INSOLVENCIES, BAILOUTS, AND RESOLUTIONS: DEAILING WITH BANKS WHEN THE MUSIC STOPS

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The failure of a bank can have adverse consequences for the real economy in terms of credit rationing. This paper analyses the effect of placing a bank into standard insolvency processes. It argues that the credit rationing that would follow from placing a bank into a standard insolvency process justifies bailouts. It then explores alternative options for resolving banks without bailouts.

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I. Introduction

This paper is about the options that are available when a bank becomes insolvent. The paper highlights the use of bail-in debt and contingent capital in bank resolution. Bail-in is a procedure whereby a regulator can write off and dilute common equity, and write off and convert unsecured debt into equity. Contingent capital bonds (**CoCo**) are debt instruments that either convert into equity or are written off on a pre-specified trigger prior to insolvency. CoCos differ from bail-in insofar as their conversion is not based on a regulator exercising a statutory power.[1] Bail-in and CoCos may be attractive policy tools to resolve systemically important banks because of the limitations of standard insolvency law and the moral hazard created by bailouts.

There are significant costs associated with using standard insolvency law to resolve systemically important banks.[2] First, there are costs associated with the administration of insolvency including legal costs and the cost of an insolvency practioner. Second, there are costs associated with bank managers losing focus on generating profit and instead managing the insolvency of the bank. By one estimate, the first and second costs are about 30% of the value of the insolvent bank's assets.[3] Third, the failure of a systemically important bank causes contagion in the banking system and (possibly) the financial system more generally. Contagion is the spread of distress from the bank to other institutions. Contagion is explained and discussed in Section IIA. The effect of these three costs is that banks and other

[1] John C Coffee, Jr, 'Systemic Risk After Dodd-Frank: Contingent Capital and the Need for Regulatory Strategies Beyond Oversight' (2011) 111 Colum L Rev 795, 805.

[2] In the United Kingdom, standard insolvency law is enshrined in statute. See Insolvency Act, 1986, (U.K.).

[3] Christopher James, 'The Losses Realised in Bank Failures' (1991) 46 J Fin 1223.

institutions are unable to lend money to positive net present value projects which is a form of credit-rationing. The lost asset value for the distressed banks and associated institutions results in their inability to make loans even if it would be profitable to do so. Credit-rationing is a problem caused by the incogruence of insolvency law with the structure of banks.

A potential solution to the credit-rationing caused by standard insolvency law is bailing out the distressed bank so that it does not become insolvent. This approach was taken by governments during the 2008 financial crisis. The rationale for providing a bailout is simple. If the cost of a bailout is lower than the expected cost of credit-rationing, then a bailout is provided. In the case of a systemically important bank, it is likely that a bailout is less costly than the cost of credit-rationing. Bailouts are a solution which avoid the credit-rationing cost of insolvency law. Bailouts create additional problems because they side-step insolvency law rather than making it more credible and effective. Notably, bailouts generate a significant moral hazard problem whereby bank creditors know that their investment in a bank is implicitly guaranteed by the state. The existence of this guarantee eliminates the incentive of creditors to discipline bank managers. In addition, bank managers that are remunerated with equity are incentivised to increase the riskiness of banks assets in order to increase the value of bank equity. Usually, creditors limit the riskiness of firm assets in order to ensure that their loans are repaid. However, if the loans are implicitly guaranteed a creditor is not incentivised to discipline bank managers and monitor risk levels. Therefore, bank managers can increase the riskiness of bank assets in order to increase equity value, but to also increase the expected value of the implicit guarantee without adverse creditor reaction. This increases the *ex-ante* probability of a bailout and also increases the cost of a bailout *ex-post* because bank assets are more risky. Bailouts are problematic because they do not solve the root problem of non-credible and ineffective insolvency laws.

Another solution to the credit-rationing caused by standard insolvency law is to establish mechanisms to resolve distressed banks which avoid the deficiencies of standard insolvency procedures. The core of such a resolution procedure is that it puts at the forefront the public policy objective of securing financial stability rather than maximising distributions to creditors.[4] Such a procedure needs to operate quickly, and for that reason, to be under administrative rather than creditor or judicial control and to provide for the overriding of creditor rights in some circumstances.[5]

Bail-in debt makes three potential contributions to the resolution of failing banks. First, when it is written off, it reduces the demands on the bank's cash flow. Conceivably, this

[4]Usually, in insolvency, the interests of creditors are given precedence: Roy Goode, *Principles of Corporate Insolvency Law* (2011) 61. '[T]he interests of creditors are in principle to be given precedence over all other interests. So in a winding up only a very limited measure of statutory support is given to employees, whilst in an administration the interests of shareholders, employees and the wider community come low down on the priority list of most administrators.'

[5]This objective is set out in legislation in the United Kingdom: Banking Act, 2009, c.1, s 4 (U.K.).

by itself may be enough to restore the bank to financial viability. If, in addition, the debt is converted into equity, two further consequences may flow. The previous owners of the company may be replaced (or supplemented) by the former debt-holders. This governance consequence of bail-in may have the *ex-ante* effect of making the creditors less incentivised to allow the managers of the bank to take risks. If the capital of the failing bank has been wiped out or reduced below its regulatory minimum, conversion of debt into equity may be a way to recapitalise the bank. (Recapitalisation does not provide liquidity, however; that may have to be provided seperately, to the extent that writing-off the debt is not sufficient.) A similar analysis may be applied to CoCos.

Post the financial crisis, no agreement has emerged on a single resolution mechanism for banks. Broadly, three types of resolution mechanism have emerged and the role of bail-in and CoCos need to be considered in relation to each of them.

First, in a resolution with a sale, the banks good assets as transferred to new shareholders and the remainder is liquidated. This is normally refered to as the 'purchase and assumption' model. The *Banking Act 2009* (UK) established a new insolvency regime for United Kingdom (**UK**) banks.[6] The mechanisms established under the *Banking Act 2009* (UK) are modelled on those used by the Federal Deposit Insurance Corporation in the United States (**FDIC**) since the 1930s.[7] The tools applied by the FDIC have been successful in resolving commercial banks without the need of a bailout. However, at least one senior official at the Bank of England has expressed some trepidation about the credibility and effectiveness of these tools in resolving systemically important banks.[8] There are at least two limitations of this recapitalisation method that may limit its credibility and effectiveness when applied to systemically important banks. First, it relies on the sale of critical parts of the distressed bank to a private sector purchaser. However, during a crisis there may be a limited amount of cash available to purchasers skilled in managing banks. This may lead to a protracted period where taxpayer funds are used to continue the operations of the bank or the sale of the loans and deposits of the bank to an unskilled manager. Second, the multi-jurisdictional nature of systemically important banks may create coordination issues, including conflict-

[6] ibid.

[7] Paul Tucker, 'Resolution and the Future of Finance' (Speech at the INSOL International World Congress, The Hague, 20 May 2013) <http://www.bankofengland.co.uk/publications/Pages/speeches/2013/658.aspx>. The FDIC was established under the Federal Deposit Insurance Corporation Act of 1991, Pub L No 102-242, 105 Stat 2236 .

[8] Tucker (n 7) 5. 'I am doubtful, however, whether those established techniques would work for a complex investment bank or a global commercial bank. Universal banks are typically run on an integrated basis, across functions and regions, so that capital can be reallocated easily as opportunities shift around. It would be a nightmare to execute over a weekend a split of any of these groups, with multiple entities across scores of countries, into those parts providing services that must be sustained at all costs and a remainders that could be wound down as part of a resolution. Moreover, this is not just a matter of critical versus not-so-critical services. Even if, contrary to my doubts, it were possible to execute that separation in the midst of a crisis, winding down a complex trading book would be hugely hazardous, with very nasty spillovers to the rest of the financial system.'

ing incentives, with regulators in other jursidctions. Accordingly, it is questionable whether recapitalisations involving a sale can resolve the problems associated with standard insolvency law. Nevertheless, the Orderly Liquidation Authority (OLA) created under Title II of Dodd-Frank[9] extends the 'purchase and assumption' model to systemically important banks.

The second type of resolution involves restructuring the liabilities and equity of the distressed bank, without a sale of its viable businesses and without liquidating the bank. Under this procedure equity in the distressed bank is written off, and debt is either written off or converted into equity. If the debt is converted into equity, control of the bank passes to new owners.[10]

The third type of recapitalisation is effectively a private sector equivalent of the second. The process involves the issue of debt securities by the bank that are either written off prior to equity value being exhausted or are converted into equity. These instruments are CoCos and have already been issued by a number of banks.[11]

The remainder of the paper is structured in the following way. Section II explores standard insolvency law and explains the problems associated with standard insolvency law and bailouts. Section III, explains the resolution options and their drawbacks. Section IV concludes.

II. Standard Insolvency Law

The application of standard insolvency law to distressed banks is costly. There are costs associated with the administration of insolvency, such as managers losing focus on operating the bank profitably, and the inability of the bank to lend when there are positive net present value opportunities. This section is about the final cost, which is known as credit-rationing.

The first subsection expains which loans are related to credit-rationing, the costs associ-

[9]Wall Street Reform and Consumer Protection (Dodd-Frank) Act of 2010, Pub L No 111-203, 124 Stat 1376 .

[10]The current proposals for this type of recapitalisation are in the form of a draft European Union directive: Proposal for a Directive of the European Parliament and of the Council Establishing a Framework for the Recovery and Resolution of Credit Institutions and Investment Firms and Amending Council Directives 77/91/EEC and 82/891/EC, Directives 2001/24/EC, 2002/47/EC, 2004,25/EC, 2005/56/EC, 2007/36/EC and 2011/35/EC and Regulation (EU) No 1093/2010 [2012] OJ C280/3 (Draft Recovery and Resolution Directive). The mechanism was described by the Independent Commission on Banking in the United Kingdom: Independent Commission on Banking, *Final Report: Recommendations* (Sep 2011); in the Liikanen report: High-level Expert Group on Reforming the Structure of the EU Banking Sector, *Final Report* (2 Oct 2012); and, the Financial Stability Board's Key Attributes paper: Financial Stability Board, *Key Attributes of Effective Resolution Regimes for Financial Institutions* (Oct 2011).

[11]Contingent capital instruments are already in existence and are frequently issued by market participants: The original CoCo issues were converted into equity. However, more recent issues, the so called "sudden death" CoCos bear losses before equity and have been issued by Belgium's KBC Group (US$1bn) and Barclays (US$3bn). , See Patrick Jenkins, 'Investor appetite for cocos is fragile' (2013) Fin Times ; Mary Watkins, 'Investors polarised by latest coco bonds' (2013) Fin Times ; John Plender, 'Central banks applaud appetite for risk' (2013) Fin Times . For a discussion of previous issues: Coffee (n 1) 826-7.

ated with standard insolvency law, and how in a banking context standard insolvency law can cause contagion and credit-rationing.

A. *The Cost of Bank Insolvency*

1. *Bank Assets.* — Credit-rationing is the reason why insolvency law needs to be redesigned.[12] Credit-rationing is important because the loans made by banks affect the real economy: particularly loans to small to medium sized enterprises (**SMEs**) and households. Figure 1 shows the proportion of banks assets used to provide loans. It shows that approximately 30% of Barclays assets are loans. A common element of loans to SMEs and households is that both types of loans are typically recouped by a bank over a long period of time. A home loan may be repaid over 30 years and a loan to an SME might be recouped over 5 years. The importance of these loans to governments and regulators is apparent in banking policy discourse.

The Independent Commission on Banking's (**ICB**) final report emphasised the importance of protecting loans to SMEs.[13] Consistent with this focus, there is empirical evidence that suggests that SMEs are funded by bank loans.[14] The evidence shows that the firms that obtain bank loans (and private placements) are on average smaller than firms using public offerings of straight debt. It also shows that the equity value of an SME that obtains a bank loan is higher than an SME funded by bonds or private placements. Accordingly, if a bank reduces the level of its lending it is likely to affect SMEs more than larger borrowers.[15]

In addition, the Bank of England has suggested that banks ought to provide home loans to households. On 13 July 2012 it launched the Funding for Lending Scheme (**FLS**), which provides funding to banks at interest rates below what is available in the market *provided* they lend to households and businesses.[16] There is a risk that, once a bank obtains funding from the FLS, it uses those funds for activities other than lending to small businesses and households. In particular, the price elasticity of the demand for loans by SMEs and households might be such that lower interest rates do not induce more borrowers to seek bank financing. Therefore, banks may deploy their funds to other asset classes. Accordingly, ongoing access to the FLS is dependent on the amount of new loans to SMEs and households made by banks.[17] Figure 2 shows that following the announcement of the FLS there was

[12]That concept is discussed in Section IIA4.

[13]ICB (n 10). Indeed, the protection of SMEs is an objective of the United Kingdom government in the *Financial Services (Banking Reform) Bill* (2013).

[14]Christopher James, 'Some Evidence on the Uniqueness of Bank Loans' (1987) 19 J Fin Econ 217, 223.

[15]ibid 226.

[16]Rohan Churm, Amar Radia, Jeremy Leake, Sylaja Srinivasan and Richard Whisker, 'The Funding for Lending Scheme' (2012) Q4 Bank of England Quarterly Bulletin 306, 307-8.

[17]ibid 308. '[T]he FLS boosts banks' incentives to lend by making both the amount and price of funding available to banks conditional on their lending to the UK real economy.'

