

Dotta, Vitor

Working Paper

Addressing systemic risk in Europe during Covid-19: The role of regulation and the policy mix

Working Paper, No. 181/2022

Provided in Cooperation with:

Berlin Institute for International Political Economy (IPE), Berlin School of Economics and Law

Suggested Citation: Dotta, Vitor (2022) : Addressing systemic risk in Europe during Covid-19: The role of regulation and the policy mix, Working Paper, No. 181/2022, Hochschule für Wirtschaft und Recht Berlin, Institute for International Political Economy (IPE), Berlin

This Version is available at:

<https://hdl.handle.net/10419/253646>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Hochschule für
Wirtschaft und Recht Berlin
Berlin School of Economics and Law

Institute for International Political Economy Berlin

Addressing Systemic Risk In Europe During Covid-19: The Role Of Regulation And The Policy Mix

Author: Vitor Dotta

Working Paper, No. 181/2022

Editors:

Sigrid Betzelt, Eckhard Hein (lead editor), Martina Metzger, Jennifer Pedussel Wu,
Martina Sproll, Christina Teipen, Achim Truger, Markus Wissen, Reingard Zimmer

Addressing systemic risk in Europe during Covid-19: the role of regulation and the policy mix.

Vitor Dotta

Abstract

This work examines the impacts which the Covid-19 pandemic brought to the stability of the European financial sector. Lockdowns, businesses unable to operate and uncertainty about how the pandemic would evolve fueled a sharp recession. From the lessons learned in the global financial crises and the Eurozone debt crises, there's an increasing role of macroprudential policies, especially the regiments of the Basel III framework and the monetary policy toolkit. Alongside macroprudential regulation, the European Central Bank provided substantial monetary policy easing, for instance the release of capital buffers and other capital requirements, expanding the TLTRO III and Pandemic Emergency Program which facilitated monetary policy transmission. Authorities also deployed strong fiscal policies which encompassed from tax holidays to direct transfers to households and firms. The combination of fiscal, monetary, and regulatory policy was unprecedented and helped the economy during the shutdown moments. As a result, indicators of systemic risks in the banking sector during the pandemic remained relatively stable.

Keywords: Systemic Risk, Covid-19 pandemic, banks, banking sector, Europe, Policy Mix, Monetary and Fiscal policy

JEL code: G21, G28, G38, E58, E62, E63

Acknowledgements: This paper is a revised version of my master thesis. I would like to thank Prof. Martina Metzger and Etienne Espagne for their valuable comments and support.

Contact: vitordota@hotmail.com

1. Introduction

The Covid-19 health crisis had severe impacts on the Euro area economy. The successive lockdowns to control the spread of the virus caused a strong decline in output worldwide during the first and second quarters of 2020, and the second wave of infections resulted in yet another downturn of the economy by the end of the year. Besides the health concern, the pandemic caused disruptions in the supply and demand sides of the economy. The initial hit forced production lines closures alongside most of the service sector. Households, businesses, and financial firms faced strong uncertainties about the developments of the pandemic.

Households increased their precautionary savings as threats of massive layoffs began to appear. Businesses took precautionary measures to prevent bankruptcies and the financial sector demanded liquidity and safe assets, adopting the strategy of ‘wait-and-see’ as the events of the pandemic were unfolding (Baldwin & Tomiura, 2020). As businesses’ cashflows were dramatically affected, threats of a wave of defaults were starting to emerge. Households were facing the possibility of defaulting on mortgages as income was threatened. Financial firms began taking precautionary actions which led to strong adjustments in the markets.

The scenario was the possibility that the pandemic would develop into a financial crisis despite the exogenous nature of the downturn. The macroeconomic shock and uncertainty were already impacting the financial sector, with strong declines in the financial market indices showing the initial distresses already materializing.

In light of these events and the possibility of yet another financial crisis emerging from the pandemic, two research questions are explored. A decade has passed since the Global Financial Crisis and some important changes were introduced in banking regulation, namely, the Basel III agreements. The pandemic is the first stress test for these new regulatory measures. Alongside the new Basel III regulations, governments deployed a combination of fiscal and monetary policy to support the most affected sectors across the economy, this policy mix overshadowed the amplitude of policies taken during the global financial crisis both in size and scope.

Therefore, this work investigates the development of systemic risk during the Covid-19 pandemic in the euro area banking sector. The first question asks what policies were implemented during the Basel III agreements and how they stood the test during the pandemic in terms of mitigating systemic risk and increasing resilience in the Eurozone banking sector.

The second research question investigates the relationship between the strong policy mix deployed by the European Central Bank, the European Commission and Local governments and how it has contributed to mitigate systemic risk in the Eurozone Banking sector.

This paper is structured as follows. The second section of this paper provides a literature review on the theory of systemic risk, macroprudential policies and the developments in regulation put forward in the Basel III. The third part lays out a comprehensive analysis of the policy mix deployed by the European authorities. The fourth part shows how systemic risk has evolved during the Covid-19 pandemic. The timeline begins from the initial impacts in February and March of 2020, until the most recent available data by July 2021. The indicators observed encompass liquidity coverage ratio (LCR) and common equity ratio (CET), which allow for interpretations regarding banks liquidity and capital availability in this moment of stress; non-performing loans (NPLs), which shows how the negative developments in the real economy is affecting banks assets and increasing fragility; the credit default swaps (CDS) of a selected group of government bonds, which is known to cause distresses in the banking sector due to sovereign holdings and the intertwining between sovereign and banks. The last indicator observed is development in composite systemic stress (CISS), especially because of its broad scope that helps to provide insights of stresses caused in the markets in real time. These selected indicators are chosen as they are able to provide an overview of stresses in the financial sector as a result of the pandemic, other measures of systemic risk such as interlinkages between financial institutions, structural risk relative to banking operations are not taken into consideration despite their importance because the primary focus of this research intends to observe the channels in which the policy mix impacted the building-up of systemic risks in the forms of assets and liabilities in the bank's balance sheet, therefore interlinkages of financial institutions and risks relative to the capacity of operating are not directly affected, even though the last is affected by the lockdowns and the speeding of digitalization. Finally, the fifth part concludes the text.

2. Concepts of systemic risk and macroprudential policy

2.1. Systemic risk

To recognize and understand the sources of systemic risk during the covid-19 pandemic as well as its possible impacts in the unfolding events, this section provides a brief literature review of systemic risks and macroprudential policies. It discusses the origins of systemic risk and

through which mechanisms it exerts influence on financial stability and the costs of financial crises.

Distresses in the financial system, financial fragility and financial vulnerability are essential characteristics of the nature of systemic risk. Decades of development in the financial system, financial innovations and the modern architecture of the financial system are central in understanding the sources of systemic risk, especially the ones which culminated in the global financial crises. A broad definition of systemic risk is the instability of the financial sector as a whole which translates into welfare costs not only to the financial system but to the entire economy. A more precise definition is that events which happen in the economy and or in the financial sector, both endogenously or exogenously derived can be contagious, spreading from a localized distress, such as a bank's individual action, via balance sheet interconnections, and cause a regional or global distress. These distresses can erupt as bank runs, increasing in non-performing assets, liquidation of banks, which may ultimately require the intervention to support banks (Caprio & Honohan, 2008; Reinhart & Rogoff, 2014). A financial sector that is susceptible to distresses is undesirable because of its socioeconomic damages.

Adrian et al (2015) argue that systemic risk is the potential for widespread externalities emerging from stresses in the financial sector, such as asset fire sales, corrections in asset valuations, which amplify shocks and ultimately can disrupt financial intermediation. In the calm periods, financial institutions accumulate liabilities against one another, but if expectations change, it can trigger shortage of liquidity and disruptions in the financial system, with potential financial externalities (Adrian et al, 2015). According to Acharya (2009), financial crises are systemic if a multitude of banks collectively fail, or the failure of a single bank contaminates the entire system.

The use of the word systemic thus is to differentiate from a single credit risk or a maturity mismatch risk which are common features of the financial sector. Therefore, systemic means the network of impacts from localized events to the collective, via the interrelation of balance sheets of firms, households, financial institutions and intermediaries, and the government. Acemoglu et al (2015) argues that the ways interconnected networks exacerbate risks by propagation and amplification is twofold: in a very diversified and interconnected financial system, in firms that are linked to one another via a structure of interbank liabilities and therefore susceptible to counterparty risk, shocks such as capital shortages are less fragile if the shock is below a certain threshold, but if it exceeds this threshold, the system is more likely

to face dramatic failures. Liquidity and capital in this second scenario no longer suffice the needs to absorb losses. This is a result of the financial actor's inability to account for spillover effects or risk taking to the entire financial network (Bank of England, 2009).

Acharya et al (2010) argues that financial institutions are systemically important if the failure of one bank to meet its obligations to counterparts will lead to drastic consequences to the financial system and to the economy. In other words, *systemic* in this context means that a financial firm's impossibility to meet its obligations because it falls short of capital will have strong impacts on other financial institutions. Furthermore, Acharya et al (2012) argues that it is only when financial institutions are incapable of stepping in to fill the void of the institution in distress that the problem becomes systemic, this can happen in the scenario which capital is low in the aggregate, possibly resulting in the need for government intervention. According to Acharya et al (2012) a firm's systemic risk depends on three components: real social costs of a crisis per dollar of capital shortage, probability of a crisis (aggregate capital shortfall) and expected capital shortfalls of a firm during a crisis.

The major concern with systemic crisis, such as the global financial crises of 2008, are the social and economic costs (Acharya, 2009). Investment falls, credit disruption occurs, firms declare bankruptcy, and unemployment increase, all contributing to reduce welfare. Reinhart & Rogoff (2009; 2014) documented that over the span of centuries, financial crises have been the ones which lasted the longest, with the eventual double-dip after the initial recovery. In these crises, output takes on average 8 years to reach pre-crises levels. The transatlantic crisis lasted much beyond the initial 2008-2009 crash, including the subsequent Eurozone crises. Countries such as Greece and Italy remained below potential output, even a decade after the unfolding of events. The U.S for instance, despite exiting relatively quickly, remained with growth below potential for almost a decade, thus holding down interest rates and inflationary pressures and bringing back the question of whether the economy was suffering from secular stagnation.

The indicators present in the literature usually divides between cross-section and time dimensions of systemic risk. The first relates to the distribution of risk across the financial system (IMF, 2011); in this approach, instability emerges from the shared exposures and balance sheet interlinkages where the dynamics of the macroeconomy are perceived as exogenous. In the cross-section approach the quality and availability of bank's capital, as well as the short-term liabilities, are identified as a major source of systemic risk (Brunnermeier &

Yogo, 2009). On the other hand, the time dimensions of systemic risks are based on the accumulation of risk during time, for instance increasing exposures to certain sectors of the economy. In line with the time dimension, the endogenous nature of risk (Minsky, 1977; Kindleberger, 1996) argues that financial firms have a tendency of increasing leverage during the upswing of the credit cycle, building-up financial imbalances, as the collective perception of risk is diminished, which ultimately can lead to a crisis if there's a change in expectations and increasing uncertainty (Yellen, 2009).

Finally, a third dimension responsible for an amplifying effect of the previous two dimensions is the network dimension. It relates the spread of systemic risk via the interconnectedness of financial institutions, as well as spillovers and contagion between institutions (Adrian et al., 2015). Firms network risk has become a more prominent feature after the globalization of financial markets, invention of new instruments, and especially due to deregulation.

Although the definitions described above provide a clear example of what systemic risk is, the identification of systemic risk remains a problem, and it is inherently difficult to pin down to a single indicator. The interconnectedness, opacity, and complexity traits of the financial sector (Montagna et al., 2020) further hinders its identification. The European Systemic Risk Board (ESRB), an authority responsible for identifying systemic risks in the European financial sector, proposes several indicators, ranging from household debt and residential price indices to composite distress indicators- in total over 20 indicators are used to identify possible sources of distress. The ESRB publishes a selection of risk indicators to assess the development and the current state of systemic risk in Europe. These indicators are divided into several risk categories: credit risk, macro risk, liquidity and funding risk, market, profitability and solvency risks, structural risk, and counterparties risk (ESRB, 2021). The board also publishes a composite indicator, which comprises a multitude of risk indicators. In the next sections four indicators of systemic risk are explored, namely the common equity ratio 1 (CET1), non-performing loans (NPL), liquidity coverage ratio (LCR), the composite stress indicator CISS and the CDS premia over sovereign debt.

