



EUROPEAN REPO COUNCIL

Shadow banking and repo

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Compiled for ICMA's European Repo Council by Richard Comotto,
Senior Visiting Fellow at the ICMA Centre at the University of Reading

All statements, opinions and conclusions contained within this report are those of its author

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Shadow banking and repo

1 Executive summary

- 1.1 “Shadow banking” is an imprecise term that has attracted various definitions. The current working definition is “non-banks performing bank-like functions”, although the Financial Stability Board (FSB) has narrowed this down to “non-banks performing *credit intermediation*” (by which they mean the recycling of savings into loans).
- 1.2 In fact, shadow banking is an alternative term for *market finance*. It is market-based because it decomposes the process of credit intermediation into an articulated sequence or *chain* of discrete operations typically performed by separate specialist non-bank entities which interact across the wholesale financial market. Shadow banking also relies on active secondary markets in order to be able to price assets and relies on the wholesale financial market for funding. The wholesale financial market includes repo.
- 1.3 The shadow banking system provides credit both directly as well as indirectly through various processes of *financial transformation* (redistribution of risk): credit, maturity and liquidity transformation. Together with leverage, these are the risk factors on which the FSB is focusing.
- 1.4 Official concern about shadow banking stems from the fear that it poses greater systemic risk than traditional banking. A range of issues have been highlighted: the scale of shadow banking; regulatory gaps; regulatory arbitrage; agency problems in securitisation; the interconnectedness of shadow banks with each other, and the interconnectedness of the shadow and traditional banking systems; the complexity of the shadow banking system; the resulting lack of transparency; the mispricing of risk in wholesale market funding; and the tendency of collateralised financing to generate excessive leverage and to amplify pro-cyclicality.
- 1.5 While some shadow banking may be the product of regulatory gaps and arbitrage, it is widely recognised that much of this activity is driven by efficiency gains from specialisation and comparative advantage over traditional banks, and is therefore desirable.
- 1.6 Part of the concern about shadow banking is about the possible instability of the wholesale funding on which the shadow banking system is seen to rely. While wholesale liabilities such as repo are like the deposits issued by traditional banks, they are judged to be riskier for a number of reasons: the greater dependency of shadow banks on such funding; less regulation; lack of any official safety net; and the fickleness of such institutional cash balances.
- 1.7 The FSB has set up a number of “workstreams” to look at the key risk factors in credit intermediation by shadow banks, one of which is focused on repo and securities lending. The repo (and securities lending) workstream is considering the possible introduction of macro-prudential requirements such as minimum margin or haircuts to mitigate pro-cyclicality, and improving the infrastructure of the secured funding markets. This paper is intended to inform this work.

- 1.8 The possible introduction of minimum haircuts as a macro-prudential requirement to mitigate systemic risk and dampen pro-cyclicality was discussed in the paper on *Haircuts and Initial Margins in the Repo Market* published by the International Capital Market Association (ICMA) in February 2012. This noted that the suggestion that repo amplified pro-cyclicality was based on the concept of a haircut-asset valuation spiral. This idea has given rise to the broader claim that the market crisis of 2007-09 was essentially, if not entirely, a “run on repo” and that repo is an inherently unstable source of funding. It underpins the proposal for mandatory minimum haircuts. However the academic literature behind this idea, not least the influential paper by Gorton and Metrick, focuses narrowly on the use of structured securities as repo collateral, despite evidence that it was a relatively minor component in the US and even less important in Europe. The bulk of collateral did not in fact suffer rapid or severe increases in initial margins/haircuts. Estimates of the likely impact of such changes on the liquidity of the European repo market between 2007 and 2009, using available data on market size and composition, suggest that their systemic impact was relatively insignificant in terms of the deleveraging that took place over this period (by an order of magnitude smaller). Recent analysis of regulatory and industry data on repo funding provided to shadow banks in the US by money market mutual funds and securities lenders also makes this point.
- 1.9 Another regulatory concern about repo is the potential for excessive leverage. In theory, repo can allow infinite leverage. In practice, firms are not free to keep borrowing, even against the best collateral. All lenders, but especially money market lenders, are very sensitive to the accumulation of excessive levels of borrowing by counterparties. This is true even where repo is the borrowing vehicle. The idea that collateral makes lenders indifferent to counterparty credit risk is a gross misunderstanding of the nature of repo and other forms of secured funding. Because even the highest quality collateral is not risk-free, the primary credit risk to a repo buyer is on the repo seller, not on the collateral. The role of collateral is not to permit lending to new and riskier counterparties but to allow lending to existing counterparties to be conducted more efficiently, but within the normal credit risk management framework. This means that credit limits (in addition to market scrutiny) will constrain access to repo financing notwithstanding the fact of collateralisation.
- 1.10 It is also important to remember that the repo market serves not just shadow banks but also traditional banks, and that it has played a key role in maintaining access by the latter to funding during the crisis, particularly through the CCP (central clearing counterparty)-cleared segment of the repo market (the experience of Spanish banks is a noteworthy example).
- 1.11 Official concern about excessive leverage has led to calls for mandatory haircuts to act as a type of fractional reserve which would inject a decay factor into the repeated re-use of collateral (in addition to acting as a break on amplification of pro-cyclicality). A mandatory haircut is undesirable as it would distort the relative pricing of secured versus unsecured instruments. It would also be a very blunt tool, which would reduce liquidity across the entire market, to deal with what should be seen as a problem of risk management specific to individual institutions and which should be addressed directly through leverage limits and capital ratios.
- 1.12 The question has also been asked as to whether repo encumbers assets sold as collateral, to the disadvantage of unsecured creditors. In both borrowing against

pledged collateral and repo, the risk of encumbrance is debatable. Given that cash is received against a pledge and through a repo, the value of the borrower's estate in insolvency has not necessarily been diminished. In the case of non-US repo, the status of the assets is clear. There has been a true sale of collateral and they must be ignored (temporarily) by unsecured creditors. This is the same situation as if the assets had been sold outright. The real problem with encumbrance would appear to be in the accounting treatment of collateralised borrowing. In the case of both borrowing against pledged collateral and repo, but for different reasons, the collateral remains on the balance sheet of the borrower/seller. However, it is unlikely that an unsecured creditor would be misled by this treatment. Pledges are registered and, when accounted for under a transparent regime such as IFRS (International Financial Reporting Standards), repo collateral is clearly identified. Moreover, because collateral remains on the balance sheet of the borrower/seller and the borrowed cash is added, the balance sheet expands, which means that the ratio of unsecured debt to unencumbered assets is unchanged by repo.

