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Resolution and Contagion

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Resolution and Contagion

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In medicine, contagion is defined as "disease transmission by direct or indirect contact". In finance contagion is said to result from the exposures that other banks may have to a bank that fails, either directly or indirectly through infrastructures such as payments, clearing and settlement infrastructures. Through such exposures or interconnectivity, the failure of one bank poses the risk of setting off a chain reaction that will cause other banks to fail.

Although such effects are important, they are not the only source of financial instability. An equally, and perhaps even more important, source of instability is radical changes in resolution policy, such as occurred in the United States in September 2008 when the US authorities ordered Lehmans to file for bankruptcy. This event abruptly reversed the pattern of support for systemically important institutions that the US authorities had followed during the crisis, notably with respect to Bear Stearns, Fannie Mae and Freddie Mac. This reversal in resolution policy radically changed market expectations with respect to the loss that a creditor would suffer, if the authorities had to intervene to resolve a troubled financial institution. That in turn increased risk premia and led to a general flight to quality and a run away from weaker institutions. These runs resulted in the failure of additional institutions, even though such institutions had limited exposure to Lehmans. As a consequence, reforming resolution policy is likely to be as important, or perhaps even more important, than limiting interconnectivity as a means of preventing future financial crises. Just as we need an exit strategy from monetary and fiscal stimulus, so too do we need an exit strategy from 'too big to fail'.

Risk and resolution

For any private sector creditor of a financial institution the risk that the creditor will incur a loss is a product of two things:

a) the probability that bank will require intervention; and

b) the loss given intervention.

The former depends on the riskiness of the bank's assets, its leverage and liquidity position – classic credit analysis.

By intervention, I mean action by the authorities either to

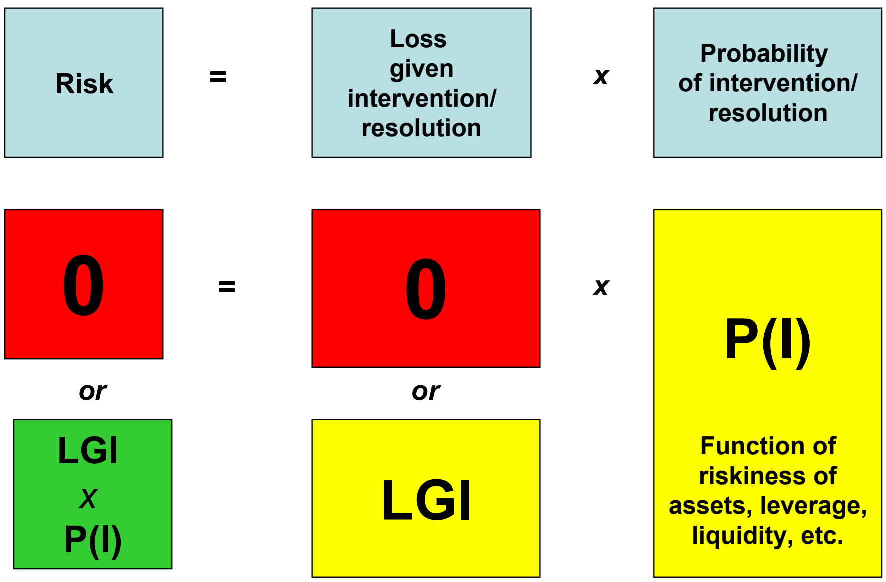
[♣] The opinions expressed here are the personal opinions of the author and do not necessarily represent the views of the FSA or CEBS. They form the basis of a presentation made before the Centre for Central Banking Studies/Financial Markets Group Conference, "Sources of Contagion," London, 26 February 2010.

1. provide open-bank assistance to the bank (e.g. through injection of new equity) in order to maintain the bank as a going concern. In such cases the loss given intervention is zero.

2. place the bank into resolution (e.g. through deposit transfer or bridge bank). In this case, the creditor of the bank may suffer significant loss.

Resolution effectively determines risk to the private creditor. If the authorities always intervene in a manner that protects the creditors of the bank, loss given intervention is zero. The risk to the creditor is also zero, no matter what the probability is that the bank will require intervention. If the authorities do not protect creditors of the bank, then the creditors can expect to suffer some loss given intervention, and risk to the creditor will be the loss given intervention times the probability that the bank will require intervention.

