at central banks (central banks). Furthermore, due to counterparty risk in dealing with large banks and risk aversion of clients, collateral re-use (or velocity) has also been decreasing rapidly lately. In fact the bilateral pledged market that offers a genuine market clearing price for collateral—unlike the tri-party system—has shrunk from about US\$10 trillion to about US\$6 trillion in recent years. More importantly, many of the proposed regulations (e.g. moving OTC derivatives to CCPs) have not yet been in force and some key start-dates are being postponed on several fronts.

The financial crisis following Lehman’s demise and the American International Group’s (AIG) bailout provided the impetus to move the lightly regulated OTC derivative contracts from bilateral clearing to CCPs. The debate about the future of financial regulation has heated up as regulators in both the U.S. and the European Union (EU) seek legislative approval to mitigate systemic risk associated with systemically important financial institutions (SIFIs) that include large banks and nonbanks. In order to mitigate systemic risk that is due to counterparty credit risks and failures, either the users of derivative contracts will have to hold more collateral (or equivalent capital) from bilateral counterparties, or margin will have to be posted to CCPs. Studies have shown that this US\$600 trillion OTC derivatives market is seriously under-collateralized and thus contributes to systemic risk (Box 1 and Table 1).¹ Also recent work has shown that the associated demand for additional collateral to satisfy the envisaged regulatory efforts will be onerous (ISDA, 2012; Bank of England (BoE), 2012; Bank for International Settlements (BIS) Quarterly, 2011). This paper provides an overview of the OTC derivatives market and the associated drawbacks in the proposed regulatory initiatives that continue to unfold and also proposes an alternative that would make this market safe with relatively little additional collateral costs.

¹ The OTC derivatives market has grown considerably in recent years; these include foreign exchange (FX) contracts, interest rate contracts, equity linked contracts, commodity contracts, and credit default swap (CDS) contracts.

Box 1. The Under-Collateralization in the OTC Derivatives Market

While a much cited figure, the notional value of contracts of about US\$600 trillion overstates the importance of this market. More relevant are the “in-the-money” (or, gross positive value) and “out-of-the money” (or, gross negative value) derivative positions, which are further reduced by “netting” of related positions. From a collateral demand/supply framework, under-collateralization is the more relevant metric for policy discussions. While typically collateral - both initial and variation margin - is posted by hedge funds, asset managers and other clients, large banks active in this space do not have a two-way margin agreement with some clients (e.g. sovereigns, quasi-sovereigns, large pensions and insurers, AAA corporations, etc.); so collateral may not be forthcoming when due and, as a quid pro quo, the banks may not be posting collateral either to such clients. Interestingly, regulatory proposals may also exempt foreign-exchange swaps from central clearing. A key incentive for moving OTC derivatives to CCPs is higher multilateral netting, i.e. offsetting exposures across all OTC products on SIFIs’ books - intuitively, the margin required to cover the exposure of the portfolio would be smaller in a CCP world. However, if there are multiple CCPs that are not linked the benefits of netting are significantly reduced, because across-product netting will not take place (since almost all CCPs presently offer multilateral netting in the *same* asset class and not *across* products).

At present, there is under-collateralization within the OTC derivatives space that stems from several privileged investors within the financial system - sovereigns/sovereign wealth funds/central banks, corporate, multilateral institutions, etc. There is reported under-collateralization in recent years of about US\$3–5 trillion per the BIS semi-annual surveys (see Table 1) and Singh (2010). However, these figures may not pick up the full extent of collateral shortfall since they may not include initial margin that is not posted since only variation margin is typically captured in financial statements. Even if we consider half of the total positions (i.e. when SIFIs are out-of-the-money) that are risks to taxpayers, these estimates are sizable. Furthermore, although BIS/ISDA sources indicate about US\$1.9 trillion of collateral dedicated to this market, this collateral is fungible and includes a re-use factor of about 2.5 to 3.0. So dedicated collateral may be only US\$700–900 billion. Most recent estimates of a re-use factor (or collateral velocity) are around 2.2 so significant additional collateral will be required to be posted.

Table 1: Under-collateralization in the OTC Derivatives Market

	Gross market value								
	H2 2008	H1 2009	H2 2009	H1 2010	H2 2010	H1 2011	H2 2011	H1 2012	H2 2012
GRAND TOTAL	35,281	25,314	21,542	24,673	21,296	19,518	27,285	25,392	24,740
A. Foreign exchange contracts	4,084	2,470	2,070	2,524	2,482	2,336	2,555	2,217	2,304
B. Interest rate contracts	20,087	15,478	14,020	17,533	14,746	13,244	20,001	19,113	18,833
C. Equity-linked contracts	1,112	879	708	706	648	708	679	645	605
D. Commodity contracts	955	682	545	457	526	471	487	390	358
E. Credit default swaps	5,116	2,987	1,801	1,666	1,351	1,345	1,586	1,187	848
F. Unallocated	3,927	2,817	2,398	1,788	1,543	1,414	1,977	1,840	1,792
GRASS CREDIT EXPOSURE *	5,005	3,744	3,521	3,578	3,480	2,971	3,912	3,668	3,626

* Gross market values have been calculated as the sum of the total gross positive market value of contracts and the absolute value of the gross negative market value of contracts with non-reporting counterparties. Gross credit exposure is after taking into account legally enforceable bilateral netting agreements. Source BIS

This paper is summarized as follows. Section B provides the macro backdrop of the changing collateral space, the new entrants in the market for collateral and how they will interact with the proposed regulations. Section C narrows the focus on the implications of moving OTC derivatives to CCPs and highlights netting - the flip side of collateral. This section shows how the status quo will be adversely impacted as multiple CCPs fragment netting between cleared and non-cleared trades resulting in deadweight loss and increasing the overall collateral needs per unit of clearing. Section D offers an alternative - fool proof and collateral efficient - that addresses the fundamental problem in the OTC derivatives market: everyone does not post their share of collateral (and the regulations will continue to exempt many such users). Section E offers a summary of the conclusions in this paper.