- 1.13 Encumbrance could arise where repo collateral is subject to an initial margin/haircut, as the assets represented by the initial margin/haircut are not compensated by cash. However, initial margins/hairecuts are not universally applied nor are they of significant size, at least in the bulk of the repo market. And where initial margins/hairecuts are deep, for example, in long-term repo and collateral swaps, the giving of the initial margin/hairecut is typically compensated by a pledge-back of the initial margin/hairecut by the buyer to the seller, which eliminates encumbrance.
- 1.14 The perceived problem of encumbrance should perhaps be considered from another angle. Initial margins/hairecuts are intended to compensate the repo buyer for the loss he may experience when trying to liquidate collateral in the event of a default by the seller. To this extent, they are intended to translate the market value derived from quotations and historic transactions into a future liquidation value. But much, if not all, of the loss which is expected by a repo buyer when collateral is liquidated, and which is compensated by an initial margin/hairecut, would also be experienced if the same assets were to be sold off outright in the cash market. This means that the share of the market value of an asset represented by an initial margin/hairecut imposed in the repo market is largely illusory and would be of no real benefit to unsecured creditors in the event of a default, even if that asset had remained in the ownership of the seller, rather than being repoed out. In other words, there may be no real value in an initial margin/hairecut to encumber. The real problem may be the going-concern valuation of assets on balance sheets rather than their value in the repo market.
- 1.14 Some accounting regimes do not indicate clearly which assets on the seller's balance sheet are out on repo. Wider adoption of IFRS is therefore desirable.
- 1.15 Questions have been raised about the transparency of repo. These doubts seem to have arisen from Lehman's Repo 105 and MF Global's repo-to-maturity, which some commentators appear to have mistakenly assumed represent the standard method of accounting for repo. In fact, the standard accounting treatment is to retain the collateral on the balance sheet of the seller to reflect the fact that, because the seller commits to repurchase the collateral at a fixed repurchase price, he retains the risk and return on that collateral. Helpfully, because a cash asset and corresponding repayment liability are added to the seller's balance sheet, this will expand to indicate increased leverage.

- 1.16 Another concern about the lack of transparency of repo arises from the impact such transactions have on the quality of the seller's assets. But this is not an issue specific to repo. Rather, it is about general balance sheet transparency. If greater balance sheet transparency is deemed necessary, assets will need to be categorised in terms of credit and liquidity risk. It would be relatively straightforward to categorise holdings of assets in terms of credit risk by using credit ratings. In terms of liquidity risk, it would seem logical and most efficient to use the proposed regulatory liquidity ratio framework (Liquidity Coverage Ratio and Net Stable Funding Ratio) to classify assets.
- 1.17 In addition to concern over the transparency of repo on a firm's balance sheet, there is also an issue about repo market transparency. However, there is a wide range of statistics already available, including the semi-annual ICMA survey of the European repo market. The problem is that the sources are disparate and inconsistent. In the US, systematic disclosure requirements on short-term funding arrangements are being introduced. Greater disclosure may be helpful for both regulators and the market. But the extent of disclosure needs to be carefully considered, so that the regulatory value of the information gathered justifies the cost of reporting.
- 1.18 In Europe, the idea of a repo trade repository has been mooted. This would be no small undertaking. The repo market has a similar transaction frequency to FX but each repo requires far more data to be captured. The repository would also have to be very flexible, as there is a wide range of repo contract variants and alternative legal constructions. A thorough cost-benefit analysis is merited.
- 1.19 While this paper is focused on repo, there are issues in the wider debate on "shadow banking" which warrant comment, including: the pejorative and vague nature of the term; the implication that traditional banks are more transparent and unsecured funding is perhaps safer; the danger of forgetting that much of what is called shadow banking is driven by efficiency gains from specialisation and comparative advantage over traditional banks; the risk of triggering a new wave of regulatory arbitrage; an uncritical acceptance of the regulation of traditional banks; a concern with network complexity in shadow banking but an acceptance of network instability in traditional banking; the discussion of issues such as over-leveraging in a macroeconomic vacuum, as though financial stability is possible without macroeconomic stability; the difficulty of deciding how much systemic risk should be factored into normal market pricing; and the danger of incoherent regulatory initiatives generating unintended consequences, ultimately on the financing of the real economy.

2 What is shadow banking?

- 2.1 “Shadow banking” is an imprecise term that has attracted various definitions. The “shadow” in shadow banking is a long-standing concept which refers to off-balance sheet financial entities (special purpose vehicles (SPV)) into which traditional firms divert certain financial activities from their balance sheets. The “banking” was added relatively recently, in 2007, although without changing the basic characteristic of being off-balance sheet.¹
- 2.2 Regulators have, to a greater or lesser degree, broadened the scope of the term. The US Federal Reserve refers to “financial intermediaries that conduct maturity, credit and liquidity transformation without access to central bank liquidity or public sector credit guarantees”.² This has drawn non-SPVs into the definition, including finance companies, asset-backed commercial paper (ABCP) and repo conduits, structured investment vehicles (SIV), leveraged arbitrage vehicles, credit hedge funds, money market and other mutual funds, securities lending agents and, in some countries, government-guaranteed financial agencies. Other regulators have (inconsistently) excluded non-bank financial mechanisms such as the corporate bond market. The resulting working definition of shadow banking has therefore become “non-banks performing bank-like functions”, although the Financial Stability Board (FSB) has narrowed this down to “non-banks performing *credit intermediation*” (by which they mean the recycling of savings into loans).
- 2.3 In fact, shadow banking is an alternative (and pejorative) term for *market finance*. Shadow banking is market-based because it decomposes the process of credit intermediation into an articulated sequence or *chain* of discrete operations typically performed by separate specialist non-bank entities which interact across the wholesale financial market. Shadow banking also relies on active secondary markets in order to be able to price assets and relies on the wholesale financial market for funding. The wholesale financial market includes repo.
- 2.4 Market finance stands in contrast to the *institutional finance* intermediated by traditional (commercial) banks. Such traditional banking integrates the various stages of credit intermediation within one firm. Whereas market finance exploits specialisation and comparative advantage, institutional finance exploits integration and diversification.
- 2.5 Each stage of shadow banking is performed by a particular type of specialist non-bank financial intermediary and is financed through particular types of funding technique, often collateralised. The process is summarised in Table 1, but a detailed exposition is provided by Pozsar et al (2010). However, whereas it is possible to classify entities as either shadow banks or traditional banks, the same is not true of the markets in which they operate, as these are shared. For example, the repo market is used by both shadow banks and traditional banks.
- 2.6 The products of shadow banking are a wide range of structured securities, in particular, ABS and CDO.

¹ “The whole alphabet soup of levered up non-bank investment conduits, vehicles and structures.” Paul McCulley, *Teton Reflections: PIMCO Global Central Bank Focus*, PIMCO (September 2007).

² Pozsar, Adrian, Ashcraft and Boesky, *Shadow Banking*, FRBNY Staff Paper 458 (July 2010).

Table 1: the stages in the chain of credit intermediation by shadow banks

function	intermediary	funding
origination of loans	non-bank finance companies	CP MTN
warehousing of loans	single & multi-seller conduits	ABCP
pooling & structuring of loans into ABS & issuance	SPV (but structuring by investment bank ABS syndicate desks)	repo sale of ABS
warehousing of ABS	conduits investment bank trading books	repo ABCP
pooling & structuring of ABS into CDO & issuance	SPV (but structuring by investment bank ABS syndicate desks)	repo CP sale of CDO
distribution & intermediation of ABS, CDO	structured investment vehicles (SIV) leveraged arbitrage vehicles credit hedge funds	repo ABCP MTN bonds
end investment	money market mutual funds enhanced cash funds securities lenders fixed-income mutual funds pension funds insurance companies	

After Pozsar et al (2010)

- 2.7 As noted already, each stage in the chain of credit intermediation by shadow banks is funded in the wholesale financial market --- that is, mainly with institutional cash balances --- by the sale of money market and longer-term debt instruments, principally, repo and ABCP. Indeed, the wholesale financial market, including the interbank market, is often taken to be largely synonymous with the funding of the shadow banking system. However, the unsecured deposit market is restricted to traditional banking and most other money markets are shared by both shadow and traditional banks.
- 2.8 The shadow banking system provides credit both directly as well as indirectly through various processes of *financial transformation* (redistribution of risk):
- 2.8.1 *Credit transformation* --- the enhancement of credit quality by means of the securitisation of pools of assets, the tranching of these pools into sets of claims and the relative prioritisation of claims, or the re-allocation of specific cashflows from the loans to different claims, to offer a range of seniority and duration, and a corresponding range of risk and return, from short-term AAA down to equity.
- 2.8.2 *Maturity transformation* --- the financing of long-term assets with short-term liabilities. This exposes short-term investors and/or market intermediaries to market liquidity and duration risks.
- 2.8.3 *Liquidity transformation* --- the funding of illiquid assets with liquid liabilities. Liquidity transformation achieves the same end as maturity transformation but uses different techniques. An example would be the creation of a liquid security from a pool of illiquid collateral assets through the use of a credit rating to reduce the information asymmetry between borrowers and lenders.

