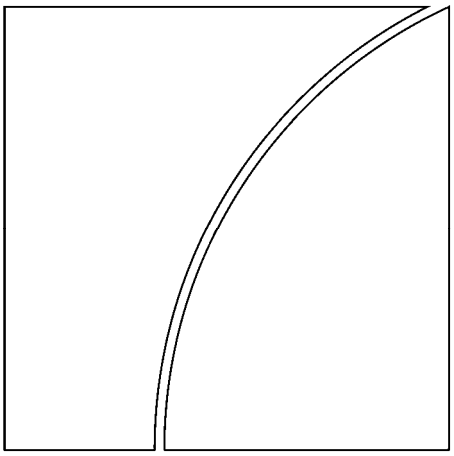
Committee on the Global Financial System



CGFS Papers

No 36

The role of margin requirements and haircuts in procyclicality

Report submitted by a Study Group established by the Committee on the Global Financial System

This Study Group was chaired by David Longworth of the Bank of Canada.

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Preface

A number of procyclical behaviours in markets amplified financial system stress during the recent crisis. The 2009 Committee on the Global Financial System (CGFS) report on *The role of valuation and leverage in procyclicality* identified haircut-setting in securities financing transactions and margining practices in over-the-counter (OTC) derivatives as one source of procyclicality. The report recommended exploring whether minimum haircuts or minimum initial margins help to reduce procyclicality.

In view of this recommendation, the CGFS asked a Study Group, chaired by David Longworth (Bank of Canada), to review haircut-setting and margining practices in securities financing transactions and OTC derivatives markets, and to explore various options for reducing their procyclical effects on financial markets. The report recommends several enhancements to haircut-setting and margining practices to dampen the build-up of leverage in good times and soften the system-wide effects during a market downturn. It also recommends that macroprudential authorities consider measures that involve countercyclical variations in margins and haircuts.

The report takes a system-wide perspective, which complements other initiatives on margining practices directed at strengthening the resilience of individual institutions. I hope that this report will inform policy deliberations on how to reduce financial system procyclicality.

Donald L Kohn

Chairman, Committee on the Global Financial System

Vice Chairman, Board of Governors of the Federal Reserve System

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Executive summary

The terms and conditions governing secured lending transactions can have a profound influence on leveraged market participants' access to credit and their risk-taking behaviour. In the run-up to the crisis which began in 2007, the increasing availability of secured financing, the rising volume of trading in over-the-counter (OTC) derivatives and the easing of credit terms – including the erosion of haircuts – contributed to the growth in leverage. A significant expansion in non-bank intermediation through securitisation and other methods broadened the range of assets eligible as collateral for secured lending, including a wider range of structured products. High credit ratings, ample liquidity and low financial market volatility during this period increased the level of comfort of borrowers with their reliance on secured funding, and the comfort of lenders with, in many cases, modest and declining haircuts.

The gradual erosion of lending terms during the period of high liquidity and low volatility was abruptly reversed when market conditions deteriorated. As valuation uncertainties for many structured products rose in 2007, haircuts on these securities were raised, forcing a few highly leveraged market participants to liquidate their holdings. A further significant and rapid tightening of the secured lending terms on a range of assets took place in 2008 that led to a contraction of the supply of secured financing and exacerbated deleveraging pressures.

The dynamics of financing terms, and in particular of haircuts, have raised the question of whether practices for setting haircuts amplify financial market procyclicality. Similar questions arise with regard to the terms applicable to OTC derivatives transactions, including requirements for daily marking to market and associated margin calls (indeed, in many instances, derivatives are close substitutes for securities financing transactions).

This report explores the linkages between margining practices, defined broadly to include the haircuts applicable to funding collateral as well as the mark to market and collateral requirements applicable to OTC derivatives, and financial system procyclicality.

In bilateral interviews with market participants, the Study Group examined market practices for setting credit terms applicable to secured lending and OTC derivatives transactions. The key findings are:

- Securities financing terms can generally be tightened or relaxed through a number of channels. Some involve changes in secured lending terms (higher haircuts and shorter maturities of financing). Others are associated with the reduced availability of funding (narrower lists of eligible counterparties, lower counterparty credit limits and restricted pools of eligible collateral assets).

- Competitive pressures have a strong influence on securities financing haircuts and the range of eligible collateral for such transactions in good times. In bad times, tightening is often implemented first through revisions to counterparty credit limits, while increases in haircuts tend to follow later.

- There were several rounds of increases in haircuts and margins during the crisis – particularly for securitised assets – as securities financing conditions tightened for a successively wider range of collateral assets in response to market events. Reassessment of the market liquidity of collateral assets and counterparty credit quality, as well as higher volatility, were the main factors that drove those increases.

- Securities financing transactions share many features across countries. However, noteworthy cross-country differences exist, for example in terms of the haircuts applicable in government repo markets and the frequency of variation margin calls.

- The withdrawal of real money investors from securities lending programmes and associated repo investments, particularly following the Lehman bankruptcy, led to a severe contraction in the supply of secured financing.

- In the OTC derivatives market, standards in many regions are moving towards the use of two-way collateral transfer agreements and zero threshold amounts to reduce counterparty risk.

Haircuts and initial margin requirements that are more stable across the cycle and calibrated to include periods of stressed market conditions have some desirable features for addressing financial system procyclicality. For example, higher haircuts and initial margins during expansions would provide greater credit loss protection if collateral assets have to be liquidated to secure the claims. Therefore, banks and prime brokers would probably cut back on credit lines more gradually in a downturn. More conservative haircuts would also indirectly constrain leverage by increasing the cost of capital employed by banks and other financial institutions. That said, it should be recognised that even if haircuts are mandated to remain stable over the business cycle, there are other lending terms that could be used to increase the availability of credit during periods of optimism and constrain credit during periods of deleveraging, with potentially some of the same procyclical effects on financial markets as that of variable haircuts.

The report recommends a series of policy options, including some for consideration, directed at margining practices to dampen the build-up of leverage in good times and soften the systemic impact of the subsequent deleveraging. These options largely complement one another.

Recommended

- To reduce the impact on financial markets of not promptly recognising declines in the value of collateral or derivative positions, link the credit terms that can be applied to securities financing transactions (SFTs) and OTC derivatives contracts to: (i) the dealers' capacity to mark to market the collateral posted (in the case of SFTs) and the contracts themselves (in the case of OTC derivatives); and (ii) the frequency with which this is done.

- To minimise the risk of breaches of credit triggers used in agreements governing OTC derivatives trades adversely affecting financial market conditions, (i) discourage the use of contractual terms that may generate large, discrete margin calls on counterparties and require that market participants,[1] irrespective of their credit rating, be subject to frequent variation margin payments, ideally on a daily basis, when the mark to market losses on derivatives trades exceed moderate threshold amounts; (ii) for all regulated market participants, disallow the use of credit triggers as a factor decreasing the estimated exposure at default (EAD) for determining regulatory capital charges; and (iii) require regulated market participants to have liquidity risk management systems that take appropriate account of various credit trigger-related liquidity shocks.

- To improve the stability of the supply of secured financing through the securities lending programme, develop best practice guidelines for negotiating terms for securities lending, and require custodian banks administering such programmes to provide improved disclosure of the risks underlying their reinvestment activities.

- To allow macroprudential authorities to assess financing conditions in secured lending and OTC derivatives markets, consider the value of regularly conducting and

[1] There could be exemptions, for operational reasons, for market participants that regulators do not see as a source of counterparty risk. This group could include a number of central banks, supranationals and governments.

disseminating a predominantly qualitative survey of credit terms used in these markets, including haircuts, initial margins, eligible pools of collateral assets, maturities and other terms of financing.

Recommended for consideration

- To reduce financial system procyclicality resulting from changes in the supply of secured financing driven by market practices for setting haircuts in SFTs, (i) set capital requirements on securities financing for banks and broker-dealers on the basis of considerations that under normal circumstances are relatively stable through the cycle; and (ii) consider the prudential impacts and practical implications of imposing a countercyclical add-on which can be used by macroprudential authorities to make discretionary changes to capital requirements on secured lending.

- To reduce financial system procyclicality arising from margining practices in secured lending and derivatives transactions, regulators and authorities should (i) promote the use of properly risk-proofed central counterparties (CCPs) that mitigate counterparty risk concerns for clearing standardised derivative instruments and seriously consider the use of such counterparties – among other options – for SFTs; (ii) encourage supervisors and other relevant authorities to review the policies and risk management practices of central counterparties for possible procyclical impacts related to haircuts and margins; and (iii) consider the prudential impacts and practical implications of imposing, through such CCPs, minimum constant through-the-cycle margins and haircuts, with a possible countercyclical add-on.

1. Introduction

The terms and conditions governing secured lending transactions, as well as the changes to the eligible pool of collateral securities and the applicable haircuts on them, can have a profound influence on leveraged market participants' access to credit and their risk-taking behaviour. In 2008, a sudden and significant tightening of these terms on a range of assets led to a contraction of the supply of secured financing and exacerbated deleveraging.

In examining forces that contributed to financial system procyclicality, the joint FSF-CGFS report entitled *The role of valuation and leverage in procyclicality* identified the haircut-setting mechanism in securities financing transactions (SFTs) as one such force. The report recommended that market practices that aim for more stable haircuts in SFTs and margins in over-the-counter (OTC) derivatives should be promoted to mitigate this source of financial system procyclicality.

In view of this recommendation, the Committee on the Global Financial System (CGFS) established a Study Group under the chairmanship of David Longworth, Deputy Governor, Bank of Canada, to review current market practices for setting margin requirements and haircuts. The overall mandate of the Study Group was to undertake a fact-finding study on margining practices, to analyse their impact on the financial system through the cycle, and to explore and analyse the desirability of various alternatives for reducing the procyclical effect of margining practices on financial markets.

This report is structured as follows. Section 2 discusses the results of the bilateral interviews conducted with market participants to gather information on how haircuts and other credit terms varied in the most recent cycle and on the decision-making process involved in setting credit terms. Section 3 examines the possible role which current practices for setting haircuts and initial margins in secured lending and OTC derivatives transactions may have in financial system procyclicality. Policy options for addressing financial system procyclicality arising from the haircut-setting process, and for ensuring greater stability of the supply of funding in secured lending markets, are then explored in Section 4.

