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IN-DEPTH ANALYSIS

Carving out legacy assets: a successful tool for bank restructuring?

External author: **Willem Pieter de Groen**
Centre for European Policy Studies

Provided at the request of the
Economic and Monetary Affairs Committee

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with the Chair of the Single Resolution Board
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Abstract

European banks have accumulated more than €1 trillion in non-performing loans (NPLs) on their balance sheets after the burst of the 2007-2009 great financial crisis. The NPLs pose a potential threat to bank stability in euro-area countries such as Cyprus, Greece, Italy, Portugal and Slovenia, where more than 15% of the loans are non-performing. This paper assesses the effectiveness of the various resolution tools to deal with legacy assets such as NPLs under the resolution framework. On the one hand, the on-balance sheet tools (no tools, sales of entire bank, and asset guarantees) and on the other hand, the tools that carve out the assets from the banks' balances (selling part of the bank, bridge bank and asset separation) are assessed based on the experiences in the aftermath of the financial crisis. The figures for the 79 euro-area banks that received capital support between 2007 and 2016 show that the differences in bank viability as well as financial and economic stability are fairly similar across tools, except for the sale of the entire business and bridge banks. Taking also the costs (losses and recapitalisation) into account, asset management companies in particular, as well as bridge banks, guarantees and no specific resolution tools, seem under the current conditions to effectively deal with legacy assets such as NPLs.

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LIST OF ABBREVIATIONS

AMC	Asset management company
DTA	Deferred tax assets
EBA	European Banking Authority
ECB	European Central Bank
ELA	Emergency liquidity assistance
ESM	European Stability Mechanism
EU	European Union
FDIC	Federal Deposit Insurance Corporation
NAMA	National Asset Management Agency
NPLs	Non-performing loans
RoRWA	Return on Risk-Weighted Assets
RWA	Risk-weighted assets
SAREB	Sociedad de Gestión de Activos procedentes de la Reestructuración Bancaria
SMEs	Small- and medium-sized enterprises
SRB	Single Resolution Board
SRF	Single Resolution Fund

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EXECUTIVE SUMMARY

In the aftermath of the 2007-2009 great financial crisis, banks have accumulated a large pool of non-performing loans (NPLs). In total EU banks have more than €1 trillion in NPLs on their balance sheets. High NPLs are putting pressure on the performance of banks in euro-area countries such as Cyprus, Greece, Italy, Portugal, and Slovenia, where the banks have NPL-levels above 15%. Some of the banks in these and other countries may fail and need to be resolved in the near future, which would test the new resolution framework.

This paper assesses the effectiveness of the different tools and approaches that can be used to resolve legacy assets such as NPLs. Since there are no cases to draw lessons from under the resolution framework, the older cases that inspired the design of the framework are analysed. The sample covers the 79 euro-area banks that received capital support in the period from 2007 to 2016. The large majority of these banks failed due to losses on legacy assets (NPLs and securities). Moreover, the applied resolution tools to deal with these legacy assets were fairly similar to the tools available under the resolution framework.

In total, six different resolution tools/approaches to deal with legacy assets have been assessed. There are three options to deal with the assets on balance sheets (no tools, sale of entire bank and asset guarantees) and three options to carve out the assets (sale of part of business, bridge bank and asset separation).

The effectiveness is measured based on the main objectives of the resolution framework: long-term bank viability, financial and economic stability and minimisation of the costs for taxpayers. The latter is best served by minimising the losses that need to be wound-down on creditors through bail-in. The NPLs have certain characteristics that determine whether the resolution tools can contribute to lowering the losses. The market values of NPLs are in most countries well below the economic and book value of the assets. The difference is likely to widen during crises and is explained by higher required returns and accounting of management costs by investors. The resolution tools can be used to maximise the values.

In order to maximise the value of the NPLs, it would be best to avoid direct sales. This makes the sale of a part of the business or the entire business ineffective. In turn, the other four tools might be effective to resolve legacy assets. Not applying any resolution tools would be an option when the portfolio of legacy assets is relatively small and the created capital buffers sufficiently high, which seems to barely put a strain on the bank's viability and loan growth. The latter is particularly important for banks that have a large market share.

For banks with substantial portfolios of NPLs it would, however, be better to clean up the balances for the viability in the longer term and stability. The bank could receive a guarantee on the legacy assets, the assets could be carved out and transferred to an asset management company (AMC), or the 'good' business could be transferred to a bridge bank. An important distinction factor is the management of the assets (i.e. recovery rates and focus on core activities). The research on whether it would be better to let the legacy assets be managed by the bank internally or externally is inconclusive. Larger pools of NPLs, however, seem to create economies of scale that might contribute to higher recovery rates, which would be an argument in favour of an AMC. Each tool has some specific disadvantages, which make the application more difficult. The guarantee has moral hazard issues, bridge banks require capital and the AMC requires liquidity.

Whereas the resolution authorities have the power to create a bridge bank, these might prove insufficient for both guarantees and AMCs. In order to make the AMCs really effective, the Single Resolution Board (SRB) should have more flexibility to use the Single Resolution Fund (SRF) for providing liquidity to the resolution tools. In addition, given the limited size of the SRF and the large amount of funds, a credit line or other liquidity facility from, for example, the ECB or the ESM is recommended.

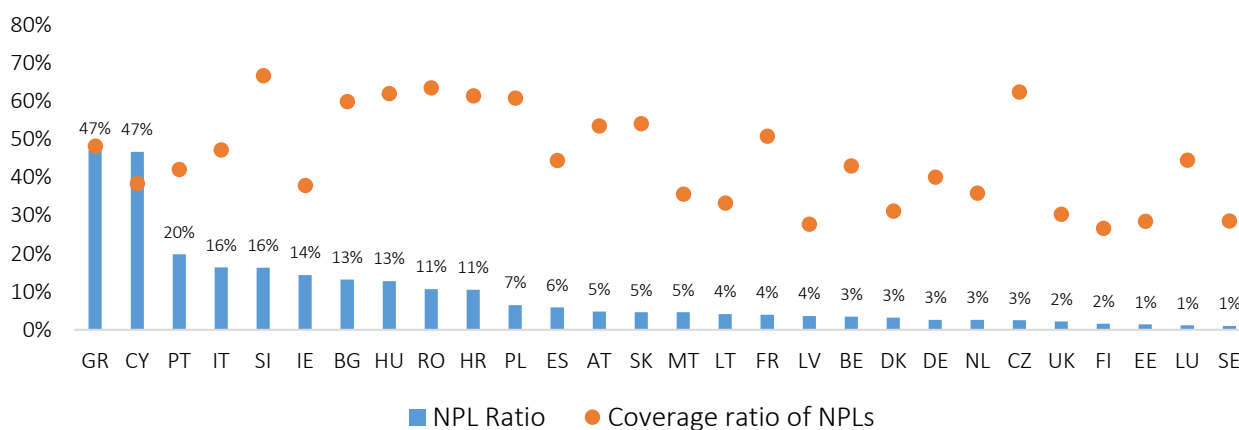
1. INTRODUCTION

Many banks in the European Union are suffering under the burden of large portfolios of non-performing loans, which deteriorate their performance and limit their possibilities to continue lending to the real economy.

