

Building a bank resolution fund over time: when should each individual bank contribute?

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ABSTRACT

A series of resolution funds, levies and taxes are being set up, implemented or discussed in several jurisdictions. The goal of some of these initiatives is to make the financial sector repay the costs of the last crisis. Some others aim to make private funding available for financing future resolutions of banks as an alternative to bailing out financial institutions with public funds. After analysing the economic implications, in terms of incentives and pro-cyclicality concerning these initiatives, this paper argues that the resolution fund, when the time dynamics are not taken into account, can have unintended consequences by exacerbating the cycle and promoting perverse incentives. A well designed resolution fund should promote financial stability as a preventive tool. This can be achieved through contributions based on a dynamic factor which would depend on assets growth and income. By setting the right incentives, dynamic contributions can prevent excessive risk-taking, reduce the probability of bank failure and smooth the cycle both at the upswings and the downturns.

KEYWORDS

Banking, Resolution fund, Regulation, Financial crisis, Incentives, Financial stability, Pro-cyclicality.

Disclaimer

The opinions and statements expressed in this paper remain solely those of the author and do not necessarily reflect the views of the European Commission.

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We need to address not just the unstable [financial] structures that have become so evident in the recent crisis, but we also need to better understand why these sorts of structures emerge and take steps to prevent their reoccurrence in whatever forms they may take, Donald L. Kohn, former Vice Chairman of the Board of Governors of the Federal Reserve System (Comments to Shin, 2010, p. 23).

1. INTRODUCTION

In June 2013, the European Commission (EC) tabled a proposal for a Single Resolution Mechanism (SRM) and a Single Bank Resolution Fund (SRF), with the final text adopted by the co-legislators in April 2014¹. This initiative was framed within the bank crisis management and resolution framework which, in turn, constitutes one of the pillars of a Banking Union (BU) in Europe.

The main goal of a resolution framework is twofold: 1) to protect public finances in future banking crises by building up an ex-ante buffer to finance the potential costs of future bank crises, and 2) to increase market discipline by allowing for an orderly winding down procedure for failing banks. On top of that, it aims to ensure the continuity of critical functions of banks, to preserve financial stability, including the prevention of contagion, and to protect depositors².

Most academic and discussion papers, such as Fonteyne et al. (2010), Goyal et al (2013) or Financial Stability Board [FSB] (2013), focus on high level issues such as the rationale of a resolution framework, the resolution tools, the powers of the resolution authority, governance, resolution triggers, the overall size of the fund needed to finance resolution, etc. However, there is a lack of in-depth discussion about the economic and financial consequences of the individual contributions to such a fund, in particular, the implications of time dynamics.

This paper tries to fill the gap by analysing the potential impact in terms of incentives and pro-cyclicality of individual contributions to a bank resolution fund. It shows that the design of the contributions to a resolution fund can influence incentives with respect to risk-taking by banks and pro-cyclicality and, therefore, it can have a positive or negative impact on financial stability.

The paper argues that a resolution fund can not only be used as a safety net against contagion when the economy is confronted with a failing bank, but it can also play an important role as a preventive tool. In other words, a resolution fund should not only ring fence taxpayers' money against excesses of financial institutions, but it could also 1) reduce the probability that banking crises occur and 2) reduce the overall costs of those crises in case they do materialise.

Unless the resolution fund is explicitly designed to be a preventive tool, it can easily fail to play such a role. There is even a risk that a badly designed resolution fund could promote perverse incentives and therefore contribute to feed future financial crises and to exacerbate their costs (Stiglitz, 2010, argues that an economic system that promotes perverse incentives constitutes one of the main roots of the recent crisis). To avoid such a scenario, this paper proposes a design of contributions to foster the resolution fund as a preventive tool.

The paper is organised as follows. Section 2 presents the background to understand the effects of the contributions to a resolution fund. It first explains the political and economic context leading to the creation of a Banking Union in Europe, as well as the main characteristics of the SRF and other existing resolution funds and levies.

Section 3 discusses how the contributions to the resolution fund can interact with the credit cycle. Section 4 provides a similar discussion with respect to the income cycle. Thereafter, the paper presents

¹ See EC (2013a) and European Parliament [EP] and Council (2014a).

² See, for instance, the BRRD (Directive 2014/59/EU), art. 31.

a proposal on how the resolution fund can be used to counterbalance the cycles and to align incentives of banks with financial stability (Section 5). Some conclusions are presented in Section 6.

2. BACKGROUND

This paper discusses how the contributions to a resolution fund can be designed to promote the right incentives for aligning the behaviour of banks with financial stability. Two aspects need to be clarified to understand the rationale of the proposal: first, the economic and political context that led to the proposal of a Banking Union and a Single Bank Resolution Fund in the EU (SRF) (Section 2.1); and second, the main characteristics of the SRF and other resolution funds (Section 2.2).

2.1. FROM THE GLOBAL FINANCIAL CRISIS TO THE BANKING UNION

The recent global economic and financial crisis evolved throughout different stages. The response to the last stage, a severe sovereign debt crisis in a number of EU countries, was the proposal to create a Banking Union (BU). This section explains the economic and political context that led to that proposal and its economic rationale.

The financial crisis started in the US in summer 2007. While it was initially restricted to the subprime segment and to securitisation activities, the collapse of Lehman Brothers in September 2008 triggered a true systemic crisis by spreading the crisis to other segments of the financial system and across jurisdictions. The EU, which hosts some of the biggest banks in global financial centres such as London, Frankfurt or Paris, was especially vulnerable.

Central banks and governments across the globe reacted to the crisis on two main fronts. In the immediate term and to prevent the collapse of the financial system, they provided a wealth of support to the banks through a diversity of measures³. In the more medium term, they embarked on a comprehensive regulatory reform agenda to "fix" the many shortcomings that the crisis had uncovered⁴.

Among the various reforms, the reinforcement of the supervisory framework in the EU should be highlighted. A European System of Financial Supervision (ESFS) was created following the recommendations put forward by the report of the high level group chaired by De Larosière (2009). It consists of a European Banking Authority (EBA), a European Securities and Markets Authority (ESMA) and a European Insurance and Occupational Pensions Authority (EIOPA). A European Systemic Risk Board (ESRB) was also entrusted with macro-prudential oversight.