2. Market practices for setting credit terms

Assessing possible procyclical links between haircuts and margins in SFTs and in the OTC derivatives markets and financial leverage requires an understanding of market practices. Members of the Study Group held bilateral interviews with market participants to gather information on haircuts and margining practices during the financial crisis. The bilateral interviews were conducted in various financial centres and included banks, prime brokers, custodians, asset managers, pension funds and hedge funds. Aggregated data on haircuts for various collateral assets in secured lending transactions gathered by the Study Group during bilateral interviews are shown in Table 1.

This section summarises the results of the fact-finding. It starts with a brief introduction to collateral management practices and the securities lending programme, including the criteria used to determine haircuts in SFTs. It then summarises the counterparty risk management practices applicable to OTC derivatives transactions and documents the risk management issues that surfaced during the financial crisis and measures taken to address them.

Table 1

Typical haircut on term securities financing transactions

In per cent

	June 2007			June 2009		
	Prime[1]	Non-prime[2]	Unrated[3]	Prime[1]	Non-prime[2]	Unrated[3]
G7 government bonds						
Short-term	0	0	0.5	0.5	1	2
Medium-term	0	0	0.5	1	2	3
US agencies						
Short-term	1	2	3	1	2	3
Medium-term	1	2	3	2	5	7
Pfandbrief	0	0	1	1	2	8
Prime MBS						
AAA-rated	4	6	10	10	20	30–100
AA- and A-rated	8	12	25	100	100	100
Asset-backed securities	10	20	20	25	50	100
Structured products (AAA)	10	15	20	100	100	100
Investment grade bonds						
AAA- and AA-rated	1	2	5	8	12	15
A- and BBB-rated	4	7	10	10	15	20
High-yield bonds	8	12	20	15	20	40
Equity						
G7 countries	10	12	20	15	20	25
Emerging economies	15	20	35	20	25	40

[1] Prime counterparty. [2] Non-prime counterparty. [3] Hedge funds and other unrated counterparties.

Source: Study Group survey.

2.1 Securities financing transactions

SFTs include repo and securities lending transactions. Both types of transaction result in collateralised lending, as they are backed either by cash or by collateral securities, but they differ in their motivation. Repo trades are generally executed to raise cash. A large share of the monetary operations of central banks is also conducted through repos.

Securities lending programmes, which include bonds and equities, are often conducted by custodian banks that act as an agent on behalf of beneficial owners, which include central banks, asset managers, pension funds and insurance companies. Prime brokers use securities lending programmes to help them meet customer buy orders, finance short sales and hedge derivative exposures. Securities lending programmes also provide funding for lower-quality assets, eg by taking those assets as collateral against the loaned government bonds.

When the cash lent on repo trades is lower than the market value of the collateral security, market participants refer to the applicable discount as a haircut. Among prime brokers and major financial institutions, there is no haircut when government bonds are used in repos. Zero haircuts are also applied to local government bond repos in some jurisdictions. In

securities lending transactions, the market value of collateral to be posted has to be higher than that of the security being lent, and the overcollateralisation amount is referred to as margin. While this distinction is important for trade execution,[2] the discount applicable to the loaned security or cash in SFTs will henceforth be referred to as a haircut. The remainder of this section discusses collateral management practices and the internal processes for establishing haircuts, the key drivers of changes in haircuts, and practices in securities lending programmes.

2.1.1 Collateral management practices

Internal processes for setting collateral requirements tend to be institution-specific. Collateral criteria and haircuts are defined either in a global collateral policy or in bespoke agreements with clients. In terms of decision-making, the risk management unit and front office are involved, as well as a committee comprised of senior managers and the chief risk officer. In some institutions, a global collateral management unit is in charge of controlling and monitoring the collateral portfolio, and of communicating requests for additional collateral or for substitution of ineligible collateral.

Collateral eligibility criteria typically include: the type of security accepted; its credit rating; its liquidity; the seniority of debt claims; issuer type; and issuer country risk. Within these broad screening criteria, the pool of eligible collateral assets can vary substantially across institutions and business units. Private banking business units, asset managers and central counterparties typically accept only a fairly restrictive set of collateral assets that include high-grade bonds and blue chip equities. Prime brokers, on the other hand, accepted a wider range of collateral assets before the crisis, including high-yield bonds, asset-backed securities and structured products. During the crisis, the range of assets included in the eligible pool of collateral assets significantly narrowed.

The collateral pool backing SFTs is managed at a portfolio level, and revaluation normally takes place daily. A fall in the market value of the collateral portfolio below the negotiated overcollateralisation level triggers a call to post additional collateral that has to be met the next business day. Valuation disputes sometimes arise when prices of less liquid assets in the collateral pool cannot be reconciled. In such cases, the collateral management unit coordinates with the credit risk and business units in order to resolve the dispute with the counterparty. If the collateral calls are not met because of a lack of liquidity in the client's assets, a failure-to-pay notice is issued, and the collateral portfolio is liquidated when the notice period expires.

2.1.2 Processes for establishing haircuts and change drivers

The risk management unit is usually responsible for the techniques and processes that are used to establish haircuts and set other credit terms. These include both quantitative and qualitative criteria. In some cases, standard supervisory haircuts under Basel II are used. Key quantitative factors include value-at-risk (VaR), measures of the liquidity of the collateral asset and – on a more ad hoc basis – stress tests. Qualitative factors include type of counterparty, competitive pressures and client relations.

The historical time period used in determining VaR-based haircuts and margins is usually one year, but longer time periods (up to five years) were also reported as being used. VaR-based haircuts are determined by estimating risk at a 95–99% confidence level over a 10-

[2] A 5% margin requirement, meaning that the collateral to be posted has to be 105% of the loaned security's market value, would be equivalent to a haircut of 4.75%.

day liquidation period. In most cases, there is an add-on to the VaR-based haircut in order to take into account liquidity risk when positions are to be unwound. Stress tests to substantiate haircut levels are generally based on a historical worst case move over 10 business days.

The credit ratings of the collateral assets and, in some cases, the counterparty credit ratings are monitored on an ongoing basis. A rating downgrade of an asset in the collateral pool could lead to a review of its collateral eligibility. Less liquid securities, such as emerging market and high-yield bonds, are only financed for very few, highly rated counterparties. Haircuts on these securities are conservative and include a historical 10-day worst case move and significant liquidity add-ons.

In practice, the haircut-setting process reflects the need to balance market and counterparty risks and business interests. While the risk management unit would argue for higher haircuts, trading desks would argue in favour of lower margins in order to remain competitive. Overall, market participants generally tried to observe the haircuts set by their competitors. For some asset classes, haircut schedules published by central banks were a helpful benchmark against which to assess levels.

Prior to the crisis, competitive pressures influenced the level of haircuts in some business areas. Indeed, competitive pressure had been particularly strong in firms that relied on securities financing as a major source of revenue, or in business lines (such as prime brokerage) that used lower haircuts to attract business. During the crisis, the risk managers were given more control, and this led to a number of assets not qualifying as eligible collateral.

The key drivers of the increase in haircuts or even the ineligibility of some assets as collateral were market illiquidity, valuation uncertainty and counterparty credit concerns. Revisions took the form of ad hoc increases in individual haircuts or the blanket introduction of multipliers.

Increased volatility of market prices also contributed to greater haircuts, though participants in some markets said that it did not contribute materially. Portfolio margining models, often used in prime brokerage, might have been expected to generate volatile margins that responded to changes in market volatility and correlation. However, the majority of such models appear to have used volatility assumptions backed out from historical stressed periods rather than the most recent data so that, for more liquid asset classes such as G7 government bonds and equities, haircuts changed only modestly.

2.1.3 Securities lending

Securities lending involves a temporary transfer of securities by a lender to a borrower on a collateralised basis, with the collateral being either cash or other securities. Securities lending shares many common features with repo transactions, and hence the distinction between the two is sometimes blurred. Although securities lending is ostensibly motivated by the desire to extract the intrinsic value in specific securities which are in demand to cover short positions, the securities lending business in recent years has been driven by the reinvestment opportunities available for the cash collateral received.

Securities lending programmes represent an important source of term secured financing for financial intermediaries. This happens through the reinvestment of the collateral cash received by securities lenders in the triparty or bilateral repo market (although these are far from being the only reinvestment options, they are the ones of interest to this Study Group), or through the borrowing of government securities against lower-quality collateral, which can then be used to generate cash through the repo market.

Before the onset of the financial crisis, beneficial owners, which include central banks, sovereign wealth funds, pension funds and insurance companies, viewed securities lending programmes as low-margin non-core activities that did not warrant much monitoring. Therefore, sufficient resources were not always devoted to the risk assessment of these

programmes. Among the less sophisticated beneficial owners of the programmes, indemnity guarantees offered by custodian banks may have provided a false sense of security. At the same time, custodians had an incentive to take significant risks by investing the cash in longer-term, complex and hard-to-value assets in order to earn additional investment income which they shared with the beneficial owners. In some cases, the beneficial owners were asking for additional income that could only be achieved by taking on increasingly risky investments. In the case of reinvestment in reverse repos, this took the form of a widening of collateral eligibility and reductions in haircuts.

As the financial crisis deepened, many beneficial owners started re-evaluating their securities lending programmes and concluded that the risks involved were too high to justify the low returns the respective programmes were generating. As a result, many withdrew from the programmes, which led to, amongst other things, a sharp contraction in the supply of secured financing. Those who wished to mitigate the risks by changing the programme reinvestment parameters found, in some cases, that their agent lenders were slow to respond to their requests or that changes were not permitted or could not be implemented quickly because of resource constraints (eg at some triparty repo agents). Losses on cash collateral reinvestment pools were another cause of large-scale programme terminations. The co-mingled nature of some accounts introduced further problems and complications. Finally, the indemnities offered by custodian banks had lost the value and credibility they once enjoyed.

All of these factors combined to make the supply of secured financing from securities lending programmes unstable during the period of heightened market stress, particularly following the demise of Lehman Brothers.[3]

2.2 OTC derivatives transactions

Collateral agreements for OTC derivatives transactions are in many cases governed by the International Swaps and Derivatives Association (ISDA) Master Agreement and related Credit Support Annex (CSA). Other local collateral agreements are sometimes used, eg the European Master Agreement (EMA), German DRV, French FBF and Japanese CSA. The CSA normally sets forth collateralisation rules that apply to the whole portfolio of OTC derivatives. Trade-level margining is seldom used. The CSA covers all agreed contractual terms related to collateral margin calls, their frequency, exposure calculations and the definition of eligible collateral.