EU banks have more than €1 trillion in NPLs on their balance sheets. The NPLs have accumulated mostly in the aftermath of the 2007-09 great financial crisis and are concentrated in a couple of EU member states. The harmonised figures at the end of the third quarter of 2016 from the European Banking Authority (EBA) show that the NPLs are substantial in countries like Cyprus, Greece, Italy, Portugal and Slovenia, where more than 15% of the total gross loans are non-performing. In turn, in countries like Sweden, Luxembourg, Finland and Estonia, the non-performing loans are below 2%. The NPLs are in particular concentrated in the loan portfolios of small- and medium-sized enterprises (SMEs) and to a lesser extent of households. The latter, however, often create fewer losses for the banks since the collateral and personal liability of households is in general less affected by failures than that of SMEs (EBA, 2016; De Groen, 2016a & 2016b).

The large variance in NPLs across member states is primarily due to differences in economic structure and situation, as well as bank lending and recovery policies, but also more structural differences in legal systems, court procedures and tax regimes (EBA, 2016; Valiante, 2016).

Figure 1: Non-performing loans in EU28 (weighted average), September 2016



Source: Author's elaboration based on EBA (2017).

There are three broad measures that are often applied internationally to reduce the large piles of distressed debt.

The first measure is to enhance the supervision of banks to ensure that NPLs are properly accounted for and that adequate provisions are being taken as well as that the banks are sufficiently prudent in their lending policies. The European banking supervisors have taken several corrective actions. They have improved the transparency of NPLs to supervisors and investors, are putting pressure on banks with high NPLs to take action to reduce the exposures and promote the usage of standardised legal contracts (Enria, 2017). Moreover, the ECB (2016) has issued a non-binding guidance for banks to develop a NPL strategy.

The second measure commonly applied is the revision of the insolvency laws and procedures, which mostly focus on reducing the time between the financial distress of the debtor and the liquidation. Hence, shorter procedures reduce the time that the distressed debt is recognised as NPL in the books

of the banks, which in general increases the recovery values (Banca d'Italia, 2016; Carpinelli et al., 2016). The reforms of the insolvency framework can be complemented by reforms of other legislation such as the tax system in order to encourage banks to recognise losses and sell distressed debt (Banca d'Italia, 2015). Some governments, such as the Italian government, have taken measures to shorten the recovery process. Nevertheless, it remains to be seen whether these measures will also be effective (Gros and De Groen, 2016). The previous reforms in Italy did not show any significant improvement (Schiantarelli et al., 2016).

The third measure includes the creation of a secondary market for distressed debt to allow banks to offload the NPLs and to reduce the capital absorption for the NPLs (IMF, 2015). The secondary market for distressed debt is currently relatively underdeveloped in the EU. Although there is much more distressed debt in Europe, the secondary market in the United States is substantially larger. The market value of distressed debt transactions accounted at the end of 2013, for example, only €64 billion in Europe and \$469 billion (approximately €340 billion) in the United States. The secondary market consists of both direct sales and joint-initiatives with specialist firms, investors and other participants acquiring (part of) the distressed debt (IMF, 2015). More concretely, this concerns for example NPL asset management companies (AMCs), corporate restructuring vehicles as well as securitisation (Jassaud and Kang, 2016).¹

The high NPLs constitute an important threat to the banking sector. Customer loans are the main asset class on the balance sheet of most banks. The high NPLs may lead to substantial losses and cause some banks to fail, which means that the resolution authorities such as the Single Resolution Board (SRB) need to be prepared to resolve some banks. The ineffective judicial systems and lack of a functioning secondary markets might aggravate the losses for banks with high NPLs. Hence, the current market price of NPLs is well below the book value,² which motivates banks to postpone resolving the NPLs to reduce the losses, but at the same limits the possibilities of banks to lend to the real economy.

Looking at the resolution framework, there are various options to deal with legacy assets such as NPLs. In this paper the effectiveness of six tools/approaches are assessed based on the experiences with bank resolutions in the aftermath of the financial crisis. These resolution tools include three approaches to deal with the assets on-balance sheet (no resolution tools, sell the entire bank and guarantees) and three in which the assets are carved out (selling the assets, bridge banks and asset separation). The analysis covers a total of 79 euro-area banks that received capital support from national governments in the period from 2007 to 2016.

In this analysis the effectiveness of the various tools to deal with legacy assets is determined across three dimensions. Bank viability, financial and economic stability and costs of measures, which are proxied by bank profitability, loan growth and capital injections and cumulative peak losses, respectively. These dimensions form an integral part of the objective of the recovery and resolution framework³ to minimise the negative consequences of bank failures for financial stability as well as to minimise the usage of taxpayers' money.

The remainder of this analysis is organised as follows: data on aided banks are presented and described in the second chapter, which is followed in chapter three with a comparison of the various options to address legacy assets in resolution. In chapter four, the findings of the data analysis on the effectiveness of the various resolution tools are presented and discussed. In the fifth and final section conclusions are drawn and policy implications are discussed.

¹ The main factors for the underdeveloped secondary market are the incomplete credit records, legal restrictions on non-banks to purchase and manage NPLs, overvalued collateral and their inability to liquidate the collateral through illiquid markets and lengthy court procedures as well as under provisioning for NPLs (IMF, 2015).

² The book value is equal to the gross loans, taking into account the provisions for loan losses.

³ OJ L 173 of 12.6.2014 (<http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32014L0059>)

