

A transparency standard for derivatives

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Derivatives exposures across large financial institutions often contribute to – if not necessarily create – systemic risk. Current reporting standards for derivatives exposures are nevertheless inadequate for assessing these systemic risk contributions. In this paper, the author explains how a transparency standard, in contrast to the current standard, would facilitate such risk analysis. He also demonstrates that such a standard is implementable by providing examples of existing disclosures from large dealer firms in their quarterly filings. These disclosures often contain useful firm-level data on derivatives, but due to a lack of standardisation, they cannot be aggregated to assess the risk to the system. He highlights the important contribution that reporting the “margin coverage ratio” (MCR), namely the ratio of a derivatives dealer’s cash (or liquidity, more broadly) to its contingent collateral or margin calls in case of a significant downgrade of its credit quality, could make toward assessing systemic risk contributions.

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The author is grateful to Melissa Johnston, John Yan and Anthony (Yuyuan) Zhu for research assistance and comments from Or Shachar and participants at the NBER conference “Measuring systemic risk initiative” (October 2010).

Derivatives exposures across large financial institutions often contribute to – if not necessarily create – systemic risk. During a crisis, lack of adequate understanding of such exposures often compromises regulatory ability to unwind an institution, inducing large-scale backstops and counterparty bailouts. It is often claimed – in spite of the massive assistance that was provided in this crisis to deal with derivatives exposures – that derivative contracts are well collateralised so that counterparty risk on derivatives exposures is not a significant issue. Documenting evidence that supports or refutes this claim beyond reasonable doubt is currently infeasible due to the poor quality – and lack of standardisation – of derivatives disclosures by financial firms. Nevertheless, all available evidence points against the claim that counterparty risk in derivative exposures is always well collateralised.

In many important cases that contributed to the crisis, most notably but not exclusively the case of American International Group (AIG) Financial Products, collateralisation was weak.¹ Some reports also suggest that the problem is probably of non-trivial magnitudes and that going forward derivatives exposures are likely to remain a potentially important contributor to systemic risk. For instance, using information from the 10-Q quarterly statements, the International Monetary Fund (IMF) reports estimate that the five key institutions that are active in the over-the-counter (OTC) derivatives market – Goldman Sachs, Citigroup, JPMorgan, Bank of America, and Morgan Stanley – were jointly carrying almost USD 500 billion in OTC derivative payables exposure as of the third quarter of 2009.² The report also estimates that five largest European banks – Deutsche Bank, Barclays, Union Bank of Switzerland (UBS), Royal Bank of Scotland (RBS) and Credit Suisse – had about USD 600-USD 700 billion in under-collateralised risk (measured by residual derivative payables) as of December 2008. This residual exposure arises for two reasons, as per the

IMF report. First, sovereigns, as well as AAA-rated insurers, corporations, large banks and multilateral institutions “do not post adequate collateral since they are viewed by large complex financial institutions as privileged and (apparently) safe clients.” Second, dealers have agreed in their bilateral contracts not to mandate adequate collateral for dealer-to-dealer positions whereby credit-worthy dealers often post no collateral to each other for these contracts.

These reports raise several pertinent questions:

- What is the true potential exposure on derivatives dealings of large institutions?
- How much of this exposure is collateralised?
- Is collateral posted adequate under some conservative requirements of maximum counterparty risk in case of system-wide stress when besides the emergence of counterparty risk, positions become illiquid, hard to replace and may have to be unwound at short notice?
- Are derivatives being deployed in under-collateralised manner to undertake significant maturity transformation and taking on attendant liquidity risks?³

This article addresses these questions by examining the theoretical justification for a transparency standard for derivatives positions. To demonstrate that such a standard is implementable, the article shows examples of existing disclosures from large dealer firms in their quarterly filings. These disclosures often contain useful firm-level data on derivatives, but due to a lack of standardisation, these are not aggregation-friendly for assessing the risk to the system. The note highlights the important role for tracking of a margin coverage ratio (MCR), namely the ratio of a derivatives dealer’s cash (or liquidity, more broadly) to its contingent collateral or margin calls in case of a significant downgrade of its credit quality.