In addition, the CSA specifies the threshold and minimum transfer amounts, and the posting of independent amounts. The threshold amount is the amount of exposure that one party is willing to have to the other party before requesting additional collateral payments. The independent amount or initial margin refers to an upfront payment demanded by one party on some OTC derivatives transactions. For hedge funds and less creditworthy counterparties, independent amounts are often negotiated on a trade-by-trade basis and serve as a form of additional collateral support.

To reduce counterparty risk, standards in the OTC derivatives market are now moving towards the use of two-way collateral transfer agreements, daily remargining practices and zero threshold amounts.[4] Such arrangements would lessen the need to post substantial

[3] The post-Lehman freeze reflected both concerns about the creditworthiness of large financial institutions and the reaction to the operational burden that typically accompanies a bankruptcy.

[4] The two-way CSA collateral agreement facilitates collateral transfers in both directions between parties when net exposures exceed the negotiated threshold amount.

collateral amounts linked to changes in the counterparty credit rating during the term of the transaction.

Many interbank ISDA Master Agreements have been negotiated under a two-way CSA with low threshold amounts and daily variation margin payments. Variation margins are calculated on the basis of the current mark to market exposure of the outstanding OTC trades. Some banks provide global netting arrangements for hedge fund clients, but this is not widespread. Such arrangements allow recognition of hedges and correlation benefits from a portfolio of securities. For interbank transactions the minimum transfer amount is usually $1 million, whereas for hedge funds and corporate clients it is lower, typically between $100,000 and $250,000.

Collateral criteria for OTC derivatives trades did not change during the crisis, perhaps because the renegotiation and modification of CSAs is quite a time-consuming process. Cash dominates the collateral received (constituting roughly 85%). The remainder is mostly made up of government bonds or other highly rated bonds with appropriate haircuts, and its composition and haircuts have remained broadly unchanged.

2.3 Risk management lessons

The financial crisis has drawn market participants' attention to a number of risks in collateral management practices. For example, valuation disputes, which create settlement delays in margin payments, have received increased attention. Prior to the crisis, prices provided by third-party vendors were deemed acceptable. Banks, prime brokers and custodians have now strengthened the internal process for pricing the collateral securities they hold. The effectiveness of collateral as a risk mitigant also depends critically on the ability of dealers to assess its value relative to the exposure being secured on a continuous basis. Recent events have demonstrated that, where this capacity is lacking, dealer responses when collateral is eventually judged insufficient can be destabilising (Box 1).

The financial crisis also revealed weaknesses in liquidity risk management practices. For example, the ability to meet collateral calls depends crucially on the way liquidity risk is managed. It appears that even sophisticated leveraged investors, such as broker-dealers, hedge funds and insurers, underprovisioned for liquidity risk during the period of declining market volatility. Among other factors, limitations in risk measurement methodologies against the backdrop of the increased complexity and opaqueness of risk transfer markets, as well as misaligned incentives, contributed to an underpricing of liquidity risk.

The underestimation of market and liquidity risk against the backdrop of low haircuts encouraged the use of a broader range of eligible collateral assets. In fact, the rapid growth of securitisation markets and structured finance products can partly be attributed to the inclusion of these assets in the eligible collateral pool with haircuts that did not adequately compensate for the valuation uncertainties and liquidity risk embedded in them. There is now greater awareness of the need to pay more attention to the liquidity risks of eligible collateral assets when setting haircuts. Indeed, a stricter criterion on liquidity now applied to screen for the pool of assets that would be accepted as collateral has narrowed that pool.

The crisis has created greater awareness of the importance of counterparty credit assessment when setting haircuts. This has been dealt with in different ways. Some banks have differentiated haircuts according to the credit quality of the counterparty; others have reduced the permissible gross exposure limits for counterparties rather than negotiating larger haircuts; or a combination of the two has been used; and in a few cases, it has resulted in a refusal to extend credit to the counterparty altogether.

Box 1

Case studies of margin calls affecting market dynamics

Experiences during the financial crisis suggest that large collateral calls are often triggering events for distress at individual financial institutions, which in some cases can impact other institutions or the broader financial system. But large collateral calls with broad impact are often associated with situations where the marking of financial positions – whether instruments held as collateral or derivatives contracts – lagged. In theory, the marking to market of positions forces recognition of modest changes in value when a range of options for dealing with counterparty risk – including requesting additional margin, restructuring contracts or further hedging exposures – still exist. However, weaknesses in valuation processes can allow losses to build to a point where their recognition can threaten the health of the institution faced with the capital and liquidity impacts. Where similar valuation weaknesses exist at multiple institutions, the result can be large-scale sales of assets with now uncertain valuations, with negative impacts on broader financial stability. Several examples from the recent crisis illustrate the potential for possible spillover effects.

Following a sharp increase in early payment defaults (EPDs) in late 2006 involving borrowers failing to make even the first payments on newly originated subprime mortgage loans in the United States, purchasers of whole mortgage loans invoked terms allowing them to put back EPD loans to the originator. New Century Financial Corporation, one of the largest independent subprime originators, faced intense funding pressure in late February 2007 as recognition of the magnitude of EPDs triggered sudden and substantial margin calls against a wide variety of subprime collateral. Market commentary suggests that New Century faced margin calls amounting to more than $300 million on $8 billion of mortgage collateral, which adversely affected the company's cash reserves and financial condition. In April 2007, New Century Financial Corporation filed for bankruptcy.

In June 2007, two hedge funds sponsored by Bear Stearns Asset Management (BSAM) that invested in highly rated structured products tied to subprime mortgages faced liquidity pressures and suspended investor redemptions. The funds utilised significant leverage obtained by financing highly rated mortgage-backed securities on very favourable terms from a number of dealers. Market commentary suggests that in June 2007 the more leveraged fund faced $145 million in outstanding margin calls while the less leveraged fund faced $60 million in margin calls. The BSAM-sponsored hedge funds sought a moratorium on margin calls from their creditors for an extended period of time. When no agreement was reached, several secured lenders seized and auctioned collateral, leading to a sharp fall in prices of subprime mortgage indices (Graph 1, left-hand panel). Despite BSAM's corporate parent eventually providing several billion dollars of replacement secured financing to the less leveraged of the two funds, several lenders reportedly suffered significant losses as negotiated haircuts proved insufficient against the backdrop of infrequent collateral marks.

In August 2007, a number of equity hedge funds that utilised proprietary quantitative trading algorithms experienced significant losses. This was unprecedented given the generally market neutral orientation of these strategies. Over time, it became clear that the unusual dynamics in equity markets were probably the result of some multi-strategy hedge funds selling their relatively liquid equity positions when faced with margin calls on structured credit positions that had become illiquid. The losses experienced by the "quant" funds led a number of prime brokers to reconsider the manner in which they margin funds which pursued what were designed to be market neutral strategies. However, the relative ease with which equity positions could continuously be valued, even during a period of market stress, mitigated the impact of this event despite the outsize losses to a number of market participants.

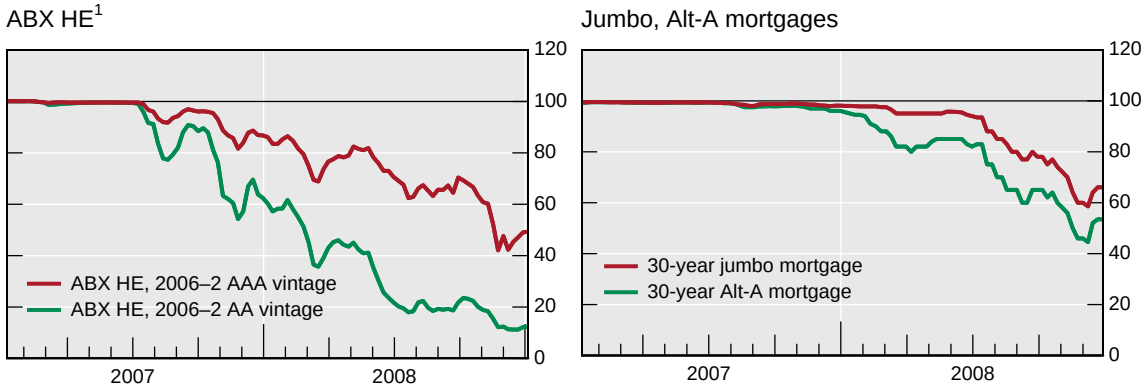
Box 1 (cont)

Case studies of margin calls affecting market dynamics

In February 2008, several well respected mortgage market participants without large subprime exposure experienced liquidity pressures. A contributing factor appears to have been sudden recognition of significant losses and subsequent sales of non-subprime mortgage positions by UBS, which led many lenders to call for additional collateral from institutions funding portfolios of Alt-A and jumbo mortgages as their prices fell (Graph 1, right-hand panel). Thornburg Mortgage, an originator of jumbo mortgages, was impacted, as well as hedge funds Carlyle Capital and Peloton. Inability to meet margin calls forced Carlyle Capital and Peloton to close down. Thornburg Mortgage managed to negotiate a one-year deferment of margin calls by raising capital through convertible notes, but eventually filed for bankruptcy in May 2009.

Graph 1

Mortgage index prices



[1] Weekly averages.

Source: JPMorgan Chase.

Hedge funds are now more conscious of the increased counterparty risk when prime brokers demand higher threshold amounts and initial margins for OTC transactions. In addition, the rehypothecation rights granted to prime brokers on the collateral they hold have brought to light the legal risks in reclaiming the collateral posted with prime brokers if they are bankrupt. Some asset managers and hedge funds have been negotiating restrictions on the rehypothecation rights. Restrictions on rehypothecation rights were seen by prime brokers as reducing market liquidity and raising funding costs that will be passed on to clients.

While the ISDA Master Agreement proved to be successful in settling OTC derivatives claims following the Lehman default, asset managers and hedge funds incurred losses on collateral posted with Lehman. Collateral losses were reported to have occurred as a result of both the inability to reclaim the independent amount posted on OTC trades and the undercollateralisation of net exposures due to the threshold amount not being zero. In some centres, there is now a desire to progressively shift OTC derivatives trades to central counterparties. As noted in Section 2.2, financial market participants are also negotiating zero threshold amounts in the CSA to reduce the counterparty risk.

