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# How Should We Deal with Large Financial Institutions in a Crisis?<sup>1</sup>

## **Banks and the Government: the Tables Turned**

Throughout history, the fate of banks and their sovereigns has been closely intertwined (Alessandri and Haldane, 2009). For centuries, they have been mutually dependant on each other. Banking dynasties such as the Medici, Fugger, Rothschild's and Morgan's served as bankers to the government, and through that role, they were also often the financial savior of the sovereign. Since the middle of the 19<sup>th</sup> century, this relationship has been reversed. These days, it is more often than not the government which has to bail out the banks. However, it has come to a point whereby this role can threaten to break the finances of the country. Some banks have become "too big to fail" (TBTF).

By now, the sums involved are extraordinary and at a historical peak. Governments' budgets and, even more, banks' balance sheets have increased disproportionately in relation to the size of the economy. As an example take the following comparison: In 1895, the American banker John Pierpont Morgan, together with some fellow bankers, rescued the US government from financial impasse. Morgan had to mobilize 1,083% (i.e. the ten-fold amount) of his bank's balance sheet in order to finance just 0.4% of the US gross domestic product. This amounted to the equivalent of the US government's expenses for two years. Some 110 years later, in 2008, the Swiss government had to bail out one of its banks, the UBS. The bailout package covered just 4% of the UBS's balance sheet, but came at a cost of 13% of the Swiss gross domestic product (the equivalent of the

Swiss government's expenses for one year).

The tables have turned. Banks have become *the* big risk for the governments, the former saviors turning into victims. Particularly vulnerable are countries that have a relatively large banking sector compared to the size of their economy, for example Ireland, UK and Switzerland. A particularly poignant example is Iceland where an attempted rescue of the banking sector in 2008 proved disastrous. The severity of the recent financial crisis has put into doubt the financial capacity of many countries, and brought them to their limits. This can be seen, for example, in the market perceptions of sovereign bond risk. Government bonds of some countries, previously regarded as safe haven, have lost their high-grade status (Dötz and Fischer, 2010). A similar development can be observed in the European Union. Financial aid programs for distressed banks and weakened member countries have attempted to reverse a drop in their stocks, not always successfully.

## **TBTF as a Source of Distortions**

Banks can fail for a number of reasons. Most of the time, their failure causes no long-lasting problem. In fact, failure is part and parcel of a healthy, robust market mechanism. However, when banks are too big (or too complex, too interconnected, too symbolic) to let fail, a whole host of problems arises. The most severe problems arise from the adverse incentives that are being created by moral hazard. In other words, TBTF banks are being subsidized by the government. In times of crisis, they can rely on discretionary

<sup>1</sup> This paper is written with Inke Nyborg, University of Zurich.

government support. The expectation of a bailout distorts the incentives of the TBTF bank and its management, even in tranquil conditions. Furthermore, the existence of one (or many) TBTF banks in a market leads to misallocation of resources. Simply put, in such an environment a poorly-run large bank has an undeserved advantage over a small, efficiently-run bank. Market entry and exit do not function effectively. Academic research has shown that the magnitude of the TBTF subsidy increases with size, portfolio risk, and leverage (e.g. O’Hara and Shaw, 1990; Hughes and Mester, 1993; Angbazo and Saunders, 1996; Cordella and Yeyati, 2003; Rime, 2005; Brewer and Jagtiani, 2007; Baker and McArthur, 2009; Gropp et al., 2010). Furthermore, TBTF rewards banks for complexity and inter-connectedness.



TBTF banks, *ceteris paribus*, take bigger risks, and they are also able to do so at lower cost compared to their smaller competitors. Market forces being circumvented, the TBTF bank is still able to attract cheap funds and keep on growing, despite potential internal inefficiency (Stern and Feldman, 2009). The allocation inefficiency is probably the most wasteful aspect of TBTF in the long run.

### The Fiscal Cost of TBTF

In the short run, the discussion often focuses on the fiscal aspect of bank bailouts. The initial cost is likely to differ from the final (net) cost. The initial bailout cost will be advanced by the government or central bank. In the case of UBS, the rescue package of October 2008 amounted to some CHF 65 billion. In effect, this represented “only” a transfer payment. Yet, the financing of a large support package will require an increase in taxes at some point. Raising taxes comes with an economic distortion (a loss in consumers’ and/or producers’ rent). The magnitude of these costs will increase with the size of the bailout. In a worst case, there is a “death spiral”: the cost of a bank rescue diminishes or even erodes the tax base of the country. Higher taxes means that mobile productive factors move abroad, further shrinking the tax base. As it happened in the case of Iceland, repeated increases in taxes were accompanied by growing emigration of young people from the island, which led to further erosion of the tax base. Iceland, in fast forward mode, thus experienced a development that many other countries, heavily dependent on their banking sector, may experience – Switzerland being definitely one of the most vulnerable candidates.