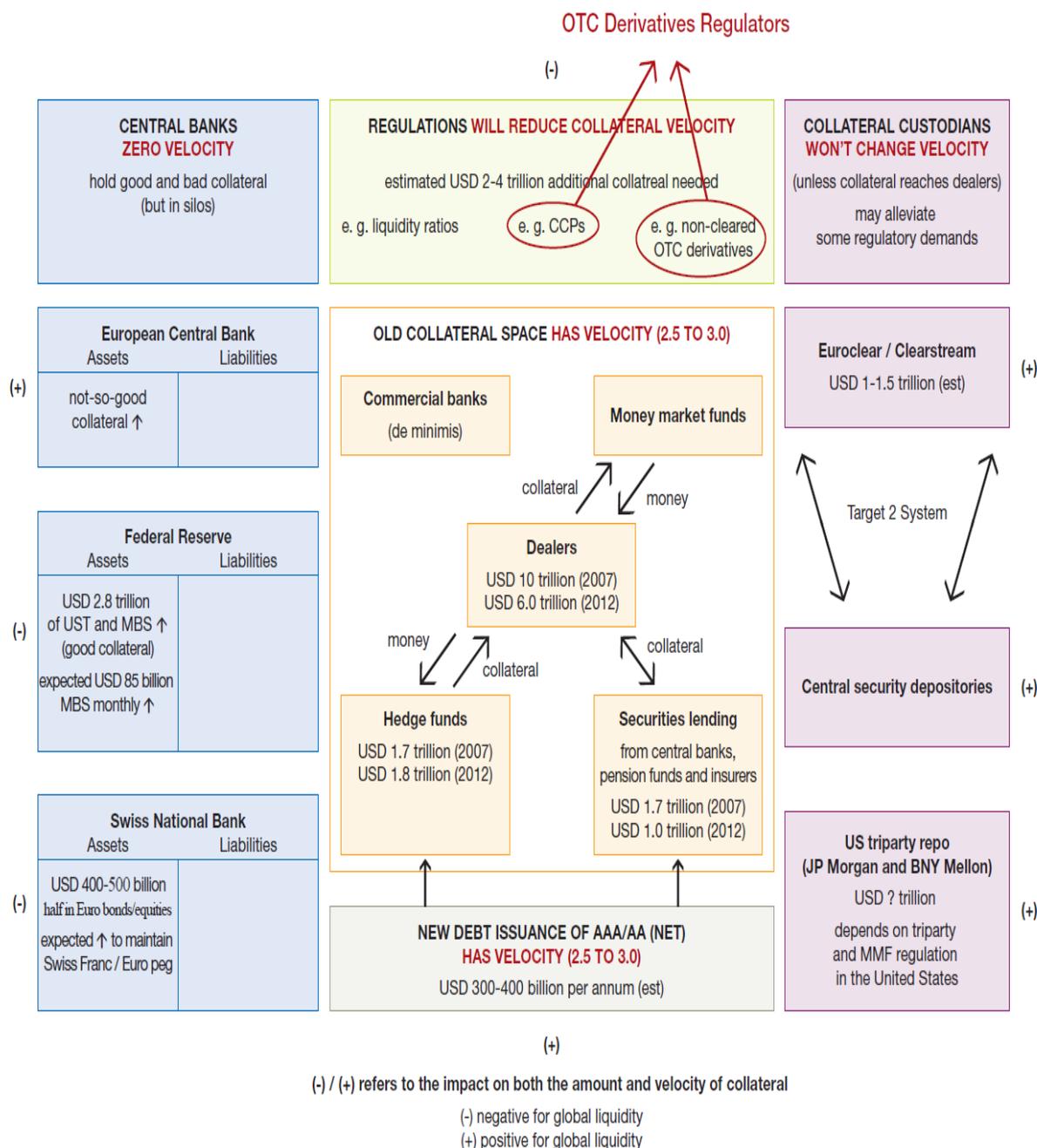
B. The Changing Collateral Space and Prices of Good Collateral

In the “new” collateral space, the increasing role of central banks, regulations and collateral custodians is significantly changing the collateral landscape. These three new dimensions involve (i) QE (and similar activities) by some central banks that remove good collateral from markets to their balance sheet where it is silo-ed; (ii) regulatory demands stemming from Basel III, Dodd Frank, EMIR, etc. that will entail building collateral buffers at banks, CCPs, etc.; and to a lesser extent (iii) collateral custodians who are striving to connect with the central security depositories (CSDs) to break out of silo(s) - see Figure 1 for the new entrants in the collateral space.

Despite the European Central Bank's (ECB) efforts to keep the ratio of good/bad collateral high in the EU, actions of Swiss National Bank (SNB) and other central banks are diluting this objective (see Figure 1, left side, blue area). After the Swiss franc/euro peg, the SNB balance sheet is now close to Swiss Franc 500 billion with half of assets comprising of "core" euro bonds/equities (and lately in addition to euro bonds, United Kingdom (U.K.) gilts and U.S. Treasuries (UST)). This reflects prudent asset-liability management at the SNB. However SNB's bond purchases withdraw the best and most liquid collateral from the Eurozone; this reduces the collateral re-use rate since these bonds are silo-ed at SNB and not pledged in the financial markets. Silo-ed collateral has zero velocity by definition.² The uncertainty in Europe will likely keep SNB balance sheet trends unchanged and this is a drag on EBC efforts to keep the collateral re-use rate high.

² http://www.snb.ch/en/i/about/assets/id/assets_reserves#tpdf

Figure 1. The Changing Collateral Space



The U.S. Federal Reserve (Fed) is also continuing QE3. The ECB now accepts non-euro collateral so this opens the door for U.S. dollar assets (and U.K. gilts, etc.) to reach Frankfurt. Since Lehman and due to the QE efforts, the Fed is housing about US\$2.8 trillion of “good collateral” (largely UST and mortgage backed securities (MBS)). The Fed’s continued purchase of MBS and UST at the rate of US\$85 billion per month via QE3 has first order implications for collateral velocity and global demand/supply of collateral. At this rate the Fed could silo US\$1 trillion of additional good collateral in the next 12 months (unless

tapering starts). But then the Fed has just started a reverse repo program to alleviate collateral shortage but this has drawbacks for financial plumbing.³

Regulatory demands stemming from Basel III and Dodd Frank are expected to demand US\$2-4 trillion of collateral. Higher liquidity ratio(s) at banks, along with collateral needs for CCPs (and non-cleared OTC derivatives) are some of the other key regulatory changes that will impact collateral markets. These safety buffers will silo the associated collateral and significantly drain collateral in the financial markets. See Figure 1, top, yellow area.

The ECB mentions that the Eurozone has €14 trillion in collateral, much of it locked in “depositories” and thus not easily accessible for cross border use (Figure 1, right side, purple area). However, Euroclear and Clearstream (the key hubs for Eurozone collateral) are working with the local/national CSDs to alleviate collateral constraints. The interconnections to the CSDs will be via the Target 2 Securities (T2S) system that will provide a single pan-European platform for securities settlement in central bank money. In the U.S., JPMorgan and Bank of New York may also improve collateral flows from within the U.S. Tri-party system; however, reforms on the tri-party and money market funds will play a role in this effort. Preliminary estimates suggest that perhaps US\$1- \$1.5 trillion of collateral may be “unlocked” via efforts of custodians to optimize collateral and build a “collateral highway.”⁴ (This collateral is unlikely to reach markets but enhance accounting debits and credits to “break” the silo).

