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Global SIFIs, Derivatives and Financial Stability

by

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(in collaboration with Samuel Eddins)*

This paper looks at Global Systemically Important Financial Institutions (GSIFIs) and the global derivatives business. The derivatives business has grown exponentially versus global GDP in sharp contrast to the primary securities on which derivatives are based. Inter-connectedness risk and unconstrained potential leverage remain the most urgent tasks still facing the financial reform process. Concentrated oligopolistic derivatives markets and the ability of banks to shift promises and/or use their IRB models to estimate ex-ante risk capital – capital that might be needed in the event of a crisis – undermine the intent of financial reform. Nor do netting and clearing eliminate aggregate risk of losses and bankruptcy. The paper repeats the need to implement two of the OECD's long-standing reform recommendations: a binding leverage ratio based on equity and the separation of high risk investment banking activities from traditional banking. A derivatives transactions tax is also put forward as a possible option that would counter the cross-subsidisation of risk from the too-big-to-fail (TBTF) problem.

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I. Introduction

Dealing with GSIFIs and inter-connectedness risk remain the most urgent tasks facing the reform process

The global financial crisis was caused by a combination of the mispricing of risk and innovations in instruments – particularly with the use of credit enhancement derivatives – that allowed leverage to expand rapidly. The crisis was also exacerbated by the presence of interconnectedness, which saw contagion of losses, both within and between large global banks and other institutions. These large universal and investment banks that encompass the global derivatives business are referred to as Global Systemically Important Financial Institutions (GSIFIs). The need to contain the huge risks to which these institutions still give rise remains the most urgent task left on the table of the financial reform process.

In recent years the OECD has produced a number of articles focusing on GSIFIs and the need for the reform of capital rules, banking structures and competition within the financial system.[1] All of these papers have focused on the need to strike a balance between sometimes conflicting policy objectives, where banks:

- have sufficient capital to absorb major shocks and thereby avoid the deadweight losses of a failing bank on the economy, but not so high so as to discourage intermediation at a reasonable price;
- are large enough to be diversified between asset classes and regionally, but with a structure of individual businesses that can be allowed to fail (closed by regulators) without materially contaminating other businesses within or outside the group. This helps to avoid underpricing of risk that results from "too-big-to-fail" (TBTF) status.

A GSIFI surcharge based on RWA will not be efficient

As recently decided by the Basel Committee,[2] a progressive Common Equity Tier 1 capital charge ranging from 1% to 2.5%, depending on a bank's systemic importance, may be imposed on banks' risk-weighted assets (RWA), with an additional 1% surcharge if such banks materially increase their global systemic importance. This paper, however, argues that a GSIFI surcharge applied to risk weighted assets would not be the most efficient approach for dealing with excess leverage and interconnectedness risk in these firms. The paper re-emphasises two previous OECD reform proposals, which are either not yet implemented in all countries, or are implemented in a way that leaves too large a gap to be effective in preventing the underpricing of risk and the under-capitalisation of financial firms; it also adds a new option for dealing with interconnectedness risk:

- a leverage ratio based of IFRS total assets;
- the separation of investment banking from retail and commercial banking operations, in order to remove the too-big-to-fail cross-subsidisation of high-risk activities;
- an OTC derivatives transactions tax.

Section II provides an overview of the global derivatives business. Section III examines concentration trends in the derivatives businesses of banks, and how this will be affected by regulatory reform. Section IV looks at the problem of interconnectedness risk related to derivatives from the perspective of past and more recent losses. Section V summarises recent regulatory reforms purporting to address the problems of leverage and counterparty risk. The main GSIFI risk mechanisms that have not been dealt with are explored in section VI. The three policy options to deal with leverage and interconnectedness risk in GSIFIs are explained in more detail in section VII. Finally, some concluding remarks are made in section VIII.

II. The global derivatives business

In very broad terms, there are two quite different types of financial products:

Primary securities versus...

- Those primary instruments associated with consumption, savings and fixed capital formation that create wealth (usually associated with loans for trade credit and working capital, and securities – equity and debt – to finance productivity-enhancing innovation and investment); and

...derivatives...

- Those associated with wealth transfer between economic agents in the attempt *(i)* to hedge risks; *(ii)* to arbitrage prices for speculative purposes; and *(iii)* to reduce tax, regulatory and agency costs (management fees, custody, brokerage, etc).

...that shift promises...

Derivatives are very much associated with the latter activity: wealth transfer (the shifting of promises embedded in underlying securities and resources, often many times over). OTC derivatives certainly result in strong revenue and profits for GSIFIs, and this profit typically arises as a transfer from other agents in opaque OTC market where bid ask spreads are wide and/or by reducing tax and regulatory costs.

...have grown exponentially versus world GDP...

Figure 1 shows the notional global value of derivatives as a share of global GDP alongside primary global financial instruments. The total of derivatives plus primary securities rises to 14 times world GDP in 2008, before dipping back to12 times in 2010, following the financial crisis. Global primary financial assets (equity market capitalisation, debt securities and bank assets), on the other hand, remained within a range of 1.5 to 2 times world GDP over the period 1998 to 2010.

...compared to primary securities that have not

Figure 2 shows the basic components of primary securities. They rose from 1.5 times GDP in 1998 to 2 times by 2000, led by the equity boom in tech stocks. While equity values fell thereafter, the steady growth of banking and securities as a share of GDP offsets this effect by 2010.

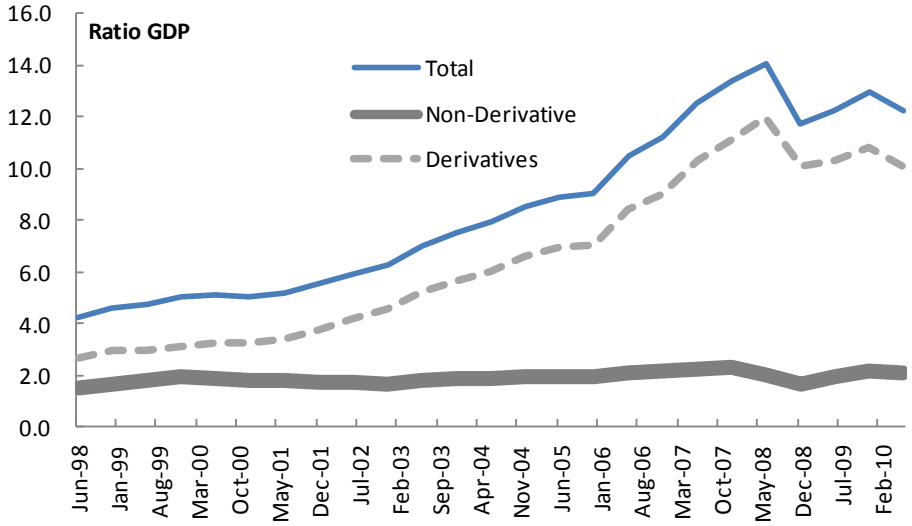
Interest rate derivatives dominate, followed by those

The notional value of derivatives, in contrast, has had spectacular growth, rising from USD 81 trillion in 1998, less than 3 times world GDP, to USD 605 trillion (around 10 times GDP) by 2010. Most of the derivatives are over-the-counter (OTC), with only USD 28 trillion (or 3.8% of the total) traded on

regarding exchange rates, CDS, commodities and equities

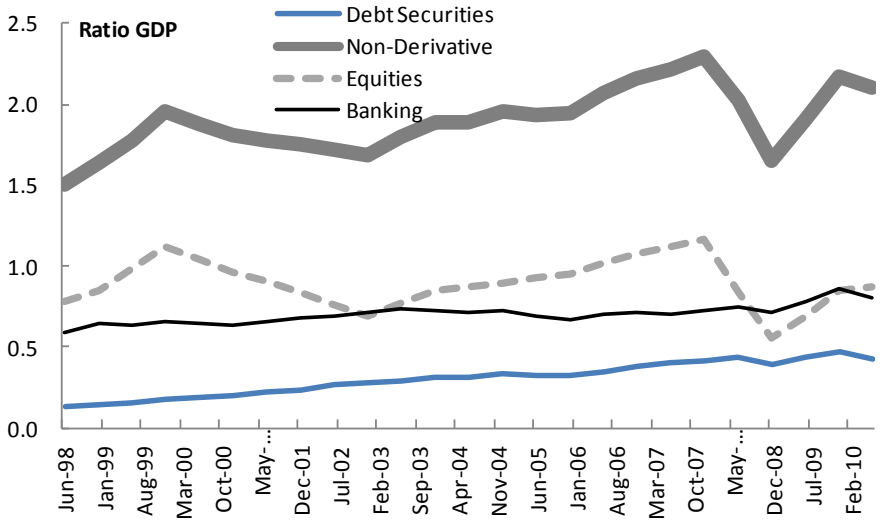
exchanges. Over this same period the gross market (current settlement) value of all derivatives rose from 8.5% to 41% of world GDP.[3] Figure 3 shows the composition of the notional outstanding value of derivatives, which is dominated by interest rate contracts (swaps, options, futures and forwards) currently at USD 452 trillion. Credit Default Swaps (CDS), which played such a major role in the global financial crisis, rose sharply after 2004 to USD 58 trillion, before declining by about half their value following the financial crisis. Currently derivative instruments are made up interest rate derivatives (USD 452 trillion), exchange rate derivatives (USD 53 trillion), CDS (USD 30 trillion), commodity derivatives (USD 28 trillion) and equity-linked derivatives (USD 6 trillion).

Figure 1. Global notional derivatives *versus* primary securities



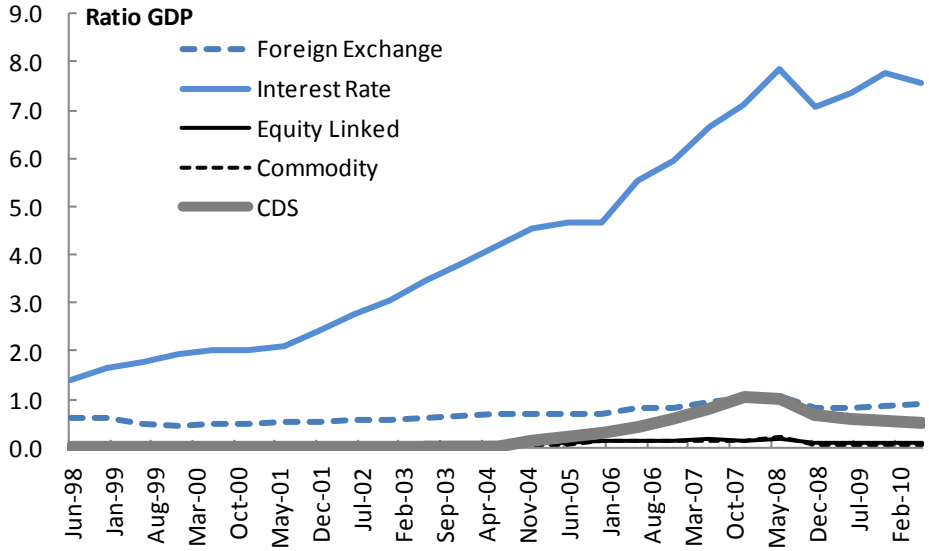
Source: BIS, Datastream, World Federation of Stock Exchanges, OECD.

Figure 2. Composition of primary securities



Source: BIS, Datastream, World Federation of Stock Exchanges, OECD.

Figure 3. Composition of derivative securities



Source: BIS, Datastream, World Federation of Stock Exchanges, OECD.

