Reaction of euro area government risk premia to common policy responses during the COVID crisis

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Abstract: Using an event study methodology, this paper examines how the risk premia of euro-area government debts were affected by supranational and inter-governmental policy announcements between January 2020 and December 2020. We find that only a few policy announcements succeeded to narrow spreads. Beyond the ECB which was a game changer, the European Council and the European Commission affected the risk perception. In turn, Eurogroup meetings made internal conflict visible and delayed the restoration of confidence. In total, all members benefited from a net positive effect of crisis management with Greece and Italy being the two main beneficiaries in absolute terms.

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JEL Code: F30, F45, H63

In 2020, the various European authorities quickly succeeded in convincing the financial markets that sovereign risk was under control. In this paper, we show that the different announcements did not always have the expected effects but in the end the European Central Bank and to a lesser extent the European Council and the European Commission succeeded in narrowing spreads. All member countries have benefited from the interventions relatively equitably to the extent of each member's needs.

After a sharp increase, peripheral government bond yields narrowed down with the result that 2020 levels have been dwarfed by those of 2011-2012 (see Fig. 1). Compared to the previous episode, euro-area members benefited from swift and sizeable common policy responses by supranational institutions (the European Central Bank and the European Commission) and from inter-governmental arrangements (European Council, Eurogroup). In other words, European authorities managed to avoid another euro crisis (Blanchard, 2020). Which measure(s)

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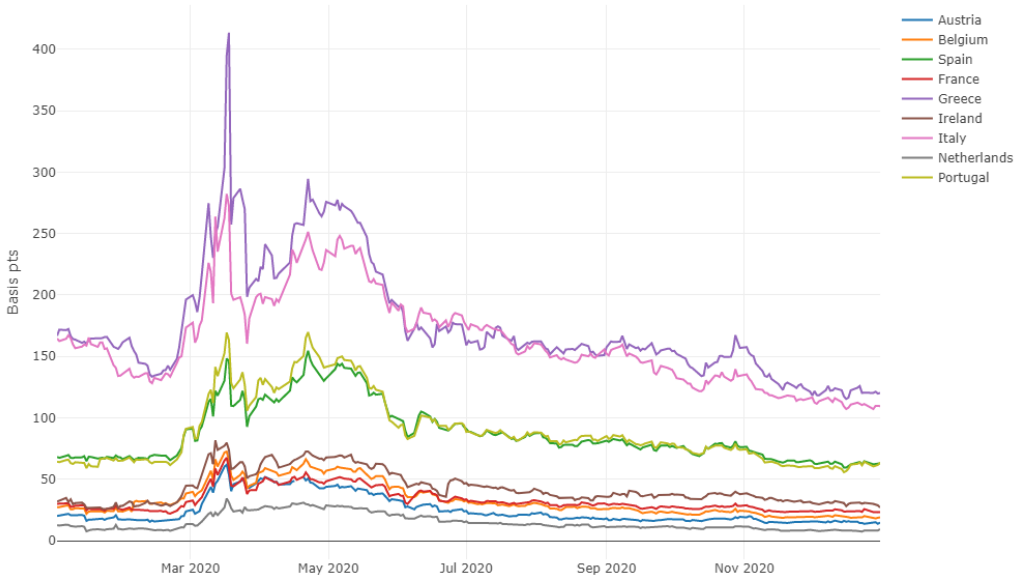
had a significant contribution on government risk premia? The answer matters to improve the resiliency to future shocks in the monetary union.

Figure 1: Sovereign Bond Spreads in Eurozone members



This Figure shows the 10 year bond yield spread against German bond since January 2 2020 of a sample of 9 euro area members. Source: Authors calculations with Eikon Datastream data.

We perform an event-study analysis of policy communications around ECB, European Commission and inter-governmental bodies announcements in 2020. The political events are based on a detailed timeline of the crisis that we developed ourselves and we classify them to unravel the different layers of the European economic governance. More precisely, we run the event-study based on 36 policy events in 2020 classified as announcements by the European Central Bank (ECB), European Council (EC), meetings of the EU economic and finance ministers (ECOFIN), Eurogroup (EG), the European Commission (CE).[1] We also include three specific country policy events largely commented in the press (see Table 2)[2].

In total, we run time series analysis of 9 daily euro-area members' yield reaction around common policy announcements from January 2, 2020 to December 14, 2020. Our empirical strategy follows the two-step procedure of Falagiarda and Reitz (2015) : i) we estimate the effect of each separate event and ii) we perform an F-test for the joint significance of the coefficients along the European governance classification just mentioned.

We find that only a few policy announcements had a significant contribution on the risk

[1] 1) The European Council gathers the government leaders of the EU members, the President of the European Council (Charles Michel during the pandemic) and the President of the European Commission (Ursula Von der Leyen); 2) the Council of the EU gathers the EU ministers in several configurations; here we include meetings of the EU economic and finance ministers (ECOFIN); 3) Eurogroup is an informal body gathering the economic and finance ministers of the euro area ahead of ECOFIN meetings. Presidents of the Eurogroup during the period of estimate were Mario Centeno until July 12 2020 and Paschal Donohoe afterwards; 4) The European Commission (CE) is the only supranational authority in the economic non monetary field and includes one member per member state, also called commissioners.

[2] All data and codes are available on a dedicated github.

premium of euro-area governments. The ECB had a significant and substantial closing effect on spreads despite the false start before the PEEP speech on March 18, 2020. The intergovernmental announcements of the European Council also contributed to the narrowing of spreads over the period, although to a lesser extent. Unfortunately, Eurogroup meetings contributed to amplify sovereign risk of most members. In total, all members benefited from a net positive effect of crisis management with Greece and Italy being the two main beneficiaries in absolute terms.

Related Literature. This paper relates with empirical works on the financial effects of COVID-19 (Capelle-Blancard and Desroziers, 2020; Haddad et al., 2020; Klose et al., 2020; Andrieș et al., 2021) and more particularly on the effect of policy responses on the price of the sovereign debt during the pandemic (Augustin et al., 2020; Ortmans and Tripier, 2020; Fendel et al., 2021). Our contribution consists in assessing the crisis management capacity of the current European polity by examining all common policy announcements and providing an analysis accounting for its complex governance structure. Our results suggest that certain modalities of the European political governance makes internal conflicts visible, in particular Eurogroup meetings, a fact that delays the restoration of confidence in the bond market and carries financial costs. Political scientists already observed that interstate bargaining rarely produces a compromise in European policy-making, as each government puts forward its national economic preferences (Jones et al., 2016). The economic consequences of this absence of compromise are reflected in the borrowing cost, as our estimates suggest.

The closest work to ours is Fendel et al. (2021) who also evaluate the impact on sovereign spreads of announcements of Covid-19 related monetary and fiscal policy measures. They point out that their results are opposite to the results that we initially commented in Delatte and Guillaume (2020). We argue that this is due to two limitations in their methodology that bias their results. To show it, we replicate their estimate and we show that addressing the biases in their estimate confirms that the ECB was a game changer while the European Commission had only a small direct impact on spreads (see the Robustness Section).

Our paper also relates to the works assessing the specific role of monetary policy on the pricing of sovereign debt (Falagiarda and Reitz, 2015; Altavilla et al., 2016; Krishnamurthy et al., 2018; Afonso and Jalles, 2019).[3] Our findings suggest that the ECB reached its target of stabilizing the risk premium of peripheral members. By committing to purchase debt securities and securing liquidity to all euro-area governments (EA), the ECB "crowded in" investors, thereby protecting E.A. members from self-fulfilling dynamics.[4] Our finding that the PEEP speech affected bond pricing before the purchase program was activated recalls the impact of President Draghi's "whatever it takes" in 2012 (Altavilla et al., 2016; Delatte et al., 2017). It is interesting to bear in mind though that OMT allowed the ECB to purchase sovereign

[3]For works examining the sovereign risk premium in the euro area, see Costantini et al. (2014); Favero and Missale (2012); Aizenman et al. (2013); Manganelli and Wolswijk (2009); Delatte et al. (2017); Stamatopoulos et al. (2017); Agiakloglou et al. (2021).

[4]This mechanism was explicitly targeted by the ECB as evidenced by the speech of Philip R. Lane on June 22 2020: "The market stabilisation role of the pandemic emergency purchase programme" .

bonds in secondary markets without explicit quantity limits but under certain conditions while PEEP was unconditional but limited (and extended several times). Our paper contributes to this question by showing that the ECB was successful in implementing an effective program tailored to the nature of the risks.

In the remainder, section 2 discusses the data and the methodology. Section 3 presents the empirical results, and section 4 reports robustness tests including the unbiased replication of Fendel et al. (2021). Section 5 concludes.

1 Empirical examination of Crisis management in the Euro-area

Early in 2020 after the first case of COVID-19 was detected in Europe, Euro-area members have benefited from swift and sizeable common policy responses on the monetary as well as on the financial assistance fronts. In order to document the crisis management episode, we run an event-study based on the following model:

$$\Delta Spread_t = \alpha + \sum_{i=1}^{2} \beta_i \Delta Spread_{t-i} + \sum_{j=1}^{n} \beta_j X_t^{Pol} + \beta_k \Delta X_t + \epsilon_t \tag{1}$$

where $\Delta Spread_t$ is the first difference of the spread between the 10-year German Bund and the 10-year Treasury bill of each country in our sample (Austria, Belgium, Spain, France, Greece, Italy, Ireland, Portugal, Netherlands), X_t^{Pol} is a set of 36 policy dummy variables that take the value of one within the event window of the announcement (the day of the announcement) and zero instead (we give more detail about the timeline of policy events below). The vector of first differentiated control variables ΔX_t includes country-specific stock market indices, the 10-year US Treasury Inflation-Protected Securities yield rate (US10Y TIPS), the VIX (a volatility index measuring the stock market volatility expectation based on the S&P 500 index option), the Citigroup Economic Surprise Index for the Eurozone (CESI Eurozone), the 3-month future of the Euribor rate, the US-$/Euro spot exchange rate and the daily number of COVID cases per country[5]. All sources are detailed in the Appendix (Table 3).