Assuming AAA/AA countries have GDP of around US\$25 trillion and with a deficit of around 4–5 percent, they supply about US\$1 trillion of debt every year (Figure 1, bottom, grey area). Database and market contacts suggest that about 30–40 percent of AAA/AA collateral inventory reaches markets via custodians for re-use (the rest of it stays with reserve managers, sovereign wealth funds, pensions, insurers, etc. who are generally buy and hold investors). So if Debt/GDP ratio(s) do not spike in developed countries, new debt stemming from the “numerator” may provide about US\$300–\$400 billion to the markets (assuming counterparty risk especially with European banks does not elevate). With a re-use/velocity rate of about 2.5 (although the latest data suggest a decrease of the re-use rate to 2.2 due to the various silo(s) in the “new” collateral space), this may alleviate collateral shortage by US\$750 billion to US\$1 trillion.

The ECB still holds good collateral (e.g. Bunds, Dutch, French bonds and other AAA/AA rated securities). Although the fraction of good collateral has dropped since end-2011, the ECB's €3 trillion balance sheet still holds about 20 percent in good collateral (or €600 billion). The ECB may want to “rent” the good collateral they hold, especially if their goal is to keep the good/bad collateral ratio high “in the markets.” So far the ECB has accepted “not so good collateral,” and thus improved the good/bad collateral ratio in the market by decreasing the denominator. Renting of good collateral does not lower the numerator - the collateral is on loan temporarily. Other EU central banks also hold good collateral and may consider renting

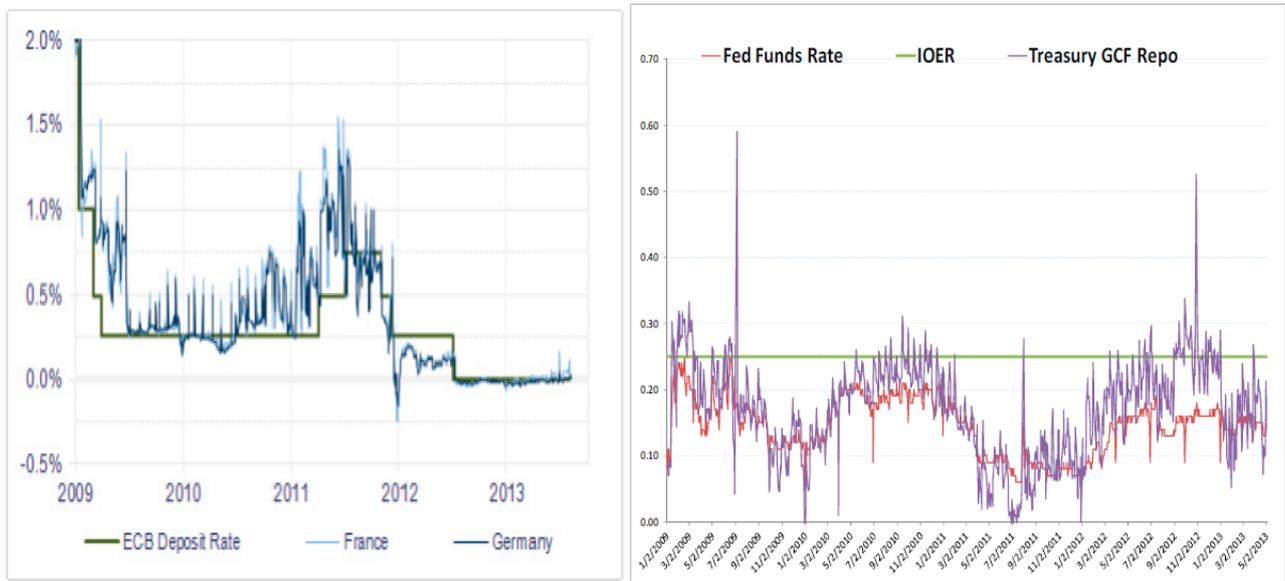
³ <http://ftalphaville.ft.com/2013/09/23/1643692/guest-post-a-central-bank-unwind-and-collateral-damage/>

⁴ <http://www.marketwatch.com/story/jp-morgan-achieves-major-milestone-in-tri-party-repo-market-reforms-2012-11-19>

it out to strong counterparties in the markets. Other central banks (the Fed, SNB, U.K.) do not have the same vested interest as the ECB to prop up collateral markets in the EU.

At present, there appears to be a shortage of collateral as repo rates (i.e., price signals from the collateral market) have been negative in the Eurozone and near zero in the U.S. (Figure 2). [Repo rate is the rate at which cash is lent for collateral for a given tenor; if collateral is scarce cash is lent at near zero or even negative rates.]

Figure 2. Collateral Rates in Selected Eurozone Countries (left); United States (right)



Sources: ICAP, Bloomberg, DTCC and staff estimates.

C. Implications of Moving OTC Derivatives to CCPs

By way of background, prior to the momentum to move OTC derivatives from SIFIs books, CCPs were viewed under the rubric of payment systems. In the aftermath of the Lehman crisis, the G-20 Pittsburgh meetings in 2009 decided that a critical mass of SIFI’s derivative-related risks will be moved to CCPs. Regulators are forcing, en-masse, sizable OTC derivatives to CCPs. This is a huge transition, primarily to move this risk outside the banking system. These new entities may also be viewed as “derivative warehouses,” or concentrated “risk nodes” of global financial markets.⁵ Figure 3 illustrates that on average, each of the top ten SIFIs carries about US\$100 billion of derivative related tail risk—this is the cost to the financial system from the failure of a SIFI (where tail risk is measured by residual derivative liabilities at a SIFI, after netting and collateral).⁶ Yet, instead of addressing the derivatives tail

⁵ There are many proposals on trying to unwind SIFIs; it is a difficult (if not an impossible) task. So creating new SIFIs like CCPs should be backed by sound economics.

⁶ The economics holds under IFRS or GAAP. For example, Barclays annual report indicates derivative liabilities of \$527 billion; after netting of \$427, the risk is \$100 billion of contracts if Barclays fails. This is reflected in GAAP accounting but not under IFRS (as it does not allow netting). However, the *economics* of \$100 billion residual risk to the market if Barclays fails holds true even under IFRS accounting.