Explaining these trends

Some of this layering of derivatives is for "legitimate" end-user hedging purposes (*e.g.* stabilising income streams, and energy and interest costs). But it is difficult to believe that such activities would have increased at an exponential rate *versus* the reference primary securities on which they are based. Other explanations include some less than socially useful activities, including:

Regulatory arbitrage

- *Regulatory arbitrage*: Basel capital rules work from the ideas of ex-ante riskiness of assets which can be weighted and added across different risk "buckets" for the purpose of capital adequacy calculations. But with complete markets in securities and credit, the riskiness of securities can readily be shifted to where capital charges are lower. An entire industry has built up around this business and some of the spectacular failures in the crisis were directly related to this activity.

Tax arbitrage

- *Tax arbitrage*: the tax treatment of investors and financial products are also very uneven, and derivatives are well suited to take advantage of the opportunities that this presents. Income streams and tax benefits can be shuffled between agents to achieve the best mix of after-tax returns. Structured tax-efficient products have the advantages of *(i)* convenience; *(ii)* tailoring products to suit individual client objectives; *(iii)* opaque pricing with respect to the source of return (income or capital gain); *(iv)* use of bank balance sheets' attractive funding costs; and *(v)* leverage to increase the profit impact of trading a given spread.

Speculation

- *Speculative trading*: where potentially highly profitable but high tail risk investments are made and churned. GSIFI participants benefit from ready low-cost liquidity and cross-subsidisation from the too-big to-fail (TBTF) status of these firms (a part of the underpricing of risk).

III. Concentration trends in OTC derivative markets

New products like CDOs are characterised by rapid entry into new revenue streams reducing concentration...

The nature of competition in product segments is such that early movers in new products that exploit the above-mentioned arbitrage opportunities gain revenue share quickly, which then induces entry into the business from other banks. This occurred in the fixed income area prior to the crisis, with CDOs and CLOs playing a key role. UBS for example was a late entrant in CDOs and suffered the collapse without enjoying a long period of gains.[4] Derivatives are easy to implement and can change and leverage positions rapidly.

...only to see it rise again as loss makers exit later on

As the CDO/structured product boom and bust showed, this entry forces margins down and increases leverage to the point where some players fail. Exit from the industry leads to a more oligopolistic structure, and the improvement of GSIFI margins for the winners of this process. There are both trends and cyclical movements in concentration and competition which have implications for the consumer and for financial stability. In the following sections these trends and dynamics are explored for interest rate, exchange rate and equity derivative markets, respectively.

Interest rate derivatives

Oligopolistic structures have emerged in interest rate derivatives...

Figure 4 shows recent trends in the Herfindahl index[5] for interest rate derivatives – forwards rate agreements, swaps and options – between BIS reporting banks and non-reporting bank clients.[6] This gives some sense of the trends in competitiveness with respect to the consumers of interest rate derivative financial services. There was a sharp pick-up in concentration following the end of the 1990s, when the Gramm-Leach-Bliley Act removed the Glass-Steagall Act, and firms re-positioned in the lucrative US market.[7] The fixed income boom, following the tech bust, saw concentration fall as entry into the fixed income products was important in market share and the stock performance of GSIFIs. The CDO/CLO CDS-based structured product boom also led to new entry from smaller and certainly less experience players. Risk was being underpriced and leverage rose sharply, with the CDS boom and credit rating agencies playing a strong role in both. Subsequently, concentration has begun to rise again, as firms have left the industry or reduced their shares.

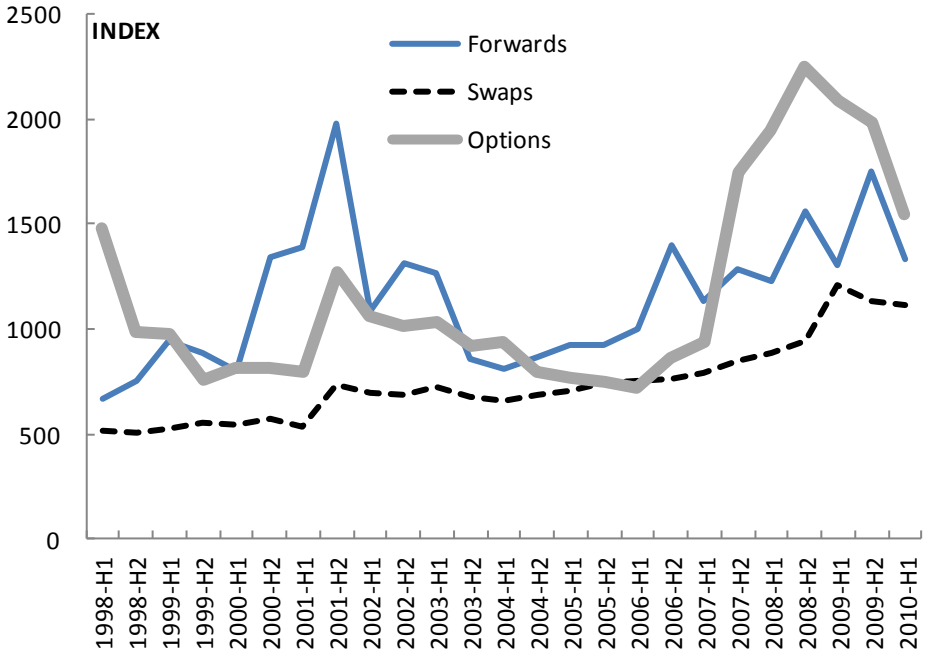
...servicing clients...

...and in bank-to-bank trading

Similar patterns emerge when the trends for contracts between reporting banks are examined, as in Figure 5. These give some idea of which way concentration is moving in the inter-bank market, where financial stability concerns related to interdependence arise. There was a sharp pick up in concentration during the M&A period post Glass-Steagall. Subsequently, there was a reduction in concentration as the CDO/CDS boom encouraged entry and

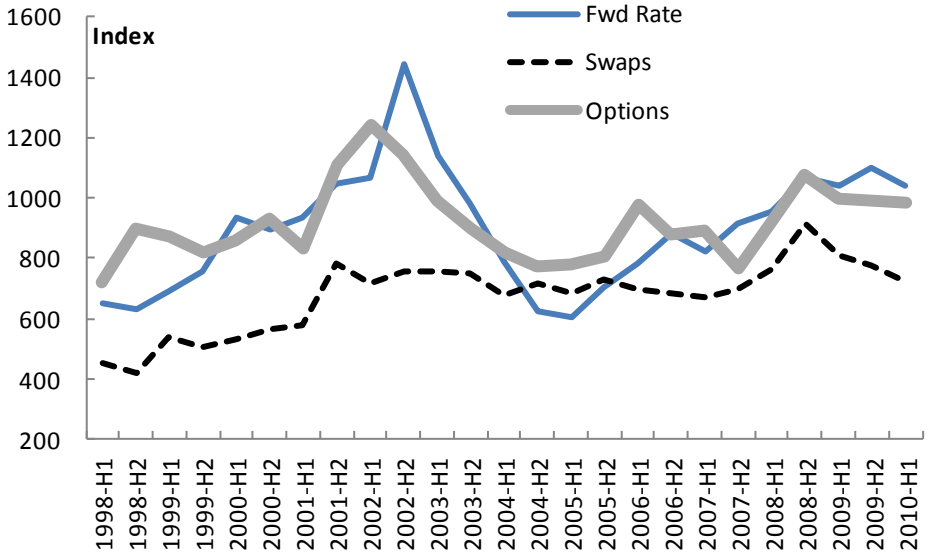
battles for market share. The crisis has led to exit from the market and concentration, as a consequence, has subsequently been rising.

Figure 4. Herfindahl index, interest rate derivatives; bank-to-non-bank clients



Source: BIS, OECD.

Figure 5. Herfindahl index, interest rate derivatives; bank-to-bank clients



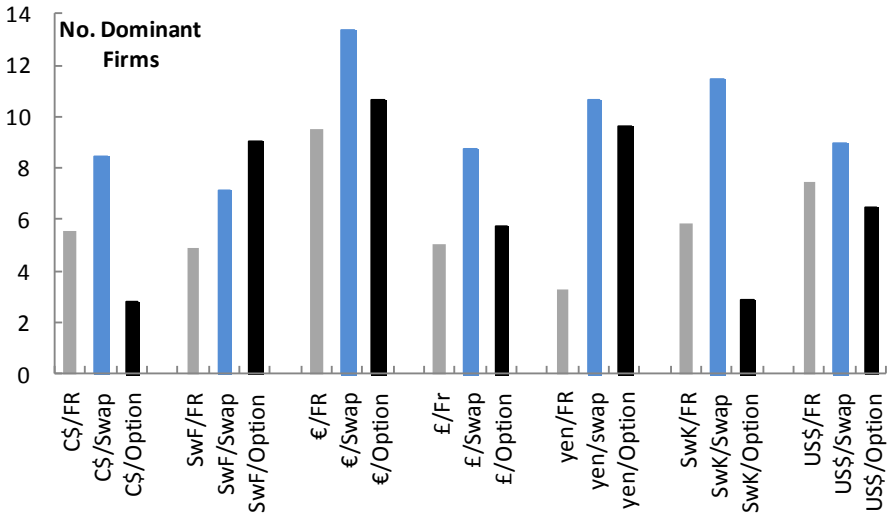
Source: BIS, OECD.

Figures 6 shows the interpretation of the most recent numbers in the bank-to-non-bank interest rate derivatives, while that for bank-to-bank derivatives is shown in Figure 7. For the large US market, the indexes imply that – if all firms had equal shares – there would be:

The equivalent of 6-9 firms service the global interest rate bank-to-client products...

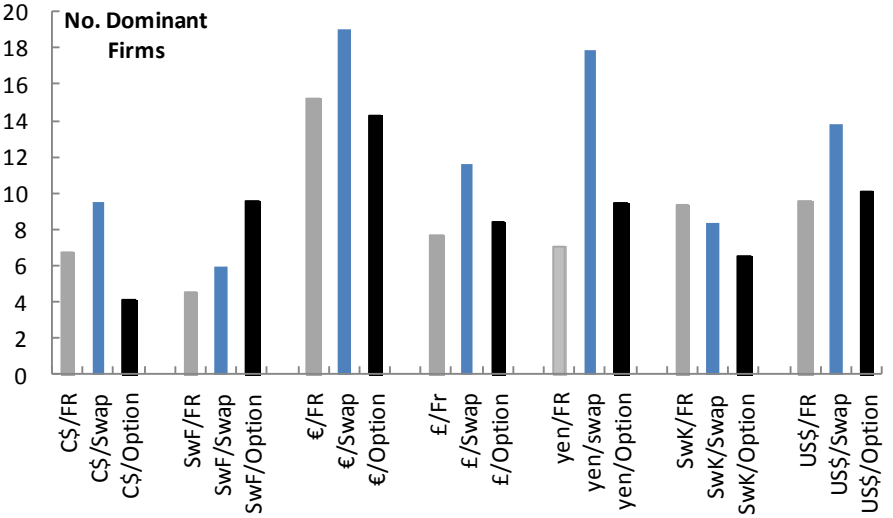
- Only 6 firms dominating the dollar-based interest rate options market to non-banks clients; 7 for forward rate agreements and 9 for interest rate swaps. There is even greater concentration in some of the smaller currency markets; the euro-based products are overall more competitive.

Figure 6. Interest rate derivatives bank-to-non-bank; number of equal share dominant firm equivalents



Source: BIS, OECD.

