S TUDY

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

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Scrutiny paper on the Single Resolution Mechanism
provided at the request of the Economic and Monetary Affairs Committee

ECON

March 2017
EN

IPOL | DIRECTORATE-GENERAL FOR INTERNAL POLICIES
EGOV | ECONOMIC GOVERNANCE SUPPORT UNIT

European Parliament

STUDY

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Provided in advance of the public hearing
with the Chair of the Single Resolution Board
in ECON
on 22 March 2017

Abstract

This paper considers a number of issues related to the restructuring of troubled banks in the EU. First, we provide an overview of how legacy assets have been dealt in a number of countries (in particular, drawing upon the experiences in Japan, the USA, Sweden and Spain), which support the case for a centralized solution in the presence of a generalized banking crisis. Second, we shed light on the need to differentiate between systemic and non-systemic events, by examining the relevant literature on the credit channel. Third, we elaborate the theoretical argument on the need for a systematic centralised approach at EU level to deal with legacy assets in bank restructuring in order to maintain fair recovery rates. Finally, we provide a preliminary assessment of the business models, risk, response to regulation and performance of 38 state aided banks via recapitalisation measures and explicit restructuring requirements, with an emphasis on APS-AMC arrangements using available data between 2005 and 2015. The indicators show that these state aided banks are only returning progressively to soundness and struggling to regain their performance levels of the pre-crisis period, which is a generalised problem throughout the European banking sector.

This paper was requested by the European Parliament's Economic and Monetary Affairs Committee.

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LIST OF ABBREVIATIONS

ADB   Asian Development Bank
AMC   Asset Management Company
APS   Asset Protection Scheme
BRRD   Bank Recovery and Resolution Directive
CNMV   Spanish Stock Exchange Commission
CAR   Capital Asset Requirements
DUTB   Družba za Upravljanje Terjatev Bank (Slovenia)
EBA   European Banking Authority
ECB   European Central Bank
ERC   European Resolution Capital
ESM   European Stability Mechanism
EU   European Union
EZ   Eurozone
EZ-BB   Eurozone Level Bad Bank
FAB   Fondos de Activos Bancarios
FIRREA   Financial Institutions Reform, Recovery and Enforcement Act
FMS   German Wertmanagement Fund (for portfolio's unwinding)
FROB   Fondo de Reestructuración Ordenada Bancaria (Spain)
GDP   Gross Domestic Product
IRCJ   Industrial Revitalization Corporation of Japan
NAMA   National Asset Management Agency (Ireland)
NPL   Non-Performing Loans
OECD   Organisation for Economic Cooperation and Development
OMT   Outright Monetary Transactions
ROA   Return on Assets
ROE   Return on Equity
RTC   Resolution Trust Corporation
RWA   Risk Weighted Assets
SAREB   Sociedad de Gestión de Activos procedentes de la Reestructuración Bancaria (Spain)
S&L   Savings and Loans
SFEF   Société de financement de l'Économie Francaise (France)
SRF   Single Resolution Fund
SSM   Single Supervisory Mechanism
TARP   Troubled Asset Relief Program
UK   United Kingdom
US   United States of America

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EXECUTIVE SUMMARY

Dealing with legacy assets carved out from banks under restructuring may be achieved via private sector or state supported initiatives. While in the case of non-systemic bank restructuring, private sector initiatives may have proven successful, state support is needed in the case of systemic crises.

Historical experience – briefly analysed in the paper – suggests the need for a centralised solution, or a comprehensive programme to deal with legacy assets when the crises are systemic. This is evidenced by the failures in Japan in the 1990s (the 'lost decade'), and the successes of Sweden in the 1990s, Spain more recently (with the creation of FROB and SAREB and the provision of European funds), and the US, both during S&L episode that led to the establishment of RTC and during the global financial crisis, with the creation of TARP and the adoption of stringent stress tests.

We also summarize credit channel literature and other relevant theoretical considerations, and present a simple model describing how bank restructurings in systemic crises may feature a 'bad' equilibrium along with a 'good' equilibrium.

We endorse the proposal – already put forth by some scholars and policy-makers – to establish a Eurozone level Bad Bank (EZ-BB). In our view, introducing EZ-BB would provide six main benefits:

(1)   A clear view on the magnitude of the legacy assets problem in the Eurozone;

(2)   It would avoid some false positives (i.e. some banks that would otherwise be forced into resolution because of excessive fire-sale haircuts induced by speculation, would be spared resolution and this would reduce the cost of depleting goodwill in EZ banking);

(3)   It would maximize the recovery rate on legacy assets (a careful, long-term-oriented and broad-shouldered EZ-BB would minimize the risk of devaluing the assets via forced fire sales);

(4)   By accomplishing (2) and (3), the EZ-BB would also act as a macroeconomic stabilizer, since it would reduce procyclicality in banking and the credit supply to the economy;

(5)   It would also greatly promote transparency in a market segment that tends to suffer extreme opaqueness and where it is difficult to tell whether opaqueness is just a fundamental variable of the problem, or it is artificially inflated by speculators who will ultimately benefit from fire sales of the disposed assets;

(6)   Finally, the EZ-BB will promote accountability, since its profits (that are likely to be quite high based on past historical records of similar experiences throughout the world) would be channelled back to the European people, possibly helping sustain the Single Resolution Fund, thus avoiding relying on taxpayers' money, should a major shock occur.

Our paper also includes an up-to-date preliminary assessment of 38 banks that have received state aid via recapitalisation and restructuring requirements in several EU countries, with an emphasis of APS-AMC programmes. Overall, more research is needed to understand the full set of reasons behind the return to viability of state aided banks.

1. INTRODUCTION

This paper was requested by the European Parliament under the supervision of its Economic Governance Support Unit.

The 2007-2009 Great Financial Crisis and the 2010-2012 euro area sovereign debt crisis were very damaging to the EU banking sector and forced EU Member States to undertake bold actions to keep the banking sector afloat. During the period 2008-2014, EU Member States committed in total EUR 4,884.1 billion of state aid[1], which was broadly divided into four categories, namely: recapitalisation (EUR 802.9 billion), asset relief measures (EUR 603.3 billion), guarantees (EUR 3,249 billion) and other liquidity measures (EUR 229.7 billion), from which an overall reported amount of (EUR 1,934.9 billion) was used (see Appendix 1). Beyond the different forms of state aid used, European banks also received emergency liquidity assistance from central banks to keep liquidity flowing in the interbank system.

The economic and social costs of bailing out European banks during this period have been unprecedentedly large for the European economy as a whole and for European taxpayers in particular. This exposed the fundamental weaknesses in Europe's financial architecture, coupled with decades of flawed banking regulation and supervision which necessitated a major regulatory overhaul from both an institutional and legislative perspective.

Amongst the institutional and legislative reforms, the Bank Recovery and Resolution Directive (BRRD)[2] was a cornerstone and the first step in dealing with failing banks in an orderly fashion as well as helping to reduce market disruptions at the EU level. By the end of 2015, national resolution authorities were established almost everywhere throughout the EU[3], with clear powers and tools to act. The practicalities of resolution and, later on, the restructuring of a failed bank are not an easy endeavour, however. Several issues may interplay to make resolution and restructuring successful. These issues range from the level of complexity and interconnectedness of the ailing bank, the effectiveness of the resolution planning process and the level of coordination among the various authorities involved in resolution, to the adequacy, fairness and transparency of balance sheet valuations, adequate planning of the restructuring process and intricacy of how to deal with legacy assets etc.

This paper delves into the restructuring process of state aided banks in the EU. First, we provide an overview of how legacy assets have been dealt with in specific cases and expose the policy lessons learnt. Second, we shed light on the need to differentiate between systemic and non-systemic events, by examining the credit channel literature. Third, we elaborate the theoretical argument on the need of a systematic, centralised EU-level approach to deal with legacy assets in bank restructuring. Finally, we report the business model, risk, response to regulation and performance of 38 state aided banks via recapitalisation measures, including Asset Protection Schemes (APS) and Asset Management Companies' (AMC) programmes and explicit restructuring requirements between 2005 and 2015.

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[1] Approved by the European Commission Directorate General Competition http://ec.europa.eu/competition/state_aid/legislation/temporary.html

[2] introduced and expected to be transposed into the member states' national laws on 31 December 2014.

[3] except five countries including Czech Republic, Luxembourg, the Netherlands, Poland, Romania and Sweden http://europa.eu/rapid/press-release_IP-15-5827_en.htm

2. DEALING WITH LEGACY ASSETS: HISTORICAL POLICY PERSPECTIVE

Bad loans are at the root of most banking crises. To understand the challenges involved in the resolution of bad loan problems in the Eurozone, we provide a brief comparative study of government-backed solutions to deal with 'bad loans', referencing selected cases in Sweden, Japan, the US (RTC and TARP) and Spain (FROB and SAREB), emphasizing what works and what doesn't work. The examples of Spain and Ireland are relevant, because they were Eurozone member states that used state-backed money to clean up the troubled financial institutions' balance sheets of toxic assets.[4]

The very definition of bad loans (non-performing loans, NPLs) is a matter of controversy, as examined in a recent paper by Bholat, Lastra and others[5]. The divergence in their valuation, accounting and regulatory treatment across jurisdictions, time, databases and – within the institutions themselves – according to whom they have to report and for what purpose, complicates the comparability of bank soundness and renders stress tests a less useful tool in assessing solvency.

According to EBA (2016), the EU weighted average NPL is highly dispersed across EU countries, ranging from below 5% in financially sound member states and up to 45% in financially distressed countries like Greece and Cyprus.

A generalized banking crisis (of a systemic nature) is treated by the authorities differently from isolated bank failures in a sound economy. A generalized banking crisis is often a result or a reflection of the deterioration in the economic environment, or of poor macroeconomic management. The costs of a crisis can, of course, be magnified in the presence of a weak bank supervisory structure, or in the case of supervisory and regulatory mistakes. And good crisis management is crucial for the preservation, or the quick restoration of confidence, in the banking system, which is indeed the ultimate rationale of the whole supervisory process.

Governments can choose to deal with each troubled bank on a case-by-case basis, using a mix of strategies (takeovers and rescue packages in some cases, liquidation in others etc.) or they can choose an overall strategy to deal with all the troubled institutions. The difficulty of calculating of *ex ante* the total amount of the losses and the speed with which a crisis unfolds, add to the complexity of its resolution. The experience in the US, Sweden[6] and Spain suggests that a comprehensive strategy involving recapitalization is the most efficient and prompt way of resolving a systemic crisis. Governmental assistance – often by creating a centralized agency - is needed to resolve a systemic crisis, because of the potential for disruption to the nation's economy and of social unrest (Lastra, 1996, pp. 139-143). Delaying the resolution of problems or 'buying time' is generally not a good strategy, and Japan's lost decade (briefly assessed below) provides clear evidence in this regard.

That is why the proposal by EBA Chairman Andrea Enria – and by Avgouleas and Goodhart – to create an EU's 'bad bank' to buy billions of euros of toxic loans (estimate: 1 trillion euros)[7] is, in our opinion, a sensible one. The taxpayer-backed fund proposed by Mr Enria is in line with historical precedents that we analyse in this section. It is also a recognition that stress tests have not been bold enough and that a large number of NPLs compromises the health of many bank balance sheets in the Eurozone.

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[4] However, as we discuss later, since the coming into force of the BRRD, any bank receiving state aid must impose losses on its unsecured bondholders. See arts 44(5) and (7), 37(10)(a), Rec 73, BRRD.

[5] http://www.bankofengland.co.uk/research/Pages/workingpapers/2016/swp594.aspx

[6] http://www.riksbank.se/Documents/Avdelningar/AFS/2015/Session%201%20-%20Englund.pdf

[7] https://www.ft.com/content/3b18e5ec-d047-36b2-a35a-10ae8e6a76ed. It should be noted, however, that the €1 trillion of gross NPLs reduces to €0.6 trillion net NPLs if one considers the average coverage ratio of 40% that European banks possess.