We include 36 policy events following a self-developed timeline of the crisis (see Table 2). Previous work examining the response of bonds spreads to European policy interventions during or prior to the pandemic grouped all financial assistance decisions into a single "fiscal" category (Afonso et al., 2019; Fendel et al., 2021). However, we argue that it is not accurate because it suggests that the decisions are made at a single level in Europe. In turn, the European economic governance for financial assistance programs is a more complex combination of supranational institution- the European Commission on the one hand and inter-governmental bodies on the other hand, including the European Council, the meetings of Economic and Finance Ministers

[5]For the sake of parsimony, we retain only those control variables that are at least significant for one of our country regressions (i.e. we drop the euro area CESI, the 3-month euribor rate and the US dollar-euro spot exchange rate). In addition, we retain the COVID cases to control for the influence of the pandemic on spreads despite their lack of significance (Ortmans and Tripier (2020)).

of the European Union and the Eurogroup (Moravcsik, 2013; Jones et al., 2016; Sacriste and Vauchez, 2019). In order to assess the functioning of the crisis management, we argue that we need a more specific breakdown of the financial assistance announcements. In total, we run the event-study based on 36 policy events classified as announcements by the European Central Bank (ECB) for the monetary front on the one hand and Eurogroup (EG), European Commission (CE), European Council (EC), Econ and Finance Ministers of the European Union (Eco) for financial assistance front on the other hand.

Last but not least, we control for three country specific policy events largely commented in the press and with potential disruptive effects (see Table 2): i) Fitch downgrading Italy on April 29, 2020 which constituted a major signal of deteriorating risk perception; ii) the ruling of the German Constitutional Court on May 5, 2020 declaring the ECB's public sector purchasing program illegal which constituted a serious threat on crisis management capacity; iii) the proposal of EUR 500 bn EU recovery fund by the German chancellor Angela Merkel and the French President Emmanuel Macron on May 18 2020 which was a cornerstone of crisis management initiated outside the European political governance.

Table 1 reports the summary statistics of our estimate variables. On the one hand, the dependent variable is the yield spread between German Bund and the 10-year Treasury bill of 9 member countries. We report the yield level and spread and their respective first-difference.[6] We have about 240 observations per country. We observe that peripheral countries (Greece, Italy, Spain and Portugal) have on average larger spreads compared to core countries (Germany, Austria, the Netherlands and, to a lesser extent, France, Belgium and Ireland). Greece and Italy display the largest average spread over the period (177 and 164 bp resp.) whereas Netherlands and Austria display the smallest (15 and 25 bp resp.). The wider standard deviation of peripheral bond spreads suggests that their risk premium was more sensitive to good and bad shocks over the period, as in 2011-2012 (this lower resilience probably results from a combination of greater exposure to the health shock and poor fundamentals before the pandemic.)[7] Compared to the previous episode of heightened sovereign risk, it is striking that Ireland moved from being a "peripheral" to a "quasi-core" country (Delatte et al., 2017). Finally, average bond spreads decreased slightly over the period, confirming that sovereign risk was kept under control. On the other hand, Table 3 reports the summary statistics of control variables (measure as first-difference) which are almost all common to every countries (except with the number of cases and the stock market indices). We have a minimum of 228 observations for each one. On average, the stock markets was quite volatile (the standard deviation is 98.4 over the period) and very slightly decreasing. All other financial and health risk indicators are equally volatile and suggest increased risk over the period.

We estimate Equation 1 in 9 time series linear regressions augmented with an autoregressive process. We prefer time-series to a panel estimate because we have a large number of daily data

[6] We report the statistics of the yield level because we later run robustness estimates on yield level instead of yield spreads (see Robustness Section).

[7] We present the country-specific number of COVID cases and deaths as well as the state of the fundamentals in the companion website of this paper.

by country, a fact that allows us to estimate country-specific parameters instead of imposing homogeneity. Parameters are estimated using ordinary least squares with HAC correction of standard errors. Daily data were obtained from the Thomson Reuters-Datastream database covering the period January 1, 2020 to December 14, 2020. We choose one-day event window for our estimates. The reason is that the estimation period is a time of crisis with a lot going on, so we want to make sure that we control for confounding effects.

2 Results

2.1 A few events had a significant contribution

Table 4 reports the estimate results of estimating the contribution of each separate event (first step). We group the events by institution. A quick look reveals a strong heterogeneity across the policy announcements: some have largely contributed to reduce the risk premium of every members (e.g. the PEEP speech by the ECB on March 18, 2020), some have contributed to increase it (e.g. the Eurogroup meetings in March 2020) and most events had a zero or almost zero contribution. In turn, the three country specific events affected the spreads: Italy consistently suffered the most from Fitch downgrading them (+8.7 bp), while other countries were not or marginally affected (results suggest that Portugal and Belgium may have benefited from tiny portfolio reallocation); the threat posed by the ruling of the German Constitutional Court affected all member countries (except for Greece and Ireland) and Italy was by far the most affected (+18.5 bp); last the Franco-German proposal relaxed the tension on all peripheral spreads and again Italy was the first beneficiary (-13.8 bp).

In order to visualize the results of Table 4, Figure 2 graphically presents the individual contribution of each event grouped into the same categories. The further right (left) the axis, the more the event contributed to increase (reduce) the sovereign yields. We observe that only a few policy announcements had a significant contribution and the few significant events affected the spreads of every members in the same direction (i.e. we can not document asymmetric responses among core and peripheral members).

More precisely, the initial policy announcement of the ECB on March 12 contributed to increase the risk premium but quickly after, the ECB March 18 EUR 750 bn PEPP announcement was unambiguously key: all members, with the exception of the Netherlands, have benefited from the purchase program, with Greece and Italy being the largest beneficiaries (-150 bp and -70 bp resp). The extension of the program on June 4 also contributed to reduce the spreads, although to a lesser extent.

The European Council had a spread-reducing effect on several occasions at the beginning of the period : on March 10, 2020 during their first video-conference, on March 26, 2020 after major Eurogroup's dissent about debt pooling (see below) and on April 23, 2020 when the heads of government first discussed the establishment of a recovery fund.[8] It is interesting to

[8]See EU fails to settle rifts over size and shape of 'recovery fund', April 24, Financial Times.

observe that the meetings discussing and confirming the historical agreement over a pan-EU Recovery Fund in June and July 2020 contributed to reduce the spreads by a lesser extent than April meetings.[9] In turn, not surprisingly, the European Council announcement of a travel ban across the Shengen area on March 17, 2020 was followed by an increase in spreads.

Regarding the European Commission, we observe that the budget rules lifting on March 20, 2020 triggered concerns on the Greek signature, while the confirmation of the recovery plan EU Next Generation on July 23 contributed to reduce the spreads homogeneously.

At the beginning of the pandemic, Eurogroup meetings were followed by spreads increases, e.g. after their first video-conference meeting on March 16, 2020 and after the stormy debate about a joint budgetary approach on March 24, 2020.[10]

Table 5 reports the results of the second step computing F-tests for joint significance at the institution level (sum and average). On the one hand, the ECB unambiguously contributed to reduce the spreads of every members with substantial reduction for peripheral members: -159 bp for Greece, -55.6 bp for Italy, -26.3 bp for Portugal and -32.7 bp for Spain. On the other hand, inter-governmental announcements had ambiguous impacts as evidenced by the opposite contribution of the Eurogroup (EG), the European Council (EC) and the Econfin (ECO). The EG contributed to increase the spread of every members except Italy and Ireland (+ 14.8 bp for Austria, + 12.2 for Belgium, + 14 bp for France, + 28 bp for Greece, + 24.3 bp for Portugal, + 13 bp for Spain) whereas the meetings of the European Council and of the Economic and Finance Ministers contributed to reduce the spreads, sometimes substantially (-20.6 bp for Italy).[11] In general, the spread-reducing effect of the European Council did not compensate for the spread-widening effect of the Eurogroup. Last, the interventions of the European Commission also contributed to reduce most spreads (-8.3 bp for Belgium, -8.8 bp for France, -6.8 bp for Ireland, -22.5 bp for Italy, -6.1 bp for Netherlands, -13.5 bp for Portugal).

2.2 Even distribution of benefits

At the country level, it is striking that Greece benefited only from ECB measures, although substantially (-163.3 bp); all other policy announcements affected the Greek risk premium in a bad or neutral way. In sum, the management of Greek sovereign risk rests with the ECB, a fact that underscores that the country was treated separately by European polity and therefore by investors (Agiakloglou et al., 2021). On the contrary, the Italian spread benefited from almost all institutional interventions, as if they were designed to manage Italian sovereign risk.

Last, but not least Figure 3 displays the cumulative contribution of the different institutions on individual spreads, proportionally to country's individual mean spread over the period. Not

[9] See EU leaders strike deal on €750bn recovery fund after marathon summit July, 21, Financial Times.