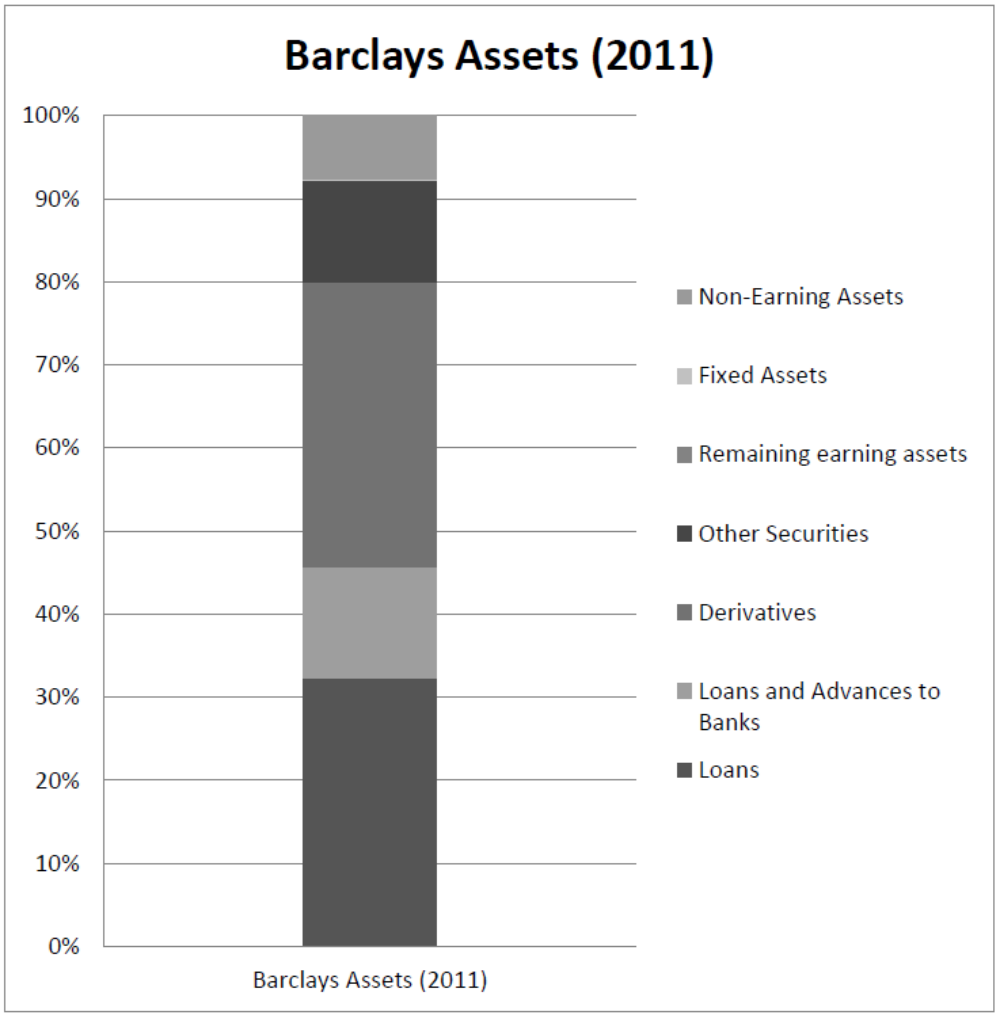


Figure 1: This figure shows the compossition of assets on the balance sheet of Barclays in 2011. It shows that about 30% of Barclay's assets were loans. This highlights the significance of loans to the business or Barclays. It also highlights the importance of other parts of its business including derivatives trading.

a decrease in the cost of long-term funding for banks. It is uncertain whether this reduced funding cost for banks has been translated to more lending to households and SMEs.

2. *Insolvency Law.* — The application of standard insolvency law to systemically important banks is undesirable because of credit-rationing. Accordingly, governments and regulators are predisposed to avoid the insolvency of systemically important banks. This predisposition is a function of the costs associated with standard insolvency. The mechanics of standard insolvency are set out here. Although the focus is on the mechanics of the process in the UK, functionally equivalent problems arise in the insolvency system of most other advanced economies. Indeed, the need for a process that eliminates agency and coordination problems is the common motivation for insolvency law in a number of jurisdictions.[18]

Professor Goode outlines two objectives for insolvency procedures:[19] either rescuing companies or facilitating their legal death. This distinction is evident in the UK when one compares the winding up process and the administration process. The purpose of winding up is to facilitate 'a sale of the firm's assets by auction'.[20] A winding up effects 'legal death through statutory dissolution.'[21] The objectives of administration, on the other hand, are to (1) rescue the company as a going concern (2) achieve a better result than an immediate winding up and (3) realise property in order to make distributions to secured and preferential creditors.[22] A by-product of both functions of insolvency law is the requirement that a process is followed which respects the property rights of the insolvent's creditors. The anticipation of and progression through this process is *costly* and leads to a significant erosion of enterprise value in three respects.[23]

First, individual creditors are able to start a reorganisation or a winding up which may entail coordination costs.[24] There is a risk that creditors may initiate proceedings that destroy asset value, but protect their individual interests. For instance, an oversecured creditor might initiate a winding up to recover the full value of their loan. However, the value of the assets from a sale process in a winding up might be lower than the going-concern value. Accordingly, unsecured creditors may receive less if insolvency proceedings are intitiated than they would through a contractual restructuring. In the context of bank

[18]Reinier Kraakman *et al.*, *The Anatomy of Corporate Law: A Comparative and Functional Approach* (2009) 122-3.

[19]Goode (n 4) 29-31. See also Kraakman *et al.* (n 18) 122. 'Reflecting the importance of the decision to continue or close down the business, jurisdictions often provide a choice of more than one bankruptcy procedure, with different associated authority and control structures. *Liquidation* procedures are geared towards a sale of the firm's assets by auction, whereas, *reorganisation*, or "rescue", procedures seek to facilitate a renegotiation of the firm's obligations to its creditors.'

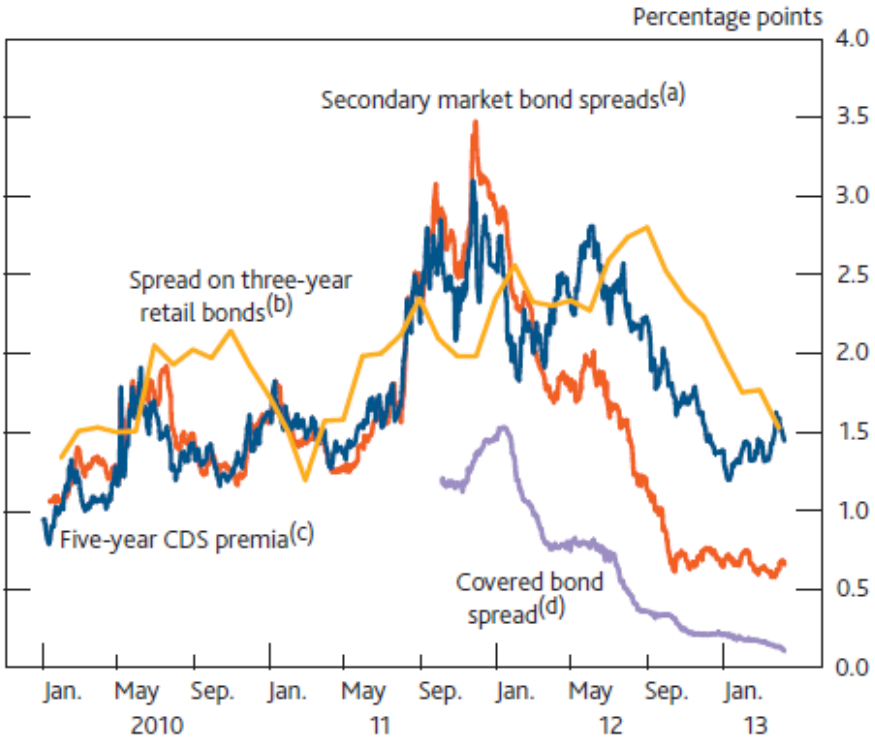
[20]ibid 122.

[21]Goode (n 4) 36 and 38.

[22]Insolvency Act (n 2) Sch B1 (3)(1).

[23]Kraakman *et al.* (n 18) 143-7.

[24]ibid 143-4.



Sources: Bloomberg, Markit Group Limited, Bank of England and Bank calculations.

(a) Constant-maturity unweighted average of secondary market spreads to mid-swaps for the major UK lenders' five-year euro senior unsecured bonds, where available. Where a five-year bond is unavailable, a proxy has been constructed based on the nearest maturity of bond available for a given institution and the historical relationship of that bond with the corresponding five-year bond. Data are up to 9 April 2013.

(b) Sterling only. Spread over the relevant swap rate. The three-year retail bond rate is a weighted average of rates from banks and building societies within the Bank of England's quoted rates sample with products meeting the specific criteria (see www.bankofengland.co.uk/statistics/Pages/iadb/notesiadb/household_int.aspx).

(c) The data show an unweighted average of the five-year senior CDS premia for the major UK lenders, which provides an indicator of the spread on euro-denominated long-term wholesale bonds. Data are up to 9 April 2013.

(d) The data show an unweighted average of the spread between euro-denominated covered bonds and equivalent maturity swap rates for a selected bond issued by each of the major UK lenders. The selected bonds have residual maturities of between three and seven years. Data are up to 9 April 2013.

Figure 2: This figure shows that following the announcement of the FLS there was a decrease in the cost of long-term funding for banks of between 50 to 100 basis points in the subsequent two quarters. Source Bank of England (2013).

insolvency, long-term secured creditors might initiate proceedings to recover their debts which may lead to an erosion in the value of the bank's assets.

Second, insolvency proceedings usually involve a delegation of control rights from directors to an insolvency practitioner and/or a court.[25] This delegation avoids the strategic negotiations involving shareholders when a bank becomes distressed, but is likely to be accompanied by diminished effectiveness in the management of the business.[26] Oversecured creditors are incentivised to prefer the least risky alternative to recover their loan because they do not benefit from an increase in enterprise value. Conversly, undersecured and unsecured creditors are incentivised to take additional risk because their proportionate return is dependent on an increase in enterprise value. An independent insolvency practitioner with duties to creditors as a whole, who relies on their reputation for future appointments is not aligned with a particular group of creditors. Similarly, a court is not inherently aligned with the incentives of a particular group. However, the appointment of these independent parties to determine the outcome of proceedings also involvess the cost of their relative inefficiency in the management of the distressed firm.

Third, despite the delegation of control rights, creditors individually retain a right to veto a plan to wind up or restructure a firm. This reintroduces the strategic bargaining of over, under and unsecured creditors. Accordingly, 'most jurisdictions do not allow voting by either creditors who will recover in full or by junior creditors who are "out of the money"'.[27]

In sum, insolvency proceedings can lead to a significant erosion of enterprise value and indeed, there is a rich literature which quantifies the erosion of value caused by insolvency. The evidence suggests that the distress costs for non-financial firms range from 10-20% of the total enterprise value of the distressed firm.[28] For banks this figure is significantly larger. The evidence suggests a bank loses 30% of its value from indirect costs and an additional 10% through the direct costs (i.e., administration and legal expenses).[29] In addition to the

[25]A key exception to this tendency is Ch 11 in the United States. Published initially as part of the Bankruptcy Reform Act of 1978, Pub L No 95-598, 92 Stat 2549 . A different explanation for the delegation is that court's to overcome the under innovation caused by freedom of contract because of (1) the resources involved in drafting a new contract and (2) the costs of enforcement including uncertainty about being able to enforce. See Julian Franks and Oren Sussman, 'Financial Innovations and Corporate Bankruptcy' (2005) 14 Journal of Financial Intermediation 283.

[26]In the context of systemically important instiutions it has been argued that delegation to judges is problematic because they lack the expertise to execute rapid resolutions. '[T]he bankruptcy process is managed by a judge. Though federal regulators are subject to political pressure, they possess expertise that is generally beyond the ken of judges. When a systemically important institution suffers distress, rapid decision making is necessary. Federal law permits this kind of speed when the FDIC seizes a bank.' See Edward R Morrison, 'Is The Bankruptcy Code An Adequate Mechanism For Resolving The Distress Of Systemically Important Institutions' (2009) 82 Temple L Rev 449, 461.

[27]Kraakman *et al.* (n 18) 143-7. In the United Kingdom this restriction is set out in Insolvency Act (n 2) Sch B1 (52).

[28]Gregor Andrade and Stephen Kaplan, 'How Costly is Financial (Not Economic) Distress? Evidence from Highly Leveraged Transactions that Became Distressed' (1998) 53 J Fin 1443, 1446-7.

[29]James (n 3) 1228.

costs of failure of one bank, the interconnectedness of banks can precipitate contagion in the financial system and cause credit-rationing in the real economy. These costs are far geater than the 30% identified in the empirical literature because of credit-rationing.[30]

3. *Contagion.* — Contagion and credit-rationing are important because the failure of a systemically important bank can significantly reduce the capacity of all affected banks to provide loans to SMEs and households as was discussed in Section IIA1. The risk of credit-rationing looms large in the Financial Stability Board's (**FSB**) Key Attributes paper, which begins:

> "The objective of an effective resolution regime is to make feasible the resolution of financial institutions without severe systemic disruption and without exposing taxpayers to loss, while protecting vital economic functions through mechanisms which make it possible for shareholders and unsecured and uninsured creditors to absorb losses in a manner that respects the hierarchy of claims in liquidation"[31]

In this paper, contagion refers to the transmission of liquidity or solvency problems from one bank to (1) non-bank instituions and (2) other banks in the financial system. The International Monetary Fund calculated that the historical average cumulative loss in output growth caused by contagion in the financial system and into the real economy was 11.5% of GDP.[32] The greater the contagion caused by the failure of a bank, the more likely that a government will bail it out to avoid the calamity associated with its failure.

