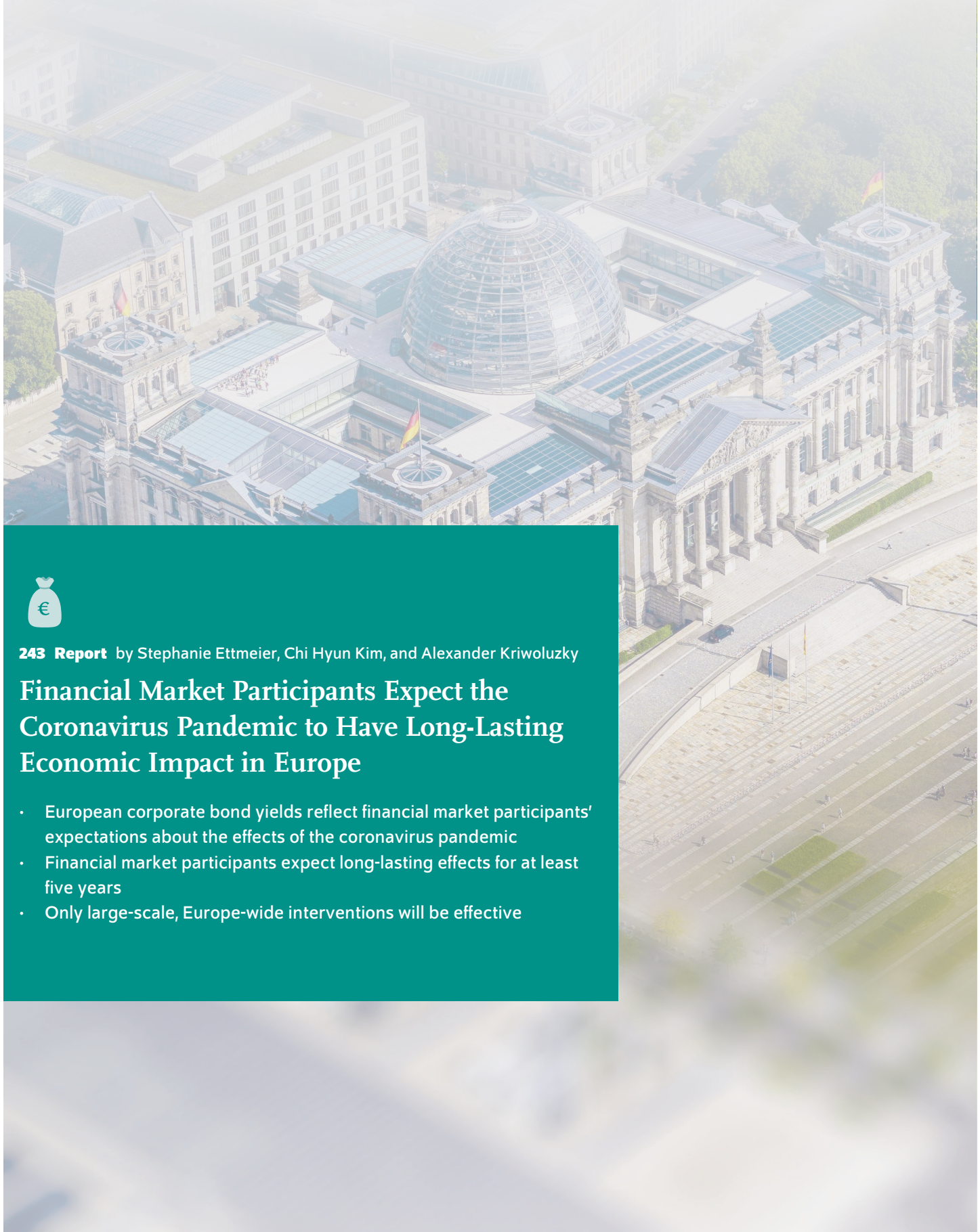


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243 Report by Stephanie Ettmeier, Chi Hyun Kim, and Alexander Kriwoluzky