[10] See Nine eurozone countries issue call for 'coronabonds', March 25, Financial Times

[11] In an auxiliary estimate, we drop the European Council announcement of March 26, 2020 out of the policy events because it was the day the ECB started the bond purchasing program announced on March 18 (Breckenfelder et al., 2020) (Table 6). When March 26 2020 EC event is dropped out, EC meetings turn to widen the spreads for Netherlands and Portugal and to have no effect on the spread of the other countries of the sample. This result, which should be taken with caution, mitigates the contribution of intergovernmental announcements.

only ECB measures benefited to all members but the relative contribution was quite similar for every members except Greece: in total, spreads decreased by about 30 to 40% after all ECB policy announcements combined; the confusing effect of EG meetings is unambiguous: spreads increased by 15 to 58%; the meetings of the European Council leaders and of the Economic and Finance Ministers contributed to reduce the spreads but did not compensate; last the European Commission had a substantial spread-closing effect for several core and peripheral members by -15% to -40%.

In short, by committing to purchase debt securities, ECB "crowded in" investors and reached its explicit target of protecting peripheral members of the euro area from self-fulfilling switch in equilibria.[12] On the contrary, Eurogroup meetings produced counter-productive effects because they were open forum of inter-state bargaining showing off the lack of consensus among members.

3 Robustness

- We replace the number of COVID cases with the Stringency Index of Oxford University to account for health restriction measures, some of which have been taken the same day as policy events included in the event-study (see Table 8). Results are confirmed.

- Replication of Fendel et al. (2021): in Introduction, we mentioned that our work is closely related to Fendel et al. (2021) who find opposite results to ours. They use a comparable dataset on a comparable period and yet they find that the ECB announcements do not show any significance, that only fiscal announcements had a significant effect on yields but this effect was to increase the borrowing cost of members with a "sound fiscal position" (the so-called core members). However, we argue that their estimate suffers from two biases so we replicate their work after addressing them.

  1. They inaccurately assign the major ECB announcement of a EUR 750 billion bond buying program to day 03/18/2020 while it was made after the market closing hour. It means that this monetary announcement could be incorporated into prices only at the opening on 03/19/2020 (Demirgüç-Kunt et al., 2020).[13] It matters because they instead categorize day 03/19/2020 within EC announcements while their objective precisely is to compare the respective contribution of ECB and EC (we could not find comments about this announcement in the press). We show the empirical implication of this mis-assignment in Table 9 which replicates their estimates on yields levels and spreads by classifying 03/19/2020 as an ECB event and not an EC event (we shorten the period of estimate to match theirs). In addition, the 7 ECB events (columns 2 and 7) are further broken down into 2 bonds-buying related announcements (columns

[12] This objective was explicitly set in the speech of Philip R. Lane on June 22 2020: "The market stabilisation role of the pandemic emergency purchase programme".

[13] "ECB to launch €750bn bond-buying programme.", Martin Arnold, Financial Times, 03/19/2020

3 and 8) and 5 *other operations* announcements (columns 4 and 9) because investors make a clear distinction.

Results suggest that the main contribution to yields comes from ECB bond-buying programs announcements. In this new estimate, not only are the estimated coefficients associated with the bond-buying programs significant but their size is substantially larger than the other announcements. This is in sharp contrast to their result of a zero effect of ECB announcements.

2. They use a single dummy per event category, ECB vs. EC announcements, meaning that they mix together 24 policy events in only two dummies (see their Table A1). In order to address the potential bias of diluting the contribution of significant events with non-significant ones, we use the same standard two-step procedure as above.

   Table 10 reports the estimated coefficients of the event-study estimated in two steps. Results (Av, line 1) suggest that on average ECB announcements have contributed to reduce the yield level and spread of southern euro-member countries while EC announcements have contributed to increase the yield level of almost all members. In the same Table, we also compute the sum of the estimated coefficients (Total, line 2) to compare the total contribution of each category. We find that ECB announcements have contributed to reduce the spread of Greece (-94 bp), Italy (-32 bp) and Spain (-18) while EC announcements have contributed to homogeneously increase the yield level of most members, implying a zero/ neutral contribution to spreads. In total, we correct the estimation biases in Fendel et al. (2021) and our results suggest that the ECB has been the main contributor during the episode.

- We perform the same analysis on yields instead of spreads (see Table 7). Indeed, focusing only on spreads might hide the fact that fiscally sound countries bear the burden with higher yields. Results suggest that it was not the case. The announcement of financial assistance by the European Council announcements had a rather large yield-reducing effect for the whole sample including core countries contrary to the findings of Fendel et al. (2021).[14]

4 Conclusion

Our results suggest that spreads reacted strongly to several policy announcements: the ECB was a game changer for all members during the pandemic. The policy coordination of the European council and the announcements by the European Commission contributed to reduce stress but Eurogroup meetings contributed to amplify it. In short, all members would benefit from keeping discontent in private.

[14]Their conclusion reads:"Financially stable countries are expected to carry most of the financing burden in the future and therefore their government bonds are traded with a higher premium".

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Table 1: Summary Statistics

	Yields Spreads				Yields Levels			
Panel A: Levels	*Avg.*	*Std.Dev*	*Obs.*	*Min.Max*	*Avg.*	*Std.Dev*	*Obs.*	*Min.Max*
Austria	25.21	11.68	244	[14.5, 61.9]	-0.22	0.17	244	[-0.474, 0.307]
Belgium	33.89	13.55	245	[18.4, 72.6]	-0.13	0.18	245	[-0.43, 0.426]
France	33.31	9.49	245	[22.1, 67.6]	-0.14	0.15	245	[-0.383, 0.363]
Greece	177.89	48.29	243	[118.2, 413.5]	1.31	0.50	243	[0.603, 3.905]
Ireland	43.20	13.44	243	[25.8, 81.4]	-0.04	0.17	243	[-0.315, 0.509]
Italy	164.55	37.35	245	[111.5, 282.3]	1.17	0.40	245	[0.511, 2.495]
Netherlands	15.20	6.78	245	[7.7, 34.4]	-0.32	0.13	245	[-0.635, 0.082]
Portugal	95.03	27.98	202	[58.4, 169.7]	0.46	0.32	202	[-0.034, 1.403]
Spain	88.36	23.01	244	[62.4, 154.6]	0.41	0.25	244	[0.006, 1.233]
Germany			245		-0.47	0.11	245	[-0.854, -0.192]
Panel B: 1st-Diff	*Avg.*	*Std.Dev*	*Obs.*	*Min.Max*	*Avg.*	*Std.Dev*	*Obs.*	*Min.Max*
Austria	-0.03	2.10	242	[-13.4, 11.4]	0.00	0.04	242	[-0.17, 0.219]
Belgium	-0.03	2.61	244	[-12.6, 16.8]	0.00	0.04	244	[-0.211, 0.2]
France	-0.02	2.47	244	[-14.4, 14.8]	0.00	0.04	244	[-0.179, 0.205]
Greece	-0.13	15.00	242	[-156.2, 91.8]	0.00	0.15	242	[-1.524, 0.947]
Ireland	0.00	2.94	242	[-15.6, 19]	0.00	0.04	242	[-0.193, 0.193]
Italy	-0.21	9.62	244	[-71.4, 70.6]	0.00	0.09	244	[-0.676, 0.709]
Netherlands	-0.02	1.29	244	[-4.8, 7.4]	0.00	0.04	244	[-0.16, 0.174]
Portugal	-0.17	5.67	202	[-35, 29.3]	0.00	0.06	202	[-0.312, 0.296]
Spain	-0.02	4.90	243	[-36.4, 20.8]	0.00	0.05	243	[-0.326, 0.211]
Germany			244		0.00	0.04	244	[-0.141, 0.202]
Panel C: Controls 1st-Difference								
	Avg.	*Std.Dev*	*Obs.*	*Min.Max*				
Stock Markets	-1.33	98.45	236	[-565.99, 375.44]				
US 10Y TIPS	0.00	0.06	228	[-0.5, 0.37]				
VIX US	0.02	3.71	232	[-17.64, 24.86]				
Cases Variation	0.66	11.94	245	[-64.33, 58.61]				
CESI Index	0.44	17.45	244	[-170.3, 89.9]				
Euribor 3-month	0.00	0.01	243	[-0.031, 0.061]				
Euro/US-Dollar ER	0.00	0.01	244	[-0.02, 0.02]				