There is a certain pattern or dynamic that develops, in terms of the measures public authorities take to deal with systemic crisis. At the beginning of a generalised banking crisis, the authorities tend to provide emergency liquidity assistance, hoping for an early restoration of confidence, in the belief that the problems are of short-term illiquidity rather than insolvency. In 2007 and early 2008, this was exactly what the ECB did in the Eurozone, the Bank of England did in the UK and the Federal Reserve Bank of New York did in the US.

However, if banks start failing or getting into further trouble (suggesting that the problems are more than liquidity constraints) the government is often compelled to provide solvency assurances to depositors and to design a coherent policy, with an expeditious decision-making process and a clear voice. The government faces the delicate and difficult policy choice of whether, and when, to commit fiscal resources to recapitalize banks. In the case of the Eurozone, this task is further complicated by the fact that fiscal policy remains in the hands of the national Member States, though the ESM (and eventually the Single Resolution Fund) can provide [limited] financing under the terms of the ESM Treaty (and the SRF under the terms of its governing rules).

There are two extreme solutions available to governments when dealing with systemic crises: liquidation on a large scale (an unlikely solution given the public interest at stake) and nationalization (total or partial) via large injections of capital to all (or most) troubled institutions, as happened in Sweden in 1992. Between those two radical solutions (saving all institutions via de facto nationalisation or letting all institutions fail) there are a variety of other solutions and policies, ranging from debt restructuring techniques (when the links between bank debt and sovereign debt prove strong, this can be a good alternative, in terms of value preservation and market attractiveness) to a mix of government and private assistance (like the so-called 'lifeboat operation' in the UK that was applied to solve the secondary banking crisis in 1974) or the creation of a government backed centralized agency or a comprehensive centralized program (funded by taxpayers' money).

It is a government backed centralized agency that is the focus of the proposals put forth by EBA Chairman Andrea Enria and by Avgouleas and Goodhart, further discussed (and endorsed) below.

A centralized agency to dispose of the assets of failed institutions was created in the US by the 1989 Financial Institutions Reform, Recovery and Enforcement Act (FIRREA) under the name of Resolution Trust Corporation (RTC). The RTC managed the assets of the failed Savings and Loan associations. Of course, the creation of such an agency was complemented by other legislative and regulatory measures designed to strengthen supervision. A centralized agency[8] also saw the Spanish banking system sail through its deep structural problems as a consequence of the effects in the Eurozone of the global financial crisis. The example of Sweden and the most recent example of TARP (Troubled Asset Relief Program/s)[9] in the US corroborate the effectiveness of government led programmes in achieving a prompt resolution of the crisis. Japan, after several failed strategies, only solved its severe banking crisis following the design of a comprehensive programme.

The Japanese authorities were perceived during the 1990s as ambivalent regarding the degree of support that they intended to provide for troubled financial institutions. The so-called 'Japan premium' represented a logical market reaction to this situation, which was only solved at a much

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[8] See http://www.frob.es/en/Paginas/Home.aspx The *Fondo de reestructuración ordenada bancaria* (FROB), was a government funded program adopted by the Spanish government in June 2009 to manage the restructuring and resolution of troubled credit institutions (*cajas de ahorro* and others)

[9] https://www.treasury.gov/initiatives/financial-stability/TARP-Programs/Pages/default.aspx
The Troubled Asset Relief Program (TARP) was signed into law by U.S. President G.W. Bush on October 3, 2008. TARP was a US government program to deal with the toxic assets that were burdening financial institutions. The TARP, the 'bazooka' to which the then Secretary of Treasury, Hank Paulson, referred to when he unveiled the program, proved an effective way of resolving the crisis, together with the adoption of other measures, including reliable stress tests that did not hide the true dire state of many financial institutions.

later stage when substantial government assistance was provided to recapitalize the ailing banking system.

As noted by Fujii and Kawai in an excellent paper published by the ADB[10]:
'The Japanese government's response to the financial crisis in the 1990s was late, unprepared and insufficient; it failed to recognize the severity of the crisis, which developed slowly; faced no major domestic or external constraints; and lacked an adequate legal framework for bank resolution. Policy measures adopted after the 1997–1998 systemic crisis, supported by a newly established comprehensive framework for bank resolution, were more decisive. Banking sector problems were eventually resolved by a series of policies implemented from that period, together with an export-led economic recovery. Japan's experience suggests that it is vital for a government not only to recapitalize the banking system but also to provide banks with adequate incentives to dispose of troubled assets from their balance sheets, even if that required the government to mobilize regulatory measures to do so, as was done in Japan in 2002. Economic stagnation can cause new nonperforming loans to emerge rapidly, and deplete bank capital. If the authorities do not address the banking sector problem promptly, then the crisis will prolong and economic recovery will be substantially delayed'.

Fujii and Kawai point out four lessons that can be learnt from the Japanese banking crisis:

*First, in order to address a banking crisis properly, prompt action to gauge the exact amount of loan losses is a critical initial step, although this is not an easy task… Second, **a government recapitalization operation that involves taxpayer funds is the most direct policy measure to contain the acute phase of market turmoil** (and, as the authors note, most of the public funds allocated to banks were recovered by 2008) … Third, the removal of impaired assets from banks' balance sheets is essential to the restoration of bank health. **A government initiative to purchase bank assets is often necessary to restructure bank balance sheets during a crisis**, as when markets lose their ability to determine prices, the government is better able to maintain flexibility in timing and so could realize higher values for those troubled assets. Fourth, economic stagnation can cause new NPLs to emerge rapidly, and deplete bank capital* (emphasis added).

Landier and Ueda (2009) argue that government intervention is justified only for systemic banks or in cases of a generalized financial crisis. Otherwise, the government can let normal bankruptcy procedures apply. Market imperfections call for a restructuring operation, to reduce the probability of default, which requires simultaneous action on both assets and liabilities. Voluntary restructuring of a bank is decided by shareholders, who would oppose such measures as debt renegotiation because they lower the value of equity relative to that of debt. That is why some transfer from the government is called for, unless the government finds a way to make restructuring compulsory. A bank that is asked to participate in a restructuring plan would be reluctant to do so because of the negative signals this would transmit to the public. Also, one of the primary considerations of any form of asset sales is what message will this send. Bank managers have better estimates of the value of the assets of their institution than the public does. Government and private investors must do their own due diligence in order to come up with an estimate of the value of the assets.

A recent paper by Stephanie Medina Cas and Irena Peresa[11] examines Asset Management Companies set up in three EU jurisdictions to carve out legacy (impaired) assets from the banking sector in the aftermath of the 2007-2009 global financial crisis and considers the factors that make such 'bad

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[10] https://www.adb.org/sites/default/files/publication/156077/adbi-wp222.pdf
The authorities had long refused to recognize the full extent of bank NPLs till the late 1990s. As a part of comprehensive efforts to revitalize the banking system and the economy, in April 2003, the government established a new asset management company, the Industrial Revitalization Corporation of Japan (IRCJ). The objective of IRCJ was designed to promote the restructuring of relatively large and troubled, but viable, firms by purchasing their loans from secondary banks, leaving the main bank and IRCJ as the only major creditors. The IRCJ was expected to promote "structural reform" of the Japanese economy.

[11] See Medina Cas and Peresa (2016). See also http://www.imf.org/external/pubs/ft/scr/2014/cr1459.pdf

banks' a success. The study features NAMA (National Asset Management Agency) set up in Ireland in December 2009, FMS Wertmanagement set up in Germany in 2010 to manage the impaired assets of one specific banking group, Hypo Real Estate Holding AG, and SAREB (*Sociedad de Gestión de Activos procedentes de la Reestructuración Bancaria)* set up in Spain in 2012. While FMG is publicly owned, NAMA and SAREB combine private-public ownership.

The final design of these three AMCs was carried out in close consultation with the European Commission, since they each had to be approved under the EU state-aid rules. The analysis of the effectiveness of these AMCs is examined according to five criteria to determine their success: (1) *Ex-ante transparency in reporting the legacy assets* (though this condition was not met in the case of SAREB); (2) *Valuation by and independent institution* (this condition was met in the three AMCs); (3) *Reference recovery rates based on trustworthy risk assessment model* (this condition was met in the three cases under consideration); (4) *Certainty of the legal framework underpinned in the structures* and, finally, (5) *Adequate skills and appropriate ethics of the management of the AMC.*

Of particular relevance for our study is the example of SAREB (Company for the Management of Assets proceeding from Restructuring of the Banking System), which was established as a condition set by the EU in exchange for aid of up to 100 billion euros for the Spanish banking sector and which was designed and developed from the work of three independent specialists: Oliver Wyman, BlackRock and European Resolution Capital (ERC).

SAREB functions as a 'bad bank' acquiring property development loans from Spanish banks in return for government bonds, with a view to maintain and, if possible, to improve the availability of affordable credit in the economy. Private shareholders own 55% of SAREB and the remaining 45% is held by FROB *Fondo de reestructuración ordenada bancaria* (FROB), the Spanish banking bailout and reconstruction program established in June 2009.

The main objective of SAREB, apart from achieving restructuring of the Spanish financial system within a maximum period of 15 years, is to obtain the maximum possible profit earning capacity from these toxic assets. About 55,000 million Euros have been transferred to SAREB from nationalised bodies and banks that have required medium-term financial aid. Of this amount, two-thirds corresponds to loans and credit linked to the real estate sector, and one-third to real estate assets. It does not possess a banking licence and, thus, is not supervised by the SSM.[12] SAREB enjoys legal advantages which do not apply to other Spanish limited liability companies, such as status as a preferential creditor for subordinated debt over other creditors.[13]

The paper by Medina Cas and Peresa emphasizes the need to attract skilled, qualified and experienced staff, to outsource some of the services and to have solid corporate governance rules. Having a favourable macroeconomic context, in particular the recovery of the mortgage market, is also a positive factor for AMCs.

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[12] As regards the legal nature of SAREB see http://www.iflr.com/Article/3302121/Spanish-schemes-and-SAREB.html and http://ec.europa.eu/eurostat/documents/1015035/2990735/ES-Classification-of-SAREB.pdf/95a10697-19f3-4387-a457-12f87f341242
SAREB is supervised by Banco de España. Sareb also has a unique and exclusive instrument, which has been specifically developed in order to serve as its very own divestment tool - Bank Asset Funds (*FAB - Fondos de Activos Bancarios*). These are flexible instruments, inspired by securitisation funds and collective investment institutions, and are specifically tailored to professional investors. Their set up and operation will be supervised by the Spanish Stock Exchange Commission (CNMV). See https://en.sareb.es/en-en/about-sareb/Pages/What-is-Sareb.aspx
[13] See https://www.boe.es/boe/dias/2012/11/15/pdfs/BOE-A-2012-14062.pdf, https://en.sareb.es/en-en/about-sareb/Pages/What-is-Sareb.aspx, and https://www.bankia.es/en//sareb

The regulatory context in which these three AMCs were created has since evolved significantly. At the time when they were being approved by the European Commission, the Banking Recovery and Resolution Directive (BRDD) was still in gestation. The directive has now been in force since 2016 and any future AMCs or 'bad banks' need to take into account the BRRD resolution tools and requirements as well as the Banking Union legislation. However, the positive experience of establishing a bad bank cannot be ignored.

