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Deal! Market reactions to the agreement on the EU Covid-19 recovery fund☆

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ABSTRACT

In response to the Covid-19 crisis, EU leaders agreed on the creation of a €750bn recovery fund (the Next Generation EU, NGEU). We investigate the short-term impact of this landmark deal on bank stocks, sovereign credit default swaps (CDS) and bank CDS. First, we find that stock market investors firmly welcomed the agreement as we find sizeable positive abnormal returns in bank stocks as a response to the NGEU proposal by the European Commission. Spreads on sovereign and bank CDS significantly declined, with more pronounced movements for heavily indebted countries and those that strongly advocated the creation of the recovery fund and for the banks located in these economies. Second, we show that banks' sovereign exposures towards other European countries, especially those with weaker financial conditions and limited fiscal capacity, play a key role in driving the strength of the stock market reaction. Overall, financial markets responded positively to the credibility of the NGEU policy as an extraordinary common effort to support the post-Covid-19 recovery and enhance economic growth in the region.

"An extraordinary situation demands extraordinary efforts"

(Former German Chancellor Angela Merkel, EU Summit, 20/07/20)

"The EU steps up and comes together to help the people of Europe"

(ECB President Christine Lagarde, Politico, 21/07/20)

1. Introduction

With the aim of reducing the rapid transmission of Covid-19, governments worldwide adopted drastic containment strategies based on social distancing, local lockdowns, travel restrictions and the closure of non-essential businesses. The huge macro-financial shock induced by the pandemic placed both banks and borrowers under substantial pressure. In March 2020, as a consequence of firms' deteriorated funding conditions and disruption to cash flows, banks experienced the largest upsurge in liquidity demands ever observed (Li et al., 2020; Acharya et al., 2021).[1]

Under these unprecedented circumstances, policymakers around the world promptly implemented a wide set of initiatives to tackle the unavoidable economic downturn and limit the detrimental effects of the crisis.[2] In particular, several fiscal, monetary and financial policies were implemented by countries in response to the Covid-19 pandemic, with some of them specifically targeted to support banking systems.[3]

Given the key role played by the financial sector and, in particular banks, to provide credit and liquidity to the real economy during and

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[1] With reference to the U.S. context following the Covid-19 outbreak, Acharya and Steffen (2020) find that firms significantly drew down existing credit lines and raised cash holdings, placing pressure on banks' balance sheets. However, unlike the 2007–10 global financial crisis (GFC), the banking sector was not central to the crisis, but rather considered a critical part of the solution.
[2] Based on IMF data (World Outlook, April 2021), the global economy contracted by 3.3% in 2020.
[3] These interventions on a global scale are continuously tracked by a number of organizations, such as the IMF, World Bank and Yale School of Management.

post-Covid-19 (Borio and Restoy, 2020; Acharya et al., 2021; Beck and Keil, 2021; Demirgüc-Kunt et al., 2021; Bitar and Tarazi, 2022), it is crucial to understand market participants' perceptions of the newly adopted policy responses. This paper investigates the financial market reactions to the creation of the "Next Generation EU" (NGEU) recovery instrument, a key fiscal policy initiative which seeks to address the social and economic damage caused by the Covid-19 pandemic.[4] As was illustrated by the largest-ever institutional bond issuance in Europe (in June 2021), NGEU represents a powerful facility to drive the collective recovery from the crisis.[5]

The multiple impacts of NGEU are transmitted to EU economies and the banking sector via four main routes. First, it is a fiscal policy that complements monetary policy but is more direct in its ability to "transfer real resources outright" (Borio, 2020). NGEU is intended to support the real economy through enhanced government resources, especially for those most affected by the Covid-19 pandemic and with limited scope for a national fiscal response. It seeks to improve sovereign credit risk and because European banks hold substantial amounts of domestic and other EU sovereign debt this is expected to improve bank credit quality and therefore boost lending to the real economy. The policy should also help to mitigate indirect negative feedback loops from the real economy to the banking sector (Berger and Demirgüc-Kunt, 2021).

Second, and distinct from the responses to the euro area sovereign debt crisis, NGEU provides significant risk-sharing among the Member States. Risk-sharing with redistributive effects, deepened by means of a common fiscal capacity, also led to the creation of a form of European safe asset (a financial asset which is low risk, highly liquid, and largely disentangled from the sovereign risk of individual Member States). Beyond the coronavirus crisis, the creation of a supranational euro-denominated asset has the potential to enable banks to reduce their exposures to national risks and to diversify their balance sheets, with positive consequences in terms of the stability of the overall banking sector. This will be especially the case during times of distress, whereby the magnitude of capital flight from more vulnerable countries into safe havens will be reduced (Brunnermeier et al., 2017; Christie et al., 2021).

A third channel arises directly via banks and their borrowing strategy to raise NGEU funds. In order to effectively deploy the novel and diversified NGEU funding strategy, which combines auctions and syndication techniques, the EU has set up a primary dealer network (PDN) of eligible banks to assist with the issuance programme and placement of the borrowing. Both financial and non-financial incentives are associated with participation in the PDN. Specifically, primary dealer banks benefit from fee-based remuneration activities (lead or co-lead of syndication transactions) and significant reputation gains. "The NGEU programme is radically changing the way the European Union interacts with financial markets because of its ambitious and ground breaking new public debt programme" (Christie et al., 2021).

Finally, the new regime offers increased revenue opportunities for banks. In supporting the NGEU and the implementation of the Recovery and Resilience Plans (RRPs), European banks will act as advisors, channelling various forms of capital, and supporting customers in selecting different financing options. Therefore, potential new streams of revenues will arise from advisory activities and ad hoc services and products that banks will offer to their clients that access NGEU funds. For instance, several Italian banks (such as Unicredit and Intesa Sanpaolo), have launched ad hoc digital platforms to help customers obtain relevant information about public tenders related to the national RRP. In this respect, banks are expected to play a primary role in the economic recovery, "acting as catalysts for the huge investments of the private sector" (Franco, 2021).

This paper investigates the short-term reactions of both equity markets and credit derivatives markets to announcements on the NGEU agreement and addresses three research questions: (i) how do financial market participants perceive the introduction of NGEU? (ii) what impact is observed on stock and credit derivatives markets, for different sub-groups of banks and sovereigns? (iii) which factors influence market reactions to the announcement of this novel instrument? Given the unpredictability and exceptionality of the Covid-19 pandemic, no ad hoc policies were ready to be deployed at the EU level. This unavoidably generated significant market uncertainty about the likely approach to be taken by European authorities to address the unfolding crisis and its economic fallout. The difficulty in anticipating the European Union (EU)'s policy response to the pandemic was exacerbated by some sudden changes in the political stances of key players during the first months of the crisis. There was also substantial cross-country debate surrounding the potential approaches for a considerable time until the final decisions were taken by the EU institutions. A clear example of surprising turning points in the political landscape is represented by the initial firm rejection by the incumbent German Chancellor, Angela Merkel, of the so-called "corona-bonds", a form of jointly guaranteed EU debt, and the subsequent Franco-German proposal in May 2020 to borrow funds on behalf of the EU. The path towards the final agreement on NGEU in July 2020 was characterised by significant conflicts, resistance (especially from northern EU countries) and delays. The extensive negotiations, in terms of (i) the content of the plan; (ii) the size of the rescue package; (iii) the breakdown between grants and loans; and (iv) the conditionality and use of the funds, fuelled uncertainty around this extraordinary policy initiative. The fear of a European break-up was also real (Reuters, 2020). Thus, given the far-reaching potential for new information content attached to the key announcements on NGEU, it is important to assess market participants' reactions to these crucial steps.

Employing an event study methodology, we provide empirical evidence of how bank stock and credit default swap (CDS) markets, as well as the sovereign CDS market, respond to the creation of the NGEU recovery instrument. The event study approach, well established in the banking and finance literature, is suitable to assess the short-term impact of policy-related announcements (Aït-Sahalia et al., 2012) and thus addresses our first two research questions. The methodology allows for the evaluation of the impact on financial markets while the final agreement was still under debate. Discussion on the establishment of a supranational recovery tool in response to the outbreak of the Covid-19 pandemic happens in 2020, thereby it is not yet feasible to analyse its long-term implications. In addition, examining the market perceptions of key intermediate announcements permits an assessment of whether the expectations of the European authorities and the EU Member States regarding the specific features and potential implications of the newly created recovery facility differ from those of financial markets. In this respect, our research adds to the strand of the empirical literature that analyses financial markets' response to announcements on policy initiatives (Aït-Sahalia et al., 2012; Altavilla et al., 2019; Fendel et al., 2021) and/or regulatory changes (Horváth and Huizinga, 2015; Schäfer et al., 2016; Onali et al., 2021). We differentiate from existing studies by drawing inferences from multiple financial markets and by focusing on an unprecedented EU-wide policy response as a result of an extraordinary common effort to tackle the negative effects of the Covid-19 crisis.

The third research question addressed in the paper is investigated in the second stage of the analysis by using a multivariate approach. The study aims to establish whether heterogeneous market reactions are connected to specific factors at the bank and country levels. Specifically, we control for a number of balance-sheet factors and focus on banks' holdings of sovereign debt. Given the key relevance of interconnectedness between bank and sovereign risk in the European context, focusing on banks' exposures to government debt (including domestic) is of primary importance. In further tests, we also control for whether banks are subject to a common regulatory framework or operate in countries that share the same political affiliation at the European level.

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[4] In the remainder of the paper, the terms "NGEU" and "recovery fund" are used interchangeably.

[5] On 15 June 2021, there was the first debt issuance which raised €20 billion through a ten-year bond.

With robustness confirmed by several tests and extensions, our main findings are as follows. First, in the univariate setting, we provide evidence that stock market investors were not convinced by the initial Franco-German proposal on the recovery package but firmly welcomed the subsequent plan envisaged by the European Commission (EC) in late May 2020. This announcement had particularly influential content, most likely due to a clearer definition between the grant and loan components and the strong redistributive element of the package. We find sizeable positive abnormal returns in bank stocks as a response to the EC's NGEU announcement, reflecting a strong appreciation for this unprecedented stimulus. Spreads on sovereign CDS considerably decrease, implying a positive perception of market participants regarding the credibility and effectiveness of the NGEU fund in reducing pressure on sovereign governments. As anticipated, this evidence is stronger for more indebted European countries with reduced fiscal capacity. Lastly, bank CDS spreads significantly declined, with reductions especially pronounced both for banks located in countries that strongly supported the creation of NGEU and those in heavily indebted and more vulnerable economies.

Second, in the multivariate setting, we relate the detected abnormal movements in bank stock prices to bank balance-sheet characteristics and sovereign debt exposures. We also account for the relevance of the domestic banking sector in channelling credit to the non-financial sector, as well as various adhoc national policies deployed following the outbreak of the Covid-19 pandemic to specifically support the banking sector. We find that the price reaction is stronger for banks with poorer asset quality and weaker capital and liquidity positions. Furthermore, sovereign debt exposures towards other EU countries, rather than the domestic government, are particularly relevant in explaining the abnormal movements in the stock market. Among these, banks' exposures to highly indebted EU countries play a key role in influencing investors' appreciation of the NGEU's creation.

From a wider perspective, this study can be positioned within the growing strand of literature that assesses the exceptional economic, social and political implications of the Covid-19 crisis (for instance, Baldwin and Weder di Mauro, 2020; Brunnermeier and Krishnamurthy, 2020; Donthu and Gustafsson, 2020; Sharma et al., 2020) and the regulatory response to tackle its effects (Borio and Restoy, 2020; Campa and Quagliariello, 2021). There has been a focus on the impact of the pandemic on international equity markets (Baker et al., 2020; Heyden and Heyden, 2020), but the evidence on credit derivatives markets is still limited and mostly confined to the sovereign CDS segment (Daehler et al., 2021; Augustin et al., 2022). In addition, by taking a European perspective, we add to the studies which empirically examine banks' behaviour and performance during the Covid-19 pandemic (Altavilla et al., 2020; Acharya et al., 2021; Beck and Keil, 2021; Berger and Demirgüc-Kunt, 2021; Demirgüc-Kunt et al., 2021; Elnahass et al., 2021; Bitar and Tarazi, 2022). Despite these strands of academic evidence, our paper remains unique in its focus on the perception of the NGEU-related announcements with evidence from multiple financial markets and sub-groups of banks and sovereigns. Thus, we add novel evidence on the impact of this unprecedented policy initiative deployed in Europe in response to the Covid-19 pandemic.

The remainder of the paper is organized as follows. Section 2 provides a review of the literature that employs event study methodology to assess financial markets' reactions to regulatory changes and policy initiatives. Section 3 presents the institutional background and develops the hypotheses. Section 4 describes the data and methodology. Sections 5 and 6 discuss the results of the univariate and multivariate analyses, respectively. Section 7 concludes the paper and offers the main policy implications.

2. Event study methodology and financial markets' reactions: an overview of the literature

Empirical studies of the short-term impact of policy and regulatory announcements upon financial markets commonly utilise event study methodology. Within the strand of the literature that investigates the response of financial markets to fiscal and monetary policy measures (Chatziantoniou et al., 2013; Fiordelisi and Galloppo, 2018; Altavilla et al., 2019), and specifically in times of crisis (Claessens et al., 2005; Aït-Sahalia et al., 2012), a recent contribution by Fendel et al. (2021) evaluates the impact of European emergency policy announcements by the ECB and EC on the government bond yields and spreads for selected euro area countries during the pandemic. By employing event study methodology, they find that announcements of fiscal measures led to increases in the bond yields of more stable countries, such as Austria, Germany and Netherlands, expected to be the ones to primarily carry the financing burden.

Studies on the impact of regulatory changes are more widespread. Horváth and Huizinga (2015) investigate the financial market reaction to the creation in 2010 of the EFSF, a temporary crisis resolution instrument. They document positive effects in terms of the creditworthiness of peripheral euro area countries (namely, the GIIPS countries – Greece, Ireland, Italy, Portugal and Spain) and in turn on banks located in these economies. Further, the EFSF announcement leads to increased GIIPS sovereign debt values, reflected in lower CDS spreads for banks exposed to these countries. Schäfer et al. (2016) consider the stock and CDS market reactions of EU and US banks to major regulatory reforms following the subprime crisis. They find significant financial market reactions to structural reforms ratified at the national level, suggesting that these announcements convey new information to market participants. Pancotto et al. (2020) investigate the financial market reactions to the implementation of the Banking Union in Europe. They show heterogeneous reactions depending on the type of announcements (for instance, related to the supervisory mechanism or the new resolution regime) and the type of bank. Andries et al. (2020) explore the manner of financial market reactions to the European Banking Authority (EBA) disclosure of the Other Systemically Important Institutions (O-SIIs) and document a short-term negative reaction in the bank stock market and an increase in banks' CDS spreads. Onali et al. (2021) investigate how bank shareholders perceive the introduction of the expected-loss model (ELM) within the IFRS 9 framework. They provide evidence of a positive market reaction to the ELM-related events and find that investors of banks characterized by different sizes, profitability and systemic risk appreciate the ELM-induced benefits.

By considering the financial market impact of key NGEU-related announcements, we contribute not only to the emerging strand of research on the extraordinary policy responses to the Covid-19 pandemic, but also to the more established literature on financial markets' responses to announcements on policy interventions and regulatory changes. We consider the impact of the establishment of the NGEU fund on multiple financial markets (namely, the bank stock market, the bank CDS market and the sovereign CDS market) and conduct our analysis on various bank and sovereign sub-groups, characterized by similarities in terms of regulatory frameworks, political stances and public finances. Lastly, we deepen our investigation by focusing on bank-specific and country-level factors that explain the cross-sectional variation in the stock market reaction.