The triggers of financial instability depend not only on shared exposures or the network links, but also on expectations. The role of expectations is essential to determine the financials' cycle upswing or downswing, affecting perceptions of liquidity as well as the flight to safety and asset fire sales. Therefore, it is important to have in mind that exposures and the increasing

leverage such as happened in the Global Financial Crisis is the building block of systemic risk, but the agent which triggers a systemic crisis are expectations and uncertainty.

2.2. Macroprudential Policies

Macroprudential policies are intended to maintain financial stability (Borio, 2011). Defining financial instability on the other hand is more complicated; for instance, financial stability is defined as the well-functioning of financial intermediation, credit, and smooth fluctuation in asset prices, preserving wealth and thus enhancing welfare. On the other hand, due to the endogenous nature of risk, a booming market although stable at first sight may be accumulating imbalances and increasing financial fragility and systemic risk. Therefore, the role of macroprudential policies is primarily to mitigate systemic risk and preserve the overall stability of the financial system.

The importance of macroprudential policies emerged in the global financial crises, previously, attention was given mostly to individual institutions in distress, regardless of the systemic impact of the institution. The mainstream thinking on financial regulatory policy until the global recession focused mostly on the supervision conducted by central banks and other authorities to individual firms, relegating its implications to systemic risk (Schoenmaker and Wiertz, 2016). Alongside this understanding, monetary policy focused on inflation targeting, and, if possible, on macroeconomic performance, i.e., the level of employment. After the Global Financial Crisis, questions were raised about the importance of microprudential regulation alone, which overlooked the system as a whole, with its interconnections and networks, as the evidence shows this intertwined nature which spread risk throughout the financial system has been central at explaining systemic risk and the 2008 crisis (Yellen, 2013). The lessons from the global financial crisis are that financial stability must rely on a holistic view of the financial system and the feedbacks from the real economy (Montagna et al, 2020).

Schoenmaker and Wiertz (2011) argue that the excessive reliance on microprudential action can lead to systemic risk if macroprudential policy is left aside, because systemic risk also can emerge by the difference between individual actions and collective actions at the firm level, for instance if single firms act according to their own profit-maximizing or risk-reducing behavior, it can have adverse effects on the whole, a fallacy of the composition. This composition problem may emerge in the boom as well as in the bust. In the booming phase, individual behavior of firms may extend leverage to specific sectors of the economy, accelerating the boom but overexposing their balance sheet to distresses in the sector. On the

other hand, in moments of distress, fire-sales may seem the prudent action to relieve the pressure of holding risky assets, but the adverse effect may cause a further pressure on prices and spiral into an asset deflation (Jácome et al, 2012). Therefore, soundness of one individual firm may not be sufficient to guarantee overall stability.

Galati and Moessner (2013) argue that there are two different views that broadly define financial stability: (i) Financial stability is defined in terms of resilience to external shocks; (ii) Due to the endogenous nature of financial distress, financial stability is the resilience to shocks originating inside the financial system, or either, as Borio and Drehman (2009) point, the vulnerability of the financial system in response to normal-sized shocks.

While there's a relative clear consensus of the tools of monetary policy, being that primarily the policy rate with support from communication (Galati and Moessner, 2013), and in the post-2008 decade the use of non-conventional policy where the zero lower bound prevents further policy reductions. Macroprudential tools are defined directly in relation to mitigating systemic risk, for instance Laeven and Valencia (2018) point that it should target explicitly systemic risk and possess an independent framework.

2.3. Macroprudential policies: Basel III

In this work two types of policies are analyzed in relation to systemic risk and the covid-19 crisis, the ex-ante regulatory measures and the policy mix. The first consists essentially of Basel III macroprudential policies, which were being implemented since the global financial crisis in order to mitigate financial distresses. The second is the policy mix deployed in the current context of the pandemic, for instance a wide range of fiscal, monetary, and regulatory measures aimed at preserving the economy during the pandemic.

The developments in assessing systemic risk that followed the 2008 crisis led to the formulation of the Basel III framework of banking regulation. Prior to the Global Financial Crisis, the risk models used were based on historic asset volatility and default rates, and as the regulatory instance of Basel II, bank's equity was made dependent on these models, therefore encountering procyclical effects and weak capacity to predict crisis (Herr et al, 2019). Furthermore, high asset valuation and apparent liquidity was a result of complex manufacturing of financial products, hindering even more the capacity to properly regulate financial institutions.

The initial reforms were announced in 2010, and further advances were put forward in 2017 to increase credibility in the calculation of risk-weighted assets (RWAs) and enhance the comparability of capital ratios (BIS, 2017a). Responding to the global financial crisis, the Basel Committee on Banking Supervision, increased supervision, and risk management on banks and strengthened regulatory measures. The evident necessity of a macroprudential approach to banking regulation led the Committee to including several new measures on top of the microprudential regulation already in place. These regulations are minimum requirements applied for internationally operating banks. In the EU, the macroprudential authorities responsible for overseen financial institutions include the European Systemic Risk Board, which is chaired by the European Central Bank and includes the European Banking Authority, European Securities and Markets authority (ESMA), the European Insurance and Occupational Pensions Authority, the Economic and Financial Committee and national macroprudential authorities (Herr et al, 2019).

First, Basel III focused on improving the quality of capital Common Equity Tier 1 (CET1), and also on increasing the level of capital requirements in order to build resilience to withstand times of stress (BIS, 2017b). The regulatory framework also revised risk-weighted capital which were miscalibrated, such as market risk, counterparty risk and securitization.

Banks fund investments with assets and liabilities, being capital in the form of shares, retained earnings and other reserves (CET1), capital instruments without fixed maturity (additional CET1), subordinated debt and general loan-loss reserves (CET2) (BIS,2017a). The quality of capital is essential to fund lending to the real economy.

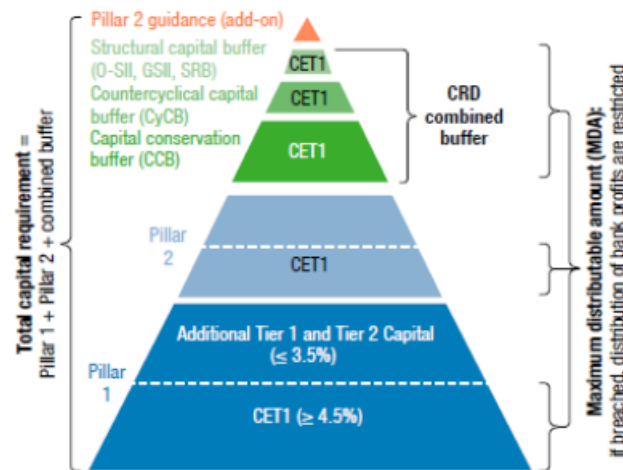
$$\text{Risk – based capital ratio} = \frac{\text{Regulatory capital}}{\text{Risk Weighted assets}}$$

Risk weighted assets are divided into credit risk, market risk, operational risk, and other risks. Each of these categories are assigned a weight according to how risky the asset is for the bank to hold. To measure credit risk, banks use two approaches: (i) standardized approach based on supervisor’s risk weights or (ii) internal ratings-based approach.

The advances induced by the need to have a macro view on regulation also led to the inclusion of several macroprudential elements. The introduction of capital buffers which are built in the booming phase and can be drawn on times of stress, are aimed at reducing procyclicality of the banking sector as well as to smooth the financial cycles. Basel III established a “large exposure regime” to reduce the systemic risks that emerge from the interconnections among financial

firms and also correlated exposures to determined sectors of the economy (BIS, 2017b). The new regulation also penalized systemically important banks by pricing their externalities via increasing the required capital buffer for these institutions. In this new framework, global systemically important banks are also required to hold a leverage ratio buffer to limit leverage and costs of being too interconnect to fail. The buffer for global systemically important banks is on top of the already existing capital requirements.

Figure 1: Regulatory requirements Basel III



Source: Pradhan et al (2021) and Basel Committee on Banking Supervision, European Banking Authority. CET1= common equity tier 1; CRD= capital requirements directive; GSII= global systemically important institutions; O-SII= other systemically important institutions; SRB= systemic risk buffer.

In order to maintain the well-functioning and resilience of the banking sector, the regulatory framework introduced an international basis to mitigate liquidity and maturity transformation risks by including a Liquidity Coverage Ratio and a Net Stable funding ratio. The capital requirements and new legislative norms are summarized in the table 1, according to the value requirements for each type of financial institution.

A variety of other microprudential measures and capital requirements were introduced, especially regarding risk weights, short-term exposures, exposure to bonds, general corporates and to residential real estate. As the focus of this study is the evaluate the performance of macroprudential policies in the context of covid-19, the details of microprudential regulation are left aside.

Table 1: Macroprudential policies

Type of Policy	Description
Capital Requirements, capital to risk weighted assets	8% + 2.5% of conservation buffers
Leverage ratio equity to total exposures	3%
Liquidity Coverage Ratio	100% for 30 days, based on net cash outflows for the period.
Net Stable Funding Ratio, A function of the liquidity and residual maturities of assets held by institutions	100%.
Countercyclical capital buffer	from 0 up to 2.5%
Systemic risk buffer in the EU	From 1%
Surcharge for Global systemically important institutions in common equity	1 to 3.5%
Surcharge on other systemically important institutions	0-2%

Source: Basel committee (BIS, 2017a), BCBS (2011), own elaboration.

The objectives of the capital buffers of 2.5% of risk-weighted assets is to increase resilience during periods of stress. For instance, banks are required to build up these buffers in calm waters and they are released when authorities observe distresses in the markets- one important mechanism of this buffer is the penalty for banks that are not meeting the required buffer; for instance, authorities can restrict dividend payouts.

The countercyclical capital buffer, on the other hand, has the impact of smoothing the financial cycle by limiting leveraging, increasing during the upward phase of the credit cycle and been drawn during financial stresses- therefore increasing banks capacity to absorb losses (Herr et al, 2019). In the EU, authorities have also introduced the systemic risk buffer, which aims at mitigating the impacts of systemic risks of a long-term and non-cyclical nature (Herr et al, 2019).

In order to mitigate the impacts of too big to fail and too interconnected to fail institutions, the surcharge on systemically important institutions requires a capital holding of up to 3.5%. These institutions pose the most risk to financial stability and pricing this negative externality is

important to maintain the stability of the sector. Institutions under this special regulation have exposures of over 200 billion Euros (BCBS 2013).

Finally, the Liquidity Coverage Ratio aims at preventing illiquidity risks which increases systemic stresses in cases of turmoil. Institutions are required to maintain a stock of high-quality liquid assets against a 30-day cash outflows. This intends to reduce the fire-sale of assets to meet short-term obligations, that reduce market prices of bank's capital and which would further deteriorate system-wide stability and exacerbate shocks.

The overview of ex-ante regulation described in the last section shows its development since the global financial crisis and the understanding of macroprudential and systemic risks. These were steps in the right direction and faced its first stress test during the covid-19 pandemic. Despite Basel III being in place, authorities in the EU deployed a wide range of policies which intended to smooth the economic effects of the pandemic. In the next section, attention is drawn to these policies, mechanisms, and how they impacted the banking sector.

3. Covid-19 and Systemic Risk in the Eurozone

3.1. The Macroeconomic Policy Mix

This section comprehensively describes the policy mix deployed by authorities in Europe. The policy mix comprises a strong expansion of central bank's balance sheet via quantitative easing and a fiscal expansion in the forms of tax holidays, direct transfer to firms and households as well as provisions of collateral for loans of firms facing restricted cashflows. It also includes regulatory actions such as release of capital buffers built since the implementation of Basel III. All these policies, as it will become clear in the next section, reinforced one another and allowed for the smooth transmission of monetary policy at the lower bound and for fiscal expansions in countries at the periphery of Europe. The large fiscal stimulus averted a similar outcome like in the great recession, even as the pandemic caused a much stronger fundamental shock than in 2008 (Brunnermeier, 2021, p.21).