Table 2: financial transformation in the shadow banking chain

function	transformation
origination of loans	credit, maturity, liquidity
warehousing of loans	credit, maturity, liquidity
pooling & structuring of loans into ABS	credit
warehousing of ABS	credit, maturity, liquidity
pooling & structuring of ABS into CDO	credit
distribution & intermediation of ABS	credit, maturity, liquidity
end investment	maturity, liquidity

After Pozsar et al (2010)

- 2.9 The effect of shadow banking on the financial system has been described as the transformation of the simple process of deposit-funded, hold-to-maturity, balance sheet-based, credit risk-intensive, spread-driven lending by low-ROE (return-on-equity) traditional banks into a more complex, wholesale-funded, hold-to-sale, securitisation-based, market risk-intensive, fee-driven lending by chains of specialist high-ROE non-banks. Shadow banking is sometimes more simply characterised as an *originate-to-distribute* business model and traditional banking as *originate-to-hold*. Shadow banking is also a product of the twin long-term trends of securitisation and the disintermediation of traditional banks.

Table 3: comparing the characteristic features of traditional and shadow banking

feature	traditional banking	shadow banking
structure	simple	complex
funding	deposits	wholesale instruments
exposure	full term	short-term
relationship	balance sheet	securitised
main risk	credit risk	market risk
type of return	spread	fee
typical intermediary	low-ROE bank	high-ROE non-bank

3 Why are regulators concerned about shadow banking?

3.1 Official concern about shadow banking stems from the fear that it poses greater systemic risk than traditional banking. A range of issues have been highlighted.

3.1.1 *Scale*. The sheer size of shadow banking, which is believed to rival the traditional banking system in the intermediation of credit to households and businesses, gives it systemic importance.

3.1.2 *Regulatory gaps*. Shadow banking entities and/or shadow banking activities are largely unregulated or lightly regulated in comparison with traditional banking. This may allow a build-up of excessive leverage and other risks, the systemic consequences of which can result in the commitment of public funds, even though shadow banks are not subject to the same degree of public regulation as traditional banks (which has been the historic precondition for access to public funds).

3.1.3 *Regulatory arbitrage*. The existence of shadow banking may allow traditional banking activities to be diverted outside the so-called 'regulatory perimeter', thereby undermining the effectiveness of traditional banking regulation.

3.1.4 *Agency problems*. Misalignments or even conflicts of interests may arise in securitisation-based credit intermediation which do not exist for a traditional bank lending from its own balance sheet. This may result in a supply of poorly underwritten loans and structured securities, which could threaten the collapse of entire markets.

3.1.5 *Interconnectedness*. The use of markets to connect the chain of shadow banks may increase system-wide correlation and facilitate the transmission of systemic risks. In addition, the involvement of traditional banks in shadow banking (through participation at various stages of the shadow banking chain and/or by providing credit to or taking credit from shadow banks) means that problems in the shadow banking system may spill over into the traditional banking system, thereby deepening the impact of a crisis.

3.1.6 *Complexity*. The longer the chain of financial intermediation in shadow banking, the more entities will be exposed to the knock-on effects of dislocation at some point further up the chain. Moreover, the complexity of the links that may form between shadow banks could have destabilising network effects. The lower the quality of the loan, the longer the chain that may be required to enhance the quality of the assets to the standards needed to sell to money market mutual funds and other end investors, and therefore the more risk in the process.

3.1.7 *Lack of transparency*. Complexity reduces transparency, which misleads intermediaries, investors and regulators as to the location of intermediated risk. This may allow "risks to accumulate unnoticed and unchecked" giving rise to the possibility that, "when hidden risks suddenly become apparent, market participants effectively panic". Opacity may also spawn "fraud, misconduct, and other opportunistic behaviour".³

3.1.8 *Mispricing of risk*. The wholesale market funding on which shadow banking relies is seen as providing unsustainably cheap funding by converting risky but opaque long-term assets into seemingly riskless money-like liabilities by not correctly pricing in the risks. The result of cheap funding may be asset bubbles. In particular, it has been argued that credit and maturity transformation in the

³ Schwarcz SL, *Systemic Risk*, 97 GEO LJ 193, 200 (2008) and Awrey, D, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1916649.

shadow banking system was a significant cause of asset bubbles in the residential and commercial real estate markets prior to 2008.

- 3.1.9 *Over-leverage.* The use of secured financing techniques in the shadow banking system --- where assets can be used as collateral to raise more funds to buy more assets which can be used as collateral to raise more funds, and so on -- may allow or even encourage excessive levels of leverage.
- 3.1.10 *Amplification of pro-cyclicality.* The reliance of shadow banking on collateralised wholesale market funding may amplify economic and market cycles by facilitating leverage when asset prices are buoyant, and margins and haircuts are low, but triggering rapid and deep deleveraging when confidence is punctured by a shock, causing asset prices to fall and margins and haircuts to rise. Pro-cyclicality is made worse by the interconnectedness with the traditional banking sector, which creates negative feedback.

4 Is there an upside to shadow banking?

- 4.1 While some shadow banking may be the product of regulatory gaps and arbitrage, it is widely recognised that much of this activity is driven by efficiency gains from specialisation and comparative advantage over traditional banks, and is therefore desirable. Pozsar et al have distinguished this type of shadow banking as *parallel banking*.
- 4.2 Securitisation-based credit intermediation can lower the cost and improve the availability of credit, and enhance the stability of the financial system as a whole. It is argued that:
- 4.2.1 The disintermediation of traditional banks allows borrowers and lenders to avoid the mark-up, and in particular the credit spread, charged by traditional banks, which may reflect the inefficiency of traditional banking and the legacy of poor lending rather than just their regulatory costs.
 - 4.2.2 Securitisation involving real credit risk transfer is an important way for an issuer to diversify borrowers, types of loan and markets.⁴
 - 4.2.3 Term ABS allow lenders to diversify funding and raise long-term maturity-matched funding to better manage their asset-liability mismatches.⁴
 - 4.2.4 Securitisation allows lenders to realise economies of scale in the origination, servicing, structuring, trading and funding of loans to both bankable and non-bankable credits.⁴
 - 4.2.5 Securitisation potentially involves the market in the supervision of banks, by providing third-party discipline and the market pricing of assets that would be opaque if left on a bank balance sheet.⁴
 - 4.2.6 A decentralised financial system can be more robust in the face of shocks to the extent that it reduces the general size of intermediaries and avoids the concentration of business into systemically-important or “too-big-to-fail” entities. The diversification of functions among more firms may also reduce system-wide correlation and dampen the transmission of systemic risk.
- 4.3 It is clear that shadow banking performs an important role in enhancing the efficiency of financial markets and reducing the cost to and risk on borrowers and lenders, and that it can reinforce the stability of the financial system. Regulatory initiatives to contain risk in shadow banking therefore need to target specific problems and avoid indiscriminate constraints that could damage its many desirable functions.