1 For example, The financial crisis inquiry Report, released in January 2011, reports: “In the housing boom, credit default swaps (CDS) were sold by firms that failed to put up any reserves or initial collateral or to hedge their exposure. In the run-up to the crisis, AIG, the largest US insurance company, would accumulate a one-half trillion dollar position in credit risk through the OTC market without being required to post one dollar’s worth of initial collateral or making any other provision for loss. AIG was not alone...”

2 Singh (M.) (2010): “Collateral, netting and systemic risk in the OTC derivatives market”, IMF Working Paper 10/99.

3 In terms of “risk topography”, derivatives can be considered the mechanism to build contingent exposures – across states of nature and over time – which when not adequately collateralised or capitalised lead to liquidity risk. Thus, derivatives facilitate complex forms of “liquidity mismatch”, discussed in greater detail elsewhere by Markus Brunnermeier, Gary Gorton and Arvind Krishnamurthy.

1 | CASE FOR REGULATORY AND MARKET DISCLOSURE OF STANDARDISED DERIVATIVES REPORTS

It is useful to understand theoretically the market failure in the provision of information in derivatives markets. Acharya and Engle (2009) and Acharya and Bisin (2010) formalise this idea under the notion of a “counterparty risk externality”.⁴

To illustrate the idea, suppose that counterparty A agrees to pay B. Then, A turns around and sells a similar contract to C. The addition to A's position from the contract with C dilutes the payoff on its contract with B in case that A turns out ex-post to not have adequate funds to repay both B and C. Thus, B's payoff dependency on what else A does represents a negative payoff externality on B due to A's counterparty risk. The key efficiency question is whether B can adequately reflect this risk in charging price or adopting risk controls (e.g. margins or overall position limits) on A. Clearly, B's ability to do so depends upon whether B can observe what A does.

Now, if markets are organised over-the-counter as with many derivatives contracts, there is opacity at level of derivatives positions of a financial firm. As a result of this opacity, counterparty risk externality described above cannot be adequately reflected in price and collateral arrangements. More broadly, since generating information about each firm's derivatives positions requires its cooperation but benefits the system at large, the firm may not fully internalise the social benefits of transparency. This theory predicts thus that there will be too little production of private information in settings that involve counterparty risk externality. Acharya and Engle (2009) and Acharya and Bisin (2010) present several proposals to address this market failure.

One proposal is that central clearing and margining on exchanges get around this failure (at least when viewed in the realm of a particular clearinghouse or exchange). Central counterparty (CCP) or trade-guaranteeing body or exchange can observe end-of-day (or even intra-day) positions, and set position limits, concentration limits and margin calls accordingly. This arrangement works best if the same clearing entity clears most products. Yet,

many markets, especially for complex and customised derivatives will almost necessarily remain OTC. They cannot easily be standardised if their primary purpose is to provide customised hedging to some end-users and the system may not find it profitable to incur transaction costs in setting up clearinghouses or exchanges for these products if their volumes are thin. For these remaining derivatives, some regulators have proposed addressing counterparty risk directly by limiting leverage (charging adequately high margin requirements) against them. Still, regulatory attempts to do design such instrument-specific requirements have failed miserably in the design of capital requirements even on simpler instruments such as mortgages, loans and lines of credit.

A second proposal, not necessarily exclusive of the first one, is to rely more on markets' transparency at large. Suppose information on derivatives position of a financial firm was made available to market participants. This would enable better pricing and managing of counterparty risk by markets themselves. This way, dealers would be incentivised to lower their counterparty risks in an efficient manner. With a market-wide standard, dealers would also be incentivised to provide transparency about their own management of counterparty risk, a move that would benefit them the most in times of significant aggregate uncertainty when customers tend to leave business with riskier counterparties, triggering a “franchise value run”, as witnessed by Goldman Sachs and Morgan Stanley around the collapse of Lehman Brothers, and instead “fly to quality”.