Resolution determines risk



The actual risk premium in the market should therefore depend on a prediction of whether or not the government will elect to provide open bank assistance in the event that the bank requires resolution.[1] It is inherently difficult to determine the probability that the government will decide to rescue a bank rather than resolve it.

[1] Call this probability p(0). The expected loss (risk premium) at any point in time is therefore a function of the probability that bank will require intervention [P(I)], times the loss given resolution [LGI] times the probability that the authorities will elect, given intervention is required, to resolve the bank in a manner that imposes losses on creditors rather than rescuing the bank [1 – p(0)]. This may be expressed as follows:

$$R = f[\{p(0)(0) + [1 - p(0)][LGI]\}P(I)]$$

$$= f\{[1 - p(0)][LGI]P(I)\}.$$

But it is clear that if the market's estimate of the probability of resolution rather than rescue were to increase suddenly, so would the risk premium that banks will have to pay. A simple example illustrates this point:

Resolution Determines Risk

	Too big to fail	Too small to save
Probability intervention will be required	20%	20%
Loss given intervention	25%	25%
Probability of rescue	95%	5%
Probability of resolution	5%	95%
Expected loss (Risk premium)	25 bp	475 bp

Take an institution that has a 20% probability that intervention will be required and assume that the loss given intervention would be 25%, if the intervention took the form of resolving the bank rather than rescuing the bank (providing open bank assistance). The only difference between the two cases is the probability that the market assigns to the form that the intervention will take. In the first case ('too big to fail') the probability that the government will decide to rescue the bank is estimated to be 95% and the probability that it will decide to resolve the bank is estimated to be 5%. In this case, the expected loss (risk premium) works out to 25 basis points. In the second case ('too small to save') the probability that the government will decide to rescue the bank is estimated to be 5% and the probability that it will decide to resolve the bank is estimated to be 95%. In this case, expected loss (risk premium) works out to 475 basis points.

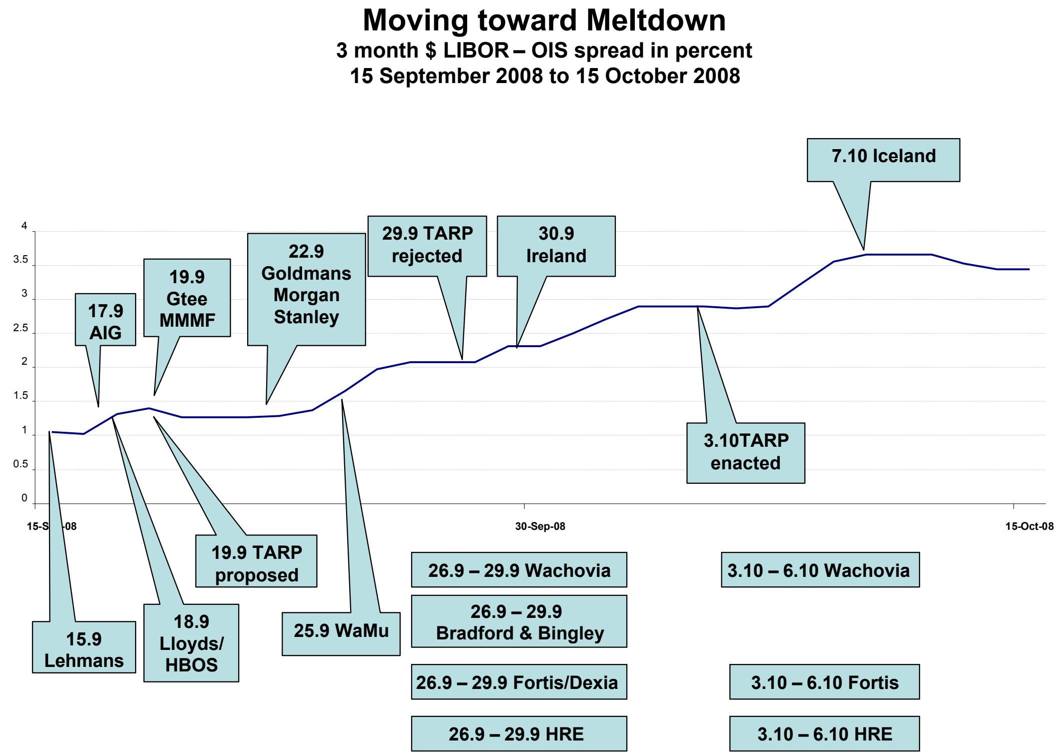
Now there has been much focus in the literature on the moral hazard that results from too big to fail, the dangers that result from such a misguided policy and the need to move banks and society away from such a policy. There has been rather less on the dangers of moving abruptly from a world where too big to fail is assumed to prevail to a world where too small to save is suddenly the rule.