3. Institutional background and hypotheses development

Since the first reported cases in January 2020, the Covid-19 virus rapidly spread across the European Union (EU) with severe negative effects, albeit with different intensity from country to country. The end of the first wave, which peaked in April 2020, was marked by the exceptional proposal by France and Germany for an EU recovery fund in May 2020 (Augustin et al., 2022). Overall, in 2020, real GDP shrank by 6.5% and 6.1% in the euro area and Europe, respectively (Eurostat). The coronavirus crisis, which represents "the most unanticipated large and widespread exogenous economic shock of all time" (Berger and Demirgüc-Kunt, 2021), provides a unique opportunity to understand how

Table 1
Sample overview.

#	Bank name	Country code	Country	Tot. assets (€bn)	Bank CDS	SSM	% tot. assets country
1	Raiffeisen Bank International	AT	Austria	151.9		x	32%
2	Erste Group Bank	AT	Austria	245.5	x	x	
3	BAWAG Group	AT	Austria	45.6	x	x	
4	KBC Group	BE	Belgium	257.2	x	x	21%
5	First Investment Bank	BG	Bulgaria	5.4			11%
6	Bank of Cyprus Holdings	CY	Cyprus	20.3		x	16%
7	Aareal Bank	DE	Germany	41.1		x	23%
8	Commerzbank	DE	Germany	463.5	x	x	
9	Deutsche Bank	DE	Germany	1296.9	x	x	
10	Deutsche Pfandbriefbank	DE	Germany	56.8		x	
11	Danske Bank	DK	Denmark	435.8	x		56%
12	Jyske Bank	DK	Denmark	87.0			
13	Sydbank	DK	Denmark	19.8		x	
14	AS LHV Group	EE	Estonia	3.0		x	6%
15	Eurobank Ergasias	EL	Greece	64.8		x	96%
16	National Bank of Greece	EL	Greece	61.4		x	
17	Piraeus Bank	EL	Greece	61.2		x	
18	Alpha Bank	EL	Greece	63.0		x	
19	Banco Bilbao Vizcaya Argentaria	ES	Spain	677.1	x	x	85%
20	Bankinter	ES	Spain	82.8	x	x	
21	Banco de Sabadell	ES	Spain	223.6	x	x	
22	CaixaBank	ES	Spain	328.4		x	
23	Liberbank	ES	Spain	42.0		x	
24	Banco Santander	ES	Spain	1507.3	x	x	
25	Unicaja Banco	ES	Spain	56.0		x	
26	Nordea Bank	FI	Finland	509.1		x	66%
27	BNP Paribas	FR	France	1920.6	x	x	46%
28	Crédit Agricole	FR	France	1629.6	x	x	
29	Société Générale	FR	France	1203.8	x	x	
30	OTP Bank	HU	Hungary	61.0			50%
31	AIB Group	IE	Ireland	98.5		x	40%
32	Bank of Ireland Group	IE	Ireland	113.4		x	
33	Banca Monte dei Paschi di Siena	IT	Italy	132.2	x	x	72%
34	BPER Banca	IT	Italy	79.0		x	
35	Banco BPM	IT	Italy	167.0		x	
36	Banca Popolare di Sondrio	IT	Italy	41.1		x	
37	Credito Emiliano	IT	Italy	40.5		x	
38	Intesa Sanpaolo	IT	Italy	648.3	x	x	
39	UBI Banca	IT	Italy	124.1	x	x	
40	Unicredit	IT	Italy	879.4	x	x	
41	ABN AMRO Bank	NL	Netherlands	375.4		x	59%
42	ING Groep	NL	Netherlands	891.7	x	x	
43	Bank Polska Kasa Opieki	PL	Poland	47.8			34%
44	PKO Bank Polski	PL	Poland	81.1			
45	Banco Comercial Português	PT	Portugal	81.7	x	x	3%
46	Banca Transilvania	RO	Romania	19.2		x	21%
47	Skandinaviska Enskilda Banken	SE	Sweden	240.8	x		72%
48	Svenska Handelsbanken	SE	Sweden	277.7	x		
49	Swedbank	SE	Sweden	209.0	x		
50	Nova Ljubljanska Banka	SV	Slovenia	14.1		x	46%

Description: This table presents a list of the banks considered in the empirical analysis, the country of origin, the total assets as of end-2019, and whether they have listed CDS and are directly supervised by the SSM. The last column shows the representativeness of the sampled banks, or group of banks, with respect to the total assets of the corresponding national banking sectors. Data on bank total assets are retrieved from S&P Global Market Intelligence.

financial market participants evaluated the European policy response to the pandemic. After the European sovereign debt crisis in 2009–2015, the Covid-19 crisis and its effects represented a major policy challenge requiring a coordinated and comprehensive strategy at the European level in order to set the foundations for economic recovery.[6] Furthermore, the simultaneous focus at the bank and sovereign level is motivated by the strong interlinkages between bank and sovereign risk in Europe (namely, the "sovereign-bank nexus") and documented in several notable contributions (Acharya et al., 2014; Acharya and Steffen, 2015; Farhi and Tirole, 2018).

On 21 July 2020, the leaders of the 27-EU countries reached a historic agreement on a €750bn recovery fund (in 2018 prices). The NGEU instrument, created to support economic recovery after the Covid-19 crisis, was agreed upon as a part of a wider package, including the 2021–2027 budget plan for €1074.3bn (namely, the multiannual financial framework, MFF). Albeit time-limited, this step represented a key milestone in European policy integration (Giovannini et al., 2020). The EU became enabled to use a federal deficit as a tool to respond to a widespread crisis, thereby introducing some risk-sharing at the European level. The mechanism allows the EC to borrow on the capital markets on the EU's behalf and to channel funds in the form of grants and loans to those Member States hardest hit by the pandemic and experiencing tighter fiscal constraints. For the first time, the NGEU

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[6] Unlike the sovereign debt crisis, which was mostly triggered by an excessive accumulation of private and public debt, the pandemic was a widespread shock that originated outside the financial sector.
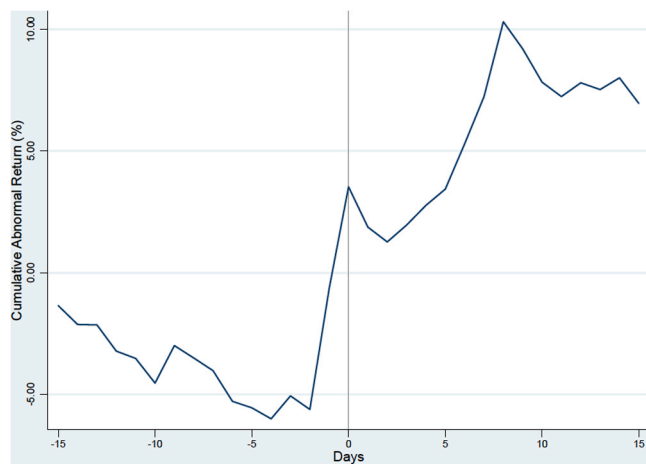
Fig. 1. Average CAR, stock market.
Description: This figure displays the average CAR for all the banks included in the sample, 15 days before and after the announcement of the EC's proposal for the recovery fund (27/05/2020).

recovery instrument also enables some central tax collection.[7]

The so-called "Frugal Four" countries (Austria, Denmark, Netherlands and Sweden) were opposed to the notion of the recovery fund disbursing grants and loans and also demanded preliminary economic reforms in recipient countries. Due to the forceful resistance from the Frugal Four, there was a shift in the originally intended balance between grants and loans. The initial proposal for up to €500bn in grants envisaged by the EC on 27 May 2020, in the wake of the earlier Franco-German plan, was reduced to €390bn.[8] The share of loans was agreed at €360bn, with a long repayment schedule until the end of 2058. While the loans will be repaid by the beneficiary countries, grant disbursements will be covered by GNI-based contributions and the EU's newly established own resources.[9] The final agreement achieved in July 2020 was set on a qualified majority enhanced by a national right to delay (not to stop) the payments from the fund. Moreover, to secure the deal, almost €6bn of rebates on budget contributions were agreed for the Frugal Four, representing a substantial increase relative to the previous 7-years MFF.[10] Therefore, on the one hand, the final agreement demonstrated an intention to protect the *status quo*, making it less focused on a long-term vision. On the other hand, it represented the first EU common counter-cyclical instrument, which (i) does not imply austerity requirements; (ii) is mostly targeted at green and digital investment opportunities; and (iii) is complemented by structural reforms. The deal is also expected to take away some (political) pressure from the European Central Bank (ECB) and might ultimately prove to be a crucial step towards the completion of the Banking Union. Finally, preventing

an asymmetric recovery across EU countries was a first-order priority for policymakers in order to preserve the whole European project (Beck, 2020). The economic impact of the Covid-19 shock was not uniform, reflecting differences across countries in terms of public healthcare systems, containment measures, economic factors, as well as fiscal capacity.

Considering the prominent role of the NGEU fund in supporting the post-Covid-19 recovery and the implications for both banks and national governments, it is crucial to understand the impact of the NGEU announcements on financial markets. In this respect, we assess the information content related to the key NGEU announcements, rather than the actual implementation of fiscal disbursements. Specifically, we aim to discover whether the new recovery facility is perceived as a concrete step towards fiscal and economic stability in the post-Covid-19 recovery period. Although temporary in nature, NGEU inaugurates an unprecedented joint funding model to support government spending in the EU (Giovannini et al., 2020). By easing the financial constraints of sovereigns, the aim of NGEU is to support the stimulus after the pandemic, mostly by boosting public investments. Furthermore, potential benefits in terms of growth in the region over the medium term, supported by structural reforms, were likely to contribute to a favourable assessment by the financial markets. In particular, increased lending opportunities for banks, arising from improved economic conditions in response to the significant support for reforms and investments ("growth effects" of NGEU) might induce investors' positive perception of the agreement. Although not direct recipients of the funds, banks will play a key role in channelling the resources to the private sector, with strong benefits from increased streams of revenues.[11] Lastly, improvements in terms of expected political, economic and fiscal stability might in turn lower equity risk premia, thereby positively impacting EU bank stock valuations. Given these arguments, we anticipate an overall positive bank stock market reaction to the establishment of NGEU and hypothesize the following:

H1. *: The NGEU-related announcements induce a positive stock price reaction for European banks.*

However, debt mutualisation and joint liability issuance in Europe has been at the core of a number of proposals over time, such as, for instance, the creation of forms of European safe assets (Brunnermeier et al., 2016). The topic remains controversial, especially with respect to the legitimate balance between solidarity and responsibility that such a process implies. In addition, discrepancies across EU countries in terms of fiscal capacity and level of indebtedness, with the potential to reinforce moral hazard issues, have been hindering this shift and have heightened the political debate (Rossi, 2019). In this regard, the continuing absence of the third pillar of the European Banking Union (the European Deposit Insurance Scheme, EDIS), highlights the difficulty to achieve permanent agreements on risk-sharing and, thereby, effective fiscal integration. Furthermore, in times of distress, key factors to reduce destabilizing forces are represented by the credibility and effectiveness of the crisis-response mechanisms in place. Therefore, depending on the equity market participants' perception of these elements, the impact of the NGEU announcements upon the stock market could also be either neutral or negative. Lastly, a negative market reaction would stem from any lack of credibility regarding the anticipated growth and stability effects associated with the implementation of the NGEU, with a consequent increase in the banks' stock risk premia and reduced valuations. The alternative hypothesis for the stock market reaction is as follows:

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[7] The first agreed tax was on non-recycled plastic waste and was introduced in January 2021. In late 2022, the EU reached a political agreement on the implementation of a Carbon Border Adjustment Mechanism (CBAM) that introduces a common carbon tax. Proposals for a digital levy are under debate.

[8] €312.5bn was allocated to the Recovery and Resilience Facility (RRF), which represents the core of NGEU and entered into force in February 2021. The largest share of the grants in the RRF (70%) was planned to be disbursed by 2022, while the other 30% will be entirely committed by the end of 2023. The maximum amount of loans for each Member State cannot exceed 6.8% of its Gross National Income (GNI). In order to benefit from the financial support of the RRF, EU Member States were required to compile national RRPs outlining their agenda of reforms and investment projects for 2021–23. The proposed plans should be implemented by 2026.

[9] On 13 August 2021, the EC disbursed the first €24.9bn to Italy as a pre-financing payment under the RRF.

[10] Table A1 in Appendix A reports details about the national contributions to the EU budget for selected Member States in 2018.

[11] For instance, as discussed in Section 1, in order to raise NGEU funds, the EC set up a PDN to facilitate the placement of EU borrowing. Depending on the characteristics of the debt issuances (maturities and volumes), EU banks acting as primary dealers receive fees (European Commissio, 2021).

Table 2
Banks' sovereign exposures by country of location.

Country	Exp_OTH	Exp_DOM	Exp_EZ	Exp_NO_EZ	Exp_F4	Exp_FAC	Exp_DEBT
Austria	19.0	12.0	4.3	14.7	0.2	3.3	0.4
Belgium	15.0	16.0	9.6	5.5	0.7	8.4	1.4
Bulgaria	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Cyprus	0.3	0.6	0.3	0.0	0.0	0.2	0.0
Germany	68.5	33.6	58.1	10.4	12.1	42.4	23.4
Denmark	11.2	9.0	8.6	2.6	3.7	5.0	0.8
Estonia	0.0	1.2	0.0	0.0	0.0	0.0	0.0
Greece	6.1	19.8	5.5	0.6	0.0	4.4	3.8
Spain	53.8	167.1	44.0	9.8	1.4	42.5	39.6
Finland	28.3	26.1	5.3	23.0	23.5	4.8	0.3
France	123.3	131.8	109.1	14.2	5.9	77.0	36.8
Hungary	0.1	0.1	0.0	0.1	0.0	0.1	0.0
Italy	98.4	176.4	88.8	9.7	13.1	73.0	1.6
Netherlands	61.6	15.4	51.8	9.8	4.5	24.8	0.1
Poland	0.0	31.7	0.0	0.0	0.0	0.0	0.0
Portugal	5.7	7.2	0.5	5.1	0.0	0.5	0.4
Romania	0.1	7.3	0.1	0.0	0.0	0.1	0.1
Sweden	5.0	8.4	5.0	0.0	0.1	3.1	0.0
Slovenia	1.0	1.1	0.9	0.2	0.2	0.5	0.1

Description: This table presents data on banks' sovereign exposure aggregated by country of location. Data are for the selected sample of banks and are expressed in billions of euros. Exp_OTH is the exposure to all the other sovereigns. Exp_DOM is the exposure to the domestic sovereign. Exp_DEBT is the exposure to the most indebted countries. Exp_EZ is the exposure to the Eurozone countries. Exp_NO_EZ is the exposure to EU_non-Eurozone countries. Exp_F4 is the exposure to the Frugal Four countries. Exp_FAC is the exposure to the fund advocate countries.

H1a. *: The NGEU-related announcements induce a neutral/negative stock price reaction for European banks.*

Beyond the bank stock market, we consider CDS spreads on sovereign debt and bank liabilities to examine market participants' perceptions of the associated credit risk. Bank and government risks are strongly interconnected, fuelled by powerful feedback effects (Dell'Ariccia et al., 2018). Also, it is extensively documented that credit markets often experience sudden upsurges in spreads (Pan and Singleton, 2008). Following the Covid-19 outbreak, governments in several European countries started to face increasing funding needs as a consequence of large fiscal stimulus packages that were instigated to support the real economy. Rising levels of sovereign debt renewed the attention on the euro area sovereign-bank nexus, based on which spillover effects could result in growing pressure on national banking sectors, due to the presence of direct and indirect channels.