Contemporary policies implemented to target the impact of Covid-19 in the economy can be divided between the authorities responsible for its deployment: The European Commission, The European Central Bank, The European Banking Authority, national governments, and the European Stability Mechanism (ESB). During the months of April and May of 2020 the European Commission approved several state aid measures, these included direct grants,

subsidized state guarantees for bank loans, public and private loans with subsidized interest rates, incentives for banks to use existing lending capacities and additional flexibility to enable short-term export credit insurance provided by the state¹ (European Commission, 2020). In line with easing the access to credit and the monetary policy transmission, in March 2020, the European Central Bank initially expanded its Asset Purchase Program (APP) and initiated the Pandemic Emergency Purchase Program (PEPP), it also reactivated the US dollar swap lines with reduced pricing.

In a timeline, the European Central Bank responses to the COVID-19 pandemic started when early signs of the economic impact of the pandemic began to take form. These policies were intended to reduce rates, especially in the scenario in which a strong deflationary tendency was forming and the ECB asserted its monetary policy forward guidance to keep rates low until inflation robustly converge to the target close to 2%. Besides reducing rates, expanding liquidity in the markets was a crucial policy in light of the increasing uncertainty and market volatility.

Quantitative Easing- Asset Purchase Program and Pandemic Emergency Purchase Program

In March 2020, the ECB expanded its Asset Purchase Program (APP) in €120 billion euros in addition to the €20 billion reinvested per month. In addition to the APP, the Pandemic Emergency Purchase Program (PEPP) was deployed with a €750 billion of initial purchase target until December 2020, including all previously eligible APP assets and a waiver to the Greek sovereign debt. The PEPP was expanded in €600 billion to a total of €1,350 billion until June 2021. The second wave of the pandemic and the prospects of a second downturn in output, the program was expanded again to a total of €1,850 billion and will stay in place until March 2022 and reinvestments of the principal payments for maturing securities bought under during the PEPP will continue until December 2023 (ECB, 2020a and 2020b)

TLTRO III

To ensure liquidity in the markets and the flow of credit to support businesses during the pandemic, the Targeted Longer-Term refinancing operations (TLTROs) (which was first introduced in 2014) was largely expanded and the asset conditions to be used in the operation was substantially eased. The dual interest rates of the ECB, i.e. the TLTRO rate and the deposit

¹ According to the information page of the European Commission under state aid actions.

facility rate function as a mechanism to incentive credit to the real economy, as the interest differentials between the paid interest to the ECB and the TLTROs received are currently positive, a bank that lends to the real economy is permitted to obtain liquidity at the ECB at low rates as the favorable rate of TLTRO is as low as -1% and the deposit rate facility is -0.5%, banks are able to profit from this difference while lending to the real economy (ECB, 2020c). The TLTROs are targeted operations to provided financing to credit institutions, it offers banks funding with long-term repayment at attractive conditions in order to boost bank credit supply to the real economy (ECB, 2020d). The mechanism in which TLTROs function is by reducing rates that banks can borrow from the central bank according to lending patterns, for example banks that issue more loans to non-financial corporations and households are entitled to receive liquidity in the operations at a lower interest rate for the duration of the long-term refinancing operations. In providing funding to banks thus, the TLTROs facilitate the transmission of monetary policy, especially in cases where the level of uncertainty is high, for instance in the bust of a financial cycle and also when interest rates are at the lower bound and inflation expectations are decreasing.

The current TLTRO III was initiated in 2019 and was modified to increase leading during the pandemic, the policy was recalibrated in March 2020 to reduce rate to as low as 25bps, and in June 2020, it was reduced to -1% and maintained until June 2022 in a decision by the Governing council of the European Central Bank's meeting in December. The borrowing allowance was also extended from 50% to 55% of the total outstanding amount of loans to non-financial corporations and households (except in loans targeted for house purchase). Another action was to reduce the minimum threshold of lending performance to zero, meaning that banks are widely entitled to participate in the TLTRO II (ECB, 2020d).

In the context of TLTRO III, the European Central Bank decided to offer 4 additional biddings and implemented the PELTROs (Pandemic Emergency longer-term refinancing operations), these policies intend to work effectively as a liquidity backstop to banks. Time for repayment was substantially extended and the program is expected to continue until 23 June 2022 (ECB, 2020d).

Collateral easing measures

To increase and facilitate the availability of assets which can be used as collateral during the pandemic to access operations providing liquidity, including the TLTROs III described above, the ECB eased conditions. To ensure the transmission of monetary policy and avoid a credit

crunch, additional credit claims were added to the eligible counterpart for central bank funding. These claims included loans to corporates and households with lower credit quality and loans to other types of debtors, as well as loans in foreign currency. It included the pandemic government guaranteed loans, small and medium enterprises (SMEs), loans to households and self-employed workers. The European Central Bank increased the acceptance of internal credit rating frameworks performed by banks to consider for liquidity operations. Furthermore, the level of reporting of additional credit claims was reduced to ensure the speed of the transmission.

The domestic credit claims non-uniform minimum size threshold was reduced to 0 € from previous 25,000 €. Concentration limits increased from 2.5% to 10% the ceiling share of unsecured bank bonds (UBBs) issued by banking institutions in the collateral pool, the motivation was to mitigate funding stresses in the money market funds by incentivizing the purchase of bank's short-term debt, allowing the absorption of outflows from money market funds. Estimates show the potential of increasing up to €160 billion of collateral eligibility (Guindos and Schnabel, 2020).

The extension of collateral was also increased by a waiver for the Greek debt instrument of minimum credit quality, thus accepting it in credit operations with central banks in Europe. Finally, haircuts on collateral valuation were reduced by a fixed factor of 20% for credit operations (ECB, 2020f)

Table 2: Collateral easing measures

Category	Collateral easing measures
Credit claims/ ACCs	Acceptance of ACC collateral covered by COVID-19 government guarantees
	Acceptance of new debtor types in ACCs covered by COVID-19 government guarantees
	Acceptance of expanded set of credit assessment systems
	Reduction of loan-level reporting requirements for credit institutions
	Removal of minimum size threshold for credit claims
Rating measures	Collateral eligibility "freeze", rating floor imposed at credit quality step 5 (CQS5)
	ABSs: eligibility "freeze", rating floor imposed at credit quality step 4 (CQS4)
Risk tolerance	Proportionate reduction of haircuts by 20%
	Reduction of haircuts for non-marketable assets
UBBs	Increase of concentration limit for unsecured bank bonds (UBBs) from 2.5% to 10%
Greek waiver	Acceptance of Greek sovereign debt as collateral

Source: Jézabel et al (2020)

Credit Rating Actions

Targeted at mitigating the impact of increasing rating downgrades in the corporate sector as a result of increasing uncertainty caused by the COVID-19 crisis, the ECB decided to freeze ratings used in their operation assessments temporarily. The rating downgrades affecting firms which are viable in the long-term but suffered pandemic-related troubles that could lead to a reduction of collateral availability of banks, thus reducing lending capacity and acting in deepening the recession (ECB, 2020g).

The Eurosystem decided to continue accepting as collateral, those assets which were eligible prior to the freezing, provided the rating remains superior to a credit quality threshold- credits that are below the required will be subject to haircuts based on the current rating during the pandemic. For marketable assets and issuers meeting the collateral eligibility by the date of 7 of April of 2020, will continue to be eligible as long as their rating is at minimum the credit quality step 5, i.e., the probability of default of 1.50%, except for asset backed securities which requires the rating to be above credit quality step 4, of 1.0% of default probability in order to prevent the triggering of haircuts. These probabilities of default are harmonized by the Eurosystem in external ratings as S&P BB+ and BB for credit quality step 4 and 5 respectively.²

Repo Lines and exchange rate swaps

In periods of high uncertainty, flight-to-safety in the form of demand for foreign currency assets may increase, pressing central banks to provide liquidity in foreign currency. To meet this demand without big constraints, disruptions in the market or instability, central banks activated new currency swap lines during the pandemic to allow the exchange of currency reserves and ensure the well-functioning of the forex market.

The swap lines activated during the Covid-19 pandemic include those countries with smaller central banks such as Denmark, Bulgaria, Croatia, Hungary, and other non-euro area countries in Europe. These lines began to be activated in March, gradually expanding until July 2020, with Euro Repurchase Agreement EUREP expected to run until March 2022. The Euro-Dollar swap line was reintroduced, with a greater periodicity, with daily operations 7-day and weekly operations 84-day, pricing was reduced by 25bps- this was reduced in June and reduced again in July to a frequency of only once a week of the 7-day operations.

² The harmonizing is provided by the EuroSystem credit assessment framework (ECAAF)

Capital Buffers and lending capacity

The European Central Bank in focusing on increasing lending capacity of banks implemented a temporary capital and operational relief. The most important aspects are: (i) the liberalizing of all capital and liquidity buffers built during the past years as a result of the Basel III new requirements for all banks and for systemically important banks. (ii) The relief in the composition of Pillar 2 capital requirements and (iii) recommendations to restrain dividend distribution (ECB, 2020h).

In the recent years' banks have built strong capital and liquidity buffers. Buffers were designed to withstand stresses such as the one imposed by covid-19. The current guidance by the ECB will allow banks to operate temporarily below the capital level required by the Capital Conservation Buffer (CCoB), the Pillar 2 Guidance (P2G) and the Liquidity Coverage Ratio (LCR) and the Countercyclical Capital Buffer (CCyC).

Temporary measures due to the pandemic will also permit the use of capital instruments that are not qualified for the Common Equity Tier 1 (CET1) capital, such as Tier 1 or 2 instruments to meet the requirements of the Pillar 2 (P2R).

Other Measures

The European Central Bank and the European Banking authority has also provided flexibility from the 2020 from EU-wide stress tests of banks. Inspections on-site and remediating actions as a result of recent inspections are being rescheduled to ensure that banks although remaining supervised are not acting pro-cyclically to present or adapt to inspections, especially regarding internal models.

State Aid Actions

The extent of the impacts of the covid-19 pandemic required not only the monetary policies described previously. Fiscal policy in the form of state aid of to mitigate the shocks caused by lockdowns or businesses unable to operate was put in place. The essential format of the fiscal policy during the pandemic aimed at to preserving firms and households' financial stability as actions to mitigate the health crisis were being implemented, such as lockdowns. The European Commission temporary framework policies included direct grants (or tax advantages), subsidies for bank loans in the form of state guarantees, public loans at subsidized interest rates, and state subsidized short-term export credit (European Commission, 2020).

As the scope of this work is to look only at the developments of systemic risk during the pandemic and the possible challenges ahead, state aid actions are only considered in that matter. For instance, the NextGenerationEU is only considered to the extent of its importance on long-term growth and expectations, and also due to its incomplete state, direct impacts are difficult to grasp, therefore it is not described in detail.

National measure to respond to the pandemic, the safety net to support jobs, workers, businesses, and member states planned a total of € 540 billion euros under the flexibility of the European Union budgetary rules i.e. the General Escape Clause. This clause allows States under special circumstances “unusual events clause and the general escape clause” to undertake appropriate budget measures without preventive or corrective actions included in the Stability and Growth Pact (European Parliament,2020)

The state aid projects included € 100 billion euros under the SURE-EU program to protect employment during the pandemic, an instrument supporting short-term working schemes in order to protect employees and self-employed against loss of income. SURE-EU approved €94.3 billion in support by May 2021.

The European Investment Bank (EIB) under the pan-European guarantee fund €25 billion, to provide up to €200 billion in loans for companies. The fund operates by providing guarantees on debt and equity instruments. The program is endorsed by the expectation that firms which are viable in the long run, may be facing financial or operational constraints as a result of the pandemic. The operational capital will be guaranteed by participating member states jointly contribution to the Bank. The fund will be guaranteed up to 70-90% of the underlying loans with the maximum maturity of 6 years, with a maximum per loan up to €800,000. The state aid under the Pandemic Crisis Support by the European Stability Mechanism (ESM, 2020) will provide up to 2% of GDP for all member states of the euro area, a total estimated value of €240 billion (European Council, 2020).