Lehmans and WaMu unleash a financial and economic tsunami

Such an abrupt reversal is exactly what happened in September 2008. On 14 September the US authorities ordered the parent holding company of Lehmans to file for bankruptcy (Paulson 2010). This abruptly reversed the pattern of protecting large systemically important firms that had been established first through the rescue of Bear Stearns (March 2008) and then through the conservatorship of Fannie Mae and Freddie Mac (September 2008).

The resolution of Washington Mutual on 25 September further compounded the shift away from rescuing systemically important firms. The FDIC resolved this very large bank – with over $300 billion in assets, nearly $200 billion in deposits and 2,200 branches in 15 different states -- under the least-cost resolution method mandated under US legislation (FDICIA). This method of resolution imposed serious losses on unsecured senior creditors of the bank. JPMorgan Chase bought the insured deposits as well as certain assets and liabilities of the insured bank subsidiaries of WaMu in an

auction conducted by the FDIC. The premium paid was $1.9 billion. Left behind were the assets and liabilities of the parent holding company as well as the unsecured debt of the operating bank subsidiaries, including uninsured deposits over the coverage limit of $100,000. This unexpected imposition of loss on senior creditors further aggravated the concern of market participants about loss given resolution and made investors nervous about placing funds in troubled banks, even on an overnight basis.



Further pressures on funding arose from the introduction of TARP. In seeking the funds from Congress, the US administration highlighted that it had exhausted its budgetary authority to save troubled institutions and outlined the dire consequences that would arise, if Congress failed to enact the proposal. Yet Congress did initially reject TARP on 29 September, creating the spectre that even the United States would be too small to save its financial institutions. Congress did finally enact TARP on 3 October, but it then became apparent that the administration did not have a plan in place to implement TARP quickly.

The reversal in US intervention/resolution policy was not contagion. The failure of Lehmans did not cause payments, clearing and settlement infrastructures to fail. In fact, they held up rather well.[2] Nor did the failure of Lehmans or Washington Mutual

[2] In part, this statement depends on the decision to prop up the US broker dealer subsidiary for a few extra days through emergency liquidity assistance from the Federal Reserve (see below). This allowed Barclays to conduct accelerated due diligence on the assets and liabilities of the US broker dealer and to buy selected assets and liabilities of Lehmans (see below). However, even in the UK, where the subsidiaries went immediately into administration, the infrastructures held up well. LCH Clearnet, for example, was able to use margin posted by Lehmans to liquidate its positions without having to have recourse to the default fund.

cause losses to other market participants which were in themselves so grave as to deplete the capital and/or liquidity of the counterparty in question. What the failure of Lehmans did do was to underline to market participants that the US government would not necessarily stand behind other broker dealers. What the resolution of WaMu did do was to underline that the US government would set a very high bar indeed for invocation of the systemic risk exemption in the FDICIA legislation, and that the US authorities would seek to resolve even very large institutions by reference to the cost to the deposit guarantee fund rather than cost to society as a whole.[3]

Instead of contagion, the failure of Lehmans and the decision to employ the least-cost method to resolve WaMu were more akin to an undersea earthquake that set off a massive tsunami in financial markets. This tsunami had severe knock-on effects on specific institutions, on financial markets as a whole and on the economy at large. The most immediate effect of the Lehmans failure was to underline that the stand-alone investment bank was not viable. If the government let Lehmans fail, it dramatically increased the probability that it would allow other stand-alone investment banks to fail as well. Consequently, it made sense for investors to move their free cash balances and securities portfolios away from such entities toward entities associated with commercial banks (which were reckoned to have a higher degree of government support).