Financial Market Participants Expect the Coronavirus Pandemic to Have Long-Lasting Economic Impact in Europe

- European corporate bond yields reflect financial market participants' expectations about the effects of the coronavirus pandemic
- Financial market participants expect long-lasting effects for at least five years
- Only large-scale, Europe-wide interventions will be effective

LEGAL AND EDITORIAL DETAILS



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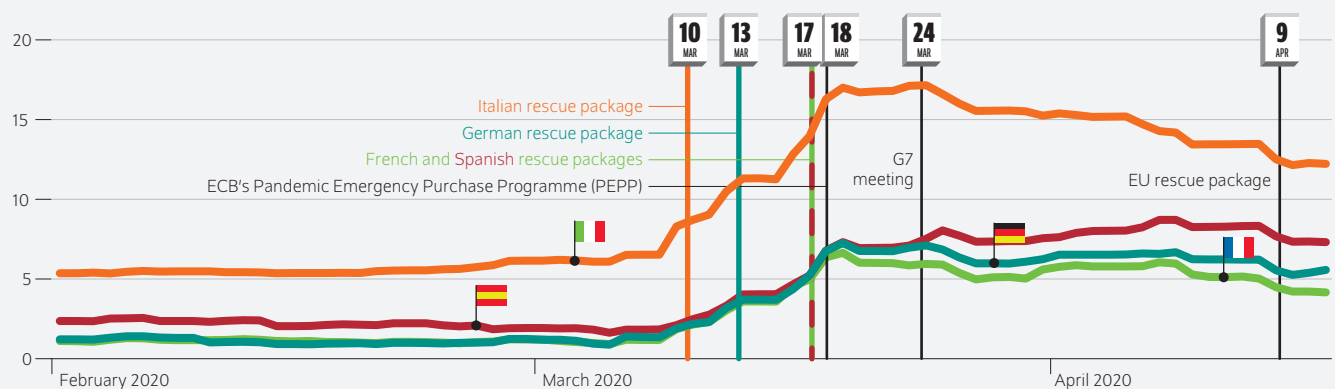
Financial Market Participants Expect the Coronavirus Pandemic to Have Long-Lasting Economic Impact in Europe

By Stephanie Ettmeier, Chi Hyun Kim, and Alexander Kriwoluzky

- European corporate bond yields reflect financial market participants' expectations about the coronavirus pandemic's economic consequences
- Increase in yields of long maturities indicates that financial market participants expect the negative effects of the coronavirus pandemic will be felt for at least five years
- Corporate bonds in the banking sector are (still) showing similar reactions as those in the real sector
- Economic policy interventions are only effective when they are large scale and coordinated Europe-wide
- Further monetary and fiscal policy measures should be coordinated to achieve a long-lasting impact

Economic policy measures of individual countries stabilized bond yields less effectively than the internationally coordinated G7, ECB, and EU announcements

Bond yields of non-financial corporations with five-year maturities in percent



Sources: Bloomberg; authors' own calculations.

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FROM THE AUTHORS

The European economy will be dealing with the effects of the coronavirus pandemic for a long time. A coordinated, Europe-wide approach to monetary and fiscal policy is absolutely necessary to combat the coming recession.

— Chi Hyun Kim —

MEDIA



Audio Interview with Chi Hyun Kim (in German)
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Financial Market Participants Expect the Coronavirus Pandemic to Have Long-Lasting Economic Impact in Europe

By Stephanie Ettmeier, Chi Hyun Kim, and Alexander Kriwoluzky

ABSTRACT

Market participants are generally in agreement that the coronavirus pandemic will have a severe impact on the European economy, but it is difficult to predict the length and extent of the pandemic's effects. However, using the yield curves of corporate bonds, we can reach some preliminary conclusions about the impact of the pandemic. The expectations of financial market participants are revealed in the yield curves of corporate bonds, as yields reflect risk expectations over various maturities. To analyze these expectations, we first estimated the yield curves of corporate bonds in Germany, France, Italy, and Spain and put them into context with the progression of the pandemic. This shows that the bond yields with long maturities are also increasing; therefore, financial market participants are expecting negative effects to last for at least five years. Using an event study, the effects of the European fiscal and monetary policy measures are analyzed as well. The results suggest that measures are successful when they are wide ranging and coordinated Europe-wide. Moreover, the results show that financial and monetary policies must also be coordinated to fight the economic impact of the pandemic effectively.