3. The role of haircuts and initial margins in procyclicality

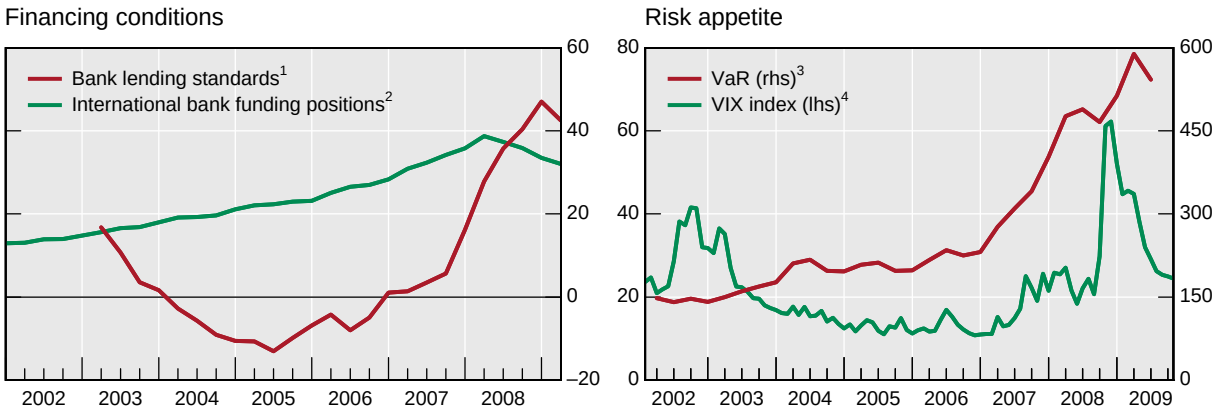
Procyclicality refers to the mutually reinforcing interactions between the financial and real sectors of the economy that tend to amplify business cycle fluctuations and cause or exacerbate financial instability. Such feedback mechanisms tend to be particularly disruptive

when stress in the financial system exacerbates economic downturns. Periods of financial distress are often preceded by unusually strong credit and asset price growth and by prolonged periods of unusually low risk premia, which tends to result in excessive leverage and risk-taking. As a consequence, efforts to reduce the procyclicality of the financial system should aim equally at limiting the build-up of risk during the expansion phase and supporting orderly risk reduction in the downturn.

For instance, international bank liabilities rose substantially in the period 2002–07 against a backdrop of a decline in bank lending standards (Graph 2, left-hand panel). Moreover, banks' trading book VaR rose in this period despite a fall in market volatility (Graph 2, right-hand panel). During the financial crisis, banks struggled to reduce exposures.

Graph 2

Indicators of financing conditions and risk-taking



1 GDP (at 2005 PPP) weighted average of net percentage of banks reporting tightening standards in various sectors in the United States, the euro area, the United Kingdom (since Q2 2007) and Japan. A negative number indicates loose conditions. [2] Total outstanding international unconsolidated (no inter-office netting-out) liabilities of all BIS reporting organisations, on an immediate borrower basis; in trillions of US dollars. [3] Simple average of 10-day 99% trading book VaRs in US dollars for Goldman Sachs, Morgan Stanley, Citigroup, JPMorgan Chase, UBS, Deutsche Bank, BNP Paribas, Société Générale, RBS, Barclays, Lehman Brothers, Bank of America, Credit Suisse and HSBC. [4] Monthly averages.

Sources: Bloomberg; Datastream; financial accounts of banks; BIS.

Procyclicality may, for instance, arise from valuation changes in collateral assets. Rising collateral asset values increase bank capital, which can then be re-employed to extend credit. Because the value of collateral assets is positively correlated with the business cycle, rising collateral values increase credit availability during economic expansions. This then feeds back into investment and consumption decisions, reinforces economic growth and further increases asset prices.

During economic contractions, a decline in the value of collateral assets erodes investors' net worth faster than gross worth when investors are leveraged. In addition, credit terms are generally tightened during such periods. As a consequence, collateral calls and credit tightening may force investors to deleverage in falling asset markets, exerting further downward pressure on prices in already falling markets.

Published in April 2008, the *Report on enhancing market and institutional resilience* traces financial system procyclicality to two fundamental sources: one is limitations in risk measurement; and the other is distortions in incentives. In addition, prudential arrangements that set bank capital requirements on the basis of measured risk or fair value accounting standards that make valuations sensitive to the economic cycle may also contribute to procyclicality where significant weaknesses exist in risk measurement or valuation capacities.

This section focuses on examining the ways in which practices for setting haircuts and initial margins in secured lending and OTC derivatives transactions may have made the financial

system more procyclical. In particular, it examines whether the low levels of haircuts and initial margins observed before the crisis encouraged an increase in leverage and asset prices, and whether the subsequent steep increase in haircuts and initial margins for some asset classes exacerbated the financial crisis through its effect on deleveraging and asset price declines.

3.1 Procyclical mechanisms

Margining practices can endogenously contribute to financial system procyclicality by easing (tightening) credit supply in the boom (downturn). In the upswing, a reduction in haircuts or initial margins increases the maximum leverage available to a borrower even if other credit terms remain unchanged. As the leverage that can be effectively employed increases, additional purchases of collateral assets can be financed. The resulting higher demand for fixed income assets, for instance, lowers credit spreads and increases the value of collateral assets. This, in turn, further increases the amount that can be borrowed against this collateral.

To the extent that lower credit spreads are perceived as reflecting lower liquidity risk premiums and/or lower default risk expectations, haircut levels and other requirements are likely to be reduced in response. Relaxation of terms may encourage higher leverage, which in turn increases asset prices and lowers asset price volatility. As a consequence, risk measures derived using these variables as inputs will be distorted. This may contribute to an underestimation of liquidity risk and induce investors to underprovision for liquidity risk. This exacerbates the procyclical effects of rising collateral values.

In a downturn, actions taken by individual market participants to protect themselves, such as calling for additional collateral, reducing the amount of credit extended to specific classes of counterparties or ceasing to accept certain types of collateral, can induce further contraction of the supply of credit through collateralised lending. This may lead leveraged investors to liquidate assets, which in turn may lower collateral values and intensify deleveraging pressure through further margin and collateral calls, or other responses by credit providers. In extremis, where calls for additional collateral cannot be met, forced liquidations or seizure of collateral by lenders can result, reinforcing and accelerating the adverse asset price dynamics.

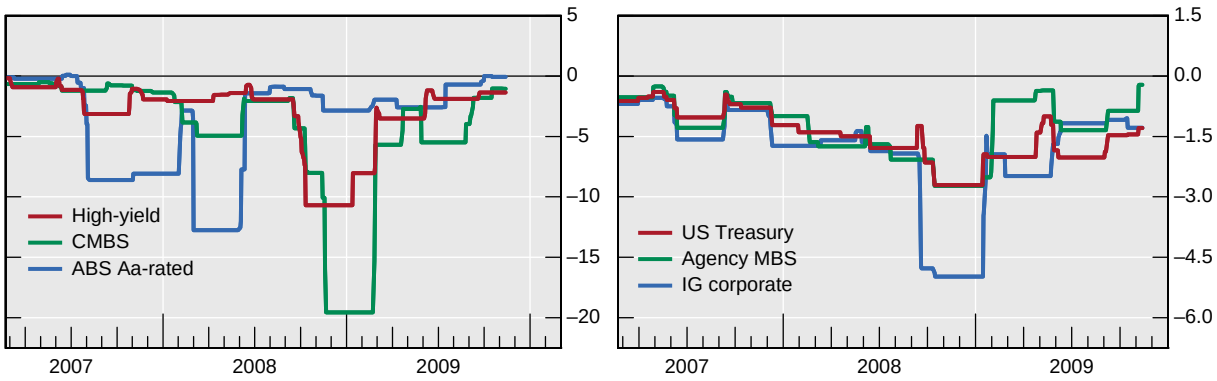
Practical experience over the last few years suggests that practices for setting credit terms such as haircuts and initial margins have indeed been procyclical. During the years of economic expansion prior to mid-2007, there was a gradual erosion of risk management standards applied to secured lending. Haircuts fell to low levels, and other credit terms were loosened in response to competitive pressures. This allowed a build-up of leverage inside and outside the regulated sector. When the cycle turned, the response was anything but gradual. Examining price changes across a number of asset classes during the financial crisis suggest that market conditions deteriorated sharply between August and October 2008 (Graph 3), at a time when the default risk of major market participants surged.

Changes in the composition and supply of collateral assets used in secured financing can further reduce credit supply in the downturn, and hence also contribute to procyclicality. For example, the supply of credit through the reinvestment activities of securities lenders contracted sharply following the Lehman failure, as beneficial owners reassessed the risks of their securities lending programmes. In some cases, it appears that it was operationally easier for beneficial owners to withdraw altogether from the programme than to change haircut levels and introduce restrictions on the reinvestment activity for the cash collateral. This was another contributing factor in disrupting the supply of secured financing.

Graph 3

Collateral performance during the crisis[1]

In per cent



[1] Minimum of rolling five-day total returns over the preceding three months.

Sources: Barclays; BIS calculations.

The practice of linking haircuts or initial margin requirements to credit ratings also adds to procyclicality. In particular, rating-based triggers in OTC derivatives contracts require additional collateral postings in response to changes in credit ratings of the counterparty. While triggers can effectively protect creditor interest against idiosyncratic shocks, they exacerbate procyclicality when the counterparty involved is systemically important and faces financial distress. This was forcefully demonstrated when the credit rating of the insurance company AIG was downgraded, triggering significant amounts of collateral payments that ultimately were met through government intervention.[5]

Overall, the procyclical nature of practices for setting haircuts and initial margins and other credit terms for secured lending points to a market failure due to negative externalities associated with the setting of credit terms. It is reasonable or even rational from the perspective of the individual financial institution to loosen credit terms during good times, only because the individual institution does not take into account the expansionary impact of its actions on the broader financial system. Similarly, as the cycle turns, individual financial institutions do not take into account the contractionary impact of abruptly tightening credit terms on the broader system. In essence, these collective actions of what is reasonable behaviour at the individual institution level allow for the materialisation of bad outcomes for the financial system as a whole.[6]

3.2 Evidence gathered from bilateral interviews

Evidence gathered during bilateral interviews confirmed that margin requirements and secured lending terms are procyclical. The procyclical nature of secured lending terms can be regarded as prudent risk management practice to the extent that such actions reduce counterparty risk to financial intermediaries. Indeed, market participants viewed the haircut-setting process as being endogenous to the counterparty risk assessment of the lender.

