How to overcome the Great Financial Crisis - An Asset Exchange Approach

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by

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Abstract

The reasons for the current financial crisis are analysed and a proposal for financing a bad bank is made. In particular, it is proposed to give the banks in trouble government zero bonds rather than cash in exchange for their toxic assets. The term of the zero bonds is determined individually according to the effective failure ratio of the toxic assets. As the latter is yet unknown, this procedure avoids the problem of evaluating them in advance and at the same time ensures that the entire costs of adjustments are lastly borne by the banks themselves rather than by the taxpayer. This solution is suitable for all but the worst cases, where insolvency is inevitable. It is argued that a similar asset exchange approach has already proved to work two times in German History, and that there is no reason to fear that it could hamper the effectiveness of financial markets in future.

1. Introduction

Few people understand what really happened in the current financial crisis. Even less people have an idea how it can be solved. And some of the latter, being involved in the crisis themselves, typically have other interests than saving the taxpayers moneybags. This might explain why a most obvious way to solve the crisis has not yet made its way in real policy, though it has yet been proposed by scientists (van Suntum 2009), journalists (Joffe 2009) and politicians (Schäfers/Frühauf 2009).

Here is the story of the bank crisis in short and a simple way how it could be overcome with minimum risk for public expenses, by making those who ruined the financial system making pay themselves.

2. A short story of the current financial crisis

The current financial crisis with its tentative culmination in 2008/09 can best be explained by starting with the fundamentals of typical bank balance:

Table i: A bank`s balance

Assets	Liabilities and Equity
Cash Reserves R	Deposits and Borrowings D
Loans and Securities L	Owner`s Capital (Equity) E
Total	Total

On the liability side, we see the bank`s equity E and also the debt D which, in the simplest case, are deposits held by the public. On the assets side, there are both the bank`s loans L and cash reserves R. Thus formally we have for the balance sheet total T:

$$(1) T = L + R = D + E$$

In principle, there are three important ratios to prevent the bank from failing:

- Reserves must be sufficiently large in relation to debt to ensure the bank`s liquidity at any time. Reserves can be either fractional according to the ratio given by the monetary authorities or voluntarily held. Anyway, they should not undergo a minimum ratio of debt. Formally, with $\alpha \equiv R/D$, we have

$$(2) R \geq \alpha_{\min} D$$

- Even if the liquidity constraint (2) is met, the bank could fail if total debt should exceed total assets, i.e. if its equity becomes negative. Thus, with $\beta \equiv E/C$ as the equity/credit-ratio, we have the additional "Basel II" requirement

$$(3) E \geq \beta_{\min} L$$

- Even if both the liquidity constraint (2) and the minimum equity/debt ratio (3) are met, the bank could fail, namely when its long term costs exceed its long term receipts. With the average loan interest (net of allowances) i_L and the average debt interest i_D (net of costs) we therefore have

$$(4) L * i_L - D * i_D \geq 0$$

Because of the leverage effect, the bank has the incentive to minimize both the liquidity ratio R/D and the equity ratio E/L within the limits of (2) and (3) respectively. The simple reason is that, with the interest on debt i_D being below the interest on loans i_D, the rate of return on equity r_E (and thereby the enterprise value of the bank) is c.p. maximized by minimizing both α and β:

$$(5) r_E = \frac{L * i_L - D * i_D}{E} = \frac{L * i_c - D * i_D}{L - D + R}$$

From (5) it immediately follows that r_E is the higher, the less reserves are held and – with $i_c > i_d$ - the higher is D/E. On the other hand, small values of α and β increase of course the risk to fail.

Employing these simple relationships, one can readily explain what went wrong. Suppose that, starting from a sound financial situation, the monetary authorities increase money supply more than would be appropriate with respect to economic growth (as both the FED and the ECB actually did after 2001). Assume that a substantial part of excess money supply flows into the asset markets, thereby boosting both house prices and stock prices. In the simplest case, both the bank sector`s total balance sheet and all of its components could rise at the asset inflation rate, thereby leaving both α and β unaltered. Even then there would accrue a considerable systemic risk, which is not visible in any bank statistic.