A contagion channel to non-bank institutions is for the failure of a bank to have an impact because of the relationship of the bank with the non-bank insistution. Using their comparative advantage in information exchange to identify purchasers, banks use their reputation to facilitate the sale and purchase of the newly issued securities.[33] Accordingly, when a bank becomes insolvent its clients lose the benefit of its reputation. Consistent with this expectation, Fernando et al estimated the loss of value to firms that employed Lehman Brothers to assist in the issue of equity and debt securities. They found that those firms lost 5% of their equity market value or $23bn of market capitalisation following the failure of Lehman Brothers.[34] This statistic highlights that the failure of financial institutions can have direct detrimental effects on the real economy. While significant, this form of contagion is not the

[30]Joseph E Stiglitz and Andrew Weiss, 'Credit Rationing in Markets with Imperfect Information' (1981) 71 Am Econ Rev 393. See also Stephen D Williamson, 'Costly Monitoring, Loan Contracts, and Equilibrium Credit Rationing' (1987) 102 QJ Econ 135.

[31]Financial Stability Board (n 10) 3.

[32]Int'l Monetary Fund, *IV World Economic Outlook - Financial Crises: Characteristics and Indicators of Vulnerability* (1998) 74, 79.

[33]Alan D Morrison and William J Wilhelm, Jr, *Investment Banking: Institutions, Politics, and Law* (2007) Ch 3.

[34]Chitru S Fernando, Anthony D May and William L Megginson, 'The Value of Investment Banking Relationships: Evidence from the Collapse of Lehman Brothers' (2012) 67 J Fin 235, 33.

usual justification for bailing out G-SIBs and other banks. The justification for avoiding insolvency law is credit-rationing by a number of banks because of the spread of contagion.

A channel of contagion to other banks arises out of interconnections on the asset side or the liability side of the distressed bank's balance sheet.

On the asset side, in situations of distress the assets held by banks appear to become correlated.[35] This occurs irrespective of whether the institutions hold correlated assets. In other words, two institutions might hold completely uncorrelated assets and yet when one is in distress there is an adverse effect on the other. A number of explanations have been proffered to explain this type of contagion.

First, prices can be temporarily dislocated because distressed banks sell assets below their fundamental value due to their need for liquidity. This dislocation of prices from their value in an efficient market is supported by the notion that market efficiency requires price accuracy and liquidity.[36] Banks can hold significant positions in securities so that any distressed selling can move prices. Indeed, other market participants are likely to seek a liquidity discount if a bank becomes a forced seller, or the assets might become subject to cash-in-the-market pricing.[37] This example explains contagion between banks holding the same or correlated securities.

Second, investors may assess credit risk based on the reputation of a regulator so that a regulators reputation affects all regulated banks.[38] If that reputation is damaged, through for instance a regulated bank failing, then investors may charge a higher premium to all other regulated banks. Therefore, banks with uncorrelated securities may be adversely affected by a perceived failure on the part of their common regulator to ensure the stability of a regulated bank.

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[35]Kathy Yuan, 'Asymmetric Price Movements and Borrowing Constraints: A Rational Expectations Equilibrium Model of Crises, Contagion, and Contagion' (2005) 60 J Fin 379, 397-403. See also Francis A Longstaff, 'The Subprime Credit Crisis and Contagion in Financial Markets' (2010) 97 J Fin Econ 436. The author finds empirical results consistent with liquidity driving contagion in the financial markets during the subprime crisis. Graciela L Kaminsky and Carmen M Reinhart, 'On Crises, Contagion, and Confusion' (2000) 51 J of Int Econ 145. The paper discusses contagion at the national level as well as through financial systems.

[36]Zoshar Goshen and Gideon Parchomovsky, 'The Essential Role of Securities Regulation' (2006) 55 Duke L Rev 711, 720. 'Efficient markets are characterized by accurate pricing and high liquidity. Accurate pricing is essential for achieving efficient allocation of resources in the economy . . . Liquid markets benefit the economy by reducing the cost of transacting and the risk associated with investments. Markets are liquid when traders can buy or sell large quantities, immediately, without causing a substantial price effect. This liquidity is a function of time, price and quantity.'

[37]Section III for a discussion of cash-in-the-market pricing. See Franklin Allen and Douglas Gale, 'Limited Market Participation and Volatility of Asset Prices' (1994) 84 Am Econ Rev 933. See also Franklin Allen and Douglas Gale 'Cash-in-the-Market Pricing to Financial Fragility' (unpublished manuscript, 2004) <http://www.econ.nyu.edu/user/galed/papers/paper04-09-03.pdf>.

[38]Alan D Morrison and Lucy White, 'Reputational Contagion and Optimal Regulatory Forbearance' (2010) Eur C Bank Working Paper 1196 .

On the liability side, banks can become interconnected through wholesale markets. However, transactions in the wholesale market can expose lending banks to the credit risk of the borrowing banks. If the borrower becomes distressed, an asset on the balance sheet of a lending bank has to be impaired. This is known as cross-holding contagion.[39] Indeed, the fear of cross-holding contagion of this type may explain why wholesale funding to banks like Northern Rock, Bear Stearns and Lehman Brothers dried up leading to their insolvency.[40]

4. *Credit-Rationing.* — Credit-rationing occurs when banks are unable to provide loans to SMEs or households for positive net present value projects.[41] There are two theories about how credit-rationing arises.

First, credit-rationing arises when interest rates reach a level where good borrowers avoid borrowing from banks while bad borrowers continue to borrow.[42] In a market with perfect information an increase in interest rates leads to an increase in a bank's expected return. However, when there is adverse selection, an increase in interest rates leads good borrowers to exit the market while bad borrowers continue to borrow. Accordingly, at a certain point, increases in interest rates actually lead to a *reduction* in a bank's expected return. Credit-rationing occurs when there is more demand for loans for positive net present value projects than supply because a bank is unwilling to increase interest rates such that the demand and supply of loans are equal.[43] When a bank is adversely affected by a shock, and its borrowing costs increase, it must in turn increase the returns from loans by increasing interest rates. However, owing to the adverse selection effect, it may drive out good borrowers by increasing interest rates. Accordingly, the bank may stop lending, rather than increasing the interest rates it charges and lowering its expected returns.[44]

The second explanation of credit-rationing is based on moral hazard.[45] In essence, banks

[39]A stylised version of this argument was described by Allen and Gale: Franklin Allen and Douglas Gale, 'Financial Contagion' (2001) 108 J Pol Econ 1 and Franklin Allen and Douglas Gale, *Understanding Financial Crises* (2007) 263. 'The only solution to a global shortage of liquidity (withdrawals exceed short assets), is to liquidate long assets ... each bank has a limited bufer that it can access by liquidating the long asset. If this buffer is exceeded, the bank must fail.'

[40]Hyun S Shin, *Risk and Liquidity* (2010) 161.

[41]Fundamentally, credit-rationing is a problem that is based on information. In the context of firms, this information perspective was well summarised by Holmstrom and Tirole. Bengt Holmström and Jean Tirole, 'Financial Intermediation, Loanable Funds, and the Real Sector' (1997) 112 Q J Econ 663, 679. 'In a credit crunch, banks will have to sort out the good risks from the bad, and small firms will not be worth the fixed cost of getting informed.'

[42]Stiglitz and Weiss (n 30) 398. 'A credit rationing equilibrium exists given ... the demand for loanable funds ... exceeds the supply of loanable funds ... and any individual bank increasing its interest rate ... would lower its return per dollar loaned.'

[43]ibid 398. See also Williamson (n 30) 141. '[A]gents who do not receive loans are "rationed" in this case, in the sense that they would be willing to pay interest rates higher than market rates to receive loans, but no one would be willing to lend to them at any interest rate.'

[44]Stiglitz and Weiss (n 30) 406-7.

[45]Jean Tirole, *The Theory of Corporate Finance* (2006) 114. 'A key feature of this model is that lenders face an agency problem as the borrower may mismanage the project. She may take a private benefit and

might be unwilling to lend to a borrower with a positive net present value project because they expect the manager of the project to act opportunistically. A project might be viable but it may be difficult for a bank to monitor the manager. The manager might mismanage the project in order to obtain private benefits or rents from the investor. The private benefits that the manager receives from opportunistic behaviour might be lower in absolute value terms than the returns from maximising profits. However, private benefits only accrue to managers whilst profits are shared with the bank. Accordingly, there are circumstances when managers are incentivised to act opportunistically despite the absolute cost of their strategy.[46]

Credit-rationing occurs at two levels. First, at the level of the distressed bank. Banks might be unwilling to lend because of moral hazard or adverse selection, meaning that positive net present value projects are not financed. Second, credit-rationing might occur at interconnected banks because of contagion. The effect of the inability to obtain liquidity is that interconnected banks may also be unable to fund positive net present value projects. In aggregate, the failure of a systemically important bank can be costly to the real economy in terms of growth and in terms of damage to the payments system.[47]

The threat of credit-rationing looms large in the minds of governments and regulators. A response is to bail out systemically important banks in order to avoid credit-rationing. This was the action taken by governments and regulators in advanced economies in the period following the insolvency of Lehman Brothers.

B. *Bailouts*

Bailouts are a method of side-stepping insolvency. This sub-section explains the justification for bailouts. It introduces the notion of moral hazard and explains how bailout costs have been increased because of moral hazard and ineffective regulation.

1. *A Solution to Credit-Rationing.* — A solution to credit-rationing is bailing out distressed banks. There is a rich history of bank bailouts which began with Continental Illinois.[48] The incentive to bail out banks is based on a desire to avoid the deleterious conse-

thereby reduce the probability that the project suceeds. The private benefit is inefficient in that its value to the borrower is smaller than the foregone profit; yet the borrower, who receives the entire private benefit and only part of the profit, may choose to enjoy the private benefit. The borrower must then keep a sufficient stake in the outcome of the project in order to have an incentive not to waste the money. Consequently, the project's income cannot be fully pledge to outside investors, which in turn implies that the project may not receive financing even if the expected income when the manager behaves exceeds the investment cost, that is, even if the project has positive net present value (NPV). That is, there may be credit rationing.'

[46]ibid 114.

[47]Mathias Dewatripont and Xavier Freixas, 'Bank Resolution: Lessons from the Crisis' in Mathias Dewatripont and Xavier Freixas eds. (ed), *The Crisis Aftermath: New Regulatory Paradigms* (2012) 109.

[48]Mathias Dewatripont and Jean Tirole, *The Prudential Regulation of Banks* (1994) 16. Continental Illinois is often cited as the first illustration of the policy of providing bailouts to banks to avoid the deleterious

quence of placing a bank into insolvency. Brierley said:

> "The failure of banks can generate large negative externalities to the stability of the financial system, in a manner unlikely to apply to non-financial companies. *Application of the corporate insolvency law could aggravate rather than reduce these system-wide losses".*[49]

The threat of credit-rationing forces governments to bail out systemically important banks. However, in order to avoid insolvency bailout funds must be used to satisfy all bank debt, including uninsured depositors and unsecured creditors. Under the *Insolvency Act 1986* (UK) a company is considered insolvent if it is "unable to pay its debts". Insolvency can be established by applying the cash flow test which is satisfied if a bank is unable to pay even a *single* debt.[50] Accordingly, in order to avoid insolvency, a bank must pay all the debts owing to all of its creditors.

To avoid insolvency, bailout funds are used to repay the bank's debt. Fortunately, not all debt causes contagion and credit-rationing. In fact, some creditors can be made to bear losses to reduce the size of bailouts *ex-post* which creates an incentive for them to discipline banks *ex-ante*. In essence, insolvency law can be changed to avoid contagion and credit-rationing so that creditors have an incentive to limit bank risk-taking in order to avoid losses. Loss-absorbing debt such as bail-in and CoCos are tailored insolvency tools that can be used to create credible and effective bank resolution.

There are at least three interrelated limitations of bailouts. First, the objective of avoiding insolvency leads to bailout funds being used to bail out creditors that are capable of bearing losses. Second, all creditors anticipate that they will receive bailout funds and therefore lack the *ex-ante* incentive to discipline banks. Third, due to a lack of creditor discipline, banks can take excessive risks to maximise shareholder return.[51]

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consequences of their insolvency. See also Dewatripont and Tirole (n 47) 111.

[49]Peter Brierley, 'The UK Special Resolution Regime for Failing Banks in an International Context' (July 2009) Bank of England Financial Stability Paper No 5 , 4.

[50]Goode (n 4) 128. 'Where a company defaults in payment of an undisputed debt after demand has been made, that is sufficient evidence that it is unable to pay its debts as they fall due, and if it persists in its failure to pay it will be taken to be unable to pay its debts even if in fact it appears to be solvent. This salutary rule, which applies on the failure to pay even a single debt, reflects the view that a company which is able to pay an undisputeddebt and chooses not to do so has only itself to blame if the inference is drawn that it is unable to pay.' See also John Armour, Henry Hansmann and Reiner Kraakman, 'The Essentials of Corporate Law: What is Corporate Law?' (2009) Harvard John M Olin Discussion Paper No 632 , 3 <http://lsr.nellco.org/harvard_olin/632/>.

