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Dispelling the Shadow of Fiscal Dominance? Fiscal and Monetary Announcement Effects for Euro Area Sovereign Spreads in the Corona Pandemic

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Executive Summary

- We use event study regressions to compare the impact of EU monetary versus fiscal policy announcements on government bond spreads of ten euro member countries. Our motivation is to evaluate which of the two players – the ECB or the EU fiscal level – has been more crucial for the stabilization of euro sovereign bond markets in a crisis environment such as the current pandemic. In addition to this, we explore the impact of personnel decisions on sovereign spreads and study bond-market reactions to the 2019 package deal on the new Commission and ECB presidents.
- Our main results suggest that the ECB's Pandemic Emergency Purchase Program (PEPP) stands out with respect to its spread compressing effect. In contrast to the high effectiveness of this monetary pandemic support, the EU fiscal support measures largely failed to have an impact on spreads in a significant way. Only the Italian spread showed a weakly significant reaction to the respective announcements. By contrast, the relaxation of European fiscal rules did not go unnoticed by bond markets within the euro area. However, the relaxation did not have a stabilizing effect. Instead, the activation of the crisis-related escape clause of the Stability and Growth Pact was associated with a sizeable positive effect on sovereign spreads.
- The analysis suggests that there was a spread-reducing effect of the July 2019 package deal on the lineup of the top two political positions within the European Union, the presidencies of the European Commission and the ECB. The decision to nominate both Christine Lagarde and Ursula von der Leyen, together with the subsequent confirmations over the formal nomination process, had a spread compressing effect. A possible interpretation is that market participants perceived the appointment of Lagarde as a decision against a more hawkish course of the ECB under the possible presidency of Jens Weidmann. Bundesbank president Weidmann, who had been a well-known skeptic of the extensive use of nonconventional monetary policy measures in the era of Mario Draghi, was one of the serious candidates for the ECB presidency until the European Council struck a deal on the combined von der Leyen-Lagarde nomination.
- Various sensitivity checks show that these key results are robust to alternative model specifications but suggest that announcement effects on sovereign spreads vary over time. This holds true in particular for interest rate decreases, (targeted) longer-term refinancing operations ((T)LTROs) and expansions of the Public Sector Purchase Program (PSPP). Their impact changes over the years and the results suggest that there is a homogenizing effect on sovereign spreads only in the earlier years of these ECB programs. In early March 2020, the mere PSPP extension was evidently perceived as a disappointment. Only the PEPP reversed the trend of rising spreads in the pandemic – a result hinting to the relevance of the suspension of rules with the PEPP (such as the orientation to ECB capital keys and issuer/issuance limits) and different to the more restrictive set of rules for the PSPP.

- In line with the existing literature, the results provide evidence of relatively slow market reactions and suggest that there were somewhat stronger effects the day after a policy had been announced (compared to the announcement day itself). Moreover, the effects are larger for less solvent EU periphery countries with a lower government bond rating.
- Our findings indicate that the stabilization of euro area sovereign bond markets in the pandemic has so far crucially depended on the ECB's support through the PEPP. It is largely the PEPP that has shown the capacity to establish more homogenous refinancing conditions in the euro area in a crisis environment. Our results on the spread-increasing effect of relaxing EU fiscal rules is evidence that the suspension of rules can even imply a negative signal on the outlook for fiscal sustainability in the longer run.
- Overall, our event-analytical findings provide an unpleasant message for the debate on a looming fiscal dominance of the ECB in the post-COVID-19 era. So far it appears to be largely the ECB alone that, from the perspective of bond market investors, must guarantee the liquidity of high-debt euro area countries. The stimulus packages of the EU fiscal level, including, e.g., the 'Next Generation EU' fund with its 750 billion euro collective debt financing, have so far been unable to relieve the ECB in this respect.

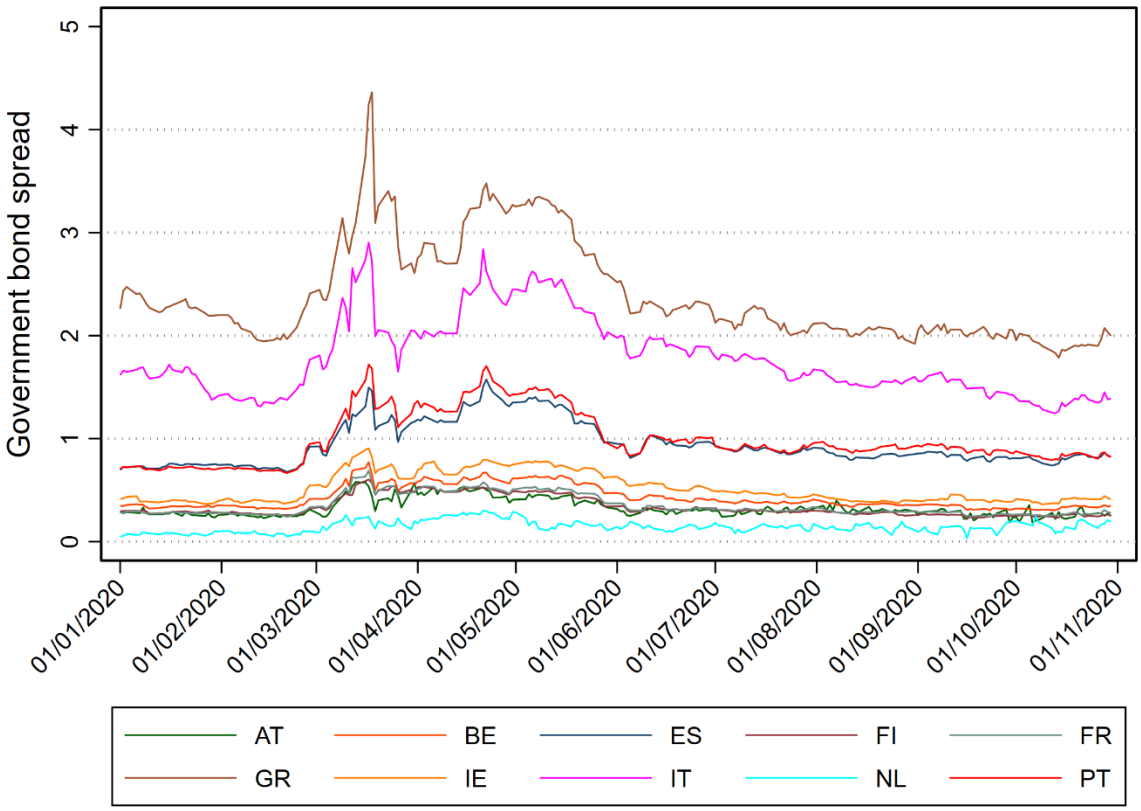
1 Introduction

The COVID-19 pandemic has put the public finances of industrial countries under severe stress. The resulting recession has not only led to shortfalls in tax revenues but also to increased public expenditures. National governments have embarked on massive rescue packages to protect citizens and companies against the potentially disastrous health, social and economic consequences of pandemic disruptions. In addition, EU Member States have designed stimulus packages in order to support the economic recovery of affected sectors. For the euro area, the deep economic contraction and the soaring public debt levels have recalled bad memories from the years of the global financial crisis and the subsequent euro area debt crisis. The concern has been that this new and substantial solvency shock could once again trigger a vicious and self-enforcing cycle of rising sovereign bond spreads, a destabilization of the financial sector and a further decline in real economic activity. Subsequently, this could all lead to a new sovereign liquidity crisis similar to the contagion following the Greek government-debt crisis in spring 2010.

The mechanisms that can push even solvent countries into a bad equilibrium with an acute illiquidity have been extensively researched (De Grauwe and Paul 2012; De Grauwe et al. 2013; Lorenzoni et al. 2019). Two risk factors crucially determine the probability of a debt crisis: first, the fundamental fiscal health of countries that are hit by a sudden solvency shock; and second, the existence and credibility of crisis mechanisms that can serve as lenders of last resort. Both risk factors still make the euro area particularly vulnerable and prone to new crises of confidence. Already before the pandemic hit, several euro countries continued to show weak fiscal fundamentals and a lack of sustainable budgetary trajectories. The European Commission had classified five euro area countries (Belgium, Spain, France, Italy and Portugal) as “high risk” cases for a lack of public debt sustainability over the medium term in its Debt Sustainability Monitor, published on the eve of the pandemic in January 2020 (European Commission 2020a). Consequently, it is these countries that have particularly suffered from an especially severe recession in 2020, already having faced severe sustainability challenges before. On the risk factor of a (missing) lender of last resort, the euro area debt crisis has seen the establishment of new fiscal and monetary liquidity facilities that can have a stabilizing function in an unfolding liquidity crisis. The European Stability Mechanism (ESM) has successfully stabilized even a high-debt country such as Greece. The ECB had set up its Outright Monetary Transactions (OMT) program to back-up the ESM liquidity support in cases of emergency. While these liquidity mechanisms were already in place when the coronavirus arrived in Europe, their effectiveness and credibility was arguably limited. The ESM not only suffered from its constrained lending capacity but also its principle of conditionality which has made it a politically controversial instrument, as potential borrowers are afraid of losing their national policy autonomy once they make use of it. Since the OMT program is conditional on ESM support, any rejection of ESM emergency liquidity also leaves the OMT inaccessible.

Although the euro sovereign bond markets were thus clearly vulnerable at the start of the COVID-19 crisis, no serious escalation has occurred so far. Risk spreads of the higher indebted euro countries started to rise with the onset of the pandemic (Figure 1) but nothing of a critical development happened similar to the crisis one decade ago. Sovereign spreads already peaked in March and were more or less stable over the course of the year 2020.

Figure 1: Government bond spreads of ten euro area countries in the crisis year 2020



Notes: The figure shows daily government bond spreads of ten euro area countries with the German yield curve functioning as a baseline. The data is fitted as a third-order polynomial yield curve of government bonds with a maturity of ten years. For more information see Section 3.2. Data source: Datastream.