A common argument against such public transparency of positions and counterparty level data is that it reduces economic benefits of undertaking these positions in the first place and could reduce risk-sharing gains for the economy. A compromise would be to provide market transparency with a reasonable lag, so that price impacts for trading parties are minimised, and yet the lagged information is useful for counterparty risk assessments.

Finally, it is highly likely that an efficient transparency standard for derivatives will in turn produce an efficient information system at each financial firm that aggregates its own derivatives positions in different subsidiaries, markets and countries. This

⁴ Acharya (V. V.) and Engle (R.) (2009): “Derivatives trades should all be transparent”, Wall Street Journal, 15 May 2009, and Acharya (V. V.) and Bisin (A.) (2010): “Counterparty risk externality: centralised versus over-the-counter markets”, Working Paper, NYU-Stern.

could improve firm's own risk management by providing timely information to senior management and chief risk officers about enterprise-wide risks.

2| A TRANSPARENCY STANDARD FOR DERIVATIVES AND COUNTERPARTY RISK

What might a transparency standard for derivatives look like? Here is an example. All dealers as well as large swap players provide to a centralised data repository frequent (for example, weekly or bi-weekly) risk reports on their derivatives positions as follows.

- Classification of exposures into:
 - product types (such as single-name credit default swaps (CDS), index CDS, interest rate swaps, currency swaps, commodities, equities, etc.);
 - by major currency categories;
 - maturity (buckets) of contracts;
 - type of counterparty (bank, broker-dealer, corporation, government-sponsored enterprise, monoline, insurance firm, etc.); and
 - credit rating of counterparties.
- Size of exposures could be reported as:⁵
 - gross (maximum notional exposure);
 - in fair-value terms (to account for mark-to-market changes);
 - net (taking account of bilateral netting arrangements); and
 - uncollateralised net (recognising collateral posted by counterparties).
- Uncollateralised net exposures could be disclosed also as “potential exposures” based on stress tests⁶ that take account of:
 - several notches of ratings downgrade of counterparty and its ability to post additional collateral; and
 - counterparty default and replacement risk for the exposures assuming severe market conditions such as replacement time of two to four weeks.⁷

To facilitate the understanding of contingent or potential exposures and for deriving implications

for systemically risky exposures, all dealers as well as large swap players could also provide two important and novel reports:

- Margin call reports that list the additional collateral liabilities of the firm as:
 - total additional liability in case the firm was to experience one, two or more (say, up to six) notch downgrades; and
 - largest such liabilities aggregated by different counterparties (say, ten largest).
- Concentration reports that provide the above information for the entity's largest counterparty exposures (say, the largest ten) or accounting for at least a substantial proportion (say, 75%) of the total exposure.

When aggregated across firms, the standardised firm-level reports aggregate to a “map” of derivatives positions and their risks (mark-to-market risk, counterparty risk and liquidity risk) as shown in Table 1.

Table 1
Outcome of the proposed transparency standard for derivatives

Disclosure	Firm 1	Firm 2	...	Firm n
Exposures				
Product type				
Maturity bucket				
Counterparty type				
Counterparty credit rating				
Value				
Maximum loss (“potential exposure”)				
Uncollateralised net				
Net of collateral				
By currency categories				
Collateral posted				
Margin Report: additional collateral to post				
One-notch downgrade				
Two-notch downgrade				
Multi-notch downgrade				
Concentration Report: firms, % exposure				

⁵ The crucial item here is “uncollateralised” as without knowledge of collateral backing the contracts, there is the risk of over-stating the derivatives exposures, but more importantly, it would create the uncertainty about magnitude of risk in the first place.

⁶ The focus of such a possible standard is on stress tests based on counterparty risk. Nevertheless, stress tests based on macroeconomic scenarios, as proposed in Darrell Duffie's note [“Systemic risk exposures: a 10-by-10-by-10 approach”], could also be used in addition.