Amidst many uncertainties, one thing is clear: the ongoing COVID-19 pandemic in Europe is severe and spreading economic uncertainty. Policymakers and economists alike understand its threat to the economic system and are working jointly on appropriate strategies and policy measures to counteract the downturn. A prerequisite for a successful and elaborate economic policy reaction is and remains solid data. Using corporate bond data of the four euro area countries with the largest economic activity (Germany, France, Italy, and Spain), we estimate yield curves. Our analysis helps us understand what is currently happening in the economy by focusing on financial market participants' expectations of the pandemic's economic consequences. As the effectiveness of economic policies hinges crucially on expectations, our exercise is a necessary first step in evaluating policy measures.

Yield curves reflect financial market participants' expectations

To identify financial market participants' expectations, we estimate yield curves for a large sample of non-financial and financial corporate bonds of different maturities for Germany, France, Italy, and Spain between January 1, 2020, and April 17, 2020 (Box).¹ This approach allows us to create a differentiated perspective on the topic. First, we can illustrate how financial market participants' expectations towards the pandemic differ in the short and in the long term. Second, we can understand expectations towards different sectors by splitting our sample of corporate bonds into non-financial and financial assets and see whether they differ. Last, we carry out an event study and contextualize the relationship between the evolution of the yield curves during the pandemic and the most important monetary and fiscal policy measures taken at the European and national levels so far.

Our sample of corporate bonds is large and can be considered as representative for the euro area. Germany, France, Italy, and Spain account for 80 percent of the euro area's population, economic activity, and financial markets. In Table 1, we

¹ Huston McCulloch, "Measuring the term structure of interest rates," *The Journal of Business* 44, no. 1 (1971): 19–31; J. Huston McCulloch, "The tax-adjusted yield curve," *The Journal of Finance* 30, no. 3 (1975): 811–830.

Box

Estimating yield curves

Meaning

Generally, investors want to be compensated for taking the risk of holding financial assets. This compensation is the yield. The yield of a corporate bond can be driven by many factors. It is driven by bond-specific factors, such as the bond's maturity (the longer, the higher the yield), its liquidity risk (the more the bond is traded, the lower the yield), and the issuer's default risk (the higher the default risk, the higher the yield). Another factor is the general economic situation. In a situation with high economic uncertainty, *ceteris paribus*, investors demand a higher compensation for holding risky assets.

A yield curve visualizes the yield of a bond for its remaining maturity. Therefore, the shape of a yield curve enables us to infer financial market participants' expectations about how the bond will evolve. Estimating yield curves for many bonds, as we do in this study, allows us to infer financial market participants' expectations about the economic conditions in general. In turn, looking at different maturities allows us to infer how long financial market participants expect the economic consequences of the COVID-19 pandemic to last.

Estimation

In general, a bond pricing formula can be simplified to

$$P = \frac{CF}{(1+i)^n}$$

where CF stands for the cash flows of the bond up to maturity n , and $(1+i)^n$ for the discount rate. In yield curve estimation, one is interested in estimating the denominator of this formula for many different maturities. In our application, we choose a non-parametric estimation as proposed by McCulloch (1971, 1975), which was recently applied by Bayer et al. (2018).¹ The method models the denominator with piecewise cubic polynomials joined at predetermined knot points. The advantage of this approach is its flexibility and its potential to measure accurately expectations at any maturity. For each bond in our sample, we collect end-of-day prices, coupon rates, coupon payment dates, and maturity dates to carry out the estimation.

