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NPLs portfolios disposals in Eurozone: Implications for Bank's Shareholders Value Creation

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Non fermatevi là dove siete arrivati.[1]

- Pitagora

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[1] Don't stop where you have come.

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Abstract

The proliferation of NPLs within the financial system carries substantial issues, such as lower banks' profitability, higher financing costs and regulatory capital requirements, and obviously creates a distortion of capital uses towards sub-optimal economic activities. After an extensive view of the market trends occurred in the aftermath of financial crisis of 2007, a detailed analysis is conducted across countries on major academic contributions. The aim of the present study is to investigate the determinants and the dynamics featuring the banking sector's shareholders value creation following disposals of NPL portfolios.

Against this background the research question of the thesis*:* given the prominent role of NPLs sales in addressing the consequences of financial crisis, do bank's share price show an increase following NPLs portfolio disposals?

Starting from the above question, this thesis is intended to provide a contribution to the existing academic research under three perspectives. First, an overview of the trends and characteristics featuring the NPLs environment is rolled out. Second, an in-depth study review is conducted on recent contributions addressing the strategies to reduce the NPLs burden on banking system. Third, the analytical section is developed to provide an updated understanding on the shareholders returns following portfolio disposals both at European and Italian level.

Introduction

The ramifications of financial crisis extended far beyond 2008. The emergence of Non-Performing Loans (NPLs[2]) as a result of deteriorated macroeconomic conditions still represents a drag on economic growth. This effect is mainly present in economies heavily relying on bank financing. Among the most widespread consequences of high NPLs levels, studies in the financial system identify: lower profitability, higher financing costs and capital requirements, and a general negative impact on credit environment and growth. This, on turn results detrimental on macroeconomic indicator such as slower GDP growth, lower credit-to-GDP ratio and ultimately unemployment.

The burden of NPLs on financial system can be understood under the perspective of lenders, in particular, through the analysis of channels of credit to the real economy[3]:

- Lower profitability: high NPLs levels imply higher provisioning needs, which have a direct negative effect on banks net operating income. Additionally, income is negatively affected by the increased deployment of human resources dedicated to deal with management of NPLs.

- Higher capital requirements: as per their nature, NPLs are inherently risky assets which carry higher risk weights than otherwise performing loans. High NPLs tie up lenders' capital resources and limit room for new credit. Unlocking such resources would act as an infusion of additional capital that could trigger new lending and benefit the whole financial system.

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[2] Non-performing loans or exposures are those that satisfy both of the following criteria: (a) material exposures that are more than 90 days past due; and (b) the debtor is assessed as unlikely to pay its credit obligations in full without realization of collateral, regardless of the existence of any past due amount or of the number of days past due (EBA).
[3] European Parliament.

- Higher funding costs: investors and other banks may result less willing to provide capital (both equity and debt) to banks showing high NPLs levels in their assets. This constraint is reflected into higher funding costs for these banks and a negative impact on their capacity to generate current and future profits.

This conundrum of mutually reinforcing agents ultimately has an impact on the access to credit of Small and Medium Enterprises (SMEs) which are the most exposed entities to such phenomenon as they rely on bank credit facilities and are difficult to evaluate during economic downturns. Also, the emergence of voluntary misconducts in management of banks' NPLs, may lead to tardive recognition of loss provisions, and to a general sub-optimal allocation of capital toward loss-making activities.

The soaring NPLs level experienced in the Eurozone system through 2015-2016 triggered the prompt action from the European Central Bank (ECB), aimed at curbing the vicious extent of bad loans on real economy. After this phase, in which Eurozone NPLs ratio peaked above 7%, the decreasing trend has brought the ratio below the threshold of 3%, though experiencing some reversal due to Covid19 effect.

Within such generalized tendency, NPLs ratios in Southern countries still face sustained NPLs levels (which is related to the increasing pre-crisis leverage of the private sector). The persistently high NPLs ratios in these systems reflects the severe recessions of their economies during the crisis period. Additionally, large concentration of NPLs sheds lights on the substantial impediments in their judicial and legislative systems, a substantial burden that prevents banks from efficient workout or disposal strategies of their NPLs. Among these countries, only Spain managed to reach a slightly lower-than-euro-area-average NPLs ratio by the end of 2017. This result has been made possible because of the intensive efforts to restructure domestic banks' and the comprehensive reforms implemented under the European Stability Mechanism

(ESM) programme (including the set-up of a national asset management company), which benefited from a strong economic recovery.

Though with differences across member countries, the extensive effort toward deleveraging has been in place until 2020. Among the various action lines, the most effective one in the deleveraging process of bank's balance sheets has been the sales of NPLs portfolios. (Bruno *et al.*, 2017). The ESM programme framework includes comprehensive NPLs strategies targeting the enhancement of supervisory, legislative, and bank level efficiencies. As a matter of fact, while certain countries, (i.e. Ireland and Spain), implemented their NPLs strategy in an efficient manner, others, (i.e. Cyprus, Greece and Portugal), has been implemented their actions with substantial delay which resulted into a still above-the-average NPLs ratios. The implementation of the banking union escalated the resolution of this issue at European Union (EU) level. This because, the spill-over effects from Member States featuring high NPLs to the rest of the EU economy have been identified as material, both in terms of growth and financial stability of risk-sharing approach has been possible though the complementary implementation of the banking union, and the set-up of the Single Resolution Fund (SRF).

Finally, the introduction of banking union allows the NPLs problem to be addressed at the broader European level, tackling at the same time the negative externalities deriving from high NPL levels. In order for the banking union to be effective, however, banks and national authorities also need to deal with national impediments. Because of increasing risk-sharing within the Euro Area, negative externalities need to be addressed by supranational measures. The key approach to limit the externalities arising from NPLs is to decrease the outstanding amount of impaired loans across the Euro Area. Various international forums have worked on the topic and it has become a priority for the SSM as well as for the European Commission.

Starting on the above premises, this thesis is intended to provide a contribution to the existing academic research under three perspectives. First, an overview of the trends and characteristics featuring the NPLs environment is rolled out. Second, an in-depth study review is conducted on recent contributions addressing the strategies to reduce the NPLs burden on banking system. Third, the analytical section is developed to provide an updated understanding on the shareholders returns following portfolio disposals both at European and Italian level.

The study outlook is rolled out as follows. Chapter 2 provides an overview on the NPLs market in Europe, addressing NPLs determinants, resolution approaches from institutions and evolution over time. Chapter 3 focuses on the available approaches aimed at reducing the burden of NPLs from the financial system, and in particular analyses the features of bad loans securitizations. In Chapter 4 the sample of selected transactions is presented and based on this, a regression model is proposed to investigate the characteristics of NPLs portfolio disposals leading to shareholders value accretion. Finally, Chapter 5 collects the main findings of the analysis.

I. An Overview on NPLs Sector

1.1 Definition and Determinants

<u>Definition</u>

NPLs can be broadly defined as banks' exposures to debtors who are no longer able to repay (entirely or partly) their contractual obligations because of their deteriorated creditworthiness and broader financial conditions. NPLs categorization may vary from country to country, however, the harmonization effort promoted in respect to the mechanism of definition and recognition of NPLs is constantly sought to promote coordination and prompt actions at systemic level across single countries. In light of the EBA approach, financial institutions must classify loans as non-performing, whether or not they are backed by guarantees, in case they consider debtor no longer able to repay them in full. Paragraph 145 - Annex V of the EBA ITS on supervisory provides that "non-performing exposures are those that satisfy either or both of the following criteria:

- material exposures which are more than 90 days past-due;

- the debtor is assessed as unlikely to pay its credit obligations in full without realization of collateral, regardless of the existence of any past-due amount or of the number of days past due."

Therefore, the definition of NPLs is based on the "past-due" and "unlikely-to-pay" criteria[4]. Accordingly, these criteria apply regardless of whether there are unpaid past-due amounts, or when there are more than 90 days past-due and/or their amount

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[4] European Central Bank.

is significant according to the criteria established at national level. According to Banca d'Italia[5], NPLs categories are divided into:

- *Bad loans or "sofferenze"*: are exposures to debtors that are insolvent or in substantially similar circumstances. These are exposures to a borrower in a position of insolvency (not necessarily recognized by a court) or a substantially similar situation. The definition of bad loans materializes irrespective of the presence of any collateral.

- *Unlikely-to-pay exposures* or "*inadempienze probabili*" (aside from those included among bad loans): are those in respect of which banks believe the debtors are unlikely to meet their contractual obligations in full unless action such as the enforcement of guarantees is taken. This definition focuses on the result of the assessment conducted from the bank about the possibility of a debtor to repay his/her obligations.

- *Overdrawn and/or past-due exposures* (aside from those classified among bad loans and unlikely-to-pay exposures): are those that are overdrawn and/or past-due by more than 90 days and for above a predefined amount. This category also includes the corresponding definition of "*incagli oggettivi*", namely the past due exposures older than 270 days.

<u>NPLs Determinants</u>

NPLs build-up are a recurrent feature of financial crises and financial stress episodes. NPLs volumes typically increase following credit booms and emerge when these turn to bust. At the same time, NPLs accumulation can result from extended

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[5] The definitions of NPLs adopted by Banca d'Italia have been harmonized within the Single Supervisory Mechanism (SSM) and meet the European Banking Authority (EBA) standards (Banca d'Italia).

periods of low growth and structural imbalances within banking sector. During the financial crisis, bad credit has evolved its occurrence into more advanced instruments, such as derivatives rather than classics loans. Whichever the actual generation of NPLs is, the determinants leading to bad loans may be different. An extensive strand of literature analyses the link between excessive credit growth, the financial cycle and banking crises. In the following paragraphs, a detailed perspective is rolled out by geographical scope.

Europe

Given the huge impact of NPLs on the growth of the financial system, a large volume of research has flourished in recent years in order to study the determinants of bank insolvencies, with a major interest on European countries. On the one hand, bank-specific features account for a key role in explaining the accumulation of bad loans in banks' balance sheets. In particular, a landmark contribution from Berger and DeYoung (1997) points to poor management hypothesis (defined as over expenditures and poor underwriting practices) as a cause leading to insurgence of bad loans. Podpiera and Weill (2008) findings contend that lower bank's cost efficiency results into a higher likelihood of NPLs, and that supervisions should address enhanced cost efficiency to curb the risks linked to bad loans and consequent bank failures. Rossi *et al.* (2008) contrarily to the largely accepted consensus, do not find significant evidence of bad management practices influence on loans quality. Rather, their study attributes an exogenous effect related to the poor luck hypothesis.

On the other hand, country-specific factors are found as meaningful determinants too. Beck *et al.* (2015) finds that GDP growth together with stock market performance, interest rates and exchange rates affect NPLs. Nkusu (2011) correlates bad loans growth with deteriorating macroeconomic conditions expressed in terms of sluggish GDP growth, decreasing assets prices and higher unemployment levels.

Anastasiou *et al.* (2016) add the implementation of personal income tax and the occurrence of output gap as both significant predictors of NPLs uptick. Karadima and Louri (2020) focusing on the main European countries (France, Germany, Italy and Spain), between 2005 and 2017, determine a positive impact of economic policy uncertainty on NPLs, however this is moderated by higher bank concentration. Vogiazas and Nikolaidou (2011) expand the application of largely investigated macroeconomic determinants with the spillover effect arising from the banking crisis of a neighboring country.

Many studies find a confounding effect of such dimensions. Louzis *et al.* (2012) taking the perspective of Greek banking sector, analyses the impact of both macroeconomic factors and bank-specific issues on different loan categories. Results show that NPLs are mainly related to macroeconomic factors (though with a varying degree of impact on different loan categories) and management quality. Makri *et al.* (2014) results support significant correlations between NPLs and a score of both macroeconomic and bank-specific dimensions. Kauko (2012) finds that a rapid credit growth before financial crisis, when associated with current account deficit, rather than alone, is a reliable predictor of the relative amount non NPLs in 2009. Messai and Jouini (2013) find that the degree of non-performing loans issue varies negatively with the growth of GDP and the banks' profitability, whereas is positively associated with unemployment rate the total loan loss reserves to total loans ratio and the real interest rate. In their extensive review, Nikopoulos and Tsalas (2017) proposes how the determinants of NPLs are not limited to concurrent macroeconomic environment and bank-specific factors, but also legal and regulatory framework matters.

Italy

With regards to Italy, Quagliariello (2007) associates the level of NPLs with the business cycle. The study conducted by Bonfondi and Ropele (2011) finds that the

quality of lending can be explained by macroeconomic variables portraiting the general status of the economy and that variations to macroeconomic conditions have a deferred effect on loans quality.

Alessi *et al.* (2014) conclude that loan loss provisions are mainly related to non-discretionary factors (such as expectations about future losses and perception related to credit risk) whereas, management discretionary behaviors and business cycle do not influence the provisioning mechanism. Milani (2017) downsizes the role related to macroeconomic factors in Italian NPLs, providing instead evidence supporting that bad management (both for big and small banks) accounts the most in explaining higher credit risk incurred.

NPLs Outside Europe

Outside the NPLs-laden European financial system, significant patterns are investigated in other countries. Ghosh (2015) finds positive relationship between NPLs increase and a score of macroeconomic factors, including liquidity risk, inefficiency cost, larger capitalization (as size of the banking sector), unemployment, inflation, and public debt. Saba *et al.* (2012) combining macroeconomic and bank-specific factors with the legal framework traits, find that, though many variables can be considered explanatory, real GDP per capita shows the most significant pattern on explaining NPLs. Allen *et al.* (2012) in their study encompassing Australian and Canadian banks, conclude that banks' specific characteristics (balance sheet and income statement related factors) do not explain the increase in the level of NPLs, a phenomenon which can be better understood under the prospective of global banking financial risk contagion.

Yilmaz (2018) studies the combination of a series of institutional and bank-specific factors on a large sample of developing countries between 2000-2013. In the first category, he finds that unemployment rate, public debt, and one-year lagged value

of NPL have a positive impact on NPLs, while economic growth, inflation, general government net lending/borrowing, and economic freedom (institutional development) have a negative impact on NPL. On the bank-specific side, domestic credit to private sector (credit growth), cost to income ratio, and one lagged value of NPL had a positive impact on NPL, while regulatory capital to risk-weighted assets, return on assets and equity and noninterest income to total income had a negative impact on NPL. Boudriga *et al.* (2009) taking the perspective of 12 countries in MENA region, find that the degree of information available on public and private providers and the characteristics of the institutional framework positively affect banks' credit quality.

Zhang *et al.* (2016) investigate the behavior of commercial banks between 2006 and 2012 and determine the presence of moral hazard in lending decisions of such institutes. In particular, riskier lending increases with NPLs level, a poisonous conundrum leading to the general worsening of loan quality and hampering the stability of financial system.

Vithessonthi (2016) analyses the relationship between credit growth and NPLs in a selection of 82 commercial banks in Japan. He determines how an increase in bank credit positively affects the accumulation of NPLs prior to the financial crisis of 2007, a trend mostly present in large banks. Ghosh (2006) in his work, concludes that, in the Indian economy, high financial leverage in corporate sector plays an important role on banks' bad loans. Given the lagged and significant relationship, a close look to the level of leverage ratio, should suggest a preventive action from policymakers. Rachman *et al.* (2018) scrutinize the bank-specific factors affecting bad loans in Indonesian banking system and shed light on the negative relationship between credit growth and profitability on NPLs levels. In fact, these two features can be considered as proxies of good managerial practices.

Isik and Bolat (2016) finds that among bank specific determinants in Turkey, higher levels of profitability and diversification of revenues negatively affect the NPLs amount with greater capital and loan loss provision affecting positively the NPLs level. On the macroeconomic side, economic growth has a negative effect on NPLs, whereas the onset of financial crisis demonstrates an increase in NPLs.

Finally, regarding the context of African economies, Olayinka and Mofoluwaso (2014) finds separate the effects in the short and long run in Nigeria. In the first case, economic growth is confirmed to have a negative effect on NPLs level, differently from unemployment rate, credit to private sector and exchange rate. In the short term, credit level to private sector, exchange rate, lending rate and stock market performance are found as the main determinants of NPLs. Amuakwa-Mensah and Boakye-Adjei (2015) conclude that in Ghana both bank-specific and macroeconomic factors have a significant effect on domestic banks' NPLs.

1.2   The European Union Policy Approach

Starting from 2013, the resolution of NPLs has been addressed through of a series of institutional and legislative initiatives. The Single Resolution Mechanism Regulation (SRMR) and the Bank Recovery and Resolution Directive (BRRD), introduced in 2014, were intended to provide authorities with a comprehensive solution to deal with failing banks at national level, tackle cross-border banking failures and limit recourse to direct state intervention in bank recapitalizations. Under the directive, banks are required to prepare recovery plans to overcome situations of financial distress. Additionally, national authorities are granted special powers to ensure orderly resolution for failing banks minimizing the burden for taxpayers. In fact, the BRRD imposes strict restrictions on the adaption of public finances in bank recapitalizations. Hence, the long-term objective is to reduce moral hazard and limit

the ground for a new accumulation of bad debts. Nonetheless, the directive limits options for state-led recapitalizations even in those cases where enough fiscal space is present.

The BRRD also includes rules to establish a national resolution fund that must be adopted in each member country. All financial institutions have to contribute to these funds according to each institution's size and risk profile. In summary, the EU's bank resolution regulations ensure that the banks' shareholders and creditors pay their share of the costs through a so-called "bail-in" mechanism. If such remedy is still not sufficient, the national resolution funds can provide the resources needed to ensure that a bank can continue operating while it is being restructured, limiting the involvement of taxpayers.

The European Council 2017 Action Plan represents a holistic response to NPLs at European level. The recognition at institutional level of the negative effects related to high NPLs ratios in a meaningful number of Member States and the risk of spill-over effects among them, prompted a decisive active action from the Commission and the Council. The main drivers of such coordinated intervention are presented in the report of the Council's Financial Services Committee[6] and articulate into four streams: (i) supervision, (ii) structural issues (i.e. insolvency), (iii) secondary markets and (iv) restructuring of banking system. The Action Plan consists of 14 specific action lines, aimed at addressing the NPLs burden through the definition of a regular reporting system on the evolution of the NPLs stocks, the restructuring of banking sector and the development of secondary markets for NPL transactions.

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[6] Council of the European Union: Report of the FSC Subgroup on Non-Performing Loans (31st May 2017).