Figure 7. Interest rate derivatives bank-to-bank; number of equal share dominant firm equivalents



Source: BIS, OECD.

...while only 10-14 service the bank-to-bank market

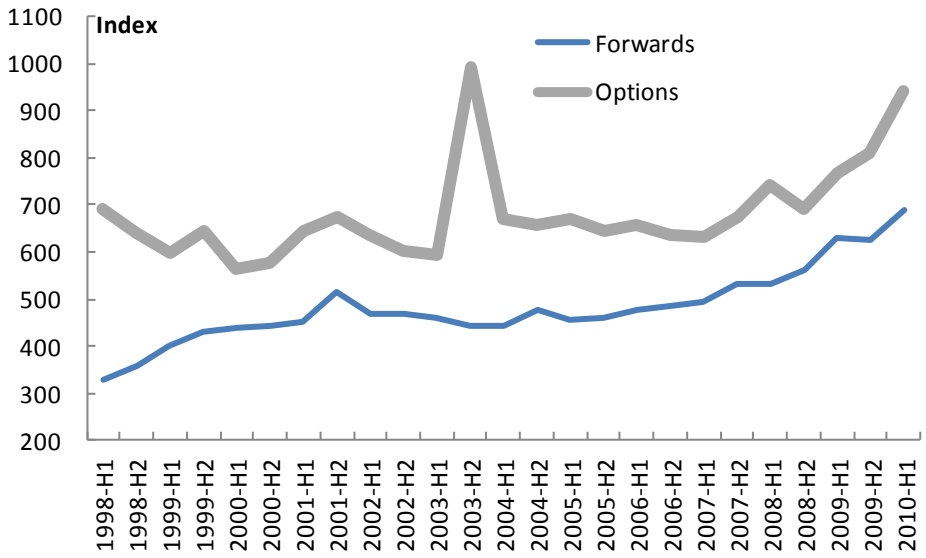
- For inter-bank interest rate derivative products, 10 dominant firms serve the forward rate agreement market and the option market, while 14 serve the swap market.

Foreign exchange derivatives

Concentration is rising in foreign exchange derivatives...

There have been similar concentration trends in the other derivative markets controlled by GSIFIs. Figure 8 shows Herfindahl indexes for foreign exchange derivatives, for forward rate agreements and options in the dealings of BIS reporting banks and their non-bank clients. Concentration has risen since the crisis led to the exit of weaker players and as regulatory and other barriers to entry have risen. While 30 equal-size dominant firms served the forward rate market and 14 served the options market at the start of the period (1998), this declined to 14 and 10 firms, respectively, by 2010.

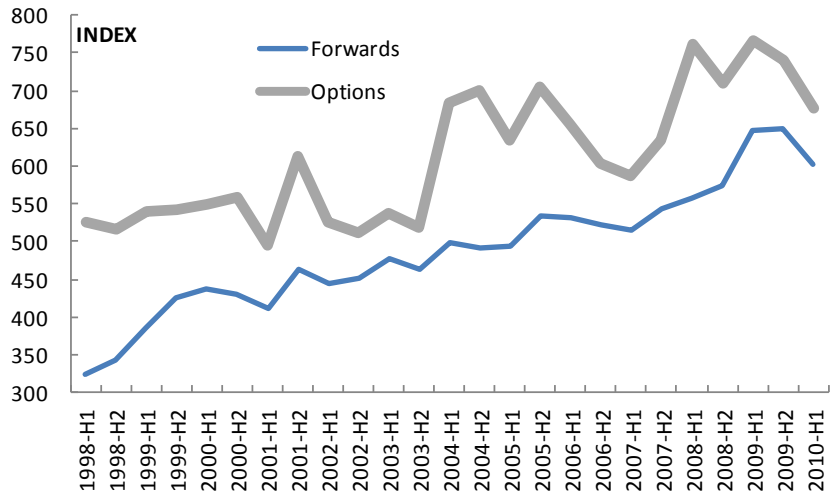
Figure 8. Herfindahl index, exchange rate derivatives; bank-to-non-bank clients



Source: BIS, OECD.

Figure 9 shows the same trends for the bank-to-bank foreign exchange derivative contracts. Here there has been an unmistakable upward trend in the concentration ratio. While 31 equal-size dominant firms served the forward rate market and 19 served the options market at the start of the period (1998), this declined to 16 and 15 firms, respectively, by 2010.

Figure 9. Herfindahl index, exchange rate derivatives; bank-to-bank clients



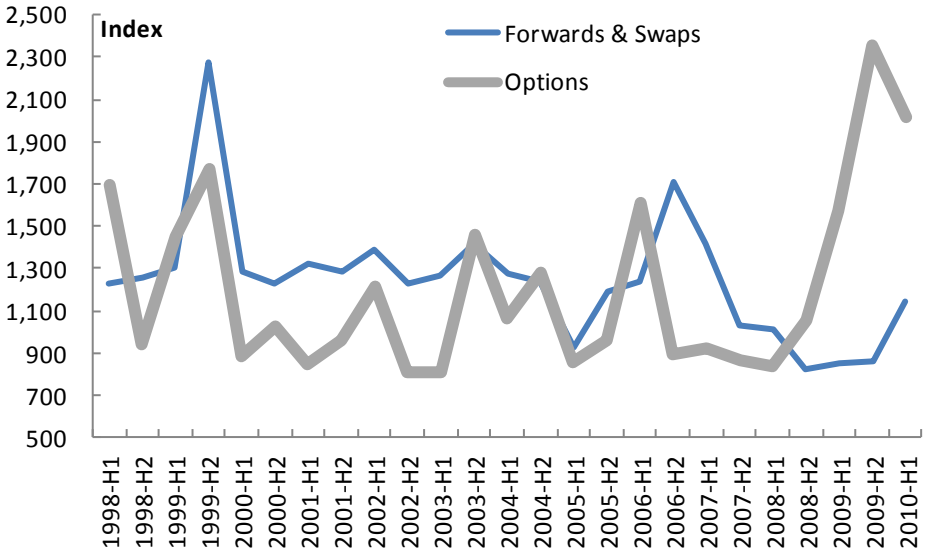
Source: BIS, OECD.

Equity derivatives

...and equity derivatives have always been very concentrated

Figure 10 shows Herfindahl indexes for equity derivatives: for forward rate agreements and swaps (taken together) and for options, for the bank-to-non-bank market. No trends are evident in the concentration in the provision of these services between BIS reporting banks and their clients, except for a large jump up in concentration of option services following the financial crisis.

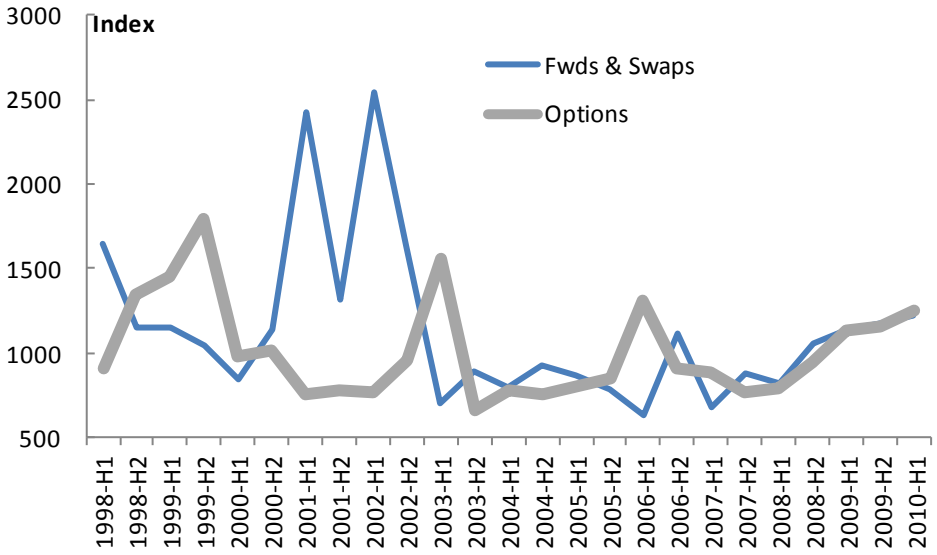
Figure 10. Herfindahl index, equity derivatives; bank-to-non-bank clients



Source: BIS, OECD.

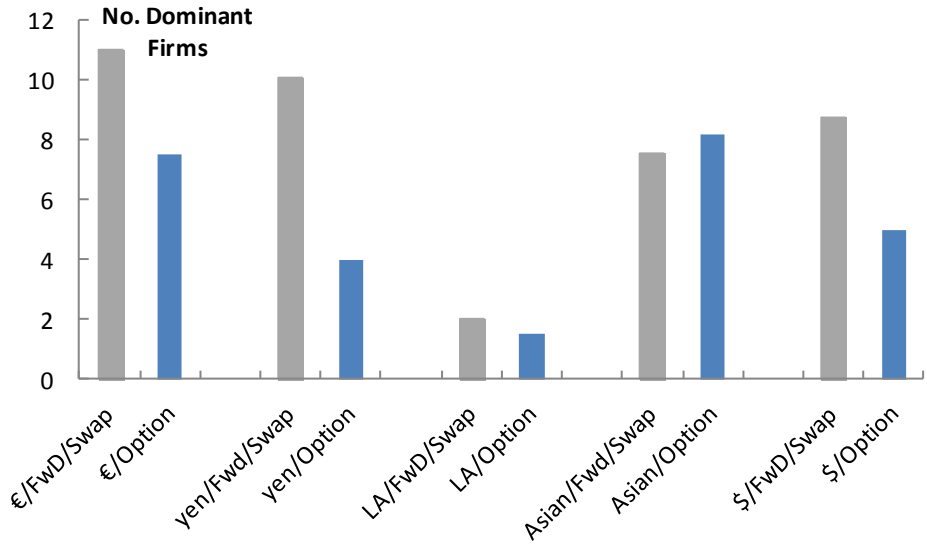
However, the market has tended to be much smaller than the other derivative markets to this point in time, and it has always been more highly concentrated than the other markets since 1998. Similar comments apply to the bank-to-bank market in equity derivatives shown in Figure 11. There was a spike in concentration at the end of Glass-Steagall, which subsequently fell away in the mid 2000s. But since the crisis concentration in the market has begun to increase.

Figure 11. Herfindahl index, equity derivatives; bank-to-bank clients



Source: BIS, OECD.

Figure 12. Herfindahl index, equity derivatives; bank-to-non-bank clients

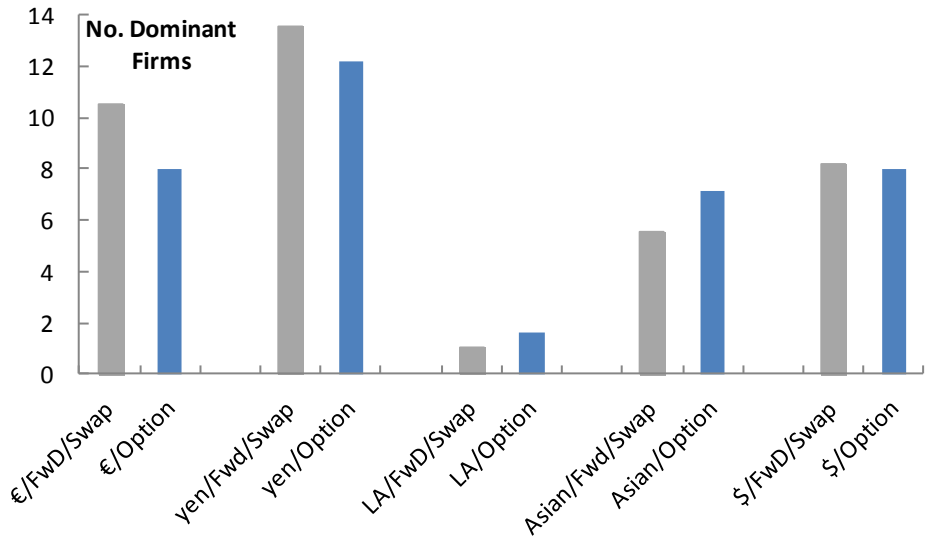


Source: BIS, OECD.