The anticipated CDS market reactions to the establishment of the NGEU appear to be more straightforward compared to those formulated for the equity market. Spreads on CDS contracts provide a direct and timely measure of the reference entity's risk of default (either banks or sovereigns, in our setting). We anticipate an overall beneficial impact of the NGEU's establishment on credit risk markets. This would translate into investors perceiving a reduction in the riskiness of debt issued by European sovereigns and banks, with a consequent lowering of the spreads on sovereign and bank CDS contracts. In particular, the key novel characteristic of the NGEU agreement, represented by the ability to provide grants (transfers), beyond loans, is expected to relieve pressure from governments, especially those with weaker fiscal conditions and thereby with a lower capacity to withstand external shocks (Augustin et al., 2022). We therefore formulate and test the following hypothesis:

H2. *: The NGEU-related announcements lead to a decrease in CDS spreads on European sovereign debt. A larger reduction is expected for countries with a higher ratio of public debt to GDP.*

For holders of bank debt, the creation of the NGEU is expected to have a beneficial impact on the basis that it is perceived as a step towards further risk-sharing and with the potential to support sovereigns' creditworthiness and national banking sectors. European banks tend to hold large amounts of European sovereign debt (Popov and Van Horen, 2013; Horváth and Huizinga, 2015). For safety and liquidity reasons, as well as to generate required interest income, banks invest in sovereign

Table 3
Descriptive statistics for bank-specific and country-level variables.

	Obs.	Min.	Max.	Mean	Median	Std.
CAR	48	-2.74	21.72	7.45	7.39	4.97
TA	48	14.90	21.57	18.73	18.48	1.53
NPL	48	0.09	33.78	7.36	3.88	9.33
ROA	48	-1.69	2.54	0.46	0.43	0.74
TE_TA	48	3.94	13.51	7.52	6.89	2.43
LCR	48	78.24	722.49	180.05	158.70	93.92
Credit_GDP	48	24.70	159.70	88.84	83.00	30.20
N_policies	48	0.00	1.00	0.75	1.00	0.44

Description: This table presents the descriptive statistics for the bank-specific variables employed in the multivariate analysis. Figures represent the average value of the data for 2019Q3-2019Q4. CAR is the bank stock cumulative abnormal return over the 3-day event window. TA is the natural logarithm of bank total assets (measured in thousands of euros). NPL is the ratio of non-performing loans to gross loans. ROA is the ratio of net profits to average assets. TE_TA is the ratio of total equity to total assets. LCR is the ratio of quality liquid assets as a percent of net cash outflows over a thirty-day period. Credit_GDP is the domestic credit to the private sector by banks as a percentage of the GDP in 2019. N_policies is a dummy variable equal to one if the number of specific policies in support of the banking sector in response to Covid-19 (until May 2020) is above the sample median.

Table 4
Descriptive statistics for banks' sovereign exposures.

	Obs.	Min.	Max.	Mean	Median	Std.
Exp_OTH	48	0.00	22.47	3.19	2.04	3.77
Exp_DOM	48	0.13	41.35	8.16	6.53	8.88
Exp_EZ	48	0.00	21.75	2.59	1.56	3.59
Exp_NO_EZ	48	0.00	6.28	0.60	0.10	1.26
Exp_F4	48	0.00	10.31	0.47	0.01	1.61
Exp_FAC	48	0.00	11.16	1.98	1.14	2.40
Exp_DEBT	48	0.00	9.97	0.97	0.11	1.96

Description: This table presents the descriptive statistics for the banks' sovereign exposures as of 31/12/2019. Exp_OTH is the exposure to all the other sovereigns to total assets. Exp_DOM is the exposure to the domestic sovereign to total assets. Exp_EZ is the exposure to the Eurozone countries to total assets. Exp_NO_EZ is the exposure to EU_non-Eurozone countries to total assets. Exp_F4 is the exposure to the Frugal Four countries to total assets. Exp_FAC is the exposure to the fund advocate countries to total assets. Exp_DEBT is the exposure to the most indebted countries to total assets. All measures are percentages.

Table 5
Bank stock market reactions.

Date			ALL	F4	FAC	EZ	NO_EZ	DEBT
18/05/20	1-day	CAAR	-0.3974	0.4735	0.0586	-0.3319	-0.6295	-1.8200
		p-value (t-test)	0.2970	0.2298	0.9167	0.4643	0.3490	0.0248 **
		p-value (BMP)	0.5923	0.2235	0.5885	0.8526	0.4018	0.0495 **
		p-value (adj BMP)	0.8831	0.5768	0.8808	0.9590	0.6709	0.3812
		p-value (GenSign)	0.3812	0.1878	0.1983	0.2305	0.6963	0.2794
	3-days	CAAR	-2.1067	-0.2060	-3.6626	-2.8242	0.4371	-4.9076
		p-value (t-test)	0.0028 ***	0.7827	0.0026 ***	0.0008 ***	0.5890	0.0002 ***
		p-value (BMP)	0.0032 ***	0.6971	0.0013 ***	0.0005 ***	0.5847	0.0007 ***
		p-value (adj BMP)	0.4182	0.8584	0.3711	0.3355	0.7818	0.1326
		p-value (GenSign)	0.0252 **	0.9132	0.0135 **	0.0030 ***	0.4144	0.0072 ***
	5-days	CAAR	-0.7990	1.5768	-2.0739	-1.2010	0.6263	-6.0443
		p-value (t-test)	0.4243	0.1982	0.1883	0.3386	0.4825	0.0000 ***
		p-value (BMP)	0.5018	0.1063	0.8907	0.6944	0.2760	0.0032 ***
		p-value (adj BMP)	0.8536	0.4591	0.9696	0.9134	0.5809	0.1884
		p-value (GenSign)	0.4108	0.1878	0.2234	0.1723	0.4144	0.0072 ***
27/05/20	1-day	CAAR	4.1752	3.8679	3.7616	4.4558	3.1804	4.3953
		p-value (t-test)	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0002 ***
		p-value (BMP)	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
		p-value (adj BMP)	0.0005 ***	0.0002 ***	0.0332 **	0.0029 ***	0.0000 ***	0.0287 **
		p-value (GenSign)	0.0000 ***	0.0012 ***	0.0000 ***	0.0000 ***	0.0009 ***	0.0002 ***
	3-days	CAAR	7.4889	7.2718	7.5419	8.1232	5.2402	9.4178
		p-value (t-test)	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
		p-value (BMP)	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
		p-value (adj BMP)	0.0006 ***	0.0001 ***	0.0047 ***	0.0016 ***	0.0038 ***	0.0228 **
		p-value (GenSign)	0.0000 ***	0.0012 ***	0.0000 ***	0.0000 ***	0.0067 ***	0.0014 ***
	5-days	CAAR	6.3257	5.3623	6.6509	6.8642	4.4166	10.1577
		p-value (t-test)	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
		p-value (BMP)	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
		p-value (adj BMP)	0.0031 ***	0.0058 ***	0.0213 **	0.0070 ***	0.0044 ***	0.0097 ***
		p-value (GenSign)	0.0000 ***	0.0085 ***	0.0000 ***	0.0000 ***	0.0067 * **	0.0014 ***
21/07/20	1-day	CAAR	0.4743	0.5018	0.2908	0.3709	0.8410	-0.2648
		p-value (t-test)	0.0869 *	0.0035 ***	0.4097	0.2775	0.0136 **	0.6392
		p-value (BMP)	0.0261 **	0.0037 ***	0.2973	0.1523	0.0088 ***	0.8618
		p-value (adj BMP)	0.5680	0.2148	0.7782	0.7097	0.1931	0.9402
		p-value (GenSign)	0.0544 *	0.0392 * *	0.5516	0.2914	0.0345 **	0.6149
	3-days	CAAR	1.4784	-0.4399	1.8141	1.6955	0.7087	4.8897
		p-value (t-test)	0.0124 **	0.6028	0.0931 *	0.0185 **	0.4025	0.0011 ***
		p-value (BMP)	0.0692 *	0.5681	0.1685	0.1007	0.4582	0.0021 ***
		p-value (adj BMP)	0.6409	0.8072	0.7098	0.6694	0.7123	0.1852
		p-value (GenSign)	0.0544 *	0.3405	0.1529	0.0900 *	0.3638	0.0012 ***
	5-days	CAAR	-0.1446	-1.6331	-0.2769	-0.3162	0.4639	1.8343
		p-value (t-test)	0.8209	0.1747	0.7997	0.6808	0.6551	0.2432
		p-value (BMP)	0.4266	0.3738	0.3933	0.2721	0.7800	0.3643
		p-value (adj BMP)	0.8383	0.7038	0.8175	0.7752	0.8896	0.6959
		p-value (GenSign)	0.0795 *	0.1197	0.1363	0.1318	0.3676	0.5714

Description: This table reports the CAARs in the bank stock market (in %) in response to the key selected dates for the agreement on the 2020 EU recovery fund. Significance is tested according to (i) t-test; (ii) BPM test; (iii) adjusted BPM test; and (iv) generalised sign test. F4 countries are Austria, Denmark, Netherlands and Sweden. FAC are France, Germany, Greece, Italy, Portugal and Spain. EZ is Eurozone countries, NO_EZ is non-Eurozone countries and DEBT is the group of most indebted countries (Cyprus, Greece, Italy and Portugal).

Note: ***significant at the 1% level; * *significant at the 5% level; *significant at the 10% level.

debt securities (BIS, 2011). The exposure to the domestic government, as well as other European governments, reinforces the interlinkages between banking sectors and sovereigns, thereby exacerbating potential concerns related to the impact of the Covid-19 pandemic on the two sectors. Based on these arguments, we propose:

H3. *: The NGEU-related announcements lead to a decrease in CDS spreads on European bank debt.*

We test for the validity of H1, H1a, H2 and H3 in a univariate setting by employing an event study methodology.

4. Data and methodology

4.1. Univariate analysis

In the first stage of our analysis, we conduct a univariate analysis and investigate whether the Cumulative Average Abnormal Returns (CAARs) for the selected announcements are significantly different from zero over our event windows. In this manner, we can assess the financial market

reactions to the announcements of the NGEU and whether new information is conveyed to the markets. Subsequently, we examine the cross-sectional determinants of Cumulative Abnormal Returns (CARs).

The announcements under consideration are (i) the joint agreement for an EU recovery package by the incumbent French president Macron and German Chancellor Merkel (Franco-German plan) on 18 May 2020; (ii) the EC's proposal on 27 May 2020; and (iii) the final agreement by the European Council on 21 July 2020.[12]

Data on daily stock prices, sovereign CDS spreads and bank CDS spreads are collected from Thomson Reuters Datastream. The selected banks are those subject to the EBA 2020 Spring EU-wide Transparency Exercise. From a sample of 127 banks, we consider only publicly listed

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[12] In unreported results, we also considered 9 April 2020, the date on which the euro area finance ministers agreed on a €540bn coronavirus stimulus package to support the recovery of European economies. Overall, the evidence does not indicate that this particular announcement conveyed new information to the financial markets.

Table 6

Sovereign CDS market reactions.

Date			ALL	F4	FAC	EZ	NO_EZ	DEBT
18/05/20	1-day	CAAR	-1.1387	0.0119	-4.6665	-1.6434	0.0389	-5.4248
		p-value (t-test)	0.1219	0.5828	0.0068 ***	0.1112	0.6127	0.0096 ***
		p-value (BMP)	0.6973	0.6197	0.0785 *	0.6475	0.3173	0.0825 *
		p-value (adj BMP)	0.8410	0.7338	0.4144	0.8190	0.4190	0.2713
		p-value (GenSign)	0.1045	0.4363	0.8886	0.1340	0.4787	0.5134
	3-days	CAAR	-2.4794	-0.0988	-8.5918	-3.5506	0.0201	-9.4712
		p-value (t-test)	0.0378 **	0.5011	0.0009 ***	0.0301 **	0.8455	0.0095 ***
		p-value (BMP)	0.0946 *	0.4219	0.0006 ***	0.0735 *	0.4313	0.0567 *
		p-value (adj BMP)	0.3886	0.5821	0.1127	0.3704	0.5248	0.2273
		p-value (GenSign)	0.7913	0.4363	0.0657 *	0.4795	0.1271	0.5134
	5-days	CAAR	-2.7738	-0.1383	-9.1517	-3.7566	-0.4804	-10.3011
		p-value (t-test)	0.0367 **	0.3601	0.0031 ***	0.0405 **	0.4393	0.0196 **
		p-value (BMP)	0.2412	0.2331	0.0013 ***	0.2420	0.8867	0.0614 *
		p-value (adj BMP)	0.5456	0.4139	0.1364	0.5581	0.9083	0.2360
		p-value (GenSign)	0.5214	0.4363	0.0657 *	0.2082	0.4787	0.0949 *
27/05/20	1-day	CAAR	-2.1686	-0.3660	-6.0472	-2.3995	-1.6298	-7.7787
		p-value (t-test)	0.1086	0.1234	0.1255	0.1940	0.2831	0.1932
		p-value (BMP)	0.0385 **	0.1389	0.0005 ***	0.1505	0.1494	0.0392 **
		p-value (adj BMP)	0.2789	0.3112	0.0990 *	0.4695	0.2427	0.1923
		p-value (GenSign)	0.5035	0.4912	0.0584 *	0.4312	0.9719	0.0773 *
	3-days	CAAR	-3.9489	-0.3406	-12.3527	-4.3189	-3.0855	-15.4735
		p-value (t-test)	0.0857 *	0.1292	0.0300 **	0.1666	0.2556	0.0603 *
		p-value (BMP)	0.3949	0.1618	0.0013 ***	0.7435	0.1820	0.0140 * *
		p-value (adj BMP)	0.6562	0.3384	0.1261	0.8692	0.2794	0.1202
		p-value (GenSign)	0.2621	0.4912	0.0584 *	0.4312	0.3943	0.4480
	5-days	CAAR	-5.0540	-1.5407	-12.2223	-5.6006	-3.7784	-14.5536
		p-value (t-test)	0.0178 **	0.0027 ***	0.0325 * *	0.0478 **	0.1899	0.0924 *
		p-value (BMP)	0.0000 ***	0.0087 ***	0.0000 ***	0.0001 ***	0.0696 *	0.0276 **
		p-value (adj BMP)	0.0268 **	0.0727 *	0.0014 ***	0.0458 **	0.1414	0.1637
		p-value (GenSign)	0.0427 **	0.1537	0.0584 *	0.0596 *	0.3943	0.0773 *
21/07/20	1-day	CAAR	-0.0625	-0.0405	-0.4201	-0.0852	0.0011	-0.5751
		p-value (t-test)	0.7657	0.6199	0.5393	0.7712	0.9906	0.5896
		p-value (BMP)	0.1456	0.7365	0.4160	0.1280	0.9188	0.5572
		p-value (adj BMP)	0.4413	0.8030	0.6949	0.4429	0.9328	0.7030
		p-value (GenSign)	0.0044 ***	0.4336	0.2110	0.0091 ***	0.2074	0.3249
	3-days	CAAR	-0.6777	-0.1459	-2.0727	-0.7892	-0.3656	-1.5414
		p-value (t-test)	0.0721 *	0.0385 **	0.0212 * *	0.1272	0.1286	0.1528
		p-value (BMP)	0.0014 ***	0.0050 ***	0.0010 ***	0.0081 ***	0.0230 **	0.0595 *
		p-value (adj BMP)	0.0911 *	0.0374 **	0.1121	0.1816	0.0601 *	0.2209
		p-value (GenSign)	0.0271 **	0.1231	0.2169	0.0892 *	0.1543	0.9875
	5-days	CAAR	-1.5915	-0.0865	-4.2944	-1.9759	-0.5150	-4.5072
		p-value (t-test)	0.0112 **	0.3145	0.0051 ***	0.0187 **	0.1414	0.0306 **
		p-value (BMP)	0.0002 ***	0.1658	0.0031 ***	0.0009 ***	0.0803 *	0.0770 *
		p-value (adj BMP)	0.0496 **	0.3041	0.1533	0.0945 *	0.1482	0.2508
		p-value (GenSign)	0.0076 ***	0.7043	0.0391 * *	0.0055 * ***	0.5965	0.0438 **

Description: This table reports the CAARs in the sovereign CDS market (in bps) in response to the key selected dates for the agreement on the 2020 EU recovery fund. Significance is tested according to (i) t-test; (ii) BPM test; (iii) adjusted BPM test; and (iv) generalised sign test. F4 countries are Austria, Denmark, Netherlands and Sweden. FAC are France, Germany, Greece, Italy, Portugal and Spain. EZ is Eurozone countries, NO_EZ is non-Eurozone countries and DEBT is the group of most indebted countries (Cyprus, Greece, Italy and Portugal).