Between October 2017 and March 2018, the European Commission announced the introduction of two packages of measures aimed respectively at curbing NPLs and setting the stage for Asset Management Companies (AMCs). The Council also decided to monitor the implementation of the Action Plan on a regular basis through a progress report. In the first progress report issued on January 2018, highlights that while progresses were ongoing in reducing NPLs ratios, at the same time NPLs still represented a meaningful risk on economic growth and financial stability. In particular, progresses are evaluated against each of the Initiatives pursued in the Action Plan:

1. Interpretation of existing supervisory powers in EU legislation referred to NPLs provisioning;

2. Limitation of the risk of potential "under provisioning" through the enactment of automatic provisioning mechanism;

3. Extension of Single Supervisory Mechanism NPLs guidelines also to small banks;

4. Adoption of an EU-wide system of management guidelines for recognition of non-performing exposures;

5. New guidelines on bank's loan origination, monitoring and internal governance systems;

6. Development of macroprudential practices to timely address future build-ups of NPLs;

7. Enhancement of disclosure requirements on asset quality (with particular respect to NPLs);

8. Improvement of loan tape information required from bank prior to accord a loan;

9. Improvement of data infrastructure for NPLs (including potential transaction platforms);

10. Development of a blueprint for Asset Management Companies;

11. Development of secondary market for NPLs;

12. Benchmarking activity of national loan enforcement and insolvency frameworks;

13. Development of the focus on insolvency issues in the European Semester;

14. Enhancement of protection of secured creditors.

European institutions proved to be time effective in the accomplishment of objectives stated in 2017, since as of June 2019 the progress report, the majority of the initiatives resulted fulfilled, with initiatives 12 and 13 resulting still ongoing and initiative 5 marked as imminent. In May 2020, the EBA published the Guidelines on loan origination and monitoring (accomplishing initiative 5), whereas in November 2020 published a report on the benchmarking of national insolvency frameworks across the EU (addressing initiative 12). Finally, with regard to initiative 13, the Commission has issued Country-Specific Recommendations (CSRs), with the focus shifting towards the maintenance of socio-economic stability during the Covid19 pandemic outbreak.

In December 2020, the Commission published a new Action Plan, with the target to prevent future build-ups of NPLs during the pandemic crisis. The NPLs strategy is intended to pursue four main goals:

1. Development of secondary markets for distressed assets, allowing banks to transfer NPLs off their balance sheets, while ensuring further strengthened protection for debtors. Under this objective, the Action Plan proposes various new initiatives such

improving data quality and comparability, launching a public consultation to promote a data hub at European level and improving the availability of information to market participants.

2. Reform of the corporate insolvency and debt recovery legislation, which will help the convergence of the various insolvency frameworks adopted by single Member State across the EU and reinforce high standards of consumer protection. The Action Plan does not propose brand-new initiatives to reform the recovery frameworks, instead, the Commission prompts an agreement between the European Parliament and the Council on the "Directive on the minimum harmonization rules on accelerated extrajudicial collateral enforcement". Despite divergences persist at national level, the resources included in the recently approved Recovery and Resilience Facility may be used to finance reforms improving insolvency, judicial and administrative frameworks.

3. Support the establishment and cooperation of national asset management companies (AMCs) at EU level. This need has been exacerbated by the severity of Covid19-related economic crisis. In the new context, the Commission considers public support toward financial institutions possible even without declaring the bank in a failure (or likely to failure) position, as Covid19 effects have been recognized a substantial disturbance to European economy, then giving room to exceptional treatment.

4. Implementation of precautionary public support measures, to ensure the continuous access to credit of the real economy under the EU's Bank Recovery and Resolution Directive and State aid frameworks. More specifically, the macroprudential actions urged at national level are: developing preemptive systems to monitor the systemic risks including borrower-focused measures in each national policy

framework and adopting capital-based macroprudential instruments (i.e. systemic risk buffers) to counter vulnerabilities that might give rise to significant build-up of NPLs in the future.

1.3   NPLs Evolution Trends

As demonstrated in Figure 1 the resolutive action at European level resulted into an evident improvement of the banks' asset quality in a timespan of five years. The comparison between the ca. 7.5% of 2015 and the 3% of 2020 returns an average yearly improvement of 90 bps. However, it is noted graphically how the pace of clean up over last quarters has steadily slowed down, with the flattening of NPLs ration curve.

The main leverage of this improvement is undoubtedly related to the decrease in the numerator term of the ration (i.e. the total value of NPLs) plummeted from €1.15trillion in 2015 to less than €500billion as of 2020 year-end. The other leverage, the denominator (i.e. the value of total loans), also contributed to the improvement of the NPLs ratio, as it moved upward from €13trillion to €17trillion in the same period (ECB).

Figure 1 – EU NPLs volume and NPLs ratio Q4 2014- Q4 2020
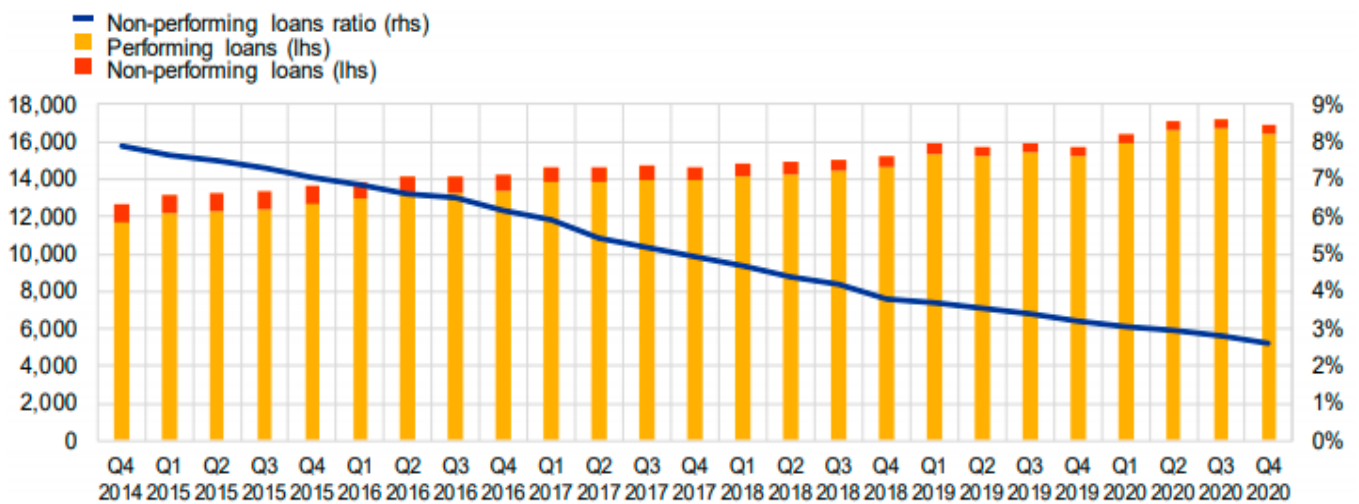
Source: European Banking Authority Risk Dashboard Q4 2020, 2021.

Despite the encouraging downward trend in NPLs ratio, marked differences persist at single country level. While the majority of cases records NPLs ratio in line with European average or below the thresholds of 5%, some countries still carry considerable concerns. As of December 2020, Greece records a NPLs ratio of 25.5%, Cyprus stands at 11.5%, whereas Bulgaria shows a 7%[7]. Hence, in light of this heterogeneity, a comprehensive resolution for NPLs cannot be successful without considering the criticalities present in these countries.

1.4 The Effects of Covid19

The outbreak of Covid19 pandemic represents a substantial treat financial sector. As this effect corresponds to a new NPLs accumulation, in 2020 the pace of bad loans reduction slowed down (with the NPLs volumes showing a slight increase between Q1 and Q2, as per EBA data). NPLs are expected to show a new positive trend in the coming months as the impact of the Covid19 crisis on the real economy intensifies. Banks need to ensure that they have the operational capacity to address

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[7] European Banking Authority Risk Dashboard Q4 2020.

NPLs swiftly and thoroughly at an early stage. A key metric, the bank provisioning levels, helps understand the degree of the phenomenon as total provisioning levels at top European banks in the UK, Spain, France, Italy and DACH have nearly doubled on yearly basis, rising from €35.7 billion in 2019 to €71.8 billion in 2020 (Debtwire). Financial institutions are preparing for anticipated future losses, even though their real scale remains uncertain to date. With stimulus packages being winded down soon and economies still facing a moderate return to pre-pandemic levels, banks and regulators should demonstrate a proactive approach in the resolution of new NPLs. In October 2020, European Central Bank's warned that, in a severe but plausible scenario, European banks NPLs could reach €1.4 trillion. This because, not only Covid19 has slowed down ongoing efforts to offload bad loans from bank's balance sheet, but also it actually laid the foundation for new bad loans to arise in the financial system.

Academic studies have laid different perspective over the last year. Demary (2021) concludes that a mixture of insolvencies, zombification and debt leveraging will emerge in the post-Covid19 European market. The prevailing scenario will depend on the regulator and bank's actions in recognizing the measure directed to viable companies.

Kasinger *et al.* (2021) despite similarities with previous crisis, find two main features from Covid19-led loan moratorium: high degree of heterogeneity across industry sectors and countries and uncertainty related to the medium-term extent of lockdown measures. Despite early and extensive government support to economy they suggest a proactive approach to banks in recognizing NPLs to ensure post-Covid19 financial stability.

Also, Ratnovski (2020) poses those differences from 2007 financial crisis should be carefully balanced. On the one side, Covid19 comes at a time when banks have a better balance sheet, there is no immediately precedent credit boom and IFRS

9 provides for an easier framework to NPL recognition. On the other side however, higher government debt, lower banks' profitability and weaker corporate balance sheets raise hurdles on an immediate NPLs resolution.

II.   Management of NPLs Resolution

2.1   An Overview on Available Alternatives

According to the classification proposed by Anastasiou (2016) available measures to for resolution of NPLs can be distinguished between Ex-Ante and Ex-Post NPLs management measures. In the paragraphs detailed here below, a description of both approaches is provided, including actions enacted by the European Union financial institutions.

Ex-Ante NPL management

Three factors should be considered as pre-conditions in order to manage NPLs:

-    Prevention of NPLs insurgence or maintenance of such loans under a level of control;

-    The characteristics and the actions of banks in which NPLs can are found; and

-    The manner insolvent banks should be treated.

Campbell (2007) in proposing these elements, argues that the first stage refers to prevention and control. This trait is embedded into adequate regulatory powers from banking supervisory authorities such as licensing power, to be enacted through banking license withdrawal when banks do not meet certain requisites. A second stage deals with the management of impaired assets, a crucial aspect in the recovery process. The final and third stage is represented by the treatment of insolvent banks. This is a critical aspect, since if on the one side, the good status of banks is a facilitating factor of economic growth, on the other side, the recognition of troublesome banks may impact other banks' activities and prompt an overnight spread of deposit withdrawal from accounts, worsening the problem.

Additionally, Campbell (2007) focuses on another element: liquidity. As many financial crises over the last decades have been triggered by the evolving nature of banking business (namely due to deregulation leading to the redefinition of scope and spread of activities), liquidity may arise as an important issue also for those banks showing solid balance sheets. In such cases, central banks should have in place actions aimed at maintaining liquidity in the interbank market to precent worse and generalized problems.

The development of stronger micro and macro prudential guidelines for banks is another area of intervention. Not allowing banks to grant loans to subsidiaries, reducing the tenure of external auditors and promoting the presence of real banking sector expert in the composition of management groups represent all useful elements to curb the accumulation of NPLs.

Pagano (2014) proposes a close relationship between bank resolution issues and supervision. In particular, from the perspective of Eurozone sovereign debt crisis, he contends that the institution of the Single Supervisory Mechanism (SSM) and Bank Recovery and Resolution Directive (BRRD) proved to be effective instruments in limiting the risks for banks deemed as "systemic". Through the establishment of a system of financial supervision based on national authorities and the provision of a common set of homogeneous standards, the SSM achieved the reduction of risk in regulatory forbearance. Additionally, the BRRD, a mechanism of enhanced collaboration between resolution authorities and national supervisors, represents a step forward in the sense that, in the effort to address a bank resolution, authorities should rely on internal resources from shareholders and debtholder (bail-in) reducing the recourse to government subsidies. This reduces the moral hazard in the ex-ante excessive tolerance in taking on extra risks.

A view on ex-post is proposed by Baudino and Yun (2017) who consider the spectrum of NPLs resolution alternatives based respectively on debtors and banks perspectives (Figure 2). Given the premise that NPLs follow a period of decline in credit quality, at first stage, alternatives should be directed to the restructuring of loans at the level of individual borrowers. However, when credit quality deterioration encompasses a larger scale, resolution tools to be considered need evaluations at an aggregate level, focusing on the banks. Finally, when NPLs problem becomes systemic, coordination on resolution mechanism is fundamental beyond individual banks to encompass entire banking system. The summary of available resolution options is summarized in Table 1.

Figure 2 – NPLs resolution policies summary

Debtors (Non-Financial Companies)	
Policy Instruments	How it Works
Debt Restructuring, including out-of-court workouts	Either Corporate or Loan Restructuring, involving the banks that are creditors to the same customer
Banks	
Policy Instruments	How it Works
Write-Off	Loans are written off from banks' balance sheets
Direct Sale	Banks or AMCs sell NPLs in dedicated markets
Securitisation	Banks, special purpose vehicles or AMCs pool and tranche loans and sell the securitised products in dedicated markets
Asset Protection Schemes	State-backed entities offer insurance on loss on NPLs in order to restart banks' credit provision
Centralised Asset Management Company (AMC)	Dedicated companies buy bad assets from the problem bank(s)

Source: NPLs resolution policies summary, Baudino and Yun, 2017.

Debtor-Focused Instruments (Debt Workouts)

As a single borrower measure, debtor resolution represents the most immediate action to preserve bank's asset value when a borrower faces financial difficulties in servicing his debt. This route is associated with operating hurdles as, the bank is required to classify the debt as non-performing, leading to higher provisioning requirements, both items bank's management may tend to postpone. Also, this may have an impact on the bank-client relationship since the classification of a debt as non-performing may have substantial impacts on borrower reputation. To sum up, headwinds towards debt workouts are common in times of financial crisis, when banks lack resources to cope with large volume restructuring and market pressure increase.

Restructuring of debt allows non-financial entities (corporate or private borrowers) to resize and/or renegotiate terms of their debts. Among restructuring alternatives, "out of-court" workouts represent the faster and cheaper route as do not require a judicial process. Hybrid approaches involving both an out-of-court workout and a formal insolvency process in the judicial system still represent a suitable option from a time perspective. Banks prepare a workout plan, requiring the court to give simple approval with no direct involved in the design of the restructuring plan ("prepack"). An important point refers to the fact that since the bank maintains the credit exposure to the customer, workouts do not completely remove the risk of credit deterioration from the banks' balance sheet, a case particularly material when workout fails.

Bank-Focused Instruments

Write-offs

Write-offs represent the most direct measure to deal with NPLs. However, given their implications on banks' balance sheets material incentives are in place to

postpone them. Write-offs are a routine accounting practice, which lead to NPLs to be represented consistently. Besides avoiding excessive build-up of bad loans, write-offs are an emergency tool in crisis times when mandate minimum write-offs thresholds on NPLs. The net result of write-off force banks to recognize that the expected recovery value will far lower than their value book value.

Based on these premises, banks tend to postpone NPLs write-off from their balance sheet, due to the negative impact on profits and capital requirements. Alternatively, maintaining the full value of the loan on their balance sheet, pushes further such decisions recognizing the value of time as thing may turn positive with full loan repayment, improved macroeconomic conditions or loan restructuring. Low provisioning and capital levels are the main roadblocks to writing-off NPLs. A sound write-offs strategy closely relates to banks' capital buffers and provisions being sufficiently high to be able to absorb these losses. As a result, write-offs are less viable in periods in which banks are more exposed with thin capital buffers and low provisioning. On the one hand they hit profits and banks' capital, on the other hand large write-offs lower the banks' capacity to absorb future credit losses. Therefore, a prerequisite for meaningful write-off policies is the set-up of stringent provisioning practices. Countries such as the United States, Brazil and Japan have intensified their regulatory provisioning regime or introduced mandatory writing-off regimes in post-crisis periods.

Direct sales

Direct sales consist of disposal of bank's assets to a counterparty, typically another financial institution (i.e. a bank, or different categories of investment funds). The selling bank provides potential buyers with the necessary information to conduct due diligence. This solution resulted appealing in several European countries (Ireland, Spain, and the United Kingdom). Direct sales may include individual loans or covered

packages of loans. This second case embeds the advantage of the diversification of risks via pooling of assets.

Success of direct sales option depends on structural characteristics and may vary from case to case. First, information asymmetries play a role as when Small Medium Enterprises (SMEs) NPLs are considered, high information costs in assessing each loan deter or preclude the adoption of direct sales. Second, during crisis periods, when sizeable amounts of NPLs may be subject to sale, each individual direct sale would require a credit assessment significantly increasing the associated transaction costs. Third, direct sales transactions heavily rely on the presence of an established market for NPLs, which as seen in following sections, even when present are seldom deep or highly liquid. This issue, common to both direct sales and securitization, is related to capacity constraints on the buyer side, given the specialized expertise required to buyers to develop and assess the NPLs before closing an NPLs acquisition. This issue is furtherly escalated in crisis period when buyers' expertise cannot easily scaled-up in a context in which different countries may face the NPLs issue at systemic level.

Turning on price discussions, information asymmetries can lead to large bid-ask spreads and hinder the viability of direct sales. Buyers and sellers may find themselves on distant valuations standpoints before they agree a fair price for a sale. Generally (and especially in crisis times) buyers tend to substantially discount NPLs prices, whereas sellers aim to carve out the highest possible value, as close as possible to the loan's book value. The main drivers of such valuation discrepancies are assets opaqueness and different perspectives between buyer and seller. In the first case, private information (a key piece of valuation of originating bank when granting the loan) cannot easily transferred from seller to buyer. In the second case, while selling banks, as provided in the IFRS accounting principles, discount future cash flows at the

asset's original effective interest rate, buyers rely on expected return on the investment, which for bad loans generally incorporate a significant risk premium.

Securitization

Compared to direct sales, securitization is a more elaborate mechanism to reduce banks' NPLs burden. In a securitization scheme, the proceeds from a series of NPLs are pooled to create a security including senior, mezzanine and subordinate tranches, with each tranche carrying a different risk-reward profile. The value proposition of securitization refers to risk diversification away from a single credit line, and with the use of tranches, investors can choose among possible combinations the one that fits their preferences.

Securitization turns NPLs into marketable securities, which could be of interest to a larger audience of buyers (including foreign investors). Furthermore, securitization option permits lower funding costs and, if assets subject to the securitization are guaranteed, higher NPL prices can be achieved than in the case of direct sales. As final advantage, securitization involving small NPLs, (i.e. households, SMEs) facilitates economies of scale, reduces high transaction costs and makes marketable NPLs otherwise not marketable individually.

The establishment of a securitized products market depends on capital markets characteristics. If such market conditions do not function well in good economic cycle, a market for NPLs securitizations is less likely to flourish. NPLs sales through securitization do not completely overcome the same issue of valuation gaps between sellers and buyers seen for direct sales. A key element in securitization transaction is the provision of guarantees as these on average improve the rating of some of the tranches attracting broader potential investment audience. State or publicly owned institutions' guarantees have been a popular instrument in the recent history and still represents a substantial success factor in the securitization market.

Securitization disposals can be combined with other resolution tools, such as public AMCs. As AMCs, especially public ones, collect NPLs from various banks, they have the advantage of sitting on a large pool of NPLs, from which the degree of diversification would likely be higher than in the case of securitization by a single bank. Setup and management costs may also be lower for AMCs due to economies of scale, and they can more easily hire the specialized expertise required to pool and tranche the NPLs they acquire (Klingebiel, 2001).