[5] In May 2008, AIG was downgraded to AA–, the last rating above the trigger level, and breached the trigger in September 2008.

[6] If the tightening of credit terms through increased haircuts and initial margin requirements is enforced during the expansion phase, this would curb excessive credit growth, and therefore contribute to a positive externality of secured financing credit terms. But, as argued in this report, market practices in the run-up to the financial crisis suggest that margin requirements are procyclical, and thus produce a negative externality.

To control for counterparty risk in secured lending business, repo dealers and prime brokers either increase haircuts or lower available credit risk limits in addition to shortening the term of lending. Consequently, counterparty credit lines cannot be viewed as independent of the level of haircuts or initial margins that have been negotiated. A reduction in credit limits is often the first line of defence for banks and prime brokers to manage counterparty risk. In circumstances where the level of haircuts or initial margin requirements were raised to control for counterparty risk in SFTs and OTC derivatives transactions, this varied considerably across financial instruments, the business line of the lender and the type of customer.

The procyclical nature of secured lending terms provides some support for the assumptions made in more recent models to study the interaction between margin requirements and asset price dynamics (Box 2). However, these models do not capture all the relevant market mechanisms. For example, the theoretical models assume that lending terms are altered through changes in margin requirements, whereas market participants have a number of channels through which counterparty risk can be reduced in secured lending and OTC derivatives transactions, as illustrated above. This observation is important in recognising the channels through which policy options can effectively mitigate excessive financial system procyclicality resulting from margining practices.

Market participants also viewed changes in haircuts and initial margins as only one factor in creating pressure for deleveraging. While in some cases changes in haircuts triggered deleveraging, they did not, in general, form part of a deleveraging or asset price spiral. Some attributed the deleveraging pressures to sharp falls in collateral values and valuation uncertainties for certain asset classes that triggered substantial variation margin calls. These observations tend to support the view that procyclical changes in asset prices can also be driven by collateral and variation margin calls, the magnitude of which increases during periods of market stress. One interpretation of the market participants' views is that raising the initial margins hedge funds post or raising haircuts in normal times to contain financial leverage in order to counteract these procyclical effects of leverage may not, however, dampen the large and disruptive variation margin calls that can arise in adverse market conditions.

3.3 Desirability of stable through-the-cycle haircuts

The evidence gathered during bilateral interviews suggests that stable through-the-cycle haircuts on SFTs are no panacea, and that significant practical difficulties in implementing such haircuts exist. In particular, credit terms have several dimensions, which creates a risk that placing restrictions on one or more parameters merely moves the operative dimension elsewhere. In addition, there are reasons to worry that imposing constraints on haircuts would induce market participants to employ other transactions with similar economics to evade the restrictions.

Second, more conservative haircuts can indirectly constrain leverage by increasing the cost of capital to financial institutions. For example, haircuts correspond to the amount of funding that must be raised in unsecured debt markets. Business units that use secured funding for their lending or prime brokerage activities will be charged a transfer price on the haircut amount, which is usually the cost of six-month or one-year unsecured term funding. The larger the haircuts on collateral assets, the higher the funding cost would be for the business units. The impact on profitability would then be a function of the size of the haircuts and the spread between term money market and overnight repo rates. The increased prime brokerage funding costs will then influence lending terms as well as the supply of credit to hedge funds.

Box 2

Evidence from recent academic studies

Recent studies that use evidence gathered from the financial crisis to analyse how changes in haircuts and margin requirements affect market outcomes emphasise the important role played by capital constraints. This literature has formalised long-standing insights about the potentially destabilising influence of secured lending and how, in particular, haircuts and initial margin may contribute to a procyclical expansion of leverage and liquidity during boom times and accelerate the contraction of leverage and liquidity during downturns.

Among others, Gârleanu and Pederson (2009) emphasise the importance of taking margin constraints into account when analysing how changes in haircuts may impact asset prices.[1] In their model, haircuts and initial margins are exogenous, thus excluding the possibility of negative spirals between haircuts and asset prices. By incorporating margin constraints into a consumption capital asset pricing model, the authors show that when margin constraints bind current or some future states, higher margins raise the required returns on assets, which lowers asset prices.

Brunnermeier and Pedersen (2009) show that an adverse feedback loop between haircuts and asset prices can be triggered by two mechanisms: the loss spiral and the margin spiral.[2] The loss spiral links the level of haircuts and margins in collateralised borrowing to the strength of deleveraging in response to asset price falls, which is endogenous to the level of the initial haircut. The margin spiral mechanism endogenises changes in haircuts/margins and changes in asset prices: a fall in asset prices induces lenders to increase haircuts and initial margins as a risk management measure. When borrowers face capital constraints, additional collateral postings may require the selling of assets into already falling markets.

The empirical literature on margining practices is nascent, and does not directly examine the causality between haircuts and asset prices, perhaps because there are no comprehensive data on haircuts and initial margin requirements. There is, however, some indirect empirical support of the hypothesis that there is a negative relationship between haircuts and asset prices: the findings of two recent studies suggest that the degree to which investors or financial intermediaries are capital-constrained matters for how the actions of intermediaries affect asset prices.[3]

How and whether the academic insights should influence policymakers is unclear, given the highly simplified and stylised nature of models explored by this literature. While the models focus on haircuts, many other terms are also relevant in determining the effective supply of leverage to market participants. Thus, while in the models credit supply invariably responds to adjustments in haircuts, effects may be less clear in the presence of other credit terms which are simultaneously adjusting. This caveat is important to keep in mind when evaluating the implications of policies that target the level of haircuts and initial margins in particular.

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[1] N Gârleanu and L H Pedersen, "Margin-based asset pricing and deviations from the law of one price", mimeo, 2009.

[2] M K Brunnermeier and L H Pedersen, "Market liquidity and funding liquidity", *Review of Financial Studies*, vol 22, pp 2201–38, 2009.

[3] See J Coughenour and M Saad, "Common market makers and commonality in liquidity", *Journal of Financial Economics*, vol 73. pp 37–70, 2004; and A Hameed, W Kang and S Vishwanathan, "Stock market declines and liquidity", *Journal of Finance*, forthcoming.

Third, more stable and conservative higher haircuts can be expected to reduce valuation-induced procyclicality in stressed market conditions. In the run-up to the crisis, the range of collateral assets used in secured financing transactions expanded to include assets whose mark to market values were dependent on the modelling of complex contingent cash flows. When the model-based valuation uncertainties on these assets exceed the overcollateralisation secured through the haircut, adverse selection risk increases. This risk materialises particularly in stressed market conditions, and the valuation uncertainties can force such securities to lose their collateral eligibility. Higher haircuts for collateral assets that are prone to this risk will mitigate it, which in turn can result in greater stability of the supply of secured financing.

4. Policy options

The findings in this report provide support to the view that the increasing availability of secured financing, the growth of OTC derivatives and the concurrent easing of terms – including the erosion of margins – contributed to an increase in leverage. The deleveraging which followed was particularly disruptive. This report identifies several reasons: infrequent collateral valuations and the presence of credit triggers that led to destabilising collateral margin calls; procyclical haircuts and margin requirements; sudden and significant changes in the supply of secured financing; and a lack of qualitative or quantitative information on secured financing terms and collateral requirements for the macroprudential authorities to assess risks in the secured lending and in the OTC derivatives markets.

In the light of this experience, this report recommends a series of policy options, including some for consideration. These policy options, which largely complement one another, are directed at margining practices to dampen the build-up of leverage in good times and to soften the systemic impact of the subsequent deleveraging.

4.1 Collateral valuation capacity

Recommendation

To reduce the impact on financial markets of not promptly recognising declines in the value of collateral or derivative positions, link the credit terms that can be applied to SFTs and OTC derivatives contracts to:

(i) the dealers' capacity to mark to market the collateral posted (in the case of SFTs) and the contracts themselves (in the case of OTC derivatives); and

(ii) the frequency with which this is done.

Motivation

There is significant evidence that, during the crisis, dealers with well developed valuation capabilities for SFTs and OTC derivatives were able to respond to adverse events sooner, in ways that better protected the dealers from credit losses. In addition, by reducing their need to seize and auction collateral or close out contracts, it lessened the impact on the broader financial system. More timely, and thus more incremental, responses may help dampen the procyclical dynamics of the gradual erosion of terms during periods of market stability followed by rapid tightening of terms during periods of stress.

Specific proposals

Require dealers to institute policies explicitly relating credit terms, including haircuts for SFTs and collateral requirements for OTC derivatives trades, to the strength of the valuation process for a particular type of collateral, counterparty or contract, and the frequency with which key components of the valuation process occur. Where valuation and related governance practices are weaker, less frequent or less developed for particular counterparties, contracts or collateral types, additional buffers would be required. An extensive literature identifies practices that are regarded as effective in this area, including the frequency of independent verification of market values provided by trading desks, governance around internal dispute escalation and resolution procedures, and consistency in the valuation of collateral financed for customers and similar positions held in the firm's own inventory.

A stronger version of this proposal would make the implementation of adequate valuation practices a condition for the credit risk mitigation benefits of collateral to be recognised in capital requirements.

Pros and cons

Pros: The relationship between credit terms and valuation capacity will incentivise additional investment in valuation capacity. This may help firms (and particular businesses within firms, which is where some investment decisions are made) to internalise the costs to the broader system of failures to mark collateral and OTC derivatives contracts, which can lead to rapid liquidations with possible procyclical consequences.

Cons: There is reliance on firms' internal risk management structures and/or the capacity of regulators to assess these structures. Implementing the policy would require meaningful distinctions to be drawn regarding the strength of processes for various types of collateral, contracts and counterparties, with these distinctions to be reflected in a systematic way in the setting of credit terms.