Only the equivalent of 5 firms serve the USD-based options market

Figure 12 shows the number of equal-share dominant firms in the equity derivatives business between banks and non-banks: the equivalent of 9 firms serve the dollar forward and swap market, and only 5 serve the options market. Figure 13 shows the same calculations for bank-to-bank equity derivatives. Eight dominant firm banks serve the dollar market for forwards, swaps and options.

Figure 13. Herfindahl index, equity derivatives; bank-to-bank clients



Source: BIS, OECD.

Explanations of recent trends

The main likely reasons for this rise in concentration in GSIFI derivative activities are as follows:

M&A

- The financial crisis led to the 'failure' and absorption of some large institutions (Merrill Lynch, Wachovia, Lehman Brothers, Bear Stearns, Northern Rock, Country Wide, etc), which directly raised concentration favouring GSIFIs.

TBTF

- A clear distinction emerged between TBTF banks and those that were not too big. Banks that are TBTF would include many of the GSIFIs considered in this paper. All small-bank, insurance, hedge fund and other clients of GSIFIs will now recognise that counterparty-risk is reduced by dealing with TBTF-banks. This is a major barrier to entry.

Technology barriers

- There are also high barriers to entry in terms of the set-up costs for large global businesses, and because of the need for sophisticated trading platforms with rapid execution times in derivatives businesses. Related to this are those barriers that arise from the need for strong risk management skills and systems in OTC derivative businesses.

Regulatory costs

- Other things given, higher Basel III and Dodd-Frank regulatory capital costs favour scale and volume.

Margin pressure and exit

- Ex ante margin pressure from regulatory reforms of Basel II and III and the Dodd-Frank Act will elicit the exit of the smaller less efficient firms from some of the derivatives businesses, as they will need to free up capital to look for better opportunities.

The netting incentive

- Regulatory changes under the Basel system permit bilateral counterparty netting for OTC derivatives, and some cross-product netting. This provides an incentive to deal directly with GSIFIs to maximise a greater bilateral netting pool to economise on capital (see the CVA discussion below).

Balance sheet efficiency

- Much of the regulatory arbitrage that arises from agency costs is due to the balance sheet efficiency of large globally interconnected banks that can trade in all jurisdictions and products. This favours a steady agglomeration of business in GSIFIs.

Competition concerns

These trends are of concern for a number of reasons.

(1) *Market efficiency and pricing*:

Un-transparent and wide bid-ask spreads

- Most of the derivatives are provided in the opaque OTC market, where pricing is difficult to monitor, due to the tailored nature of the products. While transparency will improve somewhat with better reporting and more clearing required of some products in the reform process, it is clear that oligopolistic concentration is conducive to wide bid-ask spreads and lack of price competition.[8]

Lack of diversity of views in price formation

- Price discovery in financial markets where counterparties are concerned depends on opposite sides of the trade having different views. The fewer players there are the less divergent views on security prices there are likely to be. As already noted at the outset, the financial crisis was caused in part by the mispricing of risk. The increasingly concentrated nature of the derivatives market raises the chances of mispricing assets due to the lack of competition in bid-ask spreads.

(2) *Consumer protection:*

Oligopolistic pricing power

- The trend towards even more oligopolistic structures in OTC derivative markets will improve pricing power, offsetting the pressure on margins flowing from regulatory reform. This in turn adds to cost for the non-bank client base.

(3) *Financial stability and bank interdependence:*

- It is evident from the above analysis that concentration is rising in the bank-to-bank provision of derivative services. This is particularly so in the vast interest rate derivatives market and in equity derivatives. While foreign exchange has traditionally been a more competitive derivative market, there is a clear trend towards increased concentration in this market, too. Increasing concentration and a smaller number of counterparties raises interdependence and the TBTF problem.

Equity derivatives now look relatively more profitable , post regulatory reform

- Fixed income still dominates the revenue base of GSIFIs, and the interest rate derivatives business is a massive 75% of outstanding notional derivatives. The notional outstanding size of equities derivatives, on the other hand, at 1.1% of the total, is currently very small. Interest rate derivatives contain a lot of plain vanilla low margin business and the crisis has hurt previously very profitable structured products. Much of this business already trades on lower margin exchanges. The equity derivatives business is currently relatively more profitable following the Dodd-Frank and Basel III reforms.

- Table 1 reproduces some illustrative private sector analysis that shows the equity derivatives business in total, even after all the regulatory reforms, is expected to be twice as profitable (at 22%) as the overall investment banking business (at 12%). Within the equity derivatives businesses the following points can be noted:

  1. Delta one products (those with no optionality) are more than 3 times as profitable as the overall investment bank business at a 40% ROE on average. It can therefore be expected that ETFs, and swap-based equity products generally, will be a prime candidate for the next bubble-like trend in the GSIFI business models.

  2. Convertibles are next most profitable at 30% ROE on average.

  3. Structured equity products and prop trading look especially profitable in the EU, which are less affected by reforms.

Table 1. Expected ROEs post regulatory reform of some GSIFIs

	CS	UBS	DBK	GS	MS	BNP	SG	BARC	BAC	Citi	Avg.
ROE before reg. Changes	23.5	22.7	19.9	23.4	19	19.2	17.2	17.8	na	na	20.3
Post Reg. ROE	13	11.5	10.5	13.8	12.4	13.8	10.2	12	na	na	12.1
Equity Derivatives Post Reg ROE's											
Structure products	15	13	16	11	5	21	27	15	5	4	14
Flow equity	15	15	15	30	18	19	15	21	20	8	18
Delta one (ETF,s, Swaps, fut. fwds)	38	45	34	32	53	51	55	49	32	23	40
Convertibles	27	36	23	26	42	24	18	42	36	44	30
Prop. Trading	23	36	24	21	37	12	31	29	17	22	24
Total	22	26	21	20	22	24	29	27	17	15	22

Source: JP Morgan, OECD.

Delta one products and especially ETFs are strong candidates for the next "bubble"

- Bubbles develop when *(i)* the macro rate environment is stimulatory; *(ii)* a clear profit arbitrage opportunity arises, often involving new products; *(iii)* early movers exploit the opportunities and gain in revenue market share, which induces entry into the business from other banks in a "herd-like" manner. The equity derivatives business generally, and ETFs in particular, have all the early requirements for a bubble to develop. The sector is still small, particularly swap-based ETFs, and demand for them is high. For example, ETFs tie in nicely with revenue from stock lending and swap based ETFs from opaque derivatives pricing. Early movers were State Street and Black Rock, but now the large GSIFIs are growing these products quickly, too.

The question arises as to whether recent regulatory changes have been enough to prevent these types of forces from leading to yet another financial crisis.

IV. The problem of interconnectedness risk: past and recent failures

GSIFI ex-ante risk models never predict crisis problems and losses

The recent financial crisis shows that financial risk modelling and the capital adequacy which is based upon it were woefully inadequate. All major GSIFIs suffered serious losses, which were unanticipated by their risk models. It is virtually impossible to determine whether they could have survived in the absence of the massive international bailout effort from governments around the world. Two examples are chosen for illustrative purposes: AIG, which shows just how vulnerable GSIFIs were; and MUFG (a Japanese joint venture with Morgan Stanley), which is much more recent and shows that just when the reform process is well advanced, and supervision has supposedly been toughened, bank risk models can lead to large losses even from relatively small movements in interest rates.

AIG

AIGFP was selling underpriced CDS for banks to create CDOs and to reduce their capital requirements

Basel II left the financial system with not nearly enough capital to deal with massive losses including derivative counterparty issues during the crisis. The role of AIG is instructive. AIG had capital of USD 95 bn in 2007, and balance sheet assets USD 1.05 tn. AIG Financial Products (AIGFP) had gross long and short derivatives of USD 2.13 tn in 2007, not included in the main balance sheet. The netted positions of the latter were USD 533 bn, of which USD 378 bn related to bank transactions explicitly designed to reduce their capital holdings, and USD 155 bn primarily for arbitrage purposes related to collateralised debt obligations (CDOs) based on residential mortgage-backed securities and corporate collateralised loan obligations (CLOs). In 2008, AIG lost USD 99 bn, more than all of its start-of-the-year equity capital, as credit events followed by its own downgrading by rating agencies led to collateral calls. Thereafter a series of bail-out needs put USD 182 bn of taxpayer's money at risk.

Table 2 shows the amounts of payments to the counterparties (from Tarp subordinated debt investments, Fed credit lines – to post collateral for AIGFP – and then from Maiden Lane II and III to purchases the heavily discounted

CDOs) that had bought insurance from AIG for the purposes of regulatory capital relief and for arbitrage in the CDO/CLO market. It also shows the percentage of GSIFI equity capital that these payments represented. If the AIG bailout had not been undertaken, the crisis would have followed a very different course and the cost of the bailout worldwide may well have been greater.[9]

Table 2. US Government payouts to AIG CDS counterparty losses

	In USD billion			
Institution	Collateral postings for credit default swaps[a)]	Payments to securities lending counterpaties[b)]	Total	As a share of capital[c)] at end-2008
Goldman Sachs	8.1	4.8	12.9	29.1%
Société Générale	11	0.9	11.9	28.9%
Deutsche Bank	5.4	6.4	11.9	37.4%
Barclays	1.5	7	8.5	20.0%
Merrill Lynch	4.9	1.9	6.8	77.4%
Bank of America	0.7	4.5	5.2	9.1%
UBS	3.3	1.7	5	25.2%
BNP Paribas	…	4.9	4.9	8.3%
HSBC	0.2	3.3	3.5	5.3%
[memo: Bank of America after its merger with Merrill Lynch]			12	*[18.1%]*

a) Direct payments from AIG through end-2008 plus payments by Maiden Lane III, a financing entity established by AIG & the New York federal reserve Bank to purchase underlying securities.

b) September 18 to December 12, 2008.

c) Common equity net of goodwill; net of all intangible assets for Merrill Lynch and HSBC.

Source: AIG, Financial reports for bank capital data.

MUFG

And still the problems continue after all the reforms so far bedded down

More recently (April 2011), and following the completion of most of the reform process, developments suggest that it is premature to assume bank modelling and risk management is now adequate to deal with derivatives. MUFG posted a USD 1.7 bn loss in the year to March, mainly (though the full details are difficult to acquire) as a consequence of poorly-hedged interest rate (swaption) trades. If such losses can be triggered by an unexpected 45 basis point rise in Japanese long-term interest rates coupled with an increase in swaption volatility, it is troubling to think of what might be possible in a world of higher inflation and/or widespread unexpected sovereign debt downgrades with USD 450 tn on notional interest rate derivatives currently outstanding.

V. Derivatives and regulatory reform so far

Given the role of derivatives in the crisis, a number of reforms have recently been introduced which will affect – *ex-ante* – GSIFI revenues, ROEs and the structure of their businesses. This is very important, because derivatives involve relationships between counterparties that raise interconnectedness within the financial system. This section reviews the recent reforms, while the rest of the paper suggests why problems remain and what might be done about them.