Note: ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

banks that have stock prices available and with a complete and liquid series. This reduces the sample to 62 banks. We then remove 12 banks from non-EU countries (Iceland, Norway and the United Kingdom) not involved in the agreement on the recovery package. The final sample consists of 50 publicly listed banks for the stock market analysis, 22 banks for the CDS market and 20 EU countries for the sovereign CDS market. The sample size, which is in line with other authoritative studies on European banking (Horváth and Huizinga, 2015; Andries et al., 2020; Koetter et al., 2022), represents 50% of the total assets of EU banks and 65% of the total assets of euro area banks (ECB, 2020). Moreover, 40 of the considered banks fall under the direct supervision of the Single Supervisory Mechanism (SSM) and are deemed significant. On average, the sampled banks account for 60% of total banking system assets in the national banking sectors (refer to Table 1). The reference currency is the Euro for all market prices, with only a few exceptions for the CDS data.[13]

To capture potential heterogeneity across banks located in different countries, the univariate analysis is conducted on multiple sub-groups: (i) Eurozone (EZ); (ii) non-Eurozone (NO_EZ); (iii) "Frugal Four" (F4); (iv) "fund advocate countries" (FAC); and (v) most indebted countries (DEBT).[14]

In order to quantify the short-term impact of the key NGEU-related events, we employ standard event study techniques as discussed in seminal contributions (MacKinlay, 1997; Binder, 1998). Abnormal Returns (ARs) are computed as the difference between the actual (*ex-post*) and the expected (*ex-ante*) returns, the latter obtained through a standard market model for a 255-day estimation window ending 20 days before each announcement:

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[13] For the sovereign CDS market, data for Finland and Netherlands are expressed in US dollars. For the bank CDS market, data for Intesa Sanpaolo, ING and Banco Santander are expressed in US dollars.

[14] The six "fund advocate countries" (France, Germany, Greece, Italy, Portugal and Spain) are those that strongly advocated the creation of the EU recovery fund and the underlying vision of solidarity following the pandemic. The "most indebted" category includes countries that in 2018 had a gross government debt to GDP ratio higher than 100% (namely, Cyprus, Greece, Italy and Portugal). Refer to Table A1 in Appendix A.

Table 7

Bank CDS market reactions.

Date			ALL	F4	FAC	EZ	NO_EZ	DEBT
18/05/20	1-day	CAAR	-1.6593	-0.5556	-2.3300	-1.9039	-0.5586	-2.5300
		p-value (t-test)	0.0030 ***	0.2907	0.0033 ***	0.0033 ***	0.5389	0.1481
		p-value (BMP)	0.0024 ***	0.4033	0.0009 ***	0.0004 ***	0.8193	0.1685
		p-value (adj BMP)	0.2780	0.6272	0.2152	0.1678	0.8866	0.4602
		p-value (GenSign)	0.4315	0.7846	0.2497	0.4528	0.7990	0.7704
	3-days	CAAR	-2.9719	-1.2133	-4.0635	-3.2780	-1.5940	-6.7842
		p-value (t-test)	0.0054 ***	0.0372 **	0.0109 **	0.0108 **	0.0862 *	0.0891 *
		p-value (BMP)	0.0003 ***	0.0025 ***	0.0143 **	0.0052 ***	0.0071 ***	0.0796 *
		p-value (adj BMP)	0.1960	0.0793 *	0.3613	0.2773	0.0931 *	0.3471
		p-value (GenSign)	0.2218	0.2826	0.2497	0.4528	0.1813	0.2347
	5-days	CAAR	-2.6803	-0.6398	-3.8904	-2.9618	-1.4133	-6.7462
		p-value (t-test)	0.0030 ***	0.3221	0.0025 ***	0.0064 ***	0.0306 **	0.0242 **
		p-value (BMP)	0.9674	0.4511	0.1210	0.8286	0.1322	0.0082 ***
		p-value (adj BMP)	0.9884	0.6615	0.5633	0.9328	0.3474	0.1560
		p-value (GenSign)	0.0975 *	0.7846	0.0911 *	0.2193	0.1813	0.2347
27/05/20	1-day	CAAR	-2.6540	-1.1643	-3.5887	-2.8677	-1.6925	-4.1786
		p-value (t-test)	0.0001 ***	0.0089 ***	0.0001 ***	0.0003 ***	0.0068 ***	0.0179 **
		p-value (BMP)	0.0000 ***	0.0057 ***	0.0000 ***	0.0000 ***	0.0049 ***	0.0089 ***
		p-value (adj BMP)	0.0766 *	0.1078	0.1219	0.1089	0.0800 *	0.1616
		p-value (GenSign)	0.2255	0.2719	0.2641	0.4671	0.1743	0.2307
	3-days	CAAR	-6.1501	-2.6001	-8.3650	-6.6880	-3.7294	-11.0176
		p-value (t-test)	0.0000 ***	0.0079 ***	0.0001 * ***	0.0002 * **	0.0061 * **	0.0171 * *
		p-value (BMP)	0.0000 ***	0.0092 ***	0.0000 * **	0.0000 * **	0.0141 * *	0.0150 * *
		p-value (adj BMP)	0.0501 *	0.1295	0.0572 *	0.0565 *	0.1268	0.1933
		p-value (GenSign)	0.0995 *	0.2719	0.0977 *	0.2282	0.1743	0.2307
	5-days	CAAR	-5.3367	-3.4745	-6.6472	-5.3406	-5.3193	-12.6491
		p-value (t-test)	0.0044 ***	0.0078 ***	0.0190 * *	0.0186 **	0.0021 ***	0.0027 ***
		p-value (BMP)	0.1138	0.0262 **	0.5182	0.4296	0.0236 **	0.0015 ***
		p-value (adj BMP)	0.5734	0.1957	0.8107	0.7588	0.1592	0.0893 *
		p-value (GenSign)	0.0995 *	0.2719	0.2641	0.2282	0.1743	0.2307
21/07/20	1-day	CAAR	-0.9710	-0.2226	-1.4156	-1.1367	-0.2255	-1.3820
		p-value (t-test)	0.0114 **	0.0600 *	0.0135 **	0.0138 **	0.0271 **	0.1483
		p-value (BMP)	0.0002 ***	0.0058 ***	0.0025 ***	0.0012 ***	0.0248 **	0.1417
		p-value (adj BMP)	0.1787	0.1065	0.2511	0.1983	0.1585	0.4297
		p-value (GenSign)	0.2837	0.6599	0.1621	0.3176	0.6891	0.5264
	3-days	CAAR	-3.0839	-0.8325	-4.4283	-3.6932	-0.3423	-6.3080
		p-value (t-test)	0.0007 * **	0.0661 *	0.0005 ***	0.0005 ***	0.2385	0.0376 **
		p-value (BMP)	0.0000 * **	0.1512	0.0000 ***	0.0000 ***	0.7209	0.0781 *
		p-value (adj BMP)	0.1340	0.4007	0.1072	0.0764 *	0.8224	0.3437
		p-value (GenSign)	0.0181 * *	0.6599	0.0136 **	0.0155 * *	0.6891	0.1258
	5-days	CAAR	-2.6654	-1.2809	-3.5422	-2.9944	-1.1848	-5.7924
		p-value (t-test)	0.0043 * **	0.0158 **	0.0116 **	0.0078 ***	0.0179 **	0.1075
		p-value (BMP)	0.0001 * **	0.0124 **	0.0055 ***	0.0016 ***	0.0154 **	0.2036
		p-value (adj BMP)	0.1669	0.1431	0.2913	0.2086	0.1279	0.4944
		p-value (GenSign)	0.0052 * **	0.2207	0.0136 **	0.0155 **	0.1466	0.1258

Description: This table reports the CAARs in the bank CDS market (in bps) in response to the key selected dates for the agreement on the 2020 EU recovery fund. Significance is tested according to (i) t-test; (ii) BPM test; (iii) adjusted BPM test; and (iv) generalised sign test. F4 countries are Austria, Denmark, Netherlands and Sweden. FAC are France, Germany, Greece, Italy, Portugal and Spain. EZ is Eurozone countries, NO_EZ is non-Eurozone countries and DEBT is the group of most indebted countries (Cyprus, Greece, Italy and Portugal).

Note: ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

Table 8

Cross-sectional regression results (with banks' sovereign exposures from the 2020 EBA Spring Transparency Exercise).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable: Bank stock CAR							
TA	0.780	0.805	0.751	1.016	0.828	0.991 *	0.969 **
	(0.504)	(0.554)	(0.483)	(0.657)	(0.522)	(0.494)	(0.458)
NPL	0.438 **	0.431 **	0.432 **	0.536 ***	0.535 ***	0.483 ***	0.474 ***
	(0.183)	(0.185)	(0.192)	(0.165)	(0.167)	(0.164)	(0.153)
ROA	2.226	2.189	2.206	3.214 *	3.187 *	2.994 *	2.918 *
	(1.795)	(1.697)	(1.863)	(1.706)	(1.712)	(1.705)	(1.552)
TE_TA	-0.810 *	-0.816	-0.789	-0.958 **	-0.991 **	-0.766 *	-0.847 *
	(0.465)	(0.479)	(0.539)	(0.436)	(0.455)	(0.426)	(0.430)
LCR	-0.010 *	-0.010 *	-0.010	-0.014 **	-0.013 ***	-0.013 ***	-0.013 ***
	(0.005)	(0.006)	(0.006)	(0.005)	(0.004)	(0.003)	(0.003)
Credit_GDP		-0.400					
		(1.639)					
N_policies			0.345				
			(1.986)				
Exp_DOM				0.052			
				(0.099)			
Exp_OTH				0.559 ***			
				(0.168)			
Exp_EZ					0.513 ***		
					(0.158)		
Exp_NO_EZ					0.824 ***		
					(0.225)		
Exp_F4						0.181	
						(0.206)	
Exp_FAC						0.710 **	
						(0.302)	
Exp_DEBT							0.929 ***
							(0.240)
Constant	-3.522	-3.671	-3.381	-9.448	-5.582	-9.496	-7.761
	(10.710)	(11.105)	(10.234)	(13.716)	(11.518)	(10.764)	(9.945)
Observations	48	48	48	48	48	48	48
R-squared	0.355	0.357	0.356	0.515	0.515	0.484	0.479

Description: This table provides the results for the cross-sectional regression, for the bank stock market, presented in Section 3.2, Eq.(4). The dependent variable is bank stock CAR over the 3-day event window around the EC's announcement on the recovery fund proposal on 27/05/2020. Balance-sheet variables are average of data for Q32019-Q42019. Data on banks' sovereign exposures are from the 2020 EBA Spring Transparency Exercise, as of 31/12/2019. Robust standards errors clustered at the country level are presented in parentheses.

TA is the natural logarithm of bank total assets. NPL is the ratio of non-performing loans to gross loans. ROA is the ratio of net profits to average assets. TE_TA is the ratio of total equity to total assets. LCR is the ratio of quality liquid assets as a percent of net cash outflows over a thirty-day period. Credit_GDP is a dummy variable equal to one if the domestic credit to the private sector by banks as a percentage of the GDP (in 2019) is above the sample median. N_policies is a dummy variable equal to one if the number of specific policies in support of the banking sector (until May, 2020) is above the sample median.

Exp_OTH is the exposure to all the other sovereigns to total assets. Exp_DOM is the exposure to the domestic sovereign to total assets. Exp_EZ is the exposure to the Eurozone countries to total assets. Exp_NO_EZ is the exposure to EU_non-Eurozone countries to total assets. Exp_F4 is the exposure to the Frugal Four countries to total assets. Exp_FAC is the exposure to the fund advocate countries to total assets. Exp_DEBT is the exposure to the most indebted countries to total assets.

Note: ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

$$AR_{i,t} = R_{i,t} - \left(\alpha_i - \beta_i R_{m,t} \right) \qquad (1)$$

where $R_{i,t}$ is the daily asset return of bank i at time t, $R_{m,t}$ is the market return, α_i and β_i are the market model parameters. Positive ARs for stock prices indicate "abnormal" increases following an event (signalling that market participants perceive it as beneficial), and vice versa. Negative abnormal changes in CDS spreads reflect a reduction in the market's perception of sovereign/bank debt riskiness, while positive abnormal changes in CDS spreads imply the reverse. In addition to the market model, we also employ an alternative specification with the capital asset pricing model (CAPM) used to compute the expected returns.[15]

The length of the estimation window is sufficient for an event study on daily data (MacKinlay, 1997). However, to test the robustness of our

results, we also run the analysis for all financial markets using a shorter (155-days) estimation window. The findings, reported in Appendix B in Tables B3, B4 and B5, are substantially unaltered, thereby reinforcing the validity of our main analysis. The STOXX Europe 600 index is employed for the investigation of the stock market, while the DS Europe Banks 5Y CDS index and the DS Europe Sovereign 5Y CDS index are used for the derivatives markets, respectively.[16] For the CDS markets, 5Y senior contracts with a modified-modified (MM) restructuring clause are used in the case of bank contracts, while 5Y senior contracts with a cumulative-restructuring (CR) clause are considered for the sovereign market. Absolute spread changes are considered, consistent with the extant literature (Norden and Weber, 2004; Flannery et al., 2017).

Following previous studies (e.g. Morgan et al., 2014; Andries et al., 2020), CARs, are obtained by summing the estimated ARs over any interval in the event window, and are computed as:

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[15] We alternatively use the STOXX Europe 600 index and the MSCI World index as market benchmarks and two different risk-free rates: the three-month Euro Interbank Offered Rate (EURIBOR) and the yield on the 10Y German government bonds. Results for the three event windows are consistent with those obtained by using the market model (see Tables B1 and B2 in Appendix B). Due to space constraints, we only report findings using the EURIBOR as the risk-free rate.

[16] Given the potentially significant impact of the NGEU announcements on the banking sector, via multiple channels as discussed in Section 1, in our main empirical analysis we opted for the use of a broad-based stock market index as a benchmark to estimate the abnormal returns (MacKinlay, 1997). However, for robustness purposes, we also employ the STOXX Europe 600 Banks index and the results, available upon request, are consistent.

Table 9

Cross-sectional regression results (with banks' sovereign exposures from the 2020 EBA Autumn Transparency Exercise).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable: Bank stock CAR							
TA	0.772	0.813	0.720	0.841	0.844	0.968	0.932 *
	(0.523)	(0.608)	(0.516)	(0.731)	(0.588)	(0.563)	(0.525)
NPL	0.333 *	0.326 *	0.322 *	0.351 **	0.357 **	0.322 **	0.304 **
	(0.159)	(0.160)	(0.159)	(0.140)	(0.137)	(0.143)	(0.126)
ROA	0.614	0.614	0.586	1.111	1.116	1.139	0.878
	(2.073)	(2.013)	(2.152)	(2.226)	(2.174)	(2.189)	(2.033)
TE_TA	-0.414	-0.439	-0.381	-0.339	-0.365	-0.208	-0.275
	(0.314)	(0.353)	(0.360)	(0.247)	(0.273)	(0.275)	(0.271)
LCR	-0.007	-0.007	-0.007	-0.009 *	-0.009 **	-0.010 **	-0.011 **
	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
Credit_GDP		-0.604					
		(1.867)					
N_policies			0.588				
			(1.650)				
Exp_DOM				-0.007			
				(0.071)			
Exp_OTH				0.472 ***			
				(0.146)			
Exp_EZ					0.463 ***		
					(0.156)		
Exp_NO_EZ					0.567 ***		
					(0.189)		
Exp_F4						0.223	
						(0.188)	
Exp_FAC						0.597 **	
						(0.283)	
Exp_DEBT							0.760 ***
							(0.227)
Constant	-5.136	-5.392	-4.827	-8.468	-8.460	-11.347	-9.291
	(10.841)	(11.482)	(10.373)	(15.452)	(12.748)	(12.285)	(11.275)
Observations	48	48	48	48	48	48	48
R-squared	0.304	0.307	0.306	0.446	0.446	0.430	0.419

Description: This table provides the results for the cross-sectional regression, for the bank stock market, presented in Section 3.2, Eq.(4). Balance-sheet variables are average of data for Q42019-Q12020. Data on banks' sovereign exposures are from the 2020 EBA Autumn Transparency Exercise, as of 30/06/2020. Robust standards errors clustered at the country level are presented in parentheses.