In 2009, the crisis hit the public sector. A combination of structural deficiencies, the contraction in economic activity and the massive support granted to financial institutions distressed public finances in many countries. Latvia, Hungary and Romania, outside the Euro area, followed by Greece, Ireland and Portugal, within the Eurozone, became unable to refinance themselves on the markets and had to ask their European partners and the IMF for support. Later on, Spain and Cyprus also applied for financial support⁵.

The current consensus states that interlinks among weak sovereigns, weak banks and subdued economic activity created a vicious circle which hampered recovery. Overcoming the crisis is dependent on breaking this loop. In this context, the European Council (2012) mandated the European

³ In Europe, they came both from the ECB, in the form of conventional and unconventional monetary policies, and from governments, in the form of public capital injections, guarantees on bond issuance, asset relief measures and liquidity support measures (for details, see EC, 2014a, Chapter 2).

⁴ For an overview of the EU regulatory reform agenda, see EC (2014a), Chapter 2.

⁵ For details about the European framework of financial support to sovereigns under stress, see Villar Burke (2012) and EC (2014a), Chapter 2.

Commission (2012a) to establish a *Roadmap towards a Banking Union* (BU) aimed at breaking the vicious circle between sovereign debt and bank debt. That BU will be based on three pillars: shifting the supervision of banks to the European level through a Single Supervisory Mechanism (SSM), a common system for deposit protection and an integrated bank crisis management and resolution framework.

Once the BU is in place, the stress in individual banking institutions will not spill over to individual States and their public finances. In September 2012, the European Commission (2012c) put forward a legislative proposal for a Single Supervisory Mechanism (SSM) in Europe. After final adoption by the Council in October 2013, the SSM is expected to be fully operational by Autumn 2014.

The European Commission (2010c) presented a proposal for amending the Directive on Deposit Guarantee Schemes as early as July 2010 with the aim of improving depositor protection and was finally approved in April 2014 (EP and Council, 2014b). Following the *Blueprint* (European Commission, 2012b), the current priority is to pre-fund the national Deposit Guarantee Schemes (DGS) in all countries and, only at a later stage, converge to a single European DGS.

The third leg of the BU is the framework to resolve banks. In June 2012, the European Commission (2012d) tabled a proposal for a *Directive on resolution and recovery (BRRD)* which was later complemented by a proposal on a *Regulation on a Single Resolution Mechanism (SRM) and a Single Bank Resolution Fund (SRF)*⁶ (EC, 2013a)⁷. These proposals follow the principles previously set by the European Commission (2010a, 2010b, 2012b). These legislative initiatives table a comprehensive framework including, among other things, the resolution tools, the powers of the resolution authority, governance arrangements, resolution triggers, the overall size of the fund needed to finance resolution, how the money collected should be held to ensure liquidity and avoid pro-cyclicality, which backstop would finance the fund in the event that ex-ante funds proved insufficient, how to deal with new countries and banks joining the resolution fund at a later stage...

All these elements need to be clarified for the resolution framework to be operational, but they go beyond the purpose of this paper and are not discussed here. This paper focuses on how the contributions to the resolution fund can affect economic incentives, but prior to this, the characteristics of bank resolution funds are briefly discussed in the next section.

2.2. MAIN FEATURES OF BANK RESOLUTION FUNDS

This section presents an overview of the main features of the future European Bank Resolution Fund (SRF) and of resolution funds in other jurisdictions.

2.2.1. Existing resolution funds and bank levies

The discussion in this paper focuses on the Euro Area and the European Union. However, the main findings and conclusions can be translated to other jurisdictions. Major financial centres such as the UK, the US or Japan and emerging economies such as Mexico, Russia, Korea, Brazil or Argentina, among others, have all established resolution funds or have deposit insurance systems that may be drawn on to fund bank resolutions. On top of that, a number of jurisdictions have established other taxes and levies on banks. The main rationale of the latter is to recover the costs generated by the financial institutions in the recent crisis. The findings of this paper and the proposed design of the contributions are also relevant for those other taxes and levies. This section briefly reviews the existing resolution funds and bank levies according to the compilations published by FSB (2013) and KMPG (Larking, 2012).

⁶ The BRRD applies to all 28 Members of the EU while the SRM and SRF apply to the Member States that form part of the Banking Union.

⁷ Both texts were finally adopted by the co-legislators in April 2014. See EP and Council (2014a and 2014c).

There are three FSB jurisdictions with privately funded dedicated resolution funds (Germany, Japan and the US) and fifteen jurisdictions with DGSs that may be drawn on to fund bank resolution (Argentina, Brazil, Canada, France, Indonesia, Italy, Japan, Korea, Mexico, the Netherlands, Russia, Spain, Turkey, the UK and the US). On top of those jurisdictions, KPMG adds Austria, Belgium, Hungary, Iceland, Portugal, Romania, Slovakia, Slovenia and Sweden as countries with a variation of bank levy in place.

While the FSB does not provide information about the contributions, KPMG compiles information on the tax base and the rates to be applied. In all cases, the tax base corresponds to a measure of liabilities by excluding some items such as capital or covered deposits. In some cases, derivatives (off-balance sheet) are also taxed. In most cases, the rate is the same across the board. However, in a few countries, there is a progressive rate depending on the size of each bank (Austria, Germany, Hungary and Iceland) or the rate depends on the maturity of the liabilities (Korea, the Netherlands and the UK). The rationale for variable rates lays on the risks discussed in Sections 3 and 4.

One should highlight that, in at least nine countries (Austria, France, Hungary, Iceland, Portugal, Slovakia, Slovenia, the Netherlands and the UK), the contributions levied on banks go either to the Treasury or directly to the State budget. This seems inconsistent with the goal of clearly delimiting the privately raised funds and of protecting public funds from banking crises.

This short review points to the scarce analysis available about the economic impact of the contribution to resolution funds and levies over time. Improving the understanding on how they affect incentives is the main goal of this paper.

2.2.2. The European bank resolution fund: size, transitional period and individual contributions

The contributions to a resolution fund are developed in Title VII of the BRRD and on Title V of the SRM-SRF. The BRRD provided some flexibility about the “financing arrangements”. However, the SRM established that existing national financing arrangements⁸ would be phased into an EU resolution fund (the SRF), which would be independent from national budgets or the EU budget. The SRF shall reach at least 1 per cent of covered deposits after a transitional period of 8 years.