The year 2020 has seen a swift and massive reaction of fiscal and monetary policy makers. Already in March 2020, the ECB Council established another securities purchase program, the Pandemic Emergency Purchase Program (PEPP), which contained important changes regarding the rules of sovereign purchases compared to its predecessor the Public Sector Purchase Program (PSPP). Furthermore, European fiscal players also reacted to these changes and modified pre-existing fiscal tools (new credit lines both at the ESM and the European Investment Bank). Moreover, there has been a series of institutional innovations. First, the SURE loan program (temporary Support to mitigate Unemployment Risks in an Emergency) was established. It provides liquidity to EU Member States to fund short-time working schemes and is refinanced from EU borrowing. Second, and more substantial, EU leaders agreed on the fully debt-financed 'Next Generation EU' package, mobilizing 750 billion euros (at 2018 prices) from the EU budget in the coming years to support the recovery.

So far, these consolidated fiscal and monetary efforts have been successful in protecting the euro area sovereign bond markets against a new debt crisis. However, it is unclear which player is the crucial one; the ECB with its PSPP/PEPP support or the EU fiscal level with 'Next Generation EU' and the other newly activated fiscal instruments. Observers conjecture that the stabilization of risk spreads in the pandemic is not only a consequence of the PEPP support but also reflects the new EU fiscal support (Gros 2020). However, as yet any substantive evidence on the relative importance of monetary and fiscal measures since the outbreak of the pandemic is missing. Our event-based study focuses precisely on this question. It aims to identify to which extent the stabilization of euro sovereign bond markets in the pandemic depends on ECB emergency measures or also reflects European fiscal solidarity and the emergence of the new European fiscal tools. This question is of substantial relevance to assess potential risks for the effective independence of the ECB in the future. If the containment of risk premiums for euro area countries crucially hinges on ECB support, this points to the risk of fiscal dominance (Bordo and Levy 2020). In a regime of fiscal dominance, the ECB is effectively forced to continuously finance euro area countries even if they are close to (or even already in) insolvency in order to prevent a new debt and financial crisis. If, however, the new fiscal instruments already play a decisive stabilizing role, this would signal relief for the ECB. To the extent that the compression of risk spreads in 2020 already reflects the recent fiscal innovations, this indicates a development towards a true Fiscal Union in which the protection against liquidity crises is achieved through European fiscal instruments. Any such development would help the ECB to take its monetary policy decisions with less consideration of critical fiscal developments in high-debt euro countries.

Our analytical design addresses the question on the relative importance of fiscal and monetary policy for euro area government bond spreads through an event-analytical study. We identify important announcements with a focus on the pandemic crisis measures and study their effects on the sovereign risk spreads in the euro area.

2 Theoretical considerations and literature review

The impact of ECB asset purchases and other unconventional central bank measures on sovereign yields and spreads has been studied within the scope of an ever-expanding literature.[1] Box 1 summarizes their institutional background. The first government bond purchase program introduced by the ECB was the Securities Markets Program (SMP) in 2010 following the onset of the sovereign debt crisis in several euro countries. The ECB claimed that this program was necessary to restore the appropriate functioning of the monetary policy transmission channel and "to ensure depth and liquidity in malfunctioning segments of the debt securities markets" (ECB 2010a). It subsequently came to an end in September 2012. Eser and Schwaab (2016) analyze this program for the countries Ireland, Italy, Greece, Portugal, and Spain between 2010 and 2011, and find a decrease in the yields

[1] For an overview of papers studying quantitative easing programs outside of the euro area, see Urbschat and Watzka (2020).

of about three basis points for purchases of one per mille of outstanding debt. Likewise, Ghysels et al. (2017) find that the SMP was successful in reducing government bond yields temporarily by using data from short 15-minute intervals. Furthermore, De Pooter et al. (2018) estimate that in the long term, purchases of one percent of sovereign debt decrease the liquidity premium (i.e., the liquidity component of the yield spread) by 13 to 17 basis points.

The next purchase program that was announced by the ECB in 2012, but was never activated, is the Outright Monetary Transactions (OMT) program. Altavilla et al. (2016) study the announcement of this program and show that the mere announcement of this policy measure reduced Italian and Spanish sovereign bond rates by 200 basis points, while there was no effect on German and French bond rates. They also test for other macroeconomic effects of the announcement of OMTs and find effects on credit and economic growth in Italy and Spain, but again no effect for Germany and France.

Szczerbowicz (2015), Fratzscher et al. (2016), and Ambler and Rumler (2019) employ event studies to evaluate several unconventional monetary policy announcements, among others the SMP and OMT. Szczerbowicz (2015) and Fratzscher et al. (2016) confirm that the programs were most effective for fiscally weaker periphery countries. Moreover, Fratzscher et al. (2016) also analyze the effects of these programs on equity prices and exchange rates and find that both the SMP and OMT as well as LTROs increased equity prices, while the estimated effect of the programs points in the opposite direction for the euro nominal effective exchange rate (euro appreciation for OMT, depreciation for SMP). Ambler and Rumler (2019) conclude that the SMP and OMT announcements had the strongest negative effect on sovereign bond yields and a positive effect on expected inflation among the unconventional monetary policy announcements between July 2008 and March 2016. Fendel and Neugebauer (2020) analyze unconventional monetary policy announcements between 2007 and 2017. They differentiate countries according to their solvency and find that less solvent countries experience stronger sovereign bond yield reductions than solvent countries following announcements of non-standard monetary policies.

Box 1: The Eurosystem's non-standard monetary policy measures

LTROs / TLTROs / PELTROs: Longer-term refinancing operations (LTROs) are measures by the ECB to provide additional liquidity to the euro area money markets with a longer maturity than the usual three months. The first time that the ECB provided LTROs with a longer maturity was in March 2008 with six month LTROs. In May 2009, twelvemonth LTROs followed and in December 2011, three-year LTROs were introduced (Fratzscher et al. 2016). **Targeted longer-term refinancing operations** (TLTROs) were introduced in June 2014 and borrowing was linked to the banks' loans to non-financial corporations and households. Further series, TLTRO II and III, were announced in March 2016 and March 2019, respectively (ECB 2021). Finally, in April 2020, the ECB announced **pandemic emergency longer-term refinancing operations** (PELTROs), which would start in May 2020 (ECB 2020b).

PSPP: The **Public Sector Purchase Program** (PSPP) started in March 2015 as the most important component of the Asset Purchase Program (APP) and continues until this day, with the exception of a pause in net purchases between January and October 2019. By the end of November 2020, the cumulated PSPP net purchases of the Eurosystem reached €2,445 billion (of which €2,189 billion are national debt and €256 billion supranational). With the PSPP, the Eurozone central banks purchase bonds from all euro members with the exception of Greece. APP net purchases currently amount to €20 billion per month plus purchases from an additional coronavirus crisis-related envelope of €120 billion. PSPP net purchases between September and November amounted to €21.2 billion a month (ECB 2015).

PEPP: With the **Pandemic Emergency Purchase Program** (PEPP), the Governing Council has added a second purchase program that complements the ongoing APP (ECB 2020a). PEPP is an asset purchase program of private and public sector securities. Initially, it was set up with a target of €750 billion until the end of 2020. However, the ECB Council increased the envelope further in two steps in June and December 2020 to €1,850 billion and extended the horizon for net purchases until at least March 2022. As in the APP, purchases of government bonds are by far the most important item in the PEPP. Under the PEPP, Eurosystem central banks buy bonds from all euro members including Greece. By the end of November 2020, the Eurosystem PEPP holdings of public sector securities amounted to €652 billion, which is 93% of all PEPP purchases. Between September and November 2020, the average monthly PEPP net purchases of public securities reached €67.9 billion.

In addition to the purchase programs, Szczerbowicz (2015) also investigates exceptional liquidity provisions such as the three-year LTROs and cutting the ECB deposit rate to zero. These measures successfully reduced the tensions on the money market. Finally, Szczerbowicz (2015) looks at two covered bond purchase programs (CBPP1 and CBPP2). An interesting result is that the covered bond purchase programs decreased sovereign bond spreads, although purchases of sovereign bonds also decreased covered bond spreads.

Several studies have investigated the APP and in particular the PSPP. Urbschat and Watzka (2020) look at ECB press releases between 2014 and 2016, which were covered on the first three pages of the Financial Times the day after, and estimate the effect of APP program announcements on government bond yields. They find the strongest reduction in yields for the initial announcement of the PSPP with decreasing effects for further announcements. Altavilla et al. (2015) confirm the yield-reducing effect with a similar event study. The effect amounts to a decrease of 30 to 50 basis points at ten-year maturity due to an announcement, and even double this size for high-yield countries like Spain and Italy. The authors also find significant spillover effects to other types of assets not targeted by the APP. De Santis (2020) also confirms the result of a big announcement effect on government bond yields by taking into account the discussion intensity of the announcement in the media. Moreover, Bulligan and Delle Monache (2018) explicitly study different time periods to compare the size of the effects and again find the strongest effect on government bonds in the initial phase of the APP. They also find that the APP announcement led to a depreciation of the euro exchange rate against

the British pound sterling and the US dollar. In the most recent period of their study, October 2016 to July 2017, inflation expectations appeared to have risen due to the APP. By using a VAR model, Gambetti and Musso (2017) estimate that the APP had positive effects on GDP and HICP inflation in the first two years of the program. Breckenfelder et al. (2016) once again confirm that the announcement of the APP reduced sovereign yields. A general equilibrium model also finds positive effects on output and inflation from the first announcement of the program.

The first and only paper studying the effects of the PEPP on government bond yields so far is Hartley and Rebucci (2020). However, as they evaluate purchase programs from several central banks around the world, they only analyze German sovereign bond yields in the context of the PEPP and find a decrease of 15 basis points over a three-day window following the announcement of the program.

Summing up, there is comprehensive evidence that the ECB asset purchasing programs have been effective in lowering both sovereign bond yields and spreads, and the first existing study confirms this effect also for the PEPP.