Asset Protection Schemes

Asset protection schemes (APSs) are generally measures related to specific crisis periods in which support is provided to individual banks having exceptionally high levels of NPLs. APSs are designed as insurance schemes to support banks, where a state agency intervenes to cover a certain amount of the losses on their legacy loans, in exchange for a fee. The main goal of an APS scheme is to encourage credit provisioning by individual banks, as NPLs can arise from new debt origination. APSs represent a recurrent measure implemented during the most severe phase of a banking crisis, since in other times the risk of a credit crunch is more manageable. Moreover, APSs are aimed at a restricted number of large domestic banks rather than to the entire sector in order to address the most acute problems. However, despite being eligible for APSs in some cases, banks may still prefer the option of raising capital from private sources to strengthen their balance sheets and avoid the bad signaling effects of accessing APS. The main benefit of APS regards the fact that they do not require an upfront disbursement, allowing banks to start benefiting from the guarantee from the beginning of the programme, in exchange for a fee for the service. The preconditions for the success of APSs programmes are the capacity of the official sector to maintain such guarantees, and the general level of confidence from market participants. In the

aftermath of financial crisis, early applications of APSs schemes refer to RBS in the UK for GBP 282billion (2009) and Citigroup in the US (2013) for USD 301billion.

Asset Management Companies (AMCs)

Over the last decade, Asset Management Companies (AMCs) have been used extensively in NPLs resolution, with heterogeneous settings according to each country's regulations and needs. In straightforward terms, AMCs are entities to which NPLs-laden banks can transfer their bad assets. The AMCs can vary in terms of ownership (private or public), organization (centralized or bank-specific), as well as scope of banking assets to be treated under AMCs. Different alternatives have been adopted so far, with the choice made by each country depending on the characteristics and the degree of the financial crisis for which AMCs were set up.

Generally, AMCs are devised at single-bank level in circumstances when the NPLs issues are limited to a limited number of individual banks, while sector-wide or centralized AMCs are more suitable for systemic problems (i.e. the majority of European Member States following the financial crisis). In the latter case, AMCs are usually set-up though public funds, as the scope of intervention is too broad for the private sector as private entities does not have the financial or coordination capacity to manage these system-wide programmes during periods of economic downturn. Centralized AMCs demonstrate a better implementation in terms of consistent workout practices across similar categories of NPLs from different banks. Furthermore, they bring a stronger drive to promote legal changes expediting loan recovery and bank restructuring.

An important feature of AMCs' action is whether the AMC is mandated to actively manage the purchased assets, or instead its scope is limited to sell them as soon as possible (indeed the choice should be clarified in the early stages). This element plays a role in determining the success of AMCs action. Although

comparisons between AMCs are not easy given the different characteristics at national level and success are to be appraised against their own mandates, indications of AMCs' performance refer to dispose of the assets time effectively rather than actively managing them (Klingebiel, 2001). Hence narrowly defined mandates of AMC are a key success factor of the framework. Nonetheless other elements referred to the AMC's setup (i.e. operational independence, adequacy of resources, technical competence) play a role, including the assets class the AMC is mandated to deal with.

The success for an AMC closely depends on its capacity to recover value from the NPLs it acquires and manages. In a typical AMC transaction, the company receives low-quality exposures that originating bank considers non-performing. Therefore, AMC collects such assets as it can deploy some advantage in terms of management capabilities in order to extract more value from these assets. For example, AMCs benefit from economies of scale, as they may collect large amounts of NPLs in a relatively limited timespan or are better in acquiring the necessary skills from new specialized employees. Although AMCs enjoys clear advantages, these do not necessarily grant that a particular AMC will manage such non-performing assets better than the originating banks. However, the first and most important of AMCs refers to the cleaning up the banking sector's balance sheet and restarting credit provision. These sole purposes should be sufficient to justify the transfer of NPLs out of the banking sector towards the designated AMC.

As for others NPLs transactions, the centerpiece issue in AMCs deals regards the definition of the transfer price. Given that AMCs require a transfer of the ownership of the assets from the originator bank, there is need to ensure that there are no legal hindrances to this transfer. Upon this confirmation, a transfer price must be determined. Provided that the transfer of the assets does not occur under a marketplace context, the AMC is required to set a transfer price, which should represent acceptable

terms and conditions to the originating bank. Based on best practice, AMCs could set transfer prices corresponding to the so-called real economic value of the assets, determined as the expected discounted cash flows of the exposures package. This methodology carries the main advantage to reflect the intrinsic value of the assets, as opposed to their book value. During NPLs crisis in fact, book value is generally higher than the real economic value. Also, the real economic value is also likely to stand higher than the market price, given the typically depressed prices ana lack of liquidity in stressed market conditions.

The correct determination of the transfer price for NPLs requires the recognition of the implicit trade-offs. A NPLs transfer at market prices conducted during a financial crisis implies an upfront recognition of losses for the originating bank; a downside that with narrow capital buffers, this may lead banks towards insolvency. On the other hand, a transfer price set above the real economic value could hide the real conditions of the originating banks, generating excessive upfront disbursement for the AMC and in some cases leaving ground for public subsidies to banks (when the AMC is state-managed). Accordingly, overpricing NPLs portfolios can pose AMC in a loss position when NPLs are disposed. This dilemma has been faced by a number of AMCs over their action in recent years: either allow for a purely private AMC, accept a transfer price aligned to the market value of the NPLs, and then provide direct capital access to banks to fill up any capital shortfall, or conversely set up a public AMC, pursue the possibility for higher transfer prices (than at the real economic value), and accept the risk that the transfer price may be difficult to recover under the final sale price, then accepting possible losses for the AMCs. The ultimate risk of such approach concerns the possible overpricing of NPLs in particular countries where the transactions conducted from the national AMC constitutes a meaningful share of the NPLs market.

Another operational issue for AMCs is the definition of the range of assets eligible for transfer. A first choice regards the basis for assets transfer, that is whether it should be voluntary or mandatory. As discussed in previous sections, when addressing systemic NPLs problem and reluctance of banks to recognize upfront losses, the mandatory approach, suits better to produce a successful outcome and facilitate broader NPLs resolution. Mandatory transfer also helps to overcome asset selection (or adverse selection) since, if the transfer is not mandatory, and/or not all banks are affected, a relevant driver in AMC action is to maintain a fair market conditions for all banks operating in the same country. This because, it is important to prevent banks accessing to transfers of NPLs to the AMC to gain a comparative advantage, by strengthening their balance sheets over the other banks.

The metric of reference in assessing an AMC's success is how fast it can fulfill its mandate. As general principle, given the expectation of NPLs sale prices recovery when economic conditions improve, AMCs may have incentives to postpone NPLs disposals. However, the same may apply to originating banks, or specialized financial companies, which might achieve same results due to better economic growth and improved credit conditions. With the markets returning to pre-crisis levels, and the resolving of market failures, NPLs market participants theoretically can carve as much value as AMCs do out of each transaction, as they would be available to pay the present value of the bad loans to the AMC.

A final element featuring the AMCs' scope consists of the time of operation of the entity. In fact, during market crisis, it is not clear when conditions will sufficiently normalize to wound down the adoption of AMCs. To this extent, sunset clauses help mitigate the possible risk to have an AMC operating for too long in respect to macroeconomic environment. Also, AMC's staff may have an incentive to delay the completion of its activities just to maintain their professional status. Accordingly, in

practice employment contracts for AMCs' personnel should be designed in order to align employee incentive systems with the AMC's goals, (i.e. bonuses based on progress in completing NPLs resolution).

2.2   The Choice of Securitization

2.2.1 Overview

The actual goal of the securitization process is to convert illiquid assets into tradable securities and ultimately cash. Assets may include a wide array of categories (bank loans, lease contracts, trade receivables, car loans and so on). At the same time, securitization represents an effective mechanism to transfer risks from banks to investors. In particular, securitization provides a diversified investment portfolio appealing to different categories of investors with different risk-return profiles. Additionally, the process of disposal of illiquid assets from banks' balance sheets, leads to a positive effect for the entire financial system enabling more lending activity. In a nutshell, the main benefits of securitization can be summarized for both originators and investors.

Benefits for lenders (originator bank):

- Unlocking of liquidity,

- Reduction of funding costs,

- Risk reduction and risk transfer,

- Regulatory capital relief, and

- Capital raise with reduced disclosure requirements.

Benefits for investors:

- Portfolio diversification and of customization of investments,

- Risk sharing, and

-    Leveraging on economic cycles.

2.2.2 Process and Success Factors

As introduced, securitization permits the transformation of illiquid assets in interest-bearing financial instruments, tradable on financial markets. The underlying portfolio of assets (referred to as "collateral" or "reference portfolio") can be composed of homogeneous or differentiated assets which interest plus principal payments are transferred from the originator to the capital market. The tool for such transfer is a Special Purpose Vehicle or Securitization Special Purpose Entity (SPV or SSPE), a vehicle embedding these assets.

A core part of securitization process is represented by the set-up of Asset-Backed Securities (ABS) which consist of different categories related to the asset type of the reference portfolio. For instance, securities backed by mortgages (or SMB) are secured by the principal and interest proceeds of a mortgage (or more mortgages). In this category, residential mortgages are secured by residential estates, commercial mortgages are secured by commercial properties (commercial buildings, logistics centers, offices). High-yield loans or ABS are pooled into new financial instruments, and then repackaged into differed tranches (according to their degree of risk) and sold to investors. These instruments are called Collateralized Debt Obligations (CDOs) which can be referred to as collateralized bond obligations (CBOs, backed by junk-level corporate bond), collateralized loan obligations (CLOs, backed by leveraged bank loans) or commercial real estate CDOs (CRE CDOs, backed by real estate loans).

SPVs issue these instruments sliced into tranches. A trance note gathers debt categories according to their risk-return, in order to attract investors interested in the corresponding profile. Tranches carries the risk and the yields of their underlying assets, and for instance the most senior (less risky) tranches are associated with lower

returns as they receive repayment from collateral pool ahead of others (called mezzanine or junior tranches). The level of risk is determined through a rating defining each tranche level, except junior tranches which are generally unrated (Figure 3). This close relationship between risk and return profile, is reflected into the category of investors allowed to invest in each tranche or build portfolio with a blend of various tranches. For instance, pension funds, insurance companies and other institutional investors can by statute invest only in senior tranches. On the other hand, hedge fund and other high-risk investors are oriented towards junior notes (generally unrated) which offer higher yields, but at the same time, by definition, absorb the losses of collateral pool. Junior tranches are the ones more likely to be retained by originator banks when, no investor is found in line with their risk-return, in accordance with European Capital Requirements Directive.

Figure 3 – Risk-Return Profile of Tranche Notes
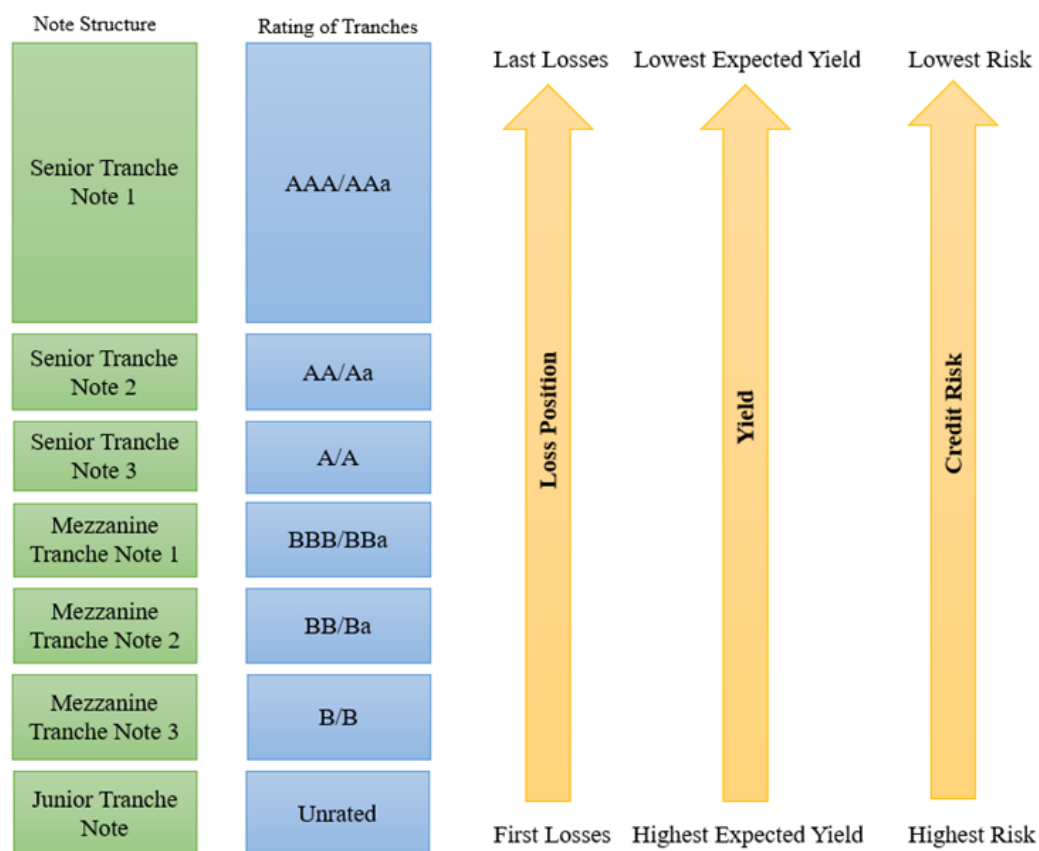
Source: Securitization – Structured Finance Solutions, Deloitte (March 2018).

Since without a rating grade it is hard to market securities to high level institutional investors, a critical factor within a securitization scheme refers to the enhancement of credit quality. This may occur as internal and/or external credit enhancement. In the first case, actions are referred to measures adopted within the securitization structure, such as overcollateralization, subordination, and the use of reserve funds. In the second case, third-party guarantees are required. The adoption of one measure over the others by the issuer is closely related to the trade-off between the effort put in place to enhance credit quality and the lower yield to be recognized to

investors. For the scope of this analysis the case of third-party (state) guarantee will be analyzed.

To better understand the peculiar dynamics of a securitization scheme, an overview on the roles and responsibilities of main subjects involved in the process is outlined below and a summary representation is provided in Figure 4.

Originator Bank (or Sponsor): it is the institution involved in the creation and underwriting of the obligations directed to the securitization process. Such obligations come from the originator's typical activity, that is the lending activity to borrowers. Originators may include a series of entities such as commercial banks, insurance companies, leasing companies and commercial companies which, in some cases, may purchase debt exposures from other entities.

Borrower: an individual or an entity entering into the contractual obligations to correspond one or more payment to the Originator Bank. The creditworthiness of the borrower is crucial for the success of the process. Typically, borrowers are not required to provide consent to the securitization of their loan, and in many cases, the relationship between borrower and originator remains in place, with the latter operating de facto as a servicer to the SPV.

Investors: have a key role as they subscribe the securities issued by the SPV and are due to receive the principal payment and interests deriving from the securitization process. Investor base in a securitization process can be very differentiated as different subjects are featured by different risk appetite. Apart from risk diversification, another reason for different actors to participate in securitization transactions is related to regulatory reasons, as some institutional investors by statute may be prevented from originating debt or accessing to certain sectors.

Asset Servicer: the servicing activity encompasses the process of collecting payments from borrowers of the debt pool and transferring funds to the SPV. Servicing

involves an increasingly complex set of specialistic competences to deal with highly differentiated asset classes and this represents the most critical element in any securitization process. The responsibilities of asset servicing companies may vary markedly (collecting-processing-transferring funds to the SPV, performing data analysis on exposures, reconciliating banks and loans accounts, initiating and processing asset enforcement procedures in cooperation with legal advisors) and they are remunerated accordingly through a servicing fee.

Credit Rating Agencies: rating agencies' role is to assign a rating on the borrower's capacity to repay debt (in terms of timing and likelihood of default). Rating may be attributed to debt issuers, debt obligations (when issued in tranches, rating is assigned to each tranche with different seniority in the order of preference of repayment) and asset servicers. From the rating issued, single tranches can be acquired by dedicated subjects (i.e. high rating debt attracts pension funds). The main drivers analyzed are: capabilities and financial strengths of the originator and servicers, legal risks of the structure, deal design, track record of the servicer and presence and quality of any guarantee or credit enhancement mechanism.

Credit Enhancement Provider: is a third-party entity which is involved in the securitization process to support and enhance the credit quality. The presence of a credit enhancement provider protect against the possibility of cash flows from collateral are not sufficient to fulfill amounts due from borrowers.

Liquidity Facility Provider: is typically a bank entity providing SPV a short-term facility (i.e. revolving loan facility or bridge loan) to hedge against the possibility that underlying collateral pool interrupt payments to investors. It is important to notice how this loan facility cannot be used to make up default events within the debt pool.

Figure 4 – Representation of a typical Securitization process
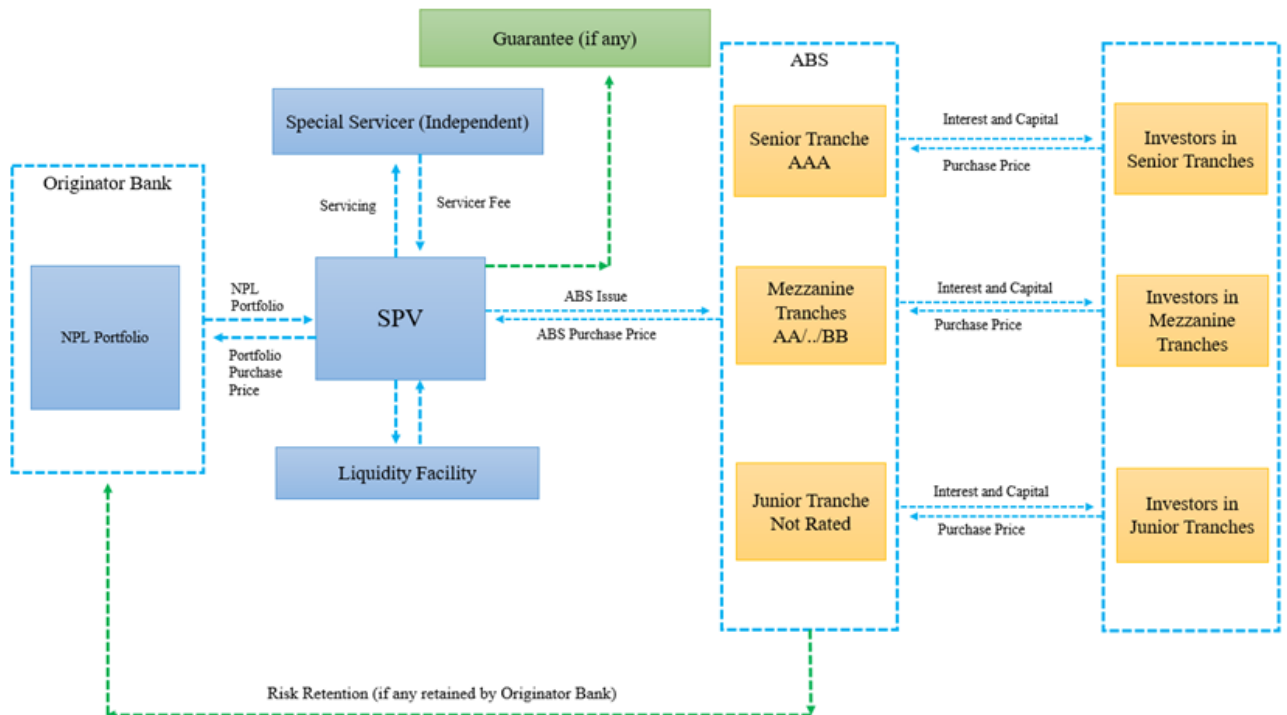
Source: Representation of a typical Securitization process (Fabbri, 2017).