The reason is that, due to declining interest rates and idle money reserves, additional real investments are carried out which are inferior to those formerly done in terms of either profitability and/or safety. This phenomenon is nothing else than the core of the old monetary overinvestment theories by Hawtrey, Wicksell, and Hayek (Haberler 1963). While at the beginning of the 21th century overinvestment concentrated in the new economy, thereafter it boosted the real estate bubble in the United States and elsewhere. Houses were bought without a cent of own capital by people who normally would not have afforded to do so. Stock prices were driven by the easy money policy to heights which were far from being fundamentally justified.

As long as asset price inflation continues, everything seems to be fine with the bank`s balance sheets. The equity/loan ratio looks even particularly sound: When L increases due to rising stock prices, E increases by the same absolute value and, hence, the equity/loan relation improves because of L > E. This effect mislead the bank managers to further exhaust the leverage effect by giving new credits and financing it by new debt (rather than by fresh equity). This is exactly what happened after 2001, strongly facilitated by new “creative” financial instruments which helped to circumvent the legally required $\beta_{\min}$.

It must be stressed, however, that this is only an additional factor of the growing instability. The true core of the problem is the collective overestimation of asset values due to inflationary monetary policy. The problem is quite similar to the main failure of the 18th century real bills doctrine, which was proposed among others by James Steuart and – tellingly – by John Law, the guy who later plunged the French financial system into ruin. According to that doctrine, any excess issue of money would be automatically prevented by a free banking system, if only some simple rules were kept in. In particular, only real bills rather than

fictitious bills should be discounted. The proponents of the doctrine erroneously thought that with this rule exclusively the “real” needs of trade would be financed. Their key failure was that the needs of trade are lastly defined in nominal terms rather than in terms of real goods, and thus the real bills doctrine did not at all prevent inflation (Mints 1956, Laidler 1984, Velde 2007).

The evaluation of bank assets in nominal terms without allowing for pure inflationary effects in the equity/loan-ratio is equally misleading. With equity E being often less than 10 percent of the bank`s loans L, even a moderate decline of assets due to stock price losses or because of exceptional write-offs can easily drive the bank into insolvency. Because a crash of asset prices is inevitably programmed by a former bubble, there results a systemic failure which cannot be outweighed by proper diversification and distribution of risks within the bank system. Hence, looking at the current crisis that way, the question should not be “Why did it happen?” but rather “How could it work well for such a long time?”. Note that there have been many heads ups, both in history and in more recent times (Kindleberger et. al. 2005). But apart from a handful of lone voices (among them Wolfram Engels 1996), they were not taken seriously.

What are the next steps into the crisis to follow? Sooner or later the monetary authorities become worried about rising prices and start to increase their interest rates. In the current crisis, this happened since the middle of the century. Now the poor performance of the artificially induced extra investments (in particular in the housing sector) becomes evident. As a consequence, the value of bank assets declines both due to unbudgeted allowances and falling stock prices. Moreover, short term interest approached long term interest and finally even exceeded it since the midst of 2007. Now the banks saw the fatal face of the leverage effect: Not only did the losses in asset value rapidly decrease their equity, but in addition they suddenly had to pay more for borrowing than they get back from lending.

Not surprisingly, such an awkward combination results in insolvency for some of the banks. The others must try to regain creditability by raising their equity/loan ratio β. Unless they can manage to get fresh capital, the only way to do this is shortening their loans. Paradoxically, the liquidity ratio α is thereby even pushed up just in the middle of the crisis. This is nothing else than the reflection of a dramatically increased liquidity preference, not only of the people, but in particular of the banks themselves. At the same time, however, credit supply for

investments decreases or becomes at least more expensive. The banks even prefer to treasure up their money with the central bank rather than running new risks and further deteriorating their equity/loan ratio β. This happens because of the beginning slowdown in the real economy, which is at the same time thereby enforced: Crisis feeds the crisis.

At first sight, this seems to be a true Keynesian scenario. However, other than in a Keynesian liquidity trap, at this stage we have the phenomenon of extreme liquidity preference with high rather than low interest rates for the firms, although central bank interest rates are low or even zero. As an illustration, bank reserves with the European Central Bank rose by the factor 1000 between September and October 2008. At the same time both short term interest and long term interest remained high with approximately 5 and 4.5 percent respectively. As a result, in spite of excess liquidity it becomes more and more difficult for firms to obtain credits at all, and even a credit crunch can emerge.[1]

3. What can be done: An asset exchange plan

To summarize our short analysis above, the following three factors have considerably contributed to the current financial crisis and its infection of the real economy. These factors are

- initially a massive excess issue of central bank money, followed by
- both an asset price inflation and a hazardous overworking of the leverage effect by the bank system, and
- finally, after the bubble had burst, a collective flight into liquidity.