Table 2: Crisis Timeline

Timeline for event study		
Date	Institution	Description
03/10/2020	EC	Meeting on how to coordinate the european response to the COVID19 outbreak.
03/12/2020	ECB	First ECB announcement since the beginning of the COVID19 crisis. Ch. Lagarde also states that it is not the role of the ECB to close the interest rate spread of the countries in the zone. She rectified this quickly after the press conference but her comment casts doubt about her commitment.
03/16/2020	EG	Meeting of finance ministers in inclusive format (all the european union member), they took stock of the special economic situation and declared that Europe will protect the "citizens and the currency". They also announced a reform of the European Stability Mechanism (ESM).
03/17/2020	EC	The European Council meets by videoconference and announces the restriction of entry at the external borders of the EU for a period of 30 days.
03/19/2020	ECB	The ECB launches the Pandemic Emergency Purchase Programme (PEPP) including a 750 billion Euros purchase of private and public securities in addition to the plans already announced.
03/20/2020	CE	For the first time, the European Commission uses the clause allowing to lift the budgetary rules of the Stability and Growth Pact and the spending limits of member states. "National governments can inject as much into the economy as they need," said the President of the European Commission.
03/23/2020	ECO	EU Finance Ministers meets in visioconference. They issue a joint statement in which they agreed with the Commission's assessment that the conditions for activating the general derogation clause in the EU's budgetary framework are met.
03/24/2020	EG	Eurogroup (meeting of eurozone finance ministers) meets by videoconference to discuss a joint budgetary approach with two options discussed but no agreement yet to be found.
03/26/2020	EC	Meeting of the members of the European Council, leaders agreed on measures to limit the spread of the virus, providing medical equipments, helping researchers etc.
04/07/2020	ECB	The ECB announces a package of measures aimed at relaxing constraints on securities eligible as collateral in exchange for liquidity.
04/23/2020	EC	Videoconference of the members of the European Council calling for the package of measures announced by the Eurogroup on 9 April to be operational by 1 June 2020. The members of the Council also discussed the establishment of a Recovery Fund. But disagreements between members remain important on the modalities of this Recovery Fund, in particular on the nature of the funds, loans or transfers.
04/29/2020	-	Fitch rating agency downgrades Italy one notch above junk.
04/30/2020	ECB	TLTROs and PELTROs new announcements after sovereign bond spreads widened relative to German benchmark bonds.
05/05/2020	-	The German Court of Justice rules on the PSPP programme which started in 2015 and declares it illegal.
05/08/2020	EG	The Eurogroup meet in a regular format to tackle the consequences of the crisis.
05/15/2020	EG	Another Eurogroup meeting with one special guest : The Chair of the European Parliament's Economic and Monetary Affairs Committee (ECON), Irene Tinagli that was invited by President Mário Centeno to discuss the economic outlook of the euro area in the context of the COVID-19 crisis.
05/18/2020	-	Joint videoconference of Angel Merkel and Emmanuel Macron announced a proposal of €500bn EU recovery fund to be discussed to the next European Council.
05/19/2020	ECO	Meeting by video conference of finance ministers. Members officially welcomed the adoption of the regulation for temporary support to mitigate unemployment risks in an emergency (SURE) presented earlier on.
05/27/2020	CE	The European Commission put forward a new recovery instrument: Next Generation EU. After the joint announcement of E. Macron & A. Merkel on may the 18th, the EC has decided to unveil a reinforced long-term EU budget for 2021-2027. Combine with previous recovery packages the total financial intervention of the EU budgets reaches €1.85 trillion. This is also a step toward new own resources for the EU budget.
06/04/2020	ECB	The envelope for the pandemic emergency purchase programme (PEPP) will be increased by €600 billion to a total of €1,350 billion with net purchases horizon extended at least to the end of June 2021 and net asset purchases under the APP program will continue "for as long as necessary".
06/09/2020	ECO	Video conference of the members of the European Council on Trade and COVID19.
06/11/2020	EG	Eurogroup regular meeting on COVID19 impact on the European banking sector and on the sixth enhanced surveillance report on Greece.
06/19/2020	EC	Video conference of the members of the European Council on the recovery fund and the Multi-annual Financial Framework proposed on may 27. A consensus has yet to be reached.
07/09/2020	EG	Eurogroup meeting on the budgetary situation in the euro area in the sanitary crisis context. The outcome will feed into the preparation of the draft budgetary plans and the recommendations for the euro area for 2021.
07/10/2020	ECO	Video conference of Finance and economic ministers of the euro area members. The European Commission and the European central bank presented their assessment on the actual sanitary crisis situation.
07/21/2020	EC	EU leaders have struck a deal on a landmark coronavirus recovery package, after a long night of negotiations, that will involve the European Commission undertaking massive borrowing on the capital markets for the first time. After 3 days of tug-of-war, European leaders agreed on a recovery package of €750bn including €390bn grants and €360bn loans.
07/23/2020	CE	The European commission agree on the European council decision undertaken 2 days ago. President von der Leyen stated that "[Europe] have now a massive and unprecedented financial firepower".
08/19/2020	EC	Regular Meeting of the European Council.
09/11/2020	EG	Formal discussion of Eurogroup members about the state of the European economy and how to use fiscal policy at the EU level.
10/02/2020	EC	Special European Council on COVID19 vaccination campaign calling for a more efficient European coordination.
10/05/2020	EG	Regular Meeting of the Eurogroup.
10/06/2020	ECO	Finance and Eco ministers reached an agreement on the Recovery and Resilience Facility among the member states present at the meeting. This agreement will be the base for further discussion at the European Parliament.
10/16/2020	EC	European Council meeting of the 15 and 16 October 2020 on the European pandemic worsening situation and the coordination of European countries on the vaccination campaign.
10/29/2020	ECB	Meeting ot the 28-29 October 2020 no significant changes in policy decisions. Unconventional measures will continue until the crisis is over. Forward Guidance. However, this meeting gave optimism about future increases in the amount purchase by the ECB under the PEPP (see CNBC press article).
11/03/2020	EG	Regular meeting of the Eurogroup.
11/04/2020	ECO	Regular meeting of the Economic and Finance ministers.
11/19/2020	EC	Meeting about the sanitary situation in Europe and further reinforcement of restrictions measures to contain the COVID spread.
11/24/2020	CE	Regular meeting of the European commission.
11/30/2020	EG	Video conference of the Eurogroup on the sanitary situation and other subjects.

Notes: This Table regroup all announcements made by European institutions during the COVID crisis in 2020. Events refer to official announcement by the European Council (EC), the European Commission (CE), Eurogroup (EG), EU Economic and Finance Ministers (Eco). Source: Consilium Europa website, ECB press releases and conferences, Financial Times (FT). Light gray meetings are meetings also listed by Fendel et al. (2021) in their crisis timeline.

Table 3: Description of variables

Definition and sources of variables used in regression analysis

Variables	**Type**	**Definition and construction**	**Sources**
Yields Spread Level	Basis points	Difference between the 10-year Treasury bill of country "i" and the 10-year German Bund in date "t".	Authors' constructions based on data avalaible on Datastream. Source: Eikon Reuters.
Yields Spread Diff	Basis points, First Difference	First difference of the Yields Spread Level variable.	Authors' constructions based on data avalaible on Datastream. Source: Eikon Reuters.
Yields Levels	Basis points	Yield level of the 10 year bond for each country "i".	Authors' constructions based on data avalaible on Datastream. Source: Eikon Reuters.
Yields Diff	Basis points, First Difference	First difference of the Yields Level variable.	Authors' constructions based on data avalaible on Datastream. Source: Eikon Reuters.
Stringency Index	Index from 0 to 100.	It reports a number between 0 to 100 that reflects the overall stringency of the governments response. It aggregates eight containment and closure indicators as well as public information campaigns. This is a measure of how many of the these nine indicators a government has acted upon. It does not take into account any economic indicators or health system policies beyond public information campaigns.	Source : Oxford OxCGRT (available here: Oxford COVID-19 Government Response Tracker).
Stock Markets	Daily Stock Market prices, First Difference	Stock market index for our sampled countries: ATX, DAX, CAC, IBEX, BFX, AEX, ISEQ, PSI, FTSE MIB, ATG.	Eikon Reuters, Datastream.
US 10Y TIPS	Basis points, First Difference	The 10-year US Treasury Inflation-Protected Securities yield rates.	Eikon Reuters, Datastream.
VIX US	Volatility, First Difference	The VIX US a volatility index measuring the stock market volatility expectation based on the SP 500 index option.	Eikon Reuters, Datastream.
Cases Variation	Cases per 100000, First Difference	First difference of the cumulative number of covid19 cases per 100 000 inhabitants 14 days basis by country (to measure for the evolution of the pandemic in each of our sampled countries).	Source : European Center For Disease Prevention and Control (available here: ECDC website).
CESI Index	Index, First Difference	The Citigroup Economic Surprise Index for the Eurozone (CESI Eurozone).	Eikon Reuters, Datastream.
Euribor 3-month	Basis points, First Difference	The future rates underlying the 3-month Eurozone main interest rate (Euribor).	Eikon Reuters, Datastream.
Euro/US-Dollar Spot Exchange	Rate, First Difference	The spot exchange rate between US-Dollar / Euro.	Eikon Reuters, Datastream.