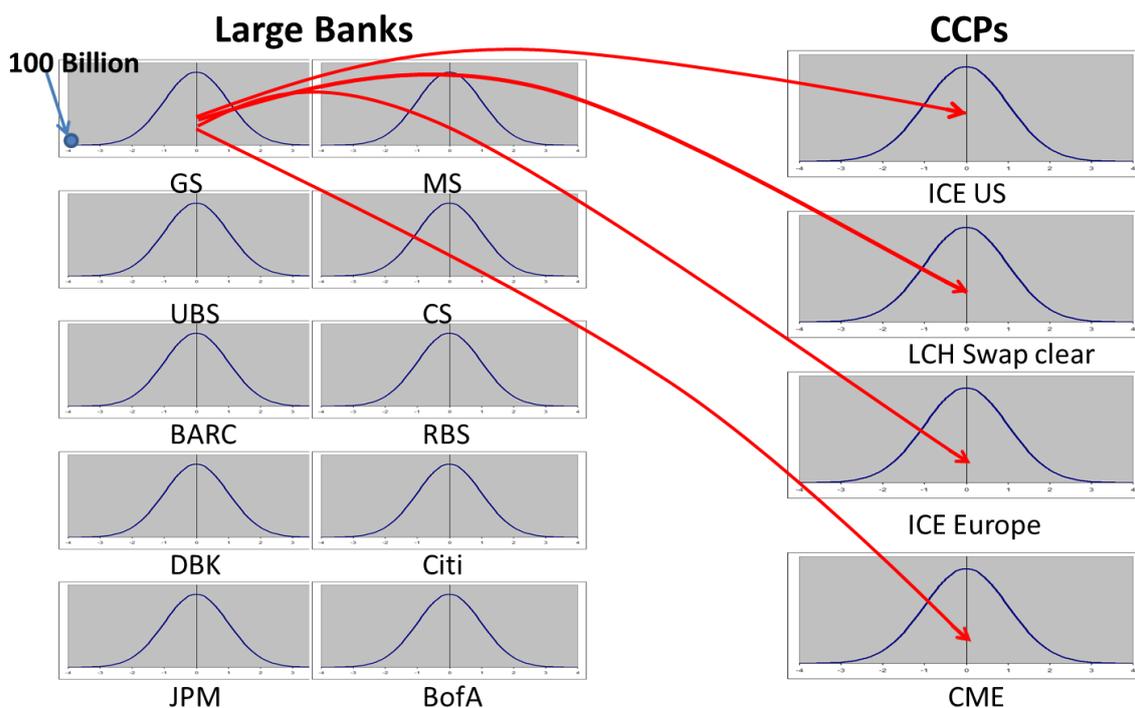
risk, the present regulatory agenda is focused on offloading all (or most) of the derivatives book to CCPs.

Past and present market practices result in residual risk in the form of derivative liabilities (and derivative assets), based on International Swap and Derivatives Association’s (ISDA) netting agreements, because:

- Sovereigns, AAA insurers, corporates, large banks, multilateral institutions (e.g. EBRD), and the “Berkshire Hathaway” types of firms do not post adequate collateral since they are viewed by banks/regulators as privileged and (presumably) safe clients;
- SIFIs (i.e. banks/dealers) typically post no initial margin/default funds to each other for these contracts.

It was envisaged that CCPs will require collateral to be posted from all members and thus offer a transparent ground for the regulatory overhaul. In essence, all parties should post collateral to CCPs; no exceptions or exemptions. This is also called two-way CSAs (Credit Support Annexes) under ISDA. However, this is not happening as envisaged. As stated above, there will be exemptions to some end-users, and many central banks, sovereigns, and municipalities are not required to post collateral. Thus, moving transactions to CCPs would make the under-collateralization obvious and requires collateral for those required to clear.

Figure 3. The SIFIs Will Offload Most of Their OTC Derivative Book to CCPs



Not surprisingly, the regulatory efforts(s) are meeting resistance from the financial industry including the large banks, asset managers such as pension funds and insurers, etc. Another market that has lobbied to avoid posting collateral are the ‘end-users’ such as airlines or non-

financial corporates, who presumably are genuine hedgers but will nevertheless contribute toward the systemic risk stemming from the use of OTC derivatives if they pass the buck to their bank by not posting their share of collateral.

Some issues relevant for discussion under the proposed regulations are detailed below and include the onerous collateral requirements, central bank backstop for CCPs, fallacy of the utility comparison, and reduced collateral re-use rate/velocity. There are still many other impediments to the successful implementation of the proposed reform agenda (e.g. lower overall netting, no interoperability between CCPs, demand for segregated collateral, extraterritoriality and regulatory arbitrage).⁷

Sizable collateral requirements:

Without interoperability, the 10 largest SIFIs will continue to keep systemic risk from OTC derivatives on their books. Regulatory efforts will introduce more new entities (i.e. CCPs) that will also hold systemic risk from OTC derivatives. This goes against the intuition that suggests the need to minimize the number of CCPs (and benefit from additional netting), rather than increasing their number. Thus, collateral needs will be higher in the proposed world. Most of the major SIFIs' derivatives books are largely concentrated in one "business" (i.e. a legal entity) to run the derivatives clearing business so as to maximize global netting. Some clients like sovereigns and U.S. municipalities are presently not in a position to post collateral. Estimated under-collateralization in the OTC derivatives market is around US\$2-\$4 trillion. Due to exemptions, a significant part of this market will not reach CCPs. A 2011 Oliver Wyman and Morgan Stanley study suggests sizable additional collateral needs. ISDA has also acknowledged the sizable collateral needs resulting from moving derivative positions to CCPs, despite their (earlier) margin surveys indicating that most of this market is collateralized. The sizable collateral needs along with the exemptions imply that CCPs may not inherit all the derivative positions from SIFIs. Interoperability of CCPs (on a cross-border basis) is unlikely so overall global netting will not increase (Box 2). Netting is the flip side of collateral needs and is discussed in Annex 1 of this paper. The large banks active in the OTC derivative space are reticent to unbundle "netted" positions on their books, as this results in deadweight loss and increases collateral needs.

Central bank backstop:

A CCP may face a pure liquidity crisis if it is suffering from a massive outflow of otherwise solvent clearing members, in which case the risk is that it will have to realize its investment portfolio at low prices. Assuming an external shock where everyone is trying to liquidate collateral simultaneously, this will lead to a problem if the CCP has repo'd out the collateral it has, cannot get it back, and for whatever reason does not want to pay cash to the members (i.e. effectively purchasing the securities at that price). In these circumstances, a central bank would be repo-ing whatever collateral the CCP would ultimately get back. In such instances,

⁷ Interoperability, or linking of CCPs, will increase each CCP's clearing fund in line with the net open positions between them. So CCP_a may hold or have access to collateral from CCP_b that may go bankrupt in the future, so that losses involved in closing out CCP_b's obligations to CCP_a can be covered. However, legal and regulatory sources indicate that cross-border margin access is subordinate to national bankruptcy laws (such as Chapter 11 in the U.S.). It is unlikely that CCP_a in one country would be allowed access to collateral posted by CCP_b registered in another country. Neither is it of interest to CCPs to change their business model and lose their niche market(s). The sheer collateral arithmetic to support interoperability is daunting.

it would be more sensible to require the bank members (e.g. JPMorgan, Credit Suisse, etc.) of the CCP to access the central bank and then provide the CCP with *liquidity*.