The contributions from each institution shall be proportional to its liabilities (excluding own funds and guaranteed deposits). Contributions should be adjusted to the risk profile of the institutions taking into consideration elements such as: trading activities, off-balance sheet exposures, leverage, stability of funding, financial conditions of the institution, probability that the institution enters into resolution, previous benefit of State support, complexity of the institution and systemic importance. The European Commission is currently working on the specifications on how the risk profile of each financial institution will be taken into account for computing its individual contribution to the fund (EC, 2014b).

The legal texts take into consideration the impact of time in the following way. The contributions to the fund *shall be spread out in time as evenly as possible until the target level is reached* (SRM-SRF, Art. 69.2 and BRRD, Art. 102.2). The parliamentary discussion added an important nuance to the initial Commission text as the contributions should have *due account of the phase of a business cycle and the impact pro-cyclical contributions may have on the financial position of contributing institutions*. But the text of the SRM-SRF continues by requiring for the overall contributions *not exceed annually the 12.5 per cent of the target level*, which corresponds to an even distribution of the contributions throughout the 8 years of the transitional period.

Our interpretation is that the legal text stipulates a strict amount for the overall annual contributions but it allows for taken into consideration cyclical effects at a lower level, i.e. at country or bank level. The rest of this paper discusses the interactions of the contributions to the resolution fund with the

⁸ See also Nieto and Garcia (2012) on how national financial arrangements could work together.

credit cycle (Section 3) and the income cycle (Section 4) and proposes a design of the contributions to avoid pro-cyclical effects and perverse incentives that could jeopardise financial stability (Section 5).

3. THE CREDIT CYCLE

3.1. BANK ASSETS AS AN INDICATOR OF THE CYCLE AND OF RISK

The Basel III Agreement (Basel Committee on Banking Supervision [BCBS], 2011) is the global framework of prudential requirements for financial institutions. The main goal of Basel III is to control excess risk-taking by banks. In paragraph 152, Basel III states that one of the underlying features of the crisis was the build-up of excessive leverage in the banking system. The role of excessive risk in the recent crisis is also stressed by HM Treasury (2009), IMF (2012), Stiglitz (2010) and many others.

Barrel et al (2011) argue that both size and growth of bank assets are related to risk taking: size leads to greater risk and growing banks are taking on more risk than banks of an equivalent size that do not grow. Similarly Pagano et al. (2014, p. 16) argue that as banking systems increase, they are increasingly likely to finance negative net-present-value projects; in other words, there is a tendency of excessively large banking systems to take excessive risk.

Ignatowski and Korte (2014) suggest that the establishment of resolution regimes are effective for disciplining risk-taking behaviour of banks, except for the largest and most systematically important institutions, which are unaffected. In a similar vein, Hoenig (2014) shows how the total size of the large banks in the US increased by a factor of 9 between 1984 and 2012 while total assets of smaller banks not even doubled in the same period. Haldane and Alessandri (2009) argue that the one of the main strategies for banks to maximise expected profits was through higher leverage, which explains the expansion in assets. The authors maintain that most of this expansion was focused on trading assets.

Shin (2010) and Adrian and Shin (2010) argue that, even under stable leverage ratios, risks can increase both on the asset and the liability side of the balance sheet. Villar Burke (2013) explains that the risks embedded in leverage and the dynamics discussed by Adrian and Shin (2010) are better captured by a marginal leverage ratio, or leverage "*speed*", than through the traditional absolute leverage ratio.

An important lesson that can be extracted from Adrian and Shin and Villar Burke is that stable leverage ratios during economic expansions can conceal aggressive balance sheet growth, which is likely to entail increasing risks. On top of that, banks can become too big to fail. Taking advantage of an implicit subsidy by the State, these banks can embark on riskier activities with benefits being enjoyed solely by the banks and the losses, in case they materialise, being supported by taxpayers' money⁹.

The arguments of all those authors support the thesis that a quick expansion in assets is a clear indicator of a bubble or the build-up of increase risks in the balance sheet of a bank. This is also somehow acknowledged by legislators in those countries where bank levies are progressive (see Section 2.2.1).

3.2. MORAL HAZARD AND THE BALANCE SHEET CYCLE

The benefit of a resolution fund in terms of financial stability would be reflected on a smoother cycle. In the troughs of the cycle, when banks under extreme difficulties can become insolvent, the resolution fund can avoid contagion and smooth the downturn. However, this paper argues that the resolution fund should have a wider scope. The positive impact of the resolution fund will be maximised if it is designed for deterring the build-up of bubbles in the expansionary phase of the cycle.

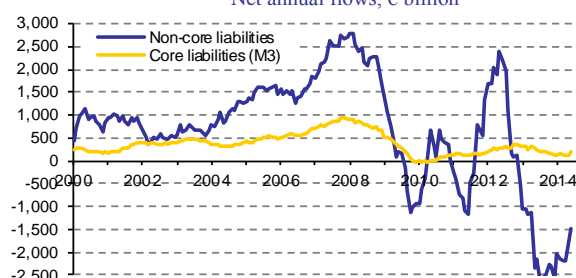
⁹ A brief discussion about the too-big-to-fail problem is presented in Villar Burke (2014a).

3.2.1. The resolution fund for smoothing the troughs

Most of the explicit goals of the resolution framework relate to smoothing the trough of the next crisis. This is the case for goals which aim to protect public finances in future banking crises, to ensure the continuity of critical functions of banks, to preserve financial stability, to prevent contagion, and to protect depositors¹⁰.