Our study contributes to the literature from a different and new perspective. Our focus is on the relative role of fiscal and monetary policy announcements for government bond spreads in the context of the COVID-19 crisis. The literature that looks at fiscal policy announcements on euro sovereign spreads is very limited. Afonso et al. (2020) study the effect of macroeconomic, monetary and fiscal policy announcements on government bond spreads of ten EMU countries. They analyze the announcements of the excessive deficit procedure (EDP) and find that spreads increase if a country is put under the EDP. Likewise, releases of the European Commission of higher debt increases spreads, whereas better budget balance forecasts lead to lower spreads. Afonso and Strauch (2007) concentrate on fiscal policy events taking place in 2002. They find significant effects for a few events of EDP announcements. They conclude that the European fiscal policy framework can have a decreasing effect on spreads through its credibility in the ability to detain excessive deficits, but also an increasing effect on spreads through the increased information availability via the surveillance. Another study that investigates the effect of EDPs on sovereign bond spreads is Kalan et al. (2018) who find that sovereign spreads are higher when countries are placed under an EDP. The authors interpret this as an information signal. Other papers study the effect of fiscal rules on sovereign risk premia with the result that credible and well-designed fiscal rules can decrease risk premia (see Eyraud et al. 2018 for an overview).

However, it is important to note that all these studies with their focus on fiscal surveillance and decisions in the context of the Stability and Growth Pact do not cover the potential impact of new European fiscal support instruments which is our key interest. Box 2 summarizes the fiscal milestones in the pandemic that we cover. The only study close to our approach is Jinjarak et al. (2020) who analyze the relative importance of pandemic-related indicators and both monetary and fiscal policy responses in the first half of 2020. Using a synthetic control group design, they find that COVID-19 mortality rates had a significant spread-increasing effect for credit default swaps (CDS)

which cannot be explained by the fundamentals driving these spreads in normal times. The authors show that national stimulus packages and the resulting indebtedness contributed to a widening of CDS spreads, although the ECB's PEPP announcement in March stopped the widening. They account for EU fiscal announcements through a non-differentiated dummy variable, which is shown to be statistically insignificant. Compared to this study, we apply a finer-grained event-analytical design to appropriately assess the variance of new European fiscal instruments set up in the pandemic. Moreover, we extend their sample period to also include, e.g., the political agreement on 'Next Generation EU' and focus on spreads of bond yields rather than CDS spreads to also capture the liquidity component in bond yields relative to the benchmark. Another innovation to the literature is that we also test for the impact of personnel decisions (the nomination and confirmation of Christine Lagarde and Ursula von der Leyen) on sovereign spreads. Although several papers in the literature investigate the effect of elections and other important political events on bond spreads (Block and Vaaler 2004; Schwendner et al. 2019; Glaurdić et al. 2020), we are the first to look at the impact of a surprising appointment of key personnel.

Box 2: EU fiscal responses to the COVID-19 crisis

European Fiscal Framework Flexibility: On March 13, 2020, the Commission announced its proposal to the European Parliament to activate the general escape clause within the Stability and Growth Pact. The European Parliament then actually proposed it on March 20, 2020. This clause allows the EU Member States to temporarily deviate from their medium-term budgetary objectives and to fulfil the requirements of the excessive deficit procedure at a later point in time, in case they are in the procedure. This flexibility allows the Member States to implement necessary measures such as stimulus packages in their countries to reduce the economic impact of the COVID-19 pandemic (European Commission 2020b; Delivorias 2020).

Mobilizing the EU budget: Equally announced on March 13, 2020 was a guarantee of EUR 1 billion from the EU budget to the European Investment Fund (EIF) in order to help small and medium enterprises (SMEs) and small mid-caps with EUR 8 billion of financing (European Commission 2020b).

Coronavirus Response Investment Initiative: This initiative, likewise announced on March 13, 2020, provides EUR 37 billion to be spent immediately on healthcare, SMEs, and short time work schemes. This money has not yet been spent under the Multiannual Financial Framework (MFF) 2014-20 Cohesion policy. Moreover, the EU Solidarity Fund was announced to be extended to include health aspects. In this fund, EUR 800 million are available in 2020 (European Commission 2020c).

SURE: The instrument **Support to mitigate Unemployment Risks in an Emergency** (SURE) was launched to support Member States in their effort to protect jobs by funding short-time work schemes and similar measures in the form of loans of up to EUR 100 billion in total. The basis of SURE are voluntary guarantees of the Member States, depending on their respective relative share of the EU's gross national income (GNI) (European Commission 2020d). In addition to this, the EU is issuing

social bonds to finance SURE (European Commission 2020e). SURE was announced on April 1, 2020. It was agreed upon on April 9, 2020 as part of the EUR 540 billion rescue package (see below).

EUR 540 billion rescue package: On April 9, 2020 the EU Finance ministers decided on a large rescue package with a volume of EUR 540 billion. It contains EUR 240 billion, made available under the ESM, a EUR 25 billion guarantee fund that shall mobilize EUR 200 billion for SMEs by the European Investment Bank (EIB) and EUR 100 billion for SURE (Sandford 2020).

French-German Initiative for the European Recovery from the coronavirus crisis: On May 18, 2020 France and Germany made a joint proposal for different policy measures. It included a Recovery Fund of EUR 500 billion within the MFF 2021-27. This fund was proposed to provide additional EU budgetary expenditure for the sectors which are severely hit by the crisis. The proposal included the possibility for the EU to borrow on markets (German Federal Government 2020). It was the foundation of 'Next Generation EU' (see below).

Next Generation EU: On May 27, 2020 the Commission proposed a new recovery plan – 'Next Generation EU'. EUR 750 billion would be added to the MFF 2021-27. The plan consists of three pillars: (i) support for Member States with investments and reforms, i.e., a recovery and resilience facility, additional cohesion and agricultural spending and funds to support the transition to climate neutrality; (ii) incentives for private investments; (iii) measures preparing for future crises including a health program, a civil protection program, research in health, resilience, green and digital transformations and support for global partners. To finance the recovery plan, the own resources ceiling will be temporarily increased to 2 % of the EU's GNI to be able to borrow the EUR 750 billion on financial markets. On July 21, 2020 the European Council agreed on 'Next Generation EU' costing EUR 750 billion and the MFF 2021-27, which both amount to EUR 1.8 trillion. The EUR 750 billion are divided into EUR 390 billion to be paid out as grants and EUR 360 billion in the form of loans. The repayment is scheduled until the end of 2058 (European Commission 2020f; European Council 2020).

3 Empirical analysis

3.1 Study design

We apply an event-analytical design to identify the relative role of monetary and fiscal policy decisions to contain euro area sovereign spreads. Our key interest is the crisis response of the ECB and EU in the pandemic. However, we include a longer time period, going back in some specifications as far as November 2014, in order to validate our approach and compare the results with established findings from the literature. We have clear sign predictions for the monetary and fiscal events. In line with the overwhelming evidence of the literature, we expect that the monetary policy announcements on unconventional expansion will compress spreads. Similarly, if European fiscal transfers have an effect this should lead in the same direction and lower spreads. Our hypothesis for the relaxation of EU fiscal rules in line with the empirical literature is that it rather increases sovereign bond spreads, as it signals a less sustainable fiscal trajectory.

We do not have a clear sign prediction for the impact of the package deal on the top positions at the ECB and the European Commission. One possibility is to picture the process of selecting a candidate as a competition between more dovish and more hawkish candidates for the ECB presidency. Markets would then adjust their expectations, depending on whether the hotly tipped candidate Jens Weidmann as a well-known skeptic of the extensive use of unconventional monetary policy measures or another candidate, more likely to continue the recent expansion of EU monetary policy activities, would make the race and determine the future orientation of ECB policies. What is arguably crucial is to view these two personnel decisions as interdependent. Once Ursula von der Leyen was nominated as president of the European Commission, appointing another German for a top EU position became politically infeasible which left Jens Weidmann without a chance. From this perspective, the same-day nominations of Ursula von der Leyen and Christine Lagarde can be viewed as a decision against the more hawkish candidate Jens Weidmann and we would expect sovereign bond markets to price this in as a positive shock with a spread-reducing effect.

In our definitions of "events", we evaluate the announcement rather than the actual implementation through asset purchases or fiscal disbursements. According to economic theory, we should expect the market reactions to occur immediately after the announcement due to updated expectations among trading agents and as a consequences of the news itself ("stock effect"), and not of the subsequent implementation ("flow effect"). In line with this argumentation, contributions from the literature identified the announcement effects of ECB purchase programs to be responsible for the largest share of the overall program impact (Altavilla et al. 2015; Urbschat and Watzka 2020). Moreover, for the pandemic-related fiscal instruments there are very long time lags between the first announcements and the actual flow of resources. For example, the European Commission announced at the end of May 2020 its intention to set up the 'Next Generation EU' package, from which the first payments will not be made before mid-2021.

3.2 Data on government bond spreads and policy events

This paper employs daily data on government bond yields for eleven Euro area countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain). The data is fitted as a third-order polynomial yield curve of government bonds with a maturity of ten years. The largest data sample that we employ for our analysis ranges from November 2014 to October 2020.[2] As the major aim of the paper is to track changes in sovereign spreads, we transform the yield data into spreads, using the German data series as a benchmark. We thus calculate the government bond spreads for each country by subtracting the German bond yield. This leaves us with a sample of ten countries. The composition of these countries is driven by the availability of data.

For the identification of events, we employ three main sources. Each source provides event dates on either monetary policy announcements, fiscal policy announcement or EU personnel decisions.

[2] Data on bond yields is taken from Datastream and is available from 1996 onwards. We restrict the sample period because of our selection of events, the first event being observed in 2015.

First, we scanned all ECB press releases[3] concerning monetary policy decisions from 2015 onwards to identify adjustments to the key interest rates and announcements of non-standard policy measures. Included programs are PEPP and PSPP as part of the APP as well as the various longer-term refinancing operations (LTRO, TLTRO, PELTRO). Most of the relevant policy changes are announced through the press releases and the press conferences following the regular monetary policy meetings of the ECB Governing Council. Extraordinary and urgent measures, such as the introduction of the PEPP, are usually published in additional press releases. Second, for comparing effects of monetary policy decisions to fiscal policy decisions, we handpicked announcements of measures to fight the impact of the COVID-19 pandemic taken by the EU. A timeline of EU actions was published by the European Commission on their website and serves as the second main source for events.[4] Third, we coded the simultaneous nomination and subsequent confirmations of two important positions at the EU level as events: Christine Lagarde as president of the ECB and Ursula von der Leyen as president of the European Commission.[5]

As we are interested in the average effect of announcing a certain type of policy, we combine all announcements regarding a certain program into one dummy.[6] To clarify this approach, we consider the PEPP. As shown in Table 1, there were two announcements regarding this ECB program, first at its implementation (March 18, 2020) and second on the increase of its envelope (June 4, 2020). Instead of including two separate dummies for these two event dates, we use one single dummy named "PEPP expansion", which is equal to 1 on these two dates and 0 otherwise. By doing so, we identify an overall number of five monetary policy event dummies as shown in Table 1. These capture twelve event dates during which one or more policy announcements were made. In addition, we include two fiscal policy event dummies, capturing eight announcements. The two distinct fiscal dummies refer to the crisis-related relaxation of EU fiscal rules and the establishment of new European financial instruments that provide resources to Member States. Finally, we capture the most crucial and recent EU personnel decisions by a dummy variable that captures the nomination and confirmation of Ursula von der Leyen and Christine Lagarde.