The CCP may also need central bank support if it has suffered a series of member defaults and is subject to a run because of credit concerns. In this case the CCP's book is not balanced (since the trades of the defaulting members have fallen away) and if the central bank provides *liquidity* support it will be taking *credit/solvency* risk on whatever the net CCP position is (Box 3). In this regard, CPSS-IOSCO Principles for FMIs (financial market infrastructures) are a good background.⁸ A CCP failure should not be ruled out (Box 2 and Box 3). As CCPs begin to clear more complex, less liquid, and longer-term instruments, their potential need for funding support in *extremis* will rise. In the most extreme scenario, where a temporary liquidity shortfall at a CCP has the potential to cause systemic disruption, or even threaten the solvency of a CCP, it is likely that a central bank will stand ready to give whatever support is necessary.⁹ However, such an arrangement would create moral hazard.¹⁰ Regulators are keen on avoiding a CCP bailout and thus the thrust to use VM (variation margin) haircuts *before* a CCP defaults. (Box 3)

Box 2. Central bank Backstop With and Without Interoperability

CCPs might need a central bank backstop even if they take adequate collateral. Central bank support for *interoperable* CCPs that are in distress could well span multiple jurisdictions, due to the associated contagion. Previous analytical work suggests that if a critical mass (i.e. about two-thirds) of OTC derivatives does move to CCPs, then about US\$200 billion will need to be contributed to initial margin and default funds at CCPs (Singh 2010). 1/ In the context of this paper, the focus is on CCPs relevant to OTC derivatives such as ICE Clear U.K., ICE Trust U.S., LCH. Clearnet/Swapclear, CME and Eurex; some of the newer names are not included. 2/ Increased netting results in lower residual risk across all SIFIs' books. In an interoperable world, if international legal challenges are overcome, the increased netting benefits may exceed the extra funds needed to augment default funds at linked-CCPs.

In the more likely scenario (i.e. under *no interoperability*), central bank support will presumably be limited to the failed CCP in one jurisdiction, assuming there is no contagion. However, the present non-linked CCP world results in lower multilateral netting that will require much higher collateral costs for all users of derivatives.

1/ As per Figure 1, augmenting default funds would imply the four linked CCPs hold more than US\$200 billion. Also see <http://www.euroccp.co.uk/leadership/index.php>.

2/ If these four CCPs are linked, they will augment their default funds, and some netting will result from some consolidation of exposures by participants at their chosen CCP. A back-of-the-envelope calculation, assuming the four key CCPs are about equal in size (i.e. each with about US\$50 billion in default funds), suggests that each default fund may need to be augmented by another US\$75 billion, mid-way between the envisaged US\$50 billion and US\$200 billion maximum.

⁸ <http://www.bis.org/publ/cpss101.htm>

⁹ See Box 3 on Variation Margin haircuts as another possible buffer before taxpayers come into the picture.

¹⁰ Under the Dodd Frank Act in the U.S., the Federal Reserve cannot bail out any derivatives dealer. More generally, there is no complete clarity on whether non-banks would have access to central bank liquidity. Sections 802 through 806 of Dodd Frank Act generally authorize the Fed to provide liquidity support under *unusual* or *exigent* circumstances to CCPs that have been designated as systemically significant. The EU has similar language. A taxpayer bailout is not ruled out but will be handled not by the Fed but by U.S. Treasury.

CCPs and utilities:

The revenue/benefits from OTC derivatives come from three sources: the origination fee *plus* netting on books *plus* the clearing fee. Banks will still keep all of the origination fee *plus* some of the netting (from OTC derivatives that do not clear). A utility has two characteristics: (a) government backstop but (b) at negotiated “economic rents.” So for CCPs to be utilities, all three revenue pieces alluded above (which comprise the total economic rent) should be negotiable. But banks will never let go of the origination or structuring fee - this is the biggest piece. The negotiation between regulators and banks is such that this fee will remain undisclosed - usually buried under the line item FICC of their annual reports. The comparison of CCPs as utilities is not apt unless it spans the full spectrum of “economic rents.”

Box 3. CCP Resolution and Recovery: Variation Margin “gain” Haircuts

Some circles of regulators continue to focus on CCP resolution and recovery that avoids taxpayer bailout of CCPs.^{1/} The BoE emphasizes that all CCPs, including those in the U.S. and Eurozone, must have plans to allocate uncovered credit losses. Variation margin (VM) haircutting is the obvious solution once default fund and initial margins and other assessment rights are exhausted. There is an increasing consensus on avoiding taxpayer bailout of CCPs. To elaborate, if a clearing member (e.g. Deutsche Bank) defaults, Deutsche Bank would contribute its share of initial margin and default fund. If losses are not fully recouped then the CCP would dip into the mutualized loss in the overall default fund. After that, there would be haircuts on the VM. Most haircut rules do not directly hurt clients of banks (e.g. hedge funds, pension and insurers, etc.), but market practice is such that in a clearing member-client relationship a clearing bank will only pass on to the client what it gets from a CCP.^{2/}

This micro-economics of variation margin haircuts can also be viewed from a macro too-big-to-fail angle. The U.K. is home to LCH.Clearnet, the largest CCP for interest rate swaps by far. The *net open interest position* (or approximate risk metric for likely losses) of LCH.Clearnet may be too big for the BoE balance sheet. Although liquidity will not be a constraint to banks or nonbanks in the U.K., it will be more difficult for the U.K. to bail-out a large CCP such as LCH.Clearnet than the U.S. or Eurozone (which are relatively bigger). So a VM haircut does provide an additional buffer to the taxpayers. As an example, if a pension fund has a swap/futures hedge and has a gain on his swap position but a loss on his futures position, then there may be a VM haircut on his swap receivable (as this is one route being considered), but this would ignore the loss on the pension fund’s futures position. This also translates into *more asymmetry* between those exempted from clearing and those that are mandated to clear since clients of CCPs (such as a hedge fund) may have to contribute towards CCP resolution and recovery to avoid a CCP default.^{3/}

1/See Tucker (2013), Central counterparties in evolving capital markets: safety, recovery and resolution.

2/Excerpt from LCH Clearnet’s letter to the EC (December 2012): “Open to questions is whether VM (and to some extent Initial Margin) haircutting should also be applied to client balances. Our rules currently allow this.” Market practice is such that in a clearing member-client relation a clearing bank will only pass on to the client what it gets from CCP.

3/ House Committee on Financial Services hearing (June 26, 2013). FDIC Chair Shelia Bair testified to being “surprised at the lack of concern over the designation of “financial market utilities,” and particularly Section 806 which permits the Fed to provide safety net access to designated FMU.” Under U.S. law, only Treasury could provide funds for a bailout.