Table 4: Event Study - European Interventions Divided Events

Institutions	Date	Austria	Belgium	France	Greece	Ireland	Italy	Netherlands	Portugal	Spain
					All Classified Events					
ECB	**3/12/2020**	4.9272+	10.1267**	8.5459**	7.7178	12.1015**	28.4426**	0.1980	16.8000*	8.0624
		(2.9466)	(3.4454)	(2.9206)	(10.9672)	(4.4467)	(9.1727)	(1.6573)	(6.4846)	(5.1830)
ECB	**3/19/2020**	-11.7414***	-11.9814***	-13.5797***	-151.8784***	-14.1500***	-65.6759***	-3.5499***	-30.4687***	-30.4211***
		(1.4868)	(0.8633)	(1.0849)	(5.6119)	(1.1961)	(3.1543)	(0.8040)	(2.7621)	(2.2140)
ECB	**4/7/2020**	-0.0307	0.3176	0.2197	-12.4512***	-2.6453***	-1.9594	-1.2337***	-2.6342*	1.2609
		(0.7154)	(0.5742)	(0.5540)	(1.7944)	(0.5924)	(1.5220)	(0.2458)	(1.2934)	(1.0579)
ECB	**4/30/2020**	1.2052+	0.8584	1.1599	3.8159	2.2924+	5.5355*	2.4370***	0.1743	-0.0574
		(0.6145)	(0.9686)	(0.8685)	(3.1771)	(1.2471)	(2.3103)	(0.5399)	(1.2770)	(1.2424)
ECB	**6/4/2020**	-4.3824***	-4.8919***	-5.6712***	-15.7358***	-1.9965*	-16.6813***	-2.9978***	-7.9286***	-8.4229***
		(0.2777)	(0.4701)	(0.4913)	(2.1092)	(0.7966)	(1.7813)	(0.2940)	(1.0192)	(0.8770)
ECB	**10/29/2020**	-0.7724	-2.2208***	-1.0889*		1.5921*	-4.9136*	0.3629+	-2.8652**	-3.8525***
		(0.5640)	(0.5206)	(0.4582)		(0.6779)	(1.9111)	(0.1893)	(0.9221)	(0.8305)
EC	**3/10/2020**	4.7997*	6.1122**	6.2412**	-30.5472***		-7.1020	3.1610***	4.6392	-0.4812
		(2.0893)	(2.0142)	(2.0742)	(4.3740)		(6.5578)	(0.9100)	(3.4869)	(2.6571)
EC	**3/17/2020**	2.6222	2.2340	6.0036**	84.5041***	6.0185*	22.9656**	9.5285***	23.1063***	23.2080***
		(2.3755)	(2.4776)	(2.2244)	(6.2424)	(2.9213)	(7.7778)	(1.0959)	(4.4666)	(3.2511)
EC	**3/26/2020**	-6.5469***	-10.1732***	-7.2024***		-8.1087***	-23.0472***	-1.3466**	-16.5344***	-18.1178***
		(0.3566)	(0.6859)	(0.8573)		(0.9987)	(1.2373)	(0.4104)	(1.5526)	(1.1208)
EC	**4/23/2020**	-3.0376***	-2.2667***	-2.2800***	-18.8651***	-1.5586***	-4.7622***	-1.1344***	-3.9149*	-5.2225***
		(0.6091)	(0.6041)	(0.5668)	(2.1869)	(0.3591)	(1.1198)	(0.1073)	(1.7073)	(1.4962)
EC	**6/19/2020**	-3.8723***	-4.6029***	-4.7481***	-8.0789***	-4.0430***	-4.0688***	-3.9219***	-0.7370	-4.4730***
		(0.1683)	(0.2819)	(0.3188)	(1.9230)	(0.4024)	(1.0600)	(0.1982)	(0.8073)	(0.5674)
EC	**7/21/2020**	0.9341**	0.9331**	0.2835	-3.7712**	-0.4669	-2.0125*	0.0174	-0.3001	-1.0400*
		(0.3088)	(0.2952)	(0.2685)	(1.1934)	(0.3726)	(0.8361)	(0.1378)	(0.5608)	(0.4285)
EC	**8/19/2020**	0.6830*	-1.2234*	0.3406	2.1972	1.0456+	1.5897	0.6490**	0.0423	0.9006
		(0.2846)	(0.5024)	(0.3693)	(1.3449)	(0.5433)	(1.1169)	(0.2177)	(0.8509)	(0.7279)
EC	**10/2/2020**	-0.0892	-0.1569	-0.0214	-4.2037***	-0.1766	-4.6967***	-0.5581***	-2.6986***	-0.3340
		(0.1312)	(0.2637)	(0.2519)	(1.1701)	(0.3564)	(0.7094)	(0.1409)	(0.5395)	(0.4864)
EC	**10/16/2020**	0.7132***	0.2618	1.1261**	-6.0159***	1.4651**	0.9848	0.1976	-1.3461	-1.2259*
		(0.1516)	(0.3486)	(0.3418)	(0.9642)	(0.5229)	(1.1505)	(0.2301)	(1.0284)	(0.6182)
EC	**11/19/2020**	-0.4910**	-0.2149	-0.3692+	3.2466***	0.1020	0.4005	-0.0704	-0.4365	-0.2775
		(0.1731)	(0.3086)	(0.2061)	(0.8051)	(0.4431)	(0.7123)	(0.1972)	(0.5422)	(0.5360)
EG	**3/16/2020**	11.4834***	9.3036**	10.7092***	29.9454**	-3.8237		4.4586***	14.3303*	7.5013
		(2.6641)	(3.3210)	(2.5467)	(9.3297)	(3.9606)		(1.2576)	(6.2813)	(4.6627)
EG	**3/24/2020**	5.0631***	5.1980***	6.4846***	-1.4940	1.6480	7.2921+	-0.8673	10.0302**	12.5618***
		(1.1681)	(1.1687)	(1.3437)	(4.4435)	(1.7449)	(3.9048)	(0.7930)	(3.5994)	(2.1463)
EG	**4/9/2020**	-1.9304*	-2.4303***	-2.2762***	2.7109+	-4.2581**	1.1567	-0.5938+	-0.8419	-1.5248
		(0.8159)	(0.6387)	(0.6655)	(1.6085)	(1.3012)	(1.8843)	(0.3439)	(2.0860)	(1.2439)
EG	**5/8/2020**	-0.8243*	-0.0507	0.1659	-2.8117***	0.3737	-4.2307***	-0.2260	-0.3835	-2.9406***
		(0.3374)	(0.3209)	(0.3620)	(0.8167)	(0.5436)	(1.1641)	(0.1469)	(0.8865)	(0.4837)
EG	**5/15/2020**	-0.6485	1.2344***	0.7840***	1.5511*	-0.6466**	1.3935	-0.0395	-0.2622	-1.5722**
		(0.4126)	(0.2979)	(0.2171)	(0.6236)	(0.2435)	(0.9228)	(0.0827)	(0.9539)	(0.5465)
EG	**6/11/2020**	0.1026	-1.8935	-1.6537	-1.3558	-2.2148	-7.4693*	-0.1630	-1.7331	-2.1536
		(1.4579)	(1.6617)	(1.4657)	(4.3768)	(1.7602)	(3.6993)	(0.8035)	(2.9613)	(2.5755)
EG	**7/9/2020**	-1.0287***	0.1397	-0.5632*	0.2013	-1.2560***	-1.9256+	-0.1365	1.0369+	-0.0894
		(0.2207)	(0.2039)	(0.2298)	(0.7382)	(0.3295)	(1.1363)	(0.1465)	(0.6175)	(0.4912)
EG	**9/11/2020**	-0.0342	0.1524	0.1913	4.0428***	5.2294***	2.0506+	0.5015***	2.6573***	0.9017
		(0.2740)	(0.2782)	(0.2764)	(0.9533)	(0.4822)	(1.1498)	(0.1295)	(0.6755)	(0.6321)
EG	**10/5/2020**	0.9922***	-0.2371	-0.0040	-1.2966	0.0560	-0.2333	-0.0855	0.8700	2.3007***
		(0.2305)	(0.2746)	(0.2160)	(0.8160)	(0.3242)	(0.8747)	(0.1475)	(0.6492)	(0.5724)
EG	**11/3/2020**	2.2896***	0.8657*	0.5301	-1.6870*	0.9089	2.6518+	0.0178		-0.9253
		(0.4758)	(0.3825)	(0.4947)	(0.8105)	(0.6112)	(1.5584)	(0.1799)		(0.6161)
EG	**11/30/2020**	-0.7046*	-0.3410	-0.7472*	-3.2990***	0.0191	-1.4450	0.3108*	-1.2835+	-1.2170
		(0.3115)	(0.2390)	(0.3394)	(0.7947)	(0.2922)	(1.2853)	(0.1309)	(0.6822)	(1.1503)
ECO	**3/23/2020**	-2.2663	0.3248	-1.1328		2.9992	-6.1141	-0.5624	-1.1696	-4.9771
		(2.6713)	(2.0543)	(2.2348)		(2.3124)	(9.1278)	(0.7306)	(4.7395)	(4.9144)
ECO	**5/19/2020**	-4.2957***	-2.9487***	-2.4541***	-13.9569***	-3.0678***	-12.5343***	-2.3661***	-6.6887***	-11.3610***
		(0.6814)	(0.5584)	(0.3915)	(1.3801)	(0.2841)	(1.9142)	(0.1083)	(1.0614)	(1.0867)
ECO	**6/9/2020**	1.3618**	0.3097	1.8902**		-0.9461	0.9676	0.6424***	3.2753***	4.3778***
		(0.4321)	(0.3434)	(0.7203)		(0.6653)	(1.1259)	(0.1696)	(0.8373)	(0.8101)
ECO	**7/10/2020**	0.0408	1.2486***	1.6799***	10.9262***	1.5226***	4.8709***	0.3682***	3.3810***	3.8360***
		(0.2062)	(0.2828)	(0.1913)	(0.8084)	(0.3372)	(0.7960)	(0.0997)	(0.7972)	(0.3986)
ECO	**10/6/2020**	-0.6349*	-0.1075	-0.7242**	2.0309*	-2.1361***	-1.5535*	-0.7481***	-1.3712+	-1.5555*
		(0.2775)	(0.3031)	(0.2208)	(0.9813)	(0.5547)	(0.7357)	(0.1178)	(0.7047)	(0.5984)
ECO	**11/4/2020**	-0.6524+	0.0308	1.1684	0.7871	1.2644+	3.2053	-0.1607	2.3266+	0.9248
		(0.3937)	(0.7616)	(0.9013)	(2.4747)	(0.6938)	(2.1961)	(0.4179)	(1.1959)	(1.0845)
CE	**3/20/2020**	4.6425	-4.8243	-4.7726	57.8350***	-1.7984	-6.4582	-4.2445*	-3.2604	2.2246
		(4.2751)	(4.2984)	(4.4446)	(16.3759)	(4.8987)	(10.6524)	(1.7810)	(6.4115)	(5.3715)
CE	**5/27/2020**	-1.6470***	-3.7621***	-3.5910***	-2.3461	-3.1439***	-8.3243***	-2.3753***	-7.4699***	-3.1870***
		(0.3790)	(0.4516)	(0.3489)	(2.1538)	(0.2533)	(0.8526)	(0.1033)	(0.9420)	(0.7399)
CE	**7/23/2020**	-0.1560	-1.0218**	-0.7317*	-12.4057***	-2.6149***	-8.8478***	0.1514	-3.0923***	-2.6722***
		(0.3588)	(0.3593)	(0.2812)	(1.3354)	(0.3369)	(0.8413)	(0.1525)	(0.6127)	(0.3980)
CE	**11/24/2020**	0.6827+	1.2828**	0.2434	-0.7089	0.7892**	1.1638	0.3281*	0.2577	0.6315
		(0.3658)	(0.4814)	(0.2197)	(0.6810)	(0.2785)	(1.1072)	(0.1493)	(0.5026)	(0.5985)