⁷ In particular, the current disclosure of Level-1, Level-2 and Level-3 of assets' underlying value should also be enhanced to report potential illiquidity and opacity of positions (not just for derivatives), so that an asset could be Level-1 in normal times, but the disclosure would also state whether it is likely to be Level-1, Level-2 or Level-3 in reasonable stress scenarios.

Although such a transparency standard appears at first to involve a large amount of information gathering, the costs of such disclosure are not likely to be that onerous. Sophisticated investment banks already maintain such information for their internal risk management purposes, and they do publish some of it in their quarterly reports (though in a highly non-standardised and less granular manner, as explained below). Therefore, it is unlikely to be a significant additional burden for them to disclose such information to regulators in a standardised format at frequent intervals. Some aggregated versions that respect customer confidentiality can then be made transparent to markets at large, say on a monthly or at least quarterly basis, to help enhance market discipline against the build-up of uncollateralised exposures.

3 | WHAT DO FINANCIAL FIRMS CURRENTLY DO AND DO NOT DISCLOSE?

The 10-Q filings of financial firms, as for any Securities and Exchange Commission-regulated firms in the United States, require disclosure of all materially relevant information. In case of financial firms, given their increasingly large presence in derivatives markets, these filings also contain information on positions – and on their risks – in these markets. A few examples below help illustrate what is useful in the current reports, and what changes would be necessary to adhere to a transparency standard such as the one outlined above.

Consider for example the reporting of credit protection sold by Citigroup and JPMorgan Chase, shown from their 10-Q filings for December 31, 2008 in Tables 2 and 3, respectively. Citigroup reports its positions by industry, product and credit rating of underlying

Table 2
Citigroup's reporting of credit derivatives as protection seller

(USD millions)

	Maximum potential amount of future payments	Fair value payable ¹⁾
Total by industry/counterparty	1,315,106	76,581
Bank	860,437	46,071
Broker-dealer	301,216	17,661
Monoline	–	–
Non-financial	2,127	96
Insurance and other financial institutions	151,326	12,753
Total by instrument	1,315,106	76,581
Credit default swaps and options	1,314,282	76,383
Total return swaps	824	198
Total by rating	1,315,106	76,581
Investment grade	759,845	23,362
Non-investment grade	422,865	33,231
Not rated	132,396	19,988

Note: The table summarises the key characteristics of the Company's credit derivative portfolio as protection seller (guarantor) as of September 30, 2009. 1) In addition, fair value amounts receivable under credit derivatives sold were USD 23,324.

reference entity, whereas JPMorgan reports them by maturity and credit rating of underlying entity. While it is possible to draw some relative conclusions about average credit rating of entities they write protection against (Citigroup wrote more risky protection than JPMorgan), other aspects of disclosures are not comparable. Nevertheless, the tables reveals that financial firms could report these data in a standardised manner if required to do so. Notably, no data on concentration of exposures in derivatives are currently revealed in any of the 10-Q filings. This creates a significant challenge in assessing systemic risk based on public disclosures of financial firms.

Table 3
JPMorgan Chase's reporting of credit derivatives as protection seller

(USD millions)

	< 1 year	1-5 years	> 5 years	Total Notional Amount	Fair value ¹⁾
Risk rating of reference entity					
Investment grade (AAA to BBB-) ²⁾	(177,404)	(1,767,004)	(713,555)	(2,657,963)	(215,217)
Noninvestment grade (BB+ and below) ²⁾	(121,040)	(992,098)	(428,895)	(1,542,033)	(244,975)
Total	(298,444)	(2,759,102)	(1,142,450)	(4,199,996)	(460,192)

Protection sold-credit derivatives and credit-linked notes (CLN) ratings/maturity profiles as of December 31, 2008. The contractual maturity for single-name CDS contract generally ranges from three months to ten years and the contractual maturity for index CDS is generally five years. The contractual maturity for CLNs typically ranges from three to five years.

1) Amounts are shown on a gross basis, before the benefit of legally enforceable master netting agreements and cash collateral held by the Firm.