⁴ Pozsar et al (July 2010)

5 Why are regulators concerned about repo?

5.1 One concern about shadow banking is the possible instability of the wholesale funding on which the shadow banking system is seen to rely. While wholesale liabilities such as repo are like the deposits issued by traditional banks, they are judged to be riskier for a number of reasons.

5.1.1 Shadow banks are seen as more dependent on these sources of financing than traditional banks are on deposits.

5.1.2 Wholesale funding is less regulated.

5.1.3 The wholesale market is not directly or permanently supported by any official safety net (deposit insurance and access to central banks as lenders of last resort). Instead, it is reliant on private sector balance sheets (eg back-up lines for ABCP, credit guarantees, and CDS provided by insurers, credit derivative product companies and credit hedge funds). The problems in measuring correlations may mean that the risks are under-priced. For example, the AAA-rated assets used as collateral are structured to withstand idiosyncratic risk but are vulnerable to systemic risk and particularly tail risk. In systemic crises, correlations among asset and institutions increase sharply. Balance sheets are tied together by mark-to-market leverage constraints. This makes private credit and liquidity support ineffective, as providers are unable to perform due to stress on their own balance sheets.

5.1.4 The wholesale market mainly intermediates institutional cash balances, whereas the traditional banking system is more reliant on retail money. Institutional cash has been described as “well-informed, herd-like and fickle”.

Consequently, wholesale funding is seen as inherently fragile and prone to runs on confidence. It is often compared with the *free banking* system of 19th and early 20th century US.

5.2 In July 2011, the FSB identified the key risk factors in shadow banking as the processes of financial transformation -- maturity transformation, liquidity transformation and imperfect credit risk transfer (credit transformation) --- plus leverage. A number of “workstreams” have been set up, one of which is focused on repo and securities lending (in the case of securities lending, cash reinvestment by securities lenders and the rehypothecation of customers’ collateral). The risk factors in repo are seen to be maturity and liquidity transformation and excessive leverage.

5.3 As regards repo, the repo and securities lending workstream is looking at:

- The possible introduction of macro-prudential requirements such as minimum margin or haircuts to mitigate pro-cyclicality. It draws on the study by the Committee on the Global Financial System (CGFS) on *The role of margin requirements and haircuts in procyclicality*.⁵
- Improving market infrastructure for secured funding markets. This includes market practices such as margining as well as infrastructure such as repo clearing, settlement and trade reporting arrangements.

5.4 Specifically, the FSB directed the repo and securities lending workstream to analyse current practices and potential risks in relation to repos and securities lending (including data collection and analysis); conduct more detailed assessments of

⁵ BIS Committee on the Global Financial System (CGFS) Paper No.36 on *The role of margin requirements and haircuts in procyclicality* (March 2010).

regulatory frameworks and their potential gaps (focussing particularly on prudential measures); analyse the role of repos and securities lending markets, as well as margining and re-hypothecation practices in these markets, during the crisis; and develop possible policy recommendations as necessary by end-2012.

- 5.5 In addition to concerns about whether repo amplifies pro-cyclicality, other concerns have been listed by policy-makers and regulators. These have included the issues of whether repo encumbers the assets of the seller, facilitates excessive levels of leverage and lacks transparency.
- 5.6 This paper is intended to inform the regulatory discussion on repo by addressing the various issues and, in particular, is intended to correct apparent misunderstandings about the structure and operation of the repo market. The points made in this paper also apply to securities lending, in as much as it is an analogous instrument to repo, but not to cash reinvestment by securities lenders.

6 Does repo amplify pro-cyclicality?

- 6.1 The possible introduction of minimum haircuts as a macro-prudential requirement to mitigate systemic risk and dampen pro-cyclicality has been discussed in the paper on *Haircuts and Initial Margins in the Repo Market* published by ICMA in February 2012. It will therefore suffice to summarise the arguments here.
- 6.2 Regulatory concerns that market practices in setting initial margins/haircuts help to amplify financial market pro-cyclicality envisage a haircut-asset valuation spiral as the amplification mechanism. In an up-cycle, ample liquidity, low volatility, rising asset values, high credit ratings and strong competition for business erode initial margins/haircuts, contributing to the growth in leverage. When an aggregate shock triggers the start of a down-cycle, initial margins/haircuts are increased in response to the initial loss of confidence. In the manner of a credit multiplier in reverse, this reduces the liquidity of market users, who sell assets in response. Asset sales reduce the value of collateral, causing initial margins/haircuts to be increased again. And so on. Each market user is behaving rationally from its point of view but, in aggregate, their individual actions create a negative systemic externality. This type of scenario has given rise to the broader claim that the market crisis of 2007-09 was essentially, if not entirely, a “run on repo” and that repo is an inherently unstable source of funding.
- 6.3 However, the regulatory debate has been taking place largely in the absence of a clear understanding of the constitution of initial margins/haircuts and without sufficient empirical data on their use or potential impact. In addition, the academic literature which is helping to drive the regulatory debate, not least the influential paper by Gorton and Metrick, tends to make assumptions about the structure and operation of the repo market which may not be entirely valid for the US, from where most of these papers originate, and are clearly wide of the mark for Europe.⁶ In particular, there is a narrow focus on the use of structured securities, despite evidence that it was not the predominant form of collateral in the repo market in the US and even less so in Europe. The postulated dynamics of this sector of the US repo market have been naively extrapolated onto the global repo market. Estimates of the likely impact of changes in initial margins/haircuts on the liquidity of the European repo market between 2007 and 2009, using available data on market size and composition, suggest that their systemic impact may be relatively insignificant in terms of the deleveraging that took place over this period (an order of magnitude smaller). This seriously undermines the argument that repo is, by virtue of initial margins/haircuts, an inherently unstable source of funding.
- 6.4 Doubts articulated in the ICMA-commissioned paper about the extent to which haircut-asset valuation spirals can explain deleveraging during the crisis have been reinforced by a study by Krishnamurthy, Nagel and Orlov, who make the point that “much of the discussion of the repo market has run ahead of our measurement of the repo market.”⁷ They have derived a new data set from regulatory and industry sources on investment in the US repo market by money market mutual funds and securities lenders cash reinvestment desks. These institutions are estimated to have provided some two-thirds of the cash borrowed by shadow banks in the US repo market in 2007.

⁶ Gorton, Gary, & Andrew Metrick, *Securitized Banking and the Run on Repo*, 9 November 2010.

⁷ Krishnamurthy, Arvind, Stefan Nagel and Dmitry Orlov, *Sizing Up Repo*, Stanford University (November 2011).