[3] ECB press releases: https://www.ecb.europa.eu/press/govcdec/mopo/html/ index.en.html.
[4] EU actions: https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/timeline-eu-action_en.
[5] The nominations took place on the same day, whereas the confirmations took place on different dates.
[6] The alternative would be to include dummies for every single event rather than grouping the announcements by policy program. We make use of a similar approach in a small excursion when analyzing the opposing effects of the PSPP over the considered period.

Table 1: Policy events and coding scheme

Event type	Event coding	Date	Announcement
Monetary policy	Interest rate decrease	03.12.2015	Decrease of the interest rate on the deposit facility by 10 basis points to -0.30%
		10.03.2016	Decrease of the interest rate on the main refinancing operations by 5 basis points to 0.00%, of the interest rate on the marginal lending facility by 5 basis points to 0.25% and of the interest rate on the deposit facility by 10 basis points to -0.40%
		12.09.2019	Decrease of the interest rate on the deposit facility by 10 basis points to -0.50%
	(T)LTRO	22.01.2015	Change in pricing of targeted longer-term refinancing operations, in the way that the interest rate applicable to future TLTRO operations is equal to the rate on the Eurosystem's main refinancing operations: Removal of the 10 basis point spread over the MRO rate that applied to the first two TLTROs
		10.03.2016	Launch of new series of four longer-term refinancing operations
		07.03.2019	Launch of new series of quarterly longer-term refinancing operations
		12.03.2020	Application of more favorable terms in TLTRO III to support bank lending to small and medium sized enterprises which are affected most by the Covid-19 pandemic and conduction of additional longer-term refinancing operations
		30.04.2020	Launch of new series of seven pandemic longer-term refinancing operations (PELTRO)
	PSPP expansion	22.01.2015	Introduction of PSPP
		03.12.2015	Extension of APP until March 2017 and inclusion of further debt instruments issued by regional and local governments in the list of eligible assets
		10.03.2016	Expansion of APP to €80 billion monthly
		12.09.2019	Restart of APP at a monthly pace of €20 billion
		12.03.2020	Addition of a temporary envelope of net asset purchases in the amount of €120 billion until the end of the year
	PEPP expansion	18.03.2020	Launch of PEPP with an envelope of €750 billion
		04.06.2020	Expansion of PEPP by €600 billion
	PSPP reduction	08.12.2016	Decrease of PSPP purchases to €60 billion monthly and decrease of the minimum remaining maturity for eligible securities in PSPP from two years to one year
		26.10.2017	Decrease of PSPP purchases to €30 billion monthly
		14.06.2018	Decrease of PSPP purchases to €15 billion monthly until the end of 2018 and then ending of purchases under APP
Fiscal policy	Relaxation of EU fiscal rules	13.03.2020	Activation of SGP escape clause
		20.03.2020	Proposal by European Commission to activate SGP escape clause
	EU fiscal corona packages	13.03.2020	Mobilization of EU budget flexibility to increase cohesion spending
		01.04.2020	Proposal of SURE (Support to mitigate Unemployment Risks in an Emergency)
		09.04.2020	Agreement by EU finance ministers on 540 billion package including SURE, EIB and ESM
		18.05.2020	German-French proposal that paved the way towards Next Generation
		27.05.2020	European Commission Proposal of Next Generation EU with various surprises compared to German-French model
		21.07.2020	Political agreement on Next Generation EU in the European Council
EU personnel decisions	Lagarde & von der Leyen	02.07.2019	Nomination of Ursula von der Leyen as president of the European Commission and Christine Lagarde as president of the ECB
		16.07.2019	Confirmation of Ursula von der Leyen as president of the European Commission
		17.09.2019	Confirmation of Christine Lagarde as president of the ECB

3.3 Identification and estimation

To estimate the effects of the policy announcements (EU monetary policies, EU fiscal policies, and EU personnel decisions) on government bond spreads of selected EU countries we first employ a panel regression. As our main specification, we estimate the following event-based model:

$$\Delta y_{i,t} = \alpha + \beta_1 Event_t + \beta_2 \Delta y_{i,t-1} + \beta_3 \Delta CESI_t + \beta_4 \Delta Corp\_spread_t + \alpha_i + \alpha_m \times \alpha_j + \varepsilon_{i,t}, \qquad (1)$$

where $y_{i,t}$ is the government bond spread in country i on day t *with* $i = 1, \dots, 10$ (ten countries relative to Germany) and $t = 1, \dots, 2189$ (with November 3, 2014 being the first and October 30, 2020 being the last trading day in the longest sample). Our main variable of interest is $Event_t$ which denotes all events of a certain event group as a dummy. We follow Fendel and Neugebauer (2020) and do not weigh the events such that each event is considered equally relevant. Figure 1 in the introduction plots the country-specific spreads and suggests that the data is non-stationary. A unit root test for panel data, proposed by Levin et al. (2002), confirms this speculation. We therefore use first differences of the data (denoted by Δ) which makes the data stationary.

To control for other factors affecting government bond spreads, we include three commonly employed control variables. First, as yield changes are likely to depend on previous changes, we include the government bond spread with a lag of one day (Urbschat and Watzka 2017). Second, to control for macroeconomic surprises other than announcements of monetary or fiscal policy measures, we include the Citi Bank Economic Surprise Index (CESI) (Fendel and Neugebauer 2020). The index is calculated on a daily basis as a rolling average over the last three months and captures unexpected changes in a series of economic indicators.[7] Third, the corporate bond spread is included to capture general risk sensitivity in the euro area. We follow Eser and Schwaab (2016) and define the corporate bond spread as the difference between BBB and AAA rated corporate bond yields to maturity of bonds with a maturity of ten and more years, covering the whole euro area. Summary statistics are reported in Table A1 in the Appendix.

Finally, we include country fixed effects (α_i) to control for unobserved country characteristics. In our main specification we also include month times year fixed effects ($\alpha_m \times \alpha_j$) to avoid that time-of-the-year effects contaminate the results or that trading days very far away from an event serve as a comparison. However, as additional robustness checks in Section 4.2 show, the choice of the time fixed effects structure has very little impact on the coefficient estimates. Moreover, to specify a meaningful comparison period, we restrict the sample period in a way that the sample starts two months before the first event in each event group. Hence, the sample for the monetary policy events

[7] More precisely, the index is calculated as the difference between the released economic indicators and the respective Bloomberg survey median (to capture market expectations). The individual economic indicators (e.g., GDP, manufacturing production, retail sales, purchasing manager index, private sector credit, unemployment, fiscal balance) are weighted using their announcement impact on exchange rates in the past. In addition, data points from the more distant past receive smaller weights. The mechanics of the index are such that a value above (below) zero marks a more positive (negative) realization of the economic indicators, relative to consensus expectations (Maveé et al. 2016).

starts on 01/11/2014 as the first announcement is observed for 22/01/2015. The fiscal policy events and EU personnel decisions took place much later in 2019 and 2020. Their sample starts in May 2019 and December 2020, respectively. Further robustness checks in Section 4.2 show that differences in the definition of the sample period affect the conclusion regarding the announcement impacts of some event types. This holds true in particular for interest rate decreases, (T)LTROs, and PSPP expansions. Their impact changes over the years and the results speak for an equalizing effect on sovereign spreads only in the earlier years of the ECB programs. In all regressions, we use robust standard errors.

In a second step, we estimate the effects for every single country using the following model:

$$\Delta y_t = \alpha + \beta_1 event_t + \beta_2 \Delta y_{t-1} + \beta_3 \Delta CESI_t + \beta_4 \Delta corp\_spread_t + \alpha_m \times \alpha_j + \varepsilon_t. \quad (2)$$

An augmented Dickey-Fuller test suggests that the country-specific data is non-stationary such that we again use first differences. The separate regressions for each country include the same control variables as our panel regression except the country fixed effects. Summary statistics for the variables are provided in Table A1 in the Appendix.

4 Results

4.1 Baseline panel regressions

In this section, we discuss our main results. Moreover, we present three types of robustness checks and three types of extensions to the analysis to develop a better understanding of the drivers behind the findings. Table 2 shows the main results from the panel model in Equation (1). We discuss the results separately for each event group (i.e., monetary policies, fiscal policies, personnel decisions).

Monetary policy announcements For the conventional monetary policy instruments in the first two columns of the table, we find rather small and statistically insignificant announcement effects on government spreads of the selected group of EU countries. Contrary to expectations, the announcement of longer-term refinancing operations even tend to have a positive effect on the sovereign spreads. The results regarding the non-standard monetary policies in columns (3) to (6) are more in line with expectations. Here, we further categorize the events and differentiate between expansionary and restrictive monetary policy announcements. As shown in column (3) of Table 2, announcements to expand the ECB's purchase programs tend to have a negative effect on government spreads. However, this effect is solely driven by the new PEPP, for which we estimate an effect with high statistical significance. The announcement of a PEPP expansion correlates with an average reduction of government bond spreads by 6.9 basis points. The effect appears to be small but it represents an average effect across all countries including those with a top credit rating. We turn to the country-specific effects below. PSPP also appears to affect sovereign yields, at least when reductions in the volume of the purchase program are taken into consideration, as shown in column

(6). The positive coefficient is in line with the interpretation that cutting back the overall purchases made via the PSPP increases the discrepancy between the yields of the considered EU countries.

Fiscal policy announcements Turning to the fiscal policy announcements, the estimated coefficients for the two event dummies that capture the relaxation of EU fiscal rules and the various EU fiscal packages to fight the economic consequences of the COVID-19 pandemic both exhibit the expected sign. A relaxation of fiscal rules at the EU level tends to increase the spreads as lower incentives for fiscal discipline increase the risk for investors. On the contrary, the announcement of fiscal packages to limit the economic impact of the pandemic correlates with a reduction in sovereign spreads even though this effect is rather small and statistically insignificant.