The early policy reactions targeted both the liquidity/debt ratio and the equity/loans ratio of the bank system. By decreasing interest rates for central bank money and giving public guarantees for both bank deposits and liabilities a bank run could successfully be prevented. Moreover, many banks were given fresh equity by the government in order to prevent insolvency due to over-indebtedness. However they did not really solve the core problem, namely the toxic assets in the banks balances.

[1] As even Wolfram Stützel (1974) had put it: Liquidity follows solvency, not the other way round, see also Sachverständigenrat (2007, 125).

Note that, in order to restore the initial equity/loan ratio, one Dollar of fresh equity must be injected for every Dollar lost at the asset side. Although the government is entitled to future profits of the particular bank in exchange, this way could turn out to be extremely costly for the taxpayer, in particular if the true value of existing capital is already negative. The guarantee measure appears to be less costly at first sight, because in the end only that part of the toxic paper`s value must be stand up for which has actually been written off. However, as there is no profit sharing as a compensation for the taxpayers in this case, they could finally be left even worse off.

The limited success of the early rescue measures eventually brought the bad bank plan on the agenda. Neglecting the details, the plain idea is that the government should simply buy the toxic papers from the banks and thereby tackle the problem from the asset side of their balances. From the viewpoint of the banks, this appears to be a most advantageous approach. It is not only that they get rid of their sins of the past, but in addition they snatch cash from the government without any equivalent compensation. It is little surprise that this solution is favoured both by many people in the financial sector and some of those politicians who are near to them.

Is, accordingly, the bad bank just another bad idea? As it is often the case, the answer depends on how it is done. Simply giving the banks cash at a one to one rate in exchange for their scrap papers would doubtlessly be a disastrous waste of money. But there is a better way. Why not give them government zero bonds, which must be held for several years and are to be exchanged for cash or ordinary government bonds thereafter (van Suntum 2008)? A similar way has already been gone twice in German history, namely after World War II and after German unification (Baumgart 1957, Schnelloh 1955, Kreiss 2003). In both cases the so called “Ausgleichsforderungen” replaced the worthless bonds issued by the German Reich and the German Democratic Republic respectively. The government paid interest on the bonds and eventually bought them back from the banks later on. By this elegant way the latter`s initial balance problem has been distributed on many years, rather than disturbing the banks by the way of a unique, huge write off.

In the current crisis, we should do roughly the same. However, because this time the crisis was caused by the banks themselves, there is no reason why the bonds should bear an interest.

A much more reasonable and at the same time cheaper way is buying the toxic assets in exchange for government zero bonds with a long, though finite term.

The advantages of this proposal are quite obvious (van Suntum 2009):

- Once the toxic assets are removed from the balance, the uncertainty and distrust in the bank sector will vanish.
- The zero bonds cause a kind of negative leverage effect for the respective bank: Because they do not bear interest, the rate of return on equity is reduced the more, the more toxic papers have been replaced by them.
- Therefore, instead of being sent into the hell of bankruptcy, the banks have to go through purgatory.
- The government can try to sell the toxic papers within the next years, without having to pay for them in advance, nor must interest be paid on the government bonds till the day of their maturity.
- Burdened by the zero bonds on the asset side of their balance, the banks have a strong incentive to revive their ordinary business of giving loans to firms and credits to the public.

Nevertheless, there remain some open questions. Firstly, it seems unclear at which rate the toxic assets should be exchanged for the zero bonds. Secondly, a decision must be made on the maturity term of the bonds. Thirdly, the effectiveness of financial markets might be hampered by the burden of the bonds. Last not least, the costs for the taxpayer appear to be untransparent and difficult to calculate. However, these issues can be solved most easily and even simultaneously, because they are all related to each other and, in a way, are just different sides of the same coin.

First of all, it is of crucial importance to understand that a zero bond has a real value V which is substantially below its nominal value, depending on both its maturity term n and the adequate target rate i. For example, with n = 20 and i = 5%, according to the present value formula the real costs for the government of issuing a 100 Dollar zero bond ZB is

$$(6) V_{ZB} = \frac{ZB}{(1+i)^n} = 37.69$$

This is substantially below the nominal value of the bond. Moreover, at least part of the real costs can be regained by the government by selling those toxic papers which need not be totally written off.