4.2 Through-the-cycle haircuts and capital charges

Recommended for consideration

To reduce financial system procyclicality resulting from changes in the supply of secured financing driven by market practices for setting haircuts in SFTs,

(i) set capital requirements on securities financing for banks and broker-dealers on the basis of considerations that under normal circumstances are relatively stable through the cycle; and

(ii) consider the prudential impacts and practical implications of imposing a countercyclical add-on which can be used by macroprudential authorities to make discretionary changes to capital requirements on secured lending.[7]

Motivation

Under the current Basel II Framework, a supervisory haircut is set for each transaction secured by eligible collateral.[8] In cases where the actual haircut is less than the supervisory haircut, the difference is treated as an unsecured exposure to the counterparty, and this will be subject to a capital charge. When the actual haircut is greater than the supervisory haircut, the secured transaction will not be subject to capital charges. The pool of eligible collateral assets is broad and includes cash, bonds, securitised assets and equities.

Supervisory haircuts depend on the transaction and collateral type, and may either be calculated by the financial intermediary using a model approved by supervisors, or be taken from a list of standard regulatory haircuts calibrated for a 10-day holding period. If the assumed holding period differs from 10 days, haircuts are scaled accordingly.[9] The goal of

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[7] See discussion in Annex 1 for some possibilities on how to calibrate the countercyclical add-on.

[8] See *Basel II: International convergence of capital measurement and capital standards: A revised framework – comprehensive version*, June 2006.

[9] For example, the haircut for a five-day holding period will be the 10-day regulatory haircut multiplied by the square root of 0.5 (ratio of five divided by 10). The assumed holding period depends on term of transaction, liquidity of collateral, and frequency of remargining for changes in collateral value.

the existing capital treatment is to deliver a capital buffer sufficient to absorb counterparty credit risk losses to the usual level of confidence. The precise calculation is under review by the Basel Committee on Banking Supervision (BCBS). This review is motivated by the desire to improve the resilience of individual institutions with a view to simultaneously reducing the potential procyclicality of capital requirements within a risk-sensitive capital framework. The Study Group fully supports the proposals coming out of this review, as set forth in the BCBS consultative paper *Strengthening the resilience of the banking sector* (December 2009).

Events during the financial crisis, however, demonstrated that existing rules for setting supervisory haircuts – in particular, allowing firms to estimate supervisory haircuts themselves – fail to take into account material *negative externalities* that arise from secured lending at low haircuts. One negative externality is the sharp contraction in the supply of secured financing when risk perceptions of collateral quality are abruptly revised, which has the effect of amplifying financial system procyclicality. The policy proposal presented below recommending recalibration of supervisory haircuts is motivated by the desire to reduce financial system procyclicality resulting from an underpricing of systemic risks created by secured lending at low haircuts. These proposals are intended to be complementary to the BCBS proposals, as the mandate of the Study Group is to take a macroprudential perspective, which in particular focuses on ensuring greater stability of the supply of secured financing and the effects this can have on the functioning of financial markets.

Specific proposal

Supervisory haircuts for secured lending should be based on two components: one that is relatively stable across the cycle; and another that is a countercyclical add-on. The relatively stable component of the supervisory haircut should be set in a conservative manner so that it acts as a disincentive to secured lending at low haircuts in good times. This relatively stable component of the supervisory haircut could in turn be based on two separate components:

- a *market volatility* component that uses the observed mid-market price volatility of the particular collateral type over a long historical time period that includes stressed market conditions, and is scaled according to the assumed holding period; and
- an independent *liquidity* component that is calibrated to reflect uncertainty over bid-offer spreads on collateral.

Given the tendency of financial market participants to collectively underprice risk in good times, capital requirements based on the relatively stable component of the supervisory haircut may not fully internalise systemic costs arising from excessive reliance on the supply of secured funding markets, which could be subject to sudden reversals. To mitigate this risk, a countercyclical add-on to the supervisory haircuts should be used by macroprudential authorities as a discretionary tool to regulate the supply of secured funding, whenever this is deemed necessary. For example, this countercyclical add-on could be used to increase capital requirements when authorities judge that markets are underpricing collateral risks in periods of rising financial leverage and asset prices.

The intention of this modified capital regime would be to lean against excessive financing of risky assets in good times given the negative externalities that such financing carries. However, just as there are now, there would be exemptions for certain interbank transactions which contribute positively to market efficiency and where the financing of the collateral is *not* the motivation for the transaction. For example, overnight interbank lending collateralised by very high-quality liquid assets (typically those recognised as core liquidity in microprudential liquidity standards) would be exempted. In this case, the purpose of the transaction is the rebalancing of short-term payment flows, and the collateral is *solely* serving the purpose of supporting the creditworthiness of the borrower. To avoid the adverse outcomes of either discouraging the use of collateral solely to support creditworthiness, or impairing the

efficiency of payment systems, national authorities should retain discretion to exempt such transactions, which would typically be secured against the highest-quality collateral.

Pros and cons

Pros: A countercyclical add-on to alter supervisory haircuts, and therefore capital charges for secured lending, can be a useful tool of macroprudential policy. The add-on can be used at the aggregate level, or selectively by macroprudential authorities to target specific asset classes. This would have the primary objective of protecting the banking system from excessive exposure to such asset classes, but would also be a public signal of concern over the sustainability of those asset prices. If directed at banking sector exposures to particular market segments, it would complement other macroprudential measures.

The proposal to introduce relatively stable through-the-cycle supervisory haircuts may appear weaker than enforcing minimum mandatory haircuts as suggested in other regulatory reform initiatives.[10] In practice, capital requirements under either regulatory rule will be equivalent. For example, under a *minimum mandatory haircut rule*, unsecured credit could also be extended, but would attract appropriate capital charges; under a *through-the-cycle haircut capital rule*, additional credit implicitly extended by charging a haircut less than the through-the-cycle value is effectively treated as unsecured and therefore attracts a capital charge. However, monitoring compliance with minimum mandatory haircut standards may be more difficult whereas supervisory haircuts may lend themselves to more effective supervisory follow-up.

Cons: Calibrating the liquidity (bid-offer spread) risk component without being overly conservative may be challenging. As with any macroprudential tool, the effectiveness of the countercyclical add-on will depend to some extent on the degree of international coordination achieved. Financial intermediaries will seek ways to reduce the capital charges by restructuring transactions, particularly in good times, and this may reintroduce procyclicality.

The size of the capital requirement depends on the credit quality of the borrower. In practice, the incentive to increase haircuts would be small for higher-quality borrowers. This measure would only be effective to restrict leverage amongst lower-quality borrowers (ie those that would find it difficult to obtain leverage via unsecured borrowing).

4.3 Credit triggers and margining practices

Recommendation

To minimise the risk of breaches of credit triggers used in agreements governing OTC derivatives trades adversely affecting financial market conditions,

(i) discourage the use of contractual terms that may generate large, discrete margin calls on counterparties and require that market participants, irrespective of their credit rating, be subject to frequent variation margin payments, ideally on a daily basis, when the mark to market losses on derivatives trades exceed moderate threshold amounts;

[10] See, for example, *The Turner Review: A regulatory response to the global banking crisis*, UK Financial Services Authority, March 2009.

(ii) for all regulated market participants, disallow the use of credit triggers as a factor decreasing the estimated exposure at default (EAD) for determining regulatory capital charges;[11] and

(iii) require regulated market participants to have liquidity risk management systems that take appropriate account of various credit trigger-related liquidity shocks.

Motivation

Market participants engaged in OTC derivatives trading use contractual credit triggers to protect themselves against deterioration in the credit quality of a counterparty beyond a preset threshold. These take the form of public credit rating-based triggers or other customised credit triggers for unrated counterparties, such as net asset value-based triggers for hedge funds. According to agreements governing OTC derivatives trades, a breach of a credit trigger would usually allow a party either to terminate the transaction and seize the collateral held or to require additional collateral to be posted. By creating a sense of security that might encourage greater extension of credit in good times, contractual credit triggers can contribute to financial system procyclicality and exacerbate liquidity shocks. The absence of public information on how widespread the use of credit triggers is, and what the network of multilateral exposures to those triggers across financial institutions is, complicates the assessment of associated risks to financial stability.

The downgrading of AIG in September 2008, and the events that followed, provide an example of adverse developments that can be caused by credit triggers.[12] AIG's credit default swap (CDS) counterparties sought to benefit from zero regulatory capital charges stemming from AIG's AAA rating, while AIG benefited by not being subject to initial and variation margin payments. However, both AIG and its counterparties failed to account for the correlation between AIG's credit quality and the mark to market value of its contracts in the seemingly very unlikely state of the world in which bespoke CDS protection contracts bought from AIG would pay out. The rating downgrade of AIG triggered simultaneous and substantial margin calls by derivatives counterparties, which led to a material liquidity shock at a time when AIG had already been facing substantial funding pressures.

Specific proposals

While contractual credit triggers can be seen as a prudent risk management practice to protect against deterioration in credit quality of the counterparty, market participants fail to take account of the negative externality resulting from the widespread use of similar triggers by other financial intermediaries and the counterparty defaulting as a result of being unable to meet large margin calls. Requiring that market participants be subject to frequent variation margin payments, ideally on a daily basis, when the mark to market losses on derivatives trades exceed a moderate threshold would provide a substantial level of credit protection. This would facilitate the removal of contractual terms that may generate large, discrete margin calls on counterparties during the term of the OTC derivatives transaction. While this regulation should apply to counterparties irrespective of their credit rating, there could, for operational reasons, be exemptions for market participants that regulators do not see as a

[11] The Risk Management and Modelling Group of the Basel Committee on Banking Supervision is currently considering such a policy in its review of the treatment of counterparty credit risk.

[12] The rating of AIG was downgraded by at least two notches by the three top global rating agencies in mid-September 2008.

source of counterparty risk.[13] This proposal does not intend to abolish the early termination option in the event of a trigger breach.

Credit triggers in margin agreements have been a source of liquidity strain for a number of market participants during the financial crisis and thereby often precipitated the deterioration in creditworthiness of counterparties. The existing Basel II Framework does not explicitly disallow the use of contractual credit trigger provisions in the calculation of EAD, and thereby allows for such provisions to reduce regulatory capital requirements. Regulators should disregard such credit triggers when computing the regulatory capital requirements for the derivative exposures, while not prohibiting the inclusion of such credit triggers in collateral agreements.