- 6.5 Krishnamurthy et al calculated that only some 3% non-Agency MBS and ABS were financed by repo bought by money market mutual funds and securities lenders. Most of their repo collateral was US Treasuries or Agencies (80% for money market mutual funds and 65% for securities lenders). The ABCP market was a far more important source of funding for shadow banking, accounting for some 22%. Moreover, between Q2 2007 and Q2 2009, of the contraction of USD 1.4 trillion in the short-term funding of non-Agency MBS and ABS by money market mutual funds and securities lenders, only about 10% was due to reductions in purchases of repo against such collateral. Reduced purchases of ABCP and sales of holdings of structured securities were far more significant. In addition, the contraction in ABCP purchases started earlier than the reduction in repo, which was largely delayed until Q1 2008, after the rescue of Bear Stearns. And while there was a deterioration in repo terms (rates, maturities and haircuts) for structured security collateral, there was no contraction in purchases of repo against Treasuries and Agencies. The conclusion is that repo was not key to the funding of shadow banking and had a modest impact on changes in aggregate funding conditions.
- 6.6 The contraction between Q2 2007 and Q2 2009 in purchases of repo by money market mutual funds and securities lenders was of repo against structured securities. This was undoubtedly serious for the firms most reliant on such assets. However, these firms were also perceived as the riskiest in the market (as measured by 5-year CDS spreads), so the loss of access to repo funding may have been a symptom of deeper problems rather than the cause of their difficulties. In contrast to repo against structured securities, repo funding from money market mutual funds and securities lenders for other dealers against Treasury and Agency collateral actually expanded over the same period. Krishnamurthy et al also note that Bear Stearns and Lehman Brothers lost repo funding against Treasury and Agencies only in the days immediately prior to bankruptcy. This is not the behavior of unstable funding.
- 6.7 The current debate also ignores evidence, often from official sources, that initial margins/haircuts on the bulk of collateral did not change significantly during 2007-09, whereas much research into the crisis uncritically accepts that “haircuts exhibit cyclical behavior”.⁸ Krishnamurthy et al observed no increase in haircuts on Treasury and Agency collateral. Moreover, in the tri-party market, they measured only modest increases in haircuts for structured securities and corporate bonds, from 3-4% in 2007 to 5-7% in 2009, compared to the changes in Gorton and Metrick’s data for structured securities in the bilateral repo market, which showed haircuts often rising from 0% to in excess of 50%. The evidence is that, rather than increasing haircuts, market users initially responded to the crisis by reducing or withdrawing credit lines, shortening the terms for which they were willing to lend and narrowing the range of eligible collateral. In this respect, the response was very similar in character to that of the unsecured market, except that the protection offered by collateral can be expected to have mitigated the overall reaction of the repo market.
- 6.8 The empirical evidence therefore strongly argues against the hypothesis that initial margins/haircuts were the principal driver of deleveraging in the crisis. And, if initial margins/haircuts were not the principal driver of deleveraging in the crisis, the idea of

⁸ Gai, Prasanna, Andrew Haldane and Sujit Kapadia, *Complexity, Concentration and Contagion* (Bank of England, August 2011, subsequently published in the *Journal of Monetary Economics*, 58(5)).

mandatory through-the-cycle initial margins/haircuts to obviate the need for dealers to raise initial margins/haircuts in a crisis is clearly redundant.

- 6.9 In addition, this proposal has serious flaws as a regulatory tool. As a matter of principle, one-size-fits-all mandatory haircuts risk distorting the market and creating rigidities that will encourage artificial arbitrages. And even if initial margins/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 the same pro-cyclical effects on financial markets as those attributed to market-driven initial margins/haircuts.
- 6.10 There are also other objections to mandatory minimum haircuts. Haircuts pose the problem that they are asymmetric and create unsecured exposures for the seller. Yet buyers can also default. And, as argued in section 8 below, haircuts can give rise to the problem of encumbrance. Concerns about excessive leverage would best be addressed at institution rather than transaction level, by the direct regulation of leverage, whatever its source, and by capital requirements.

7 The potential of repo for excessive leverage

- 7.1 In theory, repo can allow infinite leverage. Initially, a firm must finance the purchase of an asset with its own funds. It could then repo out the assets to borrow cash and use the cash to buy more assets, which it repos out for more cash and so on, ad infinitum.
- 7.2 In the real world, however, firms are not free to keep borrowing, even against collateral. There are binding practical constraints. All lenders, but especially money market lenders, are very sensitive to the accumulation of excessive levels of borrowing by counterparties. This is true even where repo is the borrowing vehicle. This is why Lehman Brothers perpetrated Repo 105 and one reason why MF Global employed repo-to-maturity (both devices took collateral off balance sheet). And although borrowing levels are only disclosed periodically, with a lag and imperfectly, participants in both the unsecured and secured money markets conduct real-time scrutiny of each other's borrowing in order to detect patterns of behavior that suggest an unusual hunger for liquidity. The market will retreat from borrowers who are seen too frequently in the market. This is what happened in the crisis. The idea that collateral makes lenders indifferent to counterparty credit risk is a gross misunderstanding of the nature of repo and other forms of secured funding.
- 7.3 Because even the highest quality collateral is not risk-free (there are market liquidity, operational and legal risks), the primary credit risk to a repo buyer (cash lender) is on the repo seller, not on the collateral. Collateral is contingent protection, that is, it provides credit insurance. Repo market participants therefore take an asymmetric view of counterparty and collateral credit risks. While it can be acceptable to take the worst collateral from the best counterparty (because the collateral is unlikely to have to be used), it is never acceptable to deal with the worst counterparty purely because he offers the best collateral (because even the best collateral is exposed to market liquidity, operational and legal risks). Indeed, it is only acceptable to lend through repo to counterparties to whom one has also extended an unsecured credit line (however small that may be). This ensures that the usual credit management safeguards are in place. The role of collateral is not to permit lending to new and riskier counterparties but to allow lending to existing counterparties to be conducted more efficiently in terms of capital. This means that credit limits will constrain access to repo financing, notwithstanding the fact of collateralisation.
- 7.4 A number of commentators have linked concern over whether repo allows and even encourages excessive leverage to the rapid growth of the repo market over the last 20 years. However, a substantial portion of this growth has reflected a trend migration from unsecured to secured funding. This trend is not a matter of concern but a cause for satisfaction in that greater collateralisation has been positive for financial stability. It is worth contemplating the counterfactual: how would the market have coped with various crises if it had remained largely unsecured! During the crisis, the unsecured wholesale deposit market retreated to the overnight end of the curve and has largely stayed there, with term deposits being limited to specific names. In contrast, the repo market has been able to maintain term funding to a broad range of participants. The ICMA European repo market survey shows a 20% contraction post-Lehman but a full recovery of aggregate volume by 2010, with little overall flight to the short end of the curve.

- 7.5 It is also important to remember that the repo market serves not just shadow banks but also traditional banks and it has played a key role in maintaining access by the latter to funding during the crisis, particularly through the CCP-cleared segment of the repo market (the experience of Spanish banks is a notable example).
- 7.6 Official concern about excessive leverage has led to calls for mandatory haircuts to act as a type of fractional reserve which would inject a decay factor into the repeated re-use of collateral (in addition to acting as a break on amplification of pro-cyclicality). There are several objections to trying to control leverage in such an instrument-specific way.
 - 7.6.1 A mandatory haircut would distort the relative pricing of secured versus unsecured instruments, making unsecured funding relatively and perversely less costly, which would create an incentive to take greater risk by borrowing more on the unsecured market.
 - 7.6.2 A mandatory haircut would be a very blunt tool, which would reduce liquidity across the entire market, to deal with what should be seen as a problem of risk management specific to individual institutions.
- 7.7 Trying to regulate leverage by tinkering with the mechanics of repo also fails to address the fact that excessive leverage is possible with both secured and unsecured funding. In addition, general instrument-based approaches are more likely to have unexpected consequences.
- 7.8 Concerns about institutions taking excessive leverage (both levels of borrowing and asset-liability mismatches) should therefore be addressed directly using institution-specific tools such as leverage limits and capital ratios.