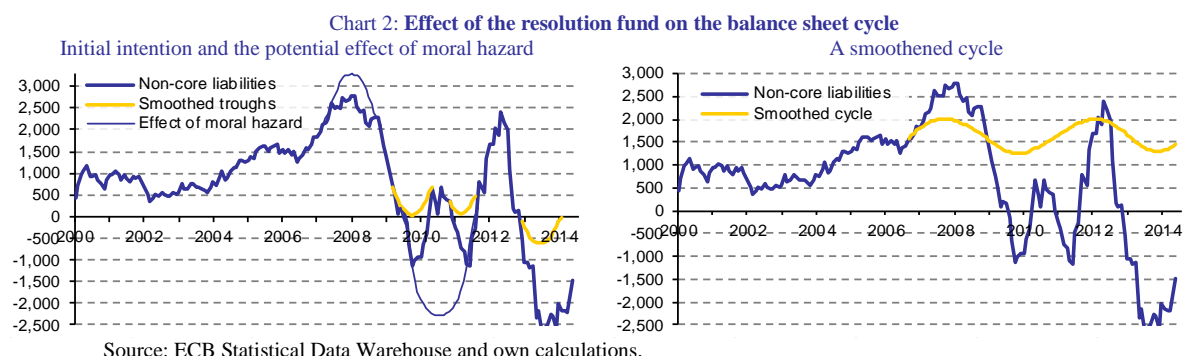
Authors like Krugman (2013), Reinhart and Rogoff (2011), Varoufakis (2011) or Fonteyne, et al. (2010) explain how traditional banks, whose balance sheets were dominated by loans and deposits, have evolved to modern banks with much more complex balance sheets, operations and contingent liabilities. The modern version of bank runs is the drying up of interbank markets and other sources of wholesale funding. Data show an increasing importance of non-core liabilities (wholesale funding) on banks' funding structure in the mid-2000s and a collapse in late 2008 and 2009, what triggered most of the problems for European banks in the recent crisis (Chart 1). This illustrates a modern bank run, as argued by Krugman (2013), Gorton and Metrick (2012), Varoufakis (2011), Abbassi and Schnabel (2009) or Cochrane (2014)¹¹.

Chart 1: Funding of banks: core versus non-core liabilities, Euro area banks
Net annual flows, € billion



Notes: M3 is used as a proxy for core liabilities. Non-core liabilities are the difference to total assets. Annual flows are computed as the sum of net flows for 12 consecutive months through a rolling window. "Net" refers to new transactions minus redemptions.
Source: ECB Statistical Data Warehouse and own calculations.

Deposit insurance, as in the case of the FDIC in the US, has prevented recurrent bank crises triggered by deteriorating depositors' confidence and runs to the bank to withdraw funds. The existence of deposit guarantee schemes (DGSs) have played an important role in smoothing the reaction of core liabilities throughout the crisis (Chart 1). The future resolution fund could act as a protection against contagion and massive withdrawals of wholesale funding in a similar way as DGSs have contained depositor runs. Article 76 of the SRM-SRF sets the mission of the Fund which includes: *"to guarantee the assets or the liabilities of the institution under resolution [...]"*¹². With a resolution fund in place, the troughs of non-core liabilities would be smoother (see Chart 2, left-hand panel).



Source: ECB Statistical Data Warehouse and own calculations.

¹⁰ It should be highlighted that the SRF will be ready for confronting future crises, but it does not intend to tackle the legacy of the current crisis, nor the potential weaknesses that may be detected by the comprehensive assessment being carried out by the ECB ahead of taking its supervisory responsibilities under the SSM.

¹¹ A similar decline in the flow of non-core liabilities is observed from mid-2012 onwards. However, this seems more linked to the process of deleveraging, balance sheet clean up and restructuring than to a panic episode as it was the case in 2008-2009.

¹² This is particularly the case for the liabilities excluded from the scope of bail-in within the BRRD. See ECB (2014b, pp. 45-46) for a short discussion about resolution tools.

The Outright Monetary Transactions (OMT) programme of the ECB provides another illustration of the potential economic effects of the resolution fund. The OMT was announced in summer 2012 in a moment of increased turbulence in the markets. The sole announcement that, in case deemed necessary, the ECB would purchase an unlimited amount of sovereign bonds was enough to calm the turmoil and bring financial indicators closer to fundamentals. This was achieved without spending a single Euro. Similarly, the actual economic impact of the resolution fund would be to foster confidence in the markets and to avoid a panic, so that the resolution fund can have a significant impact without even being activated. However, this can only be achieved if the resolution framework is credible.

3.2.2. Moral hazard and amplification of the cycle

An unintended effect of building a safety net to be used on the downturn is that it may exacerbate risk-taking during the boom. Indeed, the safety provided by any (mispriced) insurance or guarantee can generate moral hazard or "excessive risk taking". Banks that have become too big to fail constitute a typical example of this behaviour¹³: they can embark on riskier activities taking advantage of the implicit state subsidy. Barrell et al. (2011) suggest that the safety net generates risk taking incentives. This can make the amount needed to support the financial system go beyond the capacity of the safety net. Should the firepower of the safety net reveal insufficient, the panic and the run would be unavoidable and this could lead to an amplified and an even deeper downturn than the one it was supposed to prevent at a first place (see Chart 2, left-hand panel for an illustration).

The HM Treasury (2009, paragraph 3.39, 3.44 and Box 3.B) defends that the resolution funds should be designed in such a way as to mitigate moral hazard and influence firms' actions to discourage excessive risk-taking. The conversion of bail-inable debt into equity before recurring to the resolution fund is supposed to foster market discipline. It is sometimes argued (see, for instance, Verwey, 2013, 6m 35s) that the banking industry will exert peer pressure and denounce or avoid misbehaviour if the resolution of a bank would be financed from a common pot funded by the industry.

However, this latter argument has to be taken with caution. The British Financial Services Compensation Scheme (FSCS) was based on a rationale of market discipline by depositors, but this exacerbated or triggered the run on Northern Rock in late 2007. It is assumed that institutional investors can exert a much stronger control than retail depositors. However, HM Treasury (2009, paragraph 1.10) argues that the mechanism of market discipline is not always adequate to deliver this. The rationality of investors and markets might rely more on a heroic assumption rather than on reality as the subtitle of Reinhart and Rogoff (2011) suggests: "*Eight centuries of financial folly*". In a similar line, Min (2014) argues that market discipline did not prevent the build-up of bank risk that caused the recent financial crisis.

Section 3.3 presents a concrete illustration on how the contributions to the resolution fund can indeed amplify the credit cycle.

3.2.3. The resolution fund for smoothing the peaks

In order to be effective in its objective, this paper argues that the resolution fund can foster financial stability only if, beyond smoothing the trough, it is designed to mitigate moral hazard in the form of bubbles and excessive growth during the booms. This principle is somehow embedded in the objective of the SRF to increase market discipline.