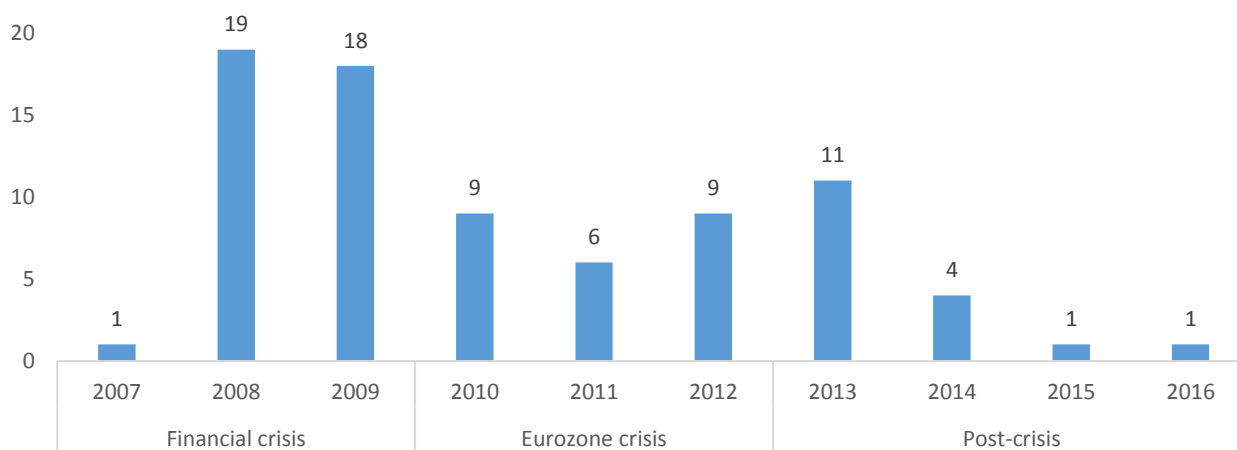
2. DATA DESCRIPTION

This chapter provides an overview of the sample of banks used to assess the effectiveness of the various resolution approaches applied to banks that received capital support in the euro area between 2007 and 2016.

2.1 Sample of banks

The euro-area banks that have received capital support in the past decade have been identified based on the state aid decisions of DG Competition. Based on the latest list available at the time of writing DG Competition took almost 400 decisions between 4 June 2008 and 29 December 2016 in the context of the financial crisis related to euro-area countries (European Commission, 2016). These decisions concern schemes as well as individual financial institutions (e.g. banks, insurers and credit enhancers). Moreover, in many instances, there are multiple decisions on single institutions. In total 79 banks are included in the dataset. Banks that were merged or formed part of the same entity before the first resolution have been considered on a consolidated basis.⁴ In turn, when a bank was split after the intervention, only the parent institution has been included.⁵ This can have some impact on the results, since in some cases the banks of which assets or business have been carved out received additional capital support.

Figure 2: Number of aided euro-area banks, 2007-16



Note: The figure only shows the first year in which banks received capital support.

Source: Author's own calculations based on De Groen & Gros (2015) and European Commission (2016).

Figure 2 shows that almost half of the 79 banks (38) received their first capital support during the 2007-09 great financial crisis and almost another third received the first aid during the 2010-12 eurozone debt crisis (24). The remaining the banks (17) received their first aid after the crises. During this post-crisis period, the number of state aid cases gradually dropped to only one new euro-area bank in each of the last two years of the sample-period (2015 and 2016).

⁴ The 21 Spanish 'cajas' that received state aid were, for example, merged into six new banks (namely BMN, BFA/Bankia, CatalunyaCaixa, CEISS, NCG Banco and Unnim Banc) and the French Groupe Caisse d'Épargne and Groupes Banques Populaires merged to become BPCE (De Groen & Gros, 2015).

⁵ For example, Dexia Belgium was carved-out of Dexia and rebranded to become Belfius. Only the results for Dexia have been considered for this exercise. Moreover, Fortis' activities in the Netherlands and Belgium were carved out of the original Fortis and rebranded to become, respectively, ASR Nederland/ABN Amro and BNP Paribas Fortis. In the exercise only Fortis has been rebranded to become Ageas after the activities in the Netherlands and Belgium were taken out (De Groen & Gros, 2015).

The banks in the sample collectively represent a sizeable part of the euro-area banking sector. In fact, the banks that received state aid in the euro-area in the past decade had in total around €14.3 trillion assets at the end of the book year preceding the initial intervention. This is equal to about 45% of the average banking assets of all euro-area banks during the sample period.⁶

The market share and number of banks are unequally spread across the member countries. The banks are headquartered in 13 of the 19 euro-area countries. They are systemically relevant in most of these countries. When they received the first capital support, the banks held more than half of the assets in seven of the countries, including Belgium (3 banks), France (6), Greece (13), Portugal (7) and Slovenia (6). In Cyprus (2), Germany (10), and Ireland (6), the banks controlled a large minority of the assets. In the other countries, the banks represented less than a quarter of the assets. In Austria (4), Italy (6) and Luxembourg (1), the aided banks had a cumulative market share of up to 15%.⁷ The market shares are calculated for the countries where the banks are headquartered. In particular the larger banks also have substantial market shares outside their home markets. Volksbanken in Austria also had, for instance, substantial activities in central and eastern Europe, and Fortis in Belgium had also a substantial market share in the Netherlands with ABN Amro.

2.2 State aid measures

The distressed banks received different forms of support for various causes after the financial crisis erupted.

Many banks received capital and liquidity support in the period from 2007 to 2016, but only the banks that received capital support are considered in this analysis. This is because the recovery and resolution framework is *de facto* only addressing capital issues (De Groen & Gros, 2015). The banks that received only liquidity support from either governments and/or central banks are thus excluded. The liquidity issues will have to be addressed by the central banks that can provide solvent banks emergency liquidity assistance (ELA) if necessary.⁸

These banks received the capital injections after different events. Based on the decision texts of DG Competition, three main causes have been identified: losses on financial assets (loans and securities), non-financial assets (goodwill, consolidations, etc.) and operations. This analysis focuses on legacy assets and in particular NPLs. The losses on financial assets include those on legacy assets, which can be divided into two broad categories with losses on loans and securities. The losses on loans were predominantly caused by deteriorating economic conditions and the losses on securities primarily due to losses on US securitised debt and government securities such as Greek government debt. For most of the banks a clear distinction can be made, except for the Greek banks and on Cypriot bank, which suffered losses on both government securities and (domestic) loan portfolios. These Greek banks have therefore been included in both categories.

⁶ The total euro-area banking assets were on average €32.0 trillion (varying between €30.4 and €34.8 trillion) between June 2008 and December 2016, see ECB Statistical Data Warehouse (2017) https://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=117.BSI.M.U2.N.A.T00.A.1.Z5.0000.Z01.E.

⁷ The market shares are estimated using the total assets of domestic credit institutions by country from the ECB Statistical Data Warehouse (2017) <http://sdw.ecb.europa.eu/reports.do?node=1000003505>.

⁸ Moreover, even if one wants to assess all banks that received liquidity support, this would be difficult since not all banks that received this kind of aid are publicly known. The ECB does not disclose the banks that receive ELA and the provided liquidity measures by member states were in some cases provided under general programmes in which the liquidity measures to individual banks were also not always disclosed.

Table 1: Main causes capital shortfalls, 2007-16

Country	Financial assets		Non-financial assets	Operational	Total (unique)
	Loans	Securities			
AT	2	2	0	0	4
BE	0	2	1	0	3
CY	2	1	0	0	2
DE	0	9	1	0	10
ES	13	0	0	0	13
FR	0	4	1	1	6
GR	13	13	0	0	13
IE	6	1	0	0	6
IT	6	0	0	0	6
LU	0	0	1	0	1
NL	1	1	1	0	2
PT	7	0	0	0	7
SI	6	0	0	0	6
Total	56	33	5	1	79

Source: Author's elaboration based on European Commission (2016).