<u>Literature Contributions on Securitization</u>

In the wake of financial crisis, a key effort from institutional framework has been addressed toward the formulation of a NPLs resolution framework aimed at reducing the burden of NPLs from banks' balance sheets. To this extent, in 2014 the European institutions (European Parliament and Council) passed the Bank Recovery and Resolution Directive BRRD and the Single Resolution Mechanism Regulation (SRMR) in order to set up a mechanism able to phase out the use of public money to fix banking failures and oriented to impose the cost of NPLs resolutions primarily to bank's shareholders and creditors (Galand *et al.* 2017). Irrespective of the spectrum of operational solutions available to banks confronting with NPLs, the scope of this study will focus on the securitization one.

Focusing on the obstacles limiting the extent of decisive actions toward the reduction of NPLs in the financial system, Jassaud and Kang (2015) point to the importance of an efficient market for selling and restructuring bad loans in order to timely address the problem. Apart from policy incentives aimed to foster the prompt recognition of NPLs they focus on the role of state-backed AMC vehicles and the creation of an international, European market for NPLs to push for a comprehensive response.

Anastasiou (2016) provides insights on the status of NPLs resolution in Europe, along with differences between *ex-ante* and *ex-post* NPLs management strategies. Among the latter category, he exposes that under securitization, the primary advantage is related to the repackaging of cash flows into a diversified portfolio, a new security aimed to attract a broad investors base. Also, in the European context featured by a slow pace of NPLs recovery, this can represent a time-effective solution to collect a significant amount of cash and allow the seller an immediate access to funds.

Affinito and Tagliaferri (2010) investigates on the ex-ante characteristics of the banks ultimately recurring to securitization in Italy. They find that, though dealing with a composited characterization, banks opting for securitization tend to be less capitalized, less profitable and liquid and featured by troubled loans. Additionally, they go through disposals earlier and for a higher amount of loans.

Though securitization schemes are often associated with wide bid-ask spreads leading to substantial lower value of the initiative, Bruno *et al.* (2017) proposes that carefully tailored securitization mechanisms involving private investors incurring some level of risk can reduce this value gap. They focus on the issue of the increasing NPLs transfer price, improving market conditions. To the same extent, Louri (2017) suggests a combination of different measures for resolution of NPLs. Such approaches

entail: platforms to be used as catalyst for providing due diligence type of information and facilitating a market for NPLs, securitization instruments promoting co-investments and risk sharing and centralized liquidation frameworks for unlikely-to-recover assets.

Also, public initiatives can reduce the information asymmetry by enhancing transparency in key factors such as real estate collateral valuation, an element facilitating the sales process in the secondary market (Garrido *et al.* 2016). Xu (2005) exposes that securitization allows the design of securities of different categories (i.e. returns and maturity) can be appealing to a diverse range of investors willing to take on such risks.

Nonetheless, structural inefficiencies persist in NPLs market limiting the scope for the development of a liquid market. In particular, information asymmetries have a direct effect on disposal price and time needed to negotiate sales. Campbell (2007), for the banking crisis occurred over the last decades, supports that the most appropriate way to deal with NPLs is the adoption of Asset Management Companies (ACMs). In some circumstances, the adoption of AMCs can effectively help overcome these issues, but the cost related to such instruments and their applicability to corporate loans make necessary that certain conditions are met (Fell *et al.*, 2016).

Bolognesi *et al.* (2020) results support that securitization provides the best possible strategy for both investors and banks. Bolognesi *et al.* (2020) also assess how securitization coupled with state-backed guarantees reduce costs of disposal (as difference between accounting price and sale price). However, Ciocchetta *et al.* (2016) conduct study on recovery rates of bad loans within the Italian market and assess how recovery rates, though varying, are generally higher for standard work-out activities than for assets disposal.

NPLs disposal represents an option for bank institutions dealing with the management of bad loans. Portfolio sales constitutes the most direct – though associated with uncertainties due to idiosyncratic lack of transparency – route for banks to reduces their exposure and gain direct access to liquidity. Following an analysis is conducted on banks' wealth effects following securitization announcements (see Annex 1 for a summary of results).

Thomas (2001) in a cross-industry study, concludes that banks' claimants (both bond and equity claimants) manage to reap significantly benefit from securitization, more than in other industries. Gasbarro *et al.* (2005) support that for securitizations conducted by multibank holding companies, value creation is determined for banks with high bond ratings, high leverage, low interest expense and high issue frequency (namely they are experienced securitizators). To this extent, Manz *et al.* (2020), on an extended sample of 317 transactions, find evidence towards positive market reaction for banks involved in NPLs disposals, for divestures featured by real estate asset collateral.

Starting from the low NPLs market valuations and the resulting bid-ask spread, Fell *et al.* (2017) propose the potential benefit of public-private joint investment strategies, aimed at reducing the information asymmetry and facilitating exchanges. Also, they point to innovative solutions such as guarantee on junior traches and forward purchase schemes to better align interests of market participants.

Uhde *et al.* (2011) in a dataset of 381 transactions between 1997 and 2007 find a negative stock market reaction following securitization announcement. The implications of the research demonstrate that returns are time-dependent suggesting a learning curve in the understanding of structured financial leading to securitization. Also, negative abnormal returns seem associated to those banks which retain the

riskiest exposures after the transaction. Such conclusions are aligned with the study of Lockwood *et al.* (1996) analyzing the U.S. market, and partially consistent with Franke and Kranhen (2006) who fails to determine either positive or negative abnormal returns on European securitizations following announcement.

Hollander e Prokop (2015) analyze the effects of securitization announcements on share price of banks. In a sample of transactions between 2002 and 2010, they find positive abnormal returns close to the announcement date, and that such return related to the respective bank's liquidity. More specifically, abnormal returns turn negative in case of transactions featuring high-risk portfolios, following the global financial crisis. In summary, the access to liquidity is positively considered from equity market operators.

Francis *et al.* (2009) conclude that both asset-backed and mortgage-backed securitizations are accompanied by negative market returns, with the trend particularly significant in the years leading to the financial crisis. Additionally, the size of the sponsor in terms of market capitalization and the frequency of recourse to this type of transactions account as explanatory factors in explaining market reaction. More specifically the relationship is positive in the first case and negative in the second case.

Martinez-Solano *et al.* (2009) in a pre-crisis analysis on Spanish sector, demonstrate positive abnormal returns following announcement and varying degree of cumulative abnormal returns along with the considered window. Their results are supportive towards a stronger positive market reaction for banks with lower leverage, lower profitability and when they have been already engaged in such transactions. Lopez-Penabad *et al.* (2015) conclude that post-announcement market reaction is dependent not only to the period, the solvency and liquidity of the bank, but is also

dependent to the volume and the categorization (mortgaged or not) of the securitized assets.

Lejard (2016) in his study encompassing 300 cases between 2001 and 2015, concludes that stock market returns are subject to the characteristics of securitized assets. In particular, seasoning (expressed as the ratio between the age of the asset and its residual maturity) results positively related to returns, whereas the percentage of assets with fixed interest in the portfolio and the number of securitizations are found to have a negative effect on returns.

2.2.3 A view on the European Securitization Market

As anticipated, in the decade following financial crisis, European banking institutions have put in place an extensive effort to reduce NPLs exposure strengthening their balance sheet. As of 2020 year-end data from EBA's Risk Dashboard, NPLs shrunk to a record low amount of around €467.7bn (excluding Great Britain), less than half the amount of €1.2bn recorded in 2014. The main countries contributing to such amount are France (€119.3bn), Italy (€76.7), Spain (€69.7) and Greece (€53.7).

This NPLs offloading activity saw its most important year in 2018, with €208.2bn worth of deals in Europe, a record followed by a sharp decline in disposal activity, with €102.8bn in 2019 and €67.7bn in 2020, making the latter year the period with the lowest level since 2016 (€67.4bn). Below are reported data collected from Debtwire (Figure 5).

Figure 5 – NPLs and Non-Core Loan Deals in Europe by Year
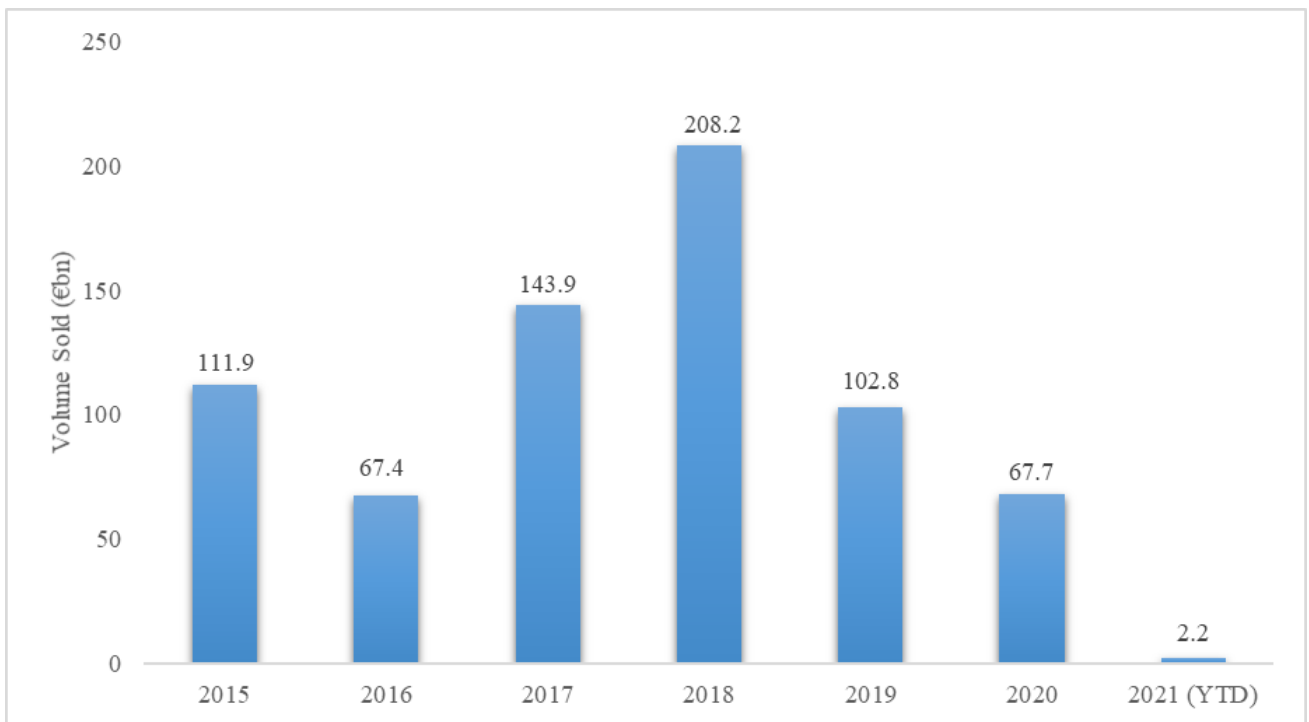
Source: Debtwire NPL Database (Debtwire, 2020).

Narrowing the focus to 2020 (Figure 6), Italy accounted by far for the most important market with deals for an aggregate countervalue of €38bn (plus another €5bn of deals in pipeline). At the same time, Greece surpassed €12bn of deals closed, while nearing additional €27bn of transactions under discussion as of 2020-year end. Other relevant market by deal activity in 2020 are Spain, UK, Ireland, Cyprus, Portugal, and Germany (all aggregating deals value above €1bn in the year).

Figure 6 – European NPLs: Closed and Live Deals by Country in 2020
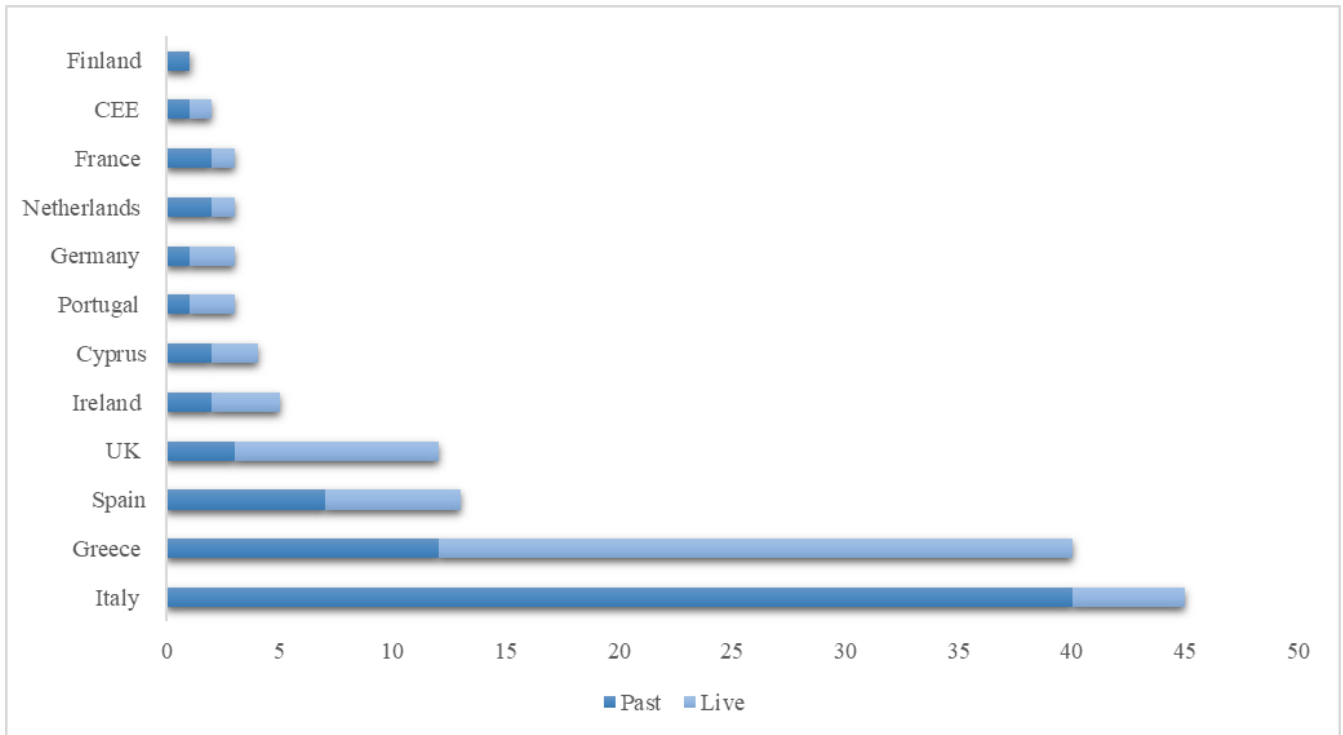
Source: Debtwire NPL Database (Debtwire, 2020).

Finally, with reference to single financial institutions dealing with NPLs sales, Figure 7 exposes the top 10 banks by deal value in 2020. It is clear how the list closely follows the trend summarized in Figure 6, as 6 out of 10 banks are Italians (with Monte Paschi standing out at above €8bn of volume sold), while 2 are from Greece, 1 from UK and 1 from Spain. The main deals refer to the disposal from Monte dei Paschi di Siena (Italy) of a €8.1billion NPLs portfolio to AMCO (the Italian AMC) and the securitization of €7.5billion of NPLs from Eurobank Eragsias (Greece).

Figure 7 – European NPLs Top Sellers in 2020
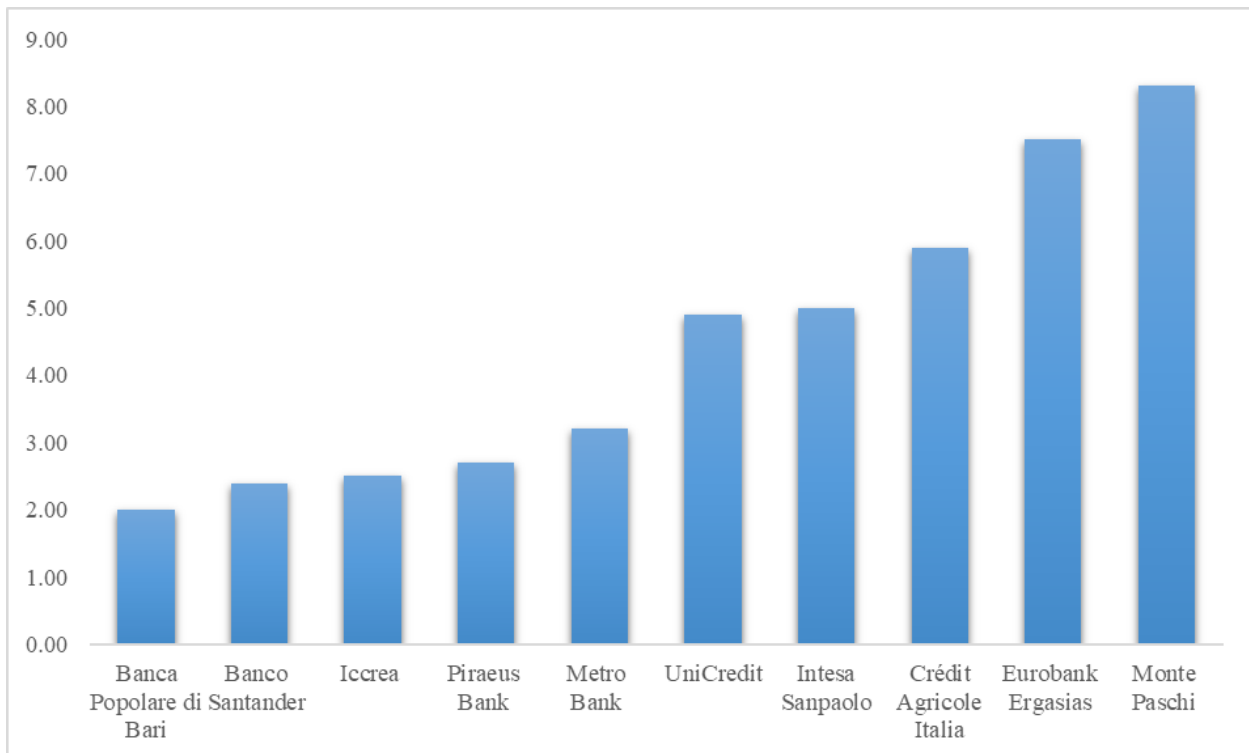
Source: Debtwire NPL Database (Debtwire, 2020).

