Lead Comment

On counterparty risk

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Abstract The financial crisis demonstrated the inadequacy of the management of counterparty credit risk and the vulnerability of financial structures to counterparty concerns. Three possible solutions are proposed to mitigate such risks in the future: improved network visibility to understand credit chains; the clearing of transactions centrally to improve transparency and reduce intra-financial system debt; and building protection against counterparty default through higher capital and margining requirements.

Keywords: *counterparty risk, contagion, financial crises, systemic risk, interbank markets*

Consider the following thought-experiment. Imagine a set of banks, indexed 1 to 100. Bank 1 lends US$100 to Bank 2. This is a private transaction in the unsecured money market. Bank 2 then lends that US$100 on to Bank 3, who in turn lends on to Bank 4, all the way up to Bank 100.

This is a classic credit chain. In principle, this credit chain seems to be relatively robust. After all, *net* debt in the financial system is only US$100, evenly distributed across 100 institutions. Or, put differently, each bank has on average only US$1.00 of net debt. Risk is well-spread, is it not?

It is not. This financial structure is an inherently fragile one. Specifically, it contains three distinct, but related, structural fault-lines:[1]

- *Counterparty risk is unmonitorable*: In the example, Bank 1's ultimate counterparty is Bank 100, but there are 99 intervening links in the chain, 99 degrees of separation and Bank 1 has no way of knowing the identity of all those counterparties to which it is exposed — Banks 2–100 in the credit chain. The credit chain is largely invisible.
- *Gross debt is unbounded*: Although net debt in this system is small, gross debt is much larger and potentially unbounded. Specifically, gross debt rises with the number of links in the credit chain (n).

In the example, gross debt is $(n - 1)$ US$100 = US$9,900.

- *Counterparty risk is unhedged*: In the example, because no collateral or capital is held against exposures, a severing of any link cascades along the credit chain. For example, if Bank 100 falls, so too does every other link in the chain. Aggregate default would then be US$9,900, with commensurately high deadweight costs. The financial system is a domino line.

This financial structure is not a hypothetical one. It broadly characterises the unsecured money market during the crisis and the identified structural fault-lines were the very ones which caused this market to suffer seizure during the crisis. At root, these fault-lines reflect failures in counterparty risk management.

These pressures were not confined to the money market. The same fault-lines in counterparty risk management were exposed in any number of core financial markets during the crisis, from plain-vanilla asset-backed securities to exotic instruments. In each case, counterparty concerns caused seizure. Of the many crisis lessons learned, the crippling impact of counterparty risk, and the inadequacy of its pre-crisis management, were among the most important.

Against that background, this edition of the *Journal of Risk Management in Financial Institutions* explores counterparty risk and the ways in which in the future it might be better understood, priced and managed. The thought-experiment in the introduction provides a convenient taxonomy of possible solutions to the counterparty risk problem. It also provides an organising framework for the papers in this volume.

- *Improving network visibility*: Knowing your counterparty is one thing. Knowing your counterparties' counterparties' counterparty quite another. It was the latter, higher-order, uncertainty that killed financial markets during the crisis. Such financial network opacity can only be tackled by a fairly fundamental rethink of the way in which financial transactions are identified and recorded. Without common identifiers — of counterparties, transaction types, product attributes — it is difficult to see how the network could ever be navigated. Elsewhere, I have called this the creation of a 'common language for finance', the like of which already exists for other well-performing networks — for example, global supply chains and the internet.[2] The papers by Grody, Hughes and Reininger and by Krishna explore dimensions of, and solutions to, this network opacity problem.
- *Central counterparty clearing*: Another route to improving network transparency, while simultaneously reducing gross exposures through netting, is to reconfigure the financial network — for example, from today's spaghetti-junction configuration to an ordered hub-and-spoke configuration. A central counterparty is the obvious mechanism for achieving such a re-wiring. The G20 Heads of State in 2009 committed the financial world to central-clearing of a much wider range of over-the-counter financial products than in the past, but this will be effective if, and only if, central counterparties themselves have robust counterparty risk management: who is allowed to clear, what is to be cleared, how is margin set and how are any remaining risks managed and allocated? The papers by Arnsdorf and by Murphy analyse those questions. They are the

same questions being addressed by the official community.[3] The stakes could not be higher. Without adequate answers, as the paper by Singh argues, central counterparties risk themselves becoming a new, more virulent, strain of the systemic virus.

- *Protecting against counterparty default*: Not all transactions, both derivative and cash instruments, will be centrally cleared, but for those instruments, counterparty risk is no less a concern. That is why on-going work by the official sector on minimum margining requirements for non-cleared trades is of such importance. It is also why adequate capitalisation of counterparty risk in non-collateralised derivative transactions is important. These so-called credit valuation adjustments (CVA) were beefed-up under Basel III.[4] The paper by Rosen explores the adequacy and calibration of CVA.

Taken together, these papers make clear there is an enormous amount still to be said and done before counterparty risk is properly recognised and managed. That is the bad news. The good news is that the technological frontier of counterparty risk management is being pushed out by financial firms, central counterparties and systemic risk regulators. This is one silver lining from the darkest of crisis clouds — even if those clouds are yet to lift and even though the technological frontier has much further to travel.

References and notes

1 For a discussion of the risk of maturity mismatch in credit chains, see Hellwig, M. (1995) 'Systemic aspects of risk management in banking and finance', *Swiss Journal of Economics and Statistics*, Vol. 131, No. 4/2, pp. 723–737.

2 Ali, R. D., Haldane, A. G. and Nahai-Williamson, P. (2012) 'Towards a common financial language', available at: http://www.bankofengland.co.uk/publications/Documents/speeches/2012/speech552.pdf (accessed 20th April, 2012).

3 See Committee on Payment and Settlement Systems (CPSS) and the Technical Committee of the International Organization of Securities Commissions (IOSCO) (2012) 'Principles for financial market infrastructures', available at: http://www.bis.org/publ/cpss101a.pdf (accessed 20th April, 2012).

4 Basel Committee on Banking Supervision (BCBS) (2011) 'Basel III: A global regulatory framework for more resilient banks and banking systems', available at: http://www.bis.org/publ/bcbs189_dec2010.htm (accessed 20th April, 2012).