The actual and potential losses on financial assets formed the main reason for the capital shortfalls, while the problems due to losses on non-financial assets and operational form the exception with just six cases (see Table 1). Looking more closely at the losses on legacy assets, more than two-thirds of the aided banks suffered primarily from shortfalls on NPLs. In particular, the banks in euro countries such as Ireland, Greece, Portugal, Slovenia and Spain suffered from large portfolios of NPLs. This makes these cases most relevant to draw lessons for addressing large portfolios of NPLs. The cases of failures due to large portfolios of US debt securities are less relevant, since these assets do not require the same specific expertise that NPLs require to be unwound (Ingves et al., 2004).

3. COMPARISON OF RESOLUTION TOOLS

The resolution tools were used by national governments during the sample period are quite similar to the tools that the resolution authorities can use under the new recovery and resolution framework when they resolve a bank. The authorities used the tools primarily with the aim of reducing the costs of the resolution, making the banks viable again and safeguarding financial stability.

3.1 Market failures and comparative (dis)advantages

The resolution tools allow the resolution authorities to overcome some market failures using their advantages compared to both banks and private investors in dealing with legacy assets such as NPLs. The main problem that resolution authorities can address by using the resolution tools is to overcome the disincentive of banks to dispose of NPLs at a loss, the asymmetric information between buyers and sellers and the intertemporal pricing problem (Enria, 2017). In other words, the resolution tools can reduce losses and enhance long-term viability as well as financial and economic stability.

The main problem in the market for NPLs is currently the asymmetric information between buyers and sellers. Investors, clients and other external stakeholders such as private investors do not have the same information on the assets as the bank possesses. To compensate for this uncertainty on the value of the assets, the investors require a higher risk premium. In fact, the current market value of NPLs is well below the economic and book value. Ciavolillo et al. (2016) calculated that the entire difference between the market and book value was due to a different required rate of return and accounting.

The banks account for the NPLs in their books at amortised costs based on the original effective interest rate minus the provision for bad loans, while private investors determine the value of the NPLs based on their required rate of return. When the legacy assets are sold in the current situation, there might be a revenue shift from banks to investors. The required rate of return of private investors is currently substantially higher than that of the banks. Besides the asymmetric information the private investors also ask a higher rate of return in order to compensate for their higher equity costs and management fees (Ciavolillo et al., 2016).

Moreover, the banks include the indirect costs to manage the NPLs (administrative and service fees) in their annual expenses, whereas the private investors deduct these indirect costs immediately when they acquire the NPLs. This means that when a bank sells the NPLs it will have to deduct the costs immediately from its capital. When the bank is distressed there is a strong incentive for the bank to postpone the recognition of these losses (Ciavolillo et al., 2016).

Another issue might be the management of the NPLs. The management of NPLs require skills that do not belong to the core competences of the banks, such as real estate and liquidation expertise (Ingves et al., 2004), which may explain the large differences in recovery rates. Ciocchetta et al. (2017) found, for example, that the five best performing banks in Italy have recovery rates that are about 14 percentage points above the country average. The difference seems not to come from differences in the composition of the portfolio, but from the approach. In Italy there is, for instance, a large difference in the management of NPLs across banks (organisational structure, reporting systems, etc.) as well as the approaches to recover the money (out-of-court agreements, bankruptcy proceedings, arrangements with creditors and foreclosures) (Carpinelli et al., 2016).

Transferring the management of NPLs to an external party has both advantages and disadvantages. The external party is likely to focus on the restructuring, create economies of scale, and the bank's books are cleaned up. This would allow the bank to focus more on its core activities (lending and borrowing). In turn, the external party does not have the same knowledge about and access to the

borrower, which might make recovery more challenging and potentially lowers the recovery rates. This makes it also more difficult to determine the appropriate transfer price (Ingves et al., 2004).

3.2 Resolution tools

Based on the state aid decisions of DG Competition, this paper identifies six broad resolution tools and approaches that can be used to deal with legacy assets such as NPLs. Three approaches deal with the legacy assets on the balance sheet of the bank: i) not applying any resolution tools, ii) selling the entire bank and iii) other resolution tools such as asset guarantees. In turn, there are also three resolution approaches used to carve out the assets: iv) selling the assets, v) creating a bridge bank and vi) creating an asset management company. The resolution authorities can use all these tools under the resolution framework. Table 2 provides an overview of the main characteristics of the resolution tools.

Table 2: Expected effectiveness of resolution tools, 2007-16

	On balance sheet			Carve out		
	None	Sale of business (entire)	Other (Guarantees)	Sale of business (part)	Bridge bank	Asset separation
<i>Description</i>	<i>Legacy assets remain on-balance sheet</i>	<i>Entire bank incl. legacy assets are sold to other bank or investor</i>	<i>Legacy assets are (partially) guaranteed by third party</i>	<i>Legacy assets are sold to other bank or investor</i>	<i>Good assets are transferred to separate bank</i>	<i>Legacy assets are transferred to asset management company</i>
<i>Transfer value</i>	<i>Book</i>	<i>Market</i>	<i>Economic</i>	<i>Market</i>	<i>Book</i>	<i>Economic</i>
Long-term viability	Unchanged	Improves	Improves	Improves	Improves	Improves
Economic and financial stability	Unchanged	Improves	Improves/Deteriorates	Improves	Improves	Improves/Deteriorates
Loss	Low	High	Medium	High	Low	Medium
Capital required	Yes	No	No	No	Yes	No
Liquidity	Bank	Bank	Bank	No	Bank	Non-bank
Management						
- strategy	Internal	Mixed	Internal	Mixed	Internal	External
- accounting	Annually	Up front	Annually	Up front	Annually	Up front
Moral hazard	No	No	Yes	No	No	No

Note: The expectations in the table above are based on the experiences with State aid cases in the past and the specific circumstances related to the legacy assets such as NPLs. The main assumptions are that the market value is and will remain below the economic and book value as well as that the transfer values in the cases where ‘artificial’ valuations are used (e.g. guarantees and asset separation) are based on valuations that are close to the ‘real’ economic value.

Source: Author’s elaboration.

The application of the different resolution tools are discussed below.

- **None [17 banks]:** The resolution authority can choose not to use any of the resolution tools. During the sample period this was primarily the case for banks that received a precautionary recapitalisation or were liquidated. In addition, there were some banks in Greece and Cyprus where the fiscal resources of the governments were limited. The latter group of banks are likely to experience downward pressure on the profitability and lending capacity for a longer period.