This started as soon as the markets opened on 15 September and continued throughout the week. The pressure was particularly intense on Morgan Stanley (whose credit default swap spread soared from 245 bp on 12 September to 883 bp on 18 September) and Goldman Sachs (whose credit default swap spread rose from 183 bp on 12 September to 548 bp on 18 September). The pressure on Morgan Stanley and Goldman Sachs began to abate only after each had announced new equity infusions from third party investors and their conversion into bank holding companies subject to oversight and supervision by the Federal Reserve with access to liquidity facilities from the Federal Reserve.

In contrast, the pressure on Merrill Lynch in the wake of Lehmans was not as great, despite much greater problems at the firm itself than at either Morgan Stanley or Goldman Sachs. The credit default swap rate on Merrills actually fell (from 455 bp to 398 bp) – evidence consistent with the hypothesis that the market expected Bank of America to support Merrills (in line with the merger agreement announced on 14 September) and the Fed, if need be, to support Bank of America.

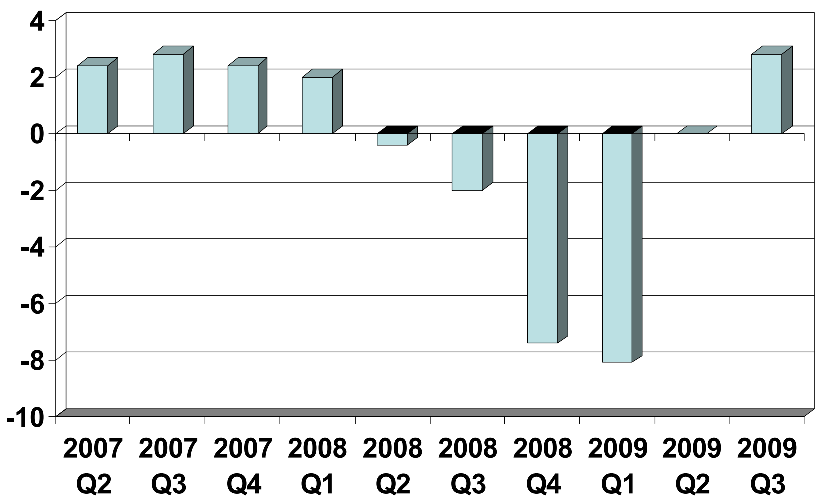
Although stand-alone investment banks were the institutions most directly affected, the tsunami unleashed by the decision to force Lehmans into bankruptcy caused havoc in financial markets generally. It led to an immediate re-pricing of risk, to a flight to

[3] The FDICIA legislation did contain a so-called systemic risk exemption that allowed the FDIC to provide open bank assistance to a failing bank provided this was judged necessary by the FDIC, approved by a supermajority of the Board of Governors of the Federal Reserve System and as well as approved by the Secretary of the Treasury "in consultation with the President". The first time this systemic risk exemption was invoked was on the weekend of 26 September in connection with the proposed acquisition of Wachovia by Citigroup. However, this deal was never completed, as Wells Fargo made a superior offer that allowed Wachovia to be resolved without cost to the FDIC. The net result was a lack of clarity as to when the US government would invoke the systemic risk exemption and a lack of clarity as to whether the US authorities would or could stick by deals that were initially struck in a crisis situation.

quality and to a run away from institutions judged most likely to require intervention. These runs accelerated the point at which various institutions ran out of liquidity and accelerated the requirement for the authorities to intervene. Immediately after the failure of Lehmans, the LIBOR – OIS spread began to climb into the stratosphere, rising from an already elevated level of 75 basis points on 12 September to 116 bp on 18 September. In this environment, institutions such as HBOS and WaMu with challenged credit portfolios and a high degree of reliance on short-term wholesale funding were particularly vulnerable, and they required, one after the other, some type of intervention.

The manner in which the US authorities resolved WaMu further aggravated the situation. The decision to impose losses on unsecured senior creditors and uninsured depositors was akin to a severe aftershock that unleashed a new tsunami. There was a renewed scramble for liquidity, with a flight to quality and away from institutions that had problematic asset and/or funding positions, such as Wachovia in the US, Bradford and Bingley in the UK and Fortis, Dexia, HRE and the Icelandic banks in the EEA. In the days following the WaMu decision, the LIBOR-OIS spread raced further toward the sky, rising from 152 bp on 26 September to 201 bp on 8 October. Together the Lehmans and WaMu decisions had created a vast scramble in financial markets for liquidity.