### Political Cost

The political cost of TBTF should not be underestimated. Not surprisingly, tax payers do not approve of having to pay for bailing out banks. The last few years have given ample examples of vented frustration and anger at highly-paid bank managers, at “Main Street” having to pay for “Wall Street”. A similar debate is being held in Switzerland (“Abzocker-Debatte”). Political tensions have arisen as a result of perceived injustice, and necessary social reforms

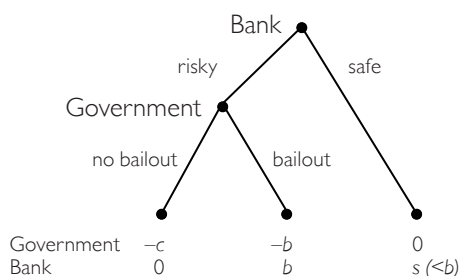
have been delayed because of this and the strain on the government's budget. A bank that is TBTF can also put the government under pressure in other ways. Politically, it can lead to disproportional lobbying power, like it has been observed by some commentators in the US. It can also lead to regulatory capture. In the case of Switzerland, a politically delicate point occurred when Swiss bank law clashed with the UBS-IRS tax pact in 2009.

### The Mechanics of TBTF

The problem with TBTF-expectations is that they cannot just be told to go away. Policy makers' pledge to end bailouts is not credible if they do not achieve consistency between words and actions over time. A denial of TBTF is not time-consistent.

Chart 1

#### Structure of the TBTF Problem



Source: Authors' compilation.

The strategic structure of the TBTF problem is shown in the game tree (chart 1)<sup>2</sup>. Let us assume two players, a bank and a government. The bank can make two investment choices; safe or risky investment. If the bank chooses the risky investment, the government chooses whether to save the bank or not. The financial consequences are listed in the lower part of the chart. In the case of the bank collapsing, the gov-

ernment loses the amount  $c$ , denoting collateral damage. This could, for example, include financial difficulties for the bank's customers, problems or stoppage in the settlement systems, possible spillover effects to other banks (contagion) and so on. On the other hand, if the government saves the bank, this will cost  $b$ , denoting bailout cost. If the government is rational, the government will want to save the bank if  $c > b$ . Likewise, if  $b > c$ , the government will let the bank collapse.

Assume now that the government announces in advance, that under no circumstances will a failing bank be rescued. If it is public information that  $c > b$ , such a statement is not credible. The same holds true for constructive ambiguity, i.e. the deliberate use of ambiguous language in order to confuse on a sensitive issue. Being known for its rationality, the government cannot convincingly announce an irrational decision.

For these reasons, the bank is safe in its knowledge that, come what may, it will be saved by the government. Thus the bank has no incentive to choose a safe investment. In chart 1, we call the bank's return on a safe investment  $s$ , denoting safe. In the absence of government support the bank would prefer the safe to the risky investment (paying nothing). Knowing that the government will step in, though, the bank prefers to receive  $b$ . As long as  $b > s$ , the bank will choose risk over safety.

This simplified game treats the bank as a monolith. In real life, the bank has shareholders and creditors. In most cases, the shareholders will have delegated the day-to-day business to the management. This would add to the complexity of the game tree. Yet, at the

<sup>2</sup> An extended version is available from the authors on request.

top of the financial “food chain” stand the potential creditors of the bank. They decide at the initial stage of the game, whether to invest in the bank or not. In the anticipation of government support in the case of financial difficulty, they would inject their money regardless of the bank’s risk profile. Therefore, at the core of the TBTF problem is a lack of creditor discipline.

### Expected and Realized Bailout

Chart 2 shows four possible scenarios in various combinations of expected and realized government support. The key aim of any measures towards reducing TBTF in a policy setting should be a transition from *TBTF* to *Laissez faire*. The scenario *Ideal* is not tenable in the long run – it would imply that banks act irrationally. The scenario *Crash* should be avoided – it would imply that the bank and the government act irrationally.

Chart 2

		Realized	
		no	yes
Expected	no	Laissez faire	Ideal
	yes	Crash	TBTF

Source: Authors' compilation.

In the above described game, we arrived at a combination of *risky* and *save* to describe TBTF. If the government could really commit itself, not to support under any circumstances, it would be preferable for the bank to invest safely. This scenario would correspond to *Laissez faire*.