					Other Events				
ITA Downgrades by Fitch	0.1019	-1.6141***	-0.5266	6.1623	0.9685	8.6794***	-0.4068+	-2.2440*	0.0235
	(0.7498)	(0.3596)	(0.4091)	(6.5685)	(2.4033)	(1.7548)	(0.2422)	(1.1276)	(0.9520)
Franco German Proposal	0.6324	-3.5478***	-1.1163+	-8.6307	1.5972	-13.7628***	0.7258*	-4.6339**	-4.3255***
	(0.6660)	(0.5366)	(0.6277)	(6.5580)	(2.4000)	(1.4225)	(0.3625)	(1.6393)	(0.9813)
Karlsruhe Statement	2.3251***	2.8402***	2.6269***	5.8456	1.3137	18.5036***	1.4166**	6.9336***	5.0190***
	(0.4371)	(0.4942)	(0.4411)	(6.5618)	(2.3511)	(1.7811)	(0.4349)	(0.8426)	(0.7643)
					Controls				
Δ Spread t-1	-0.0219	-0.0583	-0.1037	0.0688	-0.0284	-0.0813	-0.2001*	0.1699	0.1073
	(0.1000)	(0.0977)	(0.0918)	(0.0419)	(0.0646)	(0.0801)	(0.0892)	(0.1193)	(0.0927)
Δ Spread t-2	-0.2987*	-0.1176	-0.2196	0.0519	-0.0203	-0.1116	-0.1277	-0.1974+	-0.1906+
	(0.1314)	(0.1135)	(0.1424)	(0.0351)	(0.0770)	(0.1142)	(0.0976)	(0.1123)	(0.0985)
Δ Stock Market Index	-0.0144*	-0.0141***	-0.0098***	-0.2290***	-0.0073***	-0.0100***	-0.0322+	-0.0292*	-0.0128***
	(0.0068)	(0.0034)	(0.0029)	(0.0350)	(0.0020)	(0.0025)	(0.0180)	(0.0124)	(0.0031)
Δ US10Y TIPS	-6.1893+	1.1295	-1.2385	-30.9702*	-5.8471+	8.6298	2.1645	-9.7410	-6.3708
	(3.4515)	(4.2059)	(4.1341)	(11.9363)	(3.5360)	(14.3537)	(2.7233)	(8.6413)	(8.4042)
Δ VIX US	-0.0486	0.0454	0.0618	-0.2124	0.1576*	0.3825	0.0578	0.3089+	0.0713
	(0.0688)	(0.0945)	(0.0868)	(0.2029)	(0.0664)	(0.2422)	(0.0442)	(0.1681)	(0.1291)
Δ Covid Cases	-0.0005	0.0002	-0.0029	-0.1010	0.0420	0.0126	0.0094	-0.0073	-0.0121
	(0.0058)	(0.0028)	(0.0052)	(0.1431)	(0.0371)	(0.0414)	(0.0058)	(0.0167)	(0.0222)
Num.Obs.	216	220	220	213	218	222	220	187	219
R2	0.608	0.636	0.676	0.847	0.531	0.734	0.546	0.680	0.708
AIC	838.6	930.9	881.7	1439.8	1025.3	1444.9	671.6	1061.0	1152.3
HAC Correction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

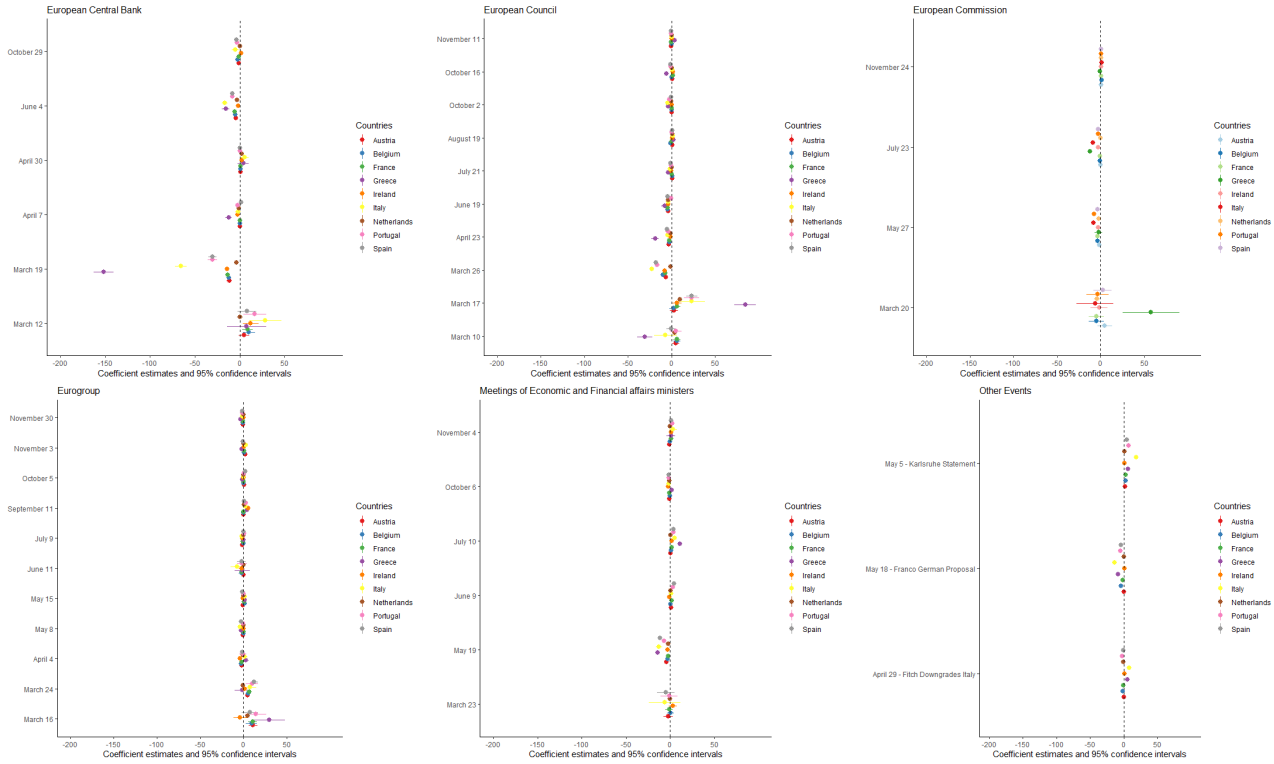
Notes: This table reports the estimated coefficients for each of listed events (see Table 2). We also report the estimated coefficients for our control variables. Standard errors are in parenthesis and are obtained using the Heteroskedasticity-and autocorrelation-consistent (HAC) estimators of the variance-covariance matrix following Zeileis (2004). *** (**, *, +) indicates statistical significance at the 0,1 (1, 5, 10) percentage level, respectively. Missing coefficients for some events are due to data limitations in yields spreads for our country based on Refnitiv Datastream 10-year sovereign bond yields data.

Table 5: Yields Spreads - A Two-step procedure

	Austria	Belgium	France	Greece	Ireland	Italy	Netherlands	Portugal	Spain
Av ECB	**-1,615****	**-1,507****	**-1,868****	**-31,796*****	**-0,553**	**-9,28*****	**-1,047****	**-4,399****	**-5,454*****
Total ECB	**-9,689****	**-9,041****	**-11,208****	**-158,98*****	**-3,315**	**-55,679*****	**-6,279****	**-26,391****	**-32,725*****
F Test	*10,375*	*4,511*	*6,729*	*139,24*	*0,378*	*20,798*	*9,544*	*6,902*	*15,143*
p-val	*0,002*	*0,035*	*0,01*	*0*	*0,539*	*0*	*0,002*	*0,01*	*0*
Av EC	**-0,079**	**-1,179****	**-0,228**	**6,17****	**-0,768***	**-2,374****	**0,487****	**0,162**	**-0,539**
Total EC	**-1,285**	**-10,908****	**-2,348**	**51,542****	**-5,986***	**-20,628****	**4,44****	**1,181**	**-5,202**
F Test	*0,178*	*9,679*	*0,636*	*8,763*	*3,883*	*4,291*	*5,5*	*0,031*	*0,958*
p-val	*0,673*	*0,002*	*0,426*	*0,004*	*0,05*	*0,04*	*0,02*	*0,861*	*0,329*
Av EG	**1,346*****	**1,107****	**1,273*****	**2,573****	**-0,331**	**0,029**	**0,305***	**2,433****	**1,184****
Total EG	**14,806*****	**12,182****	**14,006*****	**28,301****	**-3,64**	**0,288**	**3,356***	**24,329****	**13,023****
F Test	*23,3*	*9,791*	*19,833*	*5,871*	*0,715*	*0,004*	*3,825*	*8,818*	*3,978*
p-val	*0*	*0,002*	*0*	*0,016*	*0,399*	*0,951*	*0,052*	*0,003*	*0,048*
Av ECO	**-1,249****	**0,059**	**0,269**	**-2,238**	**0,048**	**-1,335**	**-0,286***	**0,158**	**-1,497***
Total ECO	**-7,491****	**0,353**	**1,612**	**-11,189**	**0,287**	**-8,011**	**-1,716***	**0,949**	**-8,984***
F Test	*7,494*	*0,033*	*0,577*	*0,284*	*0,017*	*0,731*	*3,339*	*0,036*	*3,188*
p-val	*0,007*	*0,856*	*0,449*	*0,595*	*0,896*	*0,394*	*0,069*	*0,851*	*0,076*
Av CE	**0,952**	**-2,081***	**-2,213***	**10,594****	**-1,692***	**-5,617****	**-1,535*****	**-3,391****	**-0,751**
Total CE	**3,81**	**-8,325***	**-8,852***	**42,374****	**-6,768***	**-22,467****	**-6,14*****	**-13,565****	**-3,003**
F Test	*0,697*	*3,199*	*3,736*	*5,85*	*1,767*	*4,017*	*10,898*	*4,094*	*0,274*
p-val	*0,405*	*0,075*	*0,055*	*0,017*	*0,186*	*0,047*	*0,001*	*0,045*	*0,602*