2) Ratings scale is based upon the Firm's internal ratings, which generally correspond to ratings defined by Standard & Poor's and Moody's.

Table 4
Contingent collateral liabilities for JPMorgan and Goldman Sachs
 Collateral – Credit-risk-related contingent features in derivatives

(USD billions for JPMorgan; USD millions for Goldman Sachs)

	JPMorgan			Goldman Sachs	
	Collateral posted	Additional collateral in case of downgrade AA to BBB: six-notch	Additional collateral in case of downgrade AA to AA-: one-notch	Additional collateral in case of one-notch downgrade	Additional collateral in case of two-notch downgrade
2006 Q4	26.6				NA
2007 Q1	27.0	2.6	0.1	607	NA
Q2	28.3	2.9	0.2	598	NA
Q3	32.8	3.2	0.3	752	NA
Q4	33.5	2.5	0.2	595	NA
2008 Q1	48.5	3.4	0.3	957	NA
Q2	58.2	3.5	0.6	785	NA
Q3	60.1	4.3	0.9	669	NA
Q4	99.1	6.4	2.2	897	2,140
2009 Q1	82.3	4.9	1.4	941	2,140
Q2	67.7	4.0	1.2	763	1,930
Q3	66.0	4.4	1.5	685	1,700

In contrast, there is some useful information on potential margin calls. Table 4 illustrates that during the first quarter of 2007 and the third quarter of 2009 different financial firms reported their margin liabilities in case of own downgrades with varying levels of granularity and “stress”. JPMorgan’s report historically appears the best in a relative sense in that it includes margin liabilities for one-notch downgrade and up to six-notch downgrade. Goldman Sachs, however, reports margin liabilities only up to two notches, and the second notch is disclosed only since the crisis. It is immediately apparent from this report that JPMorgan’s liquidity

risk from one to six-notch downgrade is far smaller in terms of multiplier on the required margin than it is for Goldman Sachs.

No discussion of contingent liquidity risk related to margin calls can be complete without a discussion of AIG. Table 5 shows that AIG reported only one-notch downgrade risk up until the third quarter of 2008, and in that last quarter, reported up to two notches. From one to two notches, its collateral liability increased by a factor of six, a valuable piece of information in assessing system’s counterparty risk to AIG that was

Table 5
Contingent collateral liabilities of AIG

(USD millions)

	2007-1	2007-2	2007-3	2007-4
Marginal call Reports				
Additional collateral for one-notch downgrade rating	902	847	830	1,390
Additional collateral for two-notch downgrade rating				
Additional collateral for three-notch downgrade rating				
Additional collateral for multi-Notch downgrade rating				
	2008-1	2008-2	2008-3	Actual
Marginal call Reports				
Additional collateral for one-notch downgrade rating	1,800	1,200	1,800	
Additional collateral for two-notch downgrade rating			9,800	Moody’s and Fitch downgrade
Additional collateral for three-notch downgrade rating			20,000	S&P downgrade
Additional collateral for multi-notch downgrade rating			32,000	Market risk adjustment

⁸ This information too was available not in a well tabulated form in AIG’s 10-Q of the third quarter of 2008 but in the body of the text: “Credit ratings are important to AIG’s business, results of operations and liquidity. Downgrades in AIG’s credit ratings could increase AIG’s borrowing costs and could adversely affect its competitive position and liquidity. With respect to AIG’s liquidity, it is estimated that, as of the close of business on April 30, 2008, based on AIGFP’s outstanding municipal guaranteed investment agreements (GIAs) and financial derivative transactions at that date, a downgrade of AIG’s longer-term senior debt ratings to “Aa3” by Moody’s Investors Service (Moody’s) or “-” by S&P, a division of the McGraw-Hill Companies, would permit counterparties to call for approximately USD 1.8 billion of collateral, while a downgrade to “A1” by Moody’s or A+ by S&P would permit counterparties to call for approximately USD 9.8 billion of additional collateral. Further downgrades could result in requirements for substantial additional collateral, which could have a material adverse effect on how AIGFP manages its liquidity. The actual amount of collateral that AIGFP would be required to post to counterparties in the event of such downgrades depends on market conditions, the fair value of outstanding affected transactions and other factors prevailing at the time of the downgrade. Additional obligations to post collateral would increase the demands on AIGFP’s liquidity.”