Gandrud and Hallerberg (2014) argue that assessing recovery rates has to be done in the context of preventive measures, to avoid future turmoil and fire sales. It is always more beneficial to taxpayers to insure the entire asset pool of a bank than a specific pool. Those schemes usually combine asset guarantees with capital injections, as exemplified by the UK intervention in January 2009 to support its systemically important banks, with the Royal Bank of Scotland and Lloyds HBOs being the obvious beneficiaries. It is open to conjecture as to whether the implied recovery rates can be backed up by a detailed examination of the insurance fee imposed on the beneficiary banks, as well as the conversion rate of the preferred shares that the government has acquired through capital injection. The authors also provide indications on haircuts that were observed on transferred assets to asset management companies (bad banks) in Europe during the 2007-2009 financial crisis. These vary from 10-40% (SFEF, France) to 71% in Slovenia (DUTB, Slovenia). In some other cases of bad banks, mostly with public ownership stakes, assets have not been transferred but, rather, assigned to the bad bank at book values, so that no haircut took place. Based on a simple framework, they clarify the economics behind bank restructuring and evaluate various restructuring options for systemically important banks. The case study of the recap and asset guarantee of RBS and Lloyds-HBOS suggest that the conversion rate of the preferred shares that the government has acquired through capital injection can give indications as to the market value of the recovery rate. Understanding the accounting framework imposed by Eurostat rules helps provide contrast between privately owned asset management companies and publicly owned ones.

3. DEALING WITH LEGACY ASSETS: ECONOMIC PERSPECTIVE

From an economic perspective, dealing with legacy assets carved out from banks undergoing restructuring must be distinguished according to whether it is a non-systemic event, or whether it implies a systemic risk dimension. In the former case, the issue may be addressed from a micro – individual bank – perspective while in the latter, the systemic dimension calls for necessary macro considerations. In this section, first we consider the Credit Channel literature and then we summarise two recent proposals – the one cited above put forward by Andrea Enria, chairman of the European Banking Authority (EBA), and suggestions by Emilios Avgouleas and Charles Goodhart as to how to deal more effectively and efficiently with legacy assets.

The Credit Channel literature owes greatly to Ben Bernanke – for example, Bernanke (1983) – and to a group of economists who refocused scholarly attention on the macro implications of imperfect banking markets. In essence, bank credit markets are plagued by information asymmetries between borrowers and banks, which cause two different problems: adverse selection and moral hazard.[14]

Adverse selection arises before a contract is signed, and refers to a situation in which potentially less desirable borrowers, from the point of view of creditors, are also those who will have more opportunities to be approved for a loan (Greenwald et al., 1984). This may lead to equilibrium credit rationing. Due to information asymmetries, creditors cannot examine the specific quality of each borrower and to avoid attracting low-quality borrowers (adverse selection) banks refrain from increasing the loan interest rate, to keep it stable and reducing the supply of credit (Stiglitz and Weiss, 1981). Accordingly, excess demand affects a share of potentially productive investments, which are not financed, with negative macroeconomic consequences. To minimize adverse selection, creditors must be adept at screening good quality businesses to finance.

In turn, moral hazard arises ex post where creditors undergo the risk that borrowers behave irresponsibly (opportunistic behaviour), jeopardizing loan payback. A typical moral hazard situation occurs when borrowers have incentives to invest in high-risk projects in which, if the outcome is positive, they obtain high profits; whereas, if the outcome is negative, creditors bear almost the entire losses. With high moral hazard, banks curb loan supply and, thus, contribute to slowing down economic activity. To minimize moral hazard problems, debt contracts include collateral guarantees and provisions to limit a borrower's opportunistic actions, and banks must closely monitor that borrowers respect those provisions. Screening and monitoring are very important for bank solvency, but become extremely difficult to carry out during systemic financial crises, aggravating the initial effects of the shock (Mishkin, 1999).

Many empirical studies show that interest-rate variations are not enough to explain the scope of economic fluctuations. Thus, the credit channel literature (Bernanke and Gertler, 1995) has developed a framework featuring an additional transmission mechanism of monetary policy shocks and/or financial shocks. Acknowledging the existence of frictions in the credit market, due to information asymmetries, this channel is based on the external finance premium, which is the wedge between the cost of external funding and the 'opportunity cost' of using internal funds. Normally, the cost of obtaining funds externally is higher because of the above described risks of adverse selection and moral hazard that banks (and other investors) have to face. Therefore, as the external finance premium goes up and down following monetary/financial shocks, those shocks not only influence the general level of interest rates, but also the width of this wedge, amplifying its effects on the real economy. In particular, the credit channel identifies three distinct transmission sub-channels of monetary policy: balance-sheet channel, bank-lending channel, and bank-capital channel.

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[14] This sub-section partly draws on D'Apice and Ferri (2010).

First, the balance-sheet channel, which is induced by possible borrowing constraints, connects the width of the external finance premium to the borrower's financial soundness. Specifically, the higher the latter's net worth, the smaller the external finance premium. This is because, as described above, there is a low probability of conflict of interest between high net-worth borrowers and lenders, due to the fact that a larger portion of the loan is backed by collateral. Monetary policy and/or financial shocks, via this channel, through a change in interest rates, not only modify the cost of credit, but also borrowers' financial soundness, thus creating an additional propagation effect. For example, an increase in interest rates negatively affects the financial soundness of firms and their ability to borrow money, through both direct mechanisms – such as higher cost of debt at variable rate or reduction of value of collateral securities – and through indirect mechanisms – such as the reduction of household consumption levels – which in turn reduce business profits.

Second, the bank-lending channel, instead, focuses on the possible deterioration in the capacity of intermediaries to provide credit. For example, an interest-rate increase may lead savers to shift their funds from deposits to other higher yielding investments. If banks are unable to compensate this outflow of resources with other liabilities, their capacity to grant loans is considerably reduced and this may slow down the macro-economy. Those most affected are businesses using almost exclusively bank credit, to reduce their investment level. If, on the other hand, banks can offset the deposit outflow with other kinds of liabilities, the volume of funds they raise does not change, but its cost increases, as alternative deposit funds are usually more expensive. The higher cost for funding is then translated into a further interest rate increase for the borrowing businesses, which also in this case, will have to reduce investment.

Third, the bank capital channel hinges on the following. When banks undergo a marked reduction of their capital, for example as a result of significant losses on loans granted at the peak of a strongly expansive credit cycle, they have two alternatives to re-establish the appropriate ratio between assets and net worth: collecting new capital or reducing the supply of credit. When losses occur in the middle of a systemic financial crisis, raising new capital becomes extremely difficult and, as a consequence, banks usually react by reducing their supply of credit. This, in turn, harms the macro-economy burdening it with a credit crunch. This is defined by the Council of Economic Advisors (1991) as "a situation in which the supply of credit is restricted below the range usually identified with prevailing market interest rates and the profitability of investment projects".

Many authors have studied this channel – from bank capital to bank lending – generally finding a significant negative causality, going from increased bank capital requirement to less bank lending. In a seminal paper on the subject, Peek and Rosengren (1995) argue that banks, where capital is not constraining the expansion of their assets, when receiving a negative shock to capital should intensify deposit taking in order to compensate for the drop in their liabilities implicit in the drop of capital. Thus, when banks are not capital-constrained, one should expect a negative relationship between shocks to capital and deposit taking. On the contrary, they find a positive link between shocks to capital and the dynamics of deposits in 1990 for U.S. banks. They conclude this evidence suggests the capital constraints for banks were pervasive as the Basle Committee ratios were phased in and, indeed, show that this impact is greater for banks having lower initial capital ratios. Berger and Udell (1994) concur that the expansion of loans was lower in 1990-92 for less-capitalized banks, but do not detect that the sensitivity of loan expansion to capital ratios increased then, with respect to the recession of the early 1980s. Peek and Rosengren (2000) use geographical separation as their means of identifying supply shocks: Japanese banks lost capital as a result of bad loans made in Japan. The authors then show that the withdrawal of these banks from lending to real estate in the U.S. had a strong dampening effect on U.S. commercial real estate markets. Clearly, it is hard to attribute the fall in real activity to demand side effects. In turn, Chiuri et al. (2002) for emerging economies test the hypothesis that the enforcement of bank capital asset requirements (CARs) exerts a detrimental effect on the supply of credit. They find that Basel 1 CAR enforcement significantly curtailed credit supply, particularly at less-well capitalized banks.

Let's now look at a selection of more recent papers. Van den Heuvel (2008), using U.S. data, finds the welfare cost of current capital adequacy regulation to be equivalent to a permanent loss in consumption of between 0.1 to 1%. Gambacorta and Mistrulli (2004), study cross-sectional differences in the response of lending to monetary policy and GDP shocks owing to differences in bank capitalization, trying to disentangle the effects of the "bank lending channel" from those of the "bank capital channel." The results, based on a sample of Italian banks, indicate that bank capital matters in the propagation of different types of shocks to lending, owing to the existence of regulatory capital constraints and imperfections in the market for bank fund-raising. Meh and Moran (2010) show that, following adverse shocks, economies whose banking sectors remain well-capitalized experience smaller reductions in bank lending and less pronounced downturns. Based on U.S. data from 2001 to 2011, Carlson et al. (2013) find that the relationship between capital ratios and bank lending was significant during and shortly following the recent financial crisis but not at other times. They also show that the relationship between capital ratios and loan growth is stronger for banks where loans are contracting, than where loans are expanding. Finally, they find that the elasticity of bank lending with respect to capital ratios is higher when capital ratios are relatively low, suggesting that the effect of capital ratio on bank lending is non-linear. In turn, Badarau-Semenescu and Levieuge (2010) document the existence of the bank capital channel in Europe and that this channel is heterogeneous inside the union. Specifically, the bank capital channel would be strongest in Germany and Italy, while it would be weakest in Finland, France and Spain. Meanwhile, Dell'Ariccia et al. (2008) start noticing that banking crises are usually followed by a decline in credit and growth and ask whether this is because crises tend to take place during economic downturns, or whether banking sector problems have independently negative effects on the economy. To answer this question, they study industrial sectors with differing financing needs. If banking crises have an exogenous detrimental effect on real activity, then sectors more dependent on external finance should perform relatively worse during banking crises. Their evidence supports this view. Additionally, they show that sectors predominantly populated by typically bank dependent small firms perform relatively worse during banking crises, while the differential effects across sectors are stronger in developing countries, in countries with less access to foreign finance, and where banking crises were more severe.

The ample evidence of a negative link between bank capital needs and bank lending suggests that the large accumulation of NPLs, by denting their capital, is pushing European banks to curtail their lending. For instance, studying the credit crunch in Europe, Wehinger (2014) recognizes one of the main factors in "the need for bank recapitalisation has reduced lending and further aggravated the crisis." Obviously, then, in this systemic crisis scenario, measures limiting the haircut on bank NPLs would be highly desirable to soften the credit crunch.

On 30 January 2017, Andrea Enria, EBA's chairman, called on Brussels policymakers to create a European Asset Management Company (we will call it Eurozone Bad Bank, EZ-BB) to buy billions of euros of toxic loans from lenders in order to break the vicious circle of falling profits, squeezed lending and weak economic growth. Enria noticed that the scale of the region's bad debt problem has become urgent and actionable as lenders now hold more than €1tn of toxic loans. He proposes that the EU should create a taxpayer-backed fund to buy bad loans from struggling lenders at their 'real economic value' – a level to be determined by the fund after doing due diligence on the loans. This would have the double benefit of increasing transparency around the true value of the vast piles of NPLs clogging up the balance sheets of many banks in the region and increase the size of the nascent market for such assets. The European Central Bank has also suggested that the creation of well-designed bad banks should be carefully considered as part of plans to shore up the Eurozone's financial stability.