¹ For a detailed description of the method, see Christian Bayer, Chi Hyun Kim, and Alexander Kriwoluzky, "The term structure of redenomination risk," DIW Discussion Papers, no. 1740 (2018) (available online).

present summary statistics for the non-financial and financial corporate bonds for each country in the sample. In each country, the number of financial corporate bonds outnumbers the number of non-financial corporate bonds. In addition, the credit ratings of the bonds are especially interesting, as they differ across countries (Figure 1).² While the French and German corporate bonds in the sample mainly have low-risk ratings, Italian and Spanish corporate bonds received lower ratings on average.

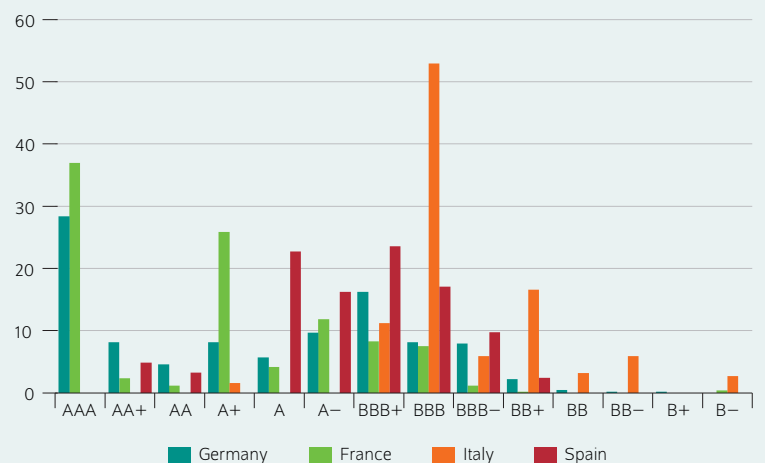
Financial market participants expect COVID-19 to have long-lasting negative economic consequences

In Figures 2 and 3, we present the estimation results for non-financial and financial corporations for maturities between one to five years. Non-financial corporations in all four countries experience a sudden and extreme increase in their financial risk from the beginning of March 2020 (Figure 2). On March 9, the date of the global stock market crash and of the lockdown in Italy due to the COVID-19 outbreak in Europe, the increase in yields accelerates (black vertical line). Italy seems to be affected the most; there, the five-year yields almost triple over the following days. Moreover, the pandemic seems to be influencing all maturities, especially in the long run: Since mid-March 2020, the five-year

Figure 1

Ratings of companies across countries

In percent per country



Note: Ratings are based on Standard & Poor's classification: AAA is the best rating (very secure), B- the worst (highly speculative). C- and D- ratings are considered to be at high risk of default.

Source: Bloomberg.

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Generally, Spanish and Italian bonds have a significantly worse rating than French and German bonds.

² A corporate bond's rating is determined on its issuance date on the primary market. In our sample, only 3.6 percent of corporate bonds were issued during the sample period (January to April 2020).

Table 1

Corporate bonds analyzed

Absolute number

	Germany	France	Italy	Spain
Non-financial corporations				
Bonds	229	172	89	53
Corporations	35	47	21	20
Financial corporations				
Bonds	1,098	670	197	107
Corporations	46	53	28	11