TA is the natural logarithm of bank total assets. NPL is the ratio of non-performing loans to gross loans. ROA is the ratio of net profits to average assets. TE_TA is the ratio of total equity to total assets. LCR is the ratio of quality liquid assets as a percent of net cash outflows over a thirty-day period. Credit_GDP is a dummy variable equal to one if the domestic credit to the private sector by banks as a percentage of the GDP (in 2019) is above the sample median. N_policies is a dummy variable equal to one if the number of specific policies in support of the banking sector (until May 2020) is above the sample median.

Exp_OTH is the exposure to all the other sovereigns to total assets. Exp_DOM is the exposure to the domestic sovereign to total assets. Exp_EZ is the exposure to the Eurozone countries to total assets. Exp_NO_EZ is the exposure to EU_non-Eurozone countries to total assets. Exp_F4 is the exposure to the Frugal Four countries to total assets. Exp_FAC is the exposure to the fund advocate countries to total assets. Exp_DEBT is the exposure to the most indebted countries to total assets.

Note: ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{i,t} \qquad (2)$$

Similarly to Horváth and Huizinga (2015), and to ensure that our findings are robust to the length of the event window, we employ three different event windows, $[0;0], [-1;1]$ and $[-2;2]$. Given that announcement dates are clearly identified, using a one-day sample interval on the exact date helps mitigate potentially confounding effects. In addition, by considering longer windows, we aim to account for both the possibility of news leakage before the announcements and market participants' slower reaction to the news arrival. The mean of the CARs for each event and sub-group are computed (namely, CAARs), as discussed in MacKinlay (1997):

$$CAAR(t_1, t_2) = \frac{1}{N} \sum_{i=1}^{N} CAR_i(t_1, t_2) \qquad (3)$$

Lastly, to further increase the reliability of inferences, multiple significance tests, both parametric and non-parametric, are utilised. For parametric tests, we use a standard cross-sectional *t-test*, the Boehmer et al. (1991) test (*BMP test*) and its adjusted version (*adjusted BMP*), as proposed by Kolari and Pynnönen (2010), to control for event clustering

and potential cross-correlation. As a non-parametric test, we employ the *generalised sign test* by Cowan (1992), which accounts for the proportional distribution of positive against negative abnormal returns.[17] All the tests are based on the null hypothesis that the CAARs are equal to zero, while the alternative hypothesis indicates that the CAARs are significantly different from zero.

4.2. Multivariate analysis

The second stage of the empirical analysis focuses on the extent to which bank-specific and country-level factors could potentially amplify or mitigate the stock market response to the selected announcements. In particular, we concentrate attention on the EC's proposal on 27 May 2020 for which we observe a sizeable market reaction in the univariate results. Fig. 1 provides evidence of the average bank CAR around the announcement. Specifically, the CARs are measured cumulatively relative to 15 days prior to and after the event date. On the event day, stocks

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[17] We also used the non-parametric *rank test* by Corrado (1989) and the parametric Patell (1976) *test*, which are not reported in the tables as they provide very similar inferences (and also due to space constraints).

Table A1
Gross National Income, national contribution per Member State and gross government debt in 2018.

Country code	Country	GNI (ml€)	Total national contribution (ml€)	%	% of GNI	Gross government debt (% GDP)
AT	Austria	384,734	3334	2.67%	0.87%	74.0
BE	Belgium	456,719	3908	3.13%	0.86%	99.8
BG	Bulgaria	55,443	495	0.40%	0.89%	22.3
CY	Cyprus	20,171	183	0.15%	0.91%	100.6
DE	Germany	3458,382	25,790	20.68%	0.75%	61.9
DK	Denmark	304,814	2607	2.09%	0.86%	33.9
EE	Estonia	25,087	214	0.17%	0.85%	8.4
EL	Greece	183,070	1517	1.22%	0.83%	181.2
ES	Spain	1207,884	10,499	8.42%	0.87%	97.6
FI	Finland	232,880	2053	1.65%	0.88%	59.6
FR	France	2407,644	20,941	16.79%	0.87%	98.1
HU	Hungary	126,623	1094	0.88%	0.86%	70.2
IE	Ireland	253,085	2368	1.90%	0.94%	63.5
IT	Italy	1773,423	15,484	12.42%	0.87%	134.8
NL	Netherlands	781,670	4958	3.98%	0.63%	52.4
PL	Poland	476,349	4053	3.25%	0.85%	48.8
PT	Portugal	196,467	1729	1.39%	0.88%	122.0
RO	Romania	198,572	1684	1.35%	0.85%	34.7
SE	Sweden	474,569	3378	2.71%	0.71%	38.8
SI	Slovenia	45,343	392	0.31%	0.87%	70.4

Source: "EU budget 2018: Financial report" published by the EC and Eurostat. Own elaboration. Note: The table is restricted to the EU Member States which are included in our analysis. This table reports (i) the two-digit ISO code; (ii) the Gross National Income (GNI) in millions of euros; (iii) the total national contribution to the EU budget (in millions of euros); (vi) the total national contribution per country over the EU total value expressed as a percentage; (vii) the total national contribution per country over the GNI expressed as a percentage; and (viii) the gross government debt to GDP expressed as a percentage.

Table A2
Description of variables and data sources.

Variable	Description	Source
Bank balance sheet variables		
Total assets	Natural logarithm of total assets (thousand €)	S&P Global Market Intelligence (authors' calculation)
NPL	Ratio of non-performing loans to gross loans (%)	S&P Global Market Intelligence (authors' calculation)
ROA	Ratio of net profit to average assets (%)	S&P Global Market Intelligence (authors' calculation)
TE_TA	Ratio of total equity to total assets (%)	S&P Global Market Intelligence (authors' calculation)
LCR	Ratio of high-quality liquid assets as a percent of net cash outflows over a thirty-day period (%)	S&P Global Market Intelligence (authors' calculation)
Bank-sovereign exposures		
Exp_OTH	Exposure to all the other sovereigns to total assets (%)	EBA Transparency Exercise (authors' calculation)
Exp_DOM	Exposure to the domestic sovereign to total assets (%)	EBA Transparency Exercise (authors' calculation)
Exp_F4	Exposure to the Frugal Four countries to total assets (%)	EBA Transparency Exercise (authors' calculation)
Exp_FAC	Exposure to the fund advocate countries to total assets (%)	EBA Transparency Exercise (authors' calculation)
Exp_EZ	Exposure to the Eurozone countries to total assets (%)	EBA Transparency Exercise (authors' calculation)
Exp_NO_EZ	Exposure to the EU non-Eurozone countries to total assets (%)	EBA Transparency Exercise (authors' calculation)
Exp_DEBT	Exposure to the most indebted countries to total assets (%)	EBA Transparency Exercise (authors' calculation)
Country-level variables		
Credit_GDP	Dummy variable: 1 if the domestic credit to the private sector by banks (% of GDP) in 2019 is above the sample median, 0 otherwise.	World Bank (authors' calculation)
N_policies	Dummy variable: 1 if the number of specific policy measures to support the banking sectors in response to Covid-19 (until Mai, 2020) is above the sample median, 0 otherwise.	World Bank (authors' calculation)

Description: This table presents the variables employed in the multivariate analysis, the related descriptions and the sources.

for the banks in our sample experienced a 4.18% average CAR.[18]

The investigation of the cross-sectional determinants of CARs using a two-stage approach is common in the related literature (Bruno et al., 2018; Onali et al., 2021). With the aim of explaining any heterogeneity in the bank CARs, we employ various explanatory variables, collected from multiple sources. Bank-balance sheet factors are gathered from S&P Global Market Intelligence. Specifically, we compute and use the average value for the Q3 and Q4 data of 2019. In this way, we aim to obtain a more accurate representation of banks' financial conditions shortly before the NGEU launch than by using annual balance-sheet figures. Information on banks' sovereign holdings is from the 2020 EBA Spring Transparency Exercise, as of the end of 2019. The exposure data are at the highest level of consolidation and are net of derivative financial assets. For the considered sample, Table 2 provides information about the exposures aggregated by the banks' country of location, expressed in billions of euros. Banks headquartered in Italy have the largest aggregate sovereign exposure (€275bn), given by the sum of the exposure towards all the other countries and the domestic sovereign, followed by France (€255bn) and Spain (€221bn). Italian and Spanish banks display the largest amounts of domestic exposure (€176bn and €167bn, respectively).

Furthermore, we control for the weight of the banking sector in financing the economy and consider the domestic credit to the private sector by banks as a percentage of GDP, as provided by the World Bank. Lastly, as in Demirgüç-Kunt et al. (2021) and Feyen et al. (2021), we also consider the number of policy measures deployed to support the banking sectors in response to the Covid-19 crisis (until May 2020). Information on these specific policy initiatives is collected from the World Bank.[19] Table A2 in Appendix A presents the selected variables and the related

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[18] Detailed research on media coverage was conducted using the online Financial Times EU edition and the ECB website. This provides confidence that no other relevant banking-related announcements occurred around the considered event.

[19] We strictly consider policy measures in support of the banking sector (under the "level 1 policy measure") and among these the prudential measures and those in support of the borrowers (under the "level 2 policy measure"). Moreover, we only refer to initiatives at the country level, therefore excluding those taken at the European level (see https://datacatalog.worldbank.org/search/dataset/0037999).

Table B1

Bank stock market reactions – based on the CAPM with a regional benchmark.

Date				ALL	F4	FAC	EZ	NO_EZ	DEBT
18/05/20	1-day		CAAR	0.7323	1.2041	1.4528	1.0646	-0.4461	-0.3187
			p-value (t-test)	0.1033	0.0790 *	0.0224 **	0.0415 **	0.5812	0.7156
			p-value (BMP)	0.0839 *	0.0734 *	0.0072 ***	0.0303 **	0.6934	0.7356
			p-value (adj BMP)	0.6382	0.4028	0.4611	0.5573	0.8396	0.8813
			p-value (GenSign)	0.2457	0.0522 *	0.2064	0.2305	0.8277	0.2702
	3-days		CAAR	-0.2636	1.2180	-1.1617	-0.5880	0.8866	-2.8643
			p-value (t-test)	0.7254	0.2206	0.3630	0.5157	0.4450	0.0285 **
			p-value (BMP)	0.9051	0.0539 *	0.5741	0.7931	0.4374	0.1254
			p-value (adj BMP)	0.9741	0.3677	0.8775	0.9433	0.6902	0.4982
			p-value (GenSign)	0.7994	0.4629	0.4103	0.4691	0.4117	0.1016
	5-days		CAAR	1.4903	3.5317	1.2139	1.5425	1.3051	-3.8327
			p-value (t-test)	0.1944	0.0286 **	0.4851	0.2801	0.3387	0.0121 **
			p-value (BMP)	0.0154 **	0.0136 **	0.0698 *	0.0355 **	0.2126	0.1920
			p-value (adj BMP)	0.5099	0.2490	0.6191	0.5689	0.5223	0.5641
			p-value (GenSign)	0.5519	0.4629	0.6680	0.8122	0.4117	0.1016
27/05/20	1-day		CAAR	4.3271	3.8781	4.0859	4.6674	3.1205	4.6206
			p-value (t-test)	0.0000 ***	0.0000 * **	0.0000 ***	0.0000 ***	0.0000 ***	0.0001 ***
			p-value (BMP)	0.0000 ***	0.0000 * **	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
			p-value (adj BMP)	0.0006 ***	0.0004 ***	0.0237 **	0.0034 ***	0.0002 ***	0.0232 **
			p-value (GenSign)	0.0000 ***	0.0013 ***	0.0000 ***	0.0000 ***	0.0010 ***	0.0015 ***
	3-days		CAAR	8.4892	7.6843	9.0844	9.4178	5.1969	10.8203
			p-value (t-test)	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
			p-value (BMP)	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
			p-value (adj BMP)	0.0017 ***	0.0001 ***	0.0028 ***	0.0038 ***	0.0085 ***	0.0293 **
			p-value (GenSign)	0.0000 ***	0.0013 ***	0.0000 ***	0.0000 ***	0.0073 ***	0.0015 ***
	5-days		CAAR	7.4979	5.7252	8.6656	8.4159	4.2433	11.8297
			p-value (t-test)	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
			p-value (BMP)	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
			p-value (adj BMP)	0.0064 ***	0.0186 **	0.0040 ***	0.0088 ***	0.0315 **	0.0112 **
			p-value (GenSign)	0.0000 ***	0.0013 ***	0.0000 ***	0.0000 ***	0.0010 ***	0.0015 ***
21/07/20	1-day		CAAR	0.4985 *	0.6173	0.2549	0.3707	0.9515	-0.3032
			p-value (t-test)	0.0722 *	0.0018 ***	0.4584	0.2786	0.0031 ***	0.5915
			p-value (BMP)	0.0137 **	0.0015 ***	0.3404	0.1232	0.0020 * **	0.8737
			p-value (adj BMP)	0.5358	0.1767	0.8031	0.6983	0.1191	0.9457
			p-value (GenSign)	0.0517 *	0.0372 **	0.8444	0.4519	0.0063 * **	0.5944
	3-days		CAAR	1.3513	-0.2567	1.4881	1.4541	0.9868	4.5365
			p-value (t-test)	0.0212 **	0.7683	0.1792	0.0444 **	0.1898	0.0027 ***
			p-value (BMP)	0.0555 *	0.7946	0.2183	0.1106	0.2859	0.0045 ***
			p-value (adj BMP)	0.6305	0.9117	0.7475	0.6883	0.5908	0.2240
			p-value (GenSign)	0.1676	0.3515	0.5397	0.2835	0.3564	0.0075 ***
	5-days		CAAR	-0.3314	-1.3125	-0.7891	-0.6867	0.9284	1.2794
			p-value (t-test)	0.6139	0.2840	0.4930	0.3820	0.3766	0.4151
			p-value (BMP)	0.4600	0.5434	0.2837	0.2194	0.5686	0.4876
			p-value (adj BMP)	0.8527	0.7958	0.7792	0.7575	0.7739	0.7662
			p-value (GenSign)	0.2437	0.3515	0.0589 *	0.0703 *	0.3564	0.9983

Description: This table reports the CAARs in the bank stock market (in %) in response to the key selected dates for the agreement on the 2020 EU recovery fund. Significance is tested according to (i) t-test; (ii) BPM test; (iii) adjusted BPM test; and (iv) generalised sign test. F4 countries are Austria, Denmark, Netherlands and Sweden. FAC are France, Germany, Greece, Italy, Portugal and Spain. EZ is Eurozone countries, NO_EZ is non-Eurozone countries and DEBT is the group of most indebted countries (Cyprus, Greece, Italy and Portugal). The model uses the STOXX 600 Europe as market index and the 3-month EURIBOR as risk-free rate.

Note: ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level

sources.