2.2.4 The Italian Context

With €38billion worth of transactions in 2020, NPLs disposals are set to overcome the threshold of €40billion in Italy in 2021 a level expected to be confirmed in 2022 as well.[8] According to Banca Ifis, the ratio determined as Market Value (€11.7bn) over Gross Book Value (€38bn) topped 31% in 2020, a showing a steady improvement over recent year (Table 1). This trend witnesses the substantial improvement of market conditions in NPLs market, a key factor in narrowing the valuation gap between seller and acquirer.

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[8] Banca IFIS, 2021.

Table 1 – Italian Market Value / Gross Book Value Ratio 2017-2020

Year	Market Value (€bn)	Gross Book Value (€bn)	Ratio
2017	13.6	72.1	18,8%
2018	17.2	66.7	25.8%
2019	10.5	37.6	27.9%
2020	11.7	37.7	31.0%

Source: Banca Ifis, 2021.

The mechanism called GACS (*Garanzia sulla Cartolarizzazione delle Sofferenze*), plays a pivotal role for the success of NPLs securitizations in the Italian market. The GACS, introduced in 2016 (and later extended in 2019 for a period of 24-36 months), envisages a guarantee to be provided from the Italian State on the senior notes repayment in rated NPLs securitization transactions. The main objective of such guarantee is to reduce the bid-ask price spread between originators (selling banks) and investors and contextually increase the number and the volume of NPLs transactions to enhance liquidity in the system. Hence, on the one side, GACS improves the transparency in the process, whereas on the other side it aims to set higher standards of information quality for market operators.

Figure 8 – NPLs Securitization under GACS protection
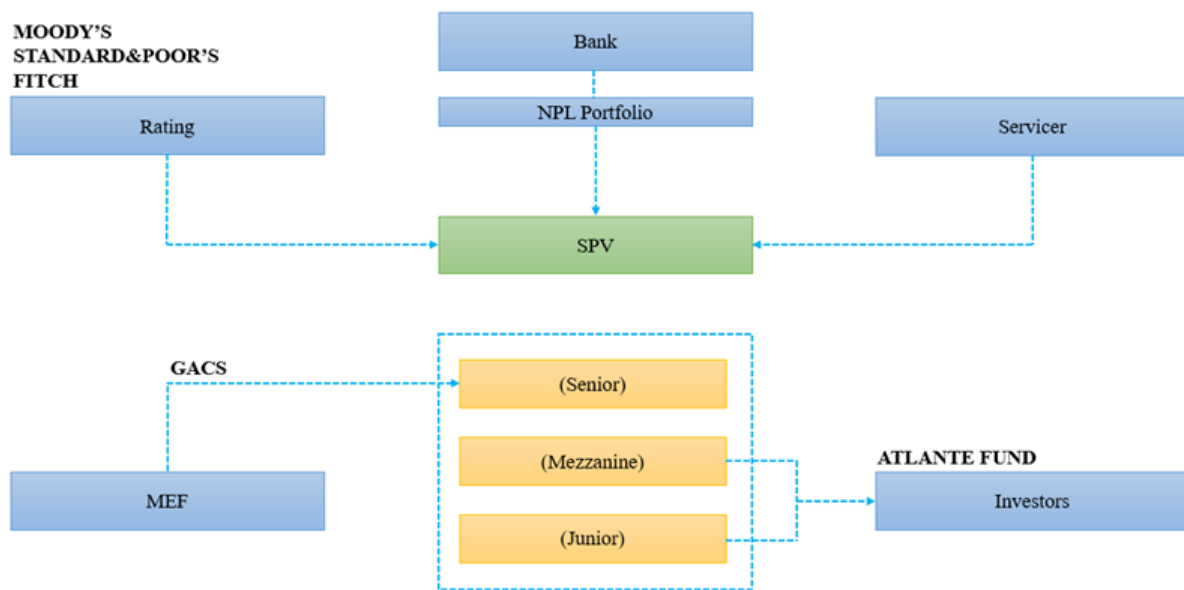
Source: PWC - Market Vision: The Italian NPL servicing market (2017).

In a typical GACS scheme (Figure 8), the bank carries out a securitization transaction of NPLs vis-à-vis a Special Purpose Vehicle (SPV). The liabilities issued by the SPV must have a rating of at least "investment grade". The GACS guarantee materializes as it is a provision for a government guarantee on senior notes issued by an Italian SPV and it is remunerated at market level (determined on annually basis on different baskets of Credit Default Swaps, as it is not considered State aid).

Collection activities are managed by an external NPLs servicer, that should be an entity independent from the originating bank. It is important to notice that the presence of a servicer is a pre-requisite for the grant of GACS guarantee. In the last stage, investors subscribe Junior Notes or Mezzanine Notes. The bank is eligible to receive GACS only if investors subscribe the majority of Junior Notes (i.e. at least 50% +1 of the Notes). Until 2020, recourse to GACS scheme featured ca. €74bn of transactions, the majority of which occurred in 2018 with €45.8bn (Figure 9).

Figure 9 – GACS covered NPLs Portfolio Disposals 2016-2020
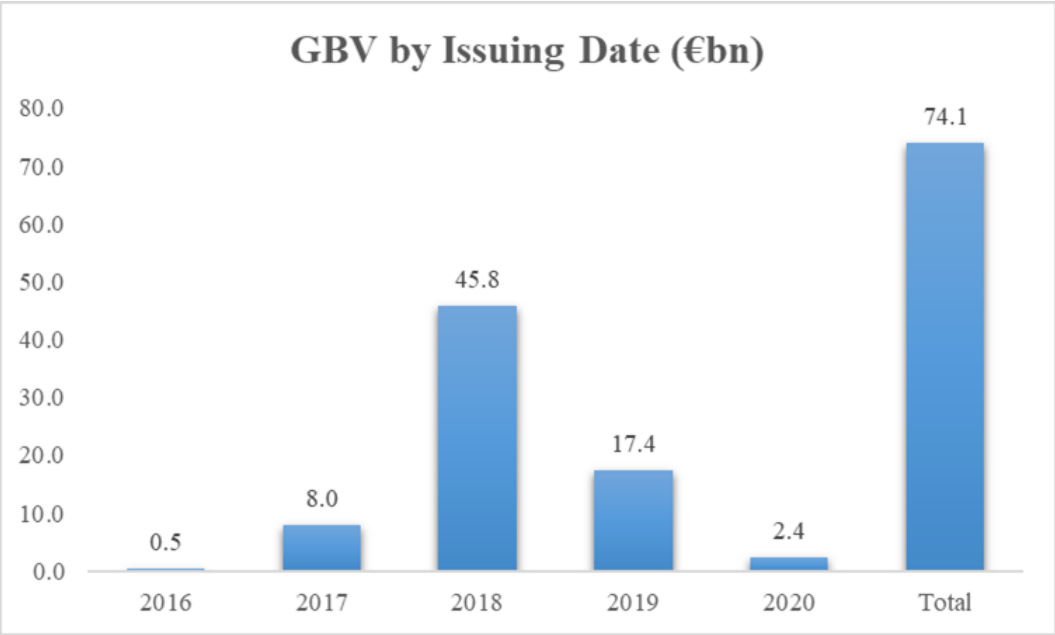
Source: PWC - The Italian NPL Market: The Calm before the Storm (December 2020).

III. Empirical Analysis

3.1 Hypothesis Description

In the previous chapters a thorough description of major dynamics featuring NPLs market in Europe has been rolled out. Against this background, the first research question addressed through the analysis conducted in this chapter is:

Given the prominent role of NPLs sales in addressing the consequences of financial crisis, in which cases do European banks' share prices show an increase following NPLs portfolio disposals?

A sample of NPLs portfolio sales completed in the Europe between 2015 and 2019, is collected to capture the main transactions occurred over the period. The analysis is conducted through an Ordinary Least Squares (OLS) regression model on the main drivers affecting shareholders return following the announcement of a portfolio disposal. The focus is centered around the following main variables of study: Gross Book Value of loans involved in the disposal, NPL Category and Asset Class. Also bank characteristics are included to control the effect of bank-specific issues such as Total Assets, Leverage Ratio and Bank Profitability (expressed as ROE).

Hypothesis 1 – Bank shareholders' returns following NPLs portfolio disposals can be explained by the presence of a deal-specific variables

Additionally, a sub-set of transactions is analyzed in respect to the Italian market. Beside the above-mentioned variables, given the large effect of state guarantee on NPLs transactions occurred in Italy over recent years, the presence of GACS guarantee is considered to investigate effects on shareholders' return. Hence, the second hypothesis is described below:

Hypothesis 2 – Beside general characteristics, the presence of the state guarantee enhances bank shareholders' returns following NPLs portfolio disposal.

3.2   Methodology

Common to the research hypothesis, an event study analysis is conducted to investigate the effects of deal announcement on the daily stock returns of the bank disposing NPLs. Event study is a largely adopted methodology to analyze the behavior of a time series in a given period close to event studied (MacKinlay, 1997). Particularly useful in economics and finance researches, event study requires some major steps to be performed.

First, it is necessary to determine the event of interest and the period in which the event will be examined (the event window). As stated, the event of interest regards the detection of daily stock returns as response to a particular announcement. It is worth to make some clarification about the determination of event windows. Because of the large applicability of this methodology, event windows arising from existing literature may vary from few days surrounding the event to years-long periods of study. The market reaction is expected to occur in the same day of announcement, and a few following days.

Since the hereby described event study is intended to detect short-term reactions and considering the warning of using event study in the long-run (Barber and Lyon, 1997), different event windows are considered within the interval of [-10; +10] around the announcement date (day 0). This time interval is assumed robust enough to absorb any information leakage before the announcement date, and to neutralize any overstatement following the bid. In this time lapse, the event study will compare the

actual stock returns[9] against the predicted returns and determine, when realized, any abnormal return. MacKinlay (1997) suggests two models for determining normal returns: constant mean model (with X_t constant) and the market return (with X_t standing for the market return). For the purpose of the proposed analysis, the market model return is chosen, as a stable linear relation between the market return and the firm's stock return is assumed.

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

$$E(\varepsilon_{it} = 0); \; var(\varepsilon_{it}) = \hat{\sigma}^2_{\varepsilon_i}$$

Where:

R_{it} is the period-t return on security i;

$R_{m,t}$ is the period-t return on market portfolio;

α, β are the market model parameters for security i;

$\sigma^2_{\varepsilon i}$ is the zero mean disturbance term.

Second, for the "normal return" of the firm's stock to be determined, an "estimation window" must be defined. To avoid influence between estimation period and event period, the former should not overlap the latter. In general, the estimation model is defined before the event study. To assess the normal return for firm's stock the estimation period is set to be [-100; -11] from the announcement date. Described in next steps, the longer the estimation window, the higher the influence of the disturbance error on variance. Abnormal returns are so determined as:

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[9] Returns calculated as follows: $\dfrac{P_t - P_{t-1}}{P_{t-1}}$

$$AR_{it} = R_{it} - E(R_{it}|X_t)$$

Where:

AR_{it} is the abnormal return for security i at time t;

R_{it} is the actual return for security i at time t;

$E(R_{it}|X_t)$ is the normal return for security i at time t given the market return in time t.

To obtain the market model parameters for security i, the general conditions ordinary least squares (OLS) provided consistent estimators. For firm i, market parameters are estimates as:

$$\hat{\beta}_i = \frac{\sum_{t=T_0+1}^{T_1} (R_{it} - \hat{\mu}_i)(R_{mt} - \hat{\mu}_m)}{\sum_{t=T_0+1}^{T_1} (R_{mt} - \hat{\mu}_m)^2}$$

$$\hat{\alpha}_i = \hat{\mu}_i - \hat{\beta}_i \hat{\mu}_m$$

$$\hat{\sigma}_{e_i}^2 = \frac{1}{L_2-2} \sum_{t=T_0+1}^{T_1} (R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt})^2$$

Where:

$\hat{\alpha}_i$, $\hat{\beta}_i$ are the market estimator for security i;

$\hat{\sigma}_{e_i}^2$ is the estimation error;

$\hat{\mu}_i$, $\hat{\mu}_m$ are respectively the mean return estimator for the security and the market within the estimation window;

With T_0 and T_1 representing the lower and upper bound of the estimation window. The interval length L_1 is computed as $T_1 - T_0$.

Once determined both estimation window and event window, the abnormal returns for firm i are expressed by:

$$AR_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt}$$

Where:

AR_{it} are the abnormal return for firm i at time t;

R_{it} is the actual return for firm i at time t;

R_{mt} is the market return at time t.

Under the null hypothesis, the security i abnormal returns are jointly normally distributed with zero mean and variance conditional on event window market return:

$$\sigma^2(AR_{it}) = \sigma^2_{\varepsilon_i} + \frac{1}{L_1}\left[1 + \frac{(R_{mt} - \hat{\mu}_m)^2}{\hat{\sigma}^2_m}\right]$$

Two components contribute on the above stated variance: the disturbance term $\sigma^2_{\varepsilon i}$, and the variance attributable to the sampling error in α_i and β_i. It is easy to notice how for increasing values of L_1 the error term falls down to $\sigma^2_{\varepsilon i}$. Accordingly, the estimation interval can be arbitrarily chosen large enough to ignore the contribution of the second term and make the abnormal returns observations independent through time.

From this point on, is possible to draw inference about the abnormal returns in the event windows under the null hypothesis H_0, that the event does not affect the firm i returns. For this reason, under H_0:

$$AR_{it} \sim N(0, \sigma^2(AR_{it}))$$

To draw overall inference for the event of interest, abnormal returns must be aggregated (MacKinlay, 1997). The aggregation of abnormal returns occurs along two dimensions: through time (in the event window) and across securities. Aggregate or cumulative abnormal returns for a given event window are computed as:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it}$$

$$\sigma_i^2(t_1, t_2) = (t_2 - t_1 + 1)\sigma_{ei}^2$$

Where:

$CAR_i\ (t_1,\ t_2)$ are the cumulative abnormal returns for security i in the event window;

σ_{ei}^2 is the CAR_i variance (under the assumptions of independent abnormal returns);

With $T_1,\ T_2$ are respectively the lower and the upper bound for event window. L_2 represents the length of event window and is defined by $T_2 - T_1$.

Under the null hypothesis H_0:

$$CAR(t_1, t_2) \sim N(0, (\sigma_i^2(t_1, t_2)))$$

At this point, the second aggregation occurs across securities to draw overall conclusions about abnormal returns. Average cumulative abnormal returns across securities are estimated:

$$ACAR(t_1, t_2) = \frac{1}{N} \sum_{i=1}^{N} CAR_i(t_1, t_2);$$

$$var(ACAR(t_1, t_2)) = \frac{1}{N^2} \sum_{i=1}^{N} \sigma_i^2(t_1, t_2)$$

Where:

ACAR(t₁,t₂) is the average cumulative abnormal return;

var(ACAR(t₁,t₂)) is the variance of average cumulative abnormal return;

N is the number of events. Finally, to test the null hypothesis that abnormal returns have zero mean, the test-statistic to be used is:

$$\theta_1 = \frac{ACAR(t_1,t_2)}{var(ACAR(t_1,t_2))^{1/2}} \sim N(0,1)$$

3.3 Sample Description

The sample utilized for quantitative analysis includes 71 NPLs securitizations conducted at European level (separating Italy from the rest of Europe). Data are retrieved from Refinitiv and Bloomberg platforms. The main features of the sample are described here below (and summarized in Table 2):

- Timespan: 2015 - 2019;

- Geographical Scope: Italy (32) - Rest of EU (39);

- NPLs featuring State Guarantee (Italy): 19;

- Gross Book Value average: 1.140.64;

- Category: Bad Loans (61) - Unlikely to Pay (10).

In general terms, the sample shows occurrences for nearly all categories.

The timespan 2015-2019 better analyses recent trends in transactions and is able to forecast in detail future variables influencing the selling bank's share price return following the disposal of NPLs portfolio. Moreover, in order to not to tarnish the sample from any anomalous values, the year 2020 was not taken into consideration due to the pandemic circumstances.

Focusing on the single categories, there is a substantial balance between NPLs disposals conducted in Italy and those from the rest of Europe. A clear imbalance

emerges in Category as Bad Loans outnumber Unlikely to Pay deals. In terms of GACS adoption, cases of state security adoption can be found in every year apart from 2015. Finally, the GBV of the securitizations has an upward trend over the period, also considering the peak in 2017: this, along with the increasing number of transactions, demonstrates the wider adoption of this instrument evolving in larger NPLs portfolios over the time.

Table 2 – Sample Summary

Year	NPLs Transactions	Country		Average GBV (€m)	Category		GACS*
		Italy	Other EU		BL	UTP	
2015	4	1	3	529.25	4	0	0
2016	11	4	7	596.90	9	2	1
2017	12	5	7	1,952.94	11	1	3
2018	23	13	10	1,041.82	20	3	10
2019	21	9	12	1,187.37	17	4	5
Total	**71**	**32**	**39**	**1,140.64**	**61**	**10**	**19**

*Only for Italian transactions.

3.4 Regression Model

Within this section, a quantitative analysis, conducted on empirical data, is developed adopting the multiple linear regression model. The model, estimated through the method of the ordinary least squares (OLS), assumes that between the dependent variable (Y) and the independent or explicative variables (X) there is a linear relationship. It is assumed that, from uncorrelated sample data observations, it can be estimated a number of relationships corresponding to the single variables featuring the sample. Hence, the result will feature a series of β coefficients measuring the variation of dependent variable in function to the unit variation of each independent variable, being the other variables kept constant.

The analytical section is complemented with the commentary on the results for each β coefficient their respective significance and finally it is evaluated the general fit of the regression model. Here below, the model is expressed:

$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_n X_{ni} + \varepsilon_i$

$E(\varepsilon_i) = 0$

Where:

Y_i is the dependent variable (where y_i represents the *i-th* sample observation of the dependent variable);

β_n is the slope corresponding to the *n-th* dependent variable X_n keeping constant the other dependent variables (where β_0 represents the regression intercept);

X_{ni} is the n-the independent variable (where x_{ni} represents the sample observation of the n-the variable subject to the analysis in respect to the *i-th* observation);

ε_i is the *i-th* error component of the model (where the expected value of the average of the errors of the model is equal to 0);

$n = 0, \ldots, N$ identify the regression coefficients;

$i = 0, \ldots, I$ identify the single observation.

CAR Determination

The analysis is set out in order to determine the impact of a series of variables of interest on the CAR resulting from the disposal of NPLs portfolios. As discussed in the previous paragraphs, through the analysis of CAR, it is possible to perform an event study analysis to determine the impact of a given event (gathering the interest of the study) on selected metrics able to capture the value creation of the banking institution (in terms of value to shareholders).

Different variables are included in the model with the aim to evaluate which kind of characteristics lead to better returns for shareholders in connection to a NPL disposal. Considering that the composition of the sample includes transactions conducted within the European financial market, abnormal returns are determined comparing the share prices of the bank disposing NPLs with the closing value of Bloomberg European 500 Index, considered the most appropriate benchmark for the purpose.