8 Does repo encumber assets?

- 8.1 Encumbrance is a problem that may be caused when assets are provided as collateral by a borrower. Those assets are no longer available to help meet the claims of unsecured creditors in the event of the insolvency of the borrower, despite still appearing on the borrower's balance sheet. Encumbrance is traditionally a problem arising from the pledging of collateral, including the issuance of covered bonds. But repo and securities lending arrangements such as collateral swaps (liquidity swaps or collateral upgrade trades) have started to be viewed as a source of encumbrance.
- 8.2 In both borrowing against pledged collateral and repo, the risk of encumbrance is debatable. Given that cash is received against a pledge and through a repo, the value of the borrower's estate in insolvency has not necessarily been diminished.
- 8.3 There is a difference between assets pledged as collateral and assets sold as collateral in a repo. Pledged collateral remains in the ownership of the cash borrower until there is an act of insolvency. It can be argued that the claim of the collateralised lender is therefore a contingent one and it is consequently difficult to know to what degree unsecured creditors should consider such assets as available to meet their claims when assessing the risk of lending to a particular counterparty (as it would be an extreme assumption to completely ignore those assets). In contrast, outside the US, the status of the assets given as collateral through repo is clear. There has been a true sale of collateral and they must be ignored (temporarily) by unsecured creditors. This is the same situation as if the assets had been sold outright.
- 8.4 It is interesting that the issue of encumbrance by repo has been most actively debated in the US. This may be because, in contrast to most other markets, where repo is a true sale of collateral, the legal character of repo in the US is defined by exceptions from the Bankruptcy Code, which give US repo pledge-like characteristics.
- 8.5 The perception of encumbrance would appear to arise from the accounting treatment of collateralised borrowing. In the case of both borrowing against pledged collateral and repo (but for different reasons --- see below), the collateral remains on the balance sheet of the borrower/seller. Would an unsecured creditor be misled by this balance sheet treatment? It seems unlikely. Lenders who rely on balance sheet analysis should be sophisticated enough to recognise the extent of pledging (which has to be registered) and repo (provided that this is accounted for on balance sheet under a transparent regime such as IFRS --- see section 9 below).
- 8.6 However, even an unsophisticated reader of balance sheets will not be seriously misled. Because collateral remains on the balance sheet of the borrower/seller and the borrowed cash is added, the balance sheet expands. By way of example, take a bank with a balance sheet of 100, consisting entirely of unencumbered assets, with borrowing from unsecured creditors of 10 and no collateralised borrowing. The ratio of unsecured debt to unencumbered assets is $10/100 = 10\%$. Now assume the bank undertakes collateralised borrowing of 10. The balance sheet expands to 110. However, unencumbered assets remain at 100. Despite the use of 10 of the original assets as collateral, the bank has received 10 in cash. The ratio of unsecured debt to unencumbered assets therefore remains at 10%. (Note, moreover, that the quality of the replacement asset (cash) is, if anything, better than the collateral.)

- 8.7 A potential problem of encumbrance might arise where repo collateral is subject to an initial margin/haircut. In this case, it can be argued that the assets represented by the initial margin/haircut are encumbered, as their sale is not compensated by cash. It would appear therefore that initial margins/haircuts structurally subordinate the claims of unsecured creditors over assets given as collateral. However, it needs to be remembered that initial margins/haircuts are not universally applied nor are they of significant size, at least in the bulk of the repo market which relies on government securities. Where initial margins/haircuts are especially deep, for example, in long-term repo and collateral swaps, over-collateralisation could be seen as giving rise to encumbrance. However, the giving of the initial margin/haircut in such transactions is typically compensated by the buyer pledging the initial margin/haircut back to the seller, which eliminates any encumbrance.
- 8.8 In considering the risk of encumbrance, we also need to consider the nature of initial margins/haircuts. They are intended to compensate the repo buyer for the loss he may experience, because of market liquidity, operational and legal risks, when trying to liquidate collateral. To this extent, the initial margin/haircut is intended to translate the market value derived from quotations and historic transactions into a future liquidation value. But much, if not all, of the loss which is expected by a repo buyer when collateral is liquidated, and which is compensated by an initial margin/haircut, would also be experienced if the same assets were to be sold off outright in the cash market. This means that the share of the market value of an asset represented by an initial margin/haircut imposed in the repo market is largely illusory and would be of no real benefit to unsecured creditors in the event of a default even if that asset had remained in the ownership of the seller rather than being repoed out. In other words, there is no real value in an initial margin/haircut to encumber. The real problem may be with the going-concern valuation of assets on balance sheets rather than their value in the repo market.
- 8.9 In reality, the risk of encumbrance is only likely to arise in orderly liquidation frameworks (bail-ins), since the impact of these mechanisms on the amount of assets available for distribution to other creditors is indeterminate. Ironically, the risk of encumbrance would also arise in proposals such as mandatory through-the-cycle initial margins/haircuts.

9 The transparency of repo

- 9.1 Is repo an opaque instrument? The concern giving rise to this question seems to have its roots in Lehman's Repo 105 and MF Global's repo-to-maturity, which some commentators appear to mistakenly assume is the standard method of accounting for repo.⁹ This is not the case. Both types of repo were unusual transactions that exploited loopholes in the US accounting regime which exceptionally allowed repo collateral to be removed from the balance sheet of the seller and were done in order to deliberately disguise the leverage of these struggling firms. As explained already, the standard accounting treatment of repo is to retain the collateral on the balance sheet of the seller to reflect the fact that, because the seller commits to repurchase the collateral at a fixed repurchase price, he retains the risk and return on that collateral. Helpfully, because a cash asset and corresponding repayment are added to the seller's balance sheet, this will expand to signal increased leverage.
- 9.2 The problem is that some accounting regimes do not indicate clearly which assets on the seller's balance sheet are out on repo. All that may be shown is a footnote giving a netted repo total. However, the accounting treatment of repo under IFRS is much clearer. Securities out on repo are reclassified from "investments" to "collateral", which is balanced by a "collateralised borrowing" liability. Wider adoption of IFRS is therefore desirable, as this makes clear which assets are being used as collateral.
- 9.3 Concern has been voiced about the lack of transparency about the nature of the collateral sold through repo and the impact that this has on the quality of the seller's assets. In normal market conditions, given that the seller will receive cash, which is a risk-free asset, there are no real grounds for concern. In addition, it must be remembered that a fundamental principle of collateral management is to mobilise "cheapest-to-deliver" assets first ("optimisation"). However, when a counterparty visibly gets into difficulties, and in a crisis, lenders will tighten their collateral eligibility criteria and high-quality collateral could rapidly drain away. Unfortunately, given the speed of events versus the periodicity of the publication of balance sheets and other returns, it seems doubtful whether greater transparency would be that useful in practice. But this is not an issue specific to repo. Rather, it is about general balance sheet transparency.
- 9.4 If greater balance sheet transparency is deemed necessary, assets will need to be categorised in terms of credit and liquidity risk. It would be relatively straightforward to categorise holdings of assets in terms of credit risk by using credit ratings (although regulators are keen to diminish reliance on ratings, they provide the most practical metric). In terms of liquidity risk, it would seem logical and most efficient to use the proposed regulatory liquidity ratio framework (Liquidity Coverage Ratio and Net Stable Funding Ratio) to classify assets.
- 9.5 In addition to concern over the transparency of repo on a firm's balance sheet, there is also an issue of repo market transparency. Some commentators have complained of the lack of market statistics on repo markets. In fact, there is a wide range of statistics already available, including the semi-annual ICMA European repo market survey, some central bank surveys, the published price and volume data of electronic repo systems and regulatory returns (Krishnamurthy et al have revealed the richness of the latter). It is worth remembering that, in Europe, a large proportion of repos are traded

⁹ Bowles, Sharon, *The Great Repo Conundrum*, The Banker (January 2012).

electronically and via voice-brokers, and are therefore visible to the market. According to the ICMA semi-annual survey of the European repo market, electronic and brokered transactions account for one half of the value of outstanding contracts. If tri-party repo is included (given that data on tri-party transactions are centrally accessible), the percentage rises to some 62%. In terms of turnover, those percentages will be much higher, as all short-term transactions will be included in turnover figures but not in a survey taken at one date.