Dodd-Frank

The US has led the way through the Dodd-Frank Act of July 2010:

CCPs

- *CCPs*: the aim is to route a majority of OTC derivatives through central counterparty clearing houses (CCPs), which reduces counterparty and operational risks. However, this is unlikely to happen for customised structured products, and exemptions will apply for exchange rate derivatives and corporate end-users of derivatives.

SEFs

- *SEFs*: all cleared swap transactions have to be traded on exchanges or through swap execution facilities (SEFs). This would lead to ex-ante margin compression for OTC swaps (affecting investment bank revenue which will be resisted) as the more transparent platforms should allow more competition from the shadow banking sector. However, the major GSIFIs control much of the flow in OTC derivatives and are the natural candidates to be clearing members and will likely dominate the SEFs. There are many exemptions, for customised products, exchange rates and, of course, structured products that will not be eligible for clearing.

Reporting and transparency

- *Reporting*: Customised swaps that are subject to mandatory clearing are to be subject to real-time reporting of price and volume. This will apply also to swap transactions reported to central repositories or the SEC. The EU is following suit here with similar requirements for all OTC derivatives. This sort of transparency will (other things given) reduce margins, as bid ask spreads are subject to greater scrutiny and competitive comparisons.

Swap entities and no bail out

- *Bailout prohibition of some swap entities, Section 716:* the "*entity"* definition includes practically everything (dealers, SEFs, CCPs, exchanges and counterparties). However, after some fight-back by banks, it will not apply to interest rate, exchange rate, and gold/silver swaps; nor will it apply to derivatives for hedging banks' own risks. GSIFIs will have to (effectively) ring-fence and separately capitalise and fund those parts of its swaps business to which the rule does apply: agriculture, un-cleared commodities, non-investment grade CDS, most metals, energy, and equity derivatives. Such measures will not apply at all within the EU. The credit rating needed to participate in the swap market would make the cost of transacting with the entities to which the Act applies higher – as banks would need more capital. US banks would therefore be disadvantaged against EU banks in the swaps markets affected. The scope is, however, very limited, as interest rate and foreign exchange derivatives constitute 89% of total derivatives (as shown earlier), and the rule will only apply to new businesses.

Volcker rule

- *The Volcker rule:* The Volcker rule bans proprietary trading (the bank acting as principal using its trading account to deal in securities and derivatives). This will put pressure on GSIFI ROEs as this traditionally profitable business migrates elsewhere. On the other hand riskiness is

reduced, and the large negative ROEs in crisis periods should be partly ameliorated. This measure will not apply within the EU.

Trading book (2008) and Basel III reforms

Basel III

With respect to capital rules, Basel II failed to improve the original Basel I system. Basel III has attempted to close loopholes, and places additional focus on some new risks that played a role in the crisis: counterparty default and/or sharp valuation adjustments that can arise from trading derivatives in illiquid markets. Pillar 1 of the Basel system defines minimum capital required to buffer unexpected losses. Total Risk-Weighted Assets (RWA) are based on a complex system of risk weighting that applies to credit risk (CR), market risk (MR) and operational risk (OR), which are calculated separately and then added:

$$RWA = 12.5(OR+MR) + \sum_i w_i A_i \quad (1)$$

where w(i) is the risk weight for asset i; A(i) is asset i; OR and MR are directly measured and grossed up by 12.5 for 8% equivalence.

The reform of Basel II began in 2008 for trading book illiquidity issues:

IRC

- An Incremental Risk Charge (IRC) (2008) equal to the estimated default and migration risk of un-securitised products over a 1-year capital horizon at the 99% confidence interval, to allow for credit default and migration risk in bank trading books. These types of losses cannot be captured in banks' shorter term VaR modelling. This is aimed at providing for the sort of losses that resulted from banks unwinding trading book assets in illiquid markets in 2008. Other things given, it adds to market RWA.

Basel III approach

The Basel III (adjusted Basel II) approach to counterparty credit risk (CCR) is based on the concepts of exposure at default (EAD), loss given default (LGD) and probability of default (PD). The basic features of the Basel II approach carried over to Basel III include:

Bilateral netting pools

- Banks may form bilateral cross product netting pools of derivative and repo style transactions for capital purposes, provided they are legally enforceable in all of the jurisdictions concerned and banks incorporate this formally in their risk management processes.

IRB model exposure calculations...

- For banks using the internal risk-based approach (IRB) expected positive exposure (EPE) in their netting sets is a weighted average of expected future exposures (EE). The internal models calculate EE at a series of future dates, and hence across possible future values of all the relevant market risk factors (including default risk spreads). EAD is based on a simple multiplier ("alpha") of EPE (with a floor of 1.2).

...with non-normal distributions

- The EE should be calculated based on a distribution of exposures that accounts for the possible non-normality of the distribution of exposures – the so-called "fat tails" where appropriate (and if possible). The effect of margin agreements is captured and accounted for in calculating EE. Duration (maturity) adjustments are made for comparability over the first year of the future exposure.

Models all differ between banks

- All banks can use whatever models they like, provided supervisors sign off on basic rules of their use. The same derivative, therefore, may be priced differently in two different banks.

Credit equivalents calculated

- Credit equivalent amounts of bilaterally netted exposures (at fair value allowing for collateral) are calculated and added into RWA.

Basel III makes the following adjustments to deal with derivatives counterparty risk:

CCR

- To add a capital buffer based on a stressed VaR (equal to 3 times the 10-day 99% VaR calculated during a period of high stress) to the ordinary VAR-based capital requirement. This will have the effect of raising RWA. This reform was motivated in part by wrong-way risk – *i.e.* when the probability of default of a counterparty is positively correlated with general market risk factors (like the monoline insurers).

CVA

- A Credit Valuation Adjustment (CVA) – is an additional up front charge to cover mark-to-market unexpected counterparty risk losses, valuing counterparty risk in bond equivalents and applying the market risk (MR) regulatory charge to such bond equivalents (after deducting the IRC). The CVA is calculated within each of the netting sets, and is then added across netting sets.[10] The initial end 2009 proposal to multiply the standard benchmark CVA charge was abandoned after consultation with the banks in the final version.

Collateral standards

- Standards for collateral management and initial margins will be strengthened, *i.e.* for these to act as offsets to calculated market exposures.

Correlations for GSIFIs +25%

- In the models used by banks, raise the correlation factor between large financial entities (greater than USD 100 bn assets) by 25%, to help address the interconnectedness issue (higher risk of exposure to financial firms).

CCPs

- Central Counterparties (CCPs) are explicitly incorporated in the framework, where fully collateralised positions attract a modest risk weight (in the 1-3% range) – while highly favourable, the non-zero exposure recognises that CCP exposures are not risk free.

VI. GSIFI systemic risk from derivatives and leverage

The Basel Committee estimates that 2/3 of the counterparty credit risk (CCR) losses were due to Credit Valuation Adjustments (CVAs) and only 1/3 to actual defaults. Consequently, CVA risk has been an important focus of reform.

The GSIFI group dominates the massive derivatives market, and because of this, is more interconnected than other financial institutions. This interconnectedness gives rise to systemic risks which may require additional policy measures compared to non-GSIFI banks.

Derivatives have all the bankruptcy characteristics of debt, but fund nothing

Derivatives have all of the bankruptcy characteristics of debt without creating any new underlying net investment for the economy. Derivatives simply shift risk; they do not eliminate aggregate risk. When one party to a derivatives transaction makes a huge gain, another institution is making a huge loss – and that loss (if, transparently, marked to market) may cause a financial firm to fail. Systemic financial stability risk rises, because derivatives both raise leverage and require each participant in the chain of counterparties to be able to perform their obligations in order for them to be able to perform their own. In this way derivatives raise interconnectedness (systemic) risk, without adding any new equity or debt capital for the economy.

It is inter-connectedness that requires more GSIFI measures

The case for additional measures to ensure GSIFIs have relatively more capital and risk mitigation, in the view of this paper, rests on their dominance in the derivatives market and the scope this gives to misprice risk and to raise leverage and interconnectedness at the same time.

Derivatives and leverage risk

The financial system is a system of promises. Derivatives allow GSIFIs to shift those promises around to arbitrage the different risk weightings, regulatory differences and taxes between sectors and jurisdictions.

Banks use derivatives to shift promises to reduce capital...

The Basel system applies to banks only, and not to insurance companies, money market funds (MMFs), hedge funds, pension funds, and the like. It is implemented through national directives and different definitions of what can be included in capital are permitted. By using derivatives to transform securities in this uneven playing field banks obtain regulatory relief. A simple example is illustrative: bank A lends to company XYZ (100% risk weighted) and then buys CDS insurance from a bank B counterparty which is only 20% risk weighted. By shifting the promise to pay from company XYZ to Bank B, the capital charge to bank A is all but removed. Bank B, in turn, then shifts the promise again by underwriting the CDS contract with a re-insurer outside of the banking system and possibly in another jurisdiction. The charge for this is very small. In this example, the banking system in question effectively avoids meaningful capital charges and leverage is expanded.

...allowing them to adjust down the RWA/TA ratio...

By transforming risk in this manner, banks can adjust the ratio of RWA to total assets (TA): since capital ratios are applied to RWA, banks can avoid capital and expand TA per unit of capital (*i.e.* leverage) by reducing the ratio.

The incentive to do this is very strong, since a bank's ability to leverage up spreads is one of the primary means of raising the return on equity (ROE). Using equation (1) above, banks would aim to set the target (RWA/TA)* in the manner of:

$$(\text{RWA/TA})^* = [12.5(\text{OR}+\text{MR}) + \sum_i w_i A_i \,] / \sum_i A_i = \text{fn}(\text{ROE}) \qquad (2)$$

It follows that:

$$0.08\{(\text{RWA/TA})^*(\text{TA})\} = \pi/\text{ROE} \qquad (3)$$

Where π is defined to be clean net profit (underlying, before write-offs etc); ROE = π/K; and K is capital – here taken as total capital. Regulatory arbitrage can be used to achieve the target ratio of RWA to TA consistent with the targeted ROE*, where target (RWA/TA)* is π/(ROE*TA*0.08).

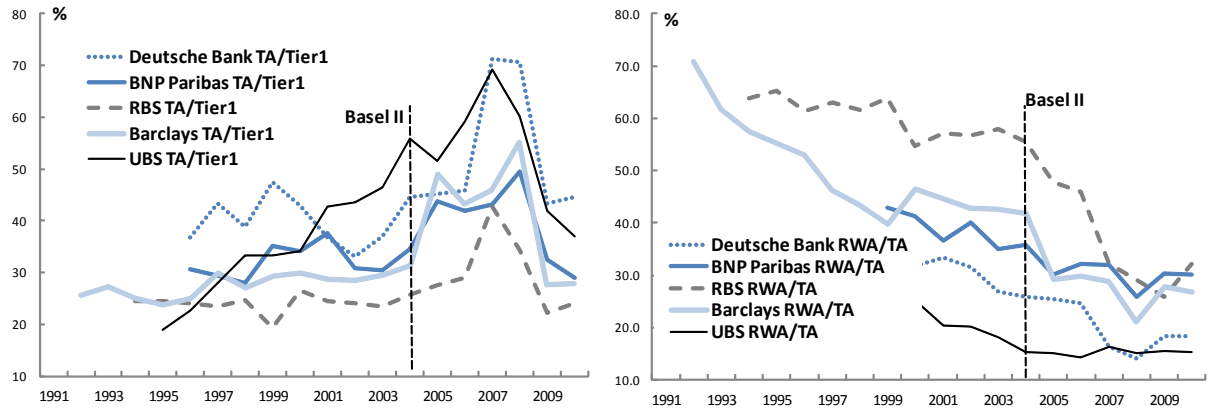
...helped along by their models

Sophisticated banks use of IRB models to determine risk weights and price derivative and exposures is integral to the process of influencing $\sum_i w_i A_i$, MR and OR in this process of shifting promises and obtaining capital relief.[11]

This all shows up clearly in the data

Figure 14 shows the leverage ratio over time of some European GSIFIs, and their ratio of RWA to TA, in the lead up to the crisis.[12] After Basel II was introduced (shown by the vertical line), leverage accelerated quite dramatically – instead of having the desired impact of tightening capital rules and reducing leverage, regulatory arbitrage and the handing over of calculation of risks to GSIFIs actually had the opposite effect.