The world economy goes into free fall
Real GDP growth, advanced (OECD) economies
quarter over quarter, annualised, in percent, 2007 - 2009



Source: OECD 2009

This set off a vicious debt-deflation cycle in the economy as a whole. To raise liquidity, banks began to sell off good assets and to contract the amount of credit that they extended. Firms began to run down inventories, slash investment expenditures, curtail production and cut jobs. Consumers stopped spending on durables such as cars, furniture and appliances and cancelled or curtailed vacations, entertainment and dining out. As a result, the world economy went into free fall. Output declined in the

fourth quarter of 2008 and the first quarter of 2009 at a rate that was even faster than the rate of deterioration in the economy at the start of the Great Depression.

Containing the crisis

In response to this economic collapse governments acted quickly and decisively. To arrest the economic downturn they employed fiscal and monetary stimulus on a scale never before implemented in peace time. Governments raised spending and incurred massive deficits – in the US and the UK deficits rose to well over 10% of GDP and in the eurozone to more than 6% on average well above the 3% ceiling set in the Maastricht Treaty. Central banks effectively slashed interest rates to zero and in some cases, such as the UK and the US, conducted even further monetary stimulus through programmes such as quantitative easing.

But monetary and fiscal stimulus was not the full story. Just as important in arresting the slide into the Great(er) Depression was the revision of resolution policy. At the start of October governments made strong statements, soon backed up by convincing actions that they would not allow systemically important institutions to fail. The statements included a pronouncement by the EU heads of state on 6 October, confirmed and elaborated by the EU finance ministers on 7 October and further extended by the G-7 Finance Ministers on 10 October. The actions included the recapitalisation of the UK banking system over the weekend of 11-12 October 2008 (including the infusion of government equity into RBS and HBOS/Lloyds) and the use of TARP money on 13 October by the US authorities to inject equity into all the leading US financial institutions.

These actions calmed financial markets and averted economic catastrophe. The LIBOR-OIS spread reached a peak of 237 bp on 26 October and then began to subside. Rather than the Great(er) Depression, the world experienced what journalists and economists are now calling the Great Recession.

The need for an 'exit strategy'

There is ample recognition that it is unsustainable to continue fiscal and monetary stimulus on the scale implemented in the fourth quarter of 2008 and throughout 2009. Finance ministries and central banks need to develop an 'exit strategy,' and the first signs of this are already apparent (Bernanke 2010).

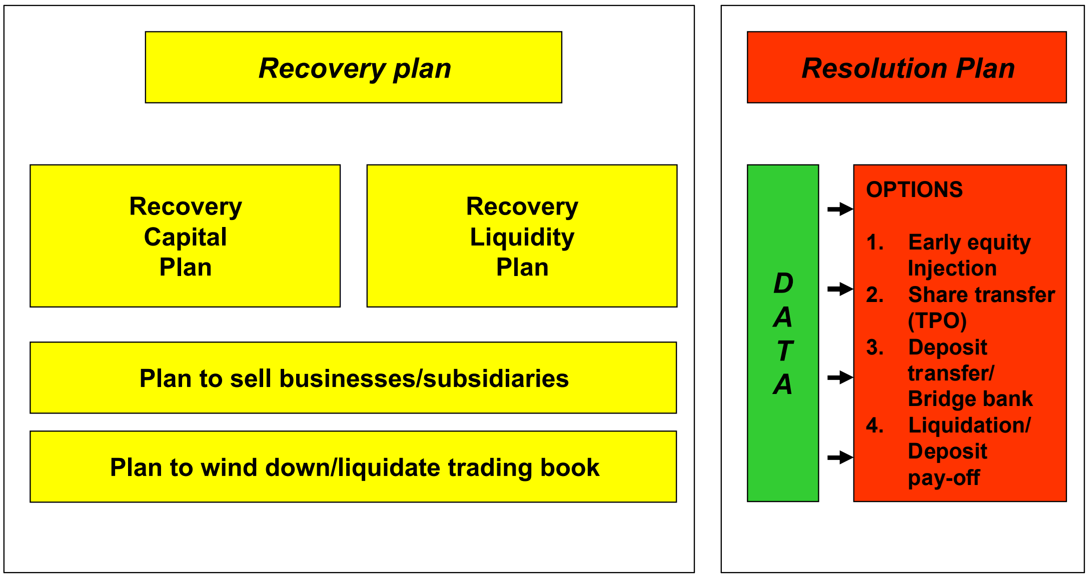
But this 'exit strategy' must encompass resolution as well. It is unsustainable for governments to continue to promise that no systemically important institution will be allowed to fail. Such a promise is unsustainable for two reasons. First, it removes market discipline from such institutions. That increases the probability that systemically important institutions will require intervention and that governments will be required to perform on the guarantee that they have given to such institutions. Second, the promise is unsustainable simply because of the potential expense involved. In many countries, the total balance sheet of the largest financial institutions is a multiple of the GDP of the country in which they are headquartered. Even if countries were willing to shoulder the responsibility of standing behind the liabilities of financial institutions headquartered in their country, they may not have