Of course, it must be made sure that the government zero bonds in *the bank`s balance* are nevertheless validated at their nominal value, which is 100 in our example. This can be justified by the fact that they are entirely safe and will actually be exchanged at their nominal value of 100 at date n. Moreover, cash reserves also appear in the balance with their nominal value, although they are dead stock. In case of need, balance rules concerning government zero bonds should be changed accordingly, for otherwise the asset exchange would not help at all. In times where we discuss the socialisation of banks, where the world financial system is at stake, and where we talk about billions of taxpayer`s Dollars, such a change in balance rules surely is the least problem.

From these considerations follows an obvious procedure how to assess the true value of the toxic assets taken over by the government. The idea is to make their price *in terms of present value* just equal to the present value of the receipts which the government can realize by selling them at the market. This can simply be done by determining the term of the zero bonds only *after* the true value of the toxic papers has become clear. This procedure obviously solves the problem that the true asset value is yet unknown, and ensures at the same time that the taxpayer is finally not charged at all.

In particular, from (6) the adequate term of the zero bonds n can be calculated as

$$(7) n^* = \frac{\ln(ZB / V_{ZB})}{\ln(1+i)}$$

where ZB/V_{ZB} is the relation of the validation of the toxic assets in the bank`s balance and their true market value, and i is the adequate target rate. If, for example, i = 5% and, after some years, the true value of the toxic assets turns out to be only 30% of the price at which they have been exchanged to zero bonds, according to (7) the latter`s term should be determined at 10.47 years. If the final term determination can only be made after more than n^*

years, the bank can be given respective compensation, otherwise after n^* years the zero bonds are bought back by the government at the same price at which they had been taken over. In either case, the costs for the taxpayer are definitely zero. Voila, that's it.

Some argue that this plan would reduce future competitiveness of the respective banks and thereby possibly hamper the financial markets of a country which adopts it. However, this is not true. In contrast, the price is paid exclusively by those who own the bank`s equity at the time when the plan is launched. For as soon as it becomes clear that future receipts of the bank will be squeezed by the burden of government bonds which do not bear any interest, the stock price of the bank`s equity will drop to a level such that the economy´s average level of return on investment is met again. Admittedly, with an uncertain term n^* of the zero bonds, there remains some uncertainty on the bank`s future performance. However, in contrast to having toxic assets with an unpredictable debt fault rate, this uncertainty is only on the duration of depressed profits, but there is no longer the risk of bankruptcy because of a sudden, huge write off. This exactly makes the difference with the asset exchange plan: reliable purgatory instead of uncertain risk of hell.

4. The asset exchange plan in more detail: An example

For a more detailed example of the whole story told above, we start again with a simplified model of a bank`s balance sheet. However, in contrast to the even more simplified model from above, we now divide loans in good loans GL and toxic loans TL. We also divide liabilities in ordinary deposits OD and bonds of debt BD. We assume that good loans GL are entirely safe, but bear a relatively low interest rate i_{GL}. In contrast, expected interest on toxic loans i_{TL} is higher, but on the other hand they bear a risk of loan fault. Concerning liabilities, we assume that interest on bonds of debt i_{BD} exceeds interest on ordinary deposits, both being below of i_{Gl} and, therefore, also below of i_{TL}.

For simplicity, we assume an infinite time horizon, so that the present value of any asset having the nominal value A can simply be calculated as

$$(8) V_A = \frac{i_A * A(1-f)}{i}$$

where f is the failure rate for the particular asset, i_A is its nominal rate of return, and i is again the adequate target rate.