In line with HM Treasury (2009, paragraph 3.40), beyond the activation of the fund in the resolution stage, the contributions to a resolution fund can play a fundamental role as a preventive tool by

¹³ A brief discussion about the too-big-to-fail problem is presented in Villar Burke (2014a).

reducing the probability that the resolution materialises; and, therefore smoothing the cycle both during the booms and the downturns (see Chart 2, right-hand panel for an illustration).

3.3. THE RESOLUTION FUND AND BALANCE SHEET GROWTH AND INCENTIVES

Even if sometimes it has been claimed that the financial crisis responsibility could have a deterrent effect against excessive leverage¹⁴, the contributions to a resolution fund are not neutral with respect to balance sheet growth and incentives. Two simulations illustrate how, given the evolution of the balance sheet over time, the contributions to a resolution fund based on a flat rate will promote the banks with a quick balance sheet expansion in detriment of banks with a more stable size. The simulations are based on the following stylised assumptions:

- The target size of the fund is set at 1 per cent of total assets.
- Annual contributions are set at 1/10 of the target (i.e. 0.1 per cent of total assets).
- There is one unique bank in the economy with €50,000 of total assets.

The above values have been chosen to provide an order of magnitude for the future European resolution fund, but the lessons from the simulations in terms of incentives would be the same with any other figure (e.g. using percentages). The target size is in the range of proposals by the IMF (Goyal et al., 2010, paragraph 30), the BRRD or the SRF; the transitional period of 10 years corresponds with the initial proposal of the Commission and €50,000 bn exceeds slightly current assets of Euro area banks to take into consideration the potential participation of non-Euro area countries in the SRF and assets growth throughout the transitional period.

By construction, when total assets remain constant, the target size of the fund (1 per cent of total assets) is reached after a transitional period of 10 years (Table 1, Scenario 1).

Table 1: Simulation on the contributions to a resolution fund

| Scenario 1: no growth in assets | | | | | Scenario 2: expansion of assets over time | | | | |
|---------------------------------|---------------|------------------|------------|--------------|-------------------------------------------|---------------|------------------|------------|--------------|
| Year | Assets | Contribution (€) | | % of Assets | Year | Assets | Contribution (€) | | % of Assets |
| | | Annual | Cumulative | | | | Annual | Cumulative | |
| 1 | 50,000 | 50 | 50 | 0.10% | 1 | 50,000 | 50 | 50 | 0.10% |
| 2 | 50,000 | 50 | 100 | 0.20% | 2 | 55,000 | 55 | 105 | 0.19% |
| 3 | 50,000 | 50 | 150 | 0.30% | 3 | 60,000 | 60 | 165 | 0.28% |
| 4 | 50,000 | 50 | 200 | 0.40% | 4 | 65,000 | 65 | 230 | 0.35% |
| 5 | 50,000 | 50 | 250 | 0.50% | 5 | 70,000 | 70 | 300 | 0.43% |
| 6 | 50,000 | 50 | 300 | 0.60% | 6 | 75,000 | 75 | 375 | 0.50% |
| 7 | 50,000 | 50 | 350 | 0.70% | 7 | 80,000 | 80 | 455 | 0.57% |
| 8 | 50,000 | 50 | 400 | 0.80% | 8 | 85,000 | 85 | 540 | 0.64% |
| 9 | 50,000 | 50 | 450 | 0.90% | 9 | 90,000 | 90 | 630 | 0.70% |
| 10 | 50,000 | 50 | 500 | 1.00% | 10 | 95,000 | 95 | 725 | 0.76% |
| 11 | 50,000 | 0 | 500 | 1.00% | 11 | 100,000 | 100 | 825 | 0.83% |
| 12 | 50,000 | | | | 12 | 105,000 | 105 | 930 | 0.89% |
| 13 | 50,000 | | | | 13 | 110,000 | 110 | 1,040 | 0.95% |
| 14 | 50,000 | | | | 14 | 115,000 | 115 | 1,155 | 1.00% |
| 15 | 50,000 | | | | 15 | 120,000 | 0 | 1,155 | 0.96% |

Notes: Annual contribution = 0.1 per cent of assets; target contribution = 1 per cent of assets.

Source: Own calculations.

However, banking assets evolve over time; besides inflation effects, banks have a tendency to grow (see Section 3.3.1). When the balance sheet grows, reaching a contribution of 1 per cent becomes a moving target: the transitional period is extended from 10 to 14 years when assets increase by €5,000 a year (Table 1, Scenario 2). A proportional increase in assets of 10 per cent a year was also investigated; in this case, the transitional period is further prolonged to 25 years.

The firepower of a resolution fund with contributions proportional to the static size of banks would lag behind the expansion of assets. This can make the fund insufficient in the boom, precisely at the moment when it will be most needed: fast expansion of assets (embedded with increasing risks)

¹⁴ See, for instance, the White House (2010) or Nieto and García (2012).

leading to a higher probability of banks becoming insolvent. These dynamics further illustrates the outcome postulated in Chart 2, left-hand panel.

Besides the extension of the transitional period, the "moving target" effect engenders two other consequences. First, if contributions were to stop completely when the 1 per cent target is reached, the size of the fund would fall below the target. Second, the cumulative contribution of a bank depends on the historical evolution of its balance sheet. After 6 years, a bank could have accumulated a total contribution of 0.60 per cent of its assets (Scenario 1), while another one could have contributed only up to 0.50 per cent (Scenario 2). This situation could, not only create perverse incentives, but also infringe the single market by jeopardising the level playing field among banks with different growth rates in their balance sheets.

To keep track of the cumulative contribution of each bank, contributions should be booked as an asset in the balance sheet of banks. This cumulative perspective would otherwise be diluted, e.g. if the contributions are considered a levy and, therefore, they are registered in the profit and loss account as an expenditure. A registration in the balance sheet can provide a robust and fair rule for distributing dividends in the future (when the fund is fully funded and it has obtained a profit).

3.3.1. Are banks' balance sheets expected to grow in the future?

With the outbreak of the recent financial crisis, the expansion of banking assets reduced its speed. Legislative reforms such as the increase of capital requirements or structural reforms like the ones proposed by the Volcker rule (Dodd Frank Act, Section 619), the Vickers Commission (2011) or the Liikanen Group (2012) place banks in a restructuring mode either through direct legal mandate or through market discipline. On top of that, State aid rules oblige public support to banks to be accompanied by restructuring plans and to be preceded by burden sharing (to the extent legally possible). Finally, the ECB is undertaking an Asset Quality Review and a Stress Test ahead of taking over supervisory functions through the SSM. This will probably trigger further write-offs and reductions of the balance sheets of European banks.

