TO BAIL OUT OR NOT TO BAIL OUT SYSTEMICALLY RELEVANT FINANCIAL INSTITUTIONS: THE INCENTIVES OF POLICY MAKERS

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Abstract

The recent financial crisis has shown that many financial institutions may be systemically relevant. Their bankruptcy would cause significant costs for the overall economy. However, a clear definition of systemic risks still does not exist. Thus, the decision, whether an institution is, or is not systemically relevant is in the end made by policy makers. This paper takes a closer look at the incentives available to policy makers and their influence on the bailout decision. In the model presented here it is possible to show, that too many financial institutions get bailed out, when assuming that policy makers tend to be more risk-averse than socially optimal. The costs due to this misallocation of resources can be significant.**

Keywords: Systemically Relevant Financial Institutions, Financial Crisis, Bankruptcy, Systemic Risks, Bailouts, Policy Makers

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1. Introduction

In recent years, both the world's financial system and then the overall economy have gone through their biggest crisis since the Great Depression. Central banks and governments all over the world used existing and new instruments to prevent it getting worse. Depending on the strength of the crisis, doctrines were neglected or new instruments introduced. The "lender of last resort" (LOLR) policy softened with central banks acting now as "bad banks" or governments investing as "investor of last resort" (IOLR). The long-term consequences of these instruments are still unknown.

This paper focuses on the relationship between bailing out systemically relevant banks and the incentives of policy makers. With a simple model it's possible to analyse the impact of policy makers on the bailout decision. Since systemic relevance is difficult to define[59], during the financial crisis policy makers assessed, whether an institution was or was not systemically relevant. When assuming that policy makers are more risk-averse than socially optimal it becomes clear that too many banks may be bailed out. To spend government's budget effectively, strict rules and definitions should be developed to reduce the misleading impact of policy makers incentives.

[59] For a description of systemic risks and a review of the relevant literature I refer to the working paper of De Bandt and Hartmann (2000).

2. Individual bank lending

When talking about the bailout of banks I first briefly summarize the different support levels for banks, since a bailout is only the latest step in the hierarchy. This hierarchy is classified by the solvency and the liquidity of the institution. The traditional instruments of the hierachy are als described in many monetary policy books (see for example Freixas and Rochet, 1997). The different support options are briefly described below.

2.1 Discount window at the central bank

A bank, facing a short term liquidity problem can use the discount window - a standing facility - offered by the central bank to bridge those liquidity problems. Usually central banks offer this facility with a term of overnight and on a secured basis (i.e. against predefined collateral via a repurchase agreement). Unexpected short-term liquidity problems might occur if interbank payments are not received in time or the treasury of the bank miscalculated the cash-flows. In the US, the Federal Reserve System offers it's counterparties this standing facility via the discount window. The European Central Bank calls it the marginal lending facility, whereas the Swiss National Bank calls it the liquidity-shortage financing facility.

2.2 Lender of Last Resort

In certain circumstances, some banks might also need additional liquidity assistance. This might be due to larger than expected withdrawals by customers. In these circumstances if banks are still solvent then they will usually get liquidity from the central bank in exchange for valuable assets. In such situations, the central bank is called the LOLR (Bagehot, 1873). In the historical LOLR theory, central banks should only provide liquidity assistance for an individual bank under certain conditions. The following rules should be followed:

- lending should be open only to solvent institutions,
- lending should be done only in exchange for good collateral,
- these loans must be at a penalty rate.

Given these points, banks can get liquidity but it sends a clear deterrent signal to other banks that LOLR liquidity is not an easy way to refinance. During the financial crisis the LOLR liquidity was also called emergency liquidity assistance (ELA). Thus, some economists were no longer talk about LOLR but rather about ELA.