[51]The last two points together highlight a time inconsistency problem. William W Lang & Douglas D Robertson, 'Analysis of Proposals for A Minimum Subordinated Debt Requirement' (2002) 54 Journal of Economics and Business 115, 119. 'The time inconsistency problem arises because it may be socially desirable in the near-term to act to prevent a systemic crisis when faced with a failure of one or more very large banks. However, the likelihood that the government may choose to bail out failing institutions may itself be a causal factor generating high-risk banks. For these types of time inconsistency problems, the optimal policy often requires the establishment of *ex ante* rules that credible eliminate or reduce the ability of policy makers to influence decisions to close banks.'

Together, these interrelated limitations of bailouts are a function of moral hazard. Creditors do not have an incentive to reduce bank risk-taking because they expect to be bailed out. This expectation has created incentives for bank managers to increase the riskiness of bank assets. One way that bank managers have increased the riskiness of bank assets is to cross-subsidise risky business lines with funds raised from their commercial banking arms. Another way that banks have increased the riskiness of their assets is by increasing the size of their balance sheet, which increases competition for assets, which in turn decreases margins and creates instability. Essentially, as bank balance sheets have increased instability has also increased. These two examples are expanded upon below.

2. *Cross-Subsidising Business Lines.* — The cost of bailouts is raised by universal banking because its lenders are also guaranteed by the state. Universal banks combine the lending and payment services of commercial banks with other financial services such as underwriting, propreitary trading, and brokerage.[52] Managers of universal banks can use money raised in their commercial banking arm, through deposits for instance, to finance their investment banking activities. If the universal bank fails, the investment banking creditors benefit from the bailout. The explicit guarantee of deposits lowers the bank's cost of funding for its commercial banking activities and the implicit guarantee of its investment banking arm lowers the cost of its other sources of funding. Bank managers are incentivised to create universal banks because the implcit guarantee of investment banking activities lowers their cost of funding relative to investment banks. Although the discussion below concerns legislative changes in the United States it is relevant to European and UK authorities because universal banks established in the United States operate in the Europe and in the UK.

In the United States, the *Glass-Steagall Act* (1933)[53] limited the possibility of cross-subsidisation. Once it was removed, behemoths developed and the focus of banks changed to cross-subsidising investment banking activities with subsidised commercial bank funding. From a deregulation perspective the most significant change in the United States was the passing of the *Financial Services Modernization (Gramm-Leach-Bliley) Act* (1999)[54] which removed the last remnants of the *Glass-Steagall Act* (1933).[55] *Glass-Steagall* separated commercial and investment banking so that institutions that provided underwriting and

[52]Alan D Morrison, 'Universal Banking' in Allen N. Berger, Philip Molyneux and John O.S. Wilson eds. (ed), *The Oxford Handbook of Banking* (2010) 171. 'Universal banks are institutions that combine the lending and payment services of commercial banks with a wider range of financial services. In particular, universal banks underwrite securities, and hence can offer their client firms access to a broader range of sources of funds that can specialist commercial or investment banks.'

[53]Banking (Glass-Steagall) Act of 1933, Pub L No 73-66, 48 Stat 162 (codified as amended in scattered sections of 12 U.S.C.).

[54]Financial Services Modernization (Gramm-Leach-Bliley) Act of 1999, Pub L No 106-02, 113 Stat 1338 (codified as amended in scattered sections of 12 and 15 U.S.C.).

[55] (n 53).

advisory services could not receive retail deposits. *Glass-Steagall* had been slowly eroded over time so that by the time it was finally repealed banks such as Citicorp and JP Morgan were well on their way to becoming the universal banks that they are today.[56]

There are at least four theoretical benefits of universal banking. First, from an agency cost perspective, bank shareholders can expropriate bank creditors by adding additional risk after borrowing; similarly, management can expropriate bank shareholders by transferring wealth to themselves using their control rights.[57] A universal bank that holds both debt and equity in a firm is incentivised to protect both types of interests by reducing agency costs. With 'appropriate incentives' a bank can reduce the cost of external finance.[58] Second, from an adverse selection perspective, a universal bank that (1) is an insider, (2) is willing to hold junior claims and (3) has a long-term banking relationship sends a robust signal about the health of a firm if it provides a loan.[59] Third, there is an argument that concentrated holdings reduce renegotiation costs and that universal banks are more likely to help restructure a distressed firm.[60] Fourth, a long-term relationship allows banks to incur costs in screening and monitoring when a firm is in its infancy. Banks collect fees below their marginal cost, and then collect fees above their marginal cost as the firm matures and becomes more profitable.[61]

Empirically, there are conflicting views about the capacity of universal banks to affect the financing costs of affiliated firms. One argument is that universal banks (banks with commercial and investment banking arms) are better able to extract valuable information from their borrowers than commercial banks. Evidence from the United States suggests that universal banking lowered the cost of financing.[62] Following the *Glass-Steagall Act* (1933) the increased informational and transactional costs associated with commercial banking led

[56]Chairman Markey argued that erosions of the *Glass-Steagall Act* (1933) gave rise to a need to discuss whether the division between commercial and investment banking ought to be included in a new type of regulation or the repeal of *Glass-Steagall*. Edward J Markey, 'Why Congress Must Amend Glass-Steagall: Recent Trends in Breaching the Wall Separating Commercial and Investment Banking' (1990-1991) 25 New Eng L Rev 457, 475 '[T]o allow unregulated affiliation between federally insured commercial banks and investment banks would be to invite a recurrence of past misdeeds. It is therefore incumbent upon Congress to enact legislation which acknowledges contemporary realities and allows the competitive and consumer benefits of affiliation while simultaneously protecting against potential abuses'.

[57]Charles W Calomiris, 'Corporate-Finance Benefits From Universal Banking: Germany and the United States, 1870-1914' (Jul 1993) Nat'l Bureau of Econ Research Working Paper 4408 , 6-7; Michael C Jensen and William H Meckling, 'Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure' (1976) 3 J Fin Econ 305.

[58]Calomiris (n 57) 18. See also, Carlos D Ramirez, 'Did J.P. Morgan's Men Add Liquidity? Corporate Investment, Cash Flow, and Financial Structure at the Turn of the Twentieth Century' (1995) 50 J Fin 661.

[59]James (n 14); Calomiris (n 57) 7.

[60]ibid 7.

[61]ibid 8-9.

[62]Charles W Calomiris, 'Universal Banking and the Financing of Industrial Development' (Nov 1995) World Bank Policy Research Working Paper 1533 , 8-10. 'The synergies between commercial banking and underwriting can be divided into three categories: economies of information and control, "brick and mortar" network cost savings, and diversification benefits that reduce intermediaries' costs of funds.'

to a lower propensity to issue equities.[63]

However, a counter argument has been developed based on empirical studies on universal banks in Germany between 1903–13. The results indicate that relationships with universal banks did not increase the liquidity that could be obtained by attached banks.[64]

A potential cost of universal banking is that it allows invest banks to take risks that are guaranteed by the government because of the contagion and credit-rationing that would follow from the insolvency of the commercial banking arm.[65] Indeed, there is support for the proposition that in a universal bank with a single balance sheet, the size of a taxpayer bailout is maximised because losses from the investment bank threaten retail depositors in a commercial bank.[66] There is little discussion about whether losses from an investment bank can cause contagion and credit-rationing from the asset side of the balance sheet. It seems plausible that this is also a possibility. Taken together, these arguments speak to the cost of universal banking and support recent reforms directed at separating commercial banks from (certain) investment banking activities.

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[63]Calomiris (n 57) 18. See Ramirez (n 58) 676. The paper shows that a relationship with J.P. Morgan between 1908 and 1912 reduced thereliance of firms to use financial slack. 'The typical Morgan corporation was observed to rely less on internal funds to finance capital expenditures. By contrast, companies not affiliated with Morgan depended more on internal funds to finance their investment expenditures.'

[64]See Caroline Fohlin, 'Relationship Banking, Liquidity, and Investment in the German Industrialization' (1998) 53 J Fin 1737, 1755. In a related paper, there is also evidence from Italy suggests that newly public firms faced liquidity constraints that were not overcome by a banking relationship. Accordingly, the receipt of debt financing from a universal bank had no positive impact on the preference for banks to build up financial slack instead of seeking financing from external sources. One explanation of this result may be that attached firms were already highly levered and thus constraints on interest rates meant financial slack was the only way to finance new projects. Caroline Fohlin, '*Fiduciari* and Firm Liquidity Constraints: The Italian Experience with German-Style Universal Banking' (1998) 35 Explorations in Economic History 83, 94-5.

[65]Alan D Morrison, 'Systemic Risks and the "Too Big to Fail" Problem' (2012) 27 Oxford Rev Econ Pol 498, 505. 'The 2007-9 financial crisis provides stronger support for the hypothesis that universal banks increase the scale of the TBTF effect. Government support was extended to a large number of non-banking firms. Part of the problem here appears to have been the sheer complexity of the firms in question. For example, Michael Foot, formerly head of banking supervision at the Bank of England, told the 2009 House of Lords inquiry into Banking Supervision and Regulation that some banks are now "too-complex-to-manage", and remarked that "I used to look at Citibank and I wondered how any group of human beings could actually run that entity"'.

[66]Xavier Freixas and Gyöngyi lóránth and Alan D Morrison, 'Regulating Financial Conglomerates' (2007) 16 Journal of Financial Intermediation 479, 482. 'In contrast to holding-company conglomerates, however, integrated conglomerates are able as a result of their single balance sheet to achieve inter-divisional diversification. For a given investment portfolio, this diversification reduces the costs of deposit insurance, and hence raises welfare relative to the standalone bank case. But risk levels are selected endogenously: they will change in response to conglomerate formation. Because they have a common balance sheet, the divisions of the integrated conglomerate have common liabilities. Large-scale losses in non-bank divisions therefore harm bank depositors, and so result in a call upon the deposit insurance fund. This mechanism extends the reach of the deposit insurance fund, and hence reduces market discipline relative to the standalone case in non-bank divisions. Depending upon the benefits derived from diversification, this reduction in market discipline may even justify *higher* capitalrequirements for the conglomerate than for its stand alone constituents.'

In summary, universal banking relationships facilitate access to the credit markets.[67] At the same time universal banking could be costly to governments because of an implicit guarantee of *all* bank creditors. The implication of this conclusion is that universal banks could be redesigned so that their benefits are retained but their costs to taxpayers, in terms of bailouts, are reduced or eliminated. One way to do this is to redesign insolvency law.

In the spirit of maintaining universal banks but limiting the exposure of taxpayers, legislation has been enacted to structurally separate the commercial and investment banking activities of universal banks in the United States, the United Kingdom, and Europe. In the United States, the Volcker rule which was enacted as part of Dodd-Frank prohibits proprietary trading but otherwise does not eliminate universal banking.[68] In Europe, the Liikanen report recommended a version of the ring-fence proposed by the ICB for non-bank financial institutions.[69] Likewise, in the United Kingdom the Independent Commision on Banking's (**ICB**) ring-fence separates commercial and investment banking activities within a corporate group.[70] The proposals attempt to facilitate the application of insolvency law to the investment banking arm of universal banks. However, credible and effectively designed insolvency law may still be necessary to ensure that the structural separation reduces the probability and size of bailouts.

3. *Increasing Bank Assets.* — The cost of bailouts is also raised by an increase in the amount of bank assets relative to gross domestic product (**GDP**). As bank assets increase, the impact of credit-rationing becomes more important as does the need for insolvency mechanisms that restore the incentives of creditors to monitor risk-taking by bank managers.

The increase in bank assets leads to increased competition amongst banks and non-bank financial institutions lowering their margins and increasing instability.[71] One way that increased competition for assets may have created instability is the incentive it creates for banks to engage in regulatory arbitrage using securitised products.

Securitisation played an important role in the financial crisis. Investment banks amassed exposures to risky securitised assets.[72] It was thought that securitisation could be used to

[67]Morrison (n 52) 175. On balance, the evidence suggests that 'a universal banking relationship could ease access to the credit markets.'

[68]Wall Street Reform and Consumer Protection (Dodd-Frank) Act of 2010, Pub L No 111-203, sec619, 124 Stat 1376 .

[69]Liikanen et al (n 10) 99-107.

[70]ICB (n 10). The ICB's proposal has been included in a draft bill currently before Parliament: the *Financial Services (Banking Reform) Bill* (2013).

[71]Dewatripont (n 48) 27. 'On the borrowing side, banks must increasingly compete with mutual funds, pension funds, and insurance companies for savings. On the lending side, highly rated firms have issued substantial amounts of commercial paper, while lesser-rated companies have also bypassed banks by issuing junk bonds.'

[72]Shin (n 40) 153. 'Far from passing on the bad loans to the greater fool next in the chain, the most sophisticated financial institutions amassed the largest exposures to the bad assets.'