In an ideal world, the bank would invest safely and responsibly, and the

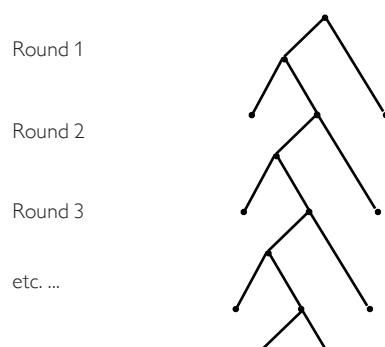
government would help out only in real emergencies. However, such a constellation would assume irrational decisions on part of the bank, and is therefore not possible. Its counterpart is the *Crash* scenario, a case where the bank is relying on a rescue which does not materialize. An example for this is Lehman Brothers in September 2008. The reason for the expectations of a rescue being so high at that point can be found in the earlier support for Bear Stearns in March 2008 (Johnson and Kwak, 2010).

### The Long Term View: Repeated Game

In a one shot game, it pays for the government to rescue the troubled bank because the bailout cost  $b$  is less than the collateral damage  $c$ . However, the nature of the game is such that the bailout of the bank is not the end of one game but the beginning of the next. It is a repeated game with infinite horizon. As shown in the chart 3, after each bailout, the next one already begins. Each round of the game is identical; except for the cost of the bailout  $b$ . In the repeated game, financial government support incurs the cost  $b$ , plus the expected cost of a (possibly) endless repetition of the game.

### Repeated Bailouts

Chart 3



Source: Authors' compilation.

### A Horrible End, or Endless Horror?

As long as all variables do not change from one round to the next, it is either advantageous to never or always to support the failing bank. In the latter case is the cost of *saving* a perpetual sequence of  $b, b, b, [ \dots ]$ . Its current value is  $b/d$ , whereby  $d$  represents the discount at which government perceives the future. In the repeated game, the decision rule for the government is as follows:

- $c < \frac{b}{d}$ : never bail out
- $c > \frac{b}{d}$  always bail out

Long termism (i.e. a low  $d$ ) would assist government in being able to claw back financial support. In other words, a government that values the present as high as the future, does not encounter a TBTF dilemma. However, in an uncertain world it would not be reasonable to put the future on par with the present.

Size is not explicit in the above decision rule, but hidden behind the individual parameters. It seems fair to assume that  $b$  increases roughly propor-

tionally to the size of the bank. It also seems plausible to assume that collateral damages  $c$  increases faster, perhaps exponentially, with size

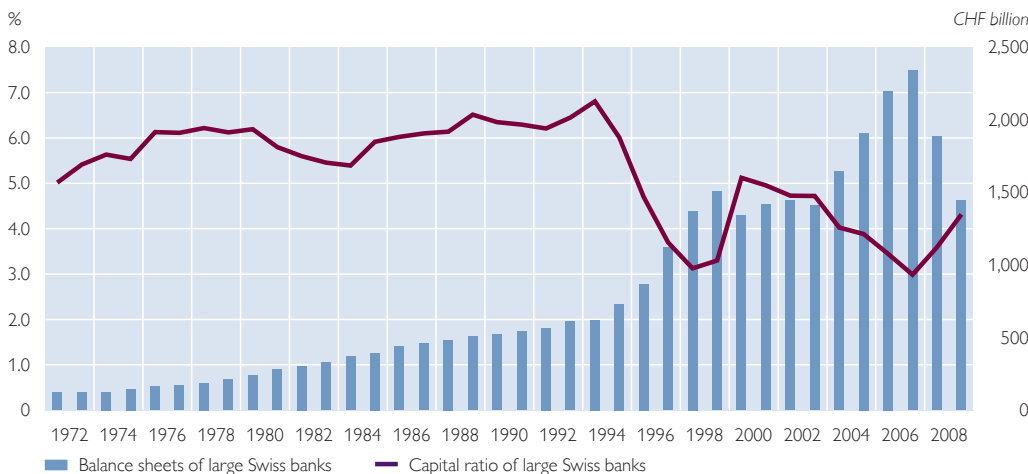
TBTF thus ends in a loop “size–risk–support–growth–size”. The limit is only reached when  $b$  breaks the government’s finance. Then  $a$  bank (or the banking sector, as in the case of Iceland) becomes too expensive to be rescued.



What chart 4 shows is that the implicit guarantee to support a bank during times of crisis is achieving a size that is untenable in the long run, even putting at risk the financial well-being

Chart 4

#### Balance Sheet and Capital Ratios of Large Swiss Banks from 1972 to 2009



Source: Swiss National Bank.

of the government as a whole. Like banks in other countries, the Swiss banks have grown considerably since the 1970s. Their balance sheets are now several times the size of annual Swiss GDP. Previous financial crises (oil crisis 1973-75, mortgage crisis 1991-94, burst of the internet bubble in



2001-02) have led to occasional bumps, and so has the recent financial crisis. Part of the recent setback was due to changes in derivatives accounting. Swiss banks' capital ratios have been stagnant for the last ten years and reached disturbingly low levels at the outset of the recent crisis. Chart 4 suggests that the TBTF\_check will tend to grow in the long term and is likely to reach unaffordable levels.