Decrease in collateral velocity (or re-use rate):

The decrease in the “churning” of collateral may be significant since there is demand from some SIFIs and/or their clients (asset managers, hedge funds, etc.) for “legally segregated/operationally commingled accounts” for the margin that they will post to CCPs.¹¹ Also, the recent demand for bankruptcy remote structures - another form of silo-ing collateral - that stems from the desire not to legally post collateral with CCPs in jurisdictions that may not have the central bank’s lender-of-last-resort backstop (i.e. liquidity and solvency support) will reduce rehypothecation. Table 2 shows that largely due to QE and counterparty risk, collateral re-use is sharply lower from 3.0 (around Lehman) to about 2.2 (end-2012).

Table 2. Sources of Pledged Collateral, Velocity, and Collateral, 2007 and 2010–12
(In trillions of U.S. dollars; velocity in units)

Year	Sources			Volume of Secured Operations	Velocity
	Hedge funds	Others	Total		
2007	1.7	1.7	3.4	10.0	3.0
2010	1.3	1.1	2.4	5.8	2.4
2011	1.3	1.05	2.35	6.1	2.5
2012	1.8	1.0	2.8	6.0	2.2

Sources: Risk Management Association; and IMF staff estimates. See also Singh (2011 and 2012).

However, cognizant that G-20 efforts in favor of CCPs are in train since 2009, the Reserve Bank of Australia’s (RBA) proposals manage to cope with the upcoming regulatory changes that will warrant significant additional high quality liquid assets (or good collateral), without issuing more debt securities (unlike discussions in some policy circles).¹² Their suggested route is akin to collateral transformation but at a penalty rate, but this would keep the collateral re-use rate from declining.¹³ In other words,

$$\text{Demand}_{\text{collateral}} = \text{Supply}_{\text{collateral}} * \text{re-use factor}$$

The RBA, however, does not face QE type dilemmas (like the Fed or BoE) where release of good collateral will be limited due to the interaction between the repo rate and the policy rate. In short, when sizable good collateral is paid 25 bps interest (e.g. the Fed) or 50 bps (e.g. the U.K.) on excess reserves, then the policy rate is “loaded” with inflationary ammunition. Thus, the collateral release rate will need to be controlled so that the repo rate stays below the policy rate. Given this constraint, only some jurisdictions will be able to emulate RBA or a variant of their approach.

¹¹ Post MF Global and Peregrine saga(s) there will be a decrease in the “reuse rate” of collateral as there is increasing demand from several clients (asset managers, hedge funds, etc.) for “legally segregated” accounts. Basel III allows a 0 percent capital charge for bankruptcy remote collateral structures, relative to the 2 percent capital charge that accompanies CCPs.

¹² BIS working paper 399, “Global Safe Assets,” Gourinchas and Jeanne, 2013.

¹³ <http://www.rba.gov.au/publications/bulletin/2012/sep/pdf/bu-0912-6.pdf> This committed liquidity facility (CLF) is akin to paying a fee to get the guarantee of contingent collateral transformation from the RBA at a penalty rate.

There are still other issues that may be important to consider. For example, *regulatory arbitrage* is likely due to the staggered implementation of this ambitious international agenda. Under the Dodd Frank Act, SIFI's banking groups can keep relatively safe OTC derivatives such as interest rate, foreign exchange, and investment grade CDS on the bank's book; the rest have to be "pushed" outside the banking entity (although this is not the case in Europe and Asia). Extraterritoriality issues that are being discussed in the U.S. may also lead to regulatory divisions and may lead to booking/netting of OTC derivative books to another jurisdiction (e.g. Asia) to "accommodate" and adhere to the final definition of extraterritoriality.

D. An Alternative to the CCP Route: Taxing Derivative Liability Positions

A relevant metric that captures derivatives risk to the financial system is the exposure of the financial system to the failure of a SIFI that is dominant in the OTC derivatives market; this is captured by the SIFI's total "derivative liabilities" (and not "derivative assets"). At present, a SIFI's derivative liabilities are not directly targeted with a regulatory capital charge and are not reflected in risk assessments. It is important to recognize that the ISDA master agreements allow SIFIs to net (or offset) their derivative asset and liability exposure on an entity. Thus, if Goldman has a positive position with Citi on an interest rate swap and a negative position with Citi on a credit derivative, ISDA allows for netting of the two positions.

By using residual (i.e. after netting, and after whatever collateral is posted) derivative liabilities as a yardstick, we thus provide a readily available metric to measure systemic risk from derivatives. The past is important to reflect upon: the five largest European banks had about US\$700 billion in under-collateralized risk in the form of (after netting) derivative liabilities as of December 2008. The U.S. banks had similarly around US\$650 billion exposure as of end-2008, as dislocations were higher then. The key SIFIs active in OTC derivatives in the U.S. are Goldman Sachs, Citi, JP Morgan, Bank of America, and Morgan Stanley. In Europe, the SIFIs that dominate this business are Deutsche Bank, Barclays, UBS, RBS, Credit Suisse and BNP Paribas.

Regulations have not mandated reducing residual derivative payables. There are other avenues to remove OTC derivative risk from the large banks books with similar underlying economics and perhaps lower collateral needs. For example, a levy on residual derivative liabilities (i.e. after netting and after whatever collateral is posted) is a more transparent approach than moving OTC derivatives to CCPs, especially if the costs of bailing out CCPs are to be funded by taxpayers (although there is now an increased focus on variation margin (VM) haircuts as discussed in Box 3 that may avoid taxpayer bailout). If a levy is punitive enough, then large banks will strive to minimize their residual derivative liabilities - *this* is the primary objective; *not the levy*. This will minimize systemic risk via the OTC derivatives markets if a large bank fails. More importantly, as a by-product of the above levy, the residual derivative assets will also go towards zero.¹⁴ From a legal angle, this is an important point. Due to national bankruptcy laws, there is an asymmetry when a bank fails at T_0 - the residual derivative assets cannot be used at time T_0 as they go under receivership; it gets

¹⁴ This will happen since the large banks typically have matched books (i.e. the size of the derivative liability and asset positions at each bank is, on average, roughly the same).

stuck. The levy route (see Box 4) brings the collateral stuck in residual derivative assets into consideration. The levy suggestion attempts to make those exempted from clearing to also pay for their use of OTC derivatives (or have their banks pay on their behalf if banks want their business). So, if every OTC derivative user (including sovereigns, quasi sovereigns, end-users, etc.) posted their share of collateral, there may be enough collateral within the OTC derivative markets that if “reshuffled” appropriately may not warrant sizable additional collateral.¹⁵ So if exempted clients pay a levy such that residual derivative liabilities of the SIFI go towards zero, and those not exempted clear via a CCP, then the risk from derivatives on the SIFIs book will be minimal. Furthermore, the SIFI may find it optimal not to unbundle sets of transactions that net (but comprise a combination of cleared/uncleared sets). This is where the mandatory requirement to clear *some* transactions results in economic inefficiency.¹⁶ Transactions used to clear even before these proposed regulations—the market opted to clear without any clearing mandate.