Figure 14. Some European Bank leverage and RWA/TA comparisons



Source: Bank reports, OECD.

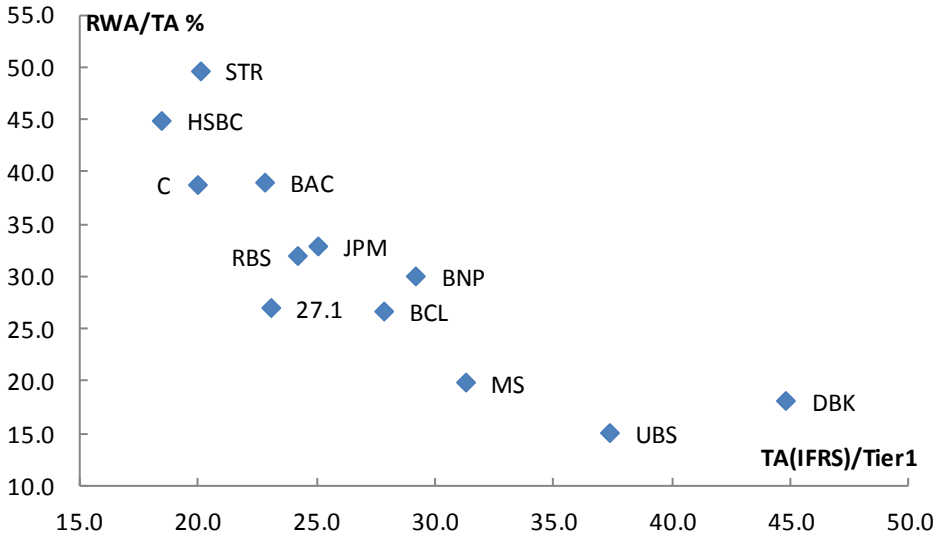
High RWA/TA banks have lower leverage

Figure 15 shows a cross section of European and US GISIFIs' RWA/TA and leverage ratios to Tier 1 capital, based on a more comparable IFRS accounting basis at Q4 2010. The negative trade-off between these two variables is very clear.

A binding leverage ratio is critical going forward

The Basel III process has proposed to have a "*parallel-run*" to calibrate a leverage ratio (*i.e.* a charge on TA, not RWA). This does not have the same status as the other settled rules. Only if a leverage ratio were to be implemented in an effective way would Basel III be able to contain overall leverage.

Figure 15. Leverage and RWA/TA compared: assorted GSIFIs



Source: Bank reports, OECD.

The proposal to impose a capital surcharge on GSIFIs agreed in late June 2011 (of up to 2.5%), as it applies to RWA only, is not an effective way to contain leverage. It would result in renewed pressure for GSIFIs to target ROEs via regulatory arbitrage.

Derivatives and counterparty risk

This section looks at derivative counterparty risk in the light of rising concentration, CCPs and the advent of the CVA charge.

No clearing: interest rate swap example

An example of simple interest rate swaps...

Figure 16 sets out a simple derivatives trade situation without clearing in the upper panel: it is a 10-year fixed 5% (shown by the dashed arrows) versus floating LIBOR (shown by the solid arrows) swap. The two GSIFI banks A and B undertake the swaps with counterparties C and D, each trade with a notional principal of USD 100m. GSIFIs A and B square up by hedging the reverse trade with each other.

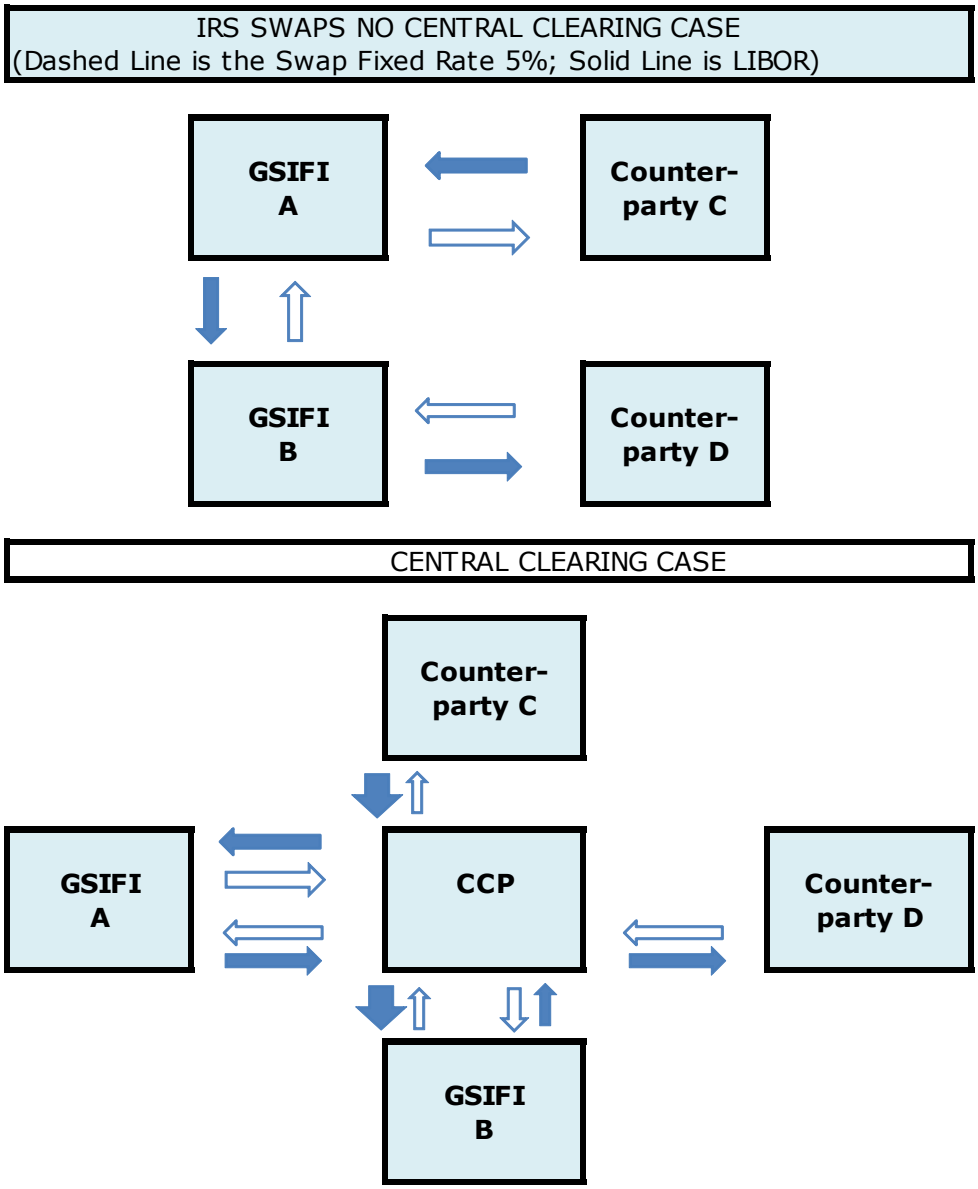
...shows the huge loss differences from volatility choice

- If the swap fixed rate rises by 1% p.a. (from 5% to 6%), the hedgers gain and the losses to the three players with fixed commitments (A, B and D) is the present value of the 1% over the 10 years, or USD 7.4m each, (USD 22.4m in aggregate).

- If a fixed rate spread move of 10% p.a. should arise (as has occurred in the EU crisis on sovereign debt), the loss to the payers of the fixed rate rises to USD 50.2m each, or USD 150m in aggregate (half of the notional value).

This illustrates that the CVA risk can be very large in unexpected stressed conditions, and it is highly unlikely that bank modelling for CCR and CVA will reflect this in an ex-ante sense. Banks never have a problem until they have a problem.

Figure 16. Interest rate swap example



Source: OECD.

No clearing plus a netting set: GSIFI A (with IRS loss and CDS gain)

Netting against other products reduces exposure

Now consider the case of GSIFI bank A, which is down USD 50m on the above IRS swap (the 10% move in rates) but is up USD 60m on a CDS position with counterparty C, where it has a netting agreement. This gives rise to a current net gain of USD 10m up.

Resulting in...

Without clearing, and following the above Basel III reforms, the GSIFI A would be holding the following capital for that portfolio:

CCR charge...

- The counterparty credit risk charge based on EPE of the entire portfolio using a stressed calibration, which would be additive to the market risk charge that applied under Basel II.

... and a CVA charge

- The CVA charge to address the mark-to-market losses based on LGD and PD, which is additive across netting sets.

Problems with such capital charges

But these charges are based on banks' own modelling of the risks

- This approach is reliant on bank risk models and the ability to input plausible volatility. This is typically based on history, and is always subject to surprise in the event of a new crisis. In the above example, the ex-ante model may use a 1% rise in rates with a USD 7.4m loss, but then be faced with an outcome of a 10% move in rates with a USD 50m loss. Furthermore, in the OTC market liquidity is a problem, with many non-standard contracts and mark-to-model instead of mark-to-market prices. This leaves considerable scope for judgement and distorted prices which are likely to favour the bank. It is difficult to specify a stress test that will capture events that arise in a crisis – particularly if it is to show the bank is under-capitalised.[13] Risk is likely to be understated.

Credit spreads built in benefit from TBTF cross subsidisation

- Models rely on credit spreads at which counterparties can borrow for discounting future cash flows. If a variety of collateral is posted it must be discounted at a variety of credit, currency and liquidity risks. Where GSIFIs are concerned, the TBTF problem is present with the result that credit spreads are less than would apply to separate derivative trading entities that do not have access to retail/commercial bank capital and official and unofficial guarantees and support. Risk (particularly from the viewpoint of the taxpayer) is likely to be underpriced.

How do you model CDS with its binary outcomes...

- Some products are very difficult to handle in a model context, particularly CDS contracts that are only triggered by a default event which is impossible to predict in advance (no one saw the potential defaults of AIG and the actual defaults of Lehman, Hypo Real Estate, and others, until it was too late). The unexpected downgrades of AIG triggered large changes in value that, without intervention, would have wiped out the capital of the entity, suggesting that the initial capital requirements were much too low.

...or the correlation between such a binary outcome product and those that trade in continuous time?

- The risk models also rely on correlations, yet these are difficult to handle in practice. How does one model the correlation between an OTC CDS with a binary outcome dependent on a default event, with continuous-time derivatives pricing on deep liquid exchanges? Correlations are well known to change dramatically in stressed conditions – rising sharply and multiplying losses. Simply raising the ex-ante correlation between financial firms by 25%, as in Basel III, and asking banks to do better does not address the problem. Choices on correlation are prone to understate crisis risks.