Notes: This Table displays the average and total contribution of the different institutions on individual spreads. F-test are performed to estimate the joint significance of European institutions announcements. Events refer to official announcements by the European Central Bank (ECB), the European Council (EC), the European Commission (CE), Eurogroup (EG), EU Economic and Finance Ministers (Eco). *** (**, *) indicates statistical significance at the 1 (5, 10) percentage level, respectively. We rely on the HAC variance co-variance matrix correction for standard errors.

Figure 2: Spreads levels Results - One-by-One Events



Notes: This Figure displays the estimated coefficients of an even-study on the 10 year bond yields of euro-area members. Events refer to official announcement by the European Central Bank (ECB), the European Council (EC), the European Commission (CE), Eurogroup (EG), EU Economic and Finance Ministers (Eco). All events are described in the timeline computed by the authors. We include one dummy variable for each event and we estimate the confidence intervals using the HAC variance co-variance matrix.

Table 6: Yield Spreads - Robustness Excluding 26 of March 2020 from EC

	Austria	Belgium	France	Greece	Ireland	Italy	Netherlands	Portugal	Spain
Av ECB	**-1,615****	**-1,507****	**-1,868****	**-31,796*****	**-0,553**	**-9,28*****	**-1,047****	**-4,399****	**-5,454*****
Total ECB	**-9,689****	**-9,041****	**-11,208****	**-158,98*****	**-3,315**	**-55,679*****	**-6,279****	**-26,391****	**-32,725*****
F Test	*10,375*	*4,511*	*6,729*	*139,24*	*0,378*	*20,798*	*9,544*	*6,902*	*15,143*
p-val	*0,002*	*0,035*	*0,01*	*0*	*0,539*	*0*	*0,002*	*0,01*	*0*
Av EC	**0,728**	**-0,088**	**0,592**	**6,17**	**0,271**	**0,14**	**0,71*****	**2,183****	**1,653**
Total EC	**5,248**	**-1,006**	**4,447**	**51,542**	**2,059**	**1,856**	**5,74*****	**17,187****	**12,871**
F Test	*0,288*	*0,051*	*2,412*	*2,145*	*0,46*	*0,06*	*17,26*	*4,228*	*2,627*
p-val	*0,592*	*0,821*	*0,122*	*0,145*	*0,499*	*0,807*	*0*	*0,042*	*0,107*
Av EG	**1,346*****	**1,107****	**1,273*****	**2,573****	**-0,331**	**0,029**	**0,305***	**2,433****	**1,184****
Total EG	**14,806*****	**12,182****	**14,006*****	**28,301****	**-3,64**	**0,288**	**3,356***	**24,329****	**13,023****
F Test	*23,3*	*9,791*	*19,833*	*5,871*	*0,715*	*0,004*	*3,825*	*8,818*	*3,978*
p-val	*0*	*0,002*	*0*	*0,016*	*0,399*	*0,951*	*0,052*	*0,003*	*0,048*
Av ECO	**-1,249****	**0,059**	**0,269**	**-2,238**	**0,048**	**-1,335**	**-0,286***	**0,158**	**-1,497***
Total ECO	**-7,491****	**0,353**	**1,612**	**-11,189**	**0,287**	**-8,011**	**-1,716***	**0,949**	**-8,984***
F Test	*7,494*	*0,033*	*0,577*	*0,284*	*0,017*	*0,731*	*3,339*	*0,036*	*3,188*
p-val	*0,007*	*0,856*	*0,449*	*0,595*	*0,896*	*0,394*	*0,069*	*0,851*	*0,076*
Av CE	**0,952**	**-2,081***	**-2,213***	**10,594****	**-1,692***	**-5,617****	**-1,535*****	**-3,391****	**-0,751**
Total CE	**3,81**	**-8,325***	**-8,852***	**42,374****	**-6,768***	**-22,467****	**-6,14*****	**-13,565****	**-3,003**
F Test	*0,697*	*3,199*	*3,736*	*5,85*	*1,767*	*4,017*	*10,898*	*4,094*	*0,274*
p-val	*0,405*	*0,075*	*0,055*	*0,017*	*0,186*	*0,047*	*0,001*	*0,045*	*0,602*

Notes: This Table displays the average and total contribution of the different institutions on individual spreads excluding the 26 March 2020 of the EC event classification as it overlap with the start of purchase by the ECB under the PEPP of sovereign bonds. F-test are performed to estimate the joint significance of European institutions announcements. Events refer to official announcements by the European Central Bank (ECB), the European Council (EC), the European Commission (CE), Eurogroup (EG), EU Economic and Finance Ministers (Eco). *** (**, *) indicates statistical significance at the 1 (5, 10) percentage level, respectively. We rely on the HAC variance co-variance matrix correction for standard errors.

Figure 3: Mean Normalized Total Effects of Institutional announcements in the EA - Yields Spreads

Notes: This Figure displays the cumulative contribution of the different institutions on individual spreads, proportionally to the individual mean spread over the period (as reported in Table 5). We report only institutions with a significant F-test. Events refer to official announcements by the European Central Bank (ECB), the European Council (EC), the European Commission (CE), Eurogroup (EG), EU Economic and Finance Ministers (Eco).

Table 7: Yields Levels - A Two-step procedure

	Austria	Belgium	France	Greece	Ireland	Italy	Netherlands	Portugal	Spain	Germany
Av ECB	**-1,715****	**-0,091**	**-1,094****	**-32,658*****	**-0,593**	**-7,122*****	**-1,165**	**-4,38*****	**-4,758****	**-0,529**
Total ECB	**-10,291****	**-0,545**	**-6,567****	**-163,288*****	**-3,556**	**-42,734*****	**-6,989**	**-26,282*****	**-28,547****	**-3,174**
F Test	*8,657*	*0,023*	*5,292*	*106,67*	*0,869*	*19,702*	*1,661*	*21,319*	*20,439*	*0,21*
p-val	*0,004*	*0,879*	*0,023*	*0*	*0,353*	*0*	*0,199*	*0*	*0,002*	*0,647*
Av EC	**-4,355*****	**-4,29*****	**-4,054*****	**1,836**	**-3,641*****	**-4,403*****	**-3,417*****	**-3,547*****	**-4,21*****	**-3,581*****
Total EC	**-43,546*****	**-42,899*****	**-40,539*****	**16,527**	**-32,769*****	**-44,025*****	**-34,171*****	**-35,475*****	**-42,105*****	**-35,806*****
F Test	*31,483*	*58,209*	*62,388*	*1,059*	*55,479*	*27,981*	*21,144*	*27,888*	*22,664*	*16,425*
p-val	*0*	*0*	*0*	*0,305*	*0*	*0*	*0*	*0*	*0*	*0*
Av EG	**1,92*****	**1,696*****	**1,43*****	**3,95****	**0,604**	**-0,853***	**0,693**	**2,989*****	**2,055****	**0,359**
Total EG	**21,117*****	**18,659*****	**15,727*****	**43,445****	**6,648**	**-8,531***	**7,621**	**29,886*****	**22,606****	**3,948**
F Test	*14,679*	*18,152*	*12,894*	*11,481*	*2,034*	*3,098*	*1,549*	*14,284*	*8,426*	*0,396*
p-val	*0*	*0*	*0*	*0,001*	*0,156*	*0,08*	*0,215*	*0*	*0,004*	*0,53*
Av ECO	**0,151**	**1,337*****	**1,218*****	**1,77**	**0,636***	**0,765**	**0,35**	**1,388****	**0,73**	**0,149**
Total ECO	**0,903**	**8,021*****	**7,308*****	**8,85**	**3,818***	**4,59**	**2,102**	**8,326****	**4,378**	**0,892**
F Test	*0,103*	*15,031*	*13,155*	*0,173*	*2,873*	*0,206*	*0,99*	*4,432*	*0,85*	*0,168*
p-val	*0,749*	*0*	*0*	*0,678*	*0,092*	*0,651*	*0,321*	*0,037*	*0,358*	*0,683*
Av CE	**1,767***	**-2,682*****	**-1,688***	**13,182*****	**-0,158**	**-3,076**	**-1,258**	**-0,624**	**0,447**	**-0,109**
Total CE	**7,069***	**-10,727*****	**-6,753***	**52,727*****	**-0,63**	**-12,305**	**-5,032**	**-2,495**	**1,79**	**-0,435**
F Test	*3,048*	*7,759*	*3,48*	*7,48*	*0,014*	*1,395*	*1,401*	*0,192*	*0,075*	0,005
p-val	*0,083*	*0,006*	*0,064*	*0,007*	*0,906*	*0,239*	*0,238*	*0,662*	*0,785*	0,943

Notes: This Table displays the average and total contribution of the different institutions on individual yields levels. F-test are performed to estimate the joint significance of European institutions announcements. Events refer to official announcements by the European Central Bank (ECB), the European Council (EC), the European Commission (CE), Eurogroup (EG), EU Economic and Finance Ministers (Eco). *** (**, *) indicates statistical significance at the 1 (5, 10) percentage level, respectively. We rely on the HAC variance co-variance matrix correction for standard errors.