Recent regulations are now addressing margin requirement for non-cleared trades; it is uncertain if exempted clients (or their banks) will prefer bilateral clearing over central clearing.¹⁷ In this bifurcated cleared and non-cleared world (and also the legacy trades that will remain uncleared as they are not addressed by the new regulations), there will likely be arbitrage as banks/clients will try to minimize their overall costs of using OTC derivatives.

¹⁵ This would also go a long way in breaking the sovereign/bank nexus umbilical cord. There would be no need for CCPs and this route offers the cleanest economics.

¹⁶ If SIFIs still find it optimal to clear some trades (that are not “bundled”, or to reduce their balance sheets), then CCPs will be much smaller (as in pre-Lehman world) than CCPs under proposed regulations. CCPs could still fail though; in this case, to avoid taxpayer funds, the VM haircuts will be targeted only on SIFIs (i.e. banks, who opted to clear and move these positions) and CCPs; no VM haircuts on anyone else (i.e. clients or end-users). Note that in this “no mandatory clearing” world, there would be no exempted clients.

¹⁷ www.bis.org/press/p130902.htm

Box 4. Analytics of the Tax on Derivative Liabilities

Under no interoperability, tail risks are less likely to decline. Let p denote the probability of a bail-out in a CCP world, and let P measure the probability of the bailout of a SIFI in the (status quo) non-CCP world.

For $p < P$, overall tail risks in the CCP world would be lower than the tail risks in the non-CCP world. Increased multilateral netting via interoperability is one way this could happen, but is unlikely because the needed legal conditions are not in place. Furthermore, no CCP offers cross-product netting, so contracts that net at a SIFI book may need to be “unbundled” when moved to two non-linked CCPs. Similarly, between-product netting may also lead to collateral inefficiencies since a standard/nonstandard combination would have to be unbundled: the standard contract would move to a CCP along with the associated collateral, while the nonstandard contract would stay with the SIFI and attract a regulatory charge. Such unbundling decreases overall netting. Thus, ex-ante, it remains unclear if the overall netting due to CCPs (primarily between products and not across products) will be higher than that from the unbundling of netted positions or other issues associated with moving derivatives to CCPs (e.g. reduced rehypothecation of collateral due to the ‘silo-ing’ of collateral at CCPs, or demands for segregated collateral accounts by certain clients).

Another way to reduce tail risks is to take collateral from those who are not posting collateral. This can be done in the CCP world by regulatory incentives. But it could also be done in the status quo world by placing a levy/tax on derivative liabilities (that would result in revenue that could be used if a SIFI needs to be bailed out in the future). Now, let p_1 and P_1 denote the probability of a bail-out when the present under-collateralization is reduced. Note that $p_1 < p$ and $P_1 < P$. Moreover, p_1 is largely exogenous due to regulatory uncertainty, while P_1 is endogenous since the tax, T , can be calibrated to reduce the risk metric (i.e. residual derivative liabilities in the non-CCP world). **Thus, P_1 can be less than p_1 and further strengthens the tax argument analytically.** However, we will make the “worst-case” assumption here that they are equal, i.e., $p_1 = P_1$.

To summarize, the tail (or bailout) risk in the envisaged CCP world and the present SIFI-only world might well remain the same. However, the CCP world would have a bail-out cost of C . The status quo world without CCPs may well have a similar bail-out cost C when a SIFI goes under, but this can be paid by the revenue T via the tax/levy that will be imposed on the large residual derivative liabilities of SIFIs who want to ‘carry’ this systemic risk.

	CCP world	Status quo with tax
At present, probability of bailout	p	P
Ex-post, probability of bailout	p_1	P_1
Ex-post, cost, C , of bailout in n years	$p_1 C$	$P_1 C - \sum_{T=1}^n T$

As argued above, since p_1 is not less than P_1 , the status quo with tax is economically more efficient.

E. Summary of Conclusions

The only residual actor left in the financial system to bridge demand and supply will be the 10–15 banks that specialize and span the global cross border collateral market. This would entail “connecting” clients (such as a pension fund) that have good collateral to lend to clients (such as a hedge fund) that do not have good collateral but need to post collateral acceptable to a CCP. In general, central banks, sovereign wealth funds, and long-term asset managers desire collateral that is low volatility, but not necessarily highly liquid. These entities should be net providers of liquidity in the financial system. On the other side are banks/hedge funds/mutual funds that have a dramatically shifting need for liquid/good collateral. So a market for collateral upgrades/transformation - in theory - could work.

However, many banks may not be able to transform collateral if the (final version of) leverage ratio encompasses all off-balance sheet pledged collateral items. If the proposed definition stays the same, then banks will have to trade off balance sheet leverage constraints vs. profitability from collateral trades.¹⁸ It should be noted that collateral transformation will further “interconnect” the financial system (and moving derivatives to CCPs was supposed to break the interconnectedness). Alternately, some central banks may supply collateral directly to the nonbanks.¹⁹ But this would not only weaken the financial plumbing between banks and nonbanks (which in essence determines the repo rate), but also provide “puts” to nonbanks such as money market funds, etc.²⁰ The Fed’s recent reverse repo program is an excellent example.

In summary, the proposed route of removing OTC derivatives from banks’ books creates new SIFIs, destroys the economics of netting on the books of the banks, silo(s) collateral and decreases collateral velocity, and increases the interconnectedness of the financial system. Alternately, if *every* user of OTC derivatives contributed their share of margin(s) when using OTC derivatives (relative to the proposed bifurcated “clearing” and “non-cleared” worlds), the risk from derivatives at SIFIs would be eliminated. There would be no need for CCPs. In fact some countries have opted not to have a CCP (Box 5).

¹⁸ Once off balance sheet items are included in the leverage ratio, this will impact their leverage; also bigger balance sheet means more deposit insurance levy (e.g. FDIC in the U.S.). So if dealers help move collateral from say a hedge fund to a pension fund, they will need the balance sheet to do so. If leverage ratios are a hard constraint, collateral scarcity may remain; there’s nothing wrong with it - markets can live with negative or zero repo rates but this may manifest itself differently. If a pension fund finds collateral very expensive to post, it may not hedge its position—that will be risk in the financial system. Alternatively the pension fund may skirt the use of OTC derivatives and use futures, as they are much cheaper than posting “expensive” collateral, and get away with it, but futures cannot mimic a 30-year hedge as an OTC (custom made) derivative.