### Measures against TBTF

A number of measures are being discussed, both at a national level and in the international arena. For ease of reference, they can be divided into three main categories (although they do overlap in practice to some extent). The first group (e.g. limit size, split banks, living wills) aims at reducing the cost of a bailout. The second group (e.g. capital charges, liquidity ratios, corrective action) targets the *ex ante* prevention of an insolvency. The third group (international or national insolvency regimes,

conditional capital, conditional convertibles) seeks to restore solvency *ex post*.

We will, at this point, not discuss the merits of the first two groups, i.e. the measures to make failures less likely or more manageable in size. This is because we argue that no set of measures can ever be reliable without tackling the thorniest problem: that of how to deal with an insolvency *ex post*, once it has occurred. This is because it is unavoidable that some banks fail at some point unexpectedly. We think therefore that the greatest potential for solution of the TBTF problem probably rests with the measures of the third category.

### How to Restore Solvency: Some Simple Accounting Arithmetic

As the chart 5 shows, there are six different ways how a bank in trouble can restore solvency. Basically, there are two main approaches: (i) assets can be increased (via fresh capital, a government bailout, or conditional capital), or (ii) debt can be reduced (via creditor renegotiation, bankruptcy or conditional conversion). In theory, any of this can be done (a) voluntarily, (b) through government intervention or (c) under contractual obligations.

Chart 5

### Possibilities of Banks' Restoration of Solvency

Insolvent Bank	
Assets	< Debt
<ul style="list-style-type: none"> <li>• Fresh capital</li> <li>• Government bailout</li> <li>• Conditional capital</li> </ul>	<ul style="list-style-type: none"> <li>• Less debt:</li> <li>• Creditor renegotiations</li> <li>• Bankruptcy</li> <li>• Conditional conversion</li> </ul>

Source: Authors' compilation.

Voluntary measures have their limits. If a bank is in real trouble, the supply of fresh capital dries out. On the

other side of the balance sheet, a voluntary agreement by creditors might even be in their common interest, but in the case of banks the sheer number of creditors precludes any Chapter 11 style agreements. The government solution would be a bailout (the very thing to avoid) or a bankruptcy procedure. Bankruptcy procedures destroy most of a bank's wealth and are mostly avoided. A better alternative is a restructuring of the balance sheets, i.e. the conversion of debt into equity (D-E), if law permits. In many countries the legal basis for a D-E-conversion does not exist, or, if it exists, it cannot be applied without considerable international legal conflict or complications.

### Debt-Equity Conversion

For the above reasons, contract based D-E conversion may be the only viable option to restore bank solvency. Conversion would be based on the principles of an *ex ante* rule and contain an objective trigger. Conditional convertible bonds are hybrid securities that convert from debt to equity if certain conditions are met or when a pre-agreed trigger is reached (see, for example, Flannery, 2005). In this way, such bonds provide a transparent yet effective mechanism for un-levering the bank, should the need arise. Academic support for such instruments comes, for example, for the influential Squam Lake working group (Squam Lake, 2009). Bankers themselves have called it "a powerful new way to recapitalize financial institutions using a bank's own money, rather than that of tax payers" (Calello and Ervin, 2010). In Switzerland, the commission of experts, in its interim report to the government (Expertenkommission, 2010), also mentions to such instruments as worth investigating.

While the market for conditional convertibles as still relatively untested, there are at least two banks that have issued them in the last two years. In the UK, Lloyds TSB issued so-called enhanced capital notes for the first time in 2009. These convert to equity if the bank's Tier 1 capital ratio should fall below 5%. In the Netherlands, Rabobank issued in 2010 contingent notes that get a 75% haircut should the bank's Tier 1 core capital ratio fall below 7%. Capital ratios are not the only trigger that can be used. Other possibilities are assets/deposit ratios, CDS spreads, supervisory announcement and more (e.g. Hart and Zingales, 2009; Pennacchi, 2010).

The attraction of instruments such as contingent convertible bonds is that they remedy the need for government support, yet they offer a solution for reducing banks' likelihood of financial distress. This comes at some cost for the bank. Investors unlike tax payers do not take risk for free. However, if implemented correctly, such instruments can take away the option to free-ride on taxpayers' future promise to make up for the bank's loss.

From a financial stability perspective, contingent convertible bonds have possibly two advantages. *Ex post*, they can assist in removing the threat of insolvency. *Ex ante*, their yields reflect market players' assessment of a bank's riskiness, and thus such bonds offer an additional tool to price risk. Contingent convertible bonds thus help to restore market discipline which has been undermined by TBTF expectations. One can argue that the mandatory issue of a sufficient amount of conditionally convertible debt alone is not a sufficient solution to the TBTF problem. Yet, it is hard to see a solution to the TBTF problem that would not have the issue of conditionally convertibles at its core.



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