While determining CAR, a meaningful choice refers to the time frame for CAR calculation. The available literature to date analyses a multitude of available options, in terms of both time extension and window definition (before, after, or alternatively around the event analyzed). The analysis proposed in the present study considers three, windows: [-1; +1], [-5; +5] and [-10; +10]. Hence, all windows include the event day plus 1, 5 and 10 days before and after the event (represented by the announcement date

of the deal). The different lengths are aimed to capture the possible market reactions to NPLs disposal announcement not only in the days following the announcement, but also in the days prior to it, trying to capture possible information leakages. Another choice refers to the length of the estimation period. To ensure a sufficient significance of the estimation, the interval of 100 days immediately before the CAR window is adopted.

As demonstrated in the Annex 2, CAR are significant across all the considered windows. For the regression analysis proposed, results relative to the window [-5; +5] are considered for a series of reasons. First, not only the window includes the days following the NPLs disposal but also embraces a sufficient timespan, to include market reactions due to potential rumors. Also the window [-5, +5], allows to factor in all information relevant for market operators, and it is fairly defined to avoid possible CAR dilution due to other co-founding effects, that may at the same time have some impact on the company market value capitalization.

The average CAR recorded in the window [-5; +5] is 2,682, is significant at an α level of 0.01 (Annex 2 shows results obtained also in windows [-1; +1] and [-10; +10] and Annex 7 shows results of regressions model determined on the same windows). Upon this evidence, it is possible to warrant the general hypothesis that the market tends to reward the choice of reducing exposure to NPLs as a sound strategy to generate cash and improve the quality of bank's assets.

Description of regression Variables

The analysis on CAR is conducted introducing in the regression model both bank-specific (*TA*, *DE* and *CET1*) and deal specific variables (*GBV* and *CAT*), in order to capture the different interactions on CAR.

CAR

Assesses the cumulative abnormal returns in the window [-5; +5] around the announcement day of the NPLs disposal, calculated as detailed in the prior paragraph.

Gross Book Value (GBV)

Also referred to as the Face Value of involved securities, refers to the carrying value (expressed in € million) of the NPL portfolio involved in the transaction. The underlying hypothesis sustains that NPL gross book value can have a significant effect either positive or negative on CAR. This because on the one hand markets may react positively to NPLs disposal as banks can free up capital, while on the other hand, fire sales at a discount may have significant effects on bank's profits. A logarithmic transformation is applied on the variable.

TA

Includes in the model the value referred to the Total Asset (expressed in € million) of the selling bank. The expected relationship on CAR is negative as the effect of a securitization of an NPLs package may decrease for larger banks. A logarithmic transformation is applied on the variable.

DE

Includes in the model the level of debt relative to equity or leverage (expressed as Debt over Equity) at market value. The study supposes a positive sign on CAR, as per higher leveraged banks, the proceeds from disposal of NPLs are expected to be emphasized from equity markets.

CET1

Includes in the model CET1 ratio of the selling bank (the value of core capital over total assets weighted for their relative risk, expressed in percentage terms) at the

time of disposal. The expected sign of the relationship on CAR is positive as this captures the level of bank solidity.

CAT

Dummy variable aimed to introduce in the model NPL category subject to disposal. Namely *CAT* takes value 1 for Bad Loans being included in the transaction and 0 for Unlikely to Pay being included. The study hypothesis considers a positive impact on CAR for Bad Loans.

3.4.1 Regression (1)

Against the background of the variables adopted in the model, the regression model is explicated by the following equation (1):

(1) $CAR_i = \beta_0 + \beta_1 GBV_i + \beta_2 TA_i + \beta_3 DE_i + \beta_4 CET1_i + \beta_5 CAT_i + \varepsilon_i$

1a – Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	Model Significance	
	B	Std. Err.	B	T	P-Value
(Constant)	1.148	7.265		0.158	0.875
lnGBV	0.071	0.607	0.014	0.118	0.907
lnTA	-1.262	0.486	-0.337	-2.598	0.012**
DE	0.491	0.208	0.305	2.363	0.021**
CET1	0.443	0.264	0.195	1.682	0.097*
CAT	3.823	1.983	0.224	1.928	0.058*

*, **, *** Values significant at α levels of 0.10, 0.05 and 0.01

1b – ANOVA

	Sum of Squares	df	Quadratic Mean	F stat	P-Value
Regression	448.616	5	89.723	2.834	0.022**
Residuals	2058.214	65	31.665		
Total	2506.830	70			

*, **, *** Values significant at α levels of 0.10, 0.05 and 0.01

1c – Model Summary

R	R^2	R^2 Adj.	Std. Err.
0.423	0.179	0.116	5.62715

From the output of the Regression (1), *DE*, *CET1* and *CAT*, have all a positive effect on the dependent variable CAR at different levels of significance. *DE* shows that for any additional unit in the Debt Equity ratio there is an impact of +0.491 on CAR, with other variables being equal. The relationship is significant at an α level = 0.05. At the same time, a similar effect is caused by a unitary increase in *CET1* (+0.443), which is significant at a α level = 0.10. When *CAT* corresponds to 1 (securitization includes Bad Loans as opposed to Unlikely to Pay), *CAR* are expected to increase by 3.823 (significant a α level = 0.10). Finally, *lnTA* shows a negative relationship on CAR of -1.262, a result significant at a α level = 0.10. No significant relationship is associated to *lnGBV*. Findings are in line with the preliminary expectations. Additionally, results are supported from F-test (2.834), significant at α = 0,05. From these values it is possible to conclude that at least an explicative variable in the model is actually significant. In respect to the overall model, the values related to R^2 (0.179) and R^2 adjusted (0.116) show a quite moderate fit of the regression model, however it should be considered the empirical nature of the study. Collinearity VIX test shows no issue (see Annex 8).

3.4.2 Regression (2)

The second regression is intended to investigate to possible effect on CAR related to the presence of state guarantee denominated GACS on *CAR* of NPLs disposals conducted in Italy. Accordingly, the sample is reduced to the 32 transactions occurred in the Italian market from 2015 to 2019, having in consideration that state guarantee has been implemented since 2016. The independent variable *GACS* is introduced to serve this scope, and in particular, it is a dummy variable taking value 1 for securitizations featuring state guarantee and 0 on the opposite case. The effect of *GACS* on *CAR* is expected to be positive, since, as discussed in previous chapters the

presence of state guarantee in presence of NPLs securitizations has a twofold benefit: facilitating the disposal and helping bank realize a higher price as percentage of portfolio's gross book value. This regression model so constructed is summarized in the following equation *(2)*.

$$(2)\ CAR_i = \beta_0 + \beta_1 GBV_i + \beta_2 TA_i + \beta_3 DE_i + \beta_4 CET1_i + \beta_5 CAT_i + \beta_6 GACS_i + \varepsilon_i$$

1a – Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	Model Significance	
	B	Std. Err.	B	T	P-Value
(Constant)	7.128	12.315		0.579	0.568
lnGBV	0.968	1.131	0.141	0.856	0.400
lnTA	-1.860	0.814	-0.421	-2.285	0.031**
DE	0.573	0.316	0.316	1.814	0.082*
CET1	2.163	0.365	0.010	0.059	0.953
CAT	3.085	2.707	0.186	1.140	0.265
GACS	5.243	2.466	0.345	2.126	0.044**

*, **, *** Values significant at α levels of 0.10, 0.05 and 0.01

<center>2b – ANOVA</center>

	Sum of Squares	df	Quadratic Mean	F stat	P-Value
Regression	716.877	6	119.479	2.801	0.032**
Residuals	1066.319	25	42.653		
Total	1783.195	31			

*, **, *** Values significant at α levels of 0.10, 0.05 and 0.01

<center>2c – Model Summary</center>

R	R^2	R^2 Adj.	Std. Err.
0.634	0.402	0.259	6.5301

From the output of Regression (2), *GACS* has a meaningful positive and significative impact on dependent variable *CAR* at an *α* level = 0.05. The presence of state guarantee increases *CAR* by 5.243, with other variables being kept equal. Hence, results are in line with the preliminary expectations of state guarantee leading to value creation in securitization transactions. Among the variables previously described, *lnTA* (-1.860) and *DE* (+0.573) both show a significant effect on *CAR*, consistently with results obtained in Regression (1). Significance is at an *α* level respectively of 0.05 and 0.10. Results are supported from F-test (2.801), significative at α = 0,05. Again, from this value it is possible to conclude that at least an explicative variable in the model is actually significative. In respect to the overall model, the values related to R^2 (0.402) and R^2 adjusted (0.259) show a quite appreciable fit of the regression model (slightly more than 25% of the error is explained), considering the empirical nature of the study. Also, from VIX test, no abnormal value of collinearity emerges (see Annex 8).

IV. Conclusions

The efforts to remedy to the issues of NPLs across Europe characterized the action of policymakers over the last years. Although substantial results have been achieved so far, the need to further reduce the burden of NPLs finds multiple justifications. First, the sudden reversal of economic growth, as demonstrated by the outbreak of Covid19 pandemic, may immediately raise new and generalized pressures on the financial system. Second, some countries still face a substantial level of NPLs accounted in their domestic banks' balance sheets, a factor which cannot be ignored by policymakers and institutions. Third, since the emergence of NPLs conventionally follows a period of poor credit quality and looser institutional control, the attention on the issue should remain high, in order to limit to room for new crisis. Fourth, room for improvements persists in terms of transparency and coordination in the market of NPLs, as despite market developments still obstacles remain for market operators.

Hinging on the extensive strand of available literature, the present study has been aimed at analyzing the broader scope of the NPLs issue in the European system under multiple perspectives. A first level of analysis has addressed the key determinants of NPLs accumulation in different geographical areas taking the perspectives of both macro and bank-specific characteristics. Then, the focus has been shifted to the study of policy instruments deployed to the resolution of NPLs crisis, mainly in the European context.

Ex-ante credit management measures (closely related to the establishment of effective supervision on the financial system) are undoubtedly the most appropriate tool to prevent shocks on the financial system. However, a careful and prompt enactment of *ex-post* measures proves to be crucial to reduce the burden of NPLs, once deteriorated exposures emerge. To this extent, write-offs, direct sales, asset protection schemes, securitizations and AMC are all options to be considered by policymakers.

Evidence from European countries shows that in the aftermath of financial crisis the adoption of these tools to a different degree and based on country-specific characteristics. In many circumstances, the successful resolution of NPLs issue has been achieved thanks to the coordination of the different alternatives applied in conjunction.

In this project a particular focus has been devoted to the discussion of the peculiar traits featuring NPLs portfolio securitizations. According to the prevailing argument discussed in literature, securitization is viewed as the most effective response to cope with non-performing exposures in bank's balance sheets and free up capital. Securitizations are based on a complex mechanism, in which bank's bad exposures are pooled into a SPV and repackages into new securities reflecting different risk profiles. This research follows this main school of thought. According to the results, compared to other alternatives, the advantages of securitization refer mainly to risk diversification for investors willing to take on certain level of risk (hence enlarging the audience of possible investors). The pooling of credit lines facilitates economies of scale, reduces the transaction costs and makes marketable NPLs not marketable individually. Furthermore, for banks, NPLs securitization provides quick access to liquidity and the easing of capital requirements. In summary, securitization of NPLs allows to realize a higher price than other alternatives in shorter time. The success of securitization schemes heavily relies on the establishment of a market for securitized securities. This relates to the fact that a number of different subjects is involved in the process. In particular, experience and skills of servicers on the one side, and the presence of specialized investors on the other side are distinctive factors to facilitate market conditions. Finally, NPLs securitization do not completely overcome the issues of valuation gaps between sellers and buyers and information asymmetry.

From this theoretical framework, the analysis conducted on *CAR*, chosen as a key metric of shareholders value creation, is aimed at determining the dynamics of NPLs portfolio disposals. Results demonstrate how shareholders returns are significatively influenced from a series of factors. In particular, in the first level regression, conducted on a sample of European NPLs securitizations, the variables associated to total assets (-), financial leverage (+) level of *CET1* of the disposing bank and the category of assets involved (+) show a significant effect on *CAR*. At the same time, in the second level regression, conducted on a sub-sample of transactions conducted in the Italian market, shows the positive effect of GACS on CAR, supporting the hypothesis that such guaranteed scheme favorites NPLs disposals. These results support the hypothesis of the research that markets tend to look at both bank specific and deal specific variables in assessing the realization of value in an NPLs transaction for the selling bank. Also, state guarantee, when provided, constitutes a key part of the deal, as such element helps bridge the gap between asking price of NPLs and the price potential buyers would be willing to pay, a difference that often remains large in markets whereby weak contract enforcement and lack of transparency lay the foundations for high levels of information asymmetry.

The overall results above described constitute a good starting point in identifying and understanding the key drivers of success for shareholders value creation in NPLs securitizations. However, the determinants of post-announcement value market reaction still seem not entirely unveiled. Due to the nature of the research questions and the limited use of variables adopted in the empirical section, this research was based on largely academic research methods. The study conducted in this research did not, for the most part, yield to practical managerial implications.

As specified in Chapter 4, the variables adopted in the empirical section are just a sub-set of the broader spectrum of possible variables to be considered in such

type of analysis. To the same extent, measures used to explain the pattern of *CAR* are based on publicly available information and in some cases represent a synthetic representation. It is possible that the extension of these points, intended to include more bank and transaction-based characteristics, could undoubtedly provide more accurate evidence on the sources of value creation in NPLs securitizations.

The limitations of this research point towards topics to be addressed in the future. Worldwide NPLs disposals will continue to evolve through different methods and alternatives. NPLs disposals should strive to lead this change. The following are a few areas for future research.

The implementation of an analysis on a wider sample under a longer time perspective could provide a better understanding and help decouple possible cofounding effects. Additionally, longer-term measures of value-creation may be considered in order to assess whether banks recurring to securitizations actually gains and maintains value beyond the short-term period. Ultimately, more practical research, such as a project based on real case studies or a survey, could better determine the managerial implications for banks and companies specializing in NPLs transfers.

Regardless of these points, findings are consistent with theoretical insights and results well-grounded from a statistical point a view. The analysis of NPLs dynamics (whether under the perspective of NPLs securitizations or not) is a growing field that seems destinated to be developed over the future along with the evolution of NPLs market. The interest towards the issue will follow this pattern.

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Annex

Annex 1 – Summary of Studies on Wealth Effects of Securitization

Author(s)	Year	Observations	Country(-ies)	Result
Lockwood et al.	1996	294	US	Negative
Thomas	2001	1,416	US	Positive
Gasbarro et al.	2005	224	US	Positive
Franke and Kranhen	2006	73	Europe	Mixed
Martinez-Solano et al.	2009	44	Spain	Positive
Francis et al.	2009	9,407	Worldwide	Negative
Uhde et al.	2011	381	EU & Switz.	Negative
Lopez-Penabad et al.	2015	162	Spain	Mixed
Hollander and Prokop	2015	97	Europe	Positive
Lejard	2016	300	EU & Switz.	Mixed
Manz et al.	2020	317	EU	Positive

Annex 2 – Summary of CAR windows

Window	Average	P-Value
[-1; +1]	2.2716	0.0263**
[-5; +5]	2.6816	0.0092***
[-10; +10]	2.0087	0.0486**

*, **, *** Significant for values of α of respectively 0.1, 0.05 and 0.01

Annex 3 – Regression (1) Sample Summary Table

n = 71	CAR	lnGBV	lnTA	DE	CET1	CAT
Max	31.53	9.78	14.30	30.06	31.00	1
Min	-8.40	3.40	8.85	5.99	9.00	0
Median	1.28	6.04	11.99	13.52	12.34	1
Mean	1.99	6.11	12.15	13.85	12.89	-
Std. Dev.	5.98	1.15	1.59	3.74	2.65	-

Annex 4 – Regression (2) Summary Table

n = 32	CAR	lnGBV	lnTA	DE	CET1	CAT	GACS
Max	31.53	9.29	14.25	30.06	31.00	1	1
Min	-8.40	3.40	8.85	6.09	10.00	0	0
Median	4.04	6.29	13.58	12.87	12.00	1	1
Mean	3.71	6.03	12.29	13.93	13.17	-	-
Std. Dev.	7.58	1.10	1.71	4.18	3.61	-	-

Annex 5 – Regression (1) Correlation Matrix

n = 71	CAR	lnGBV	lnTA	DE	CET1	CAT
CAR	1					
lnGBV	0.023	1				
lnTA	-0.228	0.252	1			
DE	0.094	0.152	0.411	1		
CET1	0.208	0.099	-0.053	-0.182	1	
CAT	0.145	0.073	0.040	-0.131	-0.082	1

Annex 6 – Regression (2) Correlation Matrix

n = 32	CAR	lnGBV	lnTA	DE	CET1	CAT	GACS
CAR	1						
lnGBV	0.156	1					
lnTA	-0.354	0.086	1				
DE	0.159	0.020	0.399	1			
CET1	0.139	0.244	-0.300	-0.920	1		
CAT	0.192	0.112	-0.205	-0.211	0.211	1	
GACS	0.417	0.064	-0.087	0.141	-0.122	-0.093	1

Annex 7 – Regression (1) Results for CAR [-1; +1] and [-10; +10] windows

1a – Regression Coefficients [-1; +1]

Model	Unstandardized Coefficients		Standardized Coefficients	Model Significance	
	B	Std. Err.	B	T	P-Value
(Constant)	0.383	5.076		0.075	0.940
GBV	-0.087	0.422	-0.024	-0.207	0.837
TA	-0.627	0.336	-0.243	-1.865	0.067*
DE	0.466	0.144	0.417	3.242	0.002***
CET1	0.054	0.185	0.034	0.292	0.771
CAT	2.064	1.376	0.175	1.500	0.138

*, **, *** Values significant at α levels of 0.10, 0.05 and 0.01

2b – ANOVA

	Sum of Squares	df	Quadratic Mean	F stat	P-Value
Regression	182.282	5	36.456	2.347	0.051*
Residuals	1009.696	65	15.534		
Total	1191.978	70			

*, **, *** Values significant at α levels of 0.10, 0.005 and 0.01

2c – Model Summary

R	R²	R² Adj.	Std. Err.
0.391	0.153	0.088	3.9413

1a – Regression Coefficients [-10; +10]

Model	Unstandardized Coefficients		Standardized Coefficients	Model Significance	
	B	**Std. Err.**	**B**	**T**	**P-Value**
(Constant)	9.047	9.435		0.959	0.341
GBV	-0.217	0.744	-0.041	-0.292	0.771
TA	-1.770	0.645	-0.429	-2.746	0.008***
DE	0.975	0.286	0.525	3.404	0.001***
CET1	0.189	0.370	0.062	0.512	0.610
CAT	-0.178	0.616	-0.037	-0.289	0.773

*, **, *** Values significant at α levels of 0.10, 0.05 and 0.01

2b – ANOVA

	Sum of Squares	df	Quadratic Mean	F stat	P-Value
Regression	858.647	5	171.729	2.824	0.023**
Residuals	3953.133	65	60.817		
Total	4811.779	70			

*, **, *** Values significant at α levels of 0.10, 0.05 and 0.01

2c – Model Summary

R	R^2	R^2 Adj.	Std. Err.
0.422	0.178	0.115	7.7985

Annex 7 - Regression (2) Results for CAR [-1; +1] and [-10; +10] windows

2a – Regression Coefficients [-1; +1]