- **Sale of business (entire) [12]:** The disposal of all of the resolved entity has been a commonly applied tool. The shareholders of the bank need to incur the losses or gains from the sale of the entire bank, whereas they do not need to put new capital in. This tool is in particular interesting to use when the market value is close to the book value. Most of the banks in the sample were therefore also only sold after the assets were carved out about which there was the most uncertainty about their valuation.
- **Other (guarantees) [9]:** Besides guarantees on liabilities, some governments provided guarantees and risk-shields on certain assets of the bank. In most cases either the first or a share of the losses had to be covered by the aided banks. This tool reduces the uncertainty about the value of the assets and capital requirement, whereas the bank at the same time continues managing the assets. This is the only tool that was commonly used during the crisis that is not considered a resolution tool by the SRB, but there are provisions in the new resolution framework that allow the SRB to use the SRF to provide guarantees. Since this tool includes some form of insurance there is also moral hazard risk, i.e. a chance that the bank will take more risk once it receives the guarantee.
- **Sale of business (part) [24]:** Disposal of part of the resolved entity is a commonly applied tool. This resolution tool forces the bank itself to absorb the potential losses of a sale. This tool was predominantly used during the sample period to sell non-core activities. Although the banks might sell the activities below book value, the sale could still improve the banks' regulatory capital position as long as the loss is below the capital charge, i.e. the deleveraging is larger than the reduction in regulatory capital due to the loss on the sale. This tool was then also primarily used to sell non-core activities to other banks and investors. In some cases part of the assets were sold to national governments.
- **Bridge bank [15]:** Part or all of the good or bad business of the bank can be transferred to a separate bank. This tool is used in most cases to carve out the core activities and in some exceptional cases to carve out the legacy assets. The main advantage of a bridge bank is that it can obtain liquidity from depositors and central banks, in turn the main disadvantage is that the bank must hold sufficient capital. The bridge bank also allows the bank to recover most of the value of the assets, since the assets are settled in an orderly manner. Hence, when the good business is carved out and placed in the bridge bank, the legacy assets remain in the old bank that is wound down. This entity does not necessarily need to remain a bank. In some cases when there are no funding issues the banking license can be handed in. The old bank then *de facto* becomes an asset management company (AMC).
- **Asset separation [28]:** In the aftermath of the financial crisis several national AMCs were created to clean bank balance sheets and resolve the NPLs. The experiences with national AMCs such as NAMA in Ireland, Sareb in Spain and FMS Wertmanagement in Germany, show that this tool can effectively contribute to stabilising the financial sector and limit the losses on legacy assets. But at the same time, the AMCs implied fiscal costs, reinforcing the bank-sovereign nexus. In particular, the governments absorbed part of the losses on the NPLs and provided the liquidity support (Medina-Cas & Peresa, 2016).

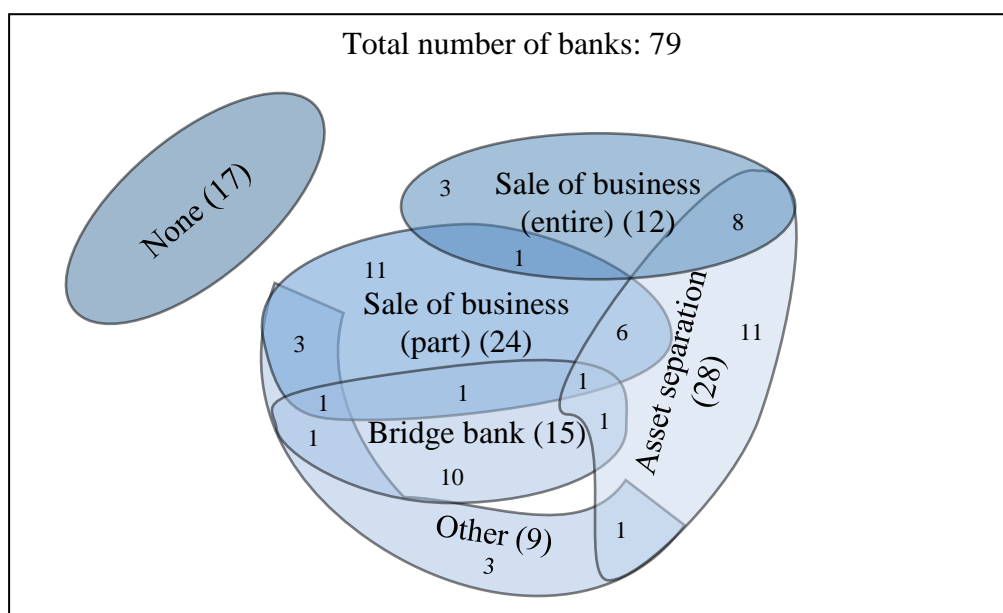
In addition to the six resolution approaches assessed in the exercise, the resolution authorities can also bail-in creditors. This tool has not been included since most banks in the sample were bailed-out with capital from the government and not bailed-in as defined under the new framework. The bail-in was in almost all cases limited to the share capital, hybrid instruments and in some cases subordinated debt holders.

3.2 Combinations of resolution tools

The use of the various tools is decided by the resolution authorities on a case-by-case basis. This means that, for instance, the specificities of the bank as well as the market it operates in are taken into account. But also other factors such as the economic circumstances and real estate prices. All six resolution approaches and tools have different characteristics, which make them suitable to address different issues in various situations.

The resolution tools can be used on a stand-alone basis, but also in combination. In the sample period resolution tools were applied to the large majority of the banks. The banks resolution tools were applied to 62 of the in total 79 aided euro-area (See Figure 3). For the resolution of the majority of these banks (38 banks) just a single tool was applied, but for a substantial minority of the aided banks two (22 or 28%) or even three (2 or 2.5%) of the tools were applied.

Figure 3: Possible combinations of resolution tools used, 2007-16



Note: See Annex 1 for an overview of the application of the resolution tools across countries and causes of the capital shortfall.

Source: Author's elaboration based on European Commission (2016).

Looking at the different combinations, the most common were the separation of assets and the sale of the entire (8) or part (6) of the remaining bank. Hence, asset separation was used to carve out the bad assets and the sales of the entire or part of the business reduced the required capital. But there were also a couple of banks, of which part of the activities were sold and part guaranteed (3). This is particularly interesting at the moment that part of the business that is sold is valued above the book value minus capital charge.

The usage of a combination of tools might make the resolution more effective, although it also makes the measurement of the effect of a single tool more difficult.