not available in their reports until the second quarter of 2008.⁸ As it turned out, while Moody's and Fitch downgraded it by two notches, Standard & Poor's did so by three notches, resulting in collateral liability of USD 20 billion which was compounded upwards eventually to USD 32 billion given mark-to-market or fair-value adjustments due to deteriorating market conditions.

Finally, it is instructive to use these margin call reports in conjunction with the cash position of these firms to assess their MCR. In the fourth quarter of 2008, JPMorgan Chase had cash-equivalent assets of USD 26 billion, so that its MCR was over four, since its margin call for a six-notch downgrade is USD 6.3 billion. Goldman Sachs had cash assets (its "total global core excess") of over USD 100 billion, giving it an MCR of around 50 for a margin call of USD 2.14 billion at a two-notch downgrade. That is, while Goldman Sachs' liquidity risk due to collateral calls is substantial, it also holds a lot of unencumbered cash to deal with this risk. In contrast, AIG had cash assets of just around USD 2.5 billion in 2008, giving it an MCR of between one and two for its USD 1.8 billion margin call at one-notch downgrade. Once it revealed its two-notch downgrade risk in August 2008, its MCR for two-notch downgrade was just around 0.25 as its (hitherto un-disclosed) margin call exposure was up at USD 9.8 billion with a two-notch downgrade. AIG's margin risk was simply not well covered for a "stress" downgrade scenario by its

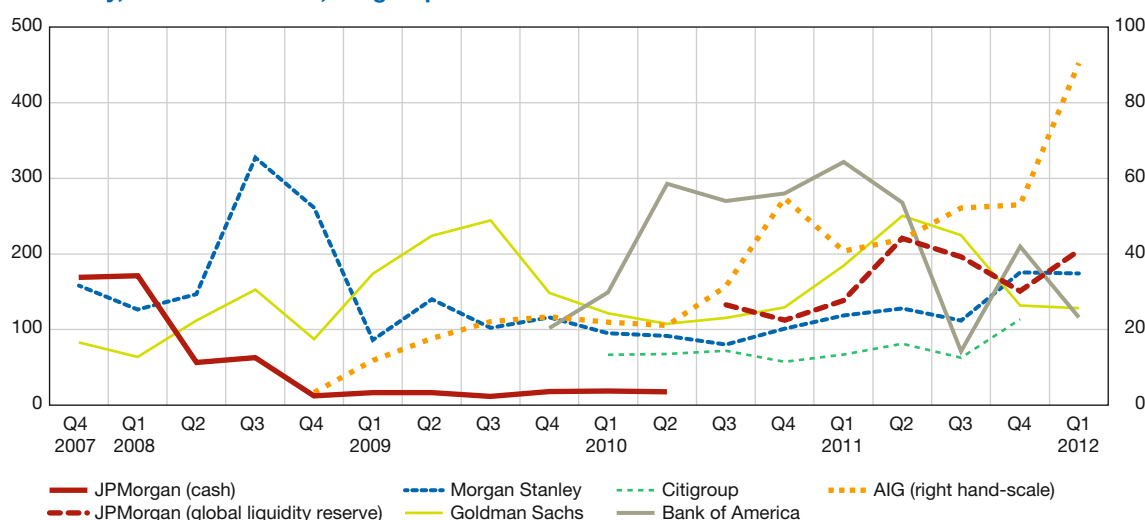
holdings of cash assets. Importantly, for a multi-notch downgrade, this was not at all transparent based on its 10-Q's prior to August 2008.