2.3 Bailout - Bad Bank - Investor of Last Resort

Unfortunately, it is not just support with temporary liquidity that central banks and public authorities have to provide but they also have to inject capital.[60] The failure of some banks may result in a systemic crisis affecting the overall economy, since for example the payment system can break down. Those banks, whose failure would cause a systemic crisis, can be ex poste defined as systemically relevant. Due to the fact that systemic relevance is only ex post observable but ax ante difficult to assess, there exists a lot of uncertainty about whether an institution is systemically relevant or not.

When the costs of an expected systemic crisis within the country exceed the rescue costs - including direct and indirect costs - the government is obliged to bailout banks even though they might be insolvent.[61] According to this the LOLR intervention policy does not hold anymore. Concerning this matter the term Investor of Last Resort (IOLR) emerged. Therefore the government provides not only liquidity assistance but also acts as an investor (following Stern and Feldman, 2009). Whether the government should rescue an institution or not can be simplified by the following equation.[62] The wealth of an country A in period t is defined as w_t^a. If a systemic crisis occurs, a fraction γ_t of this wealth will be destroyed each period.[63] On the other hand, the systemic event can be prevented by injecting a fraction κ of the bank's total balance sheet b into the bank in period $t = 0$.[64] If the institution is bailed out, moral hazard - here simply defined as m_t - increases and thus also the costs of the bailout.

$$x = \frac{\sum_{t=1}^{\infty}(\gamma_t w_t^a)}{\kappa b + \sum_{t=1}^{\infty} m_t} \qquad (1)$$

$$bailout: \begin{cases} no, & x < 1 \\ yes, & x \geq 1 \end{cases}$$

Usually the intervention decision has to be made in a time period before the systemic event actually would occur. Hence the costs of a systemic crisis would develop from period 1, whereas the prevention cost would develop from period 0. As long as the sum of the costs to prevent the systemic event is higher than the sum of the costs of the systemic crisis[65] within a country, the expression is smaller than one. Thus the elimination of the systemic event is not adequate because then social welfare would be higher with the systemic crisis. Since systemic crises are very destructive, the ratio will, in most cases, be bigger than one (or equal what is here for simplicity defined as a bailout) and hence an intervention is adequate. In the case of the rescue of the UBS, the costs of a systemic crisis were estimated at about 60 - 300 percent of Swiss GDP whereas the intervention costs amounted (maximally) 15 percent of Swiss GDP (Federal Council of Switzerland, 2008). Hence the ratio exceeded 1. This intervention policy is clear in this equation but when assessing in practice the possible costs of preventing a systemic crisis some long run effects have to be considered which are difficult to assess. As early as 1999 some economists were concerned about governments and central banks becoming more scared of a financial institution's failure and only marginally accounted for long term incentives of their interventions. They argued that when governmails bailout financial institutions (even

[60] Liquidity support should usually be done by the central bank whereas solvency support should be done by the government. This difference however might depent on the mandate of the central bank and will not always be followed.

[61] It is assumed that the government perfectly maximises the welfare of the society in the long run.

[62] Let's assume for simplicity that the following equation holds: $\beta(1+r) = 1$, whereas r is the nominal interest rate and β the intertemporal discount factor.

[63] $\gamma_t \in [0,1]$

[64] $\kappa_t \in [0,1]$

[65] The costs of a systemic crisis can be defined as the difference of wealth for all agents between not suffering from a systemic crisis and suffering the systemic crisis.

non or scarcely regulated ones) they send the wrong message and enhance the moral hazard incentive for financial institutes to taking more risks (White, 1999).