the means to do so and/or they may not secure the political authorisation for the spending that would be required in order to meet such commitments of support.

We must move away from a policy of full support for systemically important financial institutions in a measured, considered way, lest we be forced to do so abruptly and repeat the mistakes made in the case of Lehmans and WaMu. We need to map out what our long term resolution policy should be, and consider how we will take steps to move from where we are today to where we need to be.

What should our resolution policy be?

Recovery and resolution plans ('living wills')



Ideally, we want a resolution policy that allows governments to resolve institutions promptly without recourse to taxpayer funds, but at the same time minimises the social disruption that could occur from widespread interruption to deposit, insurance and/or securities accounts. This would allow for maximum continuity in customer-related activities whilst assuring that capital providers remain exposed to loss and avoiding the need to give widespread or long lasting guarantees of the bank's liabilities. Such a solution would also avoid the problems that arise from abruptly unplugging a bank from payments, clearing and settlement infrastructures. It would also allow for deposit accounts to be maintained, and revolving credit arrangements to continue functioning. In effect, such a solution would amount to an accelerated, but solvent wind down of the bank through rapid sales of certain aspects of the bank's activities to third parties and through a rapid reduction in certain activities. That

would leave customers largely unaffected, but impose losses on investors/capital providers.[4]

To ascertain how we can approach this ideal, the authorities have asked a number of large banks to prepare so-called 'living wills,' or recovery and resolution plans.[5] With respect to resolution what living wills ask banks to do in advance is to make preparations so that the bank would be able to furnish at short notice the information that the authorities would need in order to make a choice among the resolution methods open to the authorities to use, should the condition of the bank deteriorate to the point where the authorities have to intervene. The actual resolution plan (choice among resolution methods) is for the authorities to develop.

Overview of resolution methods

	Going/gone Concern	**Taxpayer Support**	**Immediate Market Impact/cost**	**Long term Market impact/ Cost (Moral Hazard**
Early equity injection	**Going**	**Very High**	**Limited**	**High**
Share transfer/TPO	**Going**	**TBD**	**TBD**	**TBD**
Deposit transfer/ Bridge bank	**Gone**	**Limited**	**High**	**Improves market discipline and reduces cost**
Liquidation/ Deposit pay-off	**Gone**	**None**	**Very high**	**Eliminates any moral hazard**

Broadly speaking, there are four methods of intervention/resolution open to the authorities, if they reach a determination that they must intervene. These are early equity injection, share transfer (temporary public ownership), deposit transfer/bridge bank and liquidation/deposit pay-off. For a large, systemically important institution it is vital that any such method be capable of implementation within a relatively short time period, no longer than the 36 to 48 hours that are available between the close of business on a Friday in North America and the reopening of business on Monday morning in Asia (Sunday evening in Europe).

[4] For a fuller discussion of the difference between customer and investor capital see Merton and Perold 1993 and Huertas 2010a.

[5] For a fuller discussion of living wills see Huertas 2010b.

There are no easy choices when it comes to intervention/resolution of a large, complex bank, especially one with significant international branches and/or subsidiaries. A decision to inject equity and avoid resolution entirely solves the immediate problem, but it poses significant immediate and even more significant potential costs in that it undermines market discipline and sows the seeds of future crises. A decision to place the bank under temporary public ownership avoids the immediate cost of an equity infusion, but could require the government to issue a blanket guarantee of some or all of the bank's liabilities. That could adversely affect the government's own credit rating and borrowing costs, unless the period of temporary public ownership were very brief indeed. A decision to resolve the bank through deposit transfer and/or bridge bank limits the scope of any government guarantee but may involve severe disruption to the credit and/or securities markets as a result of the bank's becoming a gone concern. A decision to pay off insured deposits and liquidate the bank requires no guarantee but may require significant amounts of immediate funding and will pose significant operational risks. Indeed, panic could result, if a pay-off is attempted but fails to complete within a brief time frame.