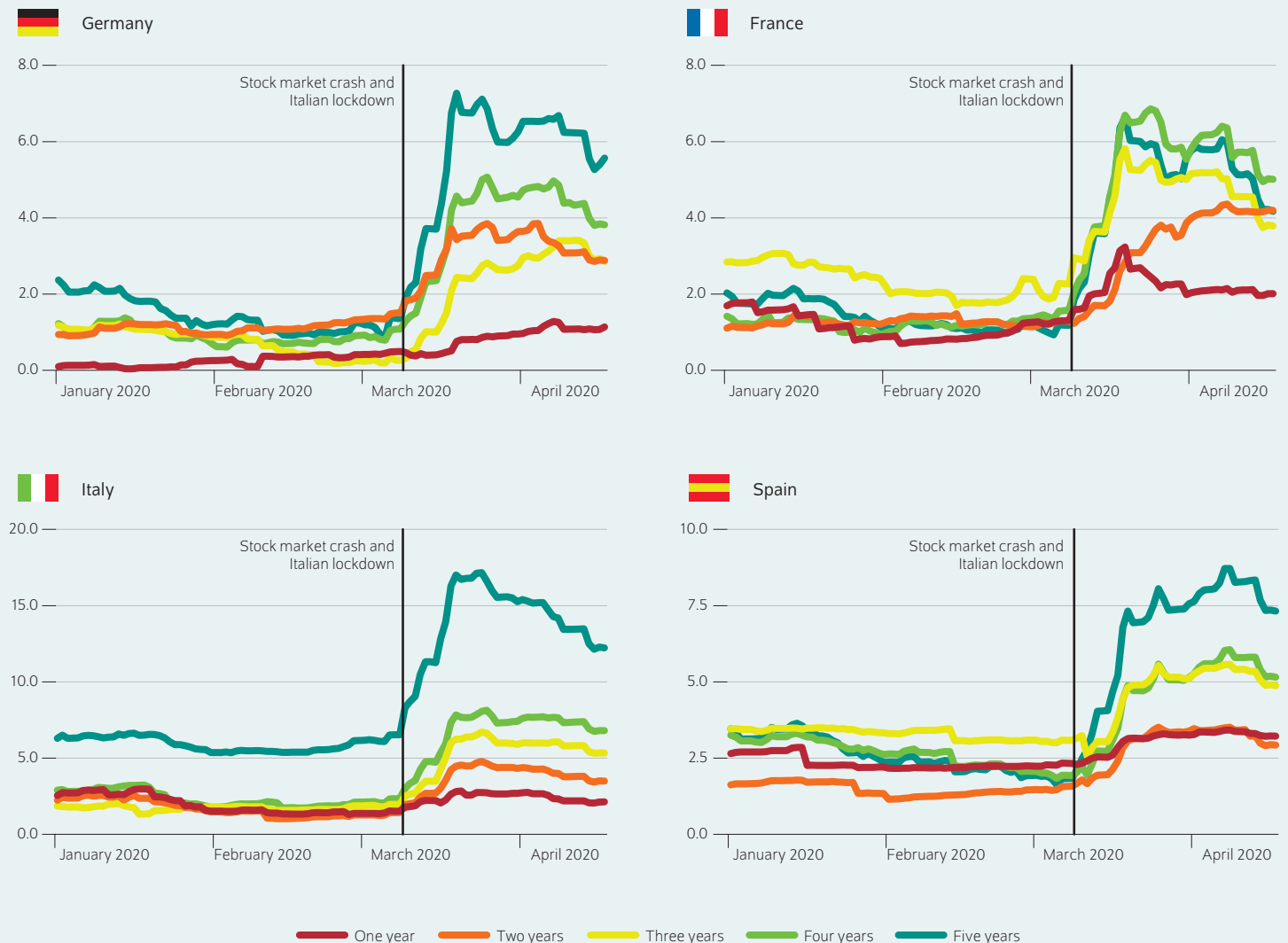
Source: Bloomberg.

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Figure 2

Bond yield curves of non-financial corporations

Yields according to maturities in percent



Note: The black vertical line represents the global stock market crash and the Italian lockdown on March 9, 2020.

Source: Bloomberg; authors' own calculations.

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The especially strong increase experienced by the bond yields with five-year maturities indicates that financial market participants expect the coronavirus pandemic to have a long-lasting impact.

maturities of all countries have increased drastically, meaning that the pandemic's negative economic consequences are currently still expected to be long lasting. The results are similar for financial corporations (Figure 3), meaning that the pandemic is affecting all sectors equally. This indicates that market participants do not (yet) believe the financial sector is more affected by the pandemic than the real sector.