Table 8: Yields Spreads - Robustness Stringency Index

	Austria	Belgium	France	Greece	Ireland	Italy	Netherlands	Portugal	Spain
Av ECB	**-1,87****	**-1,315**	**-1,726****	**-34,007*****	**-0,565**	**-9,036*****	**-0,617**	**-5,11****	**-5,353*****
Total ECB	**-11,217****	**-7,887**	**-10,358****	**-170,037*****	**-3,388**	**-54,214*****	**-3,701**	**-30,661****	**-32,115*****
F Test	*10,730*	*2,392*	*4,573*	*169,970*	*1 0,2737*	*15,820*	*2,332*	*8,522*	*17,618*
p-val	*0,001*	*0,124*	*0,034*	*0,000*	*0,602*	*0,000*	*0,129*	*0,004*	*0,000*
Av EC	**-0,309**	**-0,93****	**-0,243**	**2,27**	**-0,489**	**-1,768**	**0,684****	**0,105**	**-1,167**
Total EC	**-3,088**	**-9,295****	**-2,433**	**20,434**	**-4,402**	**-17,684**	**6,835****	**1,052**	**-11,673**
F Test	*0,444*	*4,411*	*0,369*	*2,514*	*1,703*	*1,672*	*12,062*	*0,014*	*1,777*
p-val	*0,506*	*0,037*	*0,544*	*0,115*	*0,194*	*0,198*	*0,001*	*0,905*	*0,184*
Av EG	**1,182*****	**1,077****	**1,213*****	**2,594****	**-0,398**	**-0,193**	**0,321****	**2,395****	**1,226****
Total EG	**13,006*****	**11,852****	**13,34*****	**28,534****	**-4,375**	**-1,93**	**3,53****	**23,951****	**13,485****
F Test	*12,248*	*9,678*	*18,111*	*7,787*	*1,067*	*0,155*	*4,120*	*8,253*	*4,626*
p-val	*0,000*	*0,002*	*0,000*	*0,006*	*0,303*	*0,694*	*0,044*	*0,005*	*0,033*
Av ECO	**-3,248****	**-1,197**	**-1,876**	**-13,995**	**-0,04**	**-9,405**	**-1,096***	**-4,48**	**-7,964***
Total ECO	**-6,496****	**-2,394**	**-3,751**	**-13,995**	**-0,08**	**-18,809**	**-2,192***	**-8,959**	**-15,928***
F Test	*5,598*	*0,115*	*0,012*	*0,265*	*0,263*	*1,139*	*3,780*	*0,563*	*2,987*
p-val	*0,019*	*0,735*	*0,913*	*0,607*	*0,608*	*0,287*	*0,053*	*0,454*	*0,0857*
Av CE	**0,731**	**-1,911**	**-2,274***	**9,822****	**-1,627**	**-5,543***	**-1,531****	**-4,089****	**-0,953**
Total CE	**2,923**	**-7,644**	**-9,095***	**39,29****	**-6,507**	**-22,172***	**-6,125****	**-16,358****	**-3,814**
F Test	*0,454*	*2,683*	*3,838*	*4,674*	*1,721*	*3,892*	*11,390*	*6,446*	*0,529*
p-val	*0,501*	*0,103*	*0,052*	*0,032*	*0,191*	*0,050*	*0,001*	*0,012*	*0,468*

Notes: This Table displays the average and total contribution of the different institutions on individual spreads replacing our COVID cases control variable by the Stringency Index (see Table 3). F-test are performed to estimate the joint significance of European institutions announcements. Events refer to official announcements by the European Central Bank (ECB), the European Council (EC), the European Commission (CE), Eurogroup (EG), EU Economic and Finance Ministers (Eco). *** (**, *) indicates statistical significance at the 1 (5, 10) percentage level, respectively. We rely on the HAC variance co-variance matrix correction for standard errors.

Table 9: Estimate of Fendel & al (2020) event-study with a different classification

Country	Yields levels *all 20 events*	***7 ECB events***	*2 PEPP events*	*5 ECB events*	***13 EC events***	Yields spreads *all 20 events*	***7 ECB events***	*2 PEPP events*	*5 ECB other events*	***13 EC events***
Austria	1,71	-1,45	-9,06**	0,68	3,83**	0.291	-0.111	-8.323**	1.844	0.868
Belgium	1,81	-0,9	-9**	1,84	3,46*	-0.23	-1.155	-8.512**	1.377	0.354
France	1,71	-1,35	-9,77**	1,41	3,63**	-0.239	-1.174	-9.618***	1.62	0.389
Greece	-6,9	-25,48	-77,26*	-9,06	3,75	-8.521	-26.978	-77.272*	-10.581	1.92
Ireland	1,94	-0,4	-8,55	1,56	3,73**	-0.082	-0.435	-8.982*	1.564	0.321
Italy	-0,94	-8,84	-42,33**	3,76	3,37	-9.206	-10.129	-43.757*	2.142	0.144
Netherlands	1,75	-1,08	-5,11*	0,18	3,45**	-1.429*	-1.533*	-4.036***	-0.153	0.277
Portugal	0,31	-5,36	-23,49**	1,61	3,19	-3.87	-4.195	-21.885*	1.924	-0.438
Spain	0,73	-4,76	-23,09*	1,6	3,7*	-4.845	-4.962	-21.990*	1.031	0.19
Germany	1,79	-0,2	-0,22	-0,53	2,97**					

Notes: This table reports the estimated coefficients from the Fendel et al. (2021) specification on yield levels and yield spreads, with the difference that 03/19/2020 is classified as an ECB event and not an EC event. In addition, the 7 ECB events (columns 2 and 7) are further broken down into 2 PEEP related announcement (columns 3 and 8) and 5 other announcements (columns 4 and 9). The unit is basis point. *** (**, *) indicates statistical significance at the 1 (5, 10) percentage level, respectively.

Table 10: Estimate of Fendel & al (2020) event-study using a two-step strategy

	Austria	Belgium	France	Greece	Ireland	Italy	Netherlands	Portugal	Spain	Germany
Panel A: Yields levels										
Av ECB	**-1,75***	**-0,548**	**-1,149***	**-14,463*****	**-0,065**	**-4,007****	**-1,24***	**-3,208****	**-2,692****	**-0,325**
Total ECB	**-10,502***	**-3,286**	**-6,895***	**-86,779*****	**-0,392**	**-24,042****	**-7,44***	**-19,251****	**-16,151****	**-1,947**
F Test	*3,4773*	*1,098*	*3,111*	*13,460*	*0,137*	*6,437*	*3,731*	*8,855*	*6,446*	*0,773*
p-val	*0,065*	*0,297*	*0,081*	*0,000*	*0,712*	*0,013*	*0,056*	*0,004*	*0,013*	*0,381*
Av EC	**4,14*****	**3,13****	**3,41****	**1,57**	**3,34*****	**0,26**	**3,9*****	**2,57**	**3,85****	**3,44*****
Total EC	**45,54*****	**34,45****	**37,47****	**17,26**	**33,37*****	**2,88**	**42,87*****	**28,26**	**42,39****	**37,87*****
F Test	*13,969*	*6,946*	*9,835*	*0,384*	*10,079*	*0,058*	*22,755*	*1,762*	*6,414*	*20,965*
p-val	*0,000*	*0,010*	*0,002*	*0,537*	*0,002*	*0,811*	*0,000*	*0,188*	*0,013*	*0,000*
Panel B: Yields spreads										
Av ECB	**-0,76**	**-1,03**	**-1,21**	**-15,71*****	**-0,03**	**-5,42*****	**-1,43*****	**-2,87**	**-3***	
Total ECB	**-4,54**	**-6,21**	**-7,24**	**-94,26*****	**-0,18**	**-32,52*****	**-8,57*****	**-17,21**	**-17,98***	
F Test	*0,492*	*2,139*	*2,455*	*12,007*	*0,014*	*7,168*	*39,470*	*2,185*	*3,327*	
p-val	*0,485*	*0,147*	*0,120*	*0,001*	*0,905*	*0,009*	*0,000*	*0,144*	*0,071*	
Av EC	**1,03***	**-0,33**	**-0,15**	**-0,73**	**-0,53**	**-2,94**	**0,25**	**-1,14**	**-0,09**	
Total EC	**11,3***	**-3,6**	**-1,66**	**-7,99**	**-5,32**	**-32,39**	**2,72**	**-12,51**	**-0,96**	
F Test	*3,049*	*0,153*	*0,029*	*0,032*	*0,537*	*1,608*	*1,054*	*0,495*	*0,010*	
p-val	*0,084*	*0,697*	*0,866*	*0,859*	*0,465*	*0,207*	*0,307*	*0,484*	*0,921*	

Notes: This Table reports the estimated coefficients of Fendel et al. (2021) specification with the differences that : i) 03/19/2020 is classified as an ECB event and not an EC event ii) we proceed in two-steps: first, we estimate the event-study using one single dummy by announcement and second, we test the significance of joint estimated coefficients of ECB and EC categories.*** (**, *) indicates statistical significance at the 1 (5, 10) percentage level, respectively. We rely on the HAC variance co-variance matrix correction for standard errors