Moratoria

To ensure that businesses facing economic consequences caused by covid-19, a moratorium on loan repayments was implemented in March 2020. The moratoria are targeted at obligors facing liquidity shortages which incur in difficulties to timely fulfill its obligations with creditors. The increase in non-performing loans as a result of the immediate cashflow constraint would trigger creditors attempt to raise funds and possibly impair the transmission of monetary policy in the case which banks are required to raise capital for loan loss provisions. Therefore, the European

Banking Authority guidelines published in April 2020, authorized the provision of payment holidays to obligors without automatic triggering reclassification of exposures under the definition of forbearance and which could ultimately result in defaulted classifications. The criteria in which loans do not trigger forbearance classification should not include obligors which already faced forbearance classification. According to the European Banking Authority (EBA, 2020), moratoria must be applied broadly, to encompass all the institutions within a given jurisdiction. The moratorium needs to ensure that changes in scheduled payments are not obligor-specific, thus requiring a group of obligor's requests.

Firms can apply for the loan moratoria for a total of 13 months with applications available until 31 March 2021, nevertheless institutions should mark these loans and assets as their unlikelihood to pay. It is required that institutions need to carefully assess credit quality of exposures under moratoria in a risk-based manner. Based on a revised timeframe of repayment including measures that might influence creditworthiness of the counterpart, including covid-19 related measures.

Table 3 summarizes the policies implemented ex-ante to prevent the building-up of systemic risk and the contemporary policies deployed by Central Banks in the EuroSystem, the European Commission and national governments.

Table 3: Summary of contemporary policies implemented

Responsible authority	Time of implementation	Type of Policy	Description	Proposed size in Euros	Used amounts
European Central Bank	Contemporary	Monetary Policy	TLTRO III- reduction of rates and the minimum threshold required. Reduction in collateral requirements		Outstanding amount from 25/03/2020 to 27/05/2021 € 2,00tn
European Central Bank	Contemporary	Monetary Policy	Pandemic Emergency Purchase Program (PEPP)	€1,850bn	Cumulative purchases until April 2021
					€1,104,465 ml out of which
					Public sector securities €893,844
					Commercial paper €12,766
					Corporate bonds €27,058
					Covered bonds €4,055
European Investment Bank	Contemporary	Funding for companies	Guarantee and funds to support small and medium enterprises a part of the European Guarantee fund	Up to €200 bn in mobilized investment	€103.5bn as of 31 may, 2021
European Commission	Contemporary	Support to member state countries	European Stability Mechanism to support member states	€240 bn	
European Commission	Contemporary	Flexibility of national measures (general escape clause)	Government direct spending or tax deferrals – actions to combat the pandemic impact on the health and economy	€524 bn	
European Commission	Contemporary	Employment protection	SURE- funding for short-term working schemes to mitigate unemployment risks in an emergency	€100bn	
European Commission	Contemporary	Direct EU budget support		€70 bn	

Sources: ECB (2020a,2020b,2020c,2020d,2020f,2020g,2020h), European Commission (2020), European Banking Authority (2020) and European Investment Bank (2020). Author's elaboration.

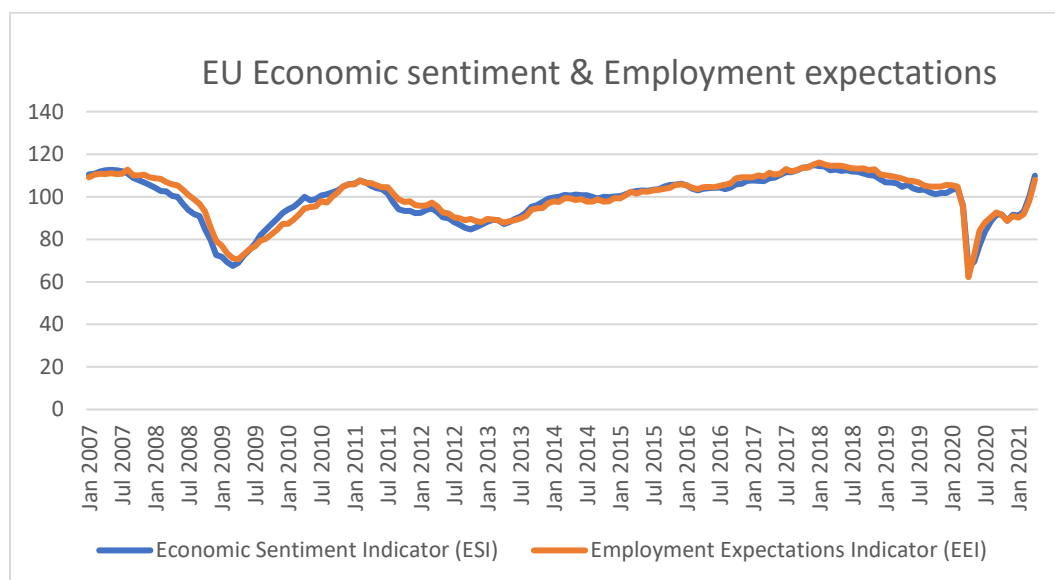
4. Systemic risk in Europe during Covid-19

The initial impacts of the covid-19 crisis are slowly becoming known, as well as the policies implemented by government authorities over the world to enforce social distancing rules and prevent the economic collapse. In this section, it is first analyzed the impacts of the pandemic to the economy, followed by an overview of the measures taken to safeguard households and firms and the financial sector through the shutdown and finally presenting how these measures combated systemic risk in the period.

Initial events of the pandemic can be described as a Knight (1921) and further Keynes (1936) argument of fundamental uncertainty, that is, the impossibility to not only set risk parameters to possible unfolding events but the more intrinsic impossibility of even knowing the events. The impossibility to grasp minimally how the pandemic would develop and to what extent the impacts to health, society and the economy followed a flight to safety, increasing savings and precautionary measures.

Economic confidence fell, and the insecurity about job prospects rose. This indicated a scenario which the pandemic, a health concern, was quickly morphing into an economic crisis. This possible scenario would not only exacerbate the rising hospitalizations and victims of Covid-19 but also undermine financial support to the health sector and measures to contain the spreading of the virus.

Figure 2: EU Economic sentiment & Employment expectations



Source: Eu surveys, available at the ECB statistical data warehouse. Own elaboration.

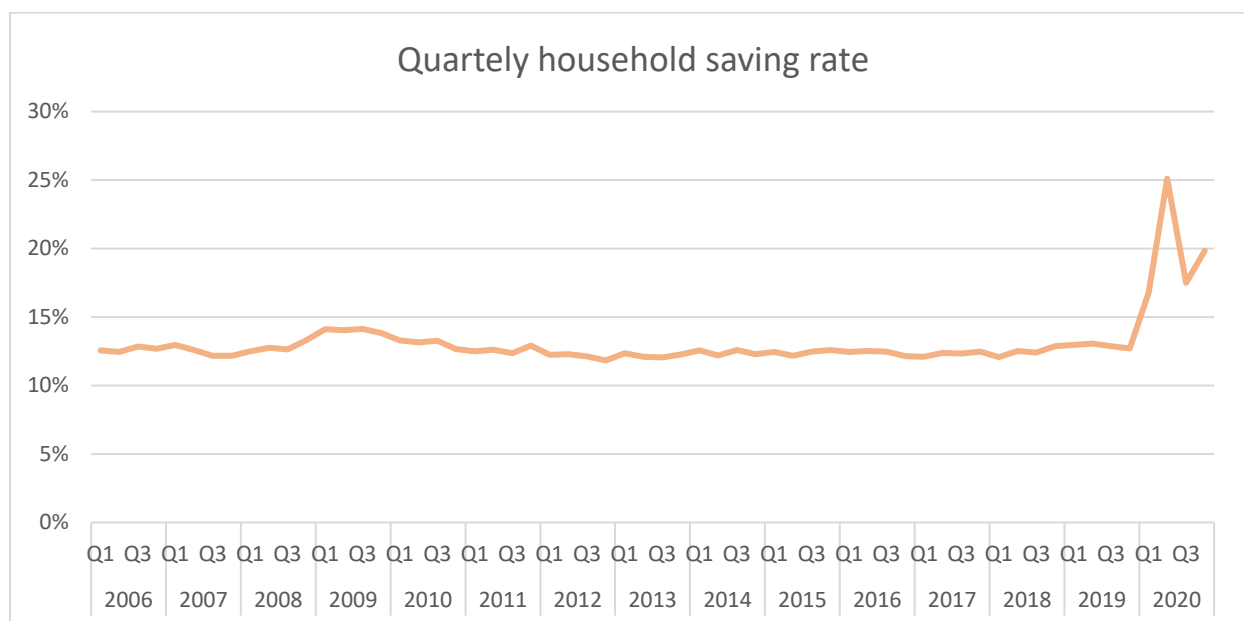
Besides the public health impact of the pandemic, the economic impacts originate from various sources. First, shutdown and uncertainty led to a sharp increase in savings in countries in the euro area, but the shock was not only concentrated on the demand. As firms were unable to operate, a supply shock emerged, especially in sectors which the spread of the virus was more pronounced, for instance services such as leisure, hospitality, and food.

The pandemic had a diverse effect in countries in the euro area. Countries in the south of Europe, like Spain and Italy were severely hit by the fast spreading of the virus and were forced to impose more drastic measures to contain the spread. Differences in the economic structure

were also determinant of the economic impact of covid-19, with countries that have an economy with a higher participation of services to output suffering the most with the lockdowns thus having a stronger negative impact on GDP. Some of these countries are also the ones which still more fragile because of the difficulties from the global financial crises and the European debt crisis.

The direct impact of the pandemic was general reduction in aggregate demand as agents adopted the strategy of “wait-and-see” (Baldwin & Tomiura, 2020). In periods of strong uncertainty, the pessimistic environment about future prospects in the job market reduces consumption and boost savings of households, but during the pandemic, this was also added to the impossibility of discretionary spending in sectors closed due to the lockdown (Brodeur et al, 2020).

Figure 3: Household saving rate in the EU19 as a percentage of gross disposable income



Source: Eurostat, own elaboration.

The financial markets have also faced strong decline in the initial phases of the pandemic as uncertainty about the duration and the size of its impact to the economy remained unknown. The shadow of the European debt crisis added to the highly uncertain scenario permeating the public policy responses to support the economy through the pandemic, especially in Europe where decisions must consider different regions which were differently affected, but also fiscal rules and fiscal space for implementing public policy support to the economy. This was

immediately translated in increasing spreads, increasing the costs of countries in the south to act against the pandemic³.

The shock to the financial markets were immediate, the European composite indicator Stoxx600 in figure 4 shows the dramatic downturn in the beginning of 2020. Uncertainty about the developments of the pandemic and the policy measures in Europe translated to distresses in the financial sector.

Figure 4: Stoxx600 stock market composite indicator



Source: Stoxx600 and CNBC

An initial approach to the sources of systemic risk during the pandemic is based on the characteristics of financial instability of previous economic crisis and its impacts on the banking sector, but the exogenous nature of the pandemic imposes some challenges. The crisis initially affected the real economy, without pre-dating indications of financial distress, over-leveraging or price correction and asset fire sales. As the crisis began in the real economy, with some sectors more affected than others, the problems would emerge from the direction of the real economy to the banking sector or directly at the financial sector via high degrees of uncertainty.