Model	Unstandardized Coefficients		Standardized Coefficients	Model Significance	
	B	Std. Err.	B	T	P-Value
(Constant)	1.513	6.859		0.221	0.827
GBV	0.380	0.630	0.085	0.603	0.552
TA	-1.061	0.453	-0.372	-2.341	0.028**
DE	0.747	0.176	0.638	4.251	0.000***
CET1	-0.231	0.203	-0.170	-1.137	0.266
CAT	3.739	1.508	0.349	2.479	0.020**
GACS	2.564	1.374	0.261	1.867	0.074*

*, **, *** Values significant at α levels of 0.10, 0.05 and 0.01

2b – ANOVA

	Sum of Squares	df	Quadratic Mean	F stat	P-Value
Regression	413.023	6	68.837	5.202	0.001***
Residuals	330.815	25	13.233		
Total	743.839	31			

*, **, *** Values significant at α levels of 0.10, 0.05 and 0.01

2c – Model Summary

R	R^2	R^2 Adj.	Std. Err.
0.745	0.555	0.449	3.63767

2a – Regression Coefficients [-10; +10]

Model	Unstandardized Coefficients		Standardized Coefficients	Model Significance	
	B	Std. Err.	B	T	P-Value
(Constant)	-6.422	15.499		-0.414	0.682
GBV	0.730	1.423	0.078	0.513	0.613
TA	-2.111	1.024	-0.354	-2.061	0.050*
DE	1.475	0.397	0.602	3.713	0.001***
CET1	0.250	0.460	0.088	0.545	0.591
CAT	5.199	3.407	0.232	1.526	0.140
GACS	4.890	3.104	0.238	1.576	0.128

*, **, *** Values significant at α levels of 0.10, 0.05 and 0.01

2b – ANOVA

	Sum of Squares	df	Quadratic Mean	F stat	P-Value
Regression	1564.761	6	260.794	3.860	0.007***
Residuals	1689.021	25	67.561		
Total	3253.784	31			

*, **, *** Values significant at α levels of 0.10, 0.05 and 0.01

2c – Model Summary

R	R^2	R^2 Adj.	Std. Err.
0.693	0.481	0.456	8.21954

Annex 8 – Multicollinearity

REGRESSIONE (1) –COLLINEARITY TEST

	Collinearity Statistics	
	Tolerance	VIF
Constant		
lnGBV	0.930	1.076
lnTA	0.749	1.336
DE	0.760	1.317
CAT	0.937	1.067
CET1	0.935	1.069

REGRESSION (2) –COLLINEARITY TEST

GACS	0.909	1.100
	Tolerance	VIF
Constant		
lnGBV	0.887	1.127
lnTA	0.704	1.421
DE	0.790	1.266
CET1	0.792	1.263
CAT	0.900	1.111

Executive Summary

1. Introduction

The proliferation of NPLs within the financial system carries substantial issues, such as lower banks' profitability, higher financing costs and regulatory capital requirements, and obviously creates a distortion of capital uses towards sub-optimal economic activities. After an extensive view of the market trends occurred in the aftermath of financial crisis of 2007, a detailed analysis is conducted across countries on major academic contributions. The aim of the present study is to investigate the determinants and the dynamics featuring the banking sector's shareholders value creation following disposals of NPL portfolios.

Against this background the research question of the thesis: given the prominent role of NPLs sales in addressing the consequences of financial crisis, do bank's share price show an increase following NPLs portfolio disposals?

Starting from the above question, this thesis is intended to provide a contribution to the existing academic research under three perspectives. First, an overview of the trends and characteristics featuring the NPLs environment is rolled out. Second, an in-depth study review is conducted on recent contributions addressing the strategies to reduce the NPLs burden on banking system. Third, the analytical section is developed to provide an updated understanding on the shareholders returns following portfolio disposals both at European and Italian level.

2. Determinants of NPLs

NPLs can be broadly defined as banks' exposures to debtors who are no longer able to repay (entirely or partly) their contractual obligations because of their deteriorated creditworthiness and broader financial conditions. NPLs categorization may vary from country to country, however, the harmonization effort promoted in respect to the mechanism of definition and recognition of NPLs is constantly sought to promote coordination and prompt actions at systemic level across single countries. In light of the EBA approach, financial institutions must classify loans as non-performing, whether or not they are backed by guarantees, in case they consider debtor no longer able to repay them in full. Paragraph 145 - Annex V of the EBA ITS on supervisory provides that "non-performing exposures are those that satisfy either or both of the following criteria:

- material exposures which are more than 90 days past-due;

- the debtor is assessed as unlikely to pay its credit obligations in full without realization of collateral, regardless of the existence of any past-due amount or of the number of days past due."

Therefore, the definition of NPLs is based on the "past-due" and "unlikely-to-pay" criteria. Accordingly, these criteria apply regardless of whether there are unpaid past-due amounts, or when there are more than 90 days past-due and/or their amount is significant according to the criteria established at national level. According to Banca d'Italia, NPLs categories are divided into:

- Bad loans or "sofferenze": are exposures to debtors that are insolvent or in substantially similar circumstances. These are exposures to a borrower in a position of insolvency (not necessarily

recognized by a court) or a substantially similar situation. The definition of bad loans materializes irrespective of the presence of any collateral.

- Unlikely-to-pay exposures or "inadempienze probabili" (aside from those included among bad loans): are those in respect of which banks believe the debtors are unlikely to meet their contractual obligations in full unless action such as the enforcement of guarantees is taken. This definition focuses on the result of the assessment conducted from the bank about the possibility of a debtor to repay his/her obligations.

- Overdrawn and/or past-due exposures (aside from those classified among bad loans and unlikely-to-pay exposures): are those that are overdrawn and/or past-due by more than 90 days and for above a predefined amount. This category also includes the corresponding definition of "incagli oggettivi", namely the past due exposures older than 270 days.

NPLs build-up are a recurrent feature of financial crises and financial stress episodes. NPLs volumes typically increase following credit booms and emerge when these turn to bust. At the same time, NPLs accumulation can result from extended periods of low growth and structural imbalances within banking sector. During the financial crisis, bad credit has evolved its occurrence into more advanced instruments, such as derivatives rather than classics loans. Whichever the actual generation of NPLs is, the determinants leading to bad loans may be different. An extensive strand of literature analyses the link between excessive credit growth, the financial cycle and banking crises.

Europe

Given the huge impact of NPLs on the growth of the financial system, a large strand of research has flourished in recent years in order to study the determinants of bank insolvencies, with a major interest on European countries. On the one hand, bank-specific features account for a key role in explaining the accumulation of bad loans in banks' balance sheets. In particular, a landmark contribution from Berger and DeYoung (1997) points to poor management hypothesis (defined as over expenditures and poor underwriting practices) as a cause leading to insurgence of bad loans. Podpiera and Weill (2008) findings contend that lower bank's cost efficiency results into a higher likelihood of NPLs, and that supervisions should address enhanced cost efficiency to curb the risks linked to bad loans and consequent bank failures. Rossi *et al.* (2008) contrarily to the largely accepted consensus, do not find significant evidence of bad management practices influence on loans quality. Rather, their study attributes an exogenous effect related to the poor luck hypothesis.

On the other hand, country-specific factors are found as meaningful determinants too. Beck *et al.* (2015) finds that GDP growth together with stock market performance, interest rates and exchange rate affect NPLs. Nkusu (2011) correlates bad loans growth with deteriorating macroeconomic conditions expressed in terms of sluggish GDP growth, decreasing assets prices and higher unemployment levels. Anastasiou *et al.* (2016) add the implementation of personal income tax and the occurrence of output gap as both significant predictors of NPLs uptick. Karadima and Louri (2020) focusing on the main European countries (France, Germany, Italy

and Spain), between 2005 and 2017, determine a positive impact of economic policy uncertainty on NPLs, however this is moderated by higher bank concentration. Vogiazas and Nikolaidou (2011) expand the application of largely investigated macroeconomic determinants with the spillover effect arising from the banking crisis of a neighboring country.

Many studies find a confounding effect of such dimensions. Louzis *et al.* (2012) taking the perspective of Greek banking sector, analyses the impact of both macroeconomic factors and bank-specific issues on different loan categories. Results show that NPLs are mainly related to macroeconomic factors (though with a varying degree of impact on different loan categories) and management quality. Makri *et al.* (2014) results support significant correlations between NPLs and a score of both macroeconomic and bank-specific dimensions. Kauko (2012) finds that a rapid credit growth before financial crisis, when associated with current account deficit, rather than alone, is a reliable predictor of the relative amount non NPLs in 2009. Messai and Jouini (2013) find that the degree of non-performing loans issue varies negatively with the growth of GDP and the banks' profitability, whereas is positively associated with unemployment rate the total loan loss reserves to total loans ratio and the real interest rate. In their extensive review, Nikopoulos and Tsalas (2017) proposes how the determinants of NPLs are not limited to concurrent macroeconomic environment and bank-specific factors, but also legal and regulatory framework matters.

Italy

With regards to Italy, Quagliariello (2007) associates the level of NPLs with the business cycle. The study conducted by Bonfondi and Ropele (2011) finds that the quality of lending can be explained by macroeconomic variables portraiting the general status of the economy and that variations to macroeconomic conditions have a deferred effect on loans quality.

Alessi *et al.* (2014) conclude that loan loss provisions are mainly related to non-discretionary factors (such as expectations about future losses and perception related to credit risk) whereas management discretionary behaviors and business cycle do not influence the provisioning mechanism. Milani (2017) downsizes the role related to macroeconomic factors in Italian NPLs, providing instead evidence supporting that bad management (both for big and small banks) accounts the most in explaining higher credit risk incurred.

NPLs Outside Europe

Outside the NPLs-laden European financial system, significant patterns are investigated in other countries. Ghosh (2015) finds positive relationship between NPLs increase and a score of macroeconomic factors, including liquidity risk, inefficiency cost, larger capitalization (as size of the banking sector), unemployment, inflation, and public debt. Saba *et al.* (2012) combining macroeconomic and bank-specific factors with the legal framework traits, find that, though many variables can be considered explanatory, real GDP per capita shows the most significant pattern on explaining NPLs.

Allen *et al.* (2012) in their study encompassing Australian and Canadian banks, conclude that banks' specific characteristics (balance sheet and income statement related factors) do not explain the increase in the level of

NPLs, a phenomenon which can be better understood under the prospective of global banking financial risk contagion.

Yilmaz (2018) studies the combination of a series of institutional and bank-specific factors on a large sample of developing countries between 2000-2013. In the first category, he finds that unemployment rate, public debt, and one-year lagged value of NPL have a positive impact on NPLs, while economic growth, inflation, general government net lending/borrowing, and economic freedom (institutional development) have a negative impact on NPL. On the bank-specific side, domestic credit to private sector (credit growth), cost to income ratio, and one lagged value of NPL had a positive impact on NPL, while regulatory capital to risk-weighted assets, return on assets and equity and noninterest income to total income had a negative impact on NPL.

Boudriga *et al.* (2009) taking the perspective of 12 countries in MENA region, find that the degree of information available on public and private providers and the characteristics of the institutional framework positively affect banks' credit quality.

Zhang *et al.* (2016) investigate the behavior of commercial banks between 2006 and 2012 and determine the presence of moral hazard in lending decisions of such institutes. In particular, riskier lending increases with NPLs level, a poisonous conundrum leading to the general worsening of loan quality and hampering the stability of financial system.

Vithessonthi (2016) analyses the relationship between credit growth and NPLs in a selection of 82 commerscial banks in Japan. He determines how an increase in bank credit positively affects the accumulation of NPLs prior to the financial crisis of 2007, a trend mostly present in large banks.

Ghosh (2006) in his work, concludes that, in the Indian economy, high financial leverage in corporate sector plays an important role on banks' bad loans. Given the lagged and significant relationship, a close look to the level of leverage ratio, should suggest a preventive action from policymakers.

Rachman *et al.* (2018) scrutinize the bank-specific factors affecting bad loans in Indonesian banking system and shed light on the negative relationship between credit growth and profitability on NPLs levels. In fact, these two features can be considered as proxies of good managerial practices.

Isik and Bolat (2016) finds that among bank specific determinants in Turkey, higher levels of profitability and diversification of revenues negatively affect the NPLs amount with greater capital and loan loss provision affecting positively the NPLs level. On the macroeconomic side, economic growth has a negative effect on NPLs, whereas the onset of financial crisis demonstrates an increase in NPLs.

Finally, regarding the context of African economies, Olayinka and Mofoluwaso (2014) finds separate the effects in the short and long run in Nigeria. In the first case, economic growth is confirmed to have a negative effect on NPLs level, differently from unemployment rate, credit to private sector and exchange rate. In the short term, credit level to private sector, exchange rate, lending rate and stock market performance are found as the main determinants of NPLs. Amuakwa-Mensah and Boakye-Adjei (2015) conclude that in Ghana both bank-specific and macroeconomic factors have a significant effect on domestic banks' NPLs.

3. NPLs during Covid19

The pervasive consequences of Covid19 pandemic on economy are having a direct impact on the NPLs level around the world. Not only Covid19 has slowed down ongoing efforts to offload bad loans from bank's balance sheet, but also it laid the foundation for new bad loans to arise in the financial system. Demary (2021) concludes that a mixture of insolvencies, zombification and debt leveraging will emerge in the post-Covid19 European market. The prevailing scenario will depend on the regulator and bank's actions in recognizing the measure directed to viable companies.

Kasinger *et al.* (2021) despite similarities with previous crisis, find two main features from Covid19-led loan moratorium: high degree of heterogeneity across industry sectors and countries and uncertainty related to the medium-term extent of lockdown measures. Despite early and extensive government support to economy they suggest a proactive approach to banks in recognizing NPLs to ensure post-Covid19 financial stability.

Also, Ratnovski (2020) poses those differences from 2007 financial crisis should be carefully balanced. On the one side, Covid19 comes at a time when banks have a better balance sheet, there is no immediately precedent credit boom and IFRS 9 provides for an easier framework to NPL recognition. On the other side however, higher government debt, lower banks' profitability and weaker corporate balance sheets raise hurdles on an immediate NPLs resolution.

4. Management of NPLs Resolution

In the wake of financial crisis, a key effort from institutional framework has been addressed toward the formulation of a NPLs resolution framework aimed at reducing the burden of NPLs from banks' balance sheets. To this extent, in 2014 the European institutions (European Parliament and Council) passed the Bank Recovery and Resolution Directive BRRD and the Single Resolution Mechanism Regulation (SRMR) in order to set up a mechanism able to phase out the use of public money to fix banking failures and oriented to impose the cost of NPLs resolutions primarily to bank's shareholders and creditors (Galand *et al.* 2017).

Focusing on the obstacles limiting the extent of decisive actions toward the reduction of NPLs in the financial system, Jassaud and Kang (2015) point to the importance of an efficient market for selling and restructuring bad loans in order to timely address the problem. Apart from policy incentives aimed to foster the prompt recognition of NPLs they focus on the role of state-backed AMC vehicles and the creation of an international, European market for NPLs to push for a comprehensive response.

According to the classification proposed by Anastasiou (2016) available measures for resolution of NPLs can be distinguished between Ex-Ante and Ex-Post NPLs management measures.

For what concerns <u>Ex-Ante</u> management measures, three factors should be considered as pre-conditions in order to manage NPLs:
- Prevention of NPLs insurgence or maintenance of such loans under a level of control;
- The characteristics and the actions of banks in which NPLs can are found; and
- The manner insolvent banks should be treated.

Campbell (2007) in proposing these elements, argues that the first stage refers to prevention and control. A second stage deals with the management of impaired assets, a crucial aspect in the recovery process. The final and third stage is represented by the treatment of insolvent banks. This is a critical aspect, since if on the one side, the good status of banks is a facilitating factor of economic growth, on the other side, the recognition of troublesome banks may impact other banks' activities and prompt an overnight spread of deposit withdrawal from accounts, worsening the problem. Additionally, Campbell (2007) focuses on another element: liquidity. As many financial crises over the last decades have been triggered by the evolving nature of banking business (namely due to deregulation leading to the redefinition of scope and spread of activities), liquidity may arise as an important issue also for those banks showing solid balance sheets. In such cases, central banks should have in place actions aimed at maintaining liquidity in the interbank market to precent worse and generalized problems. The development of stronger micro and macro prudential guidelines for banks is another area of intervention. Not allowing banks to grant loans to subsidiaries, reducing the tenure of external auditors and promoting the presence of real banking sector expert in the composition of management groups represent all useful elements to curb the accumulation of NPLs.

A view on Ex-Post is proposed by Baudino and Yun (2017) who consider the spectrum of NPLs resolution alternatives based respectively on debtors and banks perspectives. Given the premise that NPLs follow a period of decline in credit quality, at first stage, alternatives should be directed to the restructuring of loans at the level of individual borrowers. However, when credit quality deterioration encompasses a larger scale, resolution tools to be considered need evaluations at an aggregate level, focusing on the banks. Finally, when NPLs problem becomes systemic, coordination on resolution mechanism is fundamental beyond individual banks to encompass entire banking system.

Irrespective of the spectrum of operational solutions available to banks confronting with NPLs, the scope of this study will focus on the securitization one. Anastasiou (2016) provides insights on the status of NPLs resolution in Europe, along with differences between *ex-ante* and *ex-post* NPLs management strategies.

Among the latter category, he exposes that under securitization, the primary advantage is related to the repackaging of cash flows into a diversified portfolio, a new security aimed to attract a broad investors base. Also, in the European context featured by a slow pace of NPLs recovery, this can represent a time-effective solution to collect a significant amount of cash and allow the seller an immediate access to funds.

The actual goal of the securitization process is to convert illiquid assets into tradable securities and ultimately cash. Assets may include a wide array of categories (bank loans, lease contracts, trade receivables, car loans and so on). At the same time, securitization represents an effective mechanism to transfer risks from banks to investors. Securitization provides a diversified investment portfolio appealing to different categories of investors with different risk-return profiles. Additionally, the process of disposal of illiquid assets from banks' balance sheets, leads to a positive effect for the entire financial system enabling more lending activity. Securitization permits the transformation of illiquid assets in interest-bearing financial instruments, tradable on financial markets. The underlying portfolio of assets (referred to as "collateral" or "reference portfolio")

can be composed of homogeneous or differentiated assets which interest plus principal payments are transferred from the originator to the capital market. The tool for such transfer is a Special Purpose Vehicle or Securitization Special Purpose Entity (SPV or SSPE), a vehicle embedding these assets. A core part of securitization process is represented by the set-up of Asset-Backed Securities (ABS) which consist of different categories related to the asset type of the reference portfolio. For instance, securities backed by mortgages (or SMB) are secured by the principal and interest proceeds of a mortgage (or more mortgages). In this category, residential mortgages are secured by residential estates, commercial mortgages are secured by commercial properties (commercial buildings, logistics centers, offices). High-yield loans or ABS are pooled into new financial instruments, and then repackaged into differed tranches (according to their degree of risk) and sold to investors. These instruments are called Collateralized Debt Obligations (CDOs) which can be referred to as collateralized bond obligations (CBOs, backed by junk-level corporate bond), collateralized loan obligations (CLOs, backed by leveraged bank loans) or commercial real estate CDOs (CRE CDOs, backed by real estate loans). SPVs issue these instruments sliced into tranches. A trance note gathers debt categories according to their risk-return, to attract investors interested in the corresponding profile. Tranches carries the risk and the yields of their underlying assets, and for instance the most senior (less risky) tranches are associated with lower returns as they receive repayment from collateral pool ahead of others (called mezzanine or junior tranches). The level of risk is determined through a rating defining each tranche level, except junior tranches which are generally unrated. This close relationship between risk and return profile, is reflected into the category of investors allowed to invest in each tranche or build portfolio with a blend of various tranches.