In the sequel we use the following simple numerical example:

Table ii: The bank´s balance before the crisis

Interest rates	Assets		Liabilities		Interest rates
1%	Reserves R	20	Ordinary Deposits OD	20	2%
5%	Good Loans GL	40	Bonds of Debt BD	70	4%
10%	Toxic Loans TL	40	Equity E	10	10%
	Total T	100	Total T	100	

Table ii depicts the bank`s balance before the outbreak of the crisis. The interest rate on good loans i_{GL} = 5% is also used as the target rate i. Concerning the toxic loans, we assume a failure rate of 50%, such that with the interest rate i_{TL}= 10% their market value just equals their nominal value as it is accounted for in the balance. Long term cash flow can then be calculated as

$$(9) C = R * i_R + GL * i_{GL} + TL * (1 - f) * i_{TL} - OD * i_{OD} - BD * i_{BD} = 1.0$$

From equation (5) it follows that C/E = 10%. We assume that the target interest rate on equity r^* is higher than the respective target rate on loans, due to the higher risk of equity. In our example, we assume that the average ROI in the economy, that must be met by every bank, is r^* = 8%. Then it follows that the market value of equity is

$$(10) V_E = \frac{C}{r^*} = 12.50$$

Hence the shareholders of the bank are richer than is indicated in the balance, where equity has only a nominal value of E = 10.

Now suppose that the crisis starts and the additional risks are detected. Let the rate of debt fault of the toxic loans rise to f = 70%. Then, according to equations (8) to (10), we have V_{TL} = 24 for the market value of the toxic assets, C = 0.20 for the long term cash flow and V_E = 2,5 for the market value of the bank`s equity, which is now even below of its original balance value, though still positive. The problem is, however, that in case of a proper write off of the toxic papers nominal equity in the balance would become negative in this example (see Table iii).

Table iii: The bank`s true balance in the crisis

Interest rates	Assets		Liabilities		Interest rates
1%	Reserves R	20	Ordinary Deposits OD	20	2%
5%	Good Loans GL	40	Bonds of Debt BD	70	4%
10%	Value of Toxic Loans V_{TL}	24	Equity E	-6	-3.33%
	Total T	84	Total T	84	

Note that E is negative, although V_E is still positive, i.e. of the three possible causes of insolvency referred to in Section 2 only the second one (over-indebtedness), but not the third one (negative long term cash flow) is relevant in this example. This is a necessary condition for the asset exchange plan to work. Otherwise, i.e. with both a negative equity E and a negative long term cash flow C, the bank must either be closed or given fresh capital by the government (if it is of systemic relevance).

Table iv: The bank`s balance with the asset exchange approach

Interest rates	Assets		Liabilities		Interest rates
1%	Reserves R	20	Ordinary Deposits OD	20	2%
5%	Good Loans GL	40	Bonds of Debt BD	70	4%
0%	Zero Bonds ZB	40	Equity E	10	2%
	Total T	100	Total T	100	

With the asset exchange plan being adopted, the bank`s balance looks like it is depicted in Table iv. The former toxic loans TL are now replaced by government zero bonds ZB, which have an equal nominal value of 40, but yield zero interest. The contribution of the latter to long term cash flow can be calculated by translating them in equivalent regular bonds RB as follows:

$$(11) i * V_{ZB} \overset{!}{=} i_{RB} * RB \Rightarrow i_{RB} = i * \frac{V_{ZB}}{RB}$$

In our example, this yields i_{RB} = 5%*24/40 = 3%. From equation (9) total long term cash flow can then be calculated as C = 0.2, which is exactly the same value as without the rescue plan (see above). Accordingly, also the bank`s stock value is still $V_E = C/r^* = 2.5$. In other words, the asset exchange does neither alter the bank`s long term profits nor the market value of its equity. Yet the balance problems from Table iii have completely vanished in Table iv.

5. Concluding Remarks

The proposed asset exchange approach does of course not instantly lead to an economic recovery. Meanwhile the financial crisis has infected the real economy, as it did in the 1930ies. Finding out of the resulting recession is quite another story. On the other hand, without solving the bank`s balance problem there is little hope that the crisis can be overcome at all. The proposal of this paper therefore tackles a core issue. Apart from the theoretical argument, it can rely on positive experiences with a similar approach in German Economic History. As has been shown above, unlike the then employed Ausgleichsforderungen, the zero bond approach avoids to charge the taxpayer and puts the burden on those, who are responsible for the current crisis. After having gained from hazardously overstressing of the leverage effect, with the asset exchange approach they will be burdened by a kind of negative leverage effect, that reduces their profits just as long as is necessary for amortizing the write offs on their toxic loans. At the same time, the approach provides a solution for the assessment of the value of these loans.

Given these features, the bank`s shareholders will presumably be less enthusiastic about the plan than the taxpayers. Thus it may be helpful for its implementation that the latter are in the majority.

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