- 9.6 The problem is that market data sources are disparate and often inconsistent. In the US, systematic disclosure requirements on short-term funding arrangements are being introduced under the Dodd-Frank Act. Greater disclosure may be helpful for both regulators and the market. However, too much data is not only costly to the market and its users, but risks distracting regulators or lulling them into a false sense of everything being under control. The extent of disclosure therefore needs to be carefully considered, so that the regulatory value of the information gathered justifies the cost of reporting.
- 9.7 In Europe, the idea of a repo trade repository has been mooted. This would be no small undertaking. The repo market has a similar transaction frequency to FX but each repo requires far more data to be captured. The reporting interface, database and analytical functions would also have to be very flexible, as there is a wide range of repo contract variants (from fixed-rate, through open and floating-rate, to structured repos) and alternative legal constructions, as well as plethora of synthetic and analogous substitutes.
- 9.8 The arguments in favour of a trade repository for repo appear to be different from those applied to derivatives or even securities lending. Derivatives have structural complexity, while securities lending has collateral diversity (compared with repo, securities lending generates a high volume of small transactions). Both characteristics pose operational risks, which trade repositories may help to mitigate. In the repo market, similar issues are being addressed through initiatives such as affirmation/trade-matching. The case for a repo trade repository seems to be based mainly on the need to collect market statistics. Such a need might be more efficiently tackled through selective reporting. A thorough cost-benefit analysis of the case for a repo trade repository is clearly required before advancing such a proposal.

10 Other issues about repo

- 10.1 A key theme in the regulatory critique of repo is that it may be an unstable source of funding, in part, because of the lack of an official safety net to stabilise the market in times of crisis. However, this is not entirely true. It has been noted that repo is used by both traditional and shadow banks. The former of course have access to central bank assistance.
- 10.2 The repo market also possesses important inbuilt stabilising mechanisms, in particular, CCP, which reduce risk exposures and liquidity hoarding incentives by providing a creditworthy counterparty and by multilateral netting (CCP also reduce market complexity --- see below). The impact of CCP in the repo market has been extended by access being opened through post trade registrations to transactions executed directly or via a voice-broker, rather than just electronically. According to the ICMA semi-annual surveys of the European repo market, since June 2008, some 22-39% of the value of outstanding contracts has been cleared across CCP. In terms of turnover, those percentages will be much higher, as the electronically-traded repos cleared across CCP will tend to be very short-term and therefore not wholly represented in a snapshot survey. As much as half of market turnover may be cleared through CCP.
- 10.3 Regulators express great concern over the complexity of the financial market, because complex systems are less transparent and may be inherently unstable. The proposition that complex systems can exhibit unstable behaviour is uncontroversial. However, attempts to model financial networks as a basis for regulatory analysis and prescription need to be treated with caution. The real problem is how to construct and calibrate a realistic model of a network like a financial market in the absence of the requisite type of data on market microstructure. A recent attempt by Gai, Haldane and Kapadia illustrates the challenges.¹⁰ Gai et al employ a simple network model of the banking system, in which banks are randomly linked together by their interbank claims on each other, to investigate the interplay of complexity, concentration and contagion. They simulate random funding liquidity shocks in the form of increased haircuts to one or all banks in markets which have interbank linkages that are evenly distributed or characterised by a fat-tailed distribution. The model is used to test the impact of greater unsecured interbank activity and cyclical collateral haircuts, as well as various regulatory policies, mainly enhanced liquidity requirements. The results seem clear. However, the network configuration being tested is entirely theoretical and is not calibrated against any real interbank market. In the absence of the necessary data, the authors imply that the interbank market has become more complex on the basis that “financial system complexity is likely to go hand-in-hand with intra-financial system activity which tends to increase the length of credit chains...” In other words, the authors surmise that the interbank market must have become more complex only because the financial markets have done so.
- 10.4 There is little doubt that the decomposition by shadow banking of the process of credit intermediation into a chain of discrete operations has increased complexity in some parts of the financial market (at least to the extent of lengthening intermediation chains). However, the interbank market, both secured and unsecured, may have become less complex, as well as relatively less important. Since about 1996, there has been a sectoral shift in interbank markets such as Eurodollars away from interbank

¹⁰ *Ibid* Gai et al (August 2011).

lending (including repo) and into lending to non-bank customers such as US securities firms and other non-bank financial institutions. Interbank lending declined from 66-75% to below half.¹¹ At the same time, the configuration of the interbank market has been simplified by the introduction of electronic trading in spot FX, bank mergers and the re-organisation of global liquidity operations into hub-and-spoke structures in which all dealing is booked in one centre. The case for greater interbank complexity is not proven.

- 10.5 It is noteworthy that a key parameter in the model of Gai et al is the degree to which banks withdraw credit lines from other banks. This is set to 100%, whereas anecdotal evidence suggests withdrawal tends to be gradual and only becomes total immediately prior to a default. When this parameter is relaxed (as a proxy for increased network transparency) the impact is dramatic. Its importance is a reminder of the potential instability of models. And the assumption of 100% withdrawal of liquidity reflects, in the case of repo, the authors' apparent acceptance of the Gorton and Metrick mistaken assumption that all or most repo collateral is composed of structured securities.
- 10.6 Interestingly, Gai et al propose an increased liquidity buffer as one means of stabilising the interbank market. This is unremarkable, except that they see a side benefit as being reduced repo activity. However, liquidity reserves are usually financed in the repo market. Otherwise, they have to be purchased with equity, in which case, the liquidity requirement being proposed is in fact a capital requirement.
- 10.7 Gai et al also stress the need to have a tight definition of what constitutes a liquid asset for the purposes of liquidity requirements. But other than arguing for "outside" liquidity (ie non-financial assets), they do not elaborate. Liquidity is not easy to define and quantify, nor is it a static quality. Ironically, one of the necessarily practical tests of liquidity is eligibility for use as repo collateral! An active repo market, along with active cash and derivatives markets, is an essential pillar of a liquid capital market. Diminishing the liquidity of the repo market by imposing inappropriate regulatory constraints (eg high mandatory haircuts) may therefore backfire on regulatory liquidity requirements.

¹¹ McGuire, Patrick, *A shift in London's eurodollar market*, BIS Quarterly Review (September 2004).