Figure 1: Role of the EU Bad Bank as exemplified by EBA's Chairman Enria
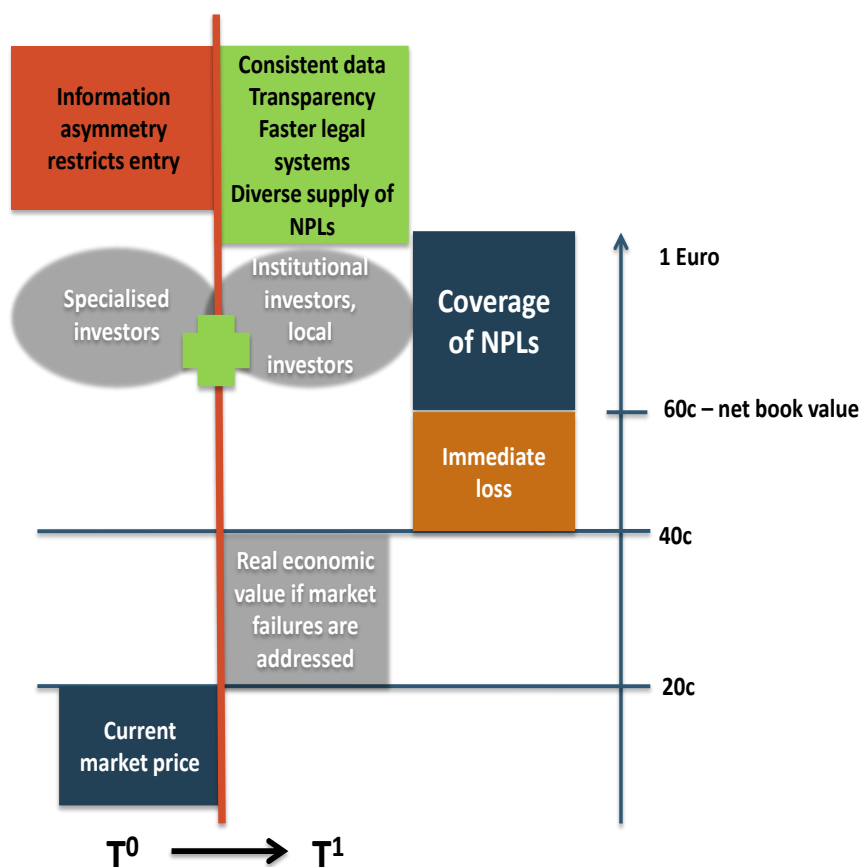
Source: Andrea Enria Speech to the ESM on 30th January 2017

In his speech to the ESM on the 30th of January 2017, Chairman Enria proposed a graph (reported here as Figure 1) to exemplify how the presence of EZ-BB would help address the current European NPL banking problem. In practice, the various market failures we outlined above (and that we will further address in section 4) are currently depressing the price of NPLs to 20c out of €1, well below the 40c that would be reached if market failures were removed. Enria argues that the unduly low NPL price – unduly high NPL haircut – depends on information asymmetry restricting entry as buyers only to specialist investors. He suggests that by releasing consistent data, increasing transparency, speeding up legal systems, and diversifying the NPL supply, EZ-BB could attract institutional investors and local investors and achieve an estimated doubling in price of NPL from 20c to 40c. Then, considering the average coverage ratio standing at 40c, recognition of NPLs would cost the average European bank an immediate loss of 20c, instead of the 40c loss suffered at the going (dysfunctional) market price. In essence, the EZ-BB would be the catalyst for attracting institutional and local investors in NPLs, which would complement specialized investors.

Mr. Enria specifies that banks would transfer some agreed segments of their NPLs to the EZ-BB at the real economic value:

i)   under EZ-BB due diligence and accompanied by full data sets available to potential investors;
ii)   in the first instance existing shareholders would be hit at any transfer price below book value;
iii)   the difference between current market prices (20c in the example) and real economic value (40c) could be the theoretical extent of state aid under precautionary recap, but in this interim period, financed by EZ-BB capital and private investors.

The EZ-BB would also set a timeline (e.g. 3 years) to sell the assets at the real economic value:

a) if that value were not achieved, the bank should take the full market price hit, and
b) a recapitalisation would be exercised by the national government as state aid accompanied by full conditionality.

Finally, Chairman Enria clarifies that five possible objections to the EZ-BB would be overcome:

1) existing shareholders are not safeguarded: they bear an immediate loss if the net book value is higher than the transfer price to the AMC (i.e. the real economic value) and are diluted if the eventual sale price is lower than the transfer price and a recapitalisation is necessary;
2) BRRD rules still apply under the EZ-BB, in particular the concept of precautionary recap;
3) State aid rules are enforced: if the clawback clause is activated because the eventual sale price is lower than the transfer price to the EZ-BB (i.e. the real economic value), the bank is recapitalised and State aid conditionality – including burden sharing – applies;
4) establishing EZ-BB implies no risk of losing any EU money: since if the eventual sale price is lower than the transfer price to EZ-BB (i.e. the real economic value) a clawback clause applies;
5) there is no burden sharing across EU countries: if the clawback clause is activated, it is the Member State which injects capital in the bank.

Independently, Emilios Avgouleas and Charles Goodhart (2016) have argued that there is a danger of over-reliance on bail-ins – the prior participation of bank creditors in meeting the costs of bank recapitalisation before any form of public contribution is made. In the authors' view, bail-in regimes will not remove the need for public injection of funds, unless the risk is idiosyncratic. This suggestion raises concerns for banks on the periphery of the euro-area, which present very high levels of non-performing assets, crippling credit growth and economic recovery. To avoid pushing Eurozone banks with high NPL levels into bail-in centred recapitalisations, Avgouleas and Goodhart (A&G) consider the benefits from, and legal obstacles to, the possible establishment of a euro-wide fund for NPLs that would enjoy an ESM guarantee. Long-term (capped) profit-loss sharing arrangements could bring the operation of the fund as close to a commercial operation as possible. Cleaning up bank balance sheets from NPLs would free up capital for new lending, boosting economic recovery in the periphery of the Eurozone.

The paper by Goodhart and Avgouleas seems to be in line with the EZ-BB proposed by Chairman Enria. Two differences can be identified, however. First, Avgouleas and Goodhart explicitly refer to an ESM guarantee supporting an EZ-BB, something Enria is silent about. Second, they suggest that institutions selling NPLs to EZ-BB should be subject to a structural conditionality, similar to that undertaken by the UK government in the context of the RBS rescue, while Mr. Enria doesn't mention such a possibility.

Overall, our arguments throughout this report support the need to establish EZ-BB. Regarding the possible involvement of the ESM as an external guarantor, that appears a natural evolution to us, given the ESM mandate extends to provide support to foster Eurozone banks stability, as exemplified through its backing of various macro adjustment programs and, especially, by the €100 billion it provided to recapitalise ailing banks in Spain.

Concerning the structural conditionality proviso for banks transferring NPLs to the EZ-BB, we concur it could help tackle fears of reinforcing big banks and the Too-Big-To-Fail subsidy, while potentially opening up Eurozone banking markets to new contestants/entrants.

4. A CASE FOR THE EUROZONE BAD BANK: THEORETICAL JUSTIFICATIONS

As argued above, the issue of carving out legacy assets towards the successful restructuring of a bank hinges vitally on the valuation of those assets. Specifically, we consider two extreme situations. In an orderly situation, we are dealing with the crisis of a single non-systemic bank, and its carved legacy assets will be valued at their fair (fundamental) value. That fair value calculation is based on historic recovery rates of bank NPLs in that country. But when the restructuring involves a systemic bank and/or materializes in a situation of systemic bank distress in the country, it is almost certain that the carved legacy assets of a bank under restructuring will be valued at a large discount under their fundamental value. Such discount depends on the fact that bank NPLs in that country, at that time, have become highly illiquid assets. Since there are few potential buyers, market participants will develop expectations that the price of the carved legacy assets will be much lower than what historic recovery rates on NPLs would imply. In turn, if there is no backstop supporting the price of the carved legacy assets close to their fair value, those assets will be sold in a fire-sale and the expectations of market participants will be confirmed. In other words, lacking a backstop, the negative expectations of the market participants will become a self-fulfilling prophecy. Thus, the creation of a Eurozone level Bad Bank (EZ-BB) – or equivalent mechanism – would make a difference and avoid two undesirable outcomes:

The first undesirable outcome is that some banks are forced into undeserved restructuring. A bank loaded with a certain amount of NPLs, which would still be sound enough if its NPLs were evaluated at their fair value, might be triggered into undeserved restructuring, if its NPLs are heavily discounted along negative market expectations. Instead, the presence of the EZ-BB would provide a backstop to fair value of this bank's NPLs and prevent it enduring unjustified restructuring. The second undesirable outcome regards a bank that effectively needs to be restructured, even when its NPLs are valued correctly at their fair value. In this case, restructuring the bank is appropriate. However, if the carved out legacy assets are valued with the heavy discount of illiquid markets, the haircut will be exaggerated with respect to fundamentals. In turn, investors who then buy those assets at extremely favourable prices will later on be able to reap extraordinary profits when either reselling the assets over time, or waiting for the historic recovery rates to kick in. In this case, the presence of the EZ-BB would also provide a backstop and prevent deserved restructurings from ending up unduly penalizing distressed banks, while generating huge profits for private investors. In other words, in both cases – avoiding undeserved bank restructurings and avoiding excessive haircuts on the carved legacy assets of appropriately restructured banks – the presence of the EZ-BB helps select the "good" equilibrium where, in a multiple equilibria set-up, the "bad" equilibrium would instead be selected by the market.

Figure 2: Bank restructuring in a non-systemic crisis with fundamental NPL haircut
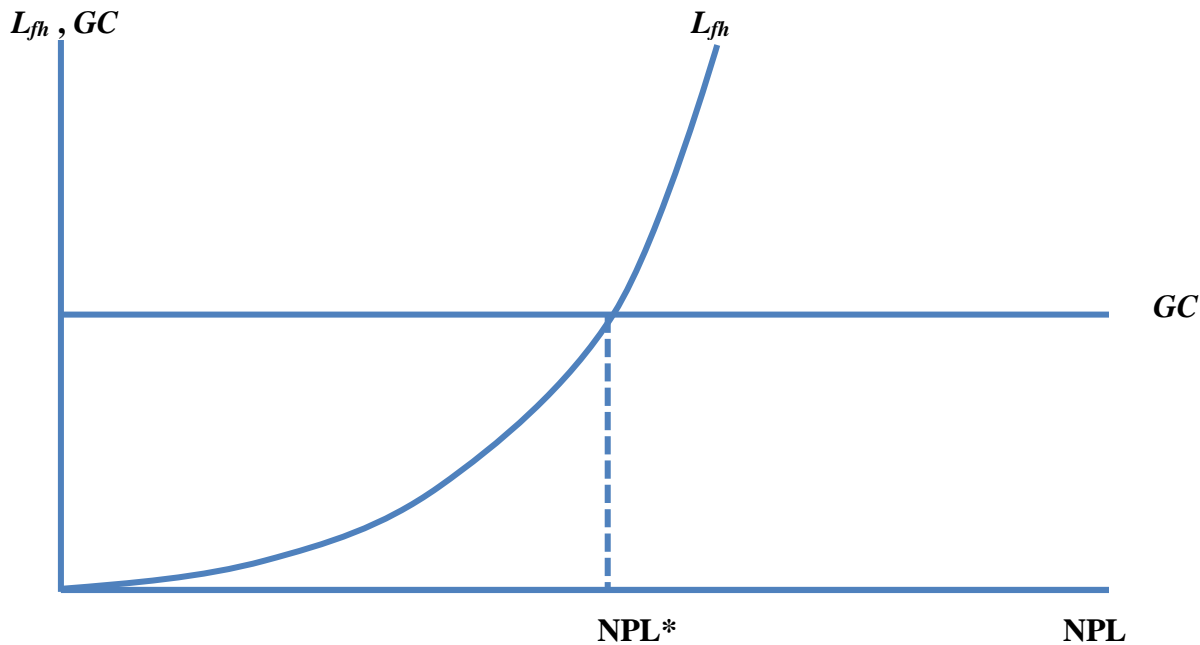
The reasoning above may be represented though a model adjusted from the one presented by Paul De Grauwe (2016) in his Chapter 5 "The Fragility of Incomplete Monetary Unions". In essence, De Grauwe proposes adjusting the second-generation model of exchange rate crisis to deal with the issue of the sovereign crises within a Monetary Union which is incomplete, in the sense that it lacks a Budgetary Union. De Grauwe's argument runs as follows, starting from exchange rate crises. Over time, fixed exchange rate regimes (incomplete Monetary Unions) tend to disintegrate after speculative crises. The fundamental reasons for the fragility of these regimes are the lack of credibility of the fixed exchange rate commitment and the international reserve (liquidity) constraint. On one hand, the "first generation model" of exchange crises predicts that these crises occur because the authorities follow domestic policies that are inconsistent with the fixing of the exchange rate. On the other hand, in the "second generation model" more than one equilibrium is possible, whereby the choice of the equilibrium depends on the expectations of speculators. In this model, speculation is self-fulfilling and can bring down the fixed exchange rate, even if the authorities behave well. At this point, De Grauwe argues that the Eurozone is an incomplete monetary union and is also fragile, much like a fixed exchange rate system. Thereby, in an incomplete monetary union like the Eurozone, multiple equilibria are possible. These can arise in a self-fulfilling way and depend only on the expectations (beliefs) of investors. These multiple equilibria arise because of the absence of a central bank willing to provide unlimited amounts of liquidity during speculative crises. Some countries can be pushed into a bad equilibrium, characterized by unsustainably high interest rates, recession and budgetary austerity. Countries that are pushed into a bad equilibrium also experience a banking crisis. Countries can also be pushed into a good equilibrium characterized by low interest rates, declining budget deficits and a boom in economic activity. These multiple equilibria arise because of a coordination failure in the market system.