3. Calibration problems of the intervention policy

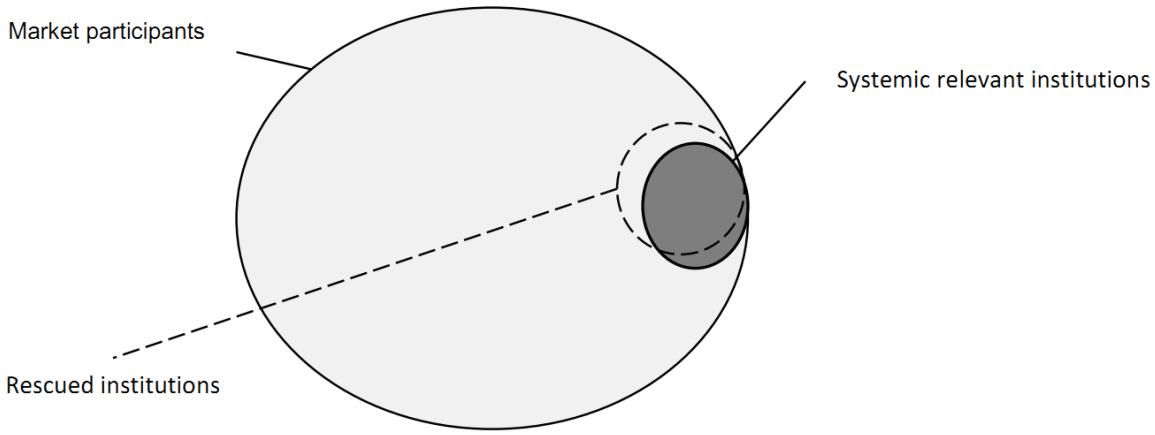
The optimal intervention policy of the government described in equation 1 seems to be clear from a theoretical perspective. However, considering that the evaluations are made ex ante and based on strong approximations and weak estimates such as the costs arising due to moral hazard incentives. Furthermore significant uncertainty about the bailout costs exists. A further problematic aspect becomes clear when considering a country which has to bailout a very globally active institution. A bailout of a single country includes a positive externality (for which the country is not compensated from abroad) because other countries profit too (do not suffer from the failure) from the bailout of the institution (With the support of the UBS by the Swiss government, Switzerland also supported the US since the US considers UBS as systemically relevant too (Stern and Feldman, 2009).). From a global social planner's point of view the costs, which can be prevented in other countries (let's say in country b), have to be included in the decision process too. This social planner intervention policy would be an extended form of equation 1 and can be rewritten in a more precise way as:

$$x = \frac{\sum_{t=1}^{\infty}(\gamma_t w_t^{a+b})}{\kappa b + \sum_{t=1}^{\infty} m_t} \qquad (2)$$

$$bailout: \begin{cases} no, & x < 1 \\ yes, & x \geq 1 \end{cases}$$

The intervention decision is the ratio of the total costs of the systemic crisis in countries a and b divided over the total cost of preventing the systemic event in the period of the systemic event. However the probability of the systemic crisis would still remain uncertain as a clear definition of a systemic event is missing. This problem of uncertainty also becomes visible in the statement of executive head of the Bank of England (BoE) in 1995 "There was just the possibility that the collapse of ... carried right through the financial system with horrific effects." (Quinn, 1995). The statement shows clearly the significant uncertainty when policymakers have to make such a bailout decision. Consider the public choice theory (Downs, 1957), whereby politicians are seen as rational agents who maximise their own benefits such as the re-election probabilities. Consequently some over risk-aversion might be the result. These facts tend towards an over intervention policy. This is schematically shown in the illustration above. This over optimal intervention policy is clearly a waste of resources, since those interventions would not be necessary. Thus it is important that uncertainty about the definitions and characterisation of systemic risks can be reduced, such that finally governments are able to allocate resources efficiently (Stern and Feldman, 2009). In the next chapter this waste of resources will be shown by a theoretical model.