The Lehmans bankruptcy illustrates some of the problems that we face in designing resolution options for large complex systemically important firms. The first we have already stressed – the need to move away from the notion that large systemically important firms will always be rescued. The market must expect that resolution as well as rescue is possible. There is a greater chance that the market will accept this, if the authorities can design resolution methods that do impose significant losses on investors and capital providers but do not impose significant costs on customers, especially depositors, and do allow clients to keep their assets out of the any possible bankruptcy/insolvency proceedings.

In this respect, it is instructive to compare the US and the international experience in the Lehmans case. First, the US authorities facilitated risk-reducing transactions between Lehmans and various market participants through a special trading session on Sunday 14 September prior to the parent holding company filing for bankruptcy. Second, even after that bankruptcy filing, the US authorities maintained (via emergency liquidity assistance from the Federal Reserve) the US broker-dealer subsidiary of Lehmans as a going concern for a few extra days. This allowed the US broker-dealer subsidiary to complete trades that were in the process of settlement at the time that the holding company filed for bankruptcy. This "overtime" also allowed Barclays to conduct some due diligence and to buy certain assets and assume certain liabilities of the broker dealer for $1.75 billion – a deal that was announced on 17 September and closed on 22 September. Together these actions reduced the possible fall-out from the failure of Lehmans.

In contrast, the international subsidiaries of Lehmans went immediately into administration/liquidation on 15 September following the bankruptcy filing of the parent holding company. In the UK, the transfer of cash from the UK subsidiary to the parent holding company on Friday 12 September left the UK subsidiary without sufficient cash to open for business on 15 September. The Federal Reserve's liquidity provision extended only to the US broker dealer, not to its international affiliates, and provisions had not been put in place to assure that subsidiaries in other countries had access to similar liquidity facilities. Nor were provisions made for risk-reducing

trades among market participants prior to the declaration of bankruptcy. As a result, when the international subsidiaries went into administration trades were interrupted in the process of settlement, and client assets were trapped within the administration proceedings. There was considerably greater disruption to clients in the case of Lehmans international operations than was the case in the US.

The contrast between the US and UK experience illustrates the very great difference between a going concern and a gone concern. This is akin to the very great difference that a few degrees in temperature can make with respect to the effect that large amounts of precipitation can have. At plus two degrees Celsius, it is likely to fall as rain and disappear quickly into the drainage systems. At minus two degrees Celsius, it is likely to fall as snow, turn the roads into sheets of ice, disrupt traffic, etc.

Although there are many lessons to be drawn from the Lehmans bankruptcy,[6] four stand out:

1. <u>the importance of having accurate and up-to-date information about the status of the firm at the point at which resolution is initiated.</u> This was not the case for Lehmans. The administrators estimate that significant value was lost during the time required for the administrators to pull together a picture of the firm. Regulators are seeking to remedy this defect by requiring firms to be able to generate on short notice the information that an administrator would require in order to make a choice among resolution methods.

2. <u>the benefit of keeping client assets out of administration or insolvency proceedings</u>. Resolution plans will require firms to have in place mechanisms to identify client assets and assure that they can be transferred, if need be, to third parties.

3. <u>the importance of international coordination in preparing for the possible resolution of large, complex financial institutions.</u> In the case of Lehmans, there was no such coordination. The US authorities appear to have reached their decision on Lehmans solely on the basis of the potential impact on the US economy and US markets (Paulson 2010). In the time available on the weekend of 12 to 14 September the focus of US regulators was on finding a potential acquirer for Lehmans as a going concern and on limiting the impact of the bankruptcy on US markets.