Figure 3: Bank restructuring in a systemic crisis with fundamental and discount NPL haircuts
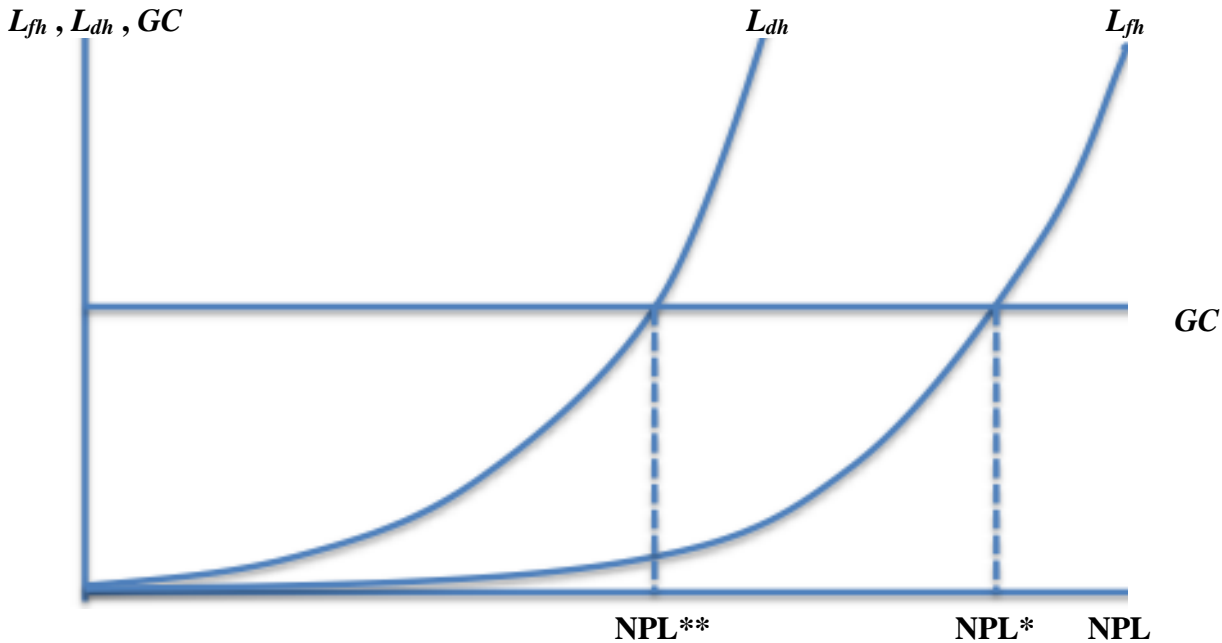
We will now adjust De Grauwe's model, taking it to the case of a single bank's restructuring, where the bank is either systemic itself, or its restructuring has to be considered in a situation of systemic crisis of the national banking system that the bank belongs to. But, before doing that, let us consider the simpler case in which the decision whether to restructure the banks is taken in a normal situation – i.e., the bank is non-systemic and its national banking system is not in a systemic crisis. We define a Loss curve (L_{fh}) that is an increasing function of the bank's NPLs, where the NPLs are valued at the 'fair' haircut. We also define the Going-Concern line (GC) representing the value of the bank as a going concern – i.e. the bank's goodwill due to its good reputation, trained workforce, established and successful procedures, tested systems, operational equipment, and necessary licenses and permits – which will be horizontal since it doesn't change with the bank's NPL. Figure 2 puts together L_{fh} and GC. Since L_{fh} is an increasing function of the bank's NPL (starting from 0 when NPL=0) while GC stays constant, as we let NPL increase there will be a unique point at which L_{fh} crosses GC from below. Let's denote that point as NPL*. For any NPL value below NPL* the losses are lower than GC, implying that the bank should not be restructured, since its value as a going concern is more than the losses it is incurring. When NPL exactly equals NPL* we are in a situation of indifference, since the losses are just equal to GC. For any NPL greater than NPL* the bank should be restructured. Here, there is only one equilibrium.

Let us now consider what happens in a systemic crisis, when we also allow for a heavy 'discount' haircut of the NPL, as represented along a second a Loss curve (L_{dh}). In Figure 3, for any NPL level L_{dh} lies to the left of L_{fh}. Now, depending on whether the fair discount applies – in which case we are along L_{fh} – or the heavy discount applies – in which case we are along L_{dh} – we will have two different thresholds: NPL*, identified by L_{fh} crossing GC, lies to the right while NPL**, identified by L_{dh} crossing GC, lies to the left. At one extreme, any bank whose NPL is below NPL** will not undergo restructuring. At the other extreme, any bank whose NPL is above NPL* will need restructuring. However, for all the banks whose NPL is above NPL** but below NPL* there is no need of restructuring applying the fair haircut, whereas they will have to undergo restructuring if the heavy discount haircut is applied. In other words, for all these banks there are two possible equilibria. In the good equilibrium they will not be restructured, whereas they will need restructuring if the bad equilibrium prevails. This shows how the EZ-BB would greatly improve the outcome. Since the EZ-BB would apply the fair haircut and would be willing to buy unlimited amounts of carved legacy assets, its presence would provide unlimited liquidity and a backstop able to anchor the market to the good equilibrium. In practice, analogously to what happened with the Outright Monetary

Transactions (OMT), it might suffice to announce the existence of the EZ-BB, in order to rule out the bad equilibrium. Indeed, even though the OMT was never used, its very announcement was enough for the market to rule out the bad equilibrium triggering undeserved sovereign debt crises of euro member countries. In analogy, here, all the banks with NPL** < NPL < NPL* would be spared unneeded restructuring, with the associated costs for those banks and with the possible negative spillovers to other banks from the same country.

Furthermore, the presence of the EZ-BB would also generate positive effects for those banks that need restructuring when evaluated with the fair haircut. These positive effects would descend from the fact that, in any case, the EZ-BB would anchor the solution to the good equilibrium and allow these banks' carved legacy assets to be valued at much higher prices than in cases where the bad equilibrium was to prevail. The only damage would be for speculators – such as vulture funds – who would no longer be able to make extraordinary profits by exploiting the fire-sale of the carved legacy assets of European banks. However, in our opinion, those exaggerated profits were the signals of a malfunctioning market that the EZ-BB would help to solve.

5. ASSESSING THE RISK AND PERFORMANCE OF RECAPITALISED STATE AIDED BANKS

In this section, we consider the business models, risk, response to regulation and performance of banks that have received state-aid[15] during the two crises periods, namely the Great Financial Crisis and the euro sovereign crisis. The risk, regulatory and performance indicators were defined and computed in Ayadi et al, (2016). Furthermore, we focus on state aided banks which benefitted from capital support, including those that benefitted from asset protection schemes (APS) and under an Asset Management Company (AMC) program.

Our sub-sample of state-aided banks that benefitted from capital support comprises 38 banks[16]. The period of observation ranges from 2005 to 2015, resulting in 374 bank-year observations. The overall sample, the definition of bank business models and the list of the state aided banks are explained in Annex 2.

Although together they represent just under 16% of the general sample of banks of Ayadi et al[17] (2016) (in terms of number of observations), the wholesale business model and investment business model are underrepresented in the sub-sample of state-aided banks (10.2% of the 374 bank-year observations). When restricted to the observations of the year before capital support and the final year (2015 in most cases) of the database, there are no more observations assuming the wholesale business model. The majority of the banks were exhibiting the retail diversified type 2 business model. These banks are generally active in retail and investment banking activities and are predominantly funded by the market[18].

To assess the risk, we use the Z-score that is a balance sheet based indicator providing an estimate of a bank's distance to default and the loan loss provisions indicator.

Over the investigated period, state-aided banks have increased their distance to default, by 75% or more, according to the three central tendency measures reported in Table 1. Comparable evolutions have occurred in the general sample and it can be said that, generally, capital support and restructuring measures have allowed state-aided banks to catch up with their other peers, as capital adequacy regulation has been tightened in the aftermath of the financial crisis of 2007-2009. Loan loss provisions (as a percentage of gross customer loans) of state-aided banks by recapitalisation, reported in Table 2, have tended to be in the ranges observed for the full sample, which is an average of 0.5%. The relatively high values for the unweighted means of the focused retail and the diversified retail type 1 banks in 2015 is an indication of persistent outlying observations, and the incapacity of a number of banks to reduce the legacy assets more effectively.

Considering the type of state aid measure, it is notable that the average distance to default of banks that only received capital injections is, in the year prior to the aid measure, about half of those that benefitted from APS, or the transfer of their troubled assets to an AMC. This has narrowed only slightly in the latest Z-score averages, suggesting a modest improvement in the riskiness of the group of state-aided banks. Counter to these observations, the other indicator of risk, the average provision for loan losses, point to lower risks for the sub-group of capital-supported banks, among their state-aided peers (Table 2), regardless of the observation period (before or after the state rescue). Yet, banks that are under APS-AMC programmes seem to have more problematic loans in their balance sheets, compared to average. Further monitoring of these banks' risk indicators is needed to assess

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[15] Using the updated database of 2016 of the Banking Business Models Monitor for Europe 2015 (BBMM, see (Ayadi et al, 2016)). More research by the team is ongoing on the assessment of risk and performance of the complete list of cases of state aided banks in Europe.

[16] This list is not comprehensive. Further research is being undertaken to provide a more comprehensive view on risk, response to regulation and performance of all cases of state aided banks in Europe.

[17] See Annex 2 Box 1.

[18] See Ayadi's definition of a business model in Annex 2 box 1.

whether APS-AMC drives the risk profiles of this category of state aided banks towards a viable outcome.