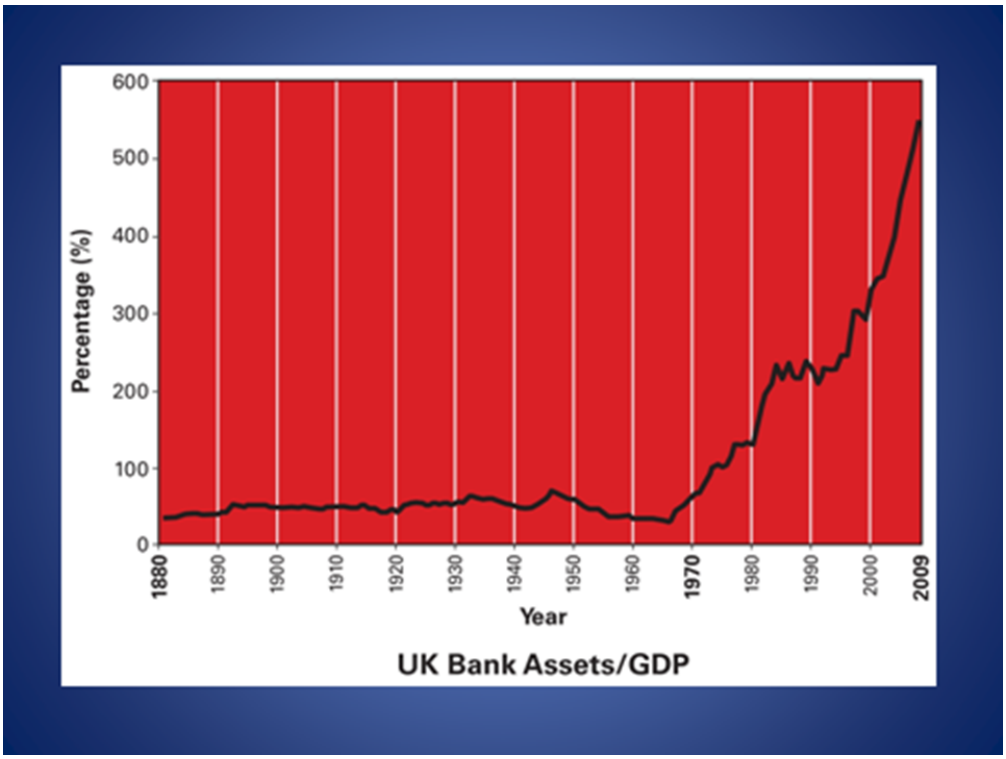

Figure 3: This figure shows the growth in UK bank assets to GDP. It highlights the growth in the banking sector and supports the notion that as banks purchase more assets they increase the competition for those assets. This competition in turn decreases the margins for holding assets and creates instability in the financial system. Source: Lord May, *Presentation at the Oxford-Man Institute* (May 2013).

overcome the maturity mismatch of bank assets and liabilities.[73] However, as history shows securitisation was not a panacea for banks. Indeed, it exacerbated the riskiness of the banking system because of interconnectedness. Through securitisation banks were immediately able to realise cash from long-term obligations such as home loans, car loans and credit card repayments. Securitised products were also used as collateral for secured wholesale transactions. There is evidence that overnight Repos were used by banks to roll over a quarter of their balance sheets every night.[74] This may still be the case. For instance, Figure 4 shows that in 2011 Goldman Sachs invested 25% of its assets in Reverse Repos and Cash Collateral.

Banks became more reliant on secured wholesale funding, and as a consequence the demand for securitised products grew tremendously. Securitisation increased systemic risk in at least two ways. First, it allowed banks to engage in regulatory arbitrage because the risk weighting of securitised assets was lower than the risk weighting of holding the long-term asset itself. For instance, a securitised product may have ten tranches. The bottom tranche could be the first to bear losses. If a bank only held the bottom tranche it would only need to hold collateral against that tranche and not against the entire product. If the bank bought the underlying assets it would need to hold capital against the entirety of the asset. Securitisation effectively allowed banks to take the same level of risk as holding the entire underlying asset by holding only a small tranche of a securitised product. Second, securitisation increased interconnectedness.[75] The same securtised product could be used by multiple participants in the wholesale market at the same time. Rehypothecation is when the same asset is used as security for a number of co-existing transactions. It increases interconnectedness and causes contagion if haircuts on the asset increase or if demand for the asset dries up. By increasing the amount of assets they manage bank managers increased instability in the financial system. These risks increase the expected size of bailouts. Creditors lack the incentives to stop bank managers from taking these risks because they expect to be bailed out. The incentive for creditors to limit risk-taking by managers can be restored by creating credible and effective insolvency.

[73]Gary Gorton 'Slapped by the Invisible Hand' (unpublished manuscript, May 2009) <http://www.frbatlanta.org/news/CONFEREN/09fmc/gorton.pdf>. 'In the early 1990s competition from non-banks (e.g., money market mutual funds, junk bonds), and deregulation (e.g., of interest rate ceilings) caused bank charter values to decline, which in turn caused banks toincrease risk and reduce capital ... The carrot essentially disappeared and regulators increasingly relied on the stick, and that was increasingly capital requirements.' See also, Dewatripont (n 48) 27.

[74]Shin (n 40) 156. Shin suggests that 'the use of overnight repos became so prevalent that, at its peak, the Wall Street investment banks were rolling over a quarter of their balance sheets every night.' See also Mark J Roe, 'The Derivatives Market's Payment Priorities as Financial Crisis Accelerator' (2011) 63 Stan L Rev 539, 552.

[75]Shin (n 40) 159-60. Shin notes: 'banks must lend more to each other in order to achieve their desired risk-taking profile and leverage, given their strong capital position. In such a scenario, banks take on more of each other's debts and the intertwining of claims and liabilities becomes more far-reaching. The image is of an increasingly elaborate edifice built on the same narrow foundation, so that the structure becomes more and more precarious.'

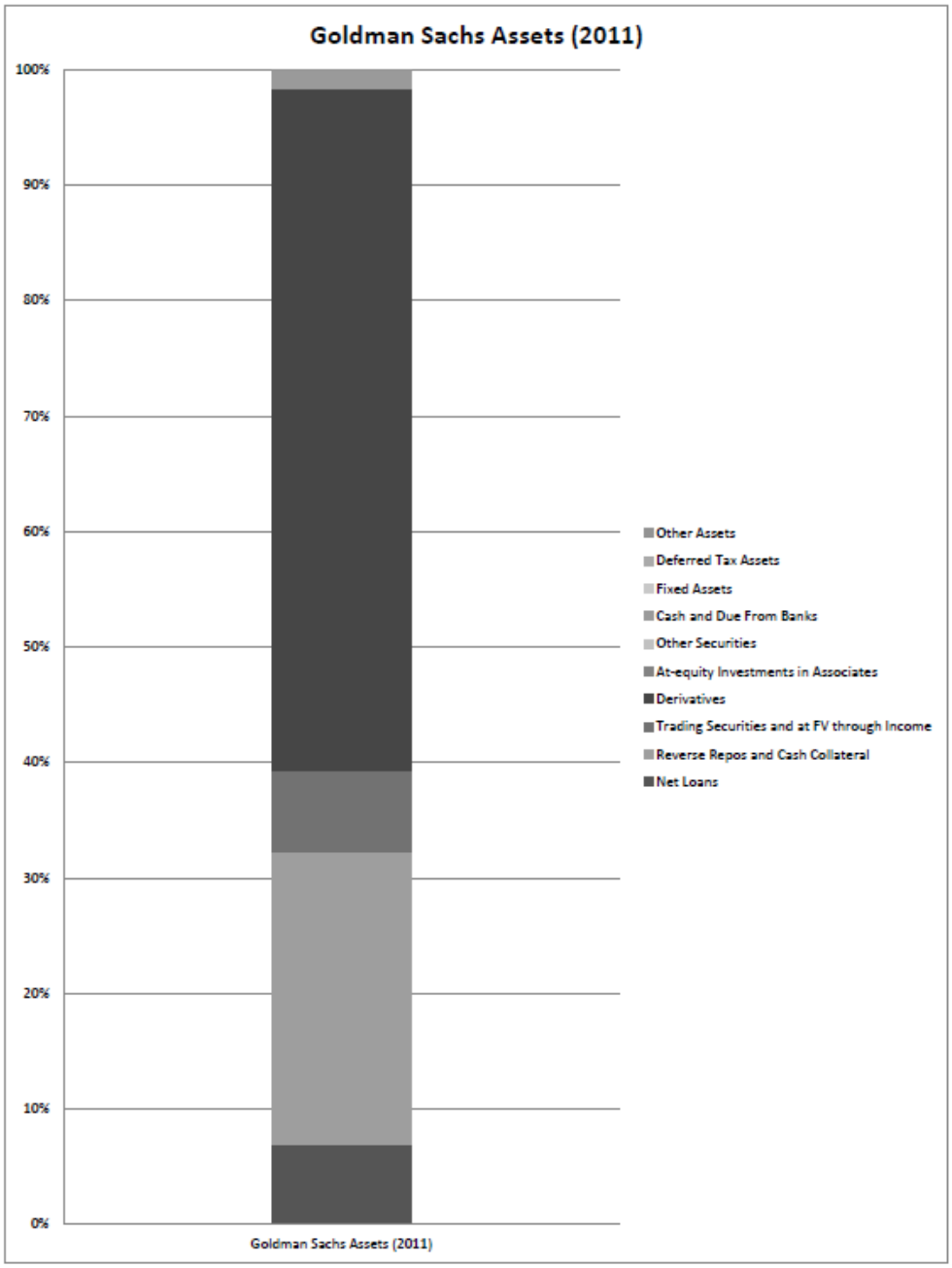

Figure 4: This figure shows the composition of assets held by Goldman Sachs in 2011. It shows that approximately 30% of Goldman's assets are reverse repos and cash collateral. This shows the importance of wholesale market transactions to the business conducted by Goldman Sachs. Source: Bankscope.

4. *Explicit Exclusion of Creditors From Insolvency.* — The size of bailouts has increased because wholesale lenders can run when a bank approaches insolvency. Although governments have a legitimate interest in the regulation of banks, this has not always resulted in the enactment of regulation reducing the size and need for bailouts. Indeed, regulation directed at reducing individual instability amongst banks has created financial instability. In order to overcome contagion in the wholesale market, there is an exception to the application of traditional insolvency laws for secured wholesale market creditors. Normally, a creditor is precluded from enforcing its contractual rights when a bank becomes insolvent. This preclusion is known as a stay and arises naturally as part of the administration procedure in the United Kingdom.[76]

There is an exemption from the stay that allows counterparties in certain wholesale transactions including Repo, secured lending and derivatives arrangements to enforce their debts against an insolvent bank.[77] The Financial Collateral Directive[78] sets out the exception in the following way:

> Member States shall ensure that on the occurrence of an enforcement event, the collateral taker shall be able to realise in the following manners, any financial collateral provided under, and subject to the terms agreed in, a security financial arrangement:
>
> (a) financial instruments by sale or appropriation and by setting off their value

[76]Insolvency Act, 1986, sch. B1, paras 42 and 43 (U.K.). See also Goode (n 4) 425-6. Franklin Edwards and Edward Morrison, 'Derivatives and the Bankruptcy Code: Why the Special Treatment' (2005) 22 Yale J on Reg 91, 96-7.

[77]In the United States this exemption has been the subject of a growing literature. The literature suggests that the exemption ought to be removed and wholesale market creditors ought to be treated like ordinary secured creditors. See Roe (n 74); Edwards and Morrison (n 76); Darrell Duffie & David Skeel, 'A Dialogue on the Costs and Benefits of Automatic Stays for Derivatives and Repurchase Agreements' (Mar 2012) University of Pennsylvania Law School Research Paper No 12-2 ; Morrison (n 26). For a model explaining the limited effect of a removal of the exemption: Antoine Martin *et al.* 'Repo Runs' (unpublished manuscript, Dec 2012). David A Skeel, Jr & Thomas H Jackson, 'Transaction Consistency And The New Finance In Bankruptcy' (2012) 112 Columbia Law Rev 152, 197. There is a slight wrinkle in the United States whereby the stay applies to secured wholesale transactions involving systemically important banks but not to other banks. 'If one concluded that the stay is most essential for large, systemically important debtors—as is plausible—the resoltion framework might appear to make a bankruptcy stay unnecessary. The kinds of institutions that featured in the crisis—the AIGs ad Lehmans—are covered by the FDIC's newly expanded powers, and these powers include a temporary stay. . . . In our view, transaction consistency should not be limited to large, systemically important financial institutions. Even if one wishes to limit its scope to these institutions, the new resolution regime would not obviate the need for bankruptcy changes. The scope of the regime, broad as it is, is not exhaustive. Most financial institutions, even quite large ones, would be subject to the bankruptcy process, not the new resolution regime.' See also (n 25). In relation to the European Union and the United Kingdom see Directive 2002/47/EC of the European Parliament and of the Council of 6 June 2002 on Financial Collateral Arrangements [2002] OJ L168/43 (Financial Collateral Directive); The Financial Collateral Arrangements (No. 2) Regulations 2003 2003/3226 (U.K.); and The Financial Markets and Insolvency (Settlement Finality and Financial Collateral Arrangements) (Amendment) Regulations 2010 2010/2993 (U.K.).

[78]Financial Collateral Directive.

against, or applying their value in discharge of, the relevant financial obligations;

(b) cash by setting off the amount against or applying it in discharge of the relevant financial obligations.

The economic effect of the exemption is to allow counterparties to enforce security against a distressed bank. The exemption was justified on the basis of reducing the credit risk in wholesale market transactions.[79]

Essentially, by allowing counterparties to enforce against distressed banks the counterparties exposure to credit risk is reduced and their individual stability is facilitated.[80] This argument is what is typically used to justify the broader exception to wholesale market transactions. Unfortunately, by allowing counterparties to enforce debt agreements against an insolvent bank to protect their individual stability, systemic stability is undermined.[81]

There is a similarity between the thinking that justifies the exemption and the argument for retail deposit insurance. However, retail depositors and wholesale market participants are very different. Protecting retail lenders can assist banks by reducing the risk of runs. Protecting wholesale lenders makes it easier for them to run.[82] Indeed, when a bank becomes insolvent, potentially due to a liquidity problem, the wholesale exemption can facilitate the withdrawal of funding for the insolvent bank when it needs funding the most. The reason why wholesale depositors withdraw funding is similar to the reason that retail depositors run in the Diamond and Dybvig model. It is a co-ordination problem that leads to cross-holding contagion if all of the collateral issued by the distressed bank is liquidated. Wholesale market participants are more sophisticated than retail market participants. They are less likely to run if a bank is solvent than retail depositors. Laws directed at eliminating credit risk facilitate the stability of individual banks at the cost of instability in the financial system.