The purpose behind reporting these data from 10-Q filings is two-fold. One, to make it clear that financial firms can, and do, report much of the possible standard discussed in this note for derivatives reporting. Second, to illustrate that standardised data can support and enhance the assessment of counterparty risk in derivatives markets using simple analytical tools such as the margin coverage ratio (that is analogous to interest coverage ratio employed by credit rating analysts in their assessment of non-financial corporations' liquidity risk).

4| RECENT TRENDS IN DERIVATIVES NET PAYABLES, COLLATERAL, AND MARGIN COVERAGE RATIOS

How has the reporting of derivatives-based liabilities of these large financial institutions evolved since the financial crisis? The next set of charts (Charts 1 and 2) illustrates some progress toward standardised Margin call Report for these dealer banks. During the first quarter of 2010 to the fourth quarter of 2011, all of these firms report their additional collateral liability

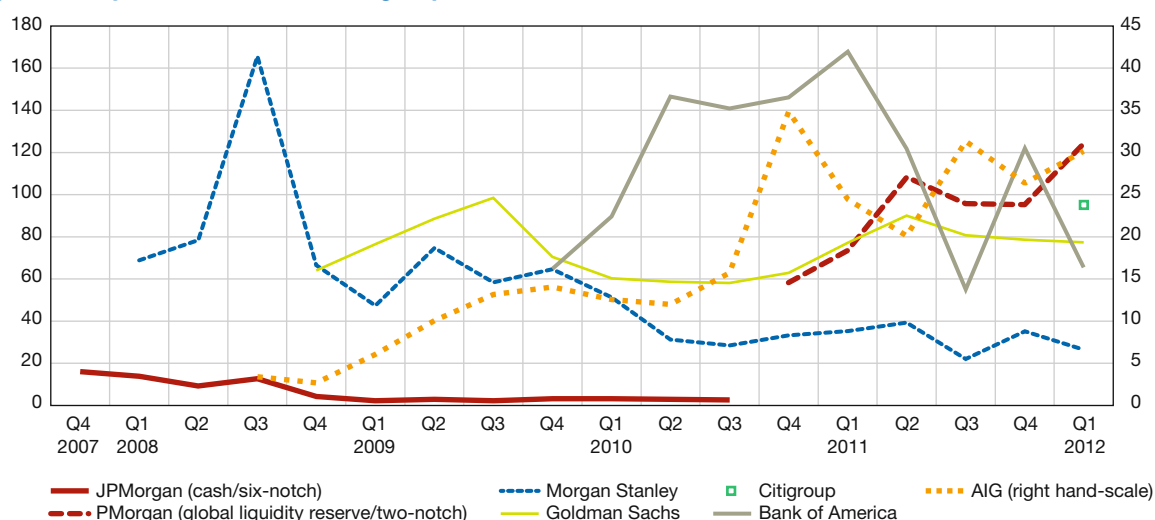
Chart 1
Margin coverage ratio in case of one-notch long-term credit rating downgrade for JPMorgan, Goldman Sachs, Morgan Stanley, Bank of America, Citigroup and AIG



Note: The MCR for JPMorgan as plotted consists of two segments: the fourth quarter of 2007 to the second quarter of 2010 is calculated using the cash or cash equivalents, and the third quarter of 2010 to the first quarter of 2012 is calculated using global liquidity reserve.

Chart 2

Margin coverage ratio in case of two-notch long-term credit rating downgrade for JPMorgan, Goldman Sachs, Morgan Stanley, Bank of America, Citigroup and AIG



Note: The MCR for JPMorgan as plotted consists of two segments: the fourth quarter of 2007 to the third quarter 2010 is calculated using the cash or cash equivalents and collateral needed for six-notch downgrades, and the fourth quarter of 2010 to the first quarter of 2012 is calculated using global liquidity reserve and collateral needed for two-notch downgrades.

in case of a one-notch downgrade in long-term credit rating (respectively to each of these firms). This facilitates a calculation of their MCR as shown in Chart 1 (calculated as the total global reserve divided by additional collateral needed, whenever global reserve is available, else as cash divided by additional collateral needed). The one-notch downgrade MCR is highest for JPMorgan and Morgan Stanley, but smaller for Citigroup (which has the highest one-notch downgrade collateral liability in absolute terms), Bank of America and Goldman Sachs. While AIG's MCR is smaller in value compared to these firms, it has the most significant improvement in terms of trend in MCR since the crisis. Chart 2 shows the MCR in case of two-notch downgrades. Now, it is Morgan Stanley and Bank of America that have the smallest two-notch downgrade MCR (along with AIG).