   To address the need for international coordination, authorities have formed cross border stability groups for major financial institutions. Key regulators will talk in advance about what they would respectively do in the event that

[6] Two are worthy of further mention here. The first lesson concerns the importance of limiting the scope of deposit guarantees both with respect to the nature of depositors eligible to receive coverage and with respect to the amount covered. Lehmans had a bank subsidiary Lehman Brothers Bankhaus AG which was a member of the German deposit guarantee scheme applicable to private banks. Somewhat unusually this scheme covered institutional as well as individual deposits, and even more unusually the coverage was not for a fixed amount but for an amount equal to 30% of the capital of the bank.

The second lesson concerns the importance of assuring a prompt and accurate basis for close-out netting.

the firm in question were to require resolution. In addition, the LCFI's resolution plan is designed to force the firm to make preparations so that it can furnish the relevant information to the authorities in a crisis.

4. the benefit of keeping trading and customer businesses on life support for a few extra days. This allows trades to complete settlement and reduces the pressure on payment, clearing and settlement infrastructures that the failure might otherwise create. The few extra days may also allow risk-reducing trades to take place with market participants under the supervision of the authorities. To accomplish this, liquidity support from central bank(s) is likely to be required, and it should be an agenda item for a cross-border stability group to determine how the relevant central banks might provide this support.

Tackling too big to fail: next steps

We fully expect that further lessons will arise from the pilot exercise on living wills, which is being conducted in the UK and other countries. Although it is premature to draw conclusions from this exercise, recommendations are likely to fall under three headings:

1. ***change the bank***. Identify and perhaps require steps that the institution itself could take under current law and regulation to improve the possibility that it could be resolved, were intervention required, without recourse to taxpayer funds. This may, for example, involve restructuring its businesses so that there is a greater identity between legal vehicles and lines of business.[7]

2. ***change the law***. Identify changes in law and/or regulation that would facilitate resolution methods that do not require taxpayer support. Such changes might include the introduction of special resolution regimes for banks and/or their extension to non-bank financial institutions; the reform of deposit guarantee schemes so that they can pay out insured deposits promptly in the event of a bank failure; the introduction of depositor preference, and/or provisions that would allow the authorities to transform non-core Tier I and Tier II capital instruments into common equity in the event that the supervisor makes a determination that the bank no longer meets threshold conditions.

   In addition, changes in law and/or regulation might be undertaken so as to enhance the prospects that banks' recovery plans could succeed. Such measures might include, for example, giving explicit recognition to contingent capital in the new capital regime to be decided in Basel.

3. ***charge the firm***. If neither of the first two recommendations is feasible, then consideration must be given to other possible measures. Effectively, these measures would charge the firm, either through additional capital and/or liquidity requirements or a tax, so as to reduce the probability that intervention would be required. But any such requirement would have to be carefully drawn, lest it confirm that the institutions subject to the tax would definitely be

[7] Note that this does not necessarily mean that subsidiarisation is required. What causes complexity is the use of multiple legal vehicles across different jurisdictions to execute a single line of business.

rescued rather than resolved, were intervention to be required. That would only confirm that too big to fail was considered to be too difficult to remove. That would be – for the reasons outlined earlier in this paper – a recipe for further crises down the road. It is far more preferable to tackle too big to fail directly, so that this threat to financial stability can be eliminated.

References

Bernanke, Ben S. 2010. Statement prepared for the Committee on Financial Services U.S. House of Representatives, February 10, 2010, available at http://www.federalreserve.gov/newsevents/testimony/bernanke20100210a.htm

Huertas, Thomas F. 2010a. "Improving Bank Capital Structures," paper presented to LSE Financial Markets Group seminar on 'Modigliani-Miller in Banking, 18 January. available at http://www.fsa.gov.uk/pages/Library/Communication/Speeches/2010/ 0118_th.shtml.

Huertas, Thomas F. 2010b. "Living Wills: How Can the Concept be Implemented?" Remarks before the Conference Cross-Border Issues in Resolving Systemically Important Financial Institutions, Wharton School of Management, University of Pennsylvania, Philadelphia, 12 February.

Merton, Robert C. and André Perold (1993), "Theory of Risk Capital in Financial Firms," ***Journal of Applied Corporate Finance*** 6 (3): 16-32. Reprinted in Donald H. Chew, ed., ***Corporate Risk Management*** (New York: Columbia Business School Publishing, 2008): 131-161.

Paulson, Henry M. Jr. 2010. ***On the Brink*: *Inside the Race to Stop the Collapse of the Global Financial System*** (New York: Business Books).