11 General observations on the shadow banking debate

- 11.1 The very term “shadow banking” is an issue. It is inherently pejorative. It is also vague, which means that it is arbitrary. This is not a secure foundation for analysis or regulatory prescription. The problem can be seen in the gradual migration of the term. Historically, it described the use of SPVs. Then, it was applied to funding with uninsured CP. Subsequently, it has gathered in repo. The term may have become too much of a Gladstone Bag. Comment has been made that “the prevailing notion of ‘shadow banking’ --- which throws a number of divergent institutions, instruments and markets into the same bucket --- has become a meaningful obstacle to regulatory reform in a number of key areas (especially wholesale funding markets). There are many different *objects* of (potential) regulation wrapped up in this definition, each manifesting different *issues* and requiring different regulatory *responses*”.¹²
- 11.2 One consequence of the use of the term “shadow banking” seems to be an acceptance that shadow banking is inherently opaque and an assumption by default that traditional banking is more transparent. Fundamentally, this is wrong. Market-based finance offers opportunities to observe intermediation that do not exist when the process is undertaken within a firm.
- 11.3 It is worth repeating the point made in section 4 that, while some shadow banking is a product of regulatory arbitrage, much is driven by efficiency gains from specialisation and comparative advantage over traditional banks. Market-based finance has generated much of the innovation that has occurred in recent decades. Like all technology-driven advances, there are positive and negative externalities. Regulation must try to constrain the latter but, at the same time, nurture the former. Care needs to be taken not to impede future innovation, particularly given the financial challenges increasingly confronting mature economies. In addition, once the technology genie is out of the bottle, it cannot be put back. It is futile to try to impose regulatory constraints on technology, if not counterproductive. This means avoiding trying to regulate instruments rather than institutions.
- 11.4 Excessive new regulations are likely to feed a new wave of regulatory arbitrage (every regulatory action has an arbitrage reaction). Regulators need to consider gaming their proposals. More consideration also needs to be given to the question of whether some of the regulation of traditional banking creates more problems than it solves.
- 11.5 The debate on shadow banking is proceeding in a macroeconomic vacuum. Excessive leverage is difficult to sustain unless there is excessive money supply and, on a global scale, underlying macroeconomic imbalances. It is notable that the shadow banking system has played a key role in financing the US current account deficit. For example, enhanced cash funds predominantly catered to non-US investors with low tolerance for credit or duration risks. The shadow banking system provided the necessary credit and maturity transformation. Other non-US investors sought duration risk by buying US Agency debt and MBS. Financial stability requires macroeconomic stability. Regulation is not a substitute.

¹² Awrey, Dan, personal communication (24 January 2012) quoted by Steven Schwarcz in *Regulating Shadow Banking*, Inaugural address to Boston University Review of Banking and Financial Law, 2012.

- 11.6 The debate on collateralised funding and some of the regulations proposed imply a preference for unsecured finance. In part, this is because unsecured instruments like bank deposits are underwritten by the authorities and users such as traditional banks are regulated and have access to public support. But while public support may help to sustain confidence in a traditional bank, it has limits (eg Northern Rock) and it passes the problem directly to tax-payers. Collateralised funding, prudently managed, reduces risk at source. The trend migration from unsecured to secured financing over the last 20 years has been positive for financial stability and should not be compromised by distorting the relative cost of collateralised and unsecured funding.
- 11.7 One of the most difficult questions in the whole debate about shadow banking is how much systemic risk should be factored into normal market pricing. Crisis, particularly on the scale of the current one, are extremely low-probability, high-impact events. How much of this long tail risk can be factored into normal market pricing without having an undesirable impact on the financing of the real economy?
- 11.8 The regulatory debate involves a very wide range of official participants, with very diverse interests and agendas. Bodies like the FSB are trying to co-ordinate the debate but cannot control it. There is a danger of incoherent regulation. How will the various regulatory initiatives fit together and what will be the net impact? Given that the whole is greater than the sum of the parts, there is scope for unintended consequences, particularly where regulations are being driven by tight deadlines.

12 Conclusions

- 12.1 Shadow banking is a somewhat pejorative and arbitrary term for market finance, within which repo has been included because of concern over issues such as: the possible propensity of collateralised financing to encourage excessive leverage; the concern that it may amplify pro-cyclicality and encumber assets; and doubts about the transparency of the repo instrument and market.
- 12.2 The risk of collateralised financing encouraging excessive leverage is somewhat mitigated by the real world constraints on over-borrowing, which apply to both unsecured and secured instruments. It is a misunderstanding to think that collateral makes lenders indifferent to counterparty credit risk. The role of collateral is not to permit lending to new and riskier counterparties but to allow lending to existing counterparties to be conducted more efficiently, within the normal credit risk management framework. Of course, some banks have over-leveraged, using both unsecured and secured financing. So, some sort of constraint can be justified. But a mandatory haircut to act as a type of fractional reserve is undesirable, as it would distort the relative pricing of secured versus unsecured instruments. It would also be a very blunt tool, which would reduce liquidity across the entire market, to deal with what should be seen as a problem of risk management specific to individual institutions. General instrument-based approaches are more likely to have unexpected consequences. And, as a matter of principle, concerns about institutions taking excessive leverage (both levels of borrowing and asset-liability mismatches) should be addressed directly using institution-specific tools such as leverage limits and capital ratios.
- 12.3 A previous paper published by ICMA dismissed the hypothesis that repo amplifies pro-cyclicality as an empirically insignificant risk. This view has been supported by research on investment in the US repo market by money market mutual funds and securities lenders cash reinvestment desks. Consequently, the case for a mandated stable through-the-cycle haircut to obviate the need for lenders to raise haircuts in a crisis is weak.
- 12.4 The issue of the encumbrance of assets by collateralised instruments is largely illusory, at least in the absence of significant initial margins/haircuts. The problem can arise where haircuts are deep, but is usually solved by pledging back haircuts to seller/borrowers.
- 12.5 Doubts about the transparency of repo seem to have been inspired by Lehman's Repo 105 and MF Global's repo-to-maturity, which some commentators appear mistakenly to have assumed represent the standard method of accounting for repo. However, the standard accounting treatment of repo clearly demonstrates the impact of borrowing. Where there may be a problem is with accounting regimes that do not indicate clearly which assets on the seller's balance sheet are out on repo. Wider adoption of IFRS is desirable, as this makes clear which assets are being used as collateral.
- 12.6 Another concern about the lack of transparency of repo arises from the impact that a sale of collateral has on the quality of the seller's balance sheet. But this is not an issue specific to repo. Rather, it is about general balance sheet transparency.

- 12.7 The wider collection of repo market statistics could be helpful for both regulators and the market. However, better use could probably be made of existing data and the extent of additional reporting requirements needs to be carefully considered, so that the regulatory value of the information gathered justifies the cost of reporting. Too much data is not only costly to the market and its users, but risks distracting regulators or lulling them into a false sense of everything being under control.
- 12.8 The arguments in favour of a trade repository for repo appear to be different from those applied to derivatives or even securities lending, where particular operational risks exist. In the case of repo, the case for a trade repository seemed to be based mainly on the need to collect market statistics. Such a need might be more efficiently tackled through selective reporting. A thorough cost-benefit analysis of the case for a repo trade repository is clearly required.
- 12.9 It has been assumed by regulators that the interbank repo and unsecured funding markets have become structurally more complex and that this may be a source of opacity and inherent instability. However, there is little evidence of such a trend. Indeed, there is evidence to the contrary.
- 12.10 The FSB workstream on repo has been charged with considering how to improve market infrastructure for secured funding markets. One element is risk management practices, such as the efficiency of margin maintenance. Frequent margining can reduce the risk of “margin shocks”. Improving market practices is therefore highly desirable. However, it is not easy for regulators to influence detailed risk management procedures given resource constraints. This would be better done through the encouragement of self-regulatory initiatives such as the promulgation by ICMA of the guidance published by its European Repo Council on margining and the promotion of trade reporting.
- 12.11 It is to be hoped that the FSB workstream will look at the barriers that remain in the repo market infrastructure to the safe and efficient cross-border mobilisation of collateral. Such barriers were described in an ICMA study published in July 2010.¹³ The free flow of collateral reinforces financial stability by allowing borrowers to maximise their ability to offer collateral and, in enhancing market liquidity, enhances the efficiency of collateral pricing.

Richard Comotto
20 March 2012

¹³ *A white paper on the operation of the European repo market, the role of short-selling, the problem of settlement failures and the need for reform of the market infrastructure.* ICMA (July 2010).