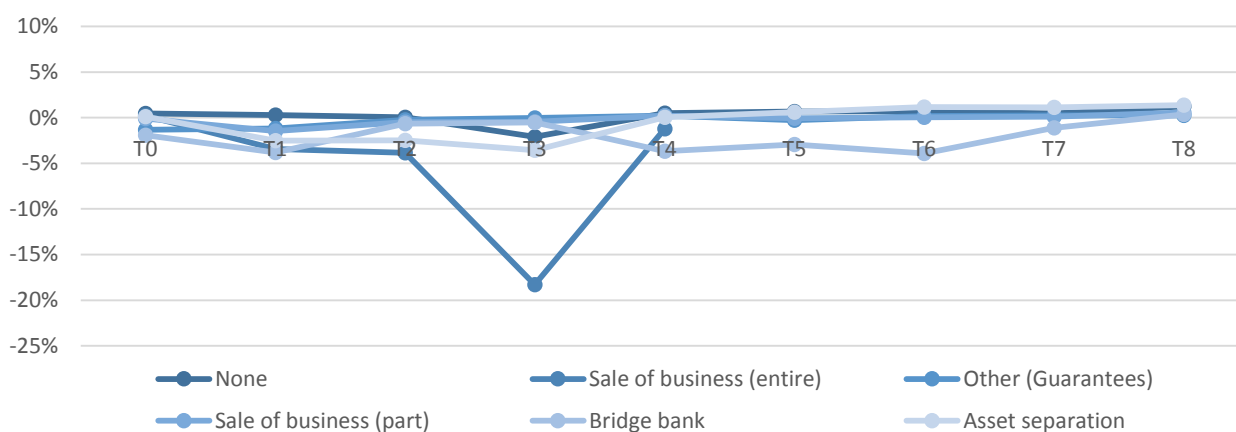
4. EFFECTIVENESS OF RESOLUTION TOOLS

The effectiveness of the resolution tools is measured across three dimensions representing the main objectives of the resolution framework. The main dimensions are long-term bank viability, contribution to financial and economic stability and the cost of the measure. The results for the different aided banks show quite some variance; thus, in order to avoid that the extreme values drive the results, median values are used.

4.1 Long-term viability

The resolution authorities need to ensure that the critical functions of banks in resolution are maintained and when liquidation is not feasible that the banks become viable in the long-term. The viability of the banks is proxied by a simple measure for bank profitability: return on risk-weighted assets (RoRWA),⁹ which is calculated as the profit after tax, adjusted for potential tax revenues as stated in the annual reports of the aided banks. The tax revenues are included in the balance sheet as deferred tax assets (DTAs). Since these DTAs are in most cases deducted from the regulatory capital, they have also been deducted from the calculated profits.¹⁰ The RWA has been chosen as the denominator and, for example, not total assets, since RWA are also the denominator of the main regulatory capital ratios. A positive RoRWA for several consecutive years would indicate that the banks are viable.

Figure 4: Median returns on risk-weighted assets after first intervention, 2007-15



Source: Author's elaboration based on annual reports and European Commission (2016).

The differences between most of the resolution tools are relatively small (see Figure 4). It is striking to note that the banks to which no resolution tool was applied have the highest median return during the sample period. They seem to have rather low losses and not applying any of the resolution tools seems to allow those banks to spread the losses across years. This is at least partially explained by the type of banks to which no resolution tools were applied. Most of these banks had portfolios of legacy assets that were relatively limited in size. In turn, the sale of the entire bank leads to the highest losses, primarily because some of the assets were carved-out and transferred against a loss before the sales.

⁹ When the risk-weighted assets were not provided for a year, the risk weighted assets were estimated based on the RWA-to-total-assets ratio. The ratio was based on either the other observations for the bank and when there were not available on the average of the banks with a similar size (i.e. small, medium, large).

¹⁰ Article 36 and 38, OJ L 176 of 27.6.2013
<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R0575&from=EN>.

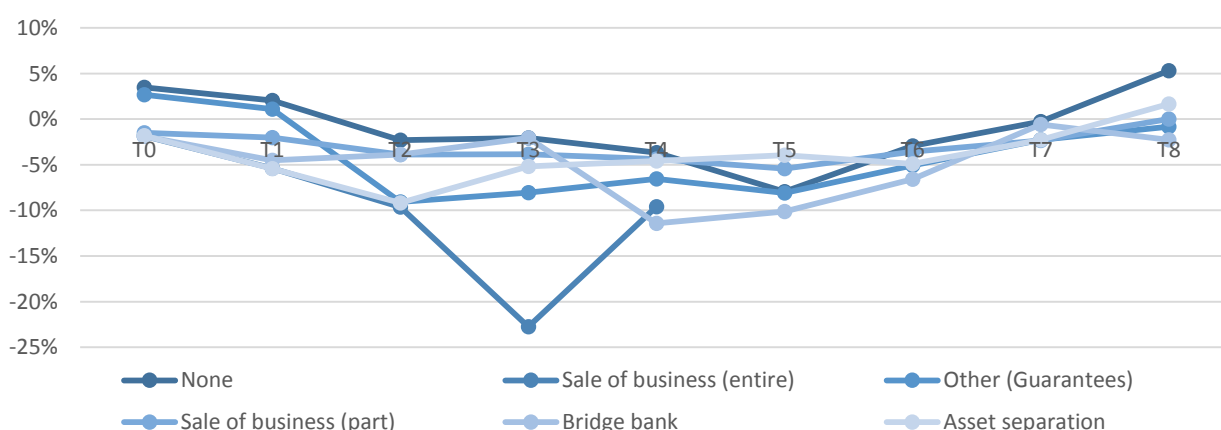
The banks to which resolution tools were applied almost non-exclusively first have to incur losses when the assets are transferred (between T0 and T3), before the returns recover. This pattern of initial loss before returns improve is strongest for asset separation and guarantees, but it is also applicable to the partial sale of business.

The bridge banks show a more volatile pattern and losses throughout the sample period. There are also large variations within the observations on the banks where part of the business was transferred to a bridge bank. This variation is primarily due to the fact that both good and bad banks were created. For most of the banks for which the financial data after the intervention was available the ‘good’ business was carved out and the original bank was used to resolve the ‘bad’ business including legacy assets, which may explain the long-term negative returns. The bridge banks were also the only banks that had still negative median returns after four years.

4.2 Financial and economic stability

The resolution authority must ensure the financial and economic stability. Based on the motivations in the state aid decisions, one of the main justifications for the aid has been the lack of credit for the real economy. This was particularly the case for banks with a large market share or when multiple banks that collectively have a large market share failed around the same time. The credit to households, non-financial companies, and governments is proxied by loan growth. The indicator is calibrated based on the annual increase in gross loans to customers as a share of the gross customers at the end of the year preceding the first capital injection. The so called “static balance sheet assumption” must ensure that the measure is neutral for the different resolution tools. Hence, the tools that carve out assets including non-performing loans [i.e. sale of business (part), bridge bank, asset separation] would otherwise record artificially higher loan growth due to a lower denominator. The bank is assumed to contribute to a stable economy when the autonomous loan growth is relatively stable (no sudden break) and over time relatively close to the nominal domestic economic growth (around 2% on average during the sample period from 2007 to 2015).

Figure 5: Loan growth after first intervention, 2007-15



Source: Author’s elaboration based on annual reports and European Commission (2016).