In short, there is every reason to believe that IRB models used to define ex-ante risk weightings will cause crisis risk to be understated; they are helping GSIFIs to obtain capital relief (certainly compared to the simplified approaches available under Basel II and III).

Concentration risk and netting

The CVA charge rewards concentration with additive netting pools

Close out netting reduces exposures in the event of an actual default. In the above simple netting set example of USD 50m down on the interest rate swap and USD 60m up on the CDS, the most the bank could lose in a close out is USD 10m compared to the USD 60 in the absence of netting. However, that the CVA charge applies at the netting set level, and is additive across netting sets, means that it does not reward diversification of counterparties. Suppose bank A in Table 3 has multiple counterparties (two here for simplicity) and the gain/loss exposures are as shown. The CVA is additive and in the diverse counterparties case results in a positive capital charge related to the USD 10m and the USD -10m. In the single counterparty (larger netting set) case there is no exposure for a counterparty charge. More generally, the additive CVA gives no benefit for using a well diversified set of counterparties, and instead rewards risk concentration in a smaller number of counterparties.

Table 3. Netting and concentration

A. Diverse Counterparties	
P1: Netting Set 1	
IRS up	100
CDS down	-90
Net	**10**
P2: Netting Set 2	
IRS up	90
CDS down	-100
Net	**-10**

B. Concentration Case	
One netting Set	
IRS up	100
CDS down	-90
IRS up	90
CDS down	-100
Net	**0**

Source: OECD.

Reduced diversification of counterparties and less capital means higher systemic risk...

The CVA charge in a netting context is therefore likely to reinforce concentration and the use of TBTF banks. That is, it will reinforce the trends towards the highly oligopolistic derivative markets illustrated earlier. Risk is increased, because diversification is reduced while capital to absorb unexpected large losses in a crisis is minimised.

...and less diversity of pricing views

Concentration also reduces market efficiency in the pricing of risks. Efficient pricing requires a diversity of views. However, it is precisely this that is undermined by rising concentration. The probability of mispricing risk is increased.

To give some idea of the enormity of netting some examples from US banks' 2010 accounts are illustrative: Bank of America had USD 1,519 bn in gross derivative assets, but with counterparty netting of USD 1,406 bn, and allowance for cash collateral, this reduces to only USD 73 bn. JP Morgan had USD 1,529 bn that nets to USD 80 bn. Citi had USD 654 bn that nets to USD 50 bn.

Clearing

Clearing reduces counterparty default risk but doesn't eliminate losses

The lower panel of Figure 16 shows the case for the interest rate swaps where all of the deals are entered into with the CCP, instead of bilaterally. The GSIFI payment streams will all cancel each other out, as shown by the sets of four arrows for each stream versus the CCP. Only the un-hedged counterparty D responsible for fixed yield flows to the CCP would have a USD 50.2m loss (in the case of the 10% spread move) with respect to the clearing house. In this way, clearing through the CCP greatly reduces the aggregate counterparty market risk.

The CCP gives rise to multilateral netting, which is something like Case B of Table 3 on a grander scale.

Problems still remain with clearing

The rules about clearing are themselves unclear, leaving scope for banks to resist

- Mandatory clearing of standardised derivatives that trade on exchanges or via Dodd-Frank SEFs would increase transparency, and undermine the ability of the bank oligopoly to maximise profits via bid-ask spreads. This is a very difficult area where the way in which rules will be applied is unclear. Banks' resistance to this is assured, and likely to spark new forms of regulatory arbitrage (see below).

GSIFIs dominate flows so that oligopolistic SEFs are likely to emerge

- As shown earlier, in section III, there are between 6 and 14 GSIFIs that control the various USD derivative products (less for some other currencies). As these institutions dominate trading volume and control flows, they will likely also control an oligopolistic SEF market structure and the anti-competitive issues discussed previously are unlikely to be fully ameliorated.

There is plenty of scope for banks to "play" with what constitutes a standardised product

- There is likely to be significant exemptions to the use of CCPs. Derivatives traded on exchanges are less than 4% of the total, and of the 96% OTC derivatives many are customised and not traded. Definitions are difficult here, and the scope for GSIFIs to ensure products are exempt from clearing is very large. Furthermore, it has now been determined that the (highly-volatile) foreign exchange swaps will be exempted from clearing under Dodd-Frank. These exclusions and scope for structuring products to avoid the intent of regulation will become very similar to the capital arbitrage via shifting promises outlined earlier.

CCPs face the same modelling risks as banks

- Placing the CCP between counterparties does not remove the modelling and concentration problems discussed earlier. Clearing requires both market prices and liquidity, with the clearer taking on risk. Setting initial margins and managing variation margin calls between clients (where these are not exchange traded) will require modelling and all of the associated problems discussed earlier.

CCPs may likely compete on margin requirements, raising risk – and concentrating trades in CCPs makes them TBTF, too

- Where standard products can be cleared, it is likely that the CCPs will follow the patterns discussed earlier for the trends in derivative market concentration in the lead up to the crisis and its aftermath. That is, they will likely compete at first on initial margin and variation margin rules. If risk is underpriced as a result of this process, then large losses could wipe out an undercapitalised CCP, and require it to be rescued by another CCP, or via the taxpayer. Indeed, the TBTF problem has in effect been transferred in part to the CCP, with every chance that it will underprice risk and generate future problems. A CCP linked with many banks and trades certainly cannot be allowed to fail.

Non-standard OTC remains

- OTC products not subject to clearing will remain, and are in any case still quite capable of leading to another systemic crisis.

Summary

The above analysis suggests that the reforms of Dodd-Frank and Basel III may not sufficiently address interconnectedness and excess leverage risks associated with GSIFIs. This group of banks is able to shift promises with derivatives to avoid capital charges tied to RWA by managing the ratio of RWA/TA and thereby leverage their balance sheets with ROE objectives in mind. A GSIFI surcharge tied to RWA, therefore, will not be an efficient approach to increasing their capital.

Counterparty risk was considered, and it was shown that CVA risk could be very high, and that banks ability to model this and hold sufficient capital to absorb extreme crisis scenarios is technically problematic and likely to lead to an underpricing of risk because:

- cross subsidisation implicit in the spreads when dealing with TBTF banks;
- scope for gaming standard versus non-standard products;
- poor risk models that always show ex-ante risks as less than ex-post crisis outcomes;
- CCP competition based on margin requirements;
- growing concentration in derivatives markets and/or clearing which reinforces TBTF while raising the scope to reduce the CVA charge;
- increased concentration resulting in less diversity of views and inefficient pricing.

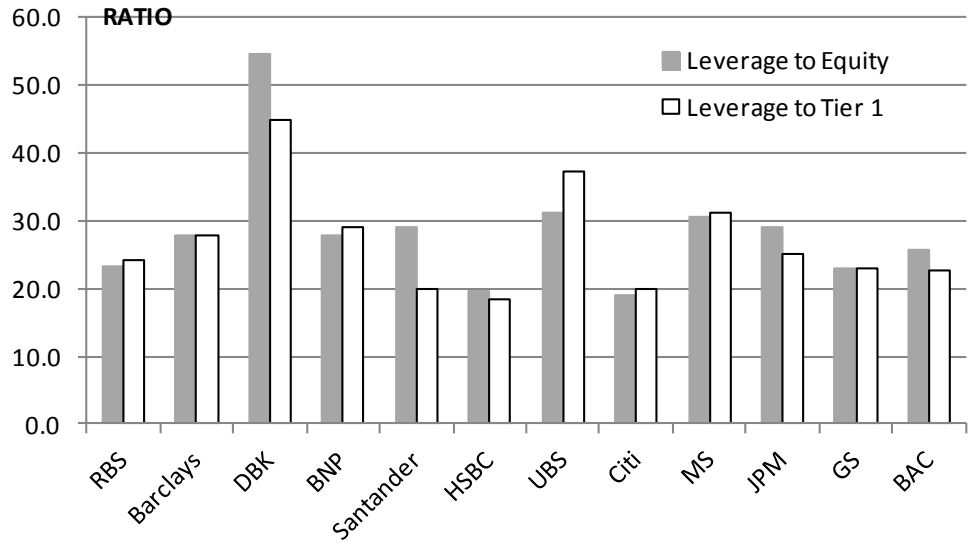
VII. Containing derivatives and leverage: policy requirements

A leverage ratio

US banks are only a little less levered than EU banks when netting is taken into account

US GAAP accounting permits derivatives subject to netting agreements to be reported on the balance sheet on a fully net basis to measure TA. IFRS includes fair value exposures in TA with very limited netting.[14] Figure 17 shows leverage to Tier 1 capital and to equity less goodwill for US and European banks on a more comparable basis – with derivatives before cash collateral and counterparty netting added back in for the US banks. US banks look similar to other European banks on this basis. The EU banks shown still have on average less capital than US banks, 2.9% *vs.* 4% of assets in the case of equity less goodwill, and slightly closer if Tier 1 is used (the EU uses more hybrids). The UK banks on average are slightly more capitalised than US banks, and significantly better than the EU group.

Figure 17. Comparing US and European banks' leverage



Source: Bank reports and OECD.

Current RWA/TA ratios imply perverse incentives if a leverage ratio is not fully binding

From this more comparable starting point, the Basel framework has already induced a perverse incentive structure, which results from the very different current ratios of RWA/TA. Table 4 shows the time profile of the different Basel capital ratio requirements in the upper panel. The lower panel for individual banks shows the maximum permitted leverage ratio of TA to core Tier 1 plus buffer (the toughest essentially equity-based Basel concept). These are constructed by assuming:

- Constant balance sheets for the TA of each bank to 2019;
- That the bank shown holds its ratio of RWA/TA at the current level (shown in the table) until 2019.

Less levered banks will be more constrained than highly-levered banks!

While maximum permitted leverage is reduced significantly over time, all banks are affected very differently. The range of outcomes is 29 times to 95 times Core Tier 1 plus buffer capital. Interestingly, the three banks that would face the toughest constraints (Santander, HSBC and BAC) are the least leveraged banks in the group.

HSBC, Santander and BAC have a high share of amortised cost accounting assets, such as loans, and a lower share of derivatives and/or other assets at fair value through profit or loss. The banks with high shares of the very products most associated with the crisis (and the AIG payouts) are the least constrained in terms of leverage. It is also worth noting that current leverage ratios are all below the maximum permitted even at the end of the process by 2019, with the one exception of Santander.