Personnel announcements As a last exercise, column (9) of Table 2 shows the announcement effect of two important and combined personnel decisions at the EU level. The closely linked nominations and appointments of Ursula von der Leyen as president of the European Commission and Christine Lagarde as president of the ECB. The result suggests that there is a small spread-reducing effect of these interdependent personnel decisions. The result confirms the view that this combined decision on the lineup for the two top positions in the European Union might have been a signal for a more dovish ECB course in future. Since it is out of question that these top positions will be filled by two candidates from Germany, opting in favor of the German von der Leyen for presidency of the European Commission implied a decision against the German candidate for the ECB presidency and his more hawkish preferences. Our empirical results are therefore consistent with this interpretation.

Overall, we observe statistically significant coefficient estimates for the PEPP, whereas the role for EU fiscal policy as a measure to influence government bond spreads is less clear and coefficient estimates are smaller and calculated with less statistical precision. This difference between the effects of EU monetary and fiscal policies will be further explored in the subsequent sections.

Table 2: Panel regressions: PEPP, PSPP and the package deal on the top two political positions within the EU – Impact of fiscal policy limited

	Dependent variable: government bond spread								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Monetary policy events						Fiscal policy events		Personnel decisions
			PSPP and PEPP						
	Interest rate decrease	(T)LTRO	Expansion (combined)	PSPP expansion	PEPP expansion	PSPP reduction	Relaxation of EU fiscal rules	EU fiscal corona packages	Lagarde & von der Leyen
Event	-0.0059	0.0126	-0.0115	0.0131	-0.0690***	0.0195**	0.0383*	-0.0061	-0.0177**
	(0.0130)	(0.0157)	(0.0147)	(0.0187)	(0.0173)	(0.0085)	(0.0205)	(0.0075)	(0.0071)
Lagged government bond spread	0.0559	0.0560	0.0559	0.0560	-0.0100	0.0559	-0.0129	-0.0204	-0.0081
	(0.0588)	(0.0588)	(0.0588)	(0.0588)	(0.0642)	(0.0588)	(0.0625)	(0.0623)	(0.0527)
Economic surprise index (CESI)	0.0001	0.0001	0.0001	0.0001	0.0001*	0.0001	0.0001	0.0001	0.0001*
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Corporate bond spread	0.6031***	0.6060***	0.6021***	0.6073***	0.5562***	0.6046***	0.5729***	0.5626***	0.4932***
	(0.0776)	(0.0770)	(0.0772)	(0.0773)	(0.0890)	(0.0769)	(0.0901)	(0.0918)	(0.0704)
Constant	-0.0007	-0.0007	-0.0001	-0.0007	-0.0005	-0.0007	-0.0016	-0.0012	-0.0011
	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0013)	(0.0007)	(0.0012)	(0.0012)	(0.0007)
Observations	15,650	15,650	15,650	15,650	2,180	15,650	2,400	2,400	4,380
Adjusted R-squared	0.0187	0.0188	0.0188	0.0188	0.0436	0.0188	0.0365	0.0337	0.0317
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Month*year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Results correspond to Equation (1).

4.2 Robustness checks

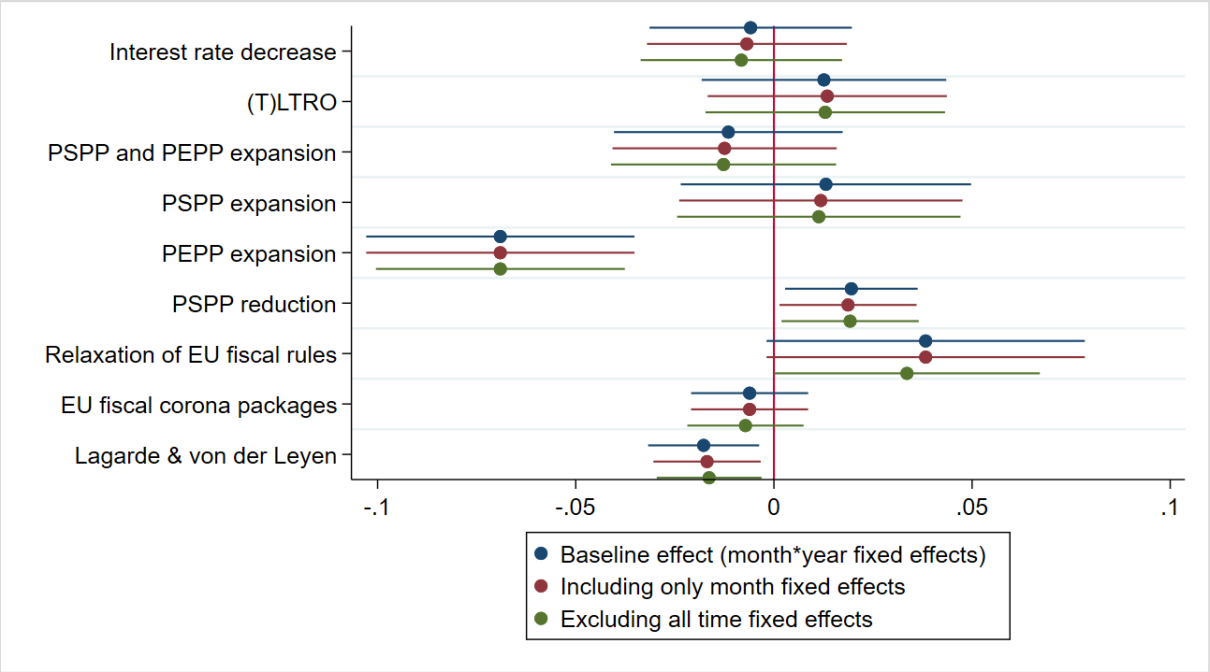
To test the sensitivity of the main results in Table 2, we present three types of robustness checks. Figure 2 visualizes the effects in a graph to support an easy-to-grasp impression regarding the relative size of the program-specific announcement impacts. The largest effects are found for announcements regarding the PEPP and EU fiscal rules. Whereas the negative impact of a PEPP expansion on government bond spreads is statistically highly significant, the positive announcement effect of relaxing EU fiscal rules is measured with less statistical precision. Methodology-wise, Figure 2 also shows the effect of running alternative model specifications with respect to the included time fixed effects. The three tested fixed effect structures address the concern that observations very far away from the events of interest function as a comparison group in the analysis. With a long time period and the natural trends in sovereign spreads which are unrelated to the events, the model might mistakenly pick up such trends as an event effect. To avoid this issue, the baseline specification makes sure that the identifying variation comes from observations from the same month and the same year of the respective event by including month*year fixed effects. The other two specifications include only month fixed effects (to capture time-of-the-year effects, irrespective of the year) or abstain from including time fixed effects altogether.

Overall, the results are very robust to these modifications and confirm the markedly negative effects of the PEPP and the decision in favor of von der Leyen/Lagarde. In turn, positive effects of announcement events are found for reductions of the PSPP and, with less statistical precision, for the relaxation of EU fiscal rules. Compared to these types of events, the European fiscal rescue packages are clearly of less statistical relevance to understand spread fluctuations.

The second robustness check addresses a similar concern as the first one; that differences in the sample periods might have an effect on the results. In addition to mistakenly picking up trends in sovereign spreads that are unrelated to the events (addressed in Figure 2), the announcement of a monetary or fiscal policy might have a different effect, depending on the fiscal and economic environment in which it is made. A related finding from the literature suggests that the ECB's purchase programs had a significant impact in the beginning when being newly introduced, but less so once they were already well established (Urbschat and Watzka 2020). Similarly, the more recent announcements to tackle the challenges related to the COVID-19 pandemic might have a stronger impact because there is more volatility and uncertainty in the spreads. In line with this view, the recent literature identifies a higher effectiveness of the ECB asset purchases in environments with particularly high sovereign risk (Altavilla et al. 2015). We therefore re-estimate the models and shorten the sample period for the monetary policy announcements to align it with the sample period for the other two event groups. This assures that our evaluation of the effectiveness of EU monetary vs. fiscal policy is based on the same sample period, which levels the playing field. Importantly, a coefficient can only be estimated if an announcement concerning a certain policy program was made during the respective sample period. For example, there were no interest rate reductions in or after

December 2019, such that Panel (a) of Figure 3 only contains a coefficient for the other two sample periods for this policy instrument.

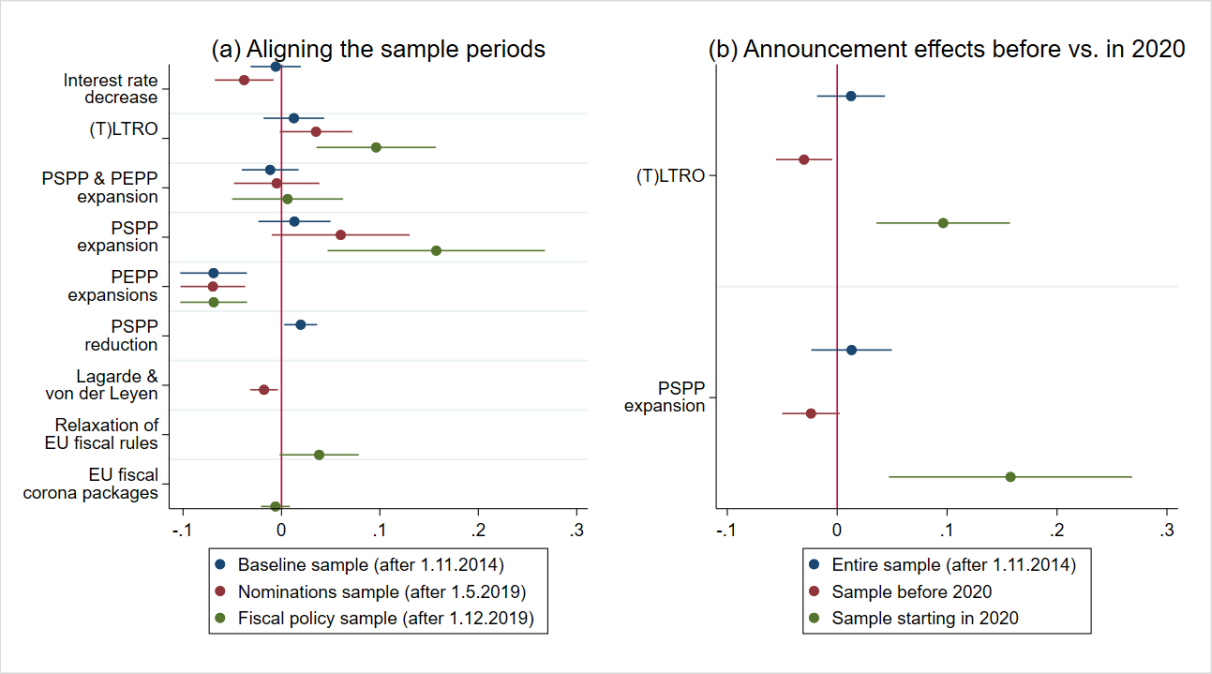
Figure 2: Alternative time fixed effects structures for the estimation models



Notes: Coefficient estimates and 95% confidence intervals for each event type. Results correspond to Equation (1) (baseline effect). Coefficient estimates in red and green are based on alternative time fixed effects structures as explained in the legend.