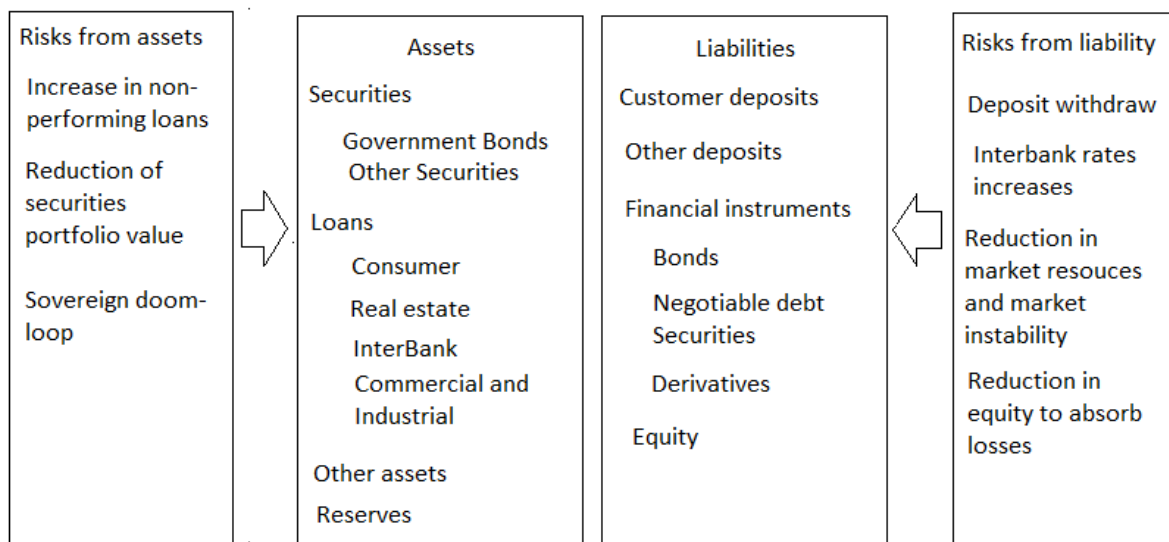
The effects hypothesized are the results of the economic freezing that occurred in the initial months of the pandemic. It increased uncertainty; some firms faced zero cashflows notably in the service sectors, governments faced increasing budget deficits as a result of lower tax revenues and increasing spending to combat the pandemic, households also faced uncertainty: savings increased, consumption fell, and threats of rising unemployment were spreading. These initial effects were the target of strong government policy. Central Banks acted to provide liquidity to firms and governments, reduce interest spreads, and calm precautionary measures

³ Country CDS spreads available as figure 1 of the appendix.

from the part of financial agents. This occurred while governments increased fiscal spending to keep employees' wages, to lend to small and medium enterprises, and to provide loan guarantees. All of these policies in turn affected the banking sector and prevented systemic risks from emerging during the pandemic in the form of firms and households defaulting, and by preventing the downward trend of asset prices.

In a balance sheet perspective, it avoided systemic risks from the asset and from the liability sides. As a result of high initial levels of capital buffers due to bank's new regulatory framework put in place in Basel III alongside relative macroeconomic stability in the second half of the 2010's banks built significant shielding from exogenous shocks.

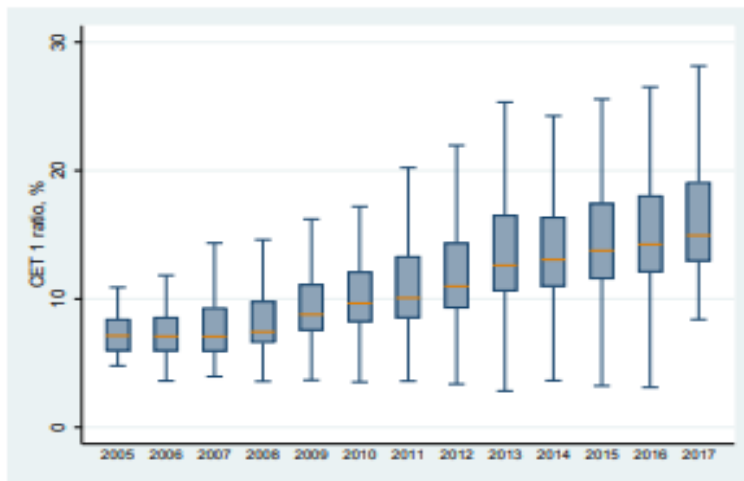
Diagram 1: Sources of systemic risk in the bank's balance sheet.



Source: own elaboration.

Capital at the initial moments of the crisis was well beyond the regulatory requirements and have not yet suffered any significant impacts. As most banks entered the covid-19 crisis with higher capital buffers, therefore effects of asset deterioration were diminished. The policies deployed during the pandemic have cushioned the immediate impact on bank's capital, with the relative stability of CET1 throughout the entire year of 2020. Compared to the 2008 crisis, the common ratio 1 nearly doubled from the previous 7 percent (Pancaro et al, 2020). This is substantially above the regulatory minimum requirement.

Figure 5. Common Equity Tier ratio 1



Source: Pancaro et al, 2020.

Non-performing loans (NPL) have been steadily falling since the peak during the Eurozone crisis to near 3 percent at the most recent data of 2021Q2. This measure was a result of banks efforts and regulatory supervision, alongside better macroeconomic conditions. Despite been better prepared to withstand the pandemic, the size of the recession and the increasing uncertainty could have resulted in detrimental conditions to the banking sector thus harming the transmission of monetary policy.

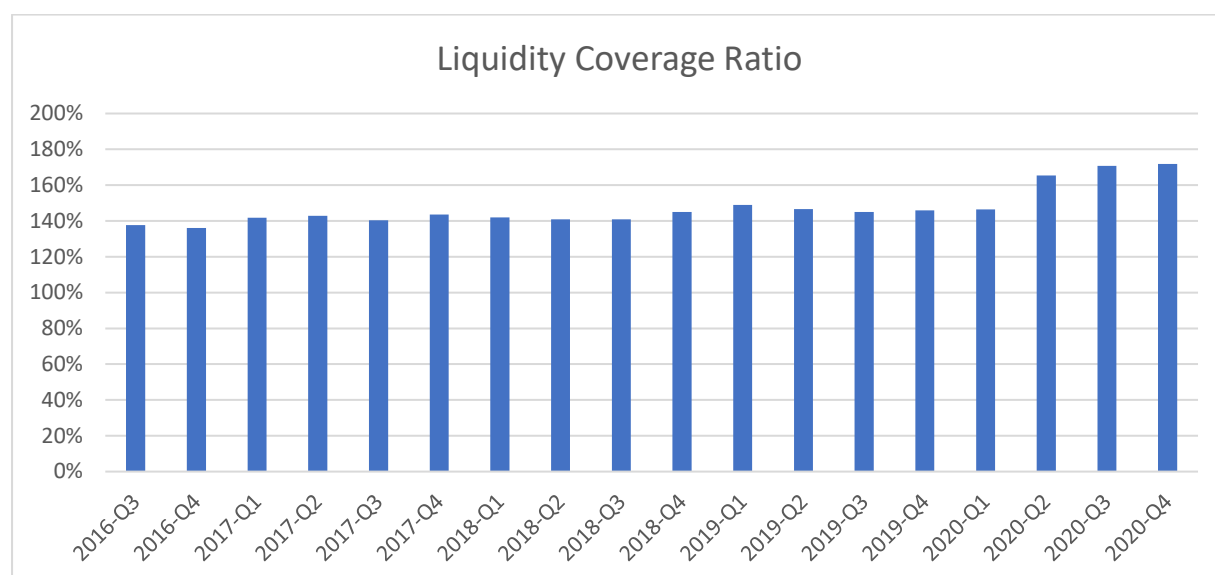
Liquidity Coverage Ratio

In terms of liquidity, the liquidity coverage ratio (LCR) was substantially above the 100% minimum threshold for the expected 30 days cash outflows. It is calculated following the formula, high quality liquid assets comprise reserves, marketable government and central bank securities, corporate debt securities of non-financial institutions and covered bonds. Net cash outflows are calculated based on the expected inflow and outflows for a 30-day stress period (Schmidt, 2019)

$$\text{Liquidity Coverage Ratio} = \frac{\text{High Quality Liquid Assets}}{E[\text{Net cash outflow}]_{30\text{days}}}$$

Despite been better prepared to endure the pandemic, authorities decided to increase the stock of liquid assets in the banks' balance sheet via the TLTROs in order to increase lending to the economy and improve resilience. It proved important in both aspects as LCR for all EU countries participating in the Single Supervisory Mechanism (SSM) steadily increased to 171%.

Figure 6: LCR in percentage for countries participating in the single supervisory mechanism

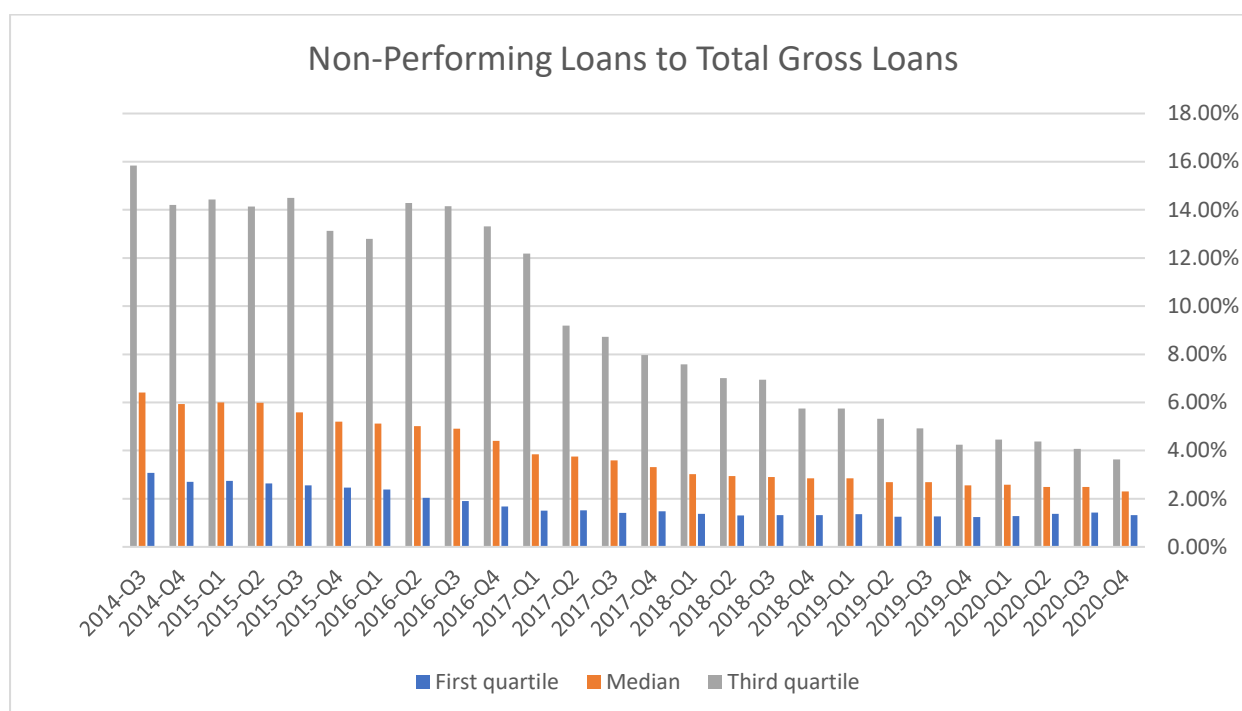


Source: ECB statistical data warehouse, own presentation.

Non-performing Loans

The first impact to non-performing loans was from the loan moratoria, either legislative or non-legislative, it prevented loans to firms which were facing liquidity constraints during the pandemic from turning into forbearance or defaulted. It effectively operated in two ways, first it bought ample time to firms which had been affected by the lockdowns and the economic downturn, but at the same time prevented a sharp increase in non-performing loans (NPL) at the banking sector. A strong rise in NPL would immediately trigger increases in loan-loss provisions and dampens bank's asset quality. A vicious-cycle of increasing NPL and increasing loan-loss provisions could negatively affect lending and the economy, harming economic recovery. According to the Pradhan et al (2021) the moratoria impact the banking sector by reducing interest income for banks but at the same time reduces temporarily the need for increasing loan-loss provision.

Figure 7. Non-Performing loans to total gross loans



Source ECB data statistical warehouse, own elaboration.