Table 1: Evolution of the Z-score of the state aided banks

Business model/Type State Aid	Year before intervention				2015 or most recent year available			
	No. Obs	Mean	Weighted Mean	Median	No. Obs	Mean	Weighted Mean	Median
Focused retail	7	1.71	1.63	1.68	5	11.73	19.36	10.82
Diversified retail type 1	9	10.02	6.50	7.40	16	8.80	10.58	6.74
Diversified retail type 2	18	7.49	11.71	6.15	14	17.69	17.60	14.37
Investment	3	11.59	15.59	9.62	2	15.53	27.76	15.53
Recapitalisation only	18	4.87	7.00	4.76	18	11.34	12.50	8.13
APS-AMC	19	9.69	16.61	7.92	19	14.42	23.96	14.44
All	**37**	**7.35**	**10.70**	**5.73**	**37**	**12.92**	**17.98**	**10.77**

Note: For the weighted mean, the weights are the variable 'total assets'.

Table 2: Evolution of the Loan loss provisions of state aided banks

Business model/Type State Aid	Year before intervention				2015 or most recent year available			
	No. Obs	Mean	Weighted Mean	Median	No. Obs	Mean	Weighted Mean	Median
Focused retail	7	0.92%	0.65%	0.72%	5	1.30%	0.52%	0.27%
Diversified retail type 1	10	1.03%	0.65%	0.34%	17	0.98%	0.44%	0.57%
Diversified retail type 2	17	0.66%	0.39%	0.56%	14	0.46%	0.26%	0.22%
Investment	3	0.47%	0.38%	0.34%	2	3.42%	0.97%	3.42%
Recapitalisation only	18	0.70%	0.26%	0.27%	19	1.14%	0.34%	0.31%
APS-AMC	19	0.88%	0.81%	0.58%	19	0.78%	0.58%	0.53%
All	**37**	**0.79%**	**0.47%**	**0.54%**	**38**	**0.96%**	**0.45%**	**0.50%**

Note: For the weighted mean, the weights are the variable 'gross customer loans'.

In terms of the response to regulation, all the three central tendency statistics show a decrease of the risk-weighted assets between the pre-rescue years and 2015 (Table 3). This trend is typical in the European banking sector (see Ayadi et al, 2016, p. 65).

Owing to the large capital injection of governments into the state-aided banks under study, it is expected that their capital position will improve significantly, at least in the early years after the state interventions. This is evident in the Tier 1 capital ratio, irrespective of the central tendency statistics (mean, weighted mean, median) reported in Table 4. As far as the type of the state-aid is concerned, the gap in the central tendency statistics of the two sub-groups is more marked in favour of recapitalised banks in the most recent years, subsequent to state rescue.

Table 3: Evolution of the RWA of state aided banks

Business model/Type State Aid	Year before intervention				2015 or most recent year available			
	No. Obs	Mean	Weighted Mean	Median	No. Obs	Mean	Weighted Mean	Median
Focused retail	7	66.60%	63.90%	64.36%	5	48.27%	36.24%	56.08%
Diversified retail type 1	10	50.59%	39.44%	54.99%	17	47.22%	38.22%	45.68%
Diversified retail type 2	16	50.99%	43.25%	50.08%	14	39.29%	30.88%	32.22%
Investment	3	31.88%	31.49%	31.89%	2	43.57%	32.84%	43.57%
Recapitalisation only	18	51.05%	38.01%	48.85%	19	43.83%	32.25%	34.61%
APS-AMC	18	53.59%	43.30%	56.95%	19	44.66%	35.81%	45.68%
All	**36**	**52.32%**	**39.99%**	**53.83%**	**38**	**44.24%**	**33.95%**	**39.60%**

Note: For the weighted mean, the weights are the variable 'total assets'.

Table 4: Evolution of the Tier 1 capital ratios of state aided banks

Business model/Type State Aid	Year before intervention				2015 or most recent year available			
	No. Obs	Mean	Weighted Mean	Median	No. Obs	Mean	Weighted Mean	Median
Focused retail	7	8.97%	9.24%	8.59%	5	15.32%	13.66%	13.43%
Diversified retail type 1	10	8.36%	7.34%	8.01%	17	14.51%	15.57%	13.89%
Diversified retail type 2	16	7.77%	7.73%	7.96%	14	18.14%	15.13%	15.97%
Investment	3	8.73%	8.07%	9.13%	2	13.36%	12.41%	13.36%
Recapitalisation only	18	8.86%	7.88%	8.35%	19	17.71%	15.95%	16.19%
APS-AMC	18	7.63%	7.56%	7.94%	19	14.07%	13.14%	13.25%
All	**36**	**8.25%**	**7.75%**	**8.04%**	**38**	**15.89%**	**14.54%**	**14.67%**

Note: For the weighted mean, the weights are the variable 'risk-weighted assets'.

Also, the decrease in leverage (which is the reciprocal of the tangible common equity ratio) has been one of the important points of recent regulatory initiatives. A target for this ratio has not yet been set in Europe. In the Basel framework, a 3% leverage ratio is considered good enough for non-systemic banks. Values displayed on table 5 (right) for the leverage ratio have greatly improved, compared to the pre-intervention period (left), in particular for the diversified retail type 1. Also, recapitalised banks have clearly improved their leverage, compared to their situation pre-intervention. They have even surpassed their peers in the sub-group that benefitted from asset relief measures.

Table 5: Evolution of the tangible common equity ratio of state aided banks

Business model/Type State Aid	Year before intervention				2015 or most recent year available			
	No. Obs	Mean	Weighted Mean	Median	No. Obs	Mean	Weighted Mean	Median
Focused retail	7	4.14%	3.87%	4.39%	5	6.26%	4.57%	5.12%
Diversified retail type 1	10	2.58%	0.47%	2.42%	17	6.25%	5.21%	5.85%
Diversified retail type 2	18	2.79%	2.44%	2.70%	14	9.33%	4.49%	4.62%
Investment	3	2.16%	2.11%	2.09%	2	5.01%	3.92%	5.01%
Recapitalisation only	19	3.41%	1.60%	3.44%	19	9.37%	4.82%	5.19%
APS-AMC	19	2.45%	2.21%	2.65%	19	5.27%	4.32%	5.12%
All	**38**	**2.93%**	**1.83%**	**2.74%**	**38**	**7.32%**	**4.58%**	**5.16%**

Note: For the weighted mean, the weights are the variable 'total tangible equity'.

Finally, when assessing the overall performance indicators, returns on assets have deteriorated across all business models of state-aided banks, except for diversified retail type 2 (Table 6). This can signal trouble for those banks, but it can also be indicative of the general economic situation. Indeed, this situation is also not very far from the findings in the full sample for 2015 (not reported here), with weighted averages only reaching 0.5% for the diversified retail type 2 banks. The returns on equity have also decreased in the sub-sample of state-aided banks, in line with their returns in assets. This is to be expected, since capital support by governments has increased the capital of these banks to at least align them with ever increasing regulatory requirements. Negative returns on equity for diversified retail type 1 banks continue to exert a downward effect on the weighted mean of the returns on equity. Our larger sample of banks also features depressed values of the returns on equity for the diversified retail type 1 in 2015, driven by nationalised banks. This is an indication that state-aided banks are struggling more than their peers in the industry. In particular, the performance measures by type of state rescue single out the sub-group of recapitalised banks, as their central tendency measures for both ROA and ROE have worsened post-intervention.

Table 6: Evolution of the ROA of state aided banks

Business model/Type State Aid	Year before intervention				2015 or most recent year available			
	No. Obs	Mean	Weighted Mean	Median	No. Obs	Mean	Weighted Mean	Median
Focused retail	7	0.36%	0.86%	0.58%	5	-0.24%	0.39%	0.38%
Diversified retail type 1	10	-0.36%	0.24%	0.30%	17	0.30%	0.14%	0.58%
Diversified retail type 2	18	0.10%	0.28%	0.13%	14	0.55%	0.38%	0.37%
Investment	3	0.28%	0.47%	0.48%	2	-1.35%	0.32%	-1.35%
Recapitalisation only	19	0.21%	0.48%	0.31%	19	0.00%	0.14%	0.23%
APS-AMC	19	-0.13%	0.08%	0.14%	19	0.47%	0.49%	0.58%
All	**38**	**0.04%**	**0.33%**	**0.18%**	**38**	**0.23%**	**0.31%**	**0.45%**

Note: For the weighted mean, the weights are the variable 'total assets'.

Table 7: Evolution of the ROE of state aided banks

Business model/Type State Aid	Year before intervention				2015 or most recent year available			
	No. Obs	Mean	Weighted Mean	Median	No. Obs	Mean	Weighted Mean	Median
Focused retail	7	6.20%	14.71%	10.07%	5	2.55%	7.95%	6.05%
Diversified retail type 1	10	-18.52%	5.02%	7.26%	17	-16.29%	2.13%	7.36%
Diversified retail type 2	18	4.07%	8.20%	4.12%	14	7.24%	7.16%	6.73%
Investment	3	8.24%	14.76%	17.64%	2	-13.08%	6.18%	-13.08%
Recapitalisation only	19	6.98%	12.80%	10.07%	19	-17.67%	2.48%	3.89%
APS-AMC	19	-9.28%	2.08%	5.19%	19	7.72%	8.64%	10.37%
All	**38**	**-1.15%**	**8.52%**	**6.22%**	**38**	**-4.97%**	**5.41%**	**6.70%**

Note: For the weighted mean, the weights are the variable 'total equity'.

This preliminary assessment[19] shows that the state-aided banks benefiting from recapitalisation measures, including APS-AMC, and having to comply with restructuring requirements under the state aid cases, are seemingly slowly returning to soundness (as per the risk and response to regulation chosen indicators) and yet some are struggling to reach healthy performance levels, as is the case for the European banking sector. A systematic monitoring of these banks is necessary to evaluate the effectiveness of the APS-AMC programmes.

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[19] These preliminary results are confirmed by a brief by DG Competition : see : http://ec.europa.eu/competition/publications/csb/csb2015_001_en.pdf
A more comprehensive assessment on all cases of state-aided banks in Europe is under way.

6. CONCLUSIONS

We have argued that dealing effectively and efficiently with legacy assets carved out from banks under restructuring may be achieved via private sector or state supported initiatives, depending on the situation at hand. While in the case of non-systemic bank restructuring, private sector initiatives might have proven successful, state support is needed when restructurings have to be dealt with in systemic crises.

Historical experience – briefly analysed in this paper – suggests the need for a centralised solution, or a comprehensive programme to deal with legacy assets when the crises are systemic. This is evidenced by the failures in Japan in the 1990s (the 'lost decade'), and the successes of Sweden in the 1990s, Spain more recently (with the creation of FROB and SAREB and the provision of European funds), and the US, both during S&L episode that led to the establishment of RTC and during the global financial crisis, with the creation of TARP and the adoption of stringent stress tests.

Considering that the banking crises throughout Europe have been prevalently systemic in nature, we have summarized in this paper the basics of credit channel literature and presented a simple model, describing how bank restructurings in systemic crises may feature a 'bad' equilibrium (triggering excessive restructurings and haircuts) along with a 'good' equilibrium (with appropriate restructurings and fair haircuts).

Drawing on historical experience, theory and empirical evidence, we support the proposal – already put forward by some scholars and policy-makers – to establish a Eurozone level Bad Bank (EZ-BB).

In our view, introducing EZ-BB would provide six main benefits:
(1) Having a clear view on the magnitude of the legacy assets problem in the Eurozone;
(2) avoiding some false positives (i.e., some banks that would otherwise be forced into resolution because of excessive fire-sale haircuts induced by speculation, would be spared resolution and this would reduce the cost of depleting goodwill in EZ banking);
(3) maximizing the recovery rate on legacy assets (a careful, long-term-oriented and broad-shouldered EZ-BB would minimize the risk of devaluing the assets via forced fire sales);
(4) by accomplishing (2) and (3), the EZ-BB would also act as a macro-economic stabilizer, since it would reduce procyclicality in banking and the credit supply to the economy;
(5) EZ-BB would also greatly promote transparency in a market segment that tends to suffer extreme opaqueness and where it is difficult to tell whether opaqueness is just a fundamental variable of the problem, or whether it is artificially inflated by speculators who will ultimately benefit from fire sales of the disposed assets;
(6) finally, but no less important, the EZ-BB will promote accountability, since its profits (that are likely to be quite high based on past historical records of similar experiences throughout the world) would be channelled back to the European people, possibly helping to fill the so far not totally funded Resolution Fund, which would avoid relying on taxpayers money in the event of a major shock occurrence.