Affinito and Tagliaferri (2010) investigates on the ex-ante characteristics of the banks ultimately recurring to securitization in Italy. They find that, though dealing with a composited characterization, banks opting for securitization tend to be less capitalized, less profitable and liquid and featured by troubled loans. Additionally, they go through disposals earlier and for a higher amount of loans.

Though securitization schemes are often associated with wide bid-ask spreads leading to substantial lower value of the initiative, Bruno *et al.* (2017) proposes that in carefully tailored securitization mechanisms involving private investors incurring some level of risk can reduce this value gap. Also, public initiatives can reduce the information asymmetry by enhancing transparency in key factors such as real estate collateral valuation, an element facilitating the sales process in the secondary market (Garrido *et al.* 2016). Xu (2005) exposes that securitization allows the design of securities of different categories (i.e. returns and maturity) can be appealing to a diverse range of investors willing to take on such risks.

Nonetheless, structural inefficiencies persist in NPLs market limiting the scope for the development of a liquid market. In particular, information asymmetries have a direct effect on disposal price and time needed to negotiate sales. Campbell (2007), for the banking crisis occurred over the last decades, supports that the most appropriate way to deal with NPLs is the adoption of Asset Management Companies (ACMs). In some circumstances, the adoption of AMCs can effectively help overcome these issues, but the cost related to such

instruments and their applicability to corporate loans make necessary that certain conditions are met (Fell *et al.* (2016)).

Bolognesi *et al.* (2020) results support that securitization provides the best possible strategy for both investors and banks. Bolognesi *et al.* (2020) also assess how securitization coupled with state-backed guarantees reduce costs of disposal (as difference between accounting price and sale price). However, Ciocchetta *et al.* (2016) conduct study on recovery rates of bad loans within the Italian market and assess how recovery rates, though varying, are generally higher for standard work-out activities than for assets disposal.

The mechanism called GACS (*Garanzia sulla Cartolarizzazione delle Sofferenze*), plays a pivotal role for the success of NPLs securitizations in the Italian market. The GACS, introduced in 2016 (and later extended in 2019 for a period of 24-36 months), envisages a guarantee to be provided from the Italian State on the senior notes repayment in rated NPLs securitization transactions. The main objective of such guarantee is to reduce the bid-ask price spread between originators (selling banks) and investors and contextually increase the number and the volume of NPLs transactions to enhance liquidity in the system. Hence, on the one side, GACS improves the transparency in the process, whereas on the other side it aims to set higher standards of information quality for market operators.

5. Empirical Analysis

The first research question addressed through the analysis conducted in this chapter is: given the prominent role of NPLs sales in addressing the consequences of financial crisis, in which cases do European banks' share prices show an increase following NPLs portfolio disposals?

A sample of NPLs portfolio sales completed in the Europe between 2015 and 2019, is collected to capture the main transactions occurred over the period. The analysis is conducted through an Ordinary Least Squares (OLS) regression model on the main drivers affecting shareholders return following the announcement of a portfolio disposal. The focus is centered around the following main variables of study: Gross Book Value of loans involved in the disposal, NPL Category and Asset Class. Also bank characteristics are included to control the effect of bank-specific issues such as Total Assets, Leverage Ratio and Bank Profitability (expressed as ROE).

Hypothesis 1 – Bank shareholders' returns following NPLs portfolio disposals can be explained by the presence of a deal-specific variables

Additionally, a sub-set of transactions is analyzed in respect to the Italian market. Beside the above-mentioned variables, given the large effect of state guarantee on NPLs transactions occurred in Italy over recent years, the presence of GACS guarantee is considered to investigate effects on shareholders' return. Hence, the second hypothesis is described below:

Hypothesis 2 – Beside general characteristics, the presence of the state guarantee enhances bank shareholders' returns following NPLs portfolio disposal.

Common to the research hypothesis, an event study analysis is conducted to investigate the effects of deal announcement on the daily stock returns of the bank disposing NPLs. First, it is necessary to determine the event of interest and the period in which the event will be examined (the event window). As stated, the event of interest regards the detection of daily stock returns as response to a particular announcement. It is worth to make some clarification about the determination of event windows. Because of the large applicability of this methodology, event windows arising from existing literature may vary from few days surrounding the event to years-long periods of study. The market reaction is expected to occur in the same day of announcement, and a few following days.

Since the hereby described event study is intended to detect short-term reactions and considering the warning of using event study in the long-run (Barber and Lyon, 1997), different event windows are considered within the interval of [-10; +10] around the announcement date (day 0). This time interval is assumed robust enough to absorb any information leakage before the announcement date, and to neutralize any overstatement following the bid. In this time lapse, the event study will compare the actual stock returns against the predicted returns and determine, when realized, any abnormal return. MacKinlay (1997) suggests two models for determining normal returns: constant mean model (with Xt constant) and the market return (with Xt standing for the market return). For the purpose of the proposed analysis, the market model return is chosen, as a stable linear relation between the market return and the firm's stock return is assumed. Second, for the "normal return" of the firm's stock to be determined, an "estimation window" must be defined. To avoid influence between estimation period and event period, the former should not overlap the latter. In general, the estimation model is defined before the event study. To assess the normal return for firm's stock the estimation period is set to be [-100; -11] from the announcement date. Described in next steps, the longer the estimation window, the higher the influence of the disturbance error on variance.

The sample utilized for quantitative analysis includes 71 NPLs securitizations conducted at European level (separating Italy from the rest of Europe). Data are retrieved from Refinitiv and Bloomberg platforms. The main features of the sample are described here below (and summarized in Table 2):

- Timespan: 2015 - 2019;
- Geographical Scope: Italy (32) - Rest of EU (39);
- NPLs featuring State Guarantee (Italy): 19;
- Gross Book Value average: 1.140.64;
- Category: Bad Loans (61) - Unlikely to Pay (10).

In general terms, the sample shows occurrences for nearly all categories. Focusing on the single categories, there is a substantial balance between NPLs disposals conducted in Italy and those from the rest of Europe. A clear imbalance emerges in Category as Bad Loans outnumber Unlikely to Pay deals. In terms of GACS adoption, cases of state security adoption can be found in every year apart from 2015. Finally, the GBV of the securitizations has an upward trend over the period, also considering the peak in 2017: this, along with the increasing number of transactions, demonstrates the wider adoption of this instrument evolving in larger NPLs portfolios over the time.

In the following section a quantitative analysis, conducted on empirical data, is developed adopting the multiple linear regression model. The model, estimated through the method of the ordinary least squares (OLS), assumes that between the dependent variable (Y) and the independent or explicative variables (X) there is a linear relationship. It is assumed that, from uncorrelated sample data observations, it can be estimated a number of relationships corresponding to the single variables featuring the sample. Hence, the result will feature a series of β coefficients measuring the variation of dependent variable in function to the unit variation of each independent variable, being the other variables kept constant. The analytical section is complemented with the commentary on the results for each β coefficient their respective significance and finally it is evaluated the general fit of the regression model. The analysis is set out in order to determine the impact of a series of variables of interest on the CAR resulting from the disposal of NPLs portfolios. Through the analysis of CAR, it is possible to perform an event study analysis to determine the impact of a given event (gathering the interest of the study) on selected metrics able to capture the value creation of the banking institution (in terms of value to shareholders). Different variables are included in the model with the aim to evaluate which kind of characteristics lead to better returns for shareholders in connection to a NPL disposal. Considering that the composition of the sample includes transactions conducted within the European financial market, abnormal returns are determined comparing the share prices of the bank disposing NPLs with the closing value of Bloomberg European 500 Index, considered the most appropriate benchmark for the purpose.

While determining CAR, a meaningful choice refers to the time frame for CAR calculation. The analysis proposed in the present study considers three, windows: [-1; +1], [-5; +5] and [-10; +10]. Hence, all windows include the event day plus 1, 5 and 10 days before and after the event (represented by the announcement date of the deal). The different lengths are aimed to capture the possible market reactions to NPLs disposal announcement not only in the days following the announcement, but also in the days prior to it, trying to capture possible information leakages. Another choice refers to the length of the estimation period. To ensure a sufficient significance of the estimation, the interval of 100 days immediately before the CAR window is adopted. For the regression analysis proposed, results relative to the window [-5; +5] are considered for a series of reasons. First, not only the window includes the days following the NPLs disposal but also embraces a sufficient timespan, to include market reactions due to potential rumors. Also the window [-5, +5], allows to factor in all information relevant for market operators, and it is fairly defined to avoid possible CAR dilution due to other co-founding effects, that may at the same time have some impact on the company market value capitalization.

The average CAR recorded in the window [-5; +5] is 2,682, is significant at an α level of 0.01. Upon this evidence, it is possible to warrant the general hypothesis that the market tends to reward the choice of reducing exposure to NPLs as a sound strategy to generate cash and improve the quality of bank's assets.

The analysis on CAR is conducted introducing in the regression model both bank-specific (*TA*, *DE* and *CET1*) and deal specific variables (*GBV* and *CAT*), in order to capture the different interactions on CAR.

CAR: Assesses the cumulative abnormal returns in the window [-5; +5] around the announcement day of the NPLs disposal, calculated as detailed in the prior paragraph.

Gross Book Value (GBV): Also referred to as the Face Value of involved securities, refers to the carrying value (expressed in € million) of the NPL portfolio involved in the transaction. The underlying hypothesis sustains that NPL gross book value can have a significant effect either positive or negative on CAR. This because on the one hand markets may react positively to NPLs disposal as banks can free up capital, while on the other hand, fire sales at a discount may have significant effects on bank's profits. A logarithmic transformation is applied on the variable.

TA: Includes in the model the value referred to the Total Asset (expressed in € million) of the selling bank. The expected relationship on CAR is negative as the effect of a securitization of an NPLs package may decrease for larger banks. A logarithmic transformation is applied on the variable.

DE: Includes in the model the level of debt relative to equity or leverage (expressed as Debt over Equity) at market value. The study supposes a positive sign on CAR, as per higher leveraged banks, the proceeds from disposal of NPLs are expected to be emphasized from equity markets.

CET1: Includes in the model CET1 ratio of the selling bank (the value of core capital over total assets weighted for their relative risk, expressed in percentage terms) at the time of disposal. The expected sign of the relationship on CAR is positive as this captures the level of bank solidity.

CAT: Dummy variable aimed to introduce in the model NPL category subject to disposal. Namely *CAT* takes value 1 for Bad Loans being included in the transaction and 0 for Unlikely to Pay being included. The study hypothesis considers a positive impact on CAR for Bad Loans.

Against the background of the variables adopted in the model, the regression model is explicated by the following equation (1):

(1) $CAR_i = \beta_0 + \beta_1 GBV_i + \beta_2 TA_i + \beta_3 DE_i + \beta_4 CET1_i + \beta_5 CAT_i + \varepsilon_i$

From the output of the Regression (1), *DE*, *CET1* and *CAT*, have all a positive effect on the dependent variable CAR at different levels of significance. *DE* shows that for any additional unit in the Debt Equity ratio there is an impact of +0.491 on CAR, with other variables being equal. The relationship is significant at an α level = 0.05. At the same time, a similar effect is caused by a unitary increase in *CET1* (+0.443), which is significant at a α level = 0.10. When *CAT* corresponds to 1 (securitization includes Bad Loans as opposed to Unlikely to Pay), *CAR* is expected to increase by 3.823 (significant a α level = 0.10). Finally, *lnTA* shows a negative relationship on CAR of -1.262, a result significant at a α level = 0.10. No significant relationship is associated to *lnGBV*. Findings are in line with the preliminary expectations. Additionally, results are supported from F-test (2.834), significant at α = 0,05. From these values it is possible to conclude that at least an explicative variable in the model is significant. In respect to the overall model, the values related to R^2 (0.179) and R^2 adjusted (0.116) show a quite moderate fit of the regression model, however it should be considered the empirical nature of the study.

The second regression is intended to investigate to possible effect on CAR related to the presence of state guarantee denominated GACS on *CAR* of NPLs disposals conducted in Italy. Accordingly, the sample is reduced to the 32 transactions occurred in the Italian market from 2015 to 2019, having in consideration that state guarantee has been implemented since 2016. The independent variable *GACS* is introduced to serve this scope, and in particular, it is a dummy variable taking value 1 for securitizations featuring state guarantee and 0 on the opposite case. The effect of *GACS* on *CAR* is expected to be positive, since, as discussed in previous chapters the presence of state guarantee in presence of NPLs securitizations has a twofold benefit: facilitating the disposal and helping bank realize a higher price as percentage of portfolio's gross book value. This regression model so constructed is summarized in the following equation *(2)*.

(2) $CAR_i = \beta_0 + \beta_1 GBV_i + \beta_2 TA_i + \beta_3 DE_i + \beta_4 CET1_i + \beta_5 CAT_i + \beta_6 GACS_i + \varepsilon_i$

From the output of Regression (2), *GACS* has a meaningful positive and significative impact on dependent variable *CAR* at an α level = 0.05. The presence of state guarantee increases *CAR* by 5.243, with other variables being kept equal. Hence, results are in line with the preliminary expectations of state guarantee leading to value creation in securitization transactions. Among the variables previously described, *lnTA* (-1.860) and *DE* (+0.573) both show a significant effect on *CAR*, consistently with results obtained in Regression (1). Significance is at an α level respectively of 0.05 and 0.10.

Results are supported from F-test (2.801), significative at $\alpha = 0,05$. Again, from this value it is possible to conclude that at least an explicative variable in the model is significative. In respect to the overall model, the values related to R^2 (0.402) and R^2 adjusted (0.259) show a quite appreciable fit of the regression model (slightly more than 25% of the error is explained), considering the empirical nature of the study.

6. Conclusions

The efforts to remedy to the issues of NPLs across Europe characterized the action of policymakers over the last years. Although substantial results have been achieved so far, the need to further reduce the burden of NPLs finds multiple justifications. First, the sudden reversal of economic growth, as demonstrated by the outbreak of Covid19 pandemic, may immediately raise new and generalized pressures on the financial system. Second, some countries still face a substantial level of NPLs accounted in their domestic banks' balance sheets, a factor which cannot be ignored by policymakers and institutions. Third, since the emergence of NPLs conventionally follows a period of poor credit quality and looser institutional control, the attention on the issue should remain high, in order to limit to room for new crisis. Fourth, room for improvements persists in terms of transparency and coordination in the market of NPLs, as despite market developments still obstacles remain for market operators. Hinging on the extensive strand of available literature, the present study has been aimed at analyzing the broader scope of the NPLs issue in the European system under multiple perspectives. A first level of analysis has addressed the key determinants of NPLs accumulation in different geographical areas taking the perspectives of both macro and bank-specific characteristics. Then, the focus has been shifted to the study of policy instruments deployed to the resolution of NPLs crisis,

mainly in the European context. Ex-ante credit management measures (closely related to the establishment of effective supervision on the financial system) are undoubtedly the most appropriate tool to prevent shocks on the financial system. However, a careful and prompt enactment of ex-post measures proves to be crucial to reduce the burden of NPLs, once deteriorated exposures emerge. To this extent, write-offs, direct sales, asset protection schemes, securitizations and AMC are all options to be considered by policymakers. Evidence from European countries shows that in the aftermath of financial crisis the adoption of these tools to a different degree and based on country-specific characteristics. In many circumstances, the successful resolution of NPLs issue has been achieved thanks to the coordination of the different alternatives applied in conjunction. A particular focus has been devoted to the discussion of the peculiar traits featuring NPLs portfolio securitizations. According to the prevailing argument discussed in literature, securitization is viewed as the most effective response to cope with non-performing exposures in bank's balance sheets and free up capital. Securitizations are based on a complex mechanism, in which bank's bad exposures are pooled into a SPV and repackages into new securities reflecting different risk profiles. Compared to other alternatives, the advantages of securitization refer mainly to risk diversification for investors willing to take on certain level of risk (hence enlarging the audience of possible investors). The pooling of credit lines facilitates economies of scale, reduces the transaction costs, and makes marketable NPLs not marketable individually. Furthermore, for banks, NPLs securitization provides quick access to liquidity and the easing of capital requirements. In summary, securitization of NPLs allows to realize a higher price than other alternatives in shorter time. The success of securitization schemes heavily relies on the establishment of a market for securitized securities. This relates to the fact that several different subjects are involved in the process. Experience and skills of servicers on the one side, and the presence of specialized investors on the other side are distinctive factors to facilitate market conditions. Finally, NPLs securitization do not completely overcome the issues of valuation gaps between sellers and buyers and information asymmetry. From this theoretical framework, the analysis conducted on CAR, chosen as a key metric of shareholders value creation, is aimed at determining the dynamics of NPLs portfolio disposals. Results demonstrate how shareholders returns are significatively influenced from a series of factors. In the first level regression, conducted on a sample of European NPLs securitizations, the variables associated to total assets (-), financial leverage (+) level of CET1 of the disposing bank and the category of assets involved (+) show a significant effect on CAR. At the same time, in the second level regression, conducted on a sub-sample of transactions conducted in the Italian market, shows the positive effect of GACS on CAR, supporting the hypothesis that such guaranteed scheme favorites NPLs disposals. These results support the hypothesis that markets tend to look at both bank specific and deal specific variables in assessing the realization of value in an NPLs transaction for the selling bank. Also, state guarantee, when provided, constitutes a key part of the deal, as such element helps bridge the gap between asking price of NPLs and the price potential buyers would be willing to pay, a difference that often remains

large in markets whereby weak contract enforcement and lack of transparency lay the foundations for high levels of information asymmetry. The overall results above described constitute a good starting point in identifying and understanding the key drivers of success for shareholders value creation in NPLs securitizations. However, the determinants of post-announcement value market reaction still seem not entirely unveiled. As specified, the variables adopted in the empirical section are just a subset of the broader spectrum of possible variables to be considered in such type of analysis. To the same extent, measures used to explain the pattern of CAR are based on publicly available information and in some cases represent a synthetic representation. The extension of these points, intended to include more bank and transaction-based characteristics, could undoubtedly provide more accurate evidence on the sources of value creation in NPLs securitizations. Furthermore, the implementation of an analysis on a wider sample under a longer time perspective could provide a better understanding and help decouple possible cofounding effects. Additionally, longer-term measures of value-creation may be considered to assess whether banks recurring to securitizations actually gains and maintains value beyond the short-term period. Regardless of these points, findings are consistent with theoretical insights and result well-grounded from a statistical point a view. The analysis of NPLs dynamics (whether under the perspective of NPLs securitizations or not) is a growing field that seems destinated to be developed over the future along with the evolution of NPLs market.