The loan growth for most of the resolution tools have been negative in most of the years (see Figure 5). The results for loan growth are further fairly similar to those of the RoRWA. Hence, the banks that were entirely sold show the lowest loan growth rates, whereas the banks for which no resolution measures were taken quoted the highest growth rates or lowest fall in gross loans. Moreover, the bridge banks show over time more negative growth rates. This may be explained by the fact that these tools were often applied to the worst cases, where no other bank was willing to acquire the ‘good’ business of the bank even after substantial support by the state.

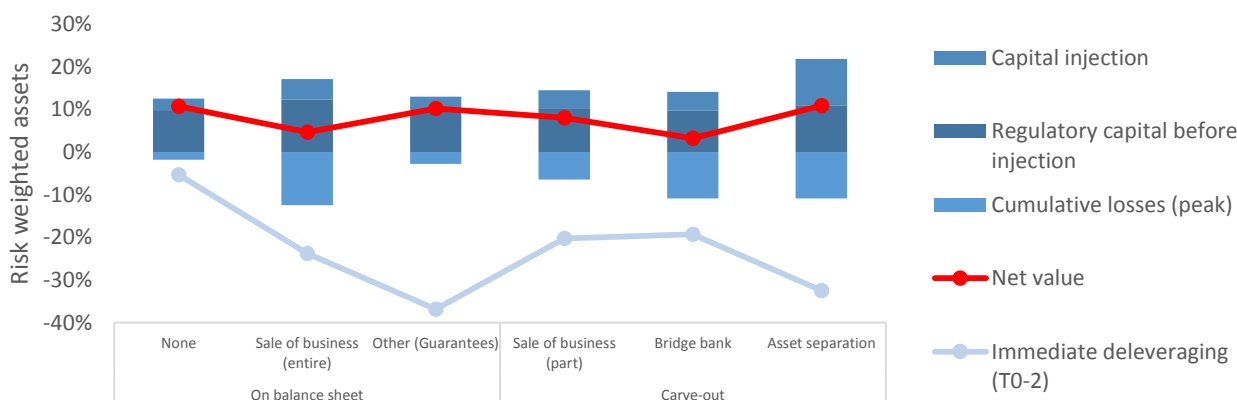
Looking more closely at the other tools that include a transfer of the risks on the assets, the guarantees and asset separation, and to a lesser extent the sale of a part of the business show again a similar pattern as for the RoRWA, the loan growth rates initially decline, before a strong recovery.

4.3 Cost of measures

Another important element of the resolution mechanism that might be an important impediment to economic stability is burden-sharing. In the analysed state aid decisions, burden-sharing was relatively limited with losses in most cases only passed on to the holders of share and hybrid instruments. The remainder of the losses were in most cases absorbed by the taxpayers to avoid that the trust in banks deteriorates and depositors might lose their money. Under the new regime the objective is to minimise taxpayers' contributions. Hence, the losses should be entirely absorbed by the shareholders and creditors of the resolved banks. Only in exceptional cases may the resolution funds or precautionary recapitalisation by national governments be used.

In order to minimise the chance that the taxpayers' money would nevertheless be used, the losses passed on to creditors should be minimised to reduce the disruption. The total costs are measured, taking four elements into account: i) the size of the capital injections; ii) the capital before the intervention; iii) the losses after the initial intervention; and, iv) deleveraging as a consequence of the intervention. The sum of the capital injection and the capital before the intervention provide an indication of the funds that were required to absorb the losses and (re)capitalise the bank. The required capital also depends on the actual losses of the banks, which are measured by the cumulative peak losses, i.e. the lowest value of the sum of annual profits starting at the year of the first intervention. The impact of the various elements on the capital requirement of the bank is estimated using the deleveraging in risk-weighted assets at the end of the second year of the intervention. All four elements are expressed in share of RWA at the end of the year preceding the first intervention, which also forms the denominator of the regulatory capital requirements.

Figure 6: Costs and capital consumption, 2007-15



Source: Author's elaboration based on annual reports and European Commission (2016).

The results show large differences between the various resolution tools (see Figure 6). These differences are partially due to the characteristics of the tools, but also the banks' characteristics and circumstances. The peak losses are in particular high for carve out-tools, i.e. the sale of part of the business, bridge bank and asset separation. This could partially be explained due to the losses as a consequence of the transfers, but also due to the losses on the continued activities. These were in the case of bridge banks and asset separation often substantially larger than in the case of the partial sale of business and the guarantees. This does not, however, need to mean that the tools were not effective, since the composition and quality of the legacy assets were unclear. The sale of the entire business

was in most cases combined with asset separation, which may explain the high losses for the businesses that were entirely sold. The lowest peak losses were reported for banks to which no resolution tool was applied, which confirms that the majority of these banks had minor problems. This is also expressed in the relatively low levels of capital support. The banks without resolution measures had to comply with the capital requirements, but this is not the case for all the resolution tools.

When the sum of the capital injections and available capital are compared to the losses (i.e. see net value in Figure 6), the results show that the required capital injection is relatively low for banks that are entirely sold (i.e. capital injections account for 39% of the cumulative peak losses). For these banks the acquirer is responsible for the bank capital and not the seller. This also means, however, that the capital injection is mostly lost, which is not necessarily the case for the banks without any resolution tools (151%) or bridge banks (41%) applied. In these cases the national governments received shares that may recover most or even more than the initial injection. These bridge banks were in most cases used to continue the ‘good’ bank operations, whereas the original bank was in most of these cases liquidated. There was thus no need for recapitalisation of the bank, except when more liabilities than assets were transferred to the bridge bank. Moreover, the deleveraging is most for resolution tools that include the transfer of part of the assets or risks from the resolved bank to (private) investors (e.g. AMCs, bridge banks, guarantors, and investors).

5. CONCLUSIONS

NPLs are putting a strain on the performance of banks in several euro-area countries, which may cause even more banks to fail in the near future (Gros & De Groen, 2016). The SRB and other resolution authorities established in the aftermath of the crisis have not been tested so far, but they need to be prepared to resolve some banks if necessary. In the absence of any experience with resolution under the new framework, this paper analyses the various tools that can be used to deal with legacy assets, such as NPLs, based on the experiences with the 79 euro-area banks that received capital support in the period from 2007 to 2016.

In total, six different resolution tools/options are assessed, for dealing with the legacy assets on balance sheets (none, sale of entire business and other[guarantees]) or for carving them out (sale of a part of the business, bridge banks and asset separation). This paper assesses the effectiveness of the various tools to deal with legacy assets based on the objectives of the new resolution framework, including restoring the long-term viability of the bank, safeguarding financial and economic stability, and minimising the costs for taxpayers. Although the objectives have in essence not changed with the implementation of the resolution framework, the resolution approach is supposed to change. Instead of a bail-out with taxpayers' money, it is expected that all of the losses will be absorbed by creditors through a bail-in. The latter might enhance spill-over and contagion effects, which makes it even more important to minimise the losses of the resolved banks and the bail-in of creditors.