Fiscal and monetary policy interventions are only partially effective

To contextualize the financial market participants' expectations with important fiscal and monetary policy

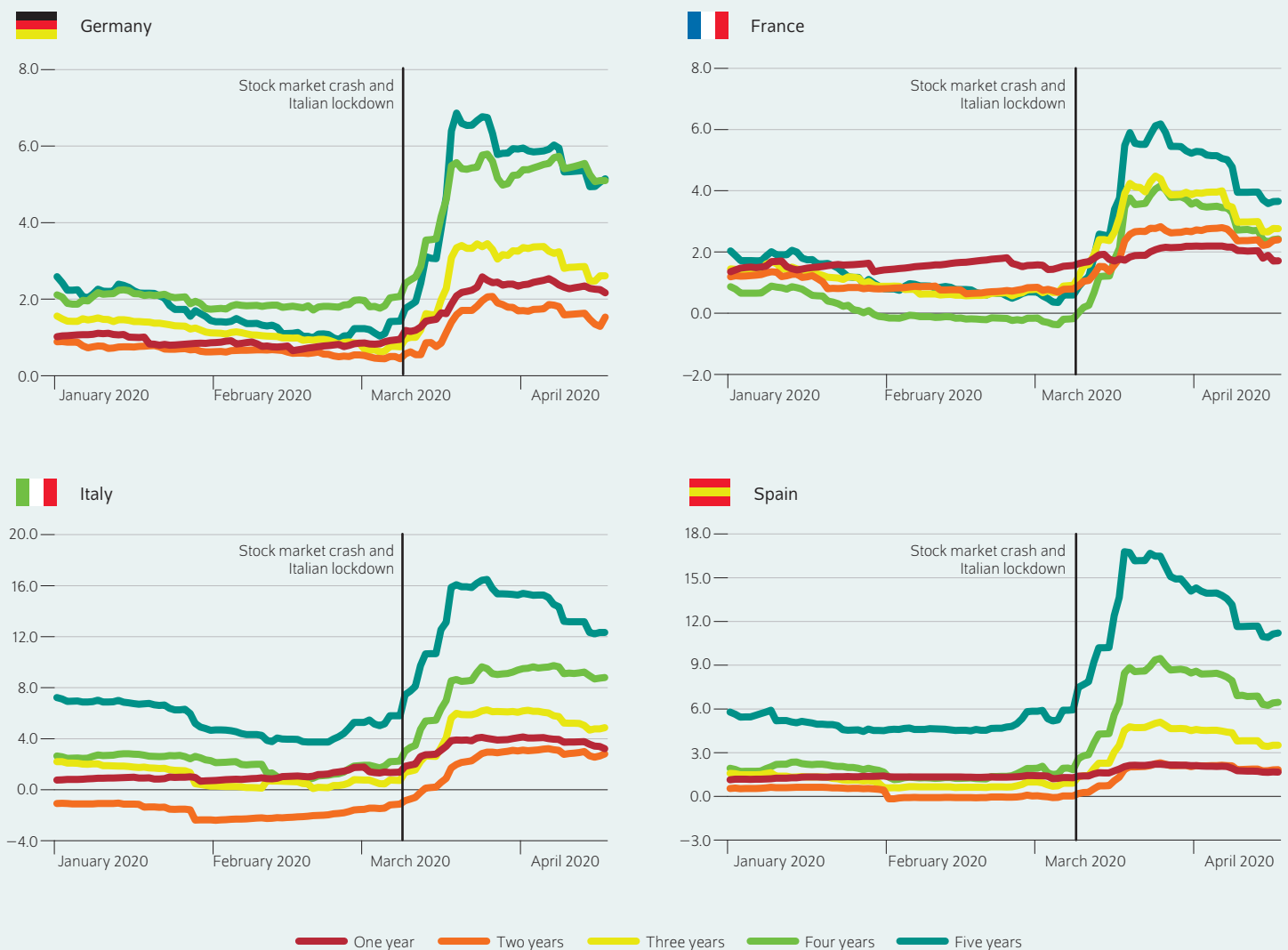
announcements in the euro area taken so far (Table 2), we conduct an event study. As the yield curves with longer maturities in particular have been experiencing a drastic increase since the arrival of COVID-19 in Europe, we focus exclusively on the five-year yield curves in the following exercise.