[79]In relation to derivatives transactions, the Bank for International Settlements said 'The legal arrangements should be such that a market participant whose counterparty in a repo transaction defaults has a legally perfected interest in the cash or securities received as collateral (in the sense of being the only claimant). The lack of such a legal basis would prevent the credit risk reduction benefit of a repo frombeing realised since it could not be considered a collateralised instrument.' Report of a Working Group Established by the Committee on the Global Financial System of the Central Banks of the Group of Ten Countries, *Implications of Repo Markets for Central Banks* (9 Mar 1999) 28.

[80]This is one of two dominant rationales for the exemption. See Skeel & Jackson (n 77) 160-2. 'Repos and derivatives need to be insulated from the ordinary bankruptcy process, according to the third rational for special treatment, because subjecting them to the stay and the trustee's preference powers would magnify volatility and retard the growth of the market ... The final rationale—which tended to silence any lingering obections (but looks more than a little ironic from a post-2008 vantage point)—was the need to keep systemic risk in check. If derivatives and repos were subject to the automatic stay, the argument went, a debtor's failure could have a domino effect, taking other participants in the derivatives market down with it.'

[81]Morrison (n 26) 452. 'The failure of a systemically important institution will, therefore, destabilize markets regardless of whether the Bankruptcy Code offers safe harbors for financial contracts. Indeed, these safe harbors may exacerbate the instability by permitting a counterparty "run" on the failing institution.'

[82]Martin *et al.* (n 77).

C. *Lender of Last Resort*

Lender of last resort facilities are a substitute for credible and effective insolvency and bailouts when a bank is financially but not economically distressed.[83] They are used to provide cash to a liquidity constrained but otherwise profitable bank. The test for insolvency does not necessarily distinguish between circumstances when a firm is unable to repay debt because it is financially or economically distressed. In this paper, financial distress refers to circumstances where a bank does not have enough liquid assets to pay its debts as and when they fall due.[84] Economic distress on the other hand is when a bank's assets, liquid and otherwise, are insufficient to pay off its debts when they fall due. Financial and economic distress are both affected by the market value of assets. In normal circumstances, a bank may be able to liquidate assets at favourable prices in order to avoid financial distress. However, during a systemic crisis, assets are often liquidated at firesale prices potentially causing financial and possibly economic distress. During times of systemic crisis, the line between financial and economic distress can become blurred. It is in these circumstances that lender of last resort programs are beneficial. The central bank can provide funding to financially distressed firms in order to ensure that they do not become economically distressed. This lender of last resort support avoids insolvency.[85]

[83]Walter Bagehot, *Lombard Street: A Description of the Money Market* (1872).

[84]SectionBII1 for a discussion on what constitutes insolvency.

[85]See ibid Ch VII.

'And with the Bank of England, as with other Banks in the same case, these advances, if they are to be made at all, should be made so as if possible to obtain the object for which they are made. The end is to stay the panic; and the advances should, if possible, stay the panic. And for this purpose there are two rules: First. That these loans should only be made at a very high rate of interest This will operate as a heavy fine on unreasonable timidity, and will prevent the greatest number of applications by persons who do not require it. The rate should be raised early in the panic, so that the fine may be paid early; that no one may borrow out of idle precaution without paying well for it; that the Banking reserve may be protected as far as possible.

Secondly. That at this rate these advances should be made on all good banking securities, and as largely as the public ask for them. The reason is plain. The object is to stay alarm, and nothing therefore should be done to cause alarm. But the way to cause alarm is to refuse some one who has good security to offer. The news of this will spread in an instant through all the money market at a moment of terror; no one can say exactly who carries it, but in half an hour it will be carried on all sides, and will intensify the terror everywhere. No advances indeed need be made by which the Bank will ultimately lose. The amount of bad business in commercial countries is an infinitesimally small fraction of the whole business. That in a panic the bank, or banks, holding the ultimate reserve should refuse bad bills or bad securities will not make the panic really worse; the 'unsound' people are a feeble minority, and they are afraid even to look frightened for fear their unsoundness may be detected. The great majority, the majority to be protected, are the 'sound' people, the people who have good security to offer. If it is known that the Bank of England is freely advancing on what in ordinary times is reckoned a good securityon what is then commonly pledged and easily convertible the alarm of the solvent merchants and bankers will be stayed. But if securities, really good and usually convertible, are refused by the Bank, the alarm will not abate, the other loans made will fail in obtaining their end, and the panic will become worse and worse.

It may be said that the reserve in the Banking Department will not be enough for all such loans. If that be so, the Banking Department must fail. But lending is, nevertheless, its best expedient. This is the method of making its money go the farthest, and of enabling it to get through the panic if anything will so enable

Lender of last resort policies involve the central bank providing liquidity with high interest rates on quality assets provided as collateral by the distressed bank. Lender of last resort support stabilises financially distressed banks during a period of crisis.[86] However, lender of last resort facilities are not a silver bullet. Gale and Yorulmazer highlight a number of limitations:

> "One concern is the possibility that the increase in the Fed's balance sheet as a result of the increase in reserves and the secured lending facilities set up by the Fed will result in inflation. Another is the possibility that the Fed can make losses as a result of counterparty risk because it is willing to extend potentially loss-making loans in order to achieve policy objectives such as financial stability. Finally, there is the problem of unwinding its position as conditions change in the economy. Some writers doubt that the Fed will be able to shrink its balance sheet quickly enough when signs of inflation appear."[87]

In essence, the provision of lender of last resort financing can cause inflation, assets provided as security may decline in value, and the decision to provide the financing may be driven by policy objectives other than the provision of liquidity to distressed firms.

That being said, despite its drawbacks, lender of last resort funding to financially distressed banks is a better policy than bailouts because it creates a disincentive for managers to herd into similar asset classes as their competitors. In essence, the possibility of *ex-post* rents from acquiring distressed bank assets at cash-in the-market pricing creates an *ex-ante* incentive for banks to avoid following correlated strategies.[88]

In the case of economically distressed banks, they do not have high quality assets and so are unable to obtain lender of last resort funding. In this case, without credible and effective insolvency, the most appealing option for governments and regulators is to bail out the distressed bank. To avoid this situation, insolvency law must be redesigned with a view

it. Making no loans as we have seen will ruin it; making large loans and stopping, as we have also seen, will ruin it. The only safe plan for the Bank is the brave plan, to lend in a panic on every kind of current security, or every sort on which money is ordinarily and usually lent. This policy may not save the Bank; but if it do not, nothing will save it.'

[86]Douglas W Diamond and Philip H Dybvig, 'Bank Runs, Deposit Insurance, and Liquidity' (1983) 91 J Pol Econ 401; Antoine Martin *et al.* 'The Fragility of Short-Term Secured Funding Markets' (unpublished manuscript, Oct 2012).

[87]Dougale Gale and Tanju Yorulmazer, 'Liquidity Hoarding' (2011) FRBNY Staff Report No 488 , 35.

[88]Viral V Archarya and Tanju Yorulmazer, 'Cash-in-the-Market Pricing and Optimal Resolution of Bank Failures' (2008) 26 Rev Fin Studies 2705, 2708. '[W]e compare these two policies (bailouts and lender of last resort) from an *ex-ante* standpoint in a setting where banks choose to differentiate or herd. Each bank invests either in a common industry or in a bank-specific industry. This decision affects the correlation of bank returns and the likelihood that banks fail together. *Ex-ante*, the regulator wishes to implement a low correlation between banks' investments to minimize the likelihood that many banks fail, and simultaneously implement resolution policies that are *ex-post* optimal. The regulator can achieve this by employing the bailout policy, only if it can commit to suficiently diluting the share of bank owners when they are bailed out. By doing so, the bailout subsidy becomes small enough that banks prefer to differentiate and capture the surplus from buying asses at cash-in-the-market prices.'

to imposing losses on creditors in order to incentivise them to reduce the likelihood of bank failure.

D. *Increasing Equity Capital Requirements*

Equity capital requirements are a partial substitute for credible and effective insolvency processes because they reduce the likelihood of insolvency. While increasing equity capital requirements can reduce or eliminate the need for bailouts it does not eliminate the incentive of equity holders to gamble for resurrection when banks become distressed. The incentive to gamble for ressurection is important when creditors lack the incentive to discipline bank managers because it can substantially increase eve of distress losses and the expected size of bailouts.

Broadly speaking, increasing equity requirements for banks is privately but not socially costly.[89] For a creditor, if a bank defaults the government will pay its debts in order to avoid the contagion and credit-rationing that follows from the bank being placed into insolvency.[90] For a shareholder, increasing the amount of debt increases the value of the deductibility of interest rates and limited liability means that losses from this fragile capital structure are capped.[91] The arrangement benefits both broad classes of investors in banks. However, the preference of shareholders and indifference of creditors for leverage increases the probability of a bailout and therefore the expected cost to taxpayers. There is divergence between what is privately optimal for investors and what is socially optimal for taxpayers.

Increasing the amount of equity that banks must hold adversely affects shareholders. Creditors are indifferent to the change because they are still the beneficiaries of an implicit guarantee. However, increasing equity does not harm the interests of the taxpayer. On this point, Admati et al have argued that increasing the amount of equity held by bankss is not socially costly. They argue that:

> "Because the social benefits of significantly reducing bank leverage are significant, and because there are no significant social costs of increasing equity requirements for banks, politicians and regulators should not be overly concerned with threats that credit markets will be adversely affected by increasing equity requirements. High equity requirements need not interfere with any of the valuable intermediation activities undertaken by banks. Regulators should therefore take steps to impose

[89] Anat R Admati, Peter M DeMarzo, Martin F Hellwig and Paul C Pfleiderer, 'Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity is not Expensive' (2011) Rock Ctr Corp Governanceat Stan Univ Working Paper No 86 .

[90] For reasons that are explained later this may be the case even if the stabilisation tools under the *Banking Act 2009* (UK) are used.

[91] Kraakman *et al.* (n 18) 9-11; Paul Davies, *Gower and Davies Principles of Modern Company Law* (8th edn, 2008) 193-8.

significantly higher equity requirements as quickly as possible."[92]

In essence, they argue that there are no significant social costs associated with making a bank raise funding in the form of equity instead of debt. The social benefits, in their view, outweigh the social costs. Increasing equity is certainly a mechanism that aligns private and taxpayer interests. Indeed, Basel III increases equity capital requirements.[93]

A problem associated with relying solely on equity capital requirements to eliminate the need for bailouts is the gambling for ressurection incentives of shareholders and managers on the eve of distress. Indeed, shareholders and managers have a powerful incentive to take significant risks on the eve of bankruptcy. If the risk pays off, the share value increases, otherwise, losses are borne by creditors.[94] Normally, creditors are incentivised to stop eve of distress gambling because they bear losses, but when they expect a bailout they do not benefit from stopping gambling. Therefore, by increasing equity without establishing a credible and effective insolvency mechanism, eve of distress gambling is incentivised. The consequence is that a bank which becomes distressed, without credible and effective insolvency procedures in place, will have eroded a greater proportion of its asset value than a bank subject to a credible and effective insolvency procedure. This increases the expected cost of a bailout of creditors. Accordingly, simply increasing equity does not overcome the problems that arise when a systemically important bank becomes distressed. A credible and effective insolvency procedure would complement increased equity capital requirements.

III. The Resolution Options

Resolving the problems associated with standard insolvency requires policy makers to re-design insolvency law. Broadly, three approaches have developed to overcome the deficiencies of standard insolvency law. These are referred to as bank resolution procedures.[95] First, resolution by a regulator involving the sale of the commercial banking assets, including deposits, to a private sector purchaser, with the remaining assets being wound up as part of a 'bridge bank'. Second, resolution by a regulator without a sale where losses are imposed on certain bank creditors either in the form of a write down of debt or a conversion of debt

[92] Admati *et al.* (n 89) 57.

[93] Basel III establishes a additional capital requirements including a requirement for additional tier 1 capital, a capital conservation buffer and a countercyclical buffer. Basel Comm on Banking Supervision, *Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems* (Jun 2011). The FSB has published a report that requires G-SIBs to hold additional capital because of their systemic risk. Financial Stability Board, *Update of Group of Global Systemically Important Banks (G-SIBs)* (1 Nov 2012).

[94] Anat R Admati, Peter M DeMarzo, Martin F Hellwig and Paul C Pfleiderer, 'Debt Overhang and Capital Regulation' (Mar 2012) Rock Ctr Corp Governanceat Stan Univ Working Paper No 114 .

[95] See Dewatripont and Tirole (n 47) 117. 'The bank-specific bankruptcy procedure has to be set not only to maximise value to creditors and provide a fair treatment of claimholders, but also to minimise the social cost of banks' bankruptcies and preserve the safety and soundness of the banking system. This implies the procedure has to be speedy in order to avoid speculation and bank runs, and it has to be orderly, characterised by legal certainty and no renegotiation.'

into equity. By reducing the interest payable by the distressed bank, the goal of this option is to allow the bank to continue as a going concern. Third, market resolution is based on the issue of instruments by the bank that impose losses on creditors prior to the need for regulatory resolution by either writing off debt and/or converting debt into equity. This section explains each of these options; how they are meant to operate theoretically and the limitations in their credibility and effectiveness.