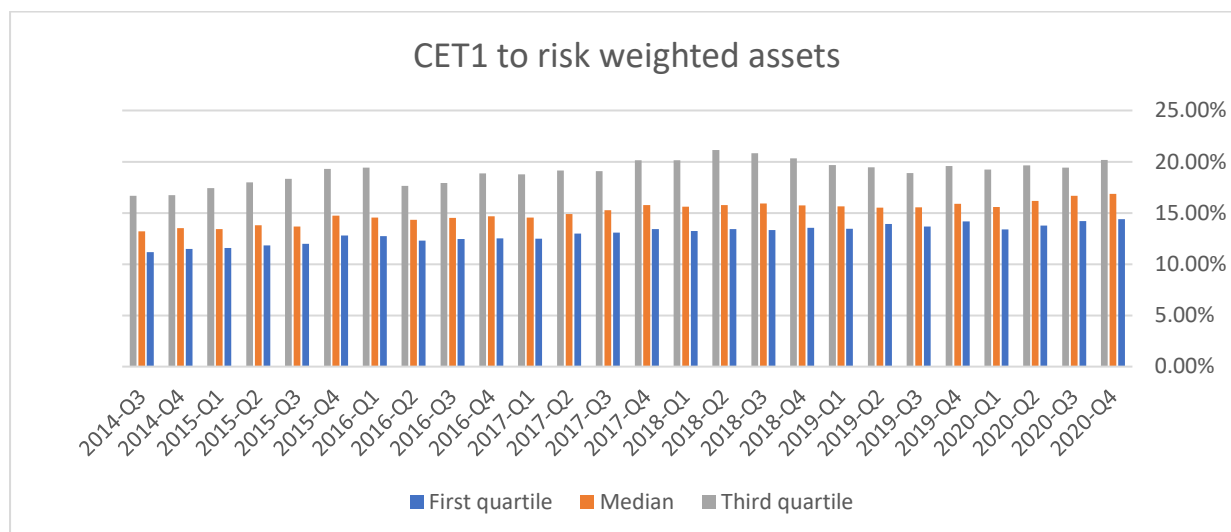
Capital Equity Ratio

Measures to support borrowers including public guarantee for loans, tax deferrals and the Support to Mitigate Unemployment Risk in an Emergency (SURE) provided over €800 bn in assistance to households and firms facing liquidity constraints. These policies were essential to preserve asset quality in the banking sector and the provision of liquidity to the real economy. By increasing available liquidity and income, it guaranteed that firms and households could continue to service on their already existing debt as well as maintain credit lines. In the case of public guarantees for instance, by removing part of the credit risk, it encourages loans to the real economy, specially to liquidity and working capital.

The steady decline in the median and a maintenance first and third quartile of the non-performing loans during the pandemic is a clear indicator that fiscal policy to support liquidity to firms and households in combination with regulatory aspects implemented by the European Banking authority allowed a transition during lockdown period the pandemic. As increases in non-performing assets are associated with slower economic growth and bank lending (Rogoff, 2014), these policies helped not only to preserve the stability of the financial sector but also the future economic recovery.

Systemic risks in the form of asset quality deterioration either visualized by decreasing Common Equity Tier Ratio 1 or by an increase in non-performing loans has not been observed during 2020.

Figure 8. CET1 to risk weighted assets



Source: European Central Bank Statistical data warehouse, own elaboration

Country spreads during the pandemic were also controlled, facilitating increases in debt without triggering rising costs for nation states. This allowed funds to flow to the fiscal programs described above and prevented impairments of monetary policy transmission. The acceptance of bonds of inferior rating- the waiver on Greek Bonds- allowed even governments with problems preceding the pandemic to support the economy as lockdowns were imposed.

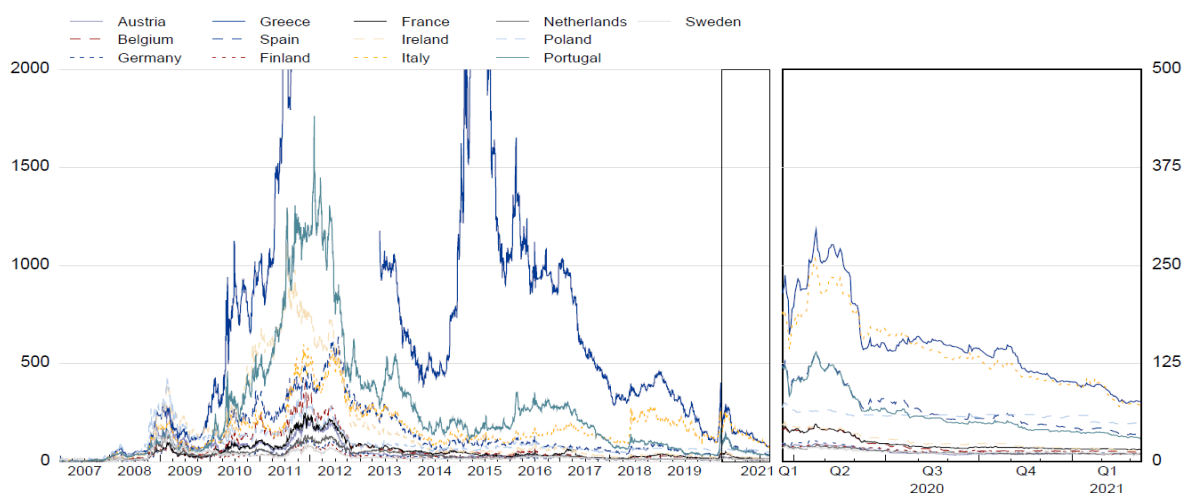
The uneven impacts of the pandemic required stronger policies in countries such as Spain, Italy, and Greece. The countries which needed the most fiscal support had a heritage of the European debt crisis of high levels of indebtedness and lower credit ratings. In addition to this, the incomplete union without a fiscal authority relegated these countries to initially fight the pandemic with their own budget. The possibility of another sovereign debt crisis in the absence of ECB action would have caused severe damage to the health and economic crisis (Tesche, 2020). The immediate result was a sharp increase in spreads as capital flew to safety in central countries' bond markets. As uncertainty increased, the demand for safe liquid assets, usually provided by central countries i.e., Germany with 83% of Triple-A rated bonds in the EU, the flight-to-safety occurs at levels unjustified by fundamentals (Brunnermeier et al, 2016) and in the absence of currency risk (Lane, 2020). Uncertainty and liquidity preference during the pandemic could have forced some governments in Europe into default. The Pandemic Emergency Purchase Programme came into place as a reedited version, with increased range,

of the quantitative easing policies put in place during the last decade. By credibly committing to purchase assets, including government bonds, the European Central Bank was crucial at stabilizing the markets.

Reducing spreads also impacts the banking sector. According to Schnabel (2016) country spreads are correlated with increasing bank spreads. The sovereign-bank doom loop where deteriorating government finances hinders bank's finances due to the high holding of government debt could have transformed the pandemic into another financial crisis, but due to the PEPP and especially by granting a waiver on purchases of Greek Bonds, spreads were controlled (Tesche, 2020). Sovereign yields are key to the transmission of monetary policy as it is the basis for funding costs of households, corporates, and banks (Lane,2020). The PEPP also operated as a market-maker of last resort by reassuring the commitment to the stability of spreads via the purchase of government securities with below investment grades.

In the right part of figure 9, the blue line and the yellow dotted line are Greece and Italy respectively, having the highest premia. The ones immediately below are Portugal and Spain. The image illustrates the initial uncertainty in the pandemic. It is difficult to perceive a counterfactual scenario where the pandemic purchase program and the other measures were not implemented, but the fast-rising CDS during the 2008 financial crisis and European Debt Crisis are an illustration of an eventual distinct scenario.

Figure 9. Credit default swaps premia selected group of European Countries in basepoints⁴

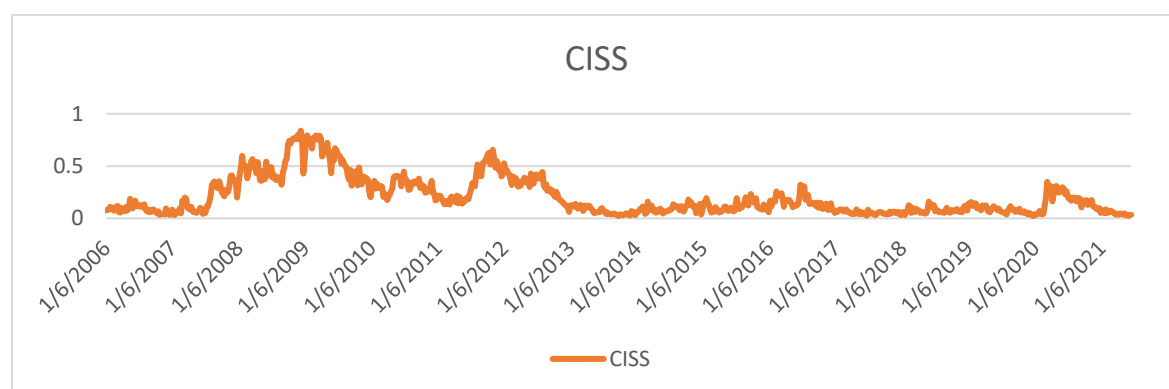


Source: ECB data warehouse, based on Refinitiv and CMA

⁴ Enlarged version available as figure 1 of the appendix.

The role of Targeted long-term refinancing (TLTROs) III operations, PEPP and the combination of other policies to support the economy, as well as the long-term commitment of the Next Generation EU project, acted as a counterweight to market forces pushing for more liquidity and precaution. The effects of uncertainty over the initial months of the pandemic led to increases in systemic distress. In figure 8, the Composite Indicator of Systemic Distress shows that after the commitment to the policies and their effective implementation, system wide pressures were reduced, with a spike in risks during the months of February and March 2020 and a further reduction to the previous trend. The composite indicator is design to identify contemporaneously stresses in 15 individual financial stress measures (Kremer et al, 2012).

Figure 10. Composite indicator of systemic stress



Source: ECB based on Kremer et al, 2012 model, own elaboration.

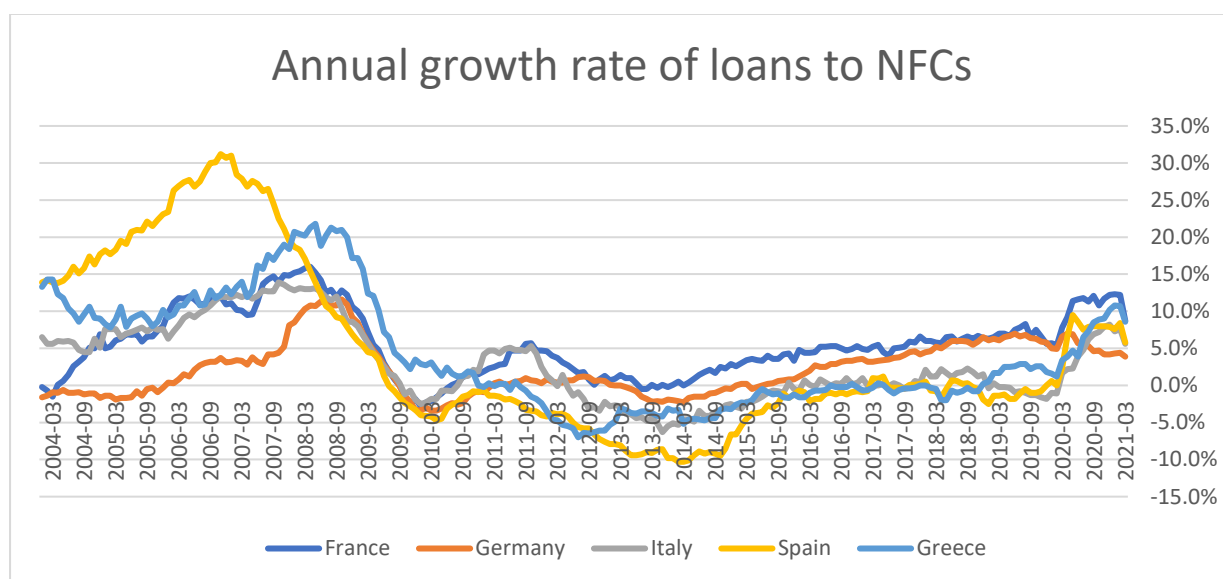
It is necessary to note that businesses' willingness to expand leverage was based on the change in expectations resulted from substantial monetary and fiscal policy. The commitment to the integrity of the European Union shown by the development program NextGenerationEU shown as well that long-term growth prospects are positive, therefore reducing risks and uncertainty. A crucial aspect of observing the evolution of systemic risk is its relation to self-fulfilling prophecies resulting from negative expectations about the prospects of the economy, forcing fire-sales, asset prices readjustments and consequently the deterioration of balance sheets and increasing systemic risks. Liquidity provision and asset purchases limited overshooting dynamics and increasing risks to financial stability (Lane, 2020).