However, there is also increasing pressure on banks to grow. With the credit to the real economy having been squeezed for several years, the reactivation of the flow of credit to the real economy has become a political priority as stressed by the European Council (2013). Therefore, once European banks have undertaken those various reforms, cleaned their balance sheets and Europe has overcome the crisis, total banking assets are expected to grow and, most probably, at significant rates. This expansion is expected in banks of all sizes and, as argued above, quick growth is often embedded with an increase in risk.

4. THE INCOME CYCLE

A series of arguments support the case for designing the contributions to the resolution fund in a way that avoids a pro-cyclicality effect on the income cycle.

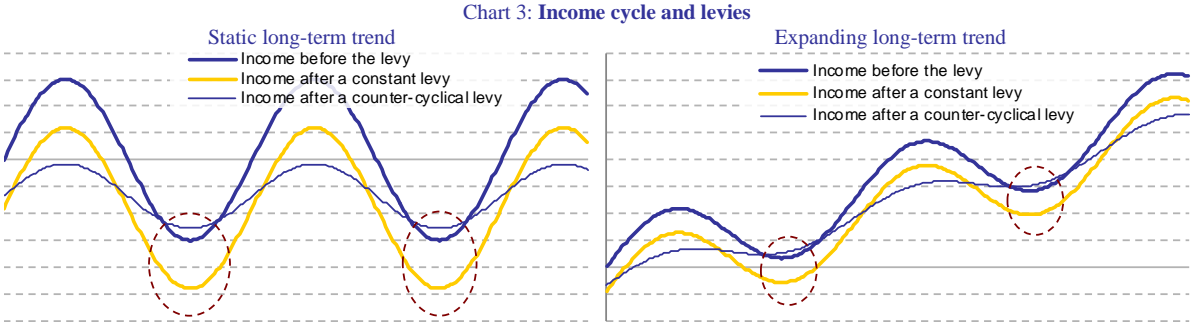
The contributions to a resolution fund imply a net drag on the income of banks¹⁵. Bank income is not constant over time, but evolves reflecting the general economic cycle. The introduction of a levy, such as the contributions to a resolution fund, can ignore or take into account the existence of such a cyclical evolution of income. These two approaches, a constant levy and a counter-cyclical one, and their impact on the income cycle are illustrated in Chart 3.

A constant levy would neglect the general economic outlook and could exacerbate the downturns. Banks can support a certain level of losses before becoming insolvent. It cannot be discarded that a

¹⁵ The European Banking Federation [EBF] (2014) highlights that fund contributions "will have a significant impact on the earnings of European financial institutions over the next decade".

levy charged during the trough could trigger the resolution. In this case, the resolution fund would be amplifying the negative shocks. In a similar vein, the EBF (2014, p. 2) argues that high fixed annual costs push troubled banks closer to failure and therefore advocates for minimising the pro-cyclicality of contributions; a similar argument is also put forward by the Association for Financial Markets in Europe (2014, p. 2).

Counter-cyclical contributions could be an alternative design which would foster financial stability. Many instances of such counter-cyclical policies are already present in most economies, e.g. the automatic stabilisers of fiscal policy or the fact that companies with losses do not pay income tax. For the specific case of banks, it is desirable that they retain equity during the booms so that more capacity is available to absorb losses during the downturn. In this vein, the Banco de España (2013) recommended banks to cap the distribution of dividends to 25 per cent of their profit.



Notes: A constant levy could be an extra burden on the downturn while a counter-cyclical levy can alleviate it.
Source: Own elaboration.

An additional argument to take into consideration the evolution of income is the competitive features of the banking sector. Classical economics foresee that, under perfect competition, all companies will operate with the same return rates. In case one company manages to get extraordinary income, resources will be attracted towards the new business model of that company until marginal costs and profits are once again identical across the economy. A sustained extraordinary benefit signals the existence of a market failure, e.g. a monopoly. The classical model of perfect competition assumes a large number of companies operating in the economy with none of them having market power; besides, there are no barriers to entry to or exit from a given industry or sector and all agents have access to perfect information.

The banking system is far from the classical model. Haldane and Alessandri (2009, p.9) explain how the global banking system is dominated by a small number of large banks, what leads to a high degree of concentration and relatively low rates of entry and exit. Indeed, by 2008, the five largest global banks had around 16 per cent of global banking assets. The situation in specific countries is even more extreme: in most EU countries, the five largest banks have more than 40 per cent of domestic assets; with this share going even beyond 60 per cent in many cases (EC, 2014a, pp. 48-51).

This structure implies that a few actors have a strong market power. The concentration of market power is one of the reasons for the banking system to be one of the most regulated and supervised sectors in the economy -which was already the case even before the outbreak of the financial crisis- and for the proposal of the Banking Union. Rather than an efficiency advantage, permanent levels of high returns in the banking sector may signal excessive risk taking (Haldane, 2010), a market failure or lack of competition (Stiglitz, 2010). Banks and bankers have tried to exploit remaining loopholes in this highly regulated sector: e.g. the manipulation of benchmarks (EC, 2013b) and foreign exchange markets, the exploitation of risk weights within the capital requirements framework (BCBS, 2013), the fact that bank managers reaped massive bonuses even when they had led their banks to enormous losses and to be bailed out by taxpayers' money (Stiglitz, 2012), etc. In short, the crisis has revealed an unbalanced order between risk, reward and responsibility within the financial sector.

Finally, from an accounting point of view, the obligation to contribute to the resolution fund should be recognised progressively (EBF, 2014, p. 2). This points to the need to take into consideration the income of banks, which is generated over time; and not just their balance sheet, which refers to a specific moment in time.

5. CONTRIBUTIONS TO THE RESOLUTION FUND AND DYNAMIC ALIGNMENT OF INCENTIVES

Because of the significant size of the resolution fund, it needs to be built throughout a transitional period. The design of the contributions to the resolution fund should not neglect the effect of time, in particular, with respect to the credit cycle and the income cycle, as to align bank incentives with risk-taking and to foster financial stability. Systems with progressive levies represent a move in the right direction, but a design in steps generates cliff effects. As an alternative, this paper proposes a continuous approach by including a dynamic factor (Equation 1). A static factor ($x*RA$) marks the final or target contribution and a dynamic factor ($y*\Delta A+z*I$) accelerates or slows down the contribution of each bank depending on the specific position of the bank in the assets and income cycles. The various components of the equation are discussed in more detail hereafter.