We have provided an up-to-date preliminary assessment of the risk, response to regulation and performance of 38 banks that have received state aid in several EU Member States during the twin financial and sovereign debt crises, via recapitalisation and restructuring requirements, with an emphasis on APS-AMC programmes. Our preliminary results show that on average these banks have managed to reduce their risk, return to soundness and slowly move towards healthier – although relatively low levels – of performance, which is part of a generalised problem within the European banking sector. State-aided banks benefitting from the APS-AMC programmes, seem to have a higher risk profile, as compared to their peers and, hence, a systematic monitoring of this group is necessary. Overall, more research is needed to understand the full set of reasons behind the return to viability of state-aided banks.

REFERENCES

- Avgouleas, E. and Goodhart, C. (2016) An Anatomy of Bank Bail-ins. Why the Eurozone Needs a Fiscal Backstop for the Banking Sector, European Economy: Banks, Regulation, and the Real Sector 2.

- Ayadi et al (2016) Banking Business Models Monitor for Europe 2015, IRCCF, HEC Montreal, Montreal.

- Badarau-Semenescu, C. and Levieuge, G. (2010) Assessing the potential strength of a bank capital channel in Europe: a principal component analysis, The Review of Finance and Banking 2.1.

- Berger, A.N. and Udell, G.F. (1994) Did Risk-Based Capital Allocate Bank Credit and Cause a 'Credit Crunch' in the U.S.?, Journal of Money, Credit, and Banking 26, 585-628.

- Bernanke, B.S. (1983) Non-Monetary Effects of the Financial Crisis in the Propagation of the Great Depression, American Economic Review, vol. 73, 257–76.

- Bernanke, B.S. and Gertler, M. (1995) Inside the Black Box: The Credit Channel of Monetary Policy Transmission, Journal of Economic Perspectives, vol. 9, 27–48.

- Bholat, D.M, Lastra R.M., Rosa, Markose, S.M., Miglionico, A. and Sen, K., Non-Performing Loans: Regulatory and Accounting Treatments of Assets (April 22, 2016). Bank of England Working Paper No. 594. Available at SSRN: https://ssrn.com/abstract=2776586

- Carlson, M., Shan, H. and Warusawitharana M. (2013) Capital ratios and bank lending: A matched bank approach, Journal of Financial Intermediation 22.4, 663-687.

- Chiuri, M.C., Ferri, G. and Majnoni, G. (2002) The macro-economic impact of bank capital requirements in emerging economies: past evidence to assess the future, Journal of Banking & Finance 26.5, 881-904.

- Council of Economic Advisors (1991) Economic Report of the President, Washington, D.C.

- D'Apice, V., Ferri, G. (2010) Financial Instability. Toolkit for Interpreting Boom and Bust Cycles, Palgrave McMillan.

- De Grauwe, P. (2016) Economics of Monetary Union, Oxford University Press, 11th Edition.

- Dell'Ariccia, G., Detragiache, E. and Rajan, R. (2008) The real effect of banking crises, Journal of Financial Intermediation 17.1, 89-112.

- Enria, A. (2017) EU needs to create 'bad bank' for €1tn toxic loan, The Financial Times, January 30th.

- European Banking Authority (2016) Dynamics and drivers of non-performing exposures in the EU banking sector, 22 July, EBA, London

- Gambacorta, L. and Mistrulli, P.E. (2004) Does bank capital affect lending behavior?, Journal of Financial intermediation 13.4, 436-457.

- Gandrud, C. and Hallerberg, M. (2014) Bad banks in the EU: The impact of Eurostat rules, Bruegel Working Paper No. 2014/15.

- Greenwald, B., Stiglitz, J.E. and Weiss, A. (1984) Information Imperfections in the Capital Market and Macro-economic Fluctuations, American Economic Review, vol. 74, 194–9.

- Landier, A. and Ueda, K. (2009) The economics of bank restructuring: Understanding the options. https://papers.ssrn.com/sol3/papers2.cfm?abstract_id=1415033.

- Lastra, R. (1996) Central Banking and Banking Regulation, Financial Markets Group of the London School of Economics (LSE).

- Medina Cas, S., Peresa, I. (2016) What makes a good 'bad bank'? The Irish, Spanish and German Experience, European Commission Discussion Paper 036, September.

- Meh, C.A. and Moran, K. (2010) The role of bank capital in the propagation of shocks, Journal of Economic Dynamics and Control 34.3, 555-576.

- Mishkin, F.S. (1999) Global Financial Instability: Framework, Events, Issues, Journal of Economic Perspectives, vol. 13, no. 4, 3–20.

- Peek, J. and Rosengren, E. (2000) Collateral Damage: Effects of the Japanese Bank Crisis on Real Activity in the United States, The American Economic Review, Vol. 90, No. 1., 30-45.

- Peek, J. and Rosengren, E. (1995) The Capital Crunch: Neither a Borrower nor a Lender Be, Journal of Money, Credit and Banking, 625-638.

- Stiglitz, J.E. and Weiss, A.M. (1981) Credit Rationing in Markets with Imperfect Information, American Economic Review, vol. 71, 393–410.

- Van den Heuvel, S.J. (2008) The welfare cost of bank capital requirements, Journal of Monetary Economics, 55.2, 298-320.

- Wehinger, G. (2014) SMEs and the credit crunch, OECD Journal: Financial Market Trends 2013.2, 115-148.

ANNEX 1: STATE AID IN THE EUROPEAN BANKING SECTOR (2008-2014)

Type of State aid	Committed aid (in EUR billion, % of EU 2014 GDP)	Effectively used (in EUR billion, % of EU 2014 GDP)	Effectively used as share of committed aid (%)
Capital measures (cumulative from 2008 to 2014)			
Re-capitalisation	802.1 (5.75 %)	453.3 (3.25 %)	56.51 %
Support for bad asset schemes	603.3 (4.32 %)	188.5 (1.35 %)	31.24 %
Liquidity measures (cumulative from 2008 to 2014)			
Debt guarantee schemes	3,249.0 (23.28 %)	1188.1 (8.51 %)	22.92 %
Liquidity support other than guarantees	229.7 (1.65 %)	105.0 (0.75 %)	32.41 %
Total	4,884.1 (34.99 %)	1,934.9 (13.86 %)	39.61 %

Note: The figures do not include the revenues obtained by governments from these support schemes.

Source: European Commission (2017),
http://ec.europa.eu/competition/state_aid/scoreboard/financial_economic_crisis_aid_en.html.

The EU Member States committed from 2008 up to 2014 in total EUR 4.9 trillion (35 % of EU GDP in 2014), of which EUR 1.9 trillion (13.9 % of GDP) has been effectively used.

ANNEX 2: SAMPLE, DEFINITION OF BANK BUSINESS MODELS AND LIST OF STATE-AIDED BANKS

Table 8: Business models of the subsample of state aided banks

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Box 1: Sample and definition of the bank business model in Europe.

The update of the database is comprised of up to 19,421 bank-year observations of 3,278 banks, covering more than 95% of assets of the EU plus EFTA countries from 2005 to 2015. The BBMM categorises the European banking industry, following a novel behavioural approach that defines banks by the interaction between their funding (liability) and activity (assets) profiles and uses a state-of-the-art clustering methodology. The analysis results in five business models which can be summarised as follows: retail focused, retail diversified (type 1), retail diversified (type 2), wholesale and investment.

The **focused retail banks** provide traditional services, such as customer loans, and are funded by customer deposits. This is also reflected in their income, which consists mostly of net interest income and commission and fees, while trading income and other income are only minor components. The share of banks that were identified as focused retail remained similar during the crises. These banks have an ownership structure that is slightly skewed towards stakeholder value banks (cooperative and savings banks).

Diversified retail (type 1) banks combine lending to customers with a moderate percentage of trading activities (i.e. 31% on average) and they primarily use customer deposits. These banks are modest in size. The ownership structure is slightly skewed towards stakeholder value banks.

Diversified retail (type 2) banks' activities consist primarily of lending to customers mainly using debt liabilities and customer deposits. Notwithstanding that the largest share of assets are allocated to customer loans, this category of bank obtained twice as much from trading activities than the other retail-oriented banks. They are relatively large in size and internationally active, compared to the other retail-oriented banks.

Wholesale banks engage in interbank lending and borrowing and are mainly categorised as shareholder value banks. However, these also include the central institutions of cooperative and savings banks that provide liquidity and other services to local banks, as well as public banks. They are among the smallest and most domestically oriented group.

Investment-oriented banks engage in trading activities, while relying on debt securities and derivatives for funding. They are the smallest in number, but the largest in size and the most internationally oriented banks among the five models.

Ayadi et al, (2016).

Table 9: Business models of the subsample of state aided banks

Business models	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total subsample of aided banks	Total sample
Focused retail	2	2	3	4	4	4	7	4	4	4	5	43	6512
Diversified retail type 1	5	6	8	8	10	9	10	18	18	18	15	125	7333
Diversified retail type 2	14	19	18	17	18	19	17	9	13	11	13	168	2703
Wholesale	2	1	1	0	0	0	0	0	0	0	0	4	1409
Investment	5	3	2	3	2	3	3	6	2	3	2	34	1464
Total	**28**	**31**	**32**	**32**	**34**	**35**	**37**	**37**	**37**	**36**	**35**	**374**	**19421**

Overall the most popular business model among aided banks is the diversified retail type 2 (44,9%).

Table 10: Migrations (changeover in business models) of state aided banks

	Business models	2015 or most recent year available				
		Focused retail	Diversified retail type 1	Diversified retail type 2	Investment	All
Year before inter-vention	Focused retail	28.57%	57.14%	0.00%	14.29%	100%
		2	*4*	*0*	*1*	*7*
	Diversified retail type 1	0.00%	80.00%	20.00%	0.00%	100%
		0	*8*	*2*	*0*	*10*
	Diversified retail type 2	16.67%	27.78%	55.56%	0.00%	100%
		3	*5*	*10*	*0*	*18*
	Investment	0.00%	0.00%	66.67%	33.33%	100%
		0	*0*	*2*	*1*	*3*
	All	*5*	*17*	*14*	*2*	*38*

Note: Only two observations before intervention (out of 38) and 3 observations after state intervention (out of 38) are of the investment oriented business model.

The bulk of the sub-sample of state-aided banks is of one of the three retail-oriented business models. The most stable one in the sub-sample is the diversified retail type 1 (80%). Its remaining 20% that have changed business model, moved to the diversified retail type 2. In turn, more of the market-funded diversified retail type 2 state-aided banks have restructured to a retail funded diversified type 1 or focused business model. Also, 4 out of the 7 banks that were pre-state aid of the focused retail type, transitioned to a more diversified business model, the retail type 1, which is mainly customer-funded.

Table 11: Summary list of banks in each of the two types of state aids considered in the analysis

Recapitalisation only	Alpha Bank, Banco Grupo Cajatres, Banco Mare Nostrum, Bankia, Bayerische Landesbank, Belfius Banque SA, Commerzbank AG, Dexia SA, FIH, Hypo Real Estate Holding, ING Bank, KBC Group, Landesbank Baden-Württemberg, Liberbank, Lloyds Banking Group,Nova Kreditna banka Maribor, Nova Ljubljanska Banka, Piraeus Bank, Royal Bank of Scotland Group
Asset Protection Scheme or transfer of legacy assets to an Asset Management Company (APS-AMC)	ABN AMRO Group Aareal Bank Allied Irish Banks BNP Paribas Banca Monte dei Paschi, Banco BPI, Bank of Valletta, Caixa Geral de Depósitos, Erste Group Bank, Governor and Company of the Bank of Ireland, Groupe BPCE, Hypo Tirol Bank, NORD/LB Girozentrale, National Bank of Greece, Raiffeisen Zentralbank Österreich, SNS Bank, Sparkasse KölnBonn, TT Hellenic Postbank

Note: This is the result of the preliminary qualitative assessment, based on reviewing the state aid cases involving these banks. Any error remains the responsibility of the authors.