Credit crunches are usual during economic crisis where there's a flight to liquidity, banks increase the purchase of government bonds and increase reserves, but the counterweight forces of government policies and central bank commitment stabilized expectations, helping to increase the supply of liquidity to households. The combination of policies: loan guarantees and moratoria, targeted long-term refinancing operations and the Pandemic Purchase

Programme increased liquidity and assured that government support would do “whatever it takes” to preserve the economy during the pandemic.

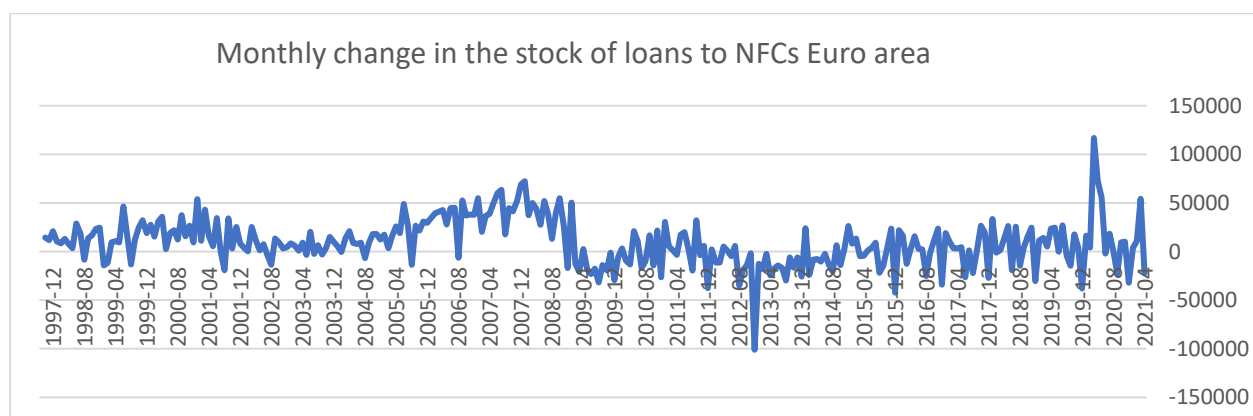
It is important to mention that the mechanism depends on previous leveraging and building of imbalances. For instance, if banks were less capitalized when entering the pandemic, the stresses on the real economy could have been amplified by the financial sector if it attempted to deleverage or conduct fire sales (Constâncio et al., 2019). The amplifying mechanisms could originate from an asset deflation, credit crunch and the financial institution itself entering in distress, thus increasing systemic risks.

Figure 11: Annual growth rate of loans to NFCs



Source: ECB statistical data warehouse, own elaboration

Figure 12: Monthly change in the stock of loans to NFCs Euro area in millions of Euros



Sources: ECB statistical data warehouse, own elaboration.

Therefore, the systemic risk indicators observed during the pandemic remained stable and were maintained by substantial policy measures. The periods preceding the pandemic were not moments of euphoria and increasing banking leverage, but of modest growth and low interest rates. The result was a rebalancing of the European banking sector, building capital and liquidity coverages beyond the minimum required and of improving asset quality.

The situation in the recovery is different. Firms are more indebted and fragile; risks of downgrades are higher for both sovereign and corporations and the usual risks from the doom-loop remain due to increasing bank holdings of government securities and the incomplete union. The essential question is to understand whether the increasing fragility will not trigger financial instability in the scenarios where growth is not sufficient to make up to loss of income and increasing indebtedness during the pandemic. The possible outcomes are a higher stock non-performing loans and deteriorating asset quality in the banking balance sheet. Another aspect is to understand if the long-term growth project- Next Generation EU- is sufficient to allow fiscal transfers and boost growth in countries hardly affected by the pandemic which still have a heritage of higher public debt.

As described in the last previously, non-performing loans are associated with longer recessions and can harm the recovery if not treated properly. Furthermore, the feedback effects of slow growth caused by high levels of NPLs can further decrease the prospects of growth. High levels of NPLs are associated with the slowdown in economy growth, as well as increasing unemployment and a reduction in performing loans (Berti et al, 2017; Sánchez, 2021;). Unresolved non-performing loans are a concern because it also induces uncertainty reducing the supply of credit to the economy depressing aggregate demand and investments, in the perspective of the borrower it freezes resources in unproductive activities (Skarica, 2014).

5. Conclusion

In this present work two research questions were addressed. First, what were the ex-ante macroprudential policies and how they stood the test to mitigate systemic risk during the pandemic. Second, what is the impact of the policy mix deployed during the pandemic in relation to systemic risks in the European banking sector.

In the second section a literature review about systemic risks, origins, and sources, is presented alongside definitions of macroprudential policies and how they target systemic risks. Systemic risk is defined as financial instability which can cause welfare costs to society, more precisely,

events which occur in the real economy or in the financial sector, derived endogenously or from an exogenous shock can be contagious, spreading from a localized distress, for instance the result of a bank's individual action, via balance sheet interconnections and cause a regional or global financial distress. These distresses in the financial sector can originate from increasing non-performing loans, liquidation of banks, bank runs, and asset-fire sales. The role of expectations and uncertainty is fundamental in determining overshooting dynamics to increase liquidity and to reduce exposures. It is possible to extract from this part that systemic risk is inherently difficult to observe in a single indicator, thus requiring a holistic view, and that three forms of analyzing it are present in the literature, the network analysis, the cross-section analysis and finally the time dimensions of systemic risk. It contextualized the sources of systemic risk with the measures taken prior to the crisis during the implementation of Basel III and its role in mitigating systemic risk. The third part presents a comprehensive view of the policy mix put in place by European Authorities, such as fiscal transfers, quantitative easing, direct spending, and tax holidays.

It was found that both policies contributed to preventing a system wide distress. The mechanisms worked to provide stability; the first is via the stabilization of expectations, which occurred as authorities committed to provide all the liquidity that was necessary to sustain stability and the commitment of the Pandemic Emergency Purchase Agreement to support all nation states despite inferior credit ratings. One mechanism was to provide income to households and firms, it was conducted by tax deferrals and the SURE program alongside special credit lines with collaterals supplied by governments, allowing the continuation of a flow of income, which prevented a wave of bankruptcies and increasing non-performing loans. Another aspect was the freezing of ratings used by banks in risk assessments, which prevented fire-sales and the reduction of banks assets that would negatively affect the credit supply during the pandemic. The moratoria provided some leeway to firms facing liquidity constraints, therefore preventing defaults (which would hurt businesses and create severe problems in the banking sector due to the rise in non-performing loans). All these policies combined, with better capitalized and liquid banks as result of improvements in regulatory aspects, allowed them to withstand the crisis.

Finally, the crisis proved that the interconnections of monetary and fiscal policy are crucial at addressing macroeconomic shocks and systemic risks. The lessons should be that given the current institutional arrangement of the European Union and the European central bank, acting collectively and swiftly can help to stabilize expectations and the economy.

6. References

Acemoglu, D., Ozdaglar, A., Tahbaz-Salehi, A. (2015): "Systemic Risk and Stability in Financial Networks," *American Economic Review*, American Economic Association, vol. 105(2), 564-608.

Acharya, V. (2009): "A theory of systemic risk and design of prudential bank regulation," *Journal of Financial Stability*, Elsevier, vol. 5(3), pages 224-255.

Acharya, V. (2010): *Measuring systemic risk*, Proceedings 1140, Federal Reserve Bank of Chicago.

Acharya, V., Engle, R. & Richardson, M. (2012): "Capital Shortfall: A New Approach to Ranking and Regulating Systemic Risks." *American Economic Review*, 102 (3): 59-64.

Adrian, T., Covitz, D. & Liang, N. (2015): "Financial Stability Monitoring" in: *Annual Review of Financial Economics*, 7, 357-395.

Bank of England (2009): *The role of macroprudential policy*, A discussion paper, Bank of England discussion papers.

Baldwin, R., Tomiura, E. (2020): "Thinking ahead about the trade impact of COVID-19" in *Economics in the Time of COVID-19*, pp. 59-73.

Berti, K., Engelen, C., Vasicek, C. (2017): "A macroeconomic perspective on non-performing loans (NPLs)," *Quarterly Report on the Euro Area (QREA)*, Directorate General Economic and Financial Affairs (DG ECFIN), European Commission, vol. 16(1), pages 7-21.

BCBS (2011). *Basel III: A global regulatory framework for more resilient banks and banking systems*. Bank for International Settlements, Basel.

BCBS (2013). *Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement*. Bank for International Settlements, Basel.

BIS, Basel Committee on Banking Supervision (2017a). *Finalising Basel III In brief*. Available at https://www.bis.org/bcbs/publ/d424_inbrief.pdf, retrieved 25/06/2021.

BIS, Basel Committee on Banking Supervision (2017b). *Basel III: Finalising post-crisis reforms*. Available at <https://www.bis.org/bcbs/publ/d424.pdf>, retrieved 25/06/2021.

Borio, C. (2011), "Implementing a Macroprudential Framework: Blending Boldness and Realism", *Capitalism & Society*, vol. 6(1), pp. 1-25.

Borio C., Drehmann, M., (2009). "Assessing the risk of banking crises - revisited," *BIS Quarterly Review, BIS Quarterly Review, international banking and financial market developments*, 29-46.

Brodeur, A., Clark, A., E. Flèche, S., Powdthavee, N., (2020). "COVID-19, Lockdowns and Well-Being: Evidence from Google Trends," IZA Discussion Papers 13204, Institute of Labor Economics (IZA).

Brunnermeier, M., Yogo, M., (2009): *A Note on Liquidity Risk Management*, NBER Working Paper 14727, National Bureau of Economic Research, Inc.

Brunnermeier, M., Garicano, L., Lane, P. Pagano., Reis, R., Santos, T. Thesmar, D. Nieuwerburgh, S. V., Vayanos, D. (2016): The Sovereign-Bank Diabolic Loop and ESBies, *American Economic Review*, American Economic Association, vol. 106(5), 508-512.

Brunnermeier, M. (2021): Introduction, in *The Resilient Society*, Endeavor Literary Press, Colorado Springs, 21.

Caprio, G., Honohan, P., (2008). *Banking Crises*, IIS Discussion Paper No. 242, Center for Development Economics 2008-09, Institute for International Integration Studies.

Constâncio, V., Cabral, I., Detken, C., Fell, J., Henry, J., Hiebert, P., Kapadia, S., Nicoletti Altimari, S, Pires, F. and Salleo, C. (2019): *Macroprudential policy at the ECB: Institutional framework, strategy, analytical tools and policies* Occasional Paper Series ECB, No 227. European Central Bank.

European Banking Authority, EBA (2020). *Banks report a significant use of COVID-19 moratoria and public guarantees*. EBA Press release. Available in <https://www.eba.europa.eu/banks-report-significant-use-covid-19-moratoria-and-public-guarantees>. Retrieved from in 20/05/2020.

ECB Statistical Data Warehouse (2021), Retrieved from: <https://sdw.ecb.europa.eu/home.do>, Accessed on: 15th June 2021.

EUROPEAN CENTRAL BANK (2020a), *Pandemic emergency purchase programme (PEPP)*, press release. Available at

<https://www.ecb.europa.eu/mopo/implement/pepp/html/index.en.html>. Retrieved from 17/06/2020.

EUROPEAN CENTRAL BANK (2020b): *ECB announces €750 billion Pandemic Emergency Purchase Programme (PEPP)*, ECB press release, available at https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200318_1~3949d6f266.en.html, retrieved from 20/05/2021.