The model specification for the cross-sectional regression is as follows:

$$CAR_{i,t} = \alpha + \beta X_{it} + \gamma(SOV\_EXP_{it}) + Credit\_GDP_j + N\_Policies_j + \varepsilon_{i,t} \quad (4)$$

where $CAR_{i,t}$ for bank i is calculated over the different event windows. X_{it} includes several bank-specific controls, commonly used in the banking literature, employed to capture the heterogeneity in banks' balance sheet conditions and financial strength (Fiordelisi et al., 2020; Onali et al., 2021). Specifically, we consider the natural logarithm of total assets (*TA*), a proxy for the bank size (*TA*). We anticipate a more pronounced positive market reaction for larger banks as they are likely to benefit more from the implementation of NGEU. This viewpoint is supported by the more extensive role played by larger institutions in supporting the post-Covid recovery, as well as the higher perceived beneficial effects for larger banks, with a potentially higher systemic risk, from economic and fiscal stability associated with the deployment of NGEU. The ratio of non-performing loans to gross loans (*NPL*) is a proxy for asset quality. Banks hampered by higher volumes of NPLs are

anticipated to present a stronger positive reaction, due to the potential beneficial effects in terms of economic recovery, also affecting borrowers' financial conditions, associated with NGEU. In a similar fashion, stock investors of banks with lower profitability (the net profit to average assets, *ROA*), weaker capitalization (the ratio of total equity to total assets, *TE_TA*) and less liquidity (the ratio of high-quality liquid assets to net cash outflows over a thirty-day period, *LCR*) are expected to positively welcome the announcement of NGEU. SOV_EXP_{it} includes various measures of bank sovereign exposure (our main focus in this stage of the analysis), all scaled by total assets (see, for instance, Horváth and Huizinga, 2015; Acharya et al., 2018; De Marco, 2019). In particular, we construct several variables and account for the (i) exposure to all the other countries in the sample (*Exp_OTH*); (ii) exposure to the domestic sovereign (*Exp_DOM*); (iii) exposure to the Eurozone countries (*Exp_EZ*); (iv) exposure to the EU non-Eurozone countries (*Exp_NO_EZ*); (v) exposure to the Frugal Four countries (*Exp_F4*); (vi) exposure to the countries that advocated the creation of the European-wide recovery fund (*Exp_FAC*); and (vii) exposure to the most indebted countries (*Exp_DEBT*). $Credit\_GDP_j$ is a dummy variable that takes the value of 1 if

Table B2

Bank stock market reactions – based on the CAPM with a global benchmark.

Date				ALL	F4	FAC	EZ	NO_EZ	DEBT
18/05/20	1-day	CAAR		1.6237	2.0528	2.3676	1.9634	0.4192	0.5610
		p-value (t-test)		0.0004 ***	0.0030 ***	0.0002 ***	0.0002 ***	0.6068	0.5245
		p-value (BMP)		0.0003 ***	0.0023 ***	0.0001 ***	0.0002 ***	0.5181	0.5411
		p-value (adj BMP)		0.4411	0.2893	0.3426	0.4013	0.7981	0.8151
		p-value (GenSign)		0.0519 *	0.0577 *	0.0937 *	0.0714 *	0.4530	0.9398
	3-days	CAAR		-0.0942	1.2132	-0.9523	-0.4066	1.0132	-2.7192
		p-value (t-test)		0.8997	0.2208	0.4575	0.6522	0.3820	0.0391 **
		p-value (BMP)		0.7644	0.0561 *	0.7238	0.9435	0.4051	0.1596
		p-value (adj BMP)		0.9487	0.5067	0.9324	0.9872	0.7417	0.5904
		p-value (GenSign)		0.7483	0.4904	0.4075	0.4461	0.4530	0.0931 *
	5-days	CAAR		-1.6290	0.1271	-1.8945	-1.5747	-1.8215	-6.9685
		p-value (t-test)		0.1495	0.9346	0.2755	0.2630	0.1674	0.0000 ***
		p-value (BMP)		0.0410 **	0.6157	0.2670	0.1526	0.0443 **	0.0000 ***
		p-value (adj BMP)		0.6609	0.8615	0.7900	0.7461	0.4259	0.0990 *
		p-value (GenSign)		0.1461	0.9320	0.4075	0.2791	0.2889	0.0268 **
27/05/20	1-day	CAAR		3.3518	2.8782	3.1017	3.6885	2.1584	3.6354
		p-value (t-test)		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0025 ***
		p-value (BMP)		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0005 ***
		p-value (adj BMP)		0.0450 **	0.0499 **	0.1233	0.0633 *	0.0323 **	0.1863
		p-value (GenSign)		0.0000 ***	0.0016 ***	0.0000 ***	0.0000 ***	0.0013 * **	0.0091 ***
	3-days	CAAR		7.8637	6.9581	8.4711	8.7918	4.5731	10.1770
		p-value (t-test)		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
		p-value (BMP)		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
		p-value (adj BMP)		0.0283 **	0.0094 ***	0.0185 **	0.0305 **	0.0816 *	0.1017
		p-value (GenSign)		0.0000 ***	0.0016 ***	0.0000 ***	0.0000 ***	0.0091 ***	0.0091 ***
	5-days	CAAR		6.1565	4.2208	7.3390	7.0722	2.9098	10.4573
		p-value (t-test)		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0001 ***	0.0000 ***
		p-value (BMP)		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0002 ***	0.0000 ***
		p-value (adj BMP)		0.0530 *	0.1262	0.0213 **	0.0478 **	0.1502	0.0507 *
		p-value (GenSign)		0.0000 ***	0.0107 **	0.0000 ***	0.0000 ***	0.0451 **	0.0017 ***
21/07/20	1-day	CAAR		0.5847	0.7315	0.3371	0.4575	1.0356	-0.2124
		p-value (t-test)		0.0356 **	0.0002 ***	0.3284	0.1830	0.0011 ***	0.7094
		p-value (BMP)		0.0059 ***	0.0001 ***	0.2460	0.0797 *	0.0006 * **	0.8145
		p-value (adj BMP)		0.5765	0.2002	0.7897	0.7092	0.1724	0.9315
		p-value (GenSign)		0.0334 **	0.0461 **	0.5593	0.3090	0.0088 * **	0.9615
	3-days	CAAR		0.4923	-1.0163	0.6069	0.5904	0.1448	3.6792
		p-value (t-test)		0.3968	0.2398	0.5836	0.4111	0.8455	0.0140 **
		p-value (BMP)		0.3993	0.4254	0.5302	0.4734	0.6539	0.0156 **
		p-value (adj BMP)		0.8641	0.7911	0.8853	0.8787	0.8587	0.3753
		p-value (GenSign)		0.6669	0.3067	0.8024	0.7063	0.8351	0.0087 ***
	5-days	CAAR		-0.0930	-0.9402	-0.5711	-0.4465	1.1605	1.5376
		p-value (t-test)		0.8867	0.4371	0.6195	0.5680	0.2598	0.3252
		p-value (BMP)		0.6681	0.6823	0.3799	0.3414	0.4355	0.3907
		p-value (adj BMP)		0.9306	0.8918	0.8400	0.8395	0.7569	0.7531
		p-value (GenSign)		0.3251	0.3067	0.1333	0.1224	0.4171	0.9615

Description: This table reports the CAARs in the bank stock market (in %) in response to the key selected dates for the agreement on the 2020 EU recovery fund. Significance is tested according to (i) t-test; (ii) BPM test; (iii) adjusted BPM test; and (iv) generalised sign test. F4 countries are Austria, Denmark, Netherlands and Sweden. FAC are France, Germany, Greece, Italy, Portugal and Spain. EZ is Eurozone countries, NO_EZ is non-Eurozone countries and DEBT is the group of most indebted countries (Cyprus, Greece, Italy and Portugal). The model uses the MSCI World as market index and the 3-month EURIBOR as risk-free rate. Note: ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

the domestic credit to the private sector by banks (as a percentage of the GDP) in 2019, for a country j, is above the sample median (83%), and 0 otherwise. $N\_policies_j$ is a dummy variable that takes value 1 if the number of specific policies in support of the banking sector of a country j is above the sample median (10), and 0 otherwise. Robust standard errors ($\varepsilon_{i,t}$) are clustered at the country level.

Two main reasons motivate our focus on banks' sovereign debt holdings. The first is the widely documented strong interconnection between bank and sovereign risk in Europe. In order to address the exceptional funding needs to tackle the adverse economic effects of Covid-19, governments worldwide had to deploy large fiscal stimulus packages, a substantial proportion of which were channelled through banks (Mai, 2020). As a consequence, the already tight link between sovereigns and banks in Europe was likely to have strengthened (Gross and Pancaro, 2021). Therefore, individual bank stock investors' reaction to the NGEU is likely to be influenced by the given bank's exposure to sovereign debt, both to the domestic government and to other EU sovereigns. The second reason is connected to the first and lies in the nature of the announcement we consider. The recovery fund is a pan-European

crisis-response mechanism established to support countries to mitigate the economic effects of the Covid-19 outbreak and to underpin the post-pandemic stimulus. Given that sovereigns are the direct beneficiaries of the recovery package and the large amounts of sovereign debt on European banks' balance sheets, a clear potential exists for banks to benefit from improved stability in government debt markets. It is therefore reasonable to expect sovereign debt holdings to be an influential factor in the strength of any bank stock market abnormal returns in response to the NGEU announcements. Specifically, we aim to capture the influence of banks' sovereign exposures to different sub-groups of countries, characterised by commonalities in terms of regulatory frameworks (Eurozone versus non-Eurozone countries), political stances ("Frugal four" versus "fund advocate countries") and public finances (countries with the highest level of public debt).

Table 3 presents the descriptive statistics for the dependent variable (namely, *CAR*) and the bank-specific and country-based variables employed in the regression model (Eq. 4). Quarterly balance-sheet information for two Irish banks was not available and these banks were therefore excluded from our original sample. Following a cross-check

Table B3

Bank stock market reactions (shortened 155-day estimation window).

Date				ALL	F4	FAC	EZ	NO_EZ	DEBT
18/05/20	1-day	CAAR		-0.4322	0.3845	0.0454	-0.3353	-0.7758	-1.7241
		p-value (t-test)		0.2609	0.3439	0.9366	0.4605	0.2672	0.0344 **
		p-value (BMP)		0.4612	0.4163	0.6045	0.7641	0.2778	0.0620 *
		p-value (adj BMP)		0.8329	0.6818	0.8782	0.9315	0.5699	0.3975
		p-value (GenSign)		0.3613	0.1942	0.2791	0.3477	0.8579	0.2339
	3-days	CAAR		-2.0375	-0.2859	-3.6131	-2.7025	0.3201	-4.5972
		p-value (t-test)		0.0039 ***	0.7094	0.0034 ***	0.0014 ***	0.7032	0.0005 ***
		p-value (BMP)		0.0035 ***	0.8394	0.0016 ***	0.0008 ***	0.7217	0.0021 ***
		p-value (adj BMP)		0.4034	0.9186	0.3503	0.3371	0.8520	0.1632
		p-value (GenSign)		0.0274 **	0.9286	0.0073 ***	0.0035 ***	0.4339	0.0052 ***
	5-days	CAAR		-0.6028	1.5307	-1.9500	-0.9366	0.5810	-5.5164
		p-value (t-test)		0.5415	0.2224	0.2184	0.4504	0.5148	0.0001 ***
		p-value (BMP)		0.4045	0.1134	0.9636	0.5979	0.2286	0.0085 ***
		p-value (adj BMP)		0.8113	0.4247	0.9892	0.8799	0.5285	0.2330
		p-value (GenSign)		0.4304	0.4877	0.1534	0.3228	0.8579	0.0238 **
27/05/20	1-day	CAAR		4.1940	3.8503	3.7517	4.4800	3.1802	4.4886
		p-value (t-test)		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0003 ***
		p-value (BMP)		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
		p-value (adj BMP)		0.0005 ***	0.0000 ***	0.0172 **	0.0033 ***	0.0000 ***	0.0526 *
		p-value (GenSign)		0.0000 ***	0.0014 ***	0.0000 ***	0.0000 ***	0.0011 ***	0.0003 ***
	3-days	CAAR		7.5021	7.1670	7.4933	8.1654	5.1507	9.6966
		p-value (t-test)		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
		p-value (BMP)		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
		p-value (adj BMP)		0.0004 ***	0.0000 ***	0.0015 ***	0.0012 ***	0.0057 ***	0.0224 **
		p-value (GenSign)		0.0000 ***	0.0014 ***	0.0000 ***	0.0000 ***	0.0011 ***	0.0022 ***
	5-days	CAAR		6.3855	5.2331	6.5865	6.9610	4.3449	10.6233
		p-value (t-test)		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
		p-value (BMP)		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
		p-value (adj BMP)		0.0045 ***	0.0049 ***	0.0121 **	0.0099 ***	0.0081 ***	0.0149 **
		p-value (GenSign)		0.0000 * **	0.0094 ***	0.0003 ***	0.0000 ***	0.0079 ***	0.0022 ***
21/07/20	1-day	CAAR		0.5253	0.4865	0.3625	0.4431	0.8166	-0.1582
		p-value (t-test)		0.0607 *	0.0071 ***	0.3223	0.1985	0.0220 **	0.7782
		p-value (BMP)		0.0196 **	0.0134 **	0.2493	0.1103	0.0148 **	0.7269
		p-value (adj BMP)		0.5391	0.2720	0.7402	0.6676	0.2331	0.8754
		p-value (GenSign)		0.0572 *	0.0337 **	0.5593	0.3093	0.0324 **	0.6292
	3-days	CAAR		1.6385	-0.4772	2.0308	1.9163	0.6536	5.2107
		p-value (t-test)		0.0066 ***	0.5614	0.0613 *	0.0088 * **	0.4476	0.0005 ***
		p-value (BMP)		0.0372 **	0.5727	0.1042	0.0476 * *	0.5126	0.0012 ***
		p-value (adj BMP)		0.5834	0.8022	0.6400	0.5942	0.7486	0.1450
		p-value (GenSign)		0.0289 **	0.3730	0.1562	0.0480 * *	0.3504	0.0011 ***
	5-days	CAAR		0.1214	-1.6963	0.0842	0.0513	0.3702	2.3691
		p-value (t-test)		0.8506	0.1407	0.9388	0.9475	0.7227	0.1285
		p-value (BMP)		0.7178	0.3674	0.6945	0.5850	0.8367	0.2196
		p-value (adj BMP)		0.9242	0.6889	0.9100	0.8832	0.9196	0.5816
		p-value (GenSign)		0.3539	0.1352	0.5046	0.3654	0.7854	0.2623

Description: This table reports the CAARs in the bank stock market (in %) in response to the key selected dates for the agreement on the 2020 EU recovery fund. Significance is tested according to (i) t-test; (ii) BPM test; (iii) adjusted BPM test; and (iv) generalised sign test. F4 countries are Austria, Denmark, Netherlands and Sweden. FAC are France, Germany, Greece, Italy, Portugal and Spain. EZ is Eurozone countries, NO_EZ is non-Eurozone countries and DEBT is the group of most indebted countries (Cyprus, Greece, Italy and Portugal).

Note: ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

with banks' annual reports, we decided not to winsorize the data, thereby exploiting the full heterogeneity across the sample. The average bank stock CAR, over the 3-day event window, is 7.49%, suggesting a strong market reaction in response to the EC's announcement on the proposal for the recovery fund. The NPL ratio presents a relatively large dispersion around the mean value (7.36%), with a minimum value close to zero (0.09%) and a maximum of 33.78%. Differences across the banks in terms of asset quality are substantial. A similar feature holds for banks' liquidity, with the *LCR* ranging from 78.24% to 722.49%.[20] The weight of the domestic banking sector in financing the private sector, as a percentage of GDP, ranges from 24.70% to 159.70%. Lastly, not all banking sectors received specific support from the national authorities in the first months of 2020. The maximum number of specific policy initiatives is 12, the minimum 3 and the average value is 8.36.

Table 4 provides the descriptive statistics for the data on banks' sovereign exposures. All the considered banks are exposed to a varying extent to their domestic government's debt, with the variable *Exp _DOM* ranging between 0.13% and 41.35%. Many institutions also hold the government debt of other EU countries. The average exposure towards Eurozone sovereigns is 2.59%, while that to European but non-Eurozone governments is 0.60%, suggesting the sampled banks' overall preference for holding euro area sovereign debt.