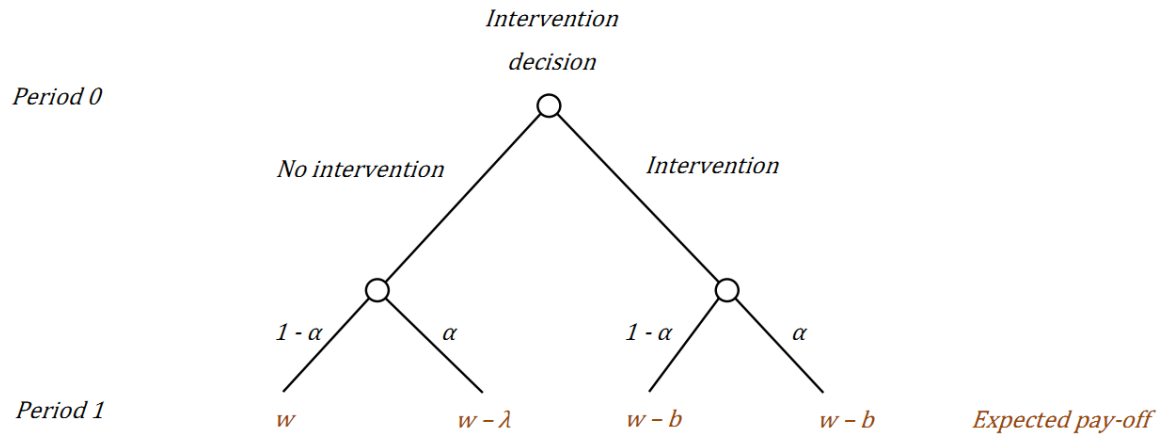
Figure 1. Systemic relevant institutions, uncertainty and the public choice theory



4. The intervention policy of the government

Consider a two period model where the government has to decide in period zero if it should bailout a bank or not. In period zero it is not possible to verify if the bailout would have been necessary or not. Only in period one does it become clear if the institution is a systemic event and would actually cause a systemic crisis or not. Hence the expected probability that the event would be strong enough to cause a systemic crisis can be defined as α. In the case of no intervention and no systemic crisis 0 costs arise in period zero and one. If a systemic event occurs the costs 0 arise in period zero and λ in period one. In the case of an intervention the government spends in period zero some specific bailout costs b, whether or not a systemic crisis would have occurred ex post in period one - what is not observable since it is assumed that the bailout would be sufficiently large to avert the systemic crisis and no further bailouts are needed. This model is illustrated schematically above. The discount factor is given by β and satisfies $\beta \in [0,1]$, the nominal interest rate is given by r whereas R is defined as $(1+r)$. To simplify it is assumed that the economy has a welfare level w in period zero which is assumed to satisfy $w > \lambda > b$ and doesn't increase in period one. Further it is assumed for simplicity, without losing explanatory power, that $R\beta = 1$. The objective of the government is to intervene in such a way that in period zero expected utility of the society is maximised.

Figure 2. Intervention decision of the government



Intervention decision of the government. Let's consider now the decision of the government whether or not it should bailout the institution in more detail. Let's assume that the social utility function is a concave, continuous and differentiable function of wealth, so that

$$u'(w) > 0\,;\, u''(w) < 0$$

the society is assumed to be risk averse. The three possible wealth levels are defined by the following notation:

$$\begin{cases} w_0 = w - 0 \\ w_\lambda = w - \lambda \\ w_b = w - b \end{cases}$$

We now assume that the government can verify the social utility function and intervenes optimally with respect to the social utility function. Then the intervention decision of the government is a discrete decision with the values 0,1 and will depend on the expected utility in the case of no intervention and the utility in the case of a bailout. The following inequalities can be used to describe the bailout policy of the government:

$$bailout: \begin{cases} yes, & u(w_b) > \alpha * u(w_\lambda) + (1-\alpha) * u(w_0) \\ indifferent, & u(w_b) = \alpha * u(w_\lambda) + (1-\alpha) * u(w_0) \\ no, & u(w_b) < \alpha * u(w_\lambda) + (1-\alpha) * u(w_0) \end{cases} \quad (3)$$