A. *Resolution With A Sale*

1. *The Legal Basis of Resolution With A Sale.* — Resolving a bank with a sale is an approach taken by the Federal Deposit Insurance Corporation (**FDIC**) in the United States.[96] FDIC receivership as it is known applies to commercial banks in the United States. Title II of the Dodd-Frank Act extended the FDIC powers to systemically important banks in the United States.[97] In the United Kingdom, the *Banking Act 2009* (UK), provides the Bank of England with the authority to exercise powers similar FDIC receivership on banks.[98]

The purpose of resolution with a sale is to transfer commercial banking assets to a private sector purchaser to avoid credit-rationing and contagion. This is done in the United Kingdom in one of three ways. First, by a sale of the commercial banking assets to a private sector purchaser.[99] Second, by transferring some or all of the assets of the distressed bank to a wholly owned subsidiary of the BoE to be managed and ultimately sold to a private sector purchaser.[100] Third, the distressed bank could be taken into temporary public ownership by a nominee of the treasury or a company owned by the treasury acquiring all of the shares in the bank with a view to selling them to a private sector purchaser.[101]

Once the commercial banking assets are sold, the rump must be resolved. FDIC receivership is the process for winding up the non-commercial assets of a bank in the United States. There is evidence to suggest that FDIC receivership leads to a lower dimunition of bank asset value than standard insolvency [102] The most striking illustration is that 19.12%

[96]Federal Deposit Insurance Act 1991 (n 7). There are five broad strategies available to the FDIC. (1) Purchase and Assumption (2) Bridge Banks and New Banks (3) Receivership and Liquidation (4) Conversavatorship and Government Assistance and (5) Open Bank Assistance: Morrison (n 26) 455-7.

[97]Dodd-Frank Act 2010 (n 9). It has been argued that the extension of FDIC receivership powers to systemically important banks is problematic because it creates inconsistency with the resolution of other non-commercial banks. It was argued that the FDIC receivership powers should extended to all banks. Skeel & Jackson (n 77).

[98]Banking Act (n 5) s 2.

[99]ibid s 11. 'The first stabilisation option is to sell all or part of the business of the bank to a commercial purchaser.'

[100]ibid s 12. This is known as a bridge bank. 'The second stabilisation option is to transfer all or part of the business of the bank to a company which is wholly owned by the Bank of England (a "bridge bank").'

[101]ibid s 13. This is known as temporary public ownership. 'The third stabilisation option is to take the bank into temporary public ownership.'

[102]James (n 3) 1228.

of a bank's asset value is lost in a whole bank transaction against a loss of 34.25% when the FDIC uses its receivership powers.[103] Because the liquidation mechanism in the *Banking Act 2009* (UK) is based on FDIC receivership, the evidence is supportive of the use of FDIC style receivership to liquidate the non-commercial banking assets of a distressed bank.

There are at least two reasons why FDIC receivership is less destructive of asset value that normal insolvency. First, from a transaction cost perspective, the FDIC is a specialised receiver that is likely to be a better manager of banking assets than a court appointed receiver.[104] Second, from an agency cost perspective, the FDIC is a significant creditor of the distressed bank because it guarantees retail deposits and is subrogated to the position of those depositors.

In terms of the sale of the commercial banking assets of the distressed bank to a private sector purchaser there are at least two problems which are dealt with below. First, the size and complexity of systemically important banks may make them difficult to resolve; second, potential purchasers may not have enough cash to purchase the commercial banking assets; and third, there may be difficulty coordinating the sale of assets in different jurisdictions.

2. *High Level Risks Associated With Resolution With A Sale.* — Opinions vary about whether the stabilisation options can be applied to nationally systemically important banks or G-SIBs.[105] There are at least two reasons why resolution with a sale may not work for systemically important banks.

First, resolving a systemically important bank using resolution could cause contagion and credit-rationing by other banks. If the distressed bank is systemically important its failure could cause reputational damage to the regulator and thus asset contagion to other regulated firms. In that sense, resolution with a sale risks asset contagion when resolution becomes imminent.

Second, resolving a systemically important bank using resolution with a sale may be ineffective because of the variation in banking structures. Gleeson notes the variation in bank group structures:

> "Bank groups are protean – not only are they very different from one another, but also they may change significantly as the business of the bank changes. Inconveniently for our purposes there is no such thing as a typical bank group."[106]

Gleeson explains that there is no typical banking structure and thus a regulator may be

[103]ibid 1228.

[104]'[W]ithout a regulatory framework, the relevant federal agency might have insufficient information o make timely rescue decisions.' :Morrison (n 26) 459.

[105]Simon Gleeson, 'Bank Resolution and Bail-ins in the Context of Bank Groups' (Jan 2012) 6 Law and Financial Markets Review 61, 63.

[106]ibid 64.

unable to expediously and effectively resolve a distressed systemically important bank. This problem might be diminished because of the European and UK ring-fencing proposals that separate the commercial and investment banking arms of banks.[107] Unfortunately, there is little evidence to support the contention that resolution with a sale can be used to resolve systemically important banks.[108]

3. *The Cash-in-the-Market Effect of Resolution With A Sale.* — Resolution with a sale requires banking assets to be sold to potential purchasers. However, when a systemically important bank fails and a regulator becomes a forced seller of its assets, it is uncertain whether assets, by way of a share sales, can be sold at a fair price. This is because of cash-in-the-market pricing. Cash-in-the-market pricing is a situation where the price of an asset is not based on expected future returns but instead on the amount of cash that potential purchasers have available to finance the acquisition.[109]

Normally, banks would be hard pressed to liquidate assets to finance an acquisition. When a systemically important bank is distressed other banks may have difficulty obtaining the liquidity to buy its assets. The assets are consequently bought at a firesale prices by investors with liquidity. It has been suggested that this cash-in-the-market pricing explains why bailouts have been used in place of resolution with a sale when there is a systemic shock to the banking system.[110]

The problem of cash-in-the-market pricing might be reduced by placing distressed banks in temporary public ownership.[111] Unfortunately, this option is functionally equivalent to a bailout with a view to selling the bank to private purchasers. This exposes taxpayers to the risk associated with the assets held by the distressed bank. In addition, temporary public ownership when a bank is deeply distressed might require the purchase of debt in the

[107]Liikanen et al (n 10); ICB (n 10). It is uncertain whether the Volcker rule will have a similar effect as the ringfencing proposals. Dodd-Frank - Volcker Rule (n 68).

[108]The special resolution powers have been used on two occassions. First, in relation to the Dunfermline Building Society. See Bank of England, *Dunfermline Building Society,* News Release (30 Mar 2009), <http://eurozone.europa.eu/newsroom/news/2013/03/eg-statement-cyprus-16-03-13/> accessed 2 May 2013. Second, in relation to the Southsea Mortgage and Investment Company. See Bank of England, *Southsea Mortgage and Invesment Company Limited,* News Release (16 Jun 2011), <http://www.bankofengland.co.uk/publications/Pages/news/2011/060.aspx> accessed 2 May 2013.

[109]Allen and Gale (n 37) 949. 'When liquidity is scarce, asset prices are not determined by discounted cash flows, but rather by the amount of cash in the market. It is the relative variation in the amount of the long asset and cash supplied to the market that is important for price volatility.' See also Allen and Gale (n 37).

[110]Archarya and Yorulmazer (n 88) 2706.'When only a few banks fail, these banks can be acquired by surviving banks. However, for a large number of failures, the liquiity of surviving banks enables them to acquire all failed banks only at fire-sale prices, an affect akin to the industry-equilibrium hypothesis ... The resulting "cash-in-the-market" pricing ... makes it more likely that investors outisde the banking sector, who are liquidity-endowed by potentially not the most efficient users of these assets, end up purchasing some failed banks' assets.'

[111]Banking Act (n 5) s 13.

bank rather than equity. This is a more complex assessment that requires consideration the resolution authority to determine contractual restrictions for the debt financing and exposes that authority to even higher levels of risk.

4. *International Coordination Difficulties.* — There are difficult coordination issues with completing resolution with a sale when a bank operates in multiple jurisdictions.[112] Incorporation of subsidiaries in different jurisdictions may require the exercise of functionally equivalent powers simultaneously by various regulators. There is a degree of harmonisation between the United States and the United Kingdom. However, the common history of their legal systems makes it easier for these jurisdictions to harmonise their bank resolution frameworks. This level of harmonisation may be more difficult with continental European countries with a civil law background.[113] In addition, international agreements are not credible when regulators are conflicted.[114] For instance, regulatory forbearance by one regulator might increase stability in their jurisdiction but cause instaibility elsewhere. Without a mechanism for enforcing compliance it may be difficult to coordinate resolution with a sale internationally.

B. *Resolution Without A Sale*

Resolution without a sale is directed at imposing losses on creditors without the costs of standard insolvency law. Standard insolvency law is costly because of coordination problems between creditors that lead to an unnecessary destruction of value and the agency costs associated with an insolvency practitioner or a court managing the assets of the distressed firm.[115] Resolution without a sale has the same basic problems but steps are taken to reduce those costs. First, not all creditors are affected by resolution without a sale. In fact, only creditors that are unable to run, i.e. those with long-term debt, are likely to face losses. This reduces coordination costs and the antecedent risk of value destroying runs. However, when rolling over this debt lenders are more likely to run. Second, agency costs are reduced by either appointing a specialised manager - a regulator to manage the process

[112]Dewatripont and Tirole (n 47) 111. 'A first key problem concerns the time when public intervention can take place and using which public intervention powers. As stressed earlier, the US prompt corrective action system is an efficient way to deal with banks in distress below a critical size. However, this system is not generalised, making such prompt action unavailable in many countries. A second key problem, discussed below, concerns depositor protection. There are clear potential incentive problems faced by the home supervisor in terms of consolidated supervision, with the risk of being pressured to "limit damage" and leaving part of the mess to foreign countries, with potential dangers in terms of contagion.'

[113]See ibid 131. Steps have been taken by the Financial Stability Board to increase coordination amongst regulators in different jurisdictions. These steps have led, in Europe, the a draft directive outlining how bank resolution is to be completed.See Financial Stability Board (n 10). See Draft Recovery and Resolution Directive.

[114]Dewatripont and Tirole (n 47) 131.

[115]Kraakman *et al.* (n 18) 143-7.

of allocating losses to creditors, or allowing parties to determine *ex-ante* how losses are to be imposed, if the borrowing bank becomes distressed. A regulator is likely to be able to assess the financial position of the distressed bank more quickly and accurately than a court or a general insolvency practitioner. Accordingly, an appropriate amount of losses can be imposed much more quickly. This in turn means that resolution of distressed banks can be concluded on a more expedited and less costly basis. This section explains the method by which regulators are able to impose losses on shareholders and creditors. It explains the theoretical benefits of the method.

1. *The Legal Basis of Resolution Without A Sale.* — The legal basis of resolution without a sale is the bail-in. The bail-in is a method that allows a regulator to impose losses on shareholders and creditors outside of standard insolvency. However, the imposition of losses on shareholders in distressed banks is not the novel element of the tool. The novel element is imposing losses on (otherwise guaranteed) creditors which creates an *ex-ante* incentive for those creditors to discipline the bank's managers. The objective that underlies the bail-in tool is the need to ensure financial stability.[116] This objective differs from that of standard insolvency law which has the objective of protecting the property rights of creditors.

Formally, the bail-in is being developed in legislation to empower a resolution authority to:

1. write off and dilute common equity or debt; and
2. write-off and convert debt into equity.

Bail-in can be used in resolution with a sale as well as resolution without a sale. In the resolution with a sale context, the purpose of bail-in is to impose losses on creditors which is the first part of what legislators are empowered to do under bail-in proposals. In the resolution without a sale context, both parts of the bail-in power can be utilised. Importantly, the conversion of debt into equity facilitates a transfer of ownership.

2. *Credible Market Discipline.* — Bail-in is a method for imposing losses on creditors with a view to minimising credit-rationing and contagion. The issuance of bail-in debt ought to create incentives for creditors to constrain managers from acting opportunistically. For instance, creditors will have incentives to restrict the ability of bank managers to substitute assets in order to increase asset risk at the expense of creditors. Hart notes:

> "If management is interested in empire-building, the danger for investors is that management will try to raise capital for unprofitable investment projects by issuing claims against earnings from existing assets. Senior long-term debt, by mortgaging

[116]The objectives of resolution under the Draft Recovery and Resolution Directive include avoiding adverse effects on financial stability. Draft Recovery and Resolution Directive.

> part of the long-term earnings, reduces management's ability to do this. However, too much long-term debt prevents managers from carrying out even those projects that are profitable."[117]

There is evidence that supports the use of debt to instil discipline in banks. The evidence suggests that subordinated debt holders are capable of providing market discipline.[118] The evidence suggests that investors in subordinated debt price the default risk of banks based on their perceptions of whether there is an implicit government guarantee of bank debt.[119] This lends support, but does not establish, that the holders of bank debt are capable of disciplining bank managers.[120] Other papers offer stronger empirical support for the idea that investors in bank debt are able to monitor, price, and influence risk-taking by bank managers.[121] The limited support for the notion that bank debt disciplines managers might be stronger if one common parameter was changed. The research assesses the capacity for debt to discipline bank managers when it is substituted with equity. The support for bank debt disciplining managers might be stronger if the research substituted implicitly guaranteed bank debt with loss absorbing bank debt.