5. Univariate analysis: results and discussion

The results for the selected financial markets are presented in Tables 5, 6 and 7. We firstly consider the preliminary Franco-German deal on 18 May 2020. For this event, a negative stock market reaction is revealed in the 3-day window for the sub-groups of banks located in fund advocate (FAC) and most indebted (DEBT) countries. It is likely that the uncertainty about the agreement at the time, as also stated by the incumbent German Chancellor, prompted this negative market sentiment (Financial Times, 2020). Albeit an unprecedented initiative, the

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[20] Due attention is paid to potential multicollinearity issues among the selected balance-sheet variables. We analyse the correlation among the variables and find no problems.

Table B4

Sovereign CDS market reactions (shortened 155-day estimation window).

Date			ALL	F4	FAC	EZ	NO_EZ	DEBT
18/05/20	1-day	CAAR	-1.2198	-0.0013	-4.9201	-1.7500	0.0174	-5.7424
		p-value (t-test)	0.1120	0.9582	0.0060 ***	0.1037	0.7953	0.0084 ***
		p-value (BMP)	0.6417	0.8567	0.0689 *	0.5936	0.3545	0.0760 *
		p-value (adj BMP)	0.8201	0.9088	0.4159	0.7960	0.4661	0.2551
		p-value (GenSign)	0.0331 **	0.2242	0.4729	0.1980	0.0565 *	0.5609
	3-days	CAAR	-2.7193	-0.1393	-9.3315	-3.8633	-0.0499	-10.3805
		p-value (t-test)	0.0379 **	0.3715	0.0013 ***	0.0320 **	0.5977	0.0124 **
		p-value (BMP)	0.0606 *	0.3192	0.0002 ***	0.0501 *	0.8579	0.0498 **
		p-value (adj BMP)	0.3591	0.5275	0.0990 *	0.3425	0.8880	0.2084
		p-value (GenSign)	0.5167	0.9639	0.1079	0.6829	0.5780	0.5609
	5-days	CAAR	-3.1694	-0.2069	-10.3588	-4.2690	-0.6038	-11.7644
		p-value (t-test)	0.0372 **	0.2100	0.0042 ***	0.0424 **	0.3976	0.0242 **
		p-value (BMP)	0.1237	0.0994 *	0.0003 ***	0.1508	0.5840	0.0505 *
		p-value (adj BMP)	0.4518	0.2959	0.1063	0.4864	0.6665	0.2097
		p-value (GenSign)	0.8530	0.9639	0.1079	0.6829	0.7911	0.5609
27/05/20	1-day	CAAR	-2.2197	-0.3745	-6.2085	-2.4674	-1.6417	-7.9695
		p-value (t-test)	0.1080	0.1125	0.1231	0.1909	0.2895	0.1912
		p-value (BMP)	0.0339 **	0.1637	0.0004 ***	0.1284	0.1410	0.0369 **
		p-value (adj BMP)	0.2854	0.3799	0.1040	0.4575	0.2304	0.1815
		p-value (GenSign)	0.9128	0.9361	0.0934 *	0.9856	0.8658	0.4694
	3-days	CAAR	-4.1045	-0.3659	-12.8437	-4.5253	-3.1228	-16.0579
		p-value (t-test)	0.0854 *	0.0936 *	0.0306 **	0.1627	0.2649	0.0622 *
		p-value (BMP)	0.3204	0.1467	0.0010 ***	0.7011	0.1733	0.0160 **
		p-value (adj BMP)	0.6167	0.3602	0.1284	0.8512	0.2673	0.1231
		p-value (GenSign)	0.2051	0.9361	0.0934 *	0.2717	0.5160	0.4694
	5-days	CAAR	-5.3019	-1.5836	-13.0062	-5.9312	-3.8334	-15.4694
		p-value (t-test)	0.0196 **	0.0022 ***	0.0324 **	0.0494 **	0.2048	0.0929 *
		p-value (BMP)	0.0000 ***	0.0049 ***	0.0000 ***	0.0000 ***	0.0637 *	0.0288 **
		p-value (adj BMP)	0.0325 **	0.0758 *	0.0019 ***	0.0439 **	0.1309	0.1616
		p-value (GenSign)	0.2051	0.2265	0.0934 *	0.2717	0.5160	0.4694
21/07/20	1-day	CAAR	-0.1198	-0.0390	-0.5845	-0.1632	0.0015	-0.8082
		p-value (t-test)	0.6212	0.6505	0.4577	0.6296	0.9888	0.5072
		p-value (BMP)	0.1908	0.8296	0.5362	0.1951	0.7935	0.6844
		p-value (adj BMP)	0.4954	0.8760	0.7728	0.5239	0.8236	0.7943
		p-value (GenSign)	0.0170 **	0.2357	0.5471	0.0101 **	0.6340	0.8202
	3-days	CAAR	-0.8004	-0.1587	-2.4066	-0.9569	-0.3620	-2.0169
		p-value (t-test)	0.0449 **	0.0316 **	0.0062 ***	0.0765 *	0.2382	0.0584 *
		p-value (BMP)	0.0006 ***	0.0016 ***	0.0003 ***	0.0033 ***	0.0493 **	0.0362 **
		p-value (adj BMP)	0.0750 *	0.0220 **	0.0950 *	0.1490	0.0943 *	0.1790
		p-value (GenSign)	0.0062 ***	0.2118	0.0548 *	0.0172 **	0.1892	0.0742 *
	5-days	CAAR	-1.7880	-0.1106	-4.8253	-2.2449	-0.5086	-5.2637
		p-value (t-test)	0.0099 ***	0.2379	0.0032 ***	0.0143 **	0.2846	0.0170 **
		p-value (BMP)	0.0001 ***	0.1097	0.0010 ***	0.0002 ***	0.1567	0.0511 *
		p-value (adj BMP)	0.0397 **	0.2462	0.1254	0.0654 *	0.2279	0.2109
		p-value (GenSign)	0.0232 **	0.9749	0.0548 *	0.0172 **	0.6757	0.0742 *

Description: This table reports the CAARs in the sovereign CDS market (in bps) in response to the key selected dates for the agreement on the 2020 EU recovery fund. Significance is tested according to (i) t-test; (ii) BPM test; (iii) adjusted BPM test; and (iv) generalised sign test. F4 countries are Austria, Denmark, Netherlands and Sweden. FAC are France, Germany, Greece, Italy, Portugal and Spain. EZ is Eurozone countries, NO_EZ is non-Eurozone countries and DEBT is the group of most indebted countries (Cyprus, Greece, Italy and Portugal).

Note: * **significant at the 1% level; * *significant at the 5% level; *significant at the 10% level.

persistent diverging views of Member States regarding the specific conditions of the proposal, including the balance between grants and loans, did not impress banks' stock investors. This is in line with our alternative hypothesis for the stock market (H1a). The negative reaction appears particularly pronounced for banks located in the most indebted countries (−4.91%) that most likely were expecting a larger recovery package. On the contrary, spreads on both sovereign and bank CDS abnormally decline, especially for FAC and DEBT economies (−8.59 and −9.47 bps in the 3-day event window, respectively) and banks located in these groups of countries (−4.06 and −6.78 bps in the 3-day event window, respectively). This evidence reflects a favourable response of credit derivatives markets to the early-stage proposal as a useful tool to relieve pressure from national governments (*H2*) with consequent beneficial effects for EU banks (*H3*).

The relevance of the second date (namely, the EC's proposal on 27 May 2020) for the bank stock market reveals a dramatic contrast. Positive, widespread and highly statistically significant coefficients are revealed for all time windows, suggesting strong credibility of the

proposed recovery plan and its effectiveness, consistent with our *H1* and with the idea of the newly established facility being a "game-changer" for Europe (Financial Times, 2021). The reactions are especially sizeable for banks located in Eurozone countries and the sub-group of highly indebted economies (8.12% and 9.42% CAARs, respectively, in the 3-day event window). For the sovereign CDS market, a sizeable positive impact (a decrease in quoted spreads, as per *H2*) is revealed for FAC and DEBT economies (in the 3-day event window, −12.35 and −15.47 bps, respectively and persisting in the 5-day window). Strong evidence is also shown for the bank CDS market. There is a substantial reduction in the quoted spreads, which is particularly marked for banks in FAC and DEBT countries (−8.37 and −11.02 bps in the 3-day event window, respectively). For the latter sub-group, the declining coefficients maintain a

Table B5

Bank CDS market reactions (shortened 155-day estimation window).

Date				ALL	F4	FAC	EZ	NO_EZ	DEBT
18/05/20	1-day		CAAR	-1.8050	-0.6790	-2.4939	-2.0528	-0.6898	-2.7512
			p-value (t-test)	0.0016 ***	0.1967	0.0021 ***	0.0019 ***	0.4511	0.1219
			p-value (BMP)	0.0004 ***	0.2841	0.0003 ***	0.0001 ***	0.6694	0.1343
			p-value (adj BMP)	0.2385	0.5693	0.1858	0.1487	0.7907	0.4200
			p-value (GenSign)	0.3149	0.8988	0.2151	0.2688	0.9821	0.9579
	3-days		CAAR	-3.4091	-1.5586	-4.5683	-3.7267	-1.9798	-7.4635
			p-value (t-test)	0.0020 ***	0.0085 ***	0.0053 ***	0.0049 ***	0.0364 **	0.0656 *
			p-value (BMP)	0.0000 ***	0.0004 ***	0.0009 ***	0.0001 ***	0.0000 ***	0.0472 **
			p-value (adj BMP)	0.1033	0.0602 *	0.2284	0.1637	0.0093 ***	0.2852
			p-value (GenSign)	0.0557 *	0.4655	0.0732 *	0.1093	0.2544	0.3363
	5-days		CAAR	-3.4093	-1.1697	-4.7553	-3.7132	-2.0415	-7.9071
			p-value (t-test)	0.0004 ***	0.0826 *	0.0005 ***	0.0014 ***	0.0035 ***	0.0102 **
			p-value (BMP)	0.0550 *	0.9454	0.0019 ***	0.1802	0.0002 ***	0.0000 ***
			p-value (adj BMP)	0.5222	0.9710	0.2610	0.6241	0.0193 **	0.0059 ***
			p-value (GenSign)	0.0179 **	0.4655	0.0191 **	0.0360 **	0.2544	0.3363
27/05/20	1-day		CAAR	-2.7501	-1.2634	-3.6877	-2.9618	-1.7975	-4.3223
			p-value (t-test)	0.0000 ***	0.0043 ***	0.0001 ***	0.0002 ***	0.0036 ***	0.0148 **
			p-value (BMP)	0.0000 ***	0.0001 ***	0.0000 ***	0.0000 ***	0.0018 ***	0.0074 ***
			p-value (adj BMP)	0.0512 *	0.0335 **	0.1112	0.0719 *	0.0502 *	0.1495
			p-value (GenSign)	0.0399 **	0.0921 *	0.1833	0.0787 *	0.2523	0.3150
	3-days		CAAR	-6.4384	-2.8908	-8.6655	-6.9708	-4.0423	-11.4531
			p-value (t-test)	0.0000 ***	0.0027 ***	0.0001 ***	0.0001 ***	0.0023 ***	0.0135 **
			p-value (BMP)	0.0000 ***	0.0027 ***	0.0000 ***	0.0000 * **	0.0044 ***	0.0122 **
			p-value (adj BMP)	0.0375 **	0.0953 *	0.0484 **	0.0423 **	0.0749 *	0.1776
			p-value (GenSign)	0.0123 **	0.0921 *	0.0602 *	0.0246 **	0.2523	0.3150
	5-days		CAAR	-5.8176	-3.8774	-7.1906	-5.8190	-5.8111	-13.4276
			p-value (t-test)	0.0020 ***	0.0037 ***	0.0112 **	0.0106 **	0.0007 ***	0.0013 ***
			p-value (BMP)	0.0763 *	0.0162 **	0.4685	0.3430	0.0175 **	0.0006 ***
			p-value (adj BMP)	0.5467	0.1822	0.7927	0.7231	0.1368	0.0633 *
			p-value (GenSign)	0.0123 **	0.0921 *	0.0602 *	0.0246 **	0.2523	0.3150
21/07/20	1-day		CAAR	-0.9862	-0.3123	-1.3921	-1.1442	-0.2752	-1.3398
			p-value (t-test)	0.0094 ***	0.0007 ***	0.0148 **	0.0122 **	0.0020 ***	0.1774
			p-value (BMP)	0.0000 ***	0.0000 ***	0.0018 ***	0.0001 ***	0.0045 ***	0.1696
			p-value (adj BMP)	0.1171	0.0038 ***	0.2419	0.1338	0.0777 *	0.4621
			p-value (GenSign)	0.0141 **	0.0714 *	0.0765 *	0.0331 **	0.1991	0.5672
	3-days		CAAR	-3.1576	-0.9832	-4.4629	-3.7542	-0.4729	-6.3316
			p-value (t-test)	0.0006 ***	0.0337 **	0.0007 ***	0.0005 ***	0.1366	0.0476 **
			p-value (BMP)	0.0000 ***	0.0752 *	0.0000 ***	0.0000 ***	0.4938	0.0849 *
			p-value (adj BMP)	0.1044	0.3228	0.0976 *	0.0554 *	0.6707	0.3563
			p-value (GenSign)	0.0038 ***	0.3220	0.0044 ***	0.0020 ***	0.8536	0.1421
	5-days		CAAR	-2.7764	-1.5819	-3.5556	-3.0799	-1.4103	-5.7686
			p-value (t-test)	0.0040 ***	0.0027 ***	0.0151 **	0.0082 ***	0.0093 ***	0.1354
			p-value (BMP)	0.0001 ***	0.0149 **	0.0039 ***	0.0010 ***	0.0071 ***	0.2315
			p-value (adj BMP)	0.1598	0.1763	0.2794	0.2047	0.0946 *	0.5218
			p-value (GenSign)	0.0141 **	0.3220	0.0210 **	0.0331 **	0.1991	0.1421

Description: This table reports the CAARs in the bank CDS market (in bps) in response to the key selected dates for the agreement on the 2020 EU recovery fund. Significance is tested according to (i) t-test; (ii) BPM test; (iii) adjusted BPM test; and (iv) generalised sign test. F4 countries are Austria, Denmark, Netherlands and Sweden. FAC are France, Germany, Greece, Italy, Portugal and Spain. EZ is Eurozone countries, NO_EZ is non-Eurozone countries and DEBT is the group of most indebted countries (Cyprus, Greece, Italy and Portugal).

Note: ***significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

consistent statistical significance in the 5-day event window (−12.65 bps).[21] This evidence lends support to the view that investors perceive potential reductions in the riskiness of banks' debt following the EC's announcement on the NGEU (*H2*). Despite the instrument not being intended to directly support the banking sector, investors in EU banks evidently valued the indirect benefits associated with the fiscal stimulus. Overall, the reaction observed in the credit derivatives markets reflects an appreciation for the recovery package and the significant step in financial and fiscal risk-sharing (Fitch, 2021), also underlying the relevance of a country's fiscal capacity to withstand external shocks

(Augustin et al., 2022).

Market reaction to the announcement of the final agreement on 21 July 2020 is mixed and not particularly noteworthy for the stock market, which has already discounted the related information content by that time. Conversely, large abnormal movements in the sovereign CDS market, in both the 3- and 5-day event windows, are revealed for the FAC group (-2.07 and -4.29 bps, respectively). This evidence again indicates a reduction in the perceived default risk and thereby a positive role associated with the NGEU in supporting the creditworthiness of these sovereigns. A far more limited reaction, in both the 3- and 5-day event windows, is shown for the F4 group (−0.15 and −0.09 bps, respectively). With reference to the 3-day event window, the decline in the CDS spreads for banks located in FAC and Eurozone (EZ) countries are pronounced (−4.43 and −3.69 bps, respectively) as compared to the corresponding coefficients for banks in the Frugal Four (F4) and non-Eurozone (NO_EZ) economies (−0.83 and −0.34 bps, respectively).