Looking at NPLs, there are several market failures that potentially aggravate the losses, which are likely to affect the valuation of assets, particularly in periods of distress. The market failures include inefficient judicial systems, which a resolution authority is unable to change. The ineffectiveness of the judicial system should be addressed by policy-makers. But there are also market failures such as the incentives for banks to postpone recognition of losses, information asymmetry between buyers and sellers and pricing problems that can be addressed by the resolution authorities with resolution tools. The market failures contribute to the differences between book, economic and market values of NPLs. In particular, outside investors require substantially higher returns and account for the costs of the management of these NPLs upfront.

In order to minimise losses, the most effective tools to resolve the legacy assets would need to avoid direct sales against the lower market values. In considering the various available tools, this makes in particular the sale of a part of or an entire business unlikely to be effective, even though also these tools contribute to long-term viability and economic and financial stability. The latter is primarily important for banks with a large market presence.

In turn, not applying any resolution tools can in exceptional cases also be an option. Based on the previous state aid cases, the resolution authorities could leave the legacy assets untouched when the size of the portfolio is relatively small and the capital buffers are high enough. When the banks have sufficient capital buffers, which is unlikely in resolution, the losses on legacy losses and the management costs can be spread across years and the negative impact on the profitability and stability are limited.

When the NPL portfolios are substantial, it is advisable to clean up the banks' balance sheets. This can be done on balance sheets via guarantees for the legacy assets or carved out by transferring the legacy assets to an AMC or creating a bridge bank with the good assets and liquidating the legacy assets in the existing banks. All three of these tools can be effective.

The academic research is not conclusive about whether it is better to have the assets managed by the bank itself or by an external party. On the one hand, the banks have better access to and more knowledge about the borrowers. But on the other hand, managing NPLs is not a core competency of banks (real estate and liquidation) and it diverts their attention and resources from their core activities.

Moreover, the creation of an AMC would allow several banks to pool their assets, thereby creating economies of scale that should lower management costs and contribute to higher recovery rates.

There are some specific disadvantages associated with each of the tools. Guarantees are currently not considered in the toolkit of the resolution authorities and some moral hazard issues arise with the partial insurance of legacy assets. In order to cover losses, bridge banks need not only funds, but also capital, while the AMCs require external funding and need to cover the management costs. Moreover, bridge banks may have some problems in returning to long-term viability as well as contributing to financial and economic stability. This may be explained by the fact that this analysis considered the distressed banks, which in most cases involving bridge banks still contained the legacy assets.

Carve-out tools also require determining the transfer value, which needs to be just. On the one hand the transfer value should be as high as possible to minimise the losses that need to be wound-down on creditors, which may lead to disruptions. On the other hand, the transfer value should be low enough to ensure that the bridge banks and AMCs will not be loss-making, necessitating recurring resolutions/bail-ins. The latter may hamper the return of banks to long-term viability and dilute the funds of the SRF as well as lead to situations in which there are insufficient bail-inable funds.

There are plans to reduce the NPL problems outside the resolution framework with the creation of a single EU AMC. In January 2017, Andrea Enria, Chair of the European Banking Authority (EBA), proposed to create a single EU AMC that would obtain NPLs from banks against the real economic value. The objective would be to move up to €250 billion of NPLs to the AMC. The EU AMC would try to sell the assets within a period of three years at the economic value and if it failed, the bank would have to absorb the additional losses, i.e. the difference between the transfer and the sale value. The latter must avoid causing taxpayers to lose money as was the case for some national AMCs that were used in the past. When the bank is unable to absorb the losses, the standard provisions under the EU bank recovery and resolution framework would apply. This would mean, however, that the uncertainty on the viability of the institutions is prolonged. The institution might benefit from scale economies in attracting funding, but would also have the difficult task of developing the required skills to manage NPLs across the various judicial systems in the EU member states.

The main challenge in creating AMCs, however, arises from obtaining the funding. Liquidity is a general issue in the current resolution framework, but is particularly relevant for AMCs, for they cannot receive deposits and access monetary funds like other resolved or bridge banks. The state aid cases in the past decade have shown that the required funding is often large and easily exceeds the maximum amounts that the SRF can provide and guarantee. The bank in resolution might potentially contribute to the funding, although it would be bound by the large exposure requirement. But in order to avoid liquidity problems, more room to use SRF funds above the 5% should be considered (De Groen & Gros, 2015). In the US this is solved with a credit line for the resolution authority. Hence, the Federal Deposit Insurance Corporation (FDIC) has an arrangement with the US Treasury, which provides working capital as well as a standing credit line of \$100 billion (€88 billion) (Ellis, 2013). In the euro area a similar arrangement could be made with a credit line from the ECB or the ESM.

Finally, the results of this analysis need to be interpreted with some care given the substantial variation in the figures for the various tools, the limited number of observations as well as the fact that the data covered the period before the bail-in tool was introduced. Moreover, additional research is needed on best practices for managing NPLs. It would be important, for instance, to collect data on recovery rates of both banks and AMCs. In order to maximise the learning from previous state aid cases, the public disclosure on resolved banks should be improved too. In particular the disclosure of banks that are being liquidated.

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ANNEX 1. RESOLUTION TOOLS

Table 3: Main resolution tools used across countries, 2007-16

	On-balance sheets			Carve outs			Total (unique)
	None	Sale of business (entire)	Other (Guarantees)	Sale of business (part)	Bridge bank	Asset separation	
Causes							
Financial assets							
Loans	10	10	2	14	11	24	56
Securities	9	1	6	14	7	3	33
Operational	1	1	1	3	1	3	5
Operational	1	0	0	0	0	0	1
Countries							
AT	1	0	2	2	2	0	4
BE	0	0	0	3	2	2	3
CY	1	0	0	0	1	0	2
DE	1	1	6	4	1	1	10
ES	0	10	0	1	0	11	13
FR	6	0	0	0	0	0	6
GR	4	0	0	6	3	0	13
IE	1	0	0	0	0	5	6
IT	0	0	1	1	4	0	6
LU	0	1	0	1	0	0	1
NL	0	0	0	2	0	2	2
PT	2	0	0	2	2	2	7
SI	1	0	0	2	0	5	6
Total	17	12	9	24	15	28	79

Source: Author's elaboration based on European Commission (2017).



Европейски парламент Parlamento Europeo Evropský parlament Europa-Parlamentet Europäisches Parlament
Euroopa Parlament Ευρωπαϊκό Κοινοβούλιο European Parliament Parlement européen Parlaimint na hEorpa
Europski parlament Parlamento europeo Eiropas Parlaments Europos Parliamentas Europai Parlament
Parlament Ewropew Europees Parlement Parlament Europejski Parlamento Europeu Parlamentul European
Európsky parlament Evropski parlament Euroopan parlamentti Europaparlamentet

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