Taking into consideration various credit trigger-related liquidity shocks in risk management (eg by stress tests) would dampen the erosion of lending standards in boom periods as well as increase significantly the resilience of counterparties during downturns. Within individual financial institutions, information on the existing credit triggers that grant rights to demand additional collateral from counterparties should be readily available. As individual financial institutions may not have information on the aggregate trigger-related exposures of their counterparties, there would be a role for supervisors to monitor the use of contractual credit triggers. This information could be shared with market participants for stress testing purposes if deemed necessary.

Pros and cons

Pros: Market practice is now moving towards the use of zero thresholds in collateral agreements so that any positive credit exposure in excess of a minimum transfer amount would generate a request for additional collateral payment. A regulatory initiative would speed up this process and further strengthen it by requiring remargining to be done, ideally on a daily basis. This would have the beneficial effect of fostering prompt resolution of valuation disputes, which in the crisis was yet another source of counterparty risk. Moreover, the combination of frequent remargining, low minimum transfer amounts and thresholds would lessen the need to include contractual triggers that may generate large one-off collateral calls.

The proposals also signal that authorities have concerns about the implications of a widespread use of credit triggers for financial stability because market participants do not take into consideration the probability of credit triggers being ineffective if a counterparty defaults as a result of being unable to meet large margin calls.

Cons: Not all counterparties may be able to meet margin calls on a daily basis, as the liquidity buffers and resources which such practice may demand could be costly. Changes to institutions' risk management systems and data collection will involve substantial costs. If liquidity risk management systems were calibrated too conservatively as a result of this policy, it could unduly reduce market efficiency.

[13] This group could include a number of central banks, supranationals and governments.

4.4 Use of central counterparties

Recommended for consideration

To reduce the financial system procyclicality arising from margining practices in secured lending and derivatives transactions, regulators and authorities should (i) promote the use of properly risk-proofed central counterparties that mitigate counterparty risk concerns for clearing standardised derivative instruments and seriously consider the use of such counterparties – among other options – for SFTs; (ii) encourage supervisors and other relevant authorities to review the policies and risk management practices of central counterparties for possible procyclical impacts related to haircuts and margins; and (iii) consider the prudential impacts and practical implications of imposing, through such CCPs, minimum constant through-the-cycle margins and haircuts, with a possible countercyclical add-on.

Background

A number of ongoing policy initiatives are examining the use of CCPs or other centralised clearing infrastructure mechanisms as a potential solution addressing issues of market infrastructure resiliency, market opacity, orderly collateral liquidations, and the management of counterparty credit risk. The September 2009 G20 communiqué from Pittsburgh stated that all standardised OTC derivatives contracts should trade through exchanges or electronic trading platforms, where appropriate, and that they should be cleared through CCPs by the end of 2012 at the latest. The statement also noted that non-centrally cleared contracts would be subject to higher capital charges.

Motivation and specific considerations

The use of CCPs can address the issue of procyclicality in several ways. First, use of CCPs reduces counterparty credit risk. This significantly decreases the probability that elevated counterparty credit concerns would lead market participants to cease trading, thereby restricting access to funding. Second, by requiring that even highly rated counterparties post collateral, a CCP can help prevent sudden and large one-off collateral calls, often arising from credit rating triggers, which may severely affect the liquidity and sometimes the solvency of an institution. Third, should a default occur, the CCPs' standardised procedures would ensure that the unwinding of positions is carried out in a more orderly fashion, and therefore should help mitigate contagion risk and spillover effects.

Designing a CCP appropriately would be best accomplished by following the relevant CPSS-IOSCO recommendations. To ensure an overall reduction in systemic risk, prudential oversight of the CCPs must hold these entities to very high standards of credit and liquidity risk management. Regulators should consider the net benefits of requiring CCPs to set initial margin and haircut levels using the through-the-cycle approach employing data from a long time series of market movements or based on stress levels where such data are unavailable. A possible countercyclical add-on to haircuts could be implemented at the discretion of macroprudential authorities.

Pros and cons

Pros: The use of CCPs provides additional benefits such as reduced counterparty risk, increased transparency with respect to participants' exposures and a better insight into the market activity that would be available for scrutiny by the regulator, which in turn will promote financial stability. The possibility of imposing relatively stable through-the-cycle margins and haircuts (for example, in the form of minimum constant through-the-cycle margins) and introducing a discretionary countercyclical add-on to haircuts charged by CCPs would make this policy option consistent with those for non-CCP-cleared transactions (see Section 4.2).

Cons: Ensuring that a sufficient number of OTC derivatives trades and SFTs are cleared through the CCP in order to realise the aforementioned benefits can be a challenge. Attempting to deal with issues of procyclicality through the use of CCPs may create incentives for market participants to trade bilaterally, which would diminish the degree of counterparty risk reduction that can be achieved.

4.5 Best practices for securities lending

Recommendation

To improve the stability of the supply of secured financing through the securities lending programme, develop best practice guidelines for negotiating terms for securities lending, and require custodian banks administering such programmes to provide improved disclosure of the risks underlying their reinvestment activities.

Motivation

Beneficial owners of securities lending programmes, which include pension funds, insurance companies and mutual funds, are subject to a diverse set of regulations. The nature of their mandate and their investment policy objectives require them to be highly sensitive to counterparty risk, and during the financial crisis they demonstrated a desire to withdraw completely from securities lending programmes rather than change programme parameters to protect their interests. Such behaviour not only reduces the supply of lendable assets, but it can also sharply reduce the liquidity in the repo market and the demand for short-term assets such as commercial paper and asset-backed securities in which the cash collateral is often invested. A sharp contraction in the demand for short-term assets and retrenchment of liquidity in the repo market will affect funding liquidity conditions and amplify financial system procyclicality.

Specific proposal

A lack of sufficient knowledge of the terms governing the securities lending programme as well as the risks associated with the eligible pool of reinvestment assets for the cash collateral were factors contributing to the rapid withdrawal of beneficial owners from the programme. To address these weaknesses, authorities should facilitate development of best practice guidelines by beneficial owners, custodian banks and securities borrowers.

The best practice guidelines should form the basis for custodian banks to offer advice to the beneficial owners of the securities lending programme on the design of effective mandates, on the ongoing operation of their relationship with their lending agent, and on risk management issues that include counterparty selection, collateral eligibility, haircut policy, exposure to maturity mismatch and segregation of funds. At the same time, custodian banks and other agents administering such programmes should be required to provide adequate disclosure to beneficial owners of the risks associated with their reinvestment activity.

4.6 Collection of information on credit terms

Recommendation

To allow macroprudential authorities to assess financing conditions in secured lending and OTC derivatives markets, consider the value of regularly conducting and disseminating a predominantly qualitative survey of credit terms used in these markets, including haircuts, initial margins, eligible pools of collateral assets, maturities and other terms of financing.

Motivation

A survey could provide a window into the evolution over time of the credit terms associated with SFTs and OTC derivatives and their procyclical behaviour. Analysis of the data collected should provide policymakers and other analysts with a useful indication of broad directional trends in aggregate leverage, competitive pressures and risk appetite in the financial system, as well as some insight into the drivers of such changes. As an indicator of trends in aggregate leverage, such survey data could be a valuable input to systemic risk assessment.

Specific proposals

The design of any survey focused on these issues must reflect the fact that credit terms, particularly those applicable to hedge funds, financial sponsors and institutional money managers, involve even at a single point in time a large number of parameters, many of which vary across counterparties or by product. For example, collateral and margin terms distinguish between initial requirements and additional calls that subsequently occur in response to market movements, with each set of parameters generally depending on both the type of product and the strength and nature of the client relationship. Consequently, any effort to describe the resulting vector of credit terms quickly runs into a problem of dimensionality that makes it essentially impossible to distil all of the relevant information into a small number of sufficient statistics that can readily be tracked so as to measure the stringency or laxness of credit terms at a point in time.

Survey design is further complicated by the fact that terms are viewed as highly sensitive by market participants. Institutions may hesitate to respond fully and frankly to requests for information that ultimately might provide even minimal insight to clients regarding the terms provided to others, or to competitors regarding strategy.

For these reasons, a qualitative survey may be both more effective and more practical than a process focused on detailed quantitative information.[14] Such a survey would aim not at reducing the dimensionality and producing a single quantitative indicator, but rather at soliciting qualitative assessments from senior credit officers at dealer firms regarding the evolution of a significant subset of the most important parameters. By understanding how each of these is evolving, in which direction and broadly by what degree, the goal is to create a dynamic picture of the credit terms relevant to professional investors and the broad directional trend in aggregate leverage.

Pros and cons

Pros: Information on changes in credit terms applicable to SFTs and OTC derivatives would usefully inform a number of official activities, including systemic risk assessment and financial institution supervision. A qualitative survey could overcome some of the significant obstacles, including the high dimensionality and proprietary nature of credit terms, that would arise in conducting a quantitative survey.

Cons: Qualitative surveys have inherent limitations. These include the identification of changes rather than levels, and the difficulties of soliciting qualitative assessments that are not unduly impacted by a variety of institutional factors.

[14] Qualitative surveys have served well in other contexts. For example, central banks conduct qualitative surveys of bank lending standards, which are made available to market participants, analysts and the general public via the web.

Follow-up

At its January 2010 meeting, the Committee on the Global Financial System agreed to work on such a qualitative survey, and has requested a small group of central banks to develop a set of core questions to assess financing conditions in SFTs and OTC derivatives markets, which central banks could choose to administer in their own jurisdictions if they so desired. The central banks represented on the Study Group are working towards that end.

Annex 1
Implementation of a countercyclical add-on: some possibilities

This annex draws together the possibilities that the Study Group has identified regarding the resolution of implementation issues related to the proposed countercyclical add-ons to haircuts. These can be used by macroprudential authorities to make discretionary changes to capital requirements on secured lending, but there is no requirement to use any of these possibilities. More analysis would be necessary to fully operationalise the add-on.

The implementation issues that arise are, broadly speaking, common to any macroprudential tool. To be effective as a macroprudential tool in discouraging rapid build-up of leverage in certain segments of financial markets that may be difficult to sustain, more selective calibration of the countercyclical add-on may be needed with a focus on particular market segments or asset classes. It being a discretionary tool, authorities will have to judge the timing and the size of the add-on, as well as the asset classes to which they may apply.