The above findings clearly indicate that the creation of NGEU was positively perceived by financial markets. New and valuable information was conveyed to the stock market on the occasion of the EC's

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[21] In a further test, we evaluate the market reactions for the group of Global Systemically Important Banks (G-SIBs). In response to the EC's proposal, we find a substantial positive reaction in the stock market (8.35% in the 3-day window) and a reduction in the quoted bank CDS spreads (−8.98 bps in the 3-day window), statistically significant at various levels. Results, available upon request, are not reported because the paper's sub-sample focus is at the country (not bank) level and also in the interests of brevity.

Table C1

Cross-sectional regression results with additional controls (common regulatory framework and EU political affiliations).

Dependent variable: Bank stock CAR	(1)
TA	0.725
	(0.506)
NPL	0.458 **
	(0.161)
ROA	3.182
	(2.080)
TE_TA	-0.947 *
	(0.503)
LCR	-0.011 **
	(0.005)
EZ	2.586 *
	(1.462)
EPP	1.363
	(1.007)
Renew_EU	-0.758
	(1.892)
SD	1.739 *
	(0.978)
Constant	-4.720
	(10.653)
Observations	48
R-squared	0.410

Description: This table provides the results for the cross-sectional regression, for the bank stock market, presented in Section 3.2, Eq.(4). The dependent variable is bank stock CAR over the 3-day event window around the EC's announcement on the recovery fund proposal on 27/05/2020. Balance-sheet variables are average of data for Q32019-Q42019. Data on banks' sovereign exposures are from the 2020 EBA Spring Transparency Exercise, as of 31/12/2019. Robust standards errors clustered at the country level are presented in parentheses. TA is the natural logarithm of bank total assets. NPL is the ratio of non-performing loans to gross loans. ROA is the ratio of net profits to average assets. TE_TA is the ratio of total equity to total assets. LCR is the ratio of quality liquid assets as a percent of net cash outflows over a thirty-day period. EZ is a dummy equal to one if a bank is located in a Eurozone country. EPP is a dummy variable equal to one if a bank is located in a country whose Head of the State is affiliated with the European People's Party. Renew_EU is a dummy variable equal to one if a bank is located in a country whose Head of the State is affiliated with the Renew Europe political group. SD is a dummy variable equal to one if a bank is located in a country whose Head of the State is affiliated with the Progressive Alliance of Socialists and Democrats.

Note: * **significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

proposal on 27 May 2020, which outlined in a clearer manner the grant and loan components of the recovery package, entailing a significant redistributive character. The growth effects associated with NGEU, and the related positive implications for EU banks, are likely to have driven stock investors' enthusiasm. Also, expected political and fiscal stability improvements are likely to have contributed to lowering equity risk premia. Regarding the CDS markets, our findings suggest that NGEU was perceived as an effective policy to reduce pressure on sovereigns, especially those more vulnerable (most likely thanks to the significant transfer element in NGEU). This translated into a reduction in sovereign CDS spreads. Furthermore, it appears that although banks are not the direct beneficiaries of the funds, the favourable effects on sovereigns (in terms of reduced debt riskiness) are also reflected in the bank CDS market. A likely explanation for this evidence is the specific relevance of sovereign debt portfolios for European banks, as investigated in the next section.

6. Multivariate analysis: results and discussion

To identify the specific factors that might explain the higher or lower bank CARs, we present the results for the cross-sectional regressions

discussed in Section 3.2. We consider both bank-level characteristics, including information on sovereign exposures, and country-level indicators. Table 8 provides the main findings of our analysis with bank stock CARs, calculated over a 3-day event window, as the dependent variable. In each model specification, we include all bank balance sheet controls. We begin by alternatively adding the two country-level variables to see whether (i) the importance of the banking sector as a financing channel for the private sector; and (ii) the specific policy measures in support of national banking sectors in response to Covid-19 had relevance in explaining abnormal movements in banks' stock prices around the EC's proposal on the NGEU. Subsequently, we assess how and to what extent banks' sovereign exposures influenced the stock market response to the announcement.

Among bank fundamentals, we document a highly significant relationship between the NPL variable and bank stock CARs. The positive sign on coefficients across different model specifications suggests that investors of banks with higher levels of NPLs, and therefore weaker asset quality, positively welcome the announcement on the NGEU. More capitalized banks, with higher equity to total assets, display a less negative reaction than those with lower capitalization. The inverse association between *TE_TA* and our dependent variable is statistically significant at different levels in most of the model specifications, indicating that the shareholders of banks with lower capitalization benefit from the EC's proposal on NGEU. The degree of bank liquidity is inversely related to the market reaction to the announcement (being overall statistically significant). Similarly to the evidence discussed for the bank capital variable, shareholders of banks with less liquidity seem to benefit from the creation of the NGEU compared to those of banks with more liquid balance sheets, thus the negative coefficient on the LCR variable. It might be the case that banks which were more robust in the pre-Covid-19 period (in terms of capitalization and liquidity conditions), were better positioned to recover after the significant initial sell-off during the most acute phase of the pandemic, from mid-February to mid-March 2020 (Aldasoro et al., 2020), thereby showing a less pronounced reaction to the NGEU announcement as compared to less sound banks. Banks' profitability shows a positive and sizeable influence on the stock market reaction with the coefficient on ROA being positive in all seven specifications. Lastly, larger banks, as captured by the total assets variable (*TA*), present more positive CARs, consistent with the view that these banks are potentially characterized by higher levels of systemic risk (Bayazitova and Shivdasani, 2012; Onali et al., 2021) and/or better positioned to benefit from the prospects for future revenues associated with the channelling of EU funds under the Recovery Fund agreement. The coefficients on the two country-level dummy variables (*N_policies* and *Credit_GDP*) are both insignificant (columns 2 and 3).

In a further extension, we also control for the potential relevance of banks being located in countries (i) with a common regulatory framework (member countries of the European Banking Union); and (ii) that share the same political affiliation at the European level. To address the first point, we included a dummy variable that takes the value 1 if a bank is located in the Eurozone, and 0 otherwise. To address the second point, we construct three additional dummy variables based on the major European political parties to which the Heads of State of the various Member States were affiliated at the time of the NGEU announcements. Specifically, we include a dummy variable for the European People's Party (*EPP*), a dummy variable for the Renew Europe (*Renew_EU*) political group and a dummy variable for the Progressive Alliance of Socialists and Democrats (*SD*). Results are reported in Table C1 in Appendix C. There is some evidence that banks located in Eurozone countries, subject to a common supervisory and regulatory framework, as well as banks in countries affiliated with the Progressive Alliance of Socialists and Democrats at the EU level, reacted more positively to the May announcement on NGEU.

Turning to the banks' sovereign exposures (column 4 of Table 8), the testing begins by considering the significance of the debt exposures towards the domestic sovereign (*Exp _DOM*) and all the other EU countries

in the sample (*Exp_OTH*).[22] While we do not find evidence of a key role played by banks' holdings of domestic debt (the positive coefficient lacks statistical significance), we observe a highly significant coefficient for the variable capturing the banks' sovereign exposure towards all the other EU countries (0.559, significant at the 1% level). In this respect, banks with large sovereign EU debt portfolios experience a more pronounced positive stock market reaction than other banks.

We then assess whether differences exist in terms of debt exposure towards the Eurozone versus EU but non-Eurozone sovereigns (column 5). The coefficients on the *Exp_EZ* and the *Exp_NO_EZ* variables are both positive and highly significant. Findings show that the measure of a bank's exposure to non-Eurozone sovereigns carries a larger coefficient (0.824) compared to that for the exposure to Eurozone sovereigns (0.513). Column 6 further distinguishes between the banks' exposures to the Frugal Four countries (*Exp_F4*) and the countries that advocate the creation of the Fund (*Exp_FAC*). Banks' exposures to the northern European countries that initially inhibited the creation of the EU-wide recovery instrument had little influence on their stock market reaction. Rather, stock investors of banks holding the debt of countries supporting the establishment of NGEU show a substantial appreciation in CARs, thus reflecting a positive view of the related EC announcement. This evidence suggests that the stock investors of these banks valued the expectation for the NGEU to restore and enhance growth in the region, especially significant for banks operating in countries with intertwined economic and political interests.

Lastly, we investigate whether exposures to sovereigns with the highest levels of public debt (*Exp_DEBT*) had an impact on stock market participants' perceptions. With a positive coefficient of 0.929, statistically significant at the 1% level, we contend that the shareholders of banks holding the debt of highly burdened EU governments strongly valued the NGEU announcement by the EC (column 7). In particular, an increase in the *Exp_DEBT* variable by one standard deviation (1.96%, see Table 4) is estimated to increase bank stock CARs by 1.82% (0.929 *0.0196), which represents more than one-third of the standard deviation of our dependent variable (4.90%, see Table 3). This evidence is consistent with the purpose of NGEU to directly support more vulnerable sovereigns and reduce increasing concerns about national sovereign debt sustainability (Reiss and Valderrama, 2020). Our findings are similar to related contributions, such as Horváth and Huizinga (2015), according to which the creation of a European crisis resolution mechanism in 2010 helped in strengthening the creditworthiness of more fiscally constrained countries with consequent beneficial effects for banks exposed to these economies.

6.1. Additional analysis

In this sub-section, we report on the re-estimation of the same regression as presented in Section 3.2 but using the average value of balance-sheet information for Q42019-Q12020. Moreover, we employ information on banks' sovereign exposure as of 30 June 2020 (from the EBA 2020 Autumn Transparency Exercise). Results are reported in Table 9. The findings are overall consistent with those discussed for the main analysis. Among bank balance-sheet fundamentals, we find that asset quality, as well as bank liquidity, play a significant role in explaining the stock market reaction. Investors of banks which are more burdened by NPLs positively reacted to the EC's announcement in May 2020. Stock prices of less liquid banks recorded more negative CARs during the considered event window. There is an inverse relationship between the *LCR* variable and our dependent variable, statistically significant in four out of seven specifications (columns 4-7). In this setting, bank capitalisation (*TE_TA*) does not seem to be relevant in explaining the stock price reactions for the banks in the sample. As in the main

analysis, the coefficients on the two country-level variables (*Credit_GDP* and *N_policies*) lack statistical significance (columns 2 and 3).

Regarding banks' sovereign exposures, the findings are consistent with those discussed for our main analysis (only the magnitude of the coefficients is slightly smaller). The coefficient of the *Exp_DOM* is insignificant. On the contrary, the *Exp_OTH* variable, which captures the banks' exposure to other European countries through government debt holdings, is positively correlated with the CARs and the related coefficient is highly statistically significant (column 4 of Table 9). This evidence suggests that stock investors perceive the benefits of the EC's proposal on NGEU as more pronounced for those banks that are more exposed to EU sovereign debt. In addition, results indicate that market participants did not weigh differently the exposures towards Eurozone (*Exp_EZ*) and EU but non-Eurozone (*Exp_NO_EZ*) countries, meaning that the announcement was overall positively perceived (the coefficients on both variables are positive and statistically significant at the 1% level, see column 5). While banks' holdings of the sovereign debt of the Frugal Four countries (*Exp_F4*) do not influence their stock price reaction (the related coefficient is insignificant), the exposure to fund advocate countries (*Exp_FAC*) is positively related to the abnormal returns. This latter finding indicates that those banks that are more exposed to the sovereign debt of countries promoting the creation of a European recovery facility reacted more positively to the NGEU announcement. The estimated coefficient (0.597) is statistically significant at the 5% level (column 6). Lastly, banks' sovereign holdings of highly indebted countries strongly influence the stock market reaction, as indicated by a positive and highly statistically significant coefficient (0.760) on *Exp_DEBT* (column 7). An increase in the *Exp_DEBT* variable by one standard deviation (1.96%, see Table 4) is estimated to increase bank stock CARs by 1.49% (0.760 *0.0196), which represents more than one-quarter of the standard deviation of our dependent variable (4.90%, see Table 3).

7. Conclusions and policy implications

This paper investigates the short-term financial market responses to the 2020 agreement on the creation of a €750bn recovery fund (the Next Generation EU, NGEU). This recovery fund is aimed at tackling the substantial economic damage caused by the Covid-19 crisis. The NGEU instrument represents the largest stimulus package ever established in Europe, characterising a landmark moment in European integration and a concrete step towards risk-sharing, fiscal and political unity.

NGEU intends to boost the real economy and support sovereigns, especially those most affected by the Covid-19 pandemic. This should help prevent large, negative feedback loops from the real economy to the banking sector, by reducing borrower defaults. In addition, NGEU offers significant risk-sharing among Member States leading to the creation of a form of European safe asset. The policy also transmits via banks and their borrowing strategy to raise NGEU funds through the set-up of a new PDN of eligible banks to assist with the issuance programme and placement of the borrowing. This is also expected to provide banks with new income streams generated by clients that access funds under NGEU.

Testing the credibility of a fiscal policy of such magnitude, especially in crisis circumstances, is of primary importance to gauge its perceived effectiveness. Our contribution is twofold. First, we analyse the impact of the key NGEU announcements on bank stock prices, sovereigns' and banks' CDS spreads by using the event study methodology. In this stage, we draw multiple inferences by looking at various sub-groups of European banks and sovereigns with commonalities in terms of regulatory frameworks, political stances and public finances. Second, we explore the cross-sectional factors that explain the abnormal movements detected in the bank stock market.

Our findings reveal a substantial positive reaction of bank stock investors to the EC's proposal in May 2020, which offered a clearer definition of the transfer and loan components of the recovery package and clarified the presence of a strong redistributive element. Declining

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[22] Due to potential multicollinearity issues, we did not include all the sovereign exposure variables in the same model specification.

spreads on both sovereign and bank CDS are also documented, which indicates a perception of reduced debt riskiness in both the sovereign and banking sectors. Overall, more pronounced CDS spread reductions are shown for the sub-group of countries that advocate the fund and for the most highly indebted countries. This evidence suggests that the announcement on the establishment of the novel EU crisis instrument mostly benefited countries with stronger economic and political ties and more vulnerable ones, as well as banks operating in both groups of countries.

Results of the multivariate analysis suggest that the shareholders of banks with lower asset quality, capitalisation and liquidity benefit the most from the EC's proposal on NGEU. Furthermore, we document a key role played by banks' sovereign debt portfolios in explaining the abnormal movements in the stock market. Interlinkages between banking sectors and sovereigns represent a key factor in shaping financial market participants' perceptions of the credibility and effectiveness of NGEU. In particular, banks' exposure towards highly indebted countries, characterised by weaker financial conditions and reduced fiscal capacity, significantly contributed to the positive reactions.

Our findings have important policy implications as we shed light on financial market participants' perceptions about a breakthrough deal, which could pave the way for a permanent fiscal instrument in the EU while supporting the economic recovery post-Covid-19. Through joint borrowing power, which affects the aggregate fiscal stance, and through the distribution to the Member States, a form of European-wide fiscal union stems from the creation of the NGEU facility. In this sense, the EU is effectively building a fiscal capacity that has long been considered an omitted essential element of a complete monetary union (Acharya and Steffen, 2017). However, the debate on the emerging fiscal union is still ongoing, especially in terms of efficiency in decision-making, competencies and long-term viability (Darvas and Wolff, 2021; Leino-Sandberg and Vihriälä, 2021). Nevertheless, the creation of NGEU is a key element for an effective post-pandemic recovery as well as for a longer-term strengthening of the EU. The perceived credibility of NGEU is revealed by the financial market reactions documented in this study.

Appendix A

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Appendix B

This appendix reports the results of a series of robustness tests for the univariate analysis. Specifically, we perform the analysis on the bank stockmarket by using two alternative versions of the CAPM (Table B1 and B2) and test the validity of our main findings for all the financial markets by using a shorter estimation window (Table B3, B4 and B5).

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Appendix C

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