An implication of the evidence that the price of subordinated debt reflects default risk is that it can be used by regulators to determine when to resolve a bank. Regulators can readily observe the price of loss absorbing debt and use this as a proxy to determine whether regulatory intervention is necessary.[122] Credible and effective loss-absorbing debt can consequently

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[117]Oliver Hart, *Firms, Contracts, and Financial Structure* (1995) 139. See also Jensen and Meckling (n 57).

[118]Mark J Flannery and Soring M Sorescu, 'Evidence of Bank Market Discipline in Subordinated Debenture Yields' (1996) 51 J Fin 1347. See also Adam B Ashcraft, 'Are Banks Really Special?' (Mar 2005) 95 Am Econ Rev 1712.

[119]Flannery and Sorescu (n 118) 1373-4. "The evidence indicates that bank investors clearly impounded the value of conjectural government guarantees into debentures prices ... Apparently, the market feels that poor credit quality and high leverage pose the greatest risks for banks; interest rate risk exposure, at least as measured by our proxies, does not generally affect bank SND prices."

[120]There is limited support for the notion that shareholders and creditors are able to influence managers by changing the price of securities issued by the bank: Robert R Bliss and Mark J Flannery, 'Market Discipline in the Governance of U.S. Bank Holding Companies: Monitoring vs. Influencing' (2009) 6 Eur Fin Rev 359, 393. 'A less rigorous, nonparametric interpretation of the regression results identifies evidence consistent with both beneficial and perverse influence. For bondholders, the instances of beneficial and perverse influence are equal in number. Stockholders appear to exert significant beneficial influence about twice as often as they exert perverse influence, consistent with the fact that equity has much more extensive control rights in normal circumstances. However one chooses to interpret these nonparametric results, the evidence cannot be said to unambiguously support the presence of beneficial investor influence on BHC firms over the sample period.'

[121]Ashcraft (n 118) 24. 'This study documents evidence that an increase in the amount of subordinated debt in regulatory capital has an important positive effect in helping a bank recover from financial distress. This result suggests that fixed-income investors are able to exert significant influence o the behaviour of a distressed institution that are aligned with the interests of bank supervisors, and sheds positive light on proposals by several economists which would force banks to issue subordinated debt.'

[122]Shadow Financial Regulatory Committee, *Reforming Bank Capital Regulation* (Mar 2000). 'But regulators could and should use the signals produced by the price subordinated debt commands in the market

act as a complement to standard monitoring techniques used by bank regulators.

Holders of loss-absorbing debt are incentivised to discipline banks because they face losses if the bank becomes distressed.[123] However, an analysis of how CoCos and bail-in impart losses on investors reveals three interconnected differences: first, CoCos are envisioned to impose losses on a going-concern basis whilst bail-in imposes loses on a gone-concern or near gone-concern basis; second, CoCos can be structured to provide loss-absorbancy without regulatory intervention; and, third, as a consequence CoCos can be structured contractually.[124]

3. *International Co-ordination Difficulties.* — Resolution without a sale potentially requires less international coordination to implement than resolution with a sale. The only conflict between regulators is whether imposing losses on particular investors might adversely affect financial stability in their jurisdiction.

C. *Market Based Resolution*

1. *The Legal Basis for Market Based Resolution.* — The legal basis for market based resolution is CoCos. CoCos are debt instruments that convert into equity on a pre-specified trigger in that sense they are a market mechanism for resolution without a sale. In that sense CoCos are similar to bail-in debt. CoCos have a number of the same benefits as the bail-in method, including reducing coordination, reducing agency costs, and instilling market discipline in investors. However, CoCos differ because losses are imposed based on agreements between investors and bank managers.[125] In that sense, CoCos give banks and investors design flexibility beyond the bail-in framework.

There are a number of design charaterstics that can be tweaked in these agreements. First, banks and investors can negotiate the conversion formula of the CoCos. Second, banks and investors can negotiate the point of conversion. Initially, CoCos were issued with a conversion based on capital requirements and would be triggered when the issuing bank approached insolvency. Using a trigger based on capital requirements, banks can use CoCos to recapitalise when they fall below the regulatory capital buffers.[126] Third, CoCos can be designed to give proportionally more voting rights to investors that have had their debt converted into equity.[127]

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to augment the information the collect as part of their regular examinations of banks and to spur, and at times require, regulatory interventions.'

[123]This is effectively the creditors' bargain: Goode (n 4) 70-3.

[124]Chris Bates and Simon Gleeson, 'Legal Aspects of Bank Bail-ins' (Jul 2011) 5 Law and Financial Markets Review 264, 265-6.

[125]Coffee (n 1) 805.

[126]Basel Comm, *Basel III* (n 93); Financial Stability Board (n 93)

[127]Coffee notes: 'Although the preferred shareholders would be entitled to cumulative arrearages, such arrearages are vulnerable and can be eliminated throughmergers and other well-known techniques. Thus, to protect this right to cumulative dividends, it would be appropriate to give the preferred an additional voting

CoCos have been issued by a number of banks - principally in two forms: first, CoCos that convert into equity upon a trigger; and second, CoCos that are written off upon a trigger.[128] The difference between the two types is priority. The first is senior to equity because the trigger converts a debt instrument into equity. The second is subordinated to equity because it is simply written off without being converted into equity.

2. *Gambling for Ressurection.* — Depending on its priority, a CoCo can eliminate the incentives for either shareholders and managers or creditors to gamble for ressurection. A problem associated with increasing equity requirements without a credible and effective insolvency system is that shareholders and managers have high powered incentives to gamble before there is a bailout. CoCos can be used to overcome this gambling for ressurection problem.[129]

When a CoCo is issued it provides shareholders and managers with the chance to act opportunistically in order increase their expected returns.[130]

If the CoCo is converted into equity shareholders interests are diluted and their expected returns from subsequent gambling are reduced. On balance, the evidence suggests that the threat of diluted interests is enough to disincentivise opportunistic behaviour by managers.[131] Therefore, the conversion feature in CoCos creates incentives for managers not to gamble when the bank approaches distress. It is beneficial for managers to have this incentive because in solvent circumstances they have control over the asset composition of the bank.

If the CoCo is written off, then shareholders are not diluted. Instead, the issue of the CoCo simply creates an incentive for them to act opportunistically to increase asset risk. The capacity to increase asset risk is determined by the restrictions in the *ex-ante* arrangement between the lenders and the bank managers. Particularly the capacity of the lenders to monitor and enforce any contractual breaches. In other words, straight write-off debt in-

right: the right to elect as a class some additional percentage of the directors each year that their dividend is omitted. The right to such class voting would end once the arrearages were fully paid. On this basis, control of the corporation might pass to the preferred shareholders within two or three years if the arrearages were not eliminated.' Coffee (n 1) 832-3.

[128]The original Coco issues were of the first type. However, more recently, so called "sudden death" contingent capital have been issued by Belgium's KBC Group (US$1bn), Barclays (US$3bn). These bonds are writte off while the bank remains a going-concern. See, Jenkins (n 11); Watkins (n 11); Plender (n 11). For a discussion of previous issues: Coffee (n 1) 826-7.

[129]See Natlya Martynova and Enrico Perotti 'Convertible Bonds and Bank Risk-Taking' (unpublished manuscript, Sep 2012). The authors show that relying on market prices and accounting triggers CoCos can create incentives for shareholders and bank managers to not gamble for resurrection.

[130]Dewatripont and Tirole (n 47) 128. '[C]ompared to bankruptcy, contingent capital will never wipe out shareholders, who will therefore be penalised only by the dilution of their shares. In the same way, regarding bank managers, there is no threat of a dismissal automatically triggered by distress as under bankruptcy, nor is there any clause regarding limits or clawbacks on bonuses. Consequently it is necessary to complement this instrument with additional supervision and regulation to provide managers and the board of directors with correct ex ante incentives.'

[131]Martynova and Perotti (n 129).

struments create a much more powerful incentive for creditors to discipline bank managers. It is uncertain whether the incentive of shareholders and managers or creditors is dominant in this situation.

3. *Market-Based Triggers.* — There are a number of possible triggers for regulatory intervention that have been forward by the FSB. Many of these are market-based triggers than can also be used as triggers for CoCos.[132] A market-based trigger for CoCos can facilitate conversion when a bank is approaching distress but may also facilitate conversion due to noise trading.[133] This highlights a trade-off between market based triggers causing unecessary conversions due to noise trading and accounting-based triggers allowing bank managers to gamble because of forbearance. There is theoretical evidence that suggests that the value destruction caused by noise trading is less than the value destruction of regulatory forbearance and thus a market based trigger ought to be adopted.[134]

4. *Accounting Triggers and Forbearance.* — The use of accounting triggers for CoCos can create agency costs with either the regulator or management. It has been argued that accounting triggers facilitate regulatory forbearance and, relative to market triggers, are more socially costly.[135] In essence, regulators concerned about their reputation may allow management of a distressed bank time to gamble for resurrection. From the regulator's perspective, reputational damage would follow from placing the bank into resolution before or after the bank's management gambles. Consequently, the regulator allows management to gamble in the hope that the gamble pays off and the bank is not placed into resolution.

It has also been argued that accounting based triggers provide management with tools to manipulate figures to facilitate wealth transfers from creditors to shareholders.[136]

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[132]Financial Stability Board (n 93) 8-9. The FSB market-based triggers include: ratings downgrades, revenue reports or P&L, credit risk limits, equity ratios, per cent renewal of wholesale financing, withdrawal of deposits and other funding, increased collateral requirements, rise in public debt, GDP forecasts, three-month LIBOR, senior debt spreads, and counterparty risk events.

[133]Martynova and Perotti (n 129) 21. 'The result is that market triggers cause more unnecessary conversions, but help avoid regulatory forbearance, which fails to trigger necessary conversions.'

[134]ibid.

[135]ibid 22. 'Relative to a market trigger, regulatory fofbearance avoids conversions which are needed but costly. It also avoids conversion for very highly levered banks, for which conversion will not restore incentives. Notice that market trigger would in this case force conversion, and would reduce losses on depositor insruance.'

[136]Dewatripont and Tirole (n 47) 127. 'As the objective of a convertible security is to provide capital automatically and quickly in case of distress while preserving the incentive effects of debt and market discipline, it is clear that accounting based triggers should be avoided, as the conversion might take place too late. As the crisis has illustrated, if accounting rules are not clearly defined and can be manipulated, financial institutions will use their leeway for window dressing, in order to increase their accounting capital and profits, thus postponing the necessary restructuring and instead bargaining for a better treatment of its shareholders.'

5. *Hybrid Triggers.* — A model for a hybrid market and regulatory-based trigger has been suggested. Under the proposal a price floor is set using CDS prices, and regulatory intervention must be made if the CDS price moves above the floor.[137] More specifically, when the CDS price goes above the floor the bank either has to issue more equity or a regulator exercises a resolution power.

The model overcomes the issue of regulatory forbearance by mandating intervention based on CDS prices and therefore excludes the political economy considerations that might lead to the exercise of resolution powers over solvent banks. However, the use of the CDS as a trigger might be a function of noise trading in the markets.[138] In addition, regulatory forbearance can be overcome by linking the regulator's budget to investments in banks deemed safe by the regulator despite the CDS price rising above the floor.[139]

IV. Conclusion

This paper has framed the need for bailouts and the associated problems in terms of insolvency law. It has discussed standard insolvency and its credit-rationing implications. It has then used credit-rationing as the motivation for bailouts and the justification for three types of resolution.

There are a number of practical implications for stakeholders in the area of banking regulation that follow from the analysis in this paper. First, the analysis of credit-rationing and bailouts can be framed in terms of insolvency law rather than being considered in isolation. Second, the design of contingent debt ought to be considered at a system wide level rather than at the level of an individual bank that is distressed. Third, the interaction of different reforms ought to be studied in more detail. For instance, reforms directed at structural separation of commercial and investment banks may create incentives that reduce the size of and need for bailouts and therefore be a complement to resolution.

This paper has also raises further questions and issues. First, what design characteristics should loss-absorbing debt have in order to be credible and effect. Second, what minimum

[137]Oliver Hart and Luigi Zingales, 'A New Capital Regulation for Large Financial Institutions' (2011) 13 Am L Econ Rev 453, 478 justifiying the use of CDS as the market based trigger the authors said: 'As we have shown in Section 3.4, however, short-term debt yields run the risk of signaling the problem too late. By contrast, bond prices suffer from the problem of market segmentation and illiquidity. Bond issues differ along several dimensions: promised yield, maturity, covenants, callability, and so on. As a rsult of this lack of standardization, the market for each bond issue tends to be rather illiquid, with most bond issues trading only occasionally. This illiquidity makes bond prices a less reliable indicator than CDS prices. *In fact, the success of CDSs is mainly due to their standardized nature, which ensures greater liquidity.'* (empahsis added)

[138]See Martynova and Perotti (n 129) 21. See also Hart and Zingales (n 137) 481-2.

[139]ibid 483: '[T]he regulator's budget could be derived from an endowment that the regulator uses to invest in instiutions that are deemed safe, in spte of having a CDS price that triggered an intervention. If this is the case, the regulator would be very afraid of investing in risky debt because any loss will impact his or her own budget.'

structural requirements are required for loss-absorbing debt. Third, which entity within a banking group should issue loss-absorbing debt and which investors ought to hold it.