In terms of monetary policy, we look at the Pandemic Emergency Purchase Programme (PEPP), which the European Central Bank (ECB) announced on March 18, 2020. With this program, the ECB aims to temporarily increase their asset purchases by 30 percent. In terms of fiscal policy, we include the first major rescue package for each country. Italy announced its rescue package (25 billion euros) on

Figure 3

Bond yield curves of financial corporations

Yields according to maturities in percent



Note: The black vertical line represents the global stock market crash and the Italian lockdown on March 9, 2020.

Source: Bloomberg; authors' own calculations.

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The yields of bonds in the financial sector and the real economy are reacting similarly to the outbreak of the COVID-19 pandemic in Europe.

Table 2

Important monetary and fiscal policy announcements between March and April 2020

As of April 17, 2020

March 10, 2020	Announcement of a rescue package in Italy	25 billion euro stimulus measures, mainly including guarantees for small- and medium-sized companies, compensations for firms, and help for workers facing temporary layoffs
March 13, 2020	Announcement of a rescue package in Germany	Unlimited liquidity for small and medium-sized enterprises, guarantees for bank loans; amount: 550 billion euros
March 17, 2020	Announcement of a rescue package in Spain	Total amount 200 billion euros; mainly state-backed guarantees for companies, loans and financial aid to workers
March 17, 2020	Announcement of a rescue package in France	Tax breaks, direct state payments for companies in the amount of 45 billion euros; 300 billion in loans
March 18, 2020	ECB announces Pandemic Emergency Purchase Programme (PEPP)	The PEPP is a new temporary asset purchase program of private and public sector securities in the amount of 750 billion euros. The purchases are conducted until the end of 2020
March 24, 2020	G7 meeting of finance ministers and central bank governors	Pledge to coordinate and do whatever it takes to mitigate the coronavirus crisis
April 9, 2020	EU finance ministers announce a European rescue package	Total amount 540 billion euros; guarantees from the European Investment Bank and European Stability Mechanism; project for national short-time working schemes by European Commission.

Source: Authors' own depiction.

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March 10, and Germany its “bazooka” (550 billion euros) on March 13. On March 17, France (45 billion euros in direct payments, 300 billion euro loan guarantee) and Spain (200 billion euros) announced their rescue packages. In addition, we include the G7 meeting of finance ministers and central bank governors on March 24, 2020, and the rescue package (540 billion euros) announced by the EU finance ministers in Paris on April 9, 2020.³

Figure 4 stresses the development of the five-year yields regarding the PEPP. Interestingly, the monetary policy intervention coincides with a drop in financial risk in all four countries and for all sectors. The drop is comparable in size, meaning that the monetary policy intervention may have been effective.

Figure 5 summarizes the fiscal policy interventions. In general, national fiscal policy interventions do not seem to coincide with a change in the five-year yields. This finding holds for non-financial and financial sectors. Germany is an exception, where the introduction of the “bazooka” coincides with a temporary stabilization of financial market participants' expectations of the pandemic's negative economic consequences. Interestingly, the German rescue package seems to temporarily stabilize the French, Italian, and Spanish yields as well. The rescue package announced by the EU finance ministers on April 9 is also visible in the yields: Across all countries and all sectors, the yields experience a drop after its

announcement. The fact that the yields already begin declining the day before the official announcement of the pandemic economic rescue package shows the financial market participants' confidence in a European agreement.