¹⁹ <http://www.federalreserve.gov/monetarypolicy/fomcminutes20130731.htm>

²⁰ Puts in the Shadows (Singh, 2012) will increase as nonbanks directly interface with central banks.

Box 5. Should Every Country Have A CCP? The Cases of Canada and Australia

Canada's decision to not have its own CCP is based on sound economic analysis that many other key jurisdictions have not yet undertaken. For example, Canadian banks deal in non-Canadian currencies so will get higher netting benefits only if they access a global CCP. Since netting will not be substantially less for Canadian participants if they used a domestic Canadian dollar only CCP (putting these participants at a competitive disadvantage relative to their global peers), Canada has decided that it is not in their interest to foot the infrastructure cost of having a Canadian CCP (that may need to be bailed out).^{1/} In particular, accessing an international CCP like LCH Swapclear was deemed to be satisfactory since the following safeguard provisions identified by the FSB (Financial Stability Board) were viewed as being sufficiently in place (since resolution regimes for CCPs are not fully in place yet).

- Fair and open access by market participants to CCPs,
- Cooperative oversight arrangements for CCPs between relevant authorities,
- Resolution and recovery regimes that aim to ensure the core functions of CCPs are maintained during times of crisis, and
- Appropriate emergency liquidity arrangements for CCPs in currencies in which they clear.

Australian banks, on the other hand, do not deal much in non-Australian dollar OTC derivatives. Thus netting benefits from cross-currency derivatives may not justify going to a global CCP (although recently, Australia has approved direct access for Australian bank interest rate swap users to LCH Swapclear). Local CCPs may suffice and thus their present position is open to hosting a domestic CCP. In such a case, regulatory oversight of Australian dollar (AUD) derivative positions along with netting benefits of banks dealing in AUD derivatives will accrue to Australia. On the flip side, since CCPs will be systemically important, any cost of bailing out a domestic CCP will be an Australian taxpayer liability.

From a global systemic risk angle and collateral perspective, consolidation of CCPs will be welcome since risk will be less fragmented and collateral per unit of clearing will decrease.

^{1/} Generally speaking, large losses stemming to a bank from their OTC derivative positions - if it leads to bailout - will typically be picked up by taxpayer from the jurisdiction in which the bank is located. Also, for example, derivative losses at branches of a Canadian bank in a foreign jurisdiction (e.g. London) will also become a Canadian taxpayer liability. Moving OTC derivative positions from say a Canadian bank to a foreign CCP that is owned/incorporated in say the U.K., could shift some of the Canadian taxpayer liability related to cleared OTC contracts to a U.K. taxpayer liability if the U.K. had to bail-out the CCP.

Annex 1. Netting Fragmentation - Cleared and Non-cleared OTC Derivatives

Before the regulatory proposal to move OTC derivatives to CCPs there were “n” big banks with “n-1” netting sets between them. Those netting sets were fully cross-product within each bilateral relationship. The beneficial effect of netting on risk (and thereby capital and margin) was around 80–90 percent of the in/out of the money positions (let us say X).

If there was one global “CCP” that became the counterparty to all OTC derivative (including across products and currencies) transactions among the “n” big banks, this would result in “n” netting sets each between a bank and CCP. This would not only preserve the cross-product nature of the netting set but also make the overall risk of the CCP to be multilateral; this would be good and the beneficial effect would be greater than X, let us say Y.

However, a global CCP is unlikely due to political, legal and business model constraints - there will be multiple CCPs - “p” (including CCPs focused on certain OTC derivative product categories like CDS only, or IRS only, due to their specialization and niche business models). Thus the netting sets proliferated to be “n x p”, plus of course the netting sets associated with the remaining bilateral trades, which were still “n-1” in number but much less diversified because many trades had been moved to the relevant CCP.

Algebraically, the original n-1 netting sets will become $np+n-1$ or $n(p+1)-1$ netting sets. The unbundling of the original netting sets will create more sets (numerically) but smaller and less diversified in content, until a CCP can offer to clear all OTC derivatives (unlikely so far). So the netting benefit is likely Z, which will be much less than X or Y. (There have been studies to show that initially Z will be less than X, but Z will only overtake X when a sizable part of the OTC D market will be offloaded to CCPs, *and* when the number of CCPs will consolidate from say p to about q (where $q < p$). For illustration, n is about 10–15; p is envisaged to be (initially) between 20 and 30 since many countries want their own CCP. It remains to be seen if the number of CCPs will consolidate where q is a single digit number (e.g., LCH, ICE, CME, Eurex and a few more). Note that ICE Europe and ICE U.S. are two CCPs from a netting perspective. Also if LCH, U.K. has a branch in the U.S. for U.S. clients, then netting will be fragmented netting since LCH, U.K. will net independently of LCH, U.S.

Non-cleared trades will continue to remain on the books of the banks but after netting bundles are broken.²¹ The n-1 remaining bilateral netting sets are proposed to be subject to different margin rules, and so the number of netting sets will become np plus at least $(2n-1)$ or, $n(p+2)-1$, since each bank’s book will not net linearly like in the past. Thus, the netting benefit from here will be even smaller than Z. Netting set fragmentation is real and increases risk. Thus, in line with the economics of ISDA agreements, the non-cleared trades should be allowed to net to limit fragmentation and collateral silo(s).

²¹ It’s like breaking a Ming vase by dropping it and then picking up one of the pieces and saying “well at least this bit’s not broken.”

Annex 2. Typical OTC Derivative Position from a SIFI's Financial Statement

	March 2009	
	Derivative Assets	Derivative Liabilities (in millions)
Derivative contracts for trading activities		
Interest rates	\$ 1,171,827	\$ 1,120,430
Credit	469,118	427,020
Currencies	92,846	85,612
Commodities	80,275	77,327
Equities	100,291	92,612
Subtotal	<u>\$ 1,914,357</u>	<u>\$ 1,803,001</u>
Derivative contracts accounted for as hedges under SFAS No. 133 ⁽¹⁾		
Interest rates	\$ 24,347 ⁽⁴⁾	\$ 1
Currencies	50 ⁽⁵⁾	31
Subtotal	<u>\$ 24,397</u>	<u>\$ 32</u>
Gross fair value of derivative contracts	\$ 1,938,754	\$ 1,803,033
Counterparty netting ⁽²⁾	(1,685,348)	(1,685,348)
Cash collateral netting ⁽³⁾	<u>(149,081)</u>	<u>(27,065)</u>
Fair value included in "Trading assets, at fair value"	<u>\$ 104,325</u>	
Fair value included in "Trading liabilities, at fair value"		<u>\$ 90,620</u>

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