As Panel (a) of Figure 3 shows, using only observations from 2019 onwards (as for the nominations and fiscal policy sample) indeed increases the coefficient estimates in absolute value for some event dummies. This suggests a higher effectiveness of the program announcements in the crisis environment related to COVID-19. We now observe a more negative and statistically significant effect of interest rate decreases on government bond spreads. Moreover, and quite surprisingly, we estimate very large and statistically significant positive effects of (T)LTROs and PSPP expansions when reducing the sample period to later years. This result stands in contrast to findings from the previous literature which documents a negative effect of both programs on sovereign spreads (see, e.g., Szczerbowicz (2015) for LTRO effects and Altavilla et al. (2015) and Urbschat and Watzka (2020) for effects of the PSPP/APP). However, these contributions only use data on policy announcements until mid-2016. Most importantly, the robustness check confirms the finding that, among the various instruments, it is the PEPP, which most clearly has reduced sovereign spreads.

Figure 3: The role of the considered sample period for the effect of policy announcements



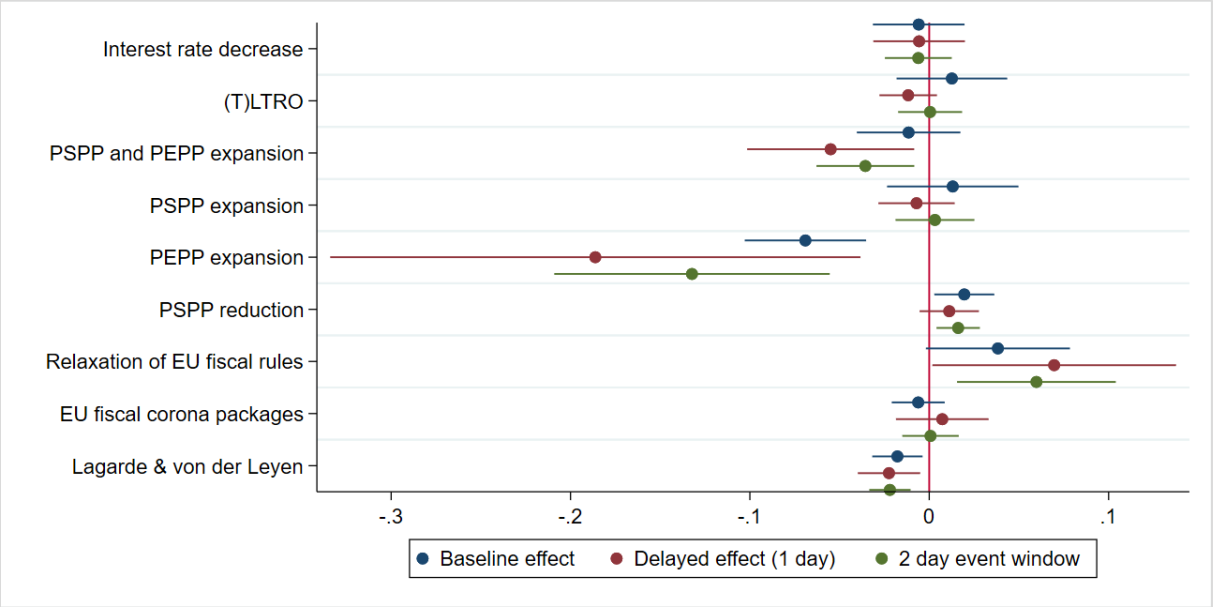
Notes: Coefficient estimates and 95% confidence intervals for each event type. Results correspond to Equation (1) but are based on different sample periods (see legend). For Panel (b) we concentrate on the two monetary policy instruments where our results deviate from the existing literature.

To explore whether the unexpected positive effects from PSPP and (T)LTROs is specific for the crisis environment of the COVID-19 pandemic, Panel (b) of Figure 3 estimates the effect of (T)LTRO and PSPP expansion announcements before 2020 and in 2020 separately. The results confirm the negative effect of (T)LTROs and PSPP expansions on government bond spreads prior to 2020, as identified in previous contributions. Moreover, they also show that the average positive effect of both programs is driven by 2020 announcements. This finding is more in line with Bulligan and Delle Monache (2018) who similarly study different time periods for this unconventional monetary policy instrument to compare the size of the effect over time. Their sample extends from 2014 to 2017 and suggests the strongest negative effect on government bonds in the initial phase of the APP.

From a market perspective, the fact that the PSPP (and (T)LTRO) announcements had a positive effect on sovereign bond spreads in the evolving pandemic is consistent with a view that markets were disappointed by these measures. In this regard, the different rules of PSPP and PEPP are important (Havlik and Heinemann, 2020). For the PSPP, the ECB Council is committed to allocating purchases across euro countries according to the ECB capital key. Even though the Eurosystem's actual PSPP purchases have been increasingly diverging from this measure, the rule raises questions to which extent PSPP is suitable for targeted support for countries in a particularly critical pandemic situation. For the PEPP, the ECB has explicitly relaxed the commitment to the ECB capital key (and other constraints such as minimum credit rating or issue and issuer limits). These program features provide a possible explanation for the sign differences for the PSPP and PEPP announcements in 2020.

As a third and final robustness test, we study the announcement effects for alternative definitions of the event windows. We follow the existing literature and consider potential lagged effects of policy announcements (e.g., Fendel and Neugebauer 2020) as well as an extended event window of two days rather than just taking into account the day of the announcement itself. A number of possible reasons could explain the existence of lagged announcement effects. These include: (i) slow market reactions (a relevant group among investors are pension funds and insurance companies who might first need to get official approval for adjustments to their portfolio), (ii) events taking place later in the day such that end-of- the-day courses do not yet fully capture the change in expectations or (iii) a time lag due to the delayed dissemination of the announcements via the media which takes some time.

Figure 4: Delayed effects of policy announcements?



Notes: Coefficient estimates and 95% confidence intervals for each event type. Results correspond to Equation (1) (baseline effect). Coefficient estimates in red and green are based on the same model but with a different coding of events. First, the event dummy is replaced by a dummy equal to 1 one day after the announcement (delayed effect). The second alternative coding uses a two-day event window such that the event dummy is equal to 1 for the day of the announcement and the day after.

Figure 4 replicates the previous results based on event dummies equal to 1 on the day of a policy announcement and 0 otherwise (baseline effect). In addition to this, the figure plots the coefficient estimates when using a lagged event dummy to show market reactions one day after the announcement (delayed effect). Finally, it shows the combined effect of the announcement day and the day after (2 day event window). Similar to Fendel und Neugebauer (2020), we find slightly stronger market reactions for government bonds one day after an announcement for most policy programs. This indicates that there is a rather slow reaction of market participants. Overall, the previous conclusions are confirmed. Yet, in the more complete picture of Figure 4, the positive coefficient for the dummy that captures the relaxation of EU fiscal rules is now larger than in the preceding

regressions and also statistically significant at conventional levels (when taking into account market reactions one day after an announcement). Nevertheless, when it comes to the question of the pandemic fiscal and monetary policy measures and their relative importance, the larger importance of the PEPP is confirmed. None of the variations of the event window leads to a statistically significant coefficient for the announcements of EU fiscal support, whereas the highly significant PEPP effect is fully robust.

4.3 Extensions and by-country analysis

In this section, we consider two conceptual extensions to the previous analysis by (i) considering the effects separately for core vs. periphery countries and by (ii) analyzing heterogeneous effects with respect to single countries.

The first extension investigates whether the effect size differs by the fiscal performance of a country. From a theoretical perspective, countries with a lower borrower reputation are likely to experience a larger reduction in sovereign spreads after an expansionary monetary or fiscal support announcement. We distinguish fiscally weaker from stronger countries on the basis of their credit ratings. We compare the core countries that receive an "Aa" rating (Moody's) or better (Austria, Belgium, Finland, France and the Netherlands) to periphery countries with a rating "A" or worse (Greece, Italy, Spain, Portugal and Ireland).[8] Figure 5 documents the results. In line with expectations, expansionary policy measures correlate in particular with a reduction in government bond spreads for the less solvent countries. The coefficients for the PEPP expansions and personnel decisions are particularly large and negative in this group of countries. Vice versa, a relaxation of EU fiscal rules is a particularly unfavorable message for the group of core countries, possibly because the risk of a bail-out of periphery countries increases with looser fiscal rules.