Table 4. Basel regulations and the time profile of restrictions for individual banks

	Regulatory Capital Requirements Time Profile						
Cap. Rules Decided	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Core T1/RWA	**0.035**	**0.04**	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**
Core+Buffer/RWA	**0.035**	**0.04**	**0.045**	**0.05125**	**0.0575**	**0.06375**	**0.07**
T1/RWA	**0.045**	**0.055**	**0.06**	**0.06**	**0.06**	**0.06**	**0.06**
Lev ratio proposed	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**
	Maximum Leverage for the Core Tier 1+Buffer Reg. for a Constant RWA/TA Assumption						
RBS RWA/TA	**0.320**						
Maximum Lev. ratio	89.3	78.1	69.4	61.0	54.3	49.0	44.6
Barclays RWA/TA	**0.267**						
Maximum Lev. ratio	107.0	93.6	83.2	73.1	65.1	58.8	53.5
DBK RWA/TA	**0.182**						
Maximum Lev. ratio	157.0	137.4	122.1	107.2	95.6	86.2	78.5
BNP RWA/TA	**0.301**						
Maximum Lev. ratio	94.9	83.1	73.8	64.8	57.8	52.1	47.5
Santander RWA/TA	**0.497**						
Maximum Lev. ratio	57.5	50.3	44.7	39.3	35.0	31.6	28.7
HSBC RWA/TA	**0.449**						
Maximum Lev. ratio	63.6	55.7	49.5	43.5	38.7	34.9	31.8
UBS RWA/TA	**0.151**						
Maximum Lev. ratio	189.2	165.6	147.2	129.2	115.2	103.9	94.6
Citi RWA/TA	**0.388**						
Maximum Lev. ratio	73.6	64.4	57.3	50.3	44.8	40.4	36.8
MS RWA/TA	**0.199**						
Maximum Lev. ratio	143.6	125.6	111.7	98.1	87.4	78.8	71.8
JPM RWA/TA	**0.329**						
Maximum Lev. ratio	86.8	76.0	67.5	59.3	52.9	47.7	43.4
GS RWA/TA	**0.271**						
Maximum Lev. ratio	105.4	92.3	82.0	72.0	64.2	57.9	52.7
BAC RWA/TA	**0.39**						
Maximum Lev. ratio	73.3	64.1	57.0	50.0	44.6	40.2	36.6

Note: These calculations ignore the Basel Committee's decision of 25 June 2011 to impose a 1-2.5% capital surcharge on GSIFIs (see endnote 2).
Source: Bank reports, BCBS, OECD.

These calculations illustrate a perverse incentive for banks looking to maximise their ROEs. If banks are prepared to bet that a leverage ratio will not eventuate in a meaningful form, then low-leverage banks will be able to grow their derivatives business and reduce their ratio of RWA/TA in line with the more highly leveraged banks in the group – exactly what the avoidance of future crises should seek to avoid.

A 3% leverage ratio based on equity capital only and the IFRS measure of TA is a critical reform

The OECD Secretariat has long backed the need for a leverage ratio, where the IFRS concept of derivatives exposure is used in the measure of TA.[15] On this basis, the *parallel run* idea of a 3% ratio, provided it is based on equity capital, would be a reasonable starting point. The idea that a leverage ratio discriminates against low-risk assets is rejected by the above analysis. The crisis amply demonstrated that in the age of complete markets in credit, there is no such thing as ex-ante fixed risk weights. The ability of financial firms to transform risk at will to obtain capital relief while expanding leverage is a risk in itself that needs to be dealt with by a leverage ratio.

Interconnectedness risk: raising CVA further versus a Tobin tax

Raising CVA isn't an efficient approach

In principle, the problem of too much interconnectedness risk via derivatives could be dealt with by raising the CVA to a level that fully offset the underpricing of risk. However, the efficiency of the charge would over time be reduced as it would reinforce the trends in concentration to expand netting sets with GSIFI domination of flows, including SEFs and CCPs.

A derivatives transactions tax is better targeted.

Historically, the OECD has been against a general Tobin tax due to the negative impact it could have on liquidity in otherwise open and transparent markets. While this view still stands, it is worth considering whether a transactions tax in the form of a regulatory charge could not be applied to the OTC derivatives market.[1] The charge could be accumulated in an insurance fund to help underwrite the solvency guarantee of CCP's. The rationale for this more targeted approach is as follows:

- The OTC market is already characterized by illiquidity, so the standard objection may not apply or matter.
- The charge would raise the cost of derivatives, resulting in higher bid/ask spreads in the OTC markets to cover the additional cost. This would reinforce the demand for standardisation, clearing and trading on exchanges.
- The incidence of the charge would fall more on active trading of a short-term gambling/churning nature in those institutions where such trades were concentrated, rather than on longer-term final user hedging in the corporate sector. It would lengthen the holding period of derivative products.
- Such a charge would help to reduce the trend towards less socially useful derivatives activity implicit in the parabolic trends shown in section II.

Either of these measures should be seen as a direct response to the under-pricing of risk and the TBTF issue discussed above—a 'subsidy' offset by the 'charge'.

[1] Such a very small charge applies in Germany.

Interconnectedness risk: separation of entities

Perhaps the most important reform of all is to separate investment banking from retail and commercial banking

If a Tobin style tax is rejected, another approach would be to allow existing market mechanisms to better manage interconnectedness risk, without the need for regulatory intervention, via initial margins, variation margin and the cost of liquidity provider channels. This could be achieved by breaking up GSIFIs so that derivatives were only traded by entities that are legally separate from retail banking and commercial banking activities – not unlike the Dodd-Frank treatment of certain exotic OTC swaps. The OECD Secretariat has long supported the idea that key investment banking and dealer activities should be carried out within a strict subsidiary structure – a non-operating holding company (NOHC) with firewall provisions.[16] The US Dodd-Frank Act has gone some of the way in this direction with the treatment of certain swap entities and the Volcker rule.[17] The point of separation is to make it clear that deposit insurance and government bail-out mechanisms will not apply to the derivatives entity, which would not be bailed out in the event of a crisis, and where transfers of capital and securities between the different entities within the group would be prohibited or subject to regulatory approval. This would ensure that collateral requirements of counterparties and clearing houses would be based on the clear understanding that the entity trading derivatives would be separately capitalised (and hence more expensive) and not a beneficiary of implicit or explicit government guarantees. Liquidity provision for posting collateral would occur in an arms-length manner or (preferably) with third parties. Collateral requirements and liquidity finance would be based on a much better appreciation of the risk that the entity could fail and cross subsidisation from TBTF would cease. The cost of transacting derivatives business would rise.

Far from this being perceived as a problem, it should be seen as a counterbalance to the systematic underpricing of risk and the undercapitalisation of financial institutions – which were the most fundamental basic causes of the global financial crisis.

VIII. Concluding remarks

OTC derivatives have grown massively...

This paper has looked at the GSIFI issues with a particular focus on their derivatives businesses. These businesses are almost entirely based on OTC products. Interest rate derivatives are a huge business that has been driven by cyclical market factors and by a very wide menu of tax and regulatory arbitrage.

...have become very concentrated...

There has been a trend towards greater concentration in the derivatives businesses. Barriers to entry have risen with TBTF, smaller players being squeezed via regulatory reform, and the increasingly complex nature of risk control and execution platforms. GSIFIs are also in a good position to be the controlling members of CCPs, and will likely dominate SEF flows.

...while regulator have not been able to deal with the issues, and may have introduced

The Basel system was ineffective in ensuring that banks had sufficient capital before the crisis, and the recent changes in Basel III contain such flaws that banks will always be able to engage in regulatory arbitrage. Concentration trends increase the size of netting pools, which economises on capital, and the additive nature of the CVA capital reform will reinforce this process.

new risks

Concentration also reduces the diversity of views in the OTC derivatives markets and along with the other factors discussed in this paper increases the chance of mispricing risk.

The most urgent problem is inter-connectedness

The most urgent problem facing the financial reform process is the need to deal with the growing interconnectedness of GISFIs as concentration in the derivatives business rises and as overall leverage remains relatively unconstrained.

There are three main options for reform

A GSIFI surcharge on RWA is a very inefficient and ineffective way to address this problem, due to the ability of banks to transform risks and reduce the ratio of RWA to TA, thereby economising on any capital charge linked to RWA and raising leverage. The main policy options for dealing with leverage and interconnectedness risk are:

- A leverage ratio with IFRS accounting for TA – which is essential, and should not be undermined and emasculated in the *parallel run* exercise.
- An increase in the CVA charge or an OTC derivatives transaction charge, the incidence of which would fall mainly on GSIFIs and regulatory arbitrage and gambling activities, as opposed to longer term hedging by end users.
- The separation of certain investment banking activities that deal in OTC derivatives from retail and commercial banking (in order to avoid cross subsidisation from explicit and implicit guarantees and the TBTF problem).

Hasty generalisations about regulatory impact in the current macro environment miss the point

An argument is often made that asking GSIFIs to hold much more capital and/or higher collateral margins would risk prolonging full recovery from the crisis. This hasty generalisation from recent economic data is not based on the correct counterfactuals. Since 1998 gross derivatives have grown at 9% p.a. compared to world nominal GDP at 3% p.a. Gross derivatives as a share of GDP have compounded up to ten times world GDP versus three times GDP in 1998 – and the benefits for improving real economic activity and reducing risk of this explosive growth are anything but evident. Primary assets that actually fund growth, and on which derivatives are based, have remained stable at around two times GDP through this period. A major reason why derivatives and leverage have built up since 1998 is because risk has been chronically underpriced. Had derivatives growth and leverage been more effectively constrained, the systemic risks would have been commensurately smaller. It seems odd to argue that the aftermath of a crisis facilitated by an ineffective regulatory framework and the underpricing of risk should be ameliorated by sticking with more of the same to help the economy in the short run.

Notes

1. See OECD (2009), Blundell-Wignall *et al.* (2009, 2010); and many more.

2. See the press release "Measures for global systemically important banks agreed by the Group of Governors and Heads of Supervision", 25 June 2001, available at http://www.bis.org/press/p110625.htm.

3. The correct concept to examine for the purposes of this paper is the notional value of outstanding derivatives, the size of which is the exposure of financial institutions to price risk, It also reflects the potential command over assets and resources that clients have, and is the basis on which fees are paid to broker/dealers. The close out value of vast derivative position – in the money and out of the money – could in principle be zero, giving a highly misleading picture of the derivatives market in terms of its role in the economy and the risks attached to it.

4. See Blundell-Wignall and Atkinson (2008), and UBS (2008).

5. The Herfindahl index sums squared shares expressed in percentages across all firms, and is expressed as an index with a maximum score of 10 000. A score of 10 000 would imply 1 firm supplies the market. The index is interpreted as the reciprocal of the index times 10 000, which is equivalent to the number of firms with equal share that are providing the service.

6. This is noticeably more concentrated than is for bank-to-bank transactions addressed in Figure 5.

7. And the notable failure of Bankers Trust allowed DBK to take a strong position in US investment banking.

8. There have also been rumours of collusive behaviour in the derivatives market; see Story (2010).

9. This is an extremely complex issue and no one will know the ultimate answer. State laws ring fence insurance subsidiaries in the USA. Had AIGFP been allowed to fail, then the cost of helping the EU GSIFIs would have fallen to the governments there and the ECB. The US government and Fed would have had bigger problems to deal with in bailing out the US GSIFIs shown in the table. Similarly, some large GSIFIs on the list claim they were not really exposed as they bought CDS protection against AIG. However, risk can only be shifted, not eliminated from the system. The firm in question would have purchased CDS on AIG from other GSIFIs in the group, simply pushing even bigger problems onto them, in a zero sum game.

10. The notional of the bond is the EAD of the counterparty, (treated as fixed); the maturity of the 'bond' is the effective maturity of the longest dated netting set of a counterparty; and the time horizon is 1-year (as opposed to the 10 day period for MR).

11. If banks could not reduce capital below the default regulation option by using the IRB models, they would not use them and would opt for the simplified system.

12. US banks are excluded from this time series due to IFRS – GAAP accounting issues.

13. Witness the August 2010 EU bank stress test, which was found wanting conceptually and was overtaken by unforeseen events within days; see Blundell-Wignall and Slovik (2010).

14. There must be an intent to settle on a net basis, or to realise the asset and settle the liability simultaneously.

15. See OECD (2009).

16. See OECD (2009).

17. At the time of writing there are also press reports that the Swiss regulator favours some form of separation for its banks IB activities. The UK is also considering ring-fencing retail banking activities. See Independent Commission on Banking (2011).

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