General approach to calibration

The countercyclical add-on can be set at different levels of granularity – for example, at the aggregate level for all secured lending, or by asset class, or by currency, or both. But there are really two broad approaches to calibration.

The first approach is to hard-wire the calibration of the countercyclical add-on by conditioning it on suitable macroeconomic variables or other indicators that model credit conditions. This has the advantage of being easier to implement consistently across jurisdictions if, for example, conditioned on a small number of global indicator variables. However, the simplicity of its design would require the countercyclical add-on to be applied at a highly aggregate level, ie to a broad range of collateral assets simultaneously. Moreover, a hard-wired approach can be more readily arbitraged.

An alternative approach would be to rely on a large element of discretion, and apply a countercyclical add-on to lending against specific asset classes. Its effect would be to lean against laxity in secured lending against particular assets whose price dynamics may be seen as unduly optimistic. Under this approach, there would be no limit to the granularity at which the add-on could be calibrated. If the countercyclical add-on is used in this way, its signalling effect would be at least as powerful as the direct incentive effect. This may reduce the importance of the need for precise calibration of the add-on.

In the way it is formulated here, the capital impact of the countercyclical add-on would vary with counterparty credit quality. The merit of this approach is that it internalises the systemic cost of lending to weaker counterparties that are likely to be less resilient to margin changes (or other triggers of deleveraging). Moreover, it will preserve consistency in the treatment of unsecured exposures, and also remove the scope to arbitrage by mixing secured and unsecured loans.

Application

As with other potential macroprudential tools, there is a question mark over the degree of international coordination that would be necessary or desirable. On the one hand, greater international coordination would reduce the scope for moving such transactions to another jurisdiction. But on the other hand, if the goal of macroprudential policy is to maintain the robustness of the supply of financial services to the domestic economy, then national implementation (ie application to domestic banks and subsidiaries) may yet be effective. Indeed, there may legitimately be different concerns in different jurisdictions given the different risks faced by their respective local banking systems.

Differentiating assets by currency would lend itself to an intermediate structure in which decisions on haircuts applicable in a particular currency will be taken by a regional authority (within an agreed framework) but then be applied internationally.

Annex 2
Mandate of the Study Group

The Committee on the Global Financial System has established a Study Group to review current market practices for setting margin requirements and haircuts, building on the work of the joint FSF-CGFS Working Group on the Role of Valuation and Leverage in Procyclicality. Its overall mandate is to undertake a fact-finding study on margining practices, to analyse their impact on the financial system through the cycle, and to explore and analyse the desirability of various alternatives for reducing the procyclical effect of margining practices on asset prices.

Definition of the problem

The Study Group's report will briefly survey earlier work by academics, the joint FSF-CGFS Working Group and central banks on how margining practices can exacerbate procyclical fluctuations of asset prices.

Two or three case studies of how margining practices have exacerbated the financial cycle will probably be included in the Study Group's report.

Scope of margin requirements and haircuts to be examined

The Study Group will look at practices regarding initial and variation margins and haircuts for over-the-counter (OTC) derivatives and securities financing transactions. With regard to the latter, it will cover margins for retail customers, for institutional customers and for customers of prime brokers. It is likely that greater attention will be paid to fixed income products and derivatives on fixed income products than to equities and derivatives on equities.

Fact-finding

The Study Group will construct a questionnaire or guide for directed interviews to be administered to major financial institutions in various centres. This will cover information on how margins varied in the most recent cycle and how margins are/were set in normal times and in highly stressed conditions. Both margins on OTC derivatives and those on securities financing transactions will be covered. In addition to banks and securities dealers, central counterparties and custodians offering triparty repo services will be interviewed.

Existing regulations regarding margins and haircuts will be surveyed, as will the powers of securities or banking regulators to set regulations in this area.

Likely changes in the infrastructure supporting OTC derivatives markets and fixed income securities transactions will be briefly surveyed to determine whether they will or could lead to possibilities of dampening procyclical margining practices.

Analysis

The implications of the facts found for the severity of the problem of procyclicality will be analysed.

Exploration and analysis of possible options

The Study Group will explore various options for reducing the effect of margining practices on the procyclicality of asset prices. The benefits and costs of these options will then be analysed.

Among the options to be examined will be: greater reliance on central counterparties in OTC derivatives markets; disclosure requirements; prohibiting ratings-based triggers; and

requiring or creating the incentives for minimum margins that are relatively stable over the cycle.

The cost-benefit analysis will take into account possible enforcement costs and the scope for evasion. It is recognised that international consistency in any regulations would be essential.

Reporting and timelines

The Study Group envisages submitting a report to the CGFS around end-2009. The Group will report on its fact-finding work to the September 2009 CGFS meeting. Based on this, a progress report will be prepared for the meeting of G20 finance ministers and central bank Governors to be held in early November 2009.

Annex 3
Questionnaire for survey on haircuts and margining practices

Type of institution (please tick)

☐ Commercial bank	☐ Prime broker	☐ Insurance company
☐ Hedge fund	☐ Asset manager[15]	☐ Custodian
☐ Exchange	☐ CCP	☐ Other (please specify)

Securities financing transactions

Criteria for determining haircuts/margins

1. What types of quantitative criteria are used in computing haircuts? How are these aggregated to compute the haircut for given collateral? Specifically, if relevant, what is the time period over which volatility is typically calculated? Are VaR-based or similar criteria used?
2. What types of qualitative criteria, if any, are used in computing haircuts?
3. How does the term of the financing influence the level of haircut?
4. How does the counterparty type or rating influence the level of haircut for given collateral?
5. For equities funded through margin lending/transactions, do margin practices differ from regulatory minimum margin requirements? What rules in your jurisdiction apply for margin transactions?

Techniques/process

6. What are the internal processes used to establish haircuts? How often are they reviewed? Who in addition to risk management is involved in the process? What happens when margin calls are not met?
7. What factors determine whether securities financing transactions will be conducted on a bilateral or a triparty agreement basis with a counterparty?

Risk management issues

8. Are stress tests employed on a regular basis to support haircut levels?
9. Under what conditions will changes in the market value of the collateral require additional posting of collateral during the term of the lending facility?
10. What factors determine whether a client will be granted term facilities, meaning lines of credit against specified collateral with fixed haircuts for the life of the trade? How widely is this applied across your counterparties?

[15] Includes pension funds and mutual funds.

Collateral practices on OTC derivatives transactions

Criteria for determining collateral amount

1. What method do you apply to estimate collateral amounts for OTC exposures with counterparties (eg current exposure, potential exposure)?
2. Could you provide indicative values for differences in collateral requirements when net derivative positions are aggregated on current exposure as opposed to potential exposure method?
3. Can you provide indicative figures on how collateral amounts to be posted may vary as a function of counterparty rating for given net exposure on derivatives trades?
4. What factors play a role in determining whether collateral requirements need to be changed? Will rating downgrade of the counterparty trigger a change in the collateral requirement? If so, how often?

Techniques/process

5. Are margin calls applied uniformly across all counterparties when a net exposure arises?
6. Which functions are responsible for managing variation margin payments, and what systems are used to compute variation margins?
7. What assets are typically accepted as collateral?
8. Is the ISDA Credit Support Document commonly used for collateral arrangements? What other forms of documentation are also used?

Risk management issues

9. For which counterparty types do you typically post initial margins?
10. From which counterparty types do you typically receive initial margins?
11. What thresholds on net exposure will trigger a margin call for a highly rated counterparty?
12. Do margin calls take into account net exposure across all derivative positions of a counterparty? What is required legally to take into account net exposure?
13. How are cross-product collateral management (across OTC derivatives and securities financing transactions) and netting implemented? What documentation is necessary to rely upon netting across products?

General questions

1. How were margins/haircuts changed during the crisis, and on what basis, and what specific factors, if any, contributed to large changes in margins?
2. What lessons in setting margins/haircuts have been drawn from the crisis?
3. Is counterparty rating still a critical parameter for establishing thresholds for collateral requirements and haircuts?
4. Are there other significant changes in your margining/haircut procedures that you have made as a result of the crisis?

Annex 4
Glossary of terms

Collateral	The assets pledged by a borrower to secure a loan or other credit, and subject to seizure in the event of default or a breach of a credit trigger.
Collateral call	A demand by a securities broker-dealer or a futures clearing house to a clearing member for additional funds or collateral to offset losses due to market movements in a trading account.
Credit trigger	The practice of linking collateral calls, early termination of a transaction or margining requirements to changes in the creditworthiness of a counterparty as measured by its credit ratings or other variables.
Haircut	The amount by which a collateral asset's market value is reduced in secured lending, expressed in per cent. A haircut of 5% would result in a secured loan of 95 when the value of the collateral asset pledged is 100.
Independent amount	An additional credit support amount that is required over and above the market value of the outstanding portfolio of OTC derivatives trades. The main purpose of the independent amount is to cater for changes in the market value of the trades between collateral calls or between the termination and replacement of trades.
Minimum transfer amount	The amount of collateral below which a counterparty is not required to transfer collateral even if the collateral agreement would otherwise provide for a transfer.
Rehypothecation	The practice that allows collateral posted by a client to its prime broker to be used again as collateral by that prime broker for its own funding.
Repo	A contract in which the seller of securities agrees to buy them back at a specified time and price.
Securities lending	The lending of securities by one party to another, with the borrower providing the lender with collateral in the form of cash or other collateral securities. As payment for the loan, the parties negotiate a fee, quoted as an annualised percentage of the value of the loaned securities.
Triparty repo	A repo transaction in which a custodian bank or a clearing house acts as an intermediary between the two parties to the repo.
Threshold amount	An unsecured credit exposure that the parties to an ISDA Master Agreement are prepared to accept before asking for collateral.

Annex 5
Members of the Study Group

Chairperson, Bank of Canada	David Longworth
Bank of Canada	Nadja Kamhi
Deutsche Bundesbank	Sebastian Wider
European Central Bank	Tomas Garbaravičius
Bank of England	Alan Sheppard
Bank of France	Anne Duquerroy
Bank of Japan	Yuko Kawai
Swiss National Bank	Signe Krogstrup
Board of Governors of the Federal Reserve System	Matthew Eichner
Federal Reserve Bank of New York	Kyle Grieser
Bank for International Settlements	Srichander Ramaswamy (Secretary) Dietrich Domanski