Interestingly, the largest drop in the yields of France, Germany, and Italy over the sample coincides with the G7 meeting of finance ministers and central bank governors on March 24, 2020. The assertion to collaborate and to do whatever is necessary to restore confidence and economic growth was apparently interpreted as a credible and strong signal by the financial market participants.⁴ In the Spanish yields, this drop does not appear; we assume this is because Spain is not a member of the G7.

Conclusion: No halfway solutions, especially on the fiscal side

Since March 2020, financial market participants have been expecting the economic consequences of the COVID-19 pandemic to be severe and long lasting. This can be seen in the increase in corporate bond yields, especially of long maturities. The ECB's policy measures helped stabilize financial market participants' expectations over all countries, but monetary policy alone cannot counteract their increased risk perception. The fiscal policy measures taken so far on a national level in France, Italy, and Spain still seem to not be effective enough to calm the markets; only the announcement of the 550 billion euro rescue package in Germany coincides with a stabilization of market expectations.

A full causal evaluation of the economic policy measures taken as a response to COVID-19 so far must still be undertaken. Our main conclusion from this event study is that international cooperation matters. The announcement of

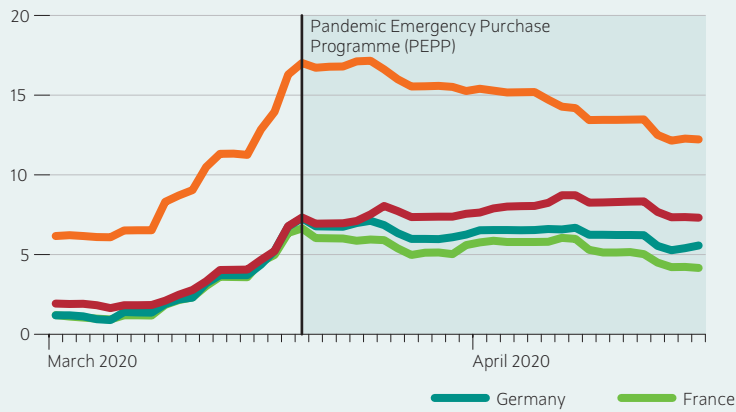
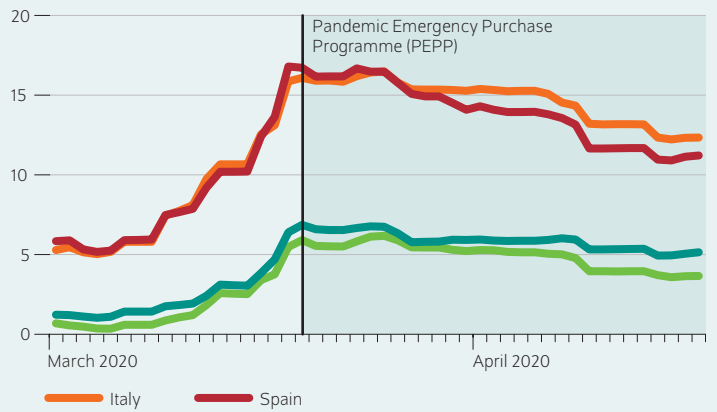
³ It is generally accepted in economics that just the announcement of an economic policy measure, not even its implementation, influences the expectations of financial market participants and thus their behavior. For this reason, it is important to take the date of each monetary and fiscal policy measure announcement into account in our event study. As our study uses the end-of-day prices of corporate bonds, we proceeded as follows: If the announcement was made during the day while the stock market was open, the event on the day of the announcement is included (such as the German rescue package on March 13). If the announcement was made late in the evening or on the weekend, the event on the next open day of the stock market was used. For example, the PEPP was announced late in the evening on March 18, and thus its effects on the stock market could first be seen on March 19.

⁴ See the final statement of the G7 (available online, accessed on April 27, 2020).

Figure 4

Monetary policy interventions of the ECB

Yields on bonds issued by non-financial corporations and financial corporations, five-year maturities, in percent

Non-financial corporations**Financial corporations**

Source: Bloomberg; authors' own calculations.