List of state-aided banks in our sub-sample
Code for business models:
F (focused retail), D1 (diversified retail type 1), D2 (diversified retail type 2), I (Investment)

Institution name	State aid case	Year of first capital support	Ownership structure in 2014	Business Model in year before capital support	Most recent year of data	Business Model in most recent year of data	Country
Erste Group Bank AG	A recapitalisation of EUR 1,220 million in 2009	2009	Savings	D1	2015	D1	Austria
Hypo Tirol Bank AG	The Federal state of Tirol issued a guarantee for a EUR 100 million capital emission (June 2009). A capital injection of EUR 220 million was also approved in 2012 State aid e SA.34716 (2012/N)	2009	Commercial	D2	2015	D2	Austria
Raiffeisen Zentralbank Österreich AG	A recapitalisation of EUR 1,750 million in 2009	2009	Cooperative	D1	2015	D1	Austria
Belfius Banque SA	The case is subsumed in that of Dexia, of which Belfius is a spin-off. Belfius was the Belgian subsidiary of Dexia.	2011	Nationalised	D1	2015	D2	Belgium
Dexia SA	A EUR 5.4 billion recapitalisation, refinancing guarantees amounting to EUR 135 billion (October 2008) and impaired asset measures worth EUR 3.2 billion (July 2009). State aids SA.33760 (11/C) (ex 11/N), SA.33763 (11/C) (ex 11/N), SA.33764 (11/C) (ex 11/N), SA.30521 (MC 2/10) Dexia is considered as its own bad bank (Handrud and Hallerberg, 2014)	2008	Nationalised	I	2015	D2	Belgium
KBC Group NV	A recapitalisation of EUR 3.5 billion (December 2008), a second recapitalisation of another EUR 3.5 billion (January 2009) and an asset relief measure on a portfolio containing CDOs (May 2009). STATE AID n° C 18/2009 (ex N 360/2009)	2008	Commercial	D1	2015	D1	Belgium
Aareal Bank AG	A recapitalisation of EUR 525 million in 2009	2009	Commercial	D1	2015	D2	Germany
Bayerische Landesbank	A recapitalisation of EUR 10 billion, a risk shield of EUR 4.8 billion and liquidity guarantees of about EUR 5 billion (2008-2009). Additional aid totalling EUR 2.638 billion guaranteed the intra-group liquidity exposure of HGAA (still BayernLB's subsidiary in 2009) towards Bayern LB. State aid N 615/2008	2008	Savings	D2	2015	D2	Germany

Commerzbank AG	A recapitalisation worth EUR 8.2 billion and a guarantee framework for securities worth up to EUR 15 billion (October 2008) additional equity capital totalling EUR 10 billion (January 2009). State aid N 244/2009	2008	Commercial	D2	2015	D1	Germany
Hypo Real Estate Holding AG	A recapitalisation of EUR 10, 000 million in 2008.	2008	Nationalised	D2	2014	D2	Germany
IKB Deutsche Industriebank AG	A recapitalisation of EUR 9, 000 million in 2008	2008	Commercial	D2	2015	D1	Germany
Landesbank Baden-Württemberg	A EUR 5 billion recapitalisation and an impaired assets relief measure through guarantees of EUR 12.7 billion (June 2009). SA.30062 (2013/N) and SA.31773 (MC13/2010)	2010	Savings	I	2015	D2	Germany
NORD/LB Norddeutsche Landesbank Girozentrale	A recapitalisation of EUR 2.6 billion (December 2011). State Aid N 412/2009, Prolongation of State Aid N 655/2008	2011	Savings	D2	2015	D2	Germany
Sparkasse KölnBonn	A recapitalisation of EUR 650 million (September 2010). STATE AID N° C 32/2009 (ex NN 50/2009)	2010	Savings	F	2015	F	Germany
FIH A/S	Benefitted from government guarantee an issued State-guaranteed bonds in the amount of EUR 5.7 billion and from an asset relief measure amounting to EUR 2.315 billion. FIH has also received a hybrid core capital injection of EUR 256 million (June 2009). There was also in 2012, the transfer of property-related assets from FIH to the Asset management Company Finansiel Stabilitet (Financial Stability Company, FSC) State aid No SA.34445 (2012/C) (ex 2012/N)	2010	Commercial	D2	2015	D2	Denmark
Banco Grupo Cajatres SA	A recapitalisation of EUR 407 million in the form of contingent convertible bonds (CoCos) subscribed by the FROB, a transfer of impaired assets and loans into SAREB for an aid amount of around EUR 770 million and state guarantees on unsecured senior debt under the Spanish bank guarantee scheme worth EUR 654 million (December 2012). State aid n° SA.35489 (2012/N)	2012	Commercial	D1	2013	D1	Spain

Banco Mare Nostrum, SA	A recapitalisation of EUR 915 million in the form of convertible preference shares subscribed by the FROB and state guarantees on unsecured senior debt under the Spanish bank guarantee scheme worth EUR 4 424 million (June 2010). BMN benefitted from an additional recapitalisation of EUR 73 million in the form of ordinary shares subscribed by the FROB, as well as from a transfer of its impaired assets and loans into SAREB for an aid amount of approximately EUR 2 100 million (December 2012). State aid n° SA.35488 (2012/N)	2012	Nationalised	F	2015	D1	Spain
Bankia, SA	A conversion of existing state owned preference shares of EUR 4 465 million into equity and a liquidity guarantee amounting to EUR 19 billion in favour of the Spanish BFA group and its subsidiary Bankia (June 2010). The approved aid does not include announced capital injections sought by BFA. With the now approved conversion of preference shares into equity, FROB holds 100% of BFA. Additionally, a liquidity guarantee amounting to EUR 19 billion will be provided (June 2012). State aid n° SA.34820 (2012/N) and State aid SA.35253 (2012/N) and State aid SA.35369 (2012/N)	2011	Nationalised	D2	2015	D1	Spain
Liberbank, SA	Benefitted from a EUR 124 million recapitalisation in the form of contingent convertible bonds (CoCos) subscribed by the FROB, as well as from a transfer of its impaired assets and loans into SAREB for an aid amount of around EUR 1 000 million. Additionally, the bank has benefitted from State guarantees on unsecured senior debt under the Spanish bank guarantee scheme worth EUR 3 875 million (December 2012). State aid n° SA.35490 (2012/N)	2012	Savings	F	2015	D1	Spain
BNP Paribas SA	A recapitalisation of EUR 5, 100 million in 2008	2008	Commercial	I	2015	I	France
Groupe BPCE	EUR 3 billion recapitalisation in the form of preference shares which are convertible into ordinary shares and a liquidity assistance of EUR 2 billion (March 2009). State Aid N 249/2009	2009	Cooperative	D2	2015	D2	France
Alpha Bank AE	A recapitalisation of EUR 940 million in 2009 and a guarantee on assets for EUR 9,800 million in 2012	2009	Nationalised	F	2015	F	Greece

National Bank of Greece SA	Two recapitalisations of EUR 350 million and EUR 1,000 million in 2009 and 2011	2009	Nationalised	F	2015	I	Greece
Piraeus Bank SA	Two recapitalisations of EUR 370 million and EUR 380 million in 2009 and 2011 and a guarantee on assets for EUR 13,500 million in 2012	2009	Nationalised	F	2015	D1	Greece
TT Hellenic Postbank SA	A recapitalisation of approximately EUR 225 million (May 2009). State aid SA.31155 (2013/C) (2013/NN) (ex 2010/N)	2009	Commercial	D1	2010	D1	Greece
Allied Irish Banks, Plc	A recapitalisation of EUR 13,100 million in 2011	2011	Nationalised	D1	2015	D1	Ireland
Governor and Company of the Bank of Ireland	A first recapitalisation of EUR 3.5 billion (March 2009) and a second one amounting to EUR 1.85 billion (July 2010). State aid N149/ 2009 and State aid N 546/2009 and State aid SA.33216 (2011/N)	2009	Nationalised	D2	2015	D2	Ireland
Banca Monte dei Paschi di Siena SpA	A first recapitalisation of EUR 1.9 billion (February 2009), a second recapitalisation of EUR 2 billion and a liquidity guarantee amounting to EUR 13 billion (December 2012). State aid n° SA.35137 (2012/N)	2009	Commercial	D2	2015	D2	Italy
Bank of Valletta Plc	A recapitalisation of EUR 13,100 million in 2011	2011	Commercial	D1	2015	D1	Malta
ABN AMRO Group NV	Recapitalisation aid worth between EUR 4.2 billion and EUR 5.45 billion respectively in favour of FBN and ABN AMRO N (the two merging entities forming ABN AMRO Group) and a EUR 71.1 billion of liquidity aid (October 2008 to January 2010). State aid case No C 11/2009 (ex NN 53b/2008, NN 2/2010 and N 19/2010)	2010	Nationalised	D2	2015	D2	Netherlands
ING Bank NV	A recapitalisation of EUR 10 billion (October 2008) and an asset relief measure worth up to EUR 5 billion (March 2009). ING also issued State-guaranteed debt under the Dutch Guarantee Scheme: The Dutch State granted a guarantee in the amount of USD 9 billion (Risk and cash flows transfer of a portion of ING's US based RMBS portfolio to the State) (October 2008). State aid n° SA.29832 (2013/N-2 and MC10/2009) (ex SA.27991(C10/2009), ex SA.28855 (N373/2009), ex SA.33305 (2012/C))	2008	Commercial	D2	2015	F	Netherlands

SNS Bank NV	A first rescue aid of EUR 750 million (December 2008). A second recapitalisation of around EUR 1.5 billion (February 2013). Furthermore, a recapitalisation of EUR 1.9 billion was approved for SNS REAAL's banking subsidiary – SNS Bank – (February 2013). State aid N 371/2009 and State aid N 611/2008	2008	Nationalised	D2	2015	F	Netherlands
Banco BPI SA	A recapitalisation of EUR 1,500 million in 2012	2012	Commercial	D2	2015	D1	Portugal
Caixa Geral de Depósitos SA	A recapitalisation of EUR 1650 million (June 2012). State aid n° SA.35062	2012	Savings	D2	2015	F	Portugal
Nova Kreditna banka Maribor d.d.	A recapitalisation of EUR 100 million in 2012. Non-performing assets transferred to BAMC.	2012	Nationalised	F	2015	D1	Slovenia
Nova Ljubljanska Banka d.d.	Two recapitalisations of EUR 250 million and EUR 383 million in 2011 and 2012. Non-performing assets transferred to BAMC.	2011	Nationalised	D2	2015	D1	Slovenia
Lloyds Banking Group Plc	On 13 October 2008, the Lloyds Banking Group received a state recapitalisation of EUR 19 billion. On 7 March 2009, the bank benefitted from an additional asset relief measure worth up to EUR 15.6 billion. State aid No. N 428/2009	2008	Commercial	D2	2015	D2	United Kingdom
Royal Bank of Scotland Group Plc	A first recapitalisation of £20 billion (October 2008) and a second one amounting to £32.5 billion (November 2008). The bank also took part of an Asset Protection Scheme: £282 billion of covered assets, with a first loss position of £60 billion (December 2008). State aid No N 422/2009 and N 621/2009	2008	Nationalised	D1	2015	D1	United Kingdom

Source: Own elaboration

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