Equation 1: Contributions to a resolution fund

$$\text{Contribution} = x*RA + y*\Delta A + z*I$$

Where:

x, y, z = Coefficients.
 RA = Resolution assets.
 A = Assets.
 I = Income.

Source: Own elaboration.

5.1. THE STATIC FACTOR

The Communication on Resolution Funds (EC, 2010a, p. 9) mentions that *a crisis management framework must ensure that any losses in the context of a bank failure are first and foremost borne by shareholders, holders of subordinated debt and unsecured creditors, before resolution funds can be available*. The static factor should, therefore, exclude subordinated liabilities such as equity, bail-inable (convertible) bonds and some subordinated debt, but also liabilities that already enjoy protection such as deposits covered by DGS.

The target contribution can potentially be corrected by its “static” risk as foreseen in the BRRD (art. 103) and currently under elaboration by the EC (2014b). Finally, resolution assets could also include off-balance sheet exposures through derivatives as it is already the case in some jurisdictions.

5.2. THE DYNAMIC FACTOR

5.2.1. The component linked to the credit cycle

Section 3 shows how a contribution based on the static factor would exacerbate the credit cycle and increase risk during the boom. A dynamic component based on the expansion of assets ($y*\Delta A$ in Equation 1) would correct this and set the right incentives (Table 2).

This dynamic component provides two main benefits. First, despite the expansion in the size of banks, the transitional period is reduced and the target contribution can be reached within a reasonable time horizon. In other words, the “moving target” problem is mitigated. For instance, under a dynamic contribution of 0.4 per cent, the transitional period is reduced from 14 to 11 years (Scenarios 2 and 3, respectively). When assets grow at a rate of 10 per cent a year (instead of a constant growth), the transitional period is reduced from 25 to 12 years.

And secondly, incentives would be realigned with risks. Banks in the expansionary phase contribute faster to the resolution fund than banks in other parts of the credit cycle. Scenario 1 shows how a bank with a stable size would contribute up to 0.60 per cent of its assets after 6 years; when the dynamic contributions are activated, a bank with an expanding size contributes with 0.63 per cent of its assets (Scenario 3) and not 0.50 per cent as it would be the case without dynamic contributions (Scenario 2).

Table 2: Simulation on the contributions to a resolution fund
Scenario 3: Expanding banking system and dynamic contributions

| Year | Assets | Contribution (€) | | % of Assets |
|----------|---------------|------------------|------------|--------------|
| | | Annual | Cumulative | |
| 1 | 50,000 | 50 | 50 | 0.10% |
| 2 | 55,000 | 75 | 125 | 0.23% |
| 3 | 60,000 | 80 | 205 | 0.34% |
| 4 | 65,000 | 85 | 290 | 0.45% |
| 5 | 70,000 | 90 | 380 | 0.54% |
| 6 | 75,000 | 95 | 475 | 0.63% |
| 7 | 80,000 | 100 | 575 | 0.72% |
| 8 | 85,000 | 105 | 680 | 0.80% |
| 9 | 90,000 | 110 | 790 | 0.88% |
| 10 | 95,000 | 115 | 905 | 0.95% |
| 11 | 100,000 | 120 | 1,025 | 1.02% |
| 12 | 105,000 | 0 | 1,025 | 0.98% |
| 13 | 110,000 | | | |
| 14 | 115,000 | | | |
| 15 | 120,000 | | | |

Notes: Annual contribution = 0.1 per cent of assets; target contribution = 1 per cent of assets. Dynamic contributions are computed as 0.4 per cent of the increase in assets with respect to the previous year.

Source: Own calculations.

Which assets should be considered as a reference of the credit cycle? The drivers of leverage (leverage targets and valuation effects) as presented in Villar Burke (2013) support the use of total assets for calculating the dynamic factor rather than resolution assets or other targeted items of the balance sheet.

5.2.2. The component linked to income

The component linked to income ($z*Inc$ in Equation 1) introduces several advantages. First, it reinforces the countercyclical effect by increasing the contributions in moments of higher profits and limiting the drag on results during the downturns; secondly, it helps to better grasp the risk stemming from valuation changes and expansion of assets as presented in Villar Burke (2013); finally, it provides an indication of the ability to pay, which is a general principle of taxation (see Common Consolidated Corporate Tax Base Working Group, 2004).

Several options are possible with respect to the specific income item to take as a reference. Contributions based on net operational income, which is very stable over time (Villar Burke, 2014b), would focus on banks' ability to pay. A contribution based on trading income or net income would target the riskier activities and would have the highest impact in terms of countercyclical effects.

5.3. SIZE OF THE FUND AND CALIBRATION OF COEFFICIENTS

Despite the mobilisation of unprecedented amounts of funds, the FSB (2013, p. 39) still considers that *"it is not clear whether [current financing] arrangements are adequate or appropriate in terms of scale or scope. Public financial support therefore remains an important component of resolution funding arrangements for SIFIs.* In other words, while the bail-in of debt and the resolution fund can mitigate the impact of future crises on public finances, it seems unrealistic that bailouts will be totally terminated. This reinforces the thesis that the focus of the resolution fund should be widened from a perspective centred on privately financing bail-outs to a broader reach. The main goal of a resolution fund should be to promote the right incentives in the behaviour of banks. This claim might seem twisted at first sight; however, a similar rationale is widely accepted for deposit guarantee regimes or the OMT programme.

On these grounds, this section discusses what could be the target size of the fund, the transitional period to build it up and general principles on how the coefficients in Equation 1 should be calibrated.

5.3.1. Size of the fund and banks' income

The recent financial crisis can provide an indication of the scale of the resolution fund that would potentially be needed for tackling future crises. In Europe, €1,700 billion of liquidity were injected by the ECB in Euro Area banks and €1,600 billion were committed by EU governments to support their banks (EC, 2014a, Chapter 2). In the US, besides the \$700 billion of the TARP programme, the Deposit Insurance Fund was pledged so that the government allowed the Fund to borrow up to \$500 billion from the Treasury while the Dodd-Frank act had eliminated the cap in the size of the Deposit Insurance Fund.