Equation 3 defines whether or not a government should bailout a bank. When the utility in the case of a bailout exceeds the expected utility in the case of no bailout then an intervention is efficient. Vice versa if the utility in the case of bailout is lower than the expected utility in the case of no bailout. The government is also indifferent if both utilities are equal. In the case of no bailout the situation can be interpreted in such a way that the government faces a lottery with two possible payoffs w_0 and w_λ. Therefore the certainty equivalent w_c of the lottery can be rewritten as

$$u(w_c) = \alpha * u(w_\lambda) + (1-\alpha) * u(w_0) \qquad (4)$$

which would make the government indifferent to the lottery. The certainty equivalent is therefore the certain amount w_c for which u(w_c) is as good as the expected utility in the case of no bailout (in the case of the lottery). Thus, we know the maximal bailout costs, given a certain risk aversion. This is an important measure for the next discussion since it indicates the willingness to pay to avert the lottery. Consider now an example where the utility function[66] is given by

$$u(w) = -e^{-cw}$$

We can easily show that the Arrow-Pratt absolute risk aversion coefficient is $r(w) = c$ by computing $u'(w) = ce^{-cw}$ and $u''(w) = c^2 e^{-cw}$. Thus the utility fuction $u(w)$ is constantly risk averse. Let's assume now that policymakers have an incentive to be more risk averse than socially optimal. This seems reasonable to assume when considering political economy theories. We will consider and compare these two utility functions which differ (only) in the degree of risk aversion. Let's define the social optimal risk aversion by the notation θ and policymaker's utility function by ϕ whereas the following inequality holds $r(w)^\phi > r(w)^\theta$. If these assumptions are given then the certainty equivalent w_c which would be at least as good or preferred to the lottery in the case of the risk aversion ϕ has to be lower than the certainty equivalent with the social optimal risk aversion θ.

$$u(w_c^\theta) > u(w_c^\phi)$$

The result indicates that the minimal wealth level that will be at least as good as the lottery decreases with increasing risk aversion. A formal proof can be found in Mas-Colell, Whinston and Green (1995) or in Keeney and Raffais (1993). Thus the maximal costs of the bailout can increase to avert the lottery in the case of more risk aversion. Therefore when comparing the risk aversion of the government with the social optimal risk aversion the possibility that the government chooses the bailout option becomes more likely by assuming that policy makers are more risk averse than the social optimum. From a social welfare view we can conclude that the bailout option will suboptimally often be chosen and hence resources are wasted.

To assume an over optimal risk aversion of policy makers might not seem very intuitive but there are some arguments to support this view. Policy makers would like to reduce the risk of a serious economic breakdown in their term of office, among other reasons because of the likely electoral consequences. The model showed that if the assumptions given are full field it might be socially desirable to restrict or at least reduce policy maker's flexibility to bailout institutions "as they want to". They should have strong guidelines or be completely independent such that the objective (assessed risk aversion) is, in the optimal case, identical or at least differs less from the socially optimal risk aversion then in the case when policy makers are completely free in their decisions.

Conclusion

The paper has reviewed the incentives of policy makers in the bailout decision for a financial institution with a simple model. Besides the traditional lending via discount window and LOLR / ELA lending, systemically relevant institutions can also be certain that they will be bailed out in case they should fail. The government or central bank has to act as IOLR to prevent worse - such as a systemic crisis with it's negative consequences for the real economy. This governmental guarantee is one of the biggest problems in financial markets. It destroys market force, leads to unequal competition and can be a massive burden for public finances in the future.

Today it is still very hard to define ex ante systemic relevance. There exists neither a clear definition nor policy rule. Hence, in the recent crisis the decision whether an institution is or is not systemically relevant was taken individually by policy makers. Unfortunately, policy makers are not able to make this decision without considering their own incentives. To ensure their re-election they are more risk averse than optimal. As became clear in the model, this leads to an over-bailout strategy with significant costs for the taxpayer and the overall economy.

To ensure that a bailout is only done when economically necessary, the definition of systemic relevance needs to be clearer. Further, decision rules

[66] $c > 0$

would reduce the influence of individual policy makers and lead to a rule based bailout strategy.

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