EUROPEAN CENTRAL BANK (2020c): *ECB recalibrates targeted lending operations to further support real economy*, PRESS RELEASE 30 April 2020. Available at <https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200430~fa46f38486.en.html>. Retrieved from in 17/06/2020

EUROPEAN CENTRAL BANK (2020d): *Amending Decision (EU) 2019/1311 on a third series of targeted longer-term refinancing operations*. Official Journal of the European Union 5/05/2020. Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020D0614&qid=1598879694432>. Retrieved 15/06/2020.

EUROPEAN CENTRAL BANK (2020e): *ECB prolongs support via targeted lending operations for banks that lend to the real economy*. Press Release, available at https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr201210_1~e8e95af01c.en.html retrieved in 17/06/2020.

EUROPEAN CENTRAL BANK (2020f): *ECB announces package of temporary collateral easing measures*. Press release. Available at <https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200407~2472a8ccda.en.html>. Retrieved from in 20/06/2020

EUROPEAN CENTRAL BANK (2020g): *ECB takes steps to mitigate impact of possible rating downgrades on collateral availability*. PRESS RELEASE, Available at https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200422_1~95e0f62a2b.en.html. Retrieved from in 12/06/2020.

EUROPEAN CENTRAL BANK (2020h): *ECB Banking Supervision provides temporary capital and operational relief in reaction to coronavirus*. PRESS RELEASE, 12 March 2020. Available at

<https://www.bankingsupervision.europa.eu/press/pr/date/2020/html/ssm.pr200312~43351ac3ac.en.html>. Retrieved from in 12/06/2020.

European Commission (2020): *Temporary Framework for State aid measures to support the economy in the current COVID-19 outbreak*. Official Journal of the European Union, 20.3.2020. Available at [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020XC0320\(03\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020XC0320(03)). Retrieved on 15/06/2020.

European Council (2020): *COVID-19: the EU's response to the economic fallout*. Available in <https://www.consilium.europa.eu/en/policies/coronavirus/covid-19-economy/>. Retrieved from in 01/06/2020.

European Investment Bank (2020): *Fact sheet: The Pan-European Guarantee Fund in response to COVID-19*. Press release. Available in <https://www.eib.org/attachments/press/covid19-paneuropen-guarantee-fund-factsheet-en.pdf>, retrieved 13/07/2020.

European Parliament (2020): *The 'general escape clause' within the Stability and Growth Pact Fiscal flexibility for severe economic shocks*. Available at [https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/649351/EPRS_BRI\(2020\)649351_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/649351/EPRS_BRI(2020)649351_EN.pdf) . Retrieved from in 26/06/2020.

European Stability Mechanism (2020): *Report on the comprehensive economic policy response to the COVID-19 pandemic*. Available at <https://www.consilium.europa.eu/en/press/press-releases/2020/04/09/report-on-the-comprehensive-economic-policy-response-to-the-covid-19-pandemic/>. Retrieved from in 15/06/2020.

European Systemic Risk Board (2021): *ESRB risk dashboard*. Available in https://www.esrb.europa.eu/pub/pdf/dashboard/esrb.risk_dashboard210406~8f2090e35d.en.pdf?9c4e43ab79a1581de7db104d9904bddb, retrieved from in 20/April/2021

Galati, G., Moessner, R., (2013): Macroprudential policy - a literature review, *Journal of Economic Surveys*, Vol. 27, No. 5, pp. 846–878.

Guindos, L., Schnabel, I. (2020): *Improving funding conditions for the real economy during the COVID-19 crisis: the ECB's collateral easing measures*. Blog post ECB, 22 April 2020. Available at

<https://www.ecb.europa.eu/press/blog/date/2020/html/ecb.blog200422~244d933f86.en.html> .

Retrieved from in 20/06/2020.

Herr, H., Metzger, M. & Nettekoven, Z. (2019): Financial Market Regulation and Macroprudential Supervision in EMU – Insufficient Steps in the Right Direction, in: *Still Time to Save the Euro: A New Agenda for Growth and Jobs with a focus on the Euro Area's Four Largest Countries*, Berlin: Social Europe Publishing, pp. 103-122.

Jácome L., Imam P., Nier E. (2012): *Building Blocks for Effective Macroprudential Policies in Latin America: Institutional Considerations*, IMF Working Papers 2012/183, International Monetary Fund.

Jézabel C., Perego E., Tripier, F. (2020): *European Banks and the Covid-19 Crash Test*, EconPol Policy Brief 30, ifo Institute - Leibniz Institute for Economic Research at the University of Munich.

Kindleberger, P. C. (1996). *Manias, Panics, and Crashes: A History of Financial Crises*, New York: Basic Books, 1978, revised and enlarged, 1989, 3rd ed. 1996.

Knight, F. H. (1921): *Risk, Uncertainty and Profit*, University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship, Urban-Champaign.

Kremer, M., Duca, M. & Holló, D. (2012): *CISS - a composite indicator of systemic stress in the financial system*, Working Paper Series 1426, European Central Bank.

Laeven, L., F. Valencia (2018): *Systemic banking crises revisited*, IMF Working Paper WP/18/206, International Monetary Fund.

Lane, P. (2020): *The market stabilisation role of the Pandemic Emergency Purchase Programme*. ECB Blog post on 22 June 2020, European Central Bank. Retrieved from https://www.ecb.europa.eu/press/blog/date/2020/html/ecb.blog200622~14c4269b9e.en.html?utm_source=ecb_twitter&utm_medium=social&utm_campaign=200622_ecb_blog_pl, accessed in 25/06/2021.

Minsky, H. (1977): The Financial Instability Hypothesis: An Interpretation of Keynes and an Alternative to "Standard" Theory". *Nebraska Journal of Economics and Business*, 16(1), 5-16.

Montagna, M., Torri, G., Covi, G. (2020): *On the origin of systemic risk*, European Central Bank working paper series, No. 2520, European Central Bank.

Pancaro, C., Żochowski, D. Arnould, G., (2020): *Bank funding costs and solvency*, Working Paper Series 2356, European Central Bank.

Pradhan, M., Aiyar, S., Mitra, S., Mineshima, A., Jobst, A., Dao, M. C., (2021). *"COVID-19: How Will European Banks Fare?*", IMF Departmental Papers / Policy Papers 2021/008, International Monetary Fund.

Reinhart, C., & Rogoff, K. (2009): "The Aftermath of Financial Crises". *The American Economic Review*, 99(2), 466-472.

Reinhart, C., & Rogoff, K (2014): "Recovery from Financial Crises: Evidence from 100 Episodes." *American Economic Review*, 104 (5): 50-55.

Schoenmaker, D., Wierds, P. (2016): *Macroprudential supervision: From theory to policy*, ESRB Working Paper Series 2, European Systemic Risk Board.

Schmidt, K., (2019): *Does Liquidity Regulation Impede the Liquidity Profile of Collateral?* ECB Working Paper No. 2256, European Central Bank.

Schnabel, I., & Schüwer, U. (2016): *What drives the relationship between bank and sovereign credit risk?*, Working Papers 07/2016, German Council of Economic Experts / Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung.

Skarica, B. (2014). "Determinants of non-performing loans in Central and Eastern European countries," *Financial Theory and Practice*, Institute of Public Finance, vol. 38(1), 37-59.

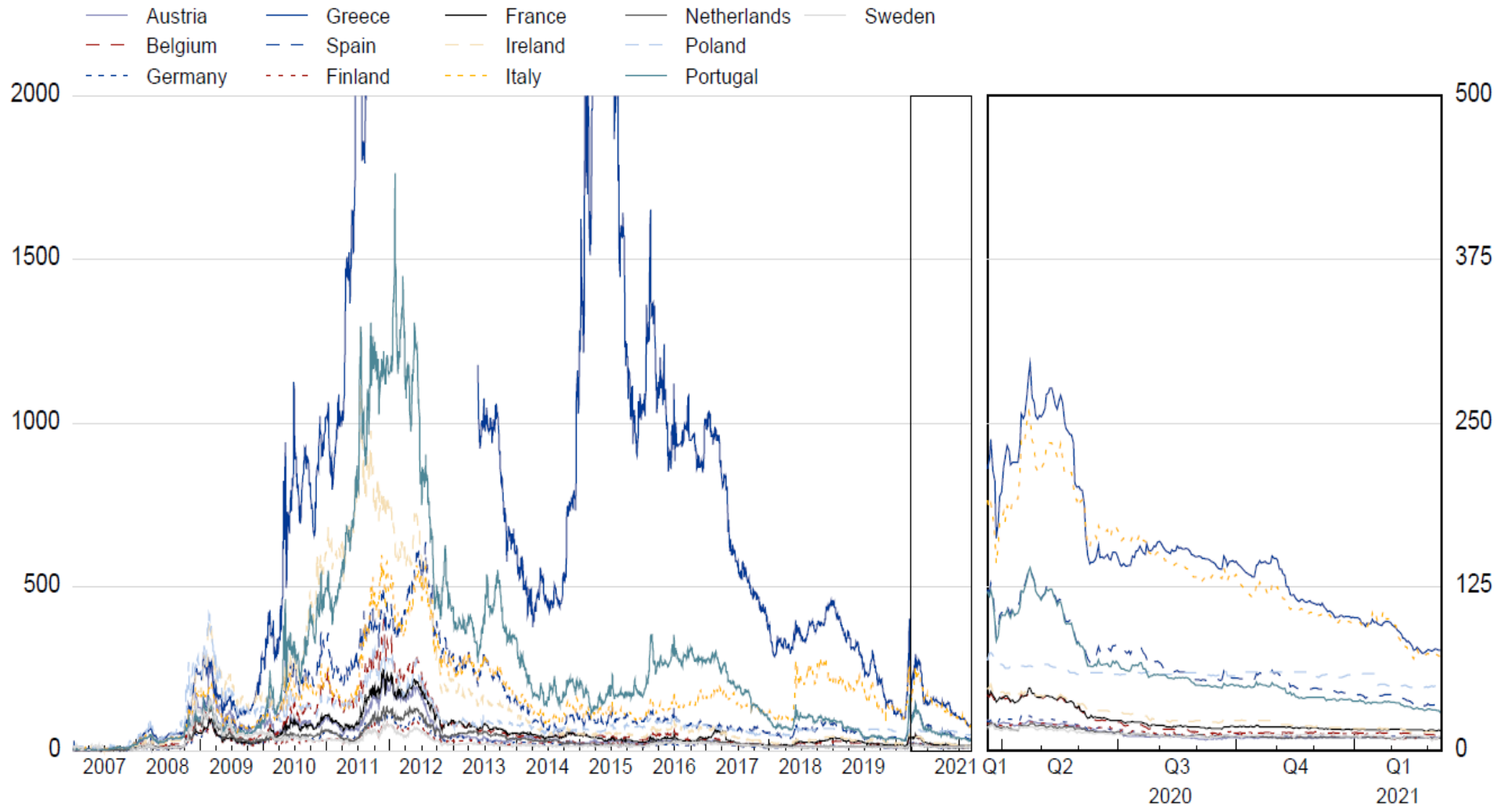
Tesche, T. (2020). *"The European Union's response to the coronavirus emergency: an early assessment,"* LEQS – LSE 'Europe in Question' Discussion Paper Series, No. 157, European Institute, LSE.

Yellen, J. (2009): *A Minsky meltdown: lessons for central bankers*, FRBSF Economic Letter, Federal Reserve Bank of San Francisco, issue May 1.

Yellen, J., (2013): *Challenges Confronting Monetary Policy : a speech at the 2013 National Association for Business Economics Policy Conference*, Washington, D.C., March 4, 2013," Speech 628, Board of Governors of the Federal Reserve System (U.S.).

8. Appendix

Figure 1. Credit default swaps for a selected group of European countries.



Source: ECB statistical data warehouse and refinitiv.

Imprint

Editors:

Sigrig Betzelt, Eckhard Hein (lead editor), Martina Metzger, Martina Sproll, Christina Teipen, Markus Wissen, Jennifer Pédussel Wu, Reingard Zimmer

ISSN 1869-6406

Printed by
HWR Berlin

Berlin April 2022