Notably, JPMorgan reports one-notch and six-notch downgrade collateral liabilities until the third quarter of 2010, but switches to reporting only one-notch and two-notch downgrade scenarios – like other firms – starting the fourth quarter of 2010. This suggests a “race to the bottom” in reporting standards. Furthermore, Citigroup reports two-notch downgrade liability only starting the first quarter of 2012. None of the stress scenarios provide any concentration reports in terms of lead counterparties exposed to these collateral liabilities. Nor do the scenarios take

account of systemic risk in the form of correlated downgrades of these firms as witnessed in 2007-08. Interestingly, large European dealer banks by and large do not disclose much information about their potential derivatives liabilities and associated margin calls. Private communication with the investor relations of these European banks suggests that they do not disclose such information as they are not required to do so.

All in all, this account of private disclosures of derivatives-linked collateral liabilities only highlights the importance of requiring a global transparency standard for derivatives reporting and associated collateral liabilities.

5| CONCLUSION

In summary, better market discipline and regulatory intelligence about counterparty risk in derivatives market likely requires a new transparency standard. This standard could be layered on top of the current quarterly disclosures of derivatives positions and risks by financial firms, but with a greater frequency for regulatory reports. Of particular importance is position-level transparency of large derivatives players, not just in a static sense, but also as potential

exposure to stress scenarios, margin call exposure in case of their credit quality deterioration, and concentration exposure for assessment of systemic interconnections. Such transparency would facilitate tracking valuable counterparty risk indicators, most notably the MCR that compares a firm's cash position to its margin call exposure under stress scenarios. While large dealer banks in the United States provide some disclosure along these lines, their disclosure is not adequately standardised, precluding a ready comparison across banks, and the downgrade scenarios considered in the disclosure are not sufficiently stressed.

It is important to recognise the desired scope as well as the limitations of such a transparency standard.

One, the focus on derivatives should not be misconstrued as being the only contingent liabilities that are important. Contingent liabilities can materialise on balance-sheets of large financial firms due to correlated drawdowns of undrawn lines of credit, triggering of guarantees provided to special purpose vehicles (SPVs) such as conduits and special investment vehicles (SIVs) (as materialised in August 2007), and inability to roll over short-term debt in the form of commercial paper and sale and repurchase ("repo") agreements. Principles of the standard proposed here should extend to these liabilities.

Second, the transparency standard proposed assumes that disclosures provided by financial firms will be reliable, that is, can be verified by suitable auditing. To the extent incentives to misreport in such disclosures remain, especially so during weak conditions for financial firm balance-sheets, auditing of positions and model assumptions underlying the disclosures would also be important. One attractive possibility is to undertake such auditing as part of the regulatory stress tests, for instance, as are being required of systemically important financial institutions under the Dodd-Frank Act in the United States.

Finally, many derivatives-based liabilities have arisen when large financial firms' top management is itself caught off-guard in terms of the scale of the liabilities, as witnessed recently during the "London Whale" trading debacle at JPMorgan. A transparency standard such as the one proposed can work well only to the extent that decentralised data on trades and liabilities are being aggregated suitably inside the large financial firms. It is quite likely in fact that putting in place a transparency standard for derivatives and auditing their disclosures helps the top management of these firms to ensure high-quality and comprehensive aggregation of decentralised data. The resulting improvement in individual firm's risk management would be an added benefit of the transparency standard, besides its natural use as a regulatory tool and its role in enhancing market discipline.