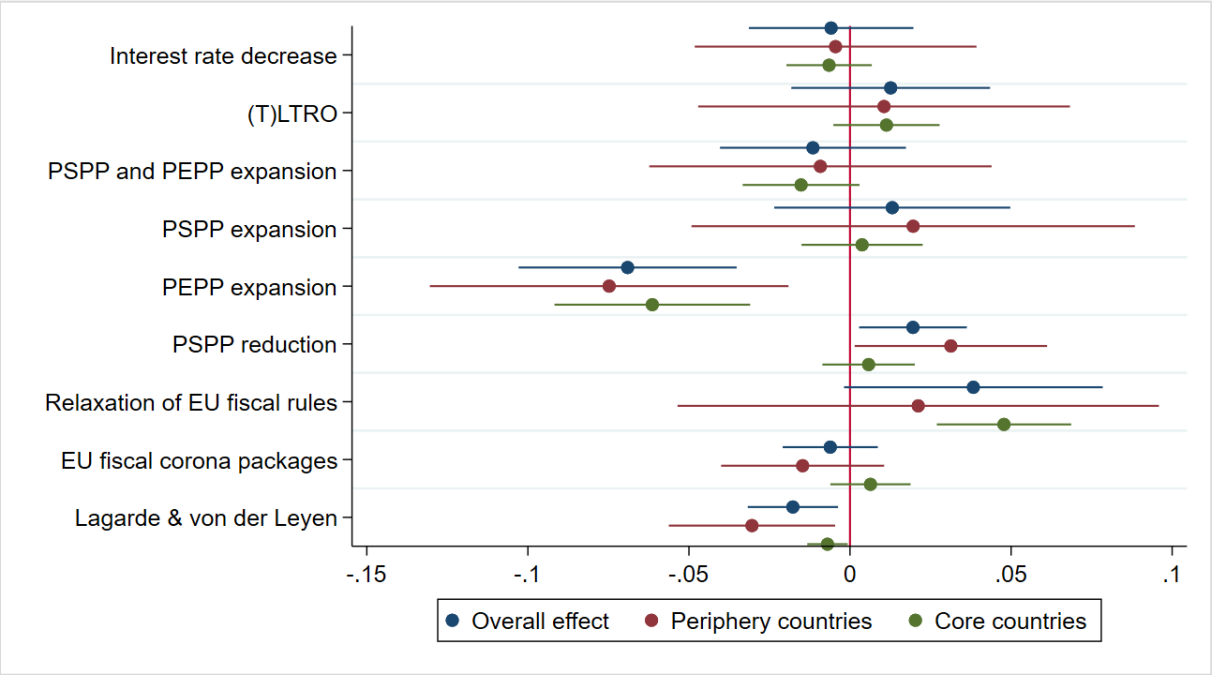
As a second and final extension, we consider the announcement effects on the individual countries' spreads (Table 3 to Table 6). They confirm the large empirical relevance of the PEPP and the disinterest of market participants in the European fiscal rescue announcements. However, the separate country regressions reveal a particularly strong PEPP effect for Italy (17 basis points) which is more than double of other larger country effect sizes. The Italian regression is also the only one for which announcements of the fiscal coronavirus pandemic packages shows a weakly significant coefficient.

The relaxation of EU fiscal rules exhibits a robust positive effect, in particular for the group of core countries. However, the largest coefficient is observed for Greece. To rationalize this finding, one might argue that market participants demand a particularly high risk premium on Greek government bonds when this highly indebted country faces a reduction in the incentives for fiscal discipline.

[8] Historical government bond ratings from Moodys can be found under the following link (registration required): https://www.moodys.com/researchandratings/market-segment/sovereign-supranational/-/005005?tb=0&type=Methodology.

Finally, the results show a spread compressing effect of the joint decision to appoint Christine Lagarde as president of the ECB and Ursula von der Leyen as president of the European Commission. The decision on the top position candidates in the European Union shows a noticeable size difference between core and periphery countries. While the effect size does not go above 1.5 basis points for core countries, it is on average larger for the Southern European countries with the largest effect identified for Greece (reduction of 8.5 basis points). The results for the other event dummies are provided in Table A2 to Table A6 in the Appendix and confirm the previous results.

Figure 5: Event effects by country groups (core vs. periphery countries)



Notes: Coefficient estimates and 95% confidence intervals for each event type. Results correspond to Equation (1) but show the event effect separately for (i) all 10 countries, (ii) the periphery countries (Spain, Greece, Ireland, Italy, Portugal), and (iii) the core countries (Austria, Belgium, Finland, France, the Netherlands).

Table 3: Country-specific effects – PEPP expansion

	Government bond spread									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Core countries					Periphery countries				
Country	Austria	Belgium	Finland	France	Netherlands	Spain	Greece	Ireland	Italy	Portugal
PEPP expansion	-0.0837**	-0.0837*	-0.0427***	-0.0824**	-0.0277	-0.0618***	0.0140	-0.0659**	-0.1747***	-0.0780***
	(0.0377)	(0.0426)	(0.0089)	(0.0378)	(0.0272)	(0.0196)	(0.0595)	(0.0270)	(0.0543)	(0.0224)
Constant	0.0023	0.0022	0.0009	0.0016	-0.0007	0.0027	0.0033	0.0013	0.0012	0.0009
	(0.0116)	(0.0020)	(0.0022)	(0.0026)	(0.0086)	(0.0049)	(0.0107)	(0.0036)	(0.0090)	(0.0054)
Observations	218	218	218	218	218	218	218	218	218	218
Adjusted R-squared	0.1108	0.1071	0.0744	0.1452	0.0195	0.0778	0.0350	0.1291	0.0400	0.0874
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Month*year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Results correspond to Equation (2). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Country-specific effects – EU fiscal corona packages

	Government bond spread									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Core countries					Periphery countries				
Country	Austria	Belgium	Finland	France	Netherlands	Spain	Greece	Ireland	Italy	Portugal
EU fiscal corona packages	-0.0061	-0.0033	0.0264*	-0.0015	0.0130	-0.0173	0.0339	0.0017	-0.0662*	-0.0233
	(0.0186)	(0.0095)	(0.0156)	(0.0083)	(0.0112)	(0.0138)	(0.0338)	(0.0139)	(0.0355)	(0.0186)
Constant	-0.0008	-0.0007	-0.0001	-0.0004	-0.0042	-0.0045*	-0.0048	-0.0027	-0.0025	-0.0045
	(0.0026)	(0.0014)	(0.0017)	(0.0026)	(0.0038)	(0.0027)	(0.0127)	(0.0035)	(0.0073)	(0.0029)
Observations	240	240	240	240	240	240	240	240	240	240
Adjusted R-squared	0.0819	0.0114	0.0781	0.0344	0.0240	0.0696	0.0388	0.0693	0.0237	0.0760
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Month*year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Results correspond to Equation (2). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Country-specific effects – Relaxation of EU fiscal rules

	Government bond spread									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Core countries					Periphery countries				
Country	Austria	Belgium	Finland	France	Netherlands	Spain	Greece	Ireland	Italy	Portugal
Relaxation of EU fiscal rules	0.0527**	0.0414	0.0882***	0.0149	0.0605***	0.0056	0.1783*	0.0352	-0.0523	-0.0356
	(0.0218)	(0.0285)	(0.0173)	(0.0202)	(0.0124)	(0.0502)	(0.1036)	(0.0338)	(0.0772)	(0.0513)
Constant	-0.0007	-0.0007	-0.0000	-0.0004	-0.0041	-0.0044	-0.0046	-0.0026	-0.0023	-0.0046
	(0.0026)	(0.0014)	(0.0018)	(0.0026)	(0.0038)	(0.0027)	(0.0130)	(0.0035)	(0.0074)	(0.0029)
Observations	240	240	240	240	240	240	240	240	240	240
Adjusted R-squared	0.0937	0.0337	0.2040	0.0377	0.0473	0.0666	0.0498	0.0849	0.0153	0.0752
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Month*year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Results correspond to Equation (2). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Country-specific effects – Nomination and confirmation of Christine Lagarde and Ursula von der Leyen

	Government bond spread									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Core countries					Periphery countries				
Country	Austria	Belgium	Finland	France	Netherlands	Spain	Greece	Ireland	Italy	Portugal
Lagarde & von der Leyen	-0.0066**	-0.0057	-0.0009	-0.0027	-0.0147**	-0.0175	-0.0851***	-0.0039	-0.0233	-0.0240
	(0.0037)	(0.0084)	(0.005)	(0.0100)	(0.0063)	(0.0169)	(0.0283)	(0.0072)	(0.0432)	(0.0186)
Constant	-0.0009	-0.0008	-0.0004	-0.0007	-0.0042	-0.0049*	-0.0048	-0.0030	-0.0026	-0.0049*
	(0.0026)	(0.0013)	(0.0017)	(0.0025)	(0.0037)	(0.0027)	(0.0126)	(0.0035)	(0.0072)	(0.0029)
Observations	438	438	438	438	438	438	438	438	438	438
Adjusted R-squared	0.0777	0.0000	0.0063	0.0167	0.0291	0.0449	0.0599	0.0536	0.0052	0.0572
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Month*year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

5 Discussion

European emergency measures have successfully contributed to shielding euro sovereign markets against another downward spiral of rising spreads and increasing market panics. However, our results do not confirm that the various European fiscal rescue measures, such as activating the provision of liquidity from the SURE program, EIB, ESM and soon the 'Next Generation EU' package, have played any crucial role in this respect. The announcements on these jointly analyzed fiscal measures largely passed by without having a measurable impact on the risk spreads of periphery euro area countries, with the only exception of a weakly significant dampening effect for the Italian spread.

Contrary to the fiscal rescue announcements, the ECB's announcements on its pandemic emergency measures have been associated with noticeable and robustly significant coefficients, indicating an instantaneous and sizeable spread compression. Monetary policy effects are largely limited to the PEPP, whereas interest rate decisions and longer-term refinancing operations did not garner any noticeable attention from sovereign bond markets over the considered period 11/2014 to 10/2020. The PSPP expansion in early March 2020 even correlates with a spread increase signaling a market disappointment. The contrast between the PSPP and the PEPP effect emphasizes the particular relevance of the latter with its relaxation of purchase constraints including the suspension of the capital key orientation and the end to any issue and issuer limits.

Fiscal announcements on a temporary relaxation of European fiscal rules through the activation of the emergency-escape clause under the Stability and Growth Pact are associated with rising spreads. However, this effect is only statistically significant for the more solvent countries. This is consistent with a view that a weakening of fiscal rules may raise concerns about possible future bail-outs.

Finally, our results point to the importance of which personality with their individual views and policy preferences takes a top seat in EU institutions. We were able to study the announcement effect of the combined political decision on the presidencies of the European Commission and the ECB which, with respect to the ECB presidency, was a decision against a German candidate with a hawkish reputation. The news that Jens Weidmann's candidature was not successful seems to have reinforced the expectations of more generous ECB help for peripheral countries already prior to the coronavirus crisis.