In this context, Goyal et al. (2013, paragraph 30) consider that a European BU would need a "relatively" small resolution fund: 1-2 per cent of total liabilities. However, given the size of the Euro area banking system, this translates into the non-negligible figure of €500 billion in the lower range. HM Treasury (2009, paragraph 3.42) acknowledges that a resolution fund would have to be built over an extended period and may ultimately need to be quite large.

On the other hand, Huertas and Nieto (2014) argue that a well-designed architecture for regulation, supervision, and resolution would make banks less likely to fail and safe to fail. Under these circumstances, the authors consider that a size of the fund of €55 billion as targeted under the SRF could be sufficient.

The feasibility of a resolution fund of any size should be assessed against the capacity of the banking system to generate resources. This is needed for assessing what could be a reasonable length for the transitional period and for ensuring the acceptability of the proposal by the banking industry.

Income fluctuates widely both over time (volatility) and across countries. The return on assets (RoA) is tiny: a maximum of 0.2 per cent for the EU average and around 0.5 per cent for the best performing core Euro area countries (Austria, Luxembourg, Finland or France). Central and Eastern European countries, including some members of the Euro area, show higher RoA, but their banking systems are small and, therefore, also their potential contributions to a European resolution fund¹⁶. Besides the impact of the crisis, these small figures for the RoA reflect the leverage of banks. With an average leverage of 18 to 1 (Villar Burke, 2013), the RoA of European banks is 18 times smaller than their return on equity (the return on equity for Euro area banks would, therefore, be around 3 per cent in 2010).

The features of net income (volatility) and RoA (very low values) reinforce the importance of taking into consideration banks' income when calculating their contribution to a resolution fund (Equation 1). This component allows for individual contributions to flexibly adapt to the circumstances of each bank and its ability to pay.

Depending on the evolution of bank income over the coming years, certain flexibility in the duration of the transitional period for building up the resolution fund could be envisaged in order not to jeopardise the survival of banks or not to impact customers with higher charges¹⁷.

5.3.2. Calibration of coefficients and incentives

This paper argues that the economic relevance of the resolution fund relies on its preventive role. On these grounds, restraining excessive risk-taking during booms could be considered more important than the speed for building the fund to its full capacity. However, a critical aspect of the resolution

¹⁶ For country data on RoA, see EC (2014a), pp. 41-42.

¹⁷ The EC (2010a, p. 4) states that *it should be avoided that increased costs are passed on to bank customers in the form of higher charges*.

fund is that it needs to be credible. This implies, on the one hand, reaching a minimum capacity rather quickly and, on the other, that some kind of backstop should be available in case available funds are revealed to be insufficient¹⁸. The role of the static and dynamic contributions (and therefore, the effect on the risk behaviour of banks) and the length of that transitional period is moulded through the coefficients of Equation 1.

Liikanen (2012, page 82), the BRRD and the SRF propose a size of 1 per cent of covered deposits for the resolution fund, corresponding to around €55 billion. This benchmark could be used to set an *interim target*. This interim target would distinguish between two stages. In a first stage, when a minimum firepower of the fund needs to be built up, the bulk of the contributions (e.g. 80 per cent) would stem from the static factor and, the rest, from the dynamic factor.

Liikanen, the BRRD and the SRF also propose a limited transitional period of 8 or 10 years. In light of the data on income generation by banks, it should be assessed if such a short transitional period may generate negative impacts for both the banking system and its customers; in which case, the transitional period might need to be extended up to 15 or 20 years.

In a second stage, once the resolution fund is equipped with the minimum firepower set by the interim target, contributions could be slowed down and recalibrated. The dynamic factor and its capacity to steer incentives would be allowed to play a prominent role (for instance, 80 per cent of the contributions could stem from the dynamic factor). The second transitional period, from the interim to the overall target, could be set in another additional 30 to 40 years. Obviously, should the fund be pledged below the interim target, the first calibration would be reactivated.

The length of the total transitional period (up to 60 years) allows enough time to investigate what would be the appropriate size of the resolution fund. It also allows a better understanding of the impact of other initiatives agreed throughout the crisis such as new rules on capital requirements, the financial transaction tax or structural reforms in the financial sector.

To ensure a level playing field, changes in the calibration should apply at system level, not at bank level. That is, independently of the amount already contributed by each bank, in a given moment, the same calibration will apply to all banks.

6. CONCLUSIONS

The recent financial crisis triggered a comprehensive regulatory reform agenda in the financial sector aimed to foster financial stability, prevent the occurrence of crises in the future and reduce the potential negative impacts and costs to society.

Analysts and policymakers insist that the rationale for establishing a resolution fund is that future crises will be financed by the financial institutions themselves so that public funds will not be used to bailout banks that have incurred excessive risk. This policy goal springs from the feeling that the balance between risks, rewards and responsibilities between society and the financial sector needs to be adjusted. A massive amount of public money was mobilised by public authorities to support the financial system while economic growth remains subdued in many countries and unemployment is breaking all historical records.

Without precluding the need to develop a framework for financial crisis management and resolution, this paper argues that the prominent role of a resolution fund is to foster financial stability and to act as a preventive tool. If properly designed, the resolution fund can steer excessive leverage and banking sector growth so that the cycle is smoothed both at upswings and downturns and banks' incentives become aligned with financial stability.

¹⁸ In this context, the SRF can borrow from the markets under certain circumstances.

The proposal for the design of the contributions to a resolution fund takes into consideration a static and a dynamic factor. The static factor depends on the total size of each bank -possible corrected for risk- and marks the final target contribution. The dynamic factor takes account of the credit cycle and the income cycle to provide for an anti-cyclical effect. The dynamic factor acts as a sort of speed switch, while the target contribution remains linked to the size of the bank. Depending on the evolution of assets and income, the dynamic factor either accelerates the contribution of banks upfront or slows it down but the target contribution is not affected. While the paper provides some guidance, the exact calibration of coefficients is left for a later research. The parameters to be used are also subject to political choice and preferences.

The proposal presented in this paper aims at aligning incentives so that banks that remain within a "manageable" size are incentivised and those that grow towards a too-big-to-fail size are penalised. While the system is robust in itself, the departing point might already be embedded with the too-big-to-fail problem, which should be addressed with other policies or measures.

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