Our key result that the pandemic monetary emergency measures through the PEPP have been highly effective, whereas fiscal rescue announcements had hardly any significant impact on spreads, survives various robustness checks that allow for various definitions of the event window, lengths of sample periods, different types of fixed effects and country-specific regressions.

Thus, in light of our analysis, the ECB and its emergency measures has played the crucial role in guaranteeing the stability of euro area sovereign bond markets in the deepest post-war recession. By contrast, the stimulus packages of the EU fiscal level, including the 750 billion euro 'Next Generation EU' plan with its collective EU debt finance, were not perceived as a game changer from the perspective of sovereign bond markets.

Overall, our results have an unpleasant implication for the debate on a looming fiscal dominance of the ECB in the presence of rising public debt levels. So far, the stabilization of sovereign bond markets appears to hinge solely on the Eurosystem's role as a massive buyer of high-debt countries' sovereign bonds.

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7 Appendix

Table A1: Summary statistics

Variable	Description	N	Mean	SD	Min	Max	Relevant datastream mnemonic
Panel sample		15.650	1,3129	1,9318	0,0324	18,5483	
Δy_t	Ten-year government bond yield spread against German bond (3rd-order polynomial yield curve, first difference)	15.650	-0,0006	0,0911	-5,4185	3,3286	
Δy_{t-1}	One day lag of Δy_t	15.650	-0,0006	0,0912	-5,4185	3,3286	
$\Delta CESI_t$	Citi Bank Economic Surprise Index	15.650	0,0866	8,2635	-170,3000	89,9000	
$\Delta Corp\_spread_t$	Corporate bond spread (difference between BBB and AAA rated corporate bonds)	15.650	0,0002	0,0194	-0,2070	0,1560	
Single countries samples							
$\Delta y_{t,AT}$	Δy_t for Austria	1.565	0,0000	0,0232	-0,1693	0,1656	GVOE03(CM10)
$\Delta y_{t,BE}$	Δy_t for Belgium	1.565	-0,0001	0,0186	-0,1542	0,1484	GVBG03(CM10)
$\Delta y_{t,FI}$	Δy_t for Finland	1.565	0,0000	0,0130	-0,1132	0,1357	GVFN03(CM10)
$\Delta y_{t,FR}$	Δy_t for France	1.565	0,0000	0,0186	-0,2305	0,1603	GVFR03(CM10)
$\Delta y_{t,NL}$	Δy_t for Netherlands	1.565	-0,0001	0,0182	-0,0852	0,1248	GVNL03(CM10)
$\Delta y_{t,ES}$	Δy_t for Spain	1.565	-0,0003	0,0441	-0,3788	0,3264	GVES03(CM10)
$\Delta y_{t,GR}$	Δy_t for Greece	1.565	-0,0036	0,2642	-5,4185	3,3286	GVGR03(CM10)
$\Delta y_{t,IE}$	Δy_t for Ireland	1.565	-0,0005	0,0267	-0,1745	0,2031	GVIR03(CM10)
$\Delta y_{t,IT}$	Δy_t for Italy	1.565	-0,0001	0,0701	-0,7314	0,6156	GVIL03(CM10)
$\Delta y_{t,PT}$	Δy_t for Portugal	1.565	-0,0013	0,0631	-0,4406	0,4436	GVPT03(CM10)
$\Delta y_{t-1,AT}$	Δy_{t-1} for Austria	1.565	0,0000	0,0232	-0,1693	0,1656	
$\Delta y_{t-1,BE}$	Δy_{t-1} for Belgium	1.565	-0,0001	0,0186	-0,1542	0,1484	
$\Delta y_{t-1,FI}$	Δy_{t-1} for Finland	1.565	0,0000	0,0130	-0,1132	0,1357	
$\Delta y_{t-1,FR}$	Δy_{t-1} for France	1.565	0,0000	0,0186	-0,2305	0,1603	
$\Delta y_{t-1,NL}$	Δy_{t-1} for Netherlands	1.565	-0,0001	0,0182	-0,0852	0,1248	
$\Delta y_{t-1,ES}$	Δy_{t-1} for Spain	1.565	-0,0004	0,0441	-0,3788	0,3264	
$\Delta y_{t-1,GR}$	Δy_{t-1} for Greece	1.565	-0,0035	0,2643	-5,4185	3,3286	
$\Delta y_{t-1,IE}$	Δy_{t-1} for Ireland	1.565	-0,0005	0,0267	-0,1745	0,2031	
$\Delta y_{t-1,IT}$	Δy_{t-1} for Italy	1.565	-0,0002	0,0701	-0,7314	0,6156	
$\Delta y_{t-1,PT}$	Δy_{t-1} for Portugal	1.565	-0,0013	0,0632	-0,4406	0,4436	

Table A2: Country-specific effects – Interest rate decrease

	Government bond spread									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Core countries					Periphery countries				
Country	Austria	Belgium	Finland	France	Netherlands	Spain	Greece	Ireland	Italy	Portugal
Interest rate decrease	-0.0012	0.0003	-0.0100**	-0.0035	-0.0180	0.0056	-0.0180	0.0058	-0.0119	-0.0014
	(0.0128)	(0.0125)	(0.0050)	(0.0207)	(0.0193)	(0.0297)	(0.0414)	(0.0052)	(0.0429)	(0.0256)
Constant	-0.0007	-0.0010	-0.0006	-0.0008	-0.0038	-0.0054**	-0.0013	-0.0036	-0.0028	-0.0042
	(0.0026)	(0.0013)	(0.0017)	(0.0025)	(0.0037)	(0.0026)	(0.0129)	(0.0035)	(0.0070)	(0.0028)
Observations	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565
Adjusted R-squared	0.0792	0.0173	0.0233	0.0238	0.0348	0.0353	0.0173	0.0317	0.0305	0.0648
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Month*year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Results correspond to Equation (2). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A3: Country-specific effects – (T)LTRO

	Government bond spread									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Core countries					Periphery countries				
	Austria	Belgium	Finland	France	Netherlands	Spain	Greece	Ireland	Italy	Portugal
(T)LTRO	0.0119	0.0277	-0.0028	0.0304	-0.0099	0.0036	-0.0454	0.0094	0.0710	0.0005
	(0.0111)	(0.0226)	(0.0068)	(0.0250)	(0.0197)	(0.0320)	(0.0725)	(0.0140)	(0.1007)	(0.0511)
Constant	-0.0007	-0.0010	-0.0006	-0.0008	-0.0038	-0.0054**	-0.0013	-0.0036	-0.0027	-0.0042
	(0.0026)	(0.0013)	(0.0017)	(0.0025)	(0.0037)	(0.0026)	(0.0129)	(0.0035)	(0.0070)	(0.0028)
Observations	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565
Adjusted R-squared	0.0803	0.0258	0.0224	0.0340	0.0341	0.0353	0.0174	0.0321	0.0344	0.0648
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Month*year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Results correspond to Equation (2). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A4: Country-specific effects – PSPP and PEPP expansion

	Government bond spread									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Core countries					Periphery countries				
	Austria	Belgium	Finland	France	Netherlands	Spain	Greece	Ireland	Italy	Portugal
PSPP and PEPP expansion	-0.0166	-0.0062	-0.0192***	-0.0044	-0.0302**	-0.0035	-0.0468	-0.0081	0.0183	-0.0086
	(0.0209)	(0.0275)	(0.0067)	(0.0291)	(0.0148)	(0.0311)	(0.0668)	(0.0190)	(0.0942)	(0.0468)
Constant	-0.0007	-0.0011	-0.0006	-0.0008	-0.0038	-0.0054**	-0.0013	-0.0037	-0.0027	-0.0042
	(0.0026)	(0.0013)	(0.0017)	(0.0025)	(0.0037)	(0.0026)	(0.0129)	(0.0035)	(0.0070)	(0.0028)
Observations	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565
Adjusted R-squared	0.0815	0.0178	0.0319	0.0240	0.0451	0.0353	0.0174	0.0321	0.0307	0.0649
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Month*year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Results correspond to Equation (2). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Country-specific effects – PSPP expansion

	Government bond spread									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Core countries					Periphery countries				
	Austria	Belgium	Finland	France	Netherlands	Spain	Greece	Ireland	Italy	Portugal
PSPP expansion	0.0103	0.0244	-0.0097***	0.0269	-0.0310**	0.0175	-0.0640	0.0150	0.0976	0.0183
	(0.0132)	(0.0264)	(0.0037)	(0.0301)	(0.0155)	(0.0397)	(0.0862)	(0.0159)	(0.1165)	(0.0616)
Constant	-0.0007	-0.0010	-0.0006	-0.0008	-0.0038	-0.0054**	-0.0013	-0.0036	-0.0027	-0.0042
	(0.0026)	(0.0013)	(0.0017)	(0.0025)	(0.0037)	(0.0026)	(0.0129)	(0.0035)	(0.0070)	(0.0028)
Observations	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565
Adjusted R-squared	0.0799	0.0227	0.0240	0.0304	0.0422	0.0358	0.0175	0.0326	0.0366	0.0651
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Month*year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Results correspond to Equation (2). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A6: Country-specific effects – PSPP reduction

	Government bond spread									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Core countries					Periphery countries				
Country	Austria	Belgium	Finland	France	Netherlands	Spain	Greece	Ireland	Italy	Portugal
PSPP reduction	-0.0039	0.0043	0.0057	0.0056	0.0188	0.0016	0.0292	0.0279*	0.0162	0.0744*
	(0.0218)	(0.0148)	(0.0093)	(0.0171)	(0.0133)	(0.0263)	(0.0505)	(0.0151)	(0.0306)	(0.0449)
Constant	-0.0007	-0.0010	-0.0006	-0.0008	-0.0038	-0.0054**	-0.0012	-0.0036	-0.0028	-0.0042
	(0.0026)	(0.0013)	(0.0017)	(0.0025)	(0.0037)	(0.0026)	(0.0129)	(0.0035)	(0.0070)	(0.0028)
Observations	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565
Adjusted R-squared	0.0793	0.0174	0.0226	0.0239	0.0350	0.0353	0.0173	0.0337	0.0305	0.0675
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Month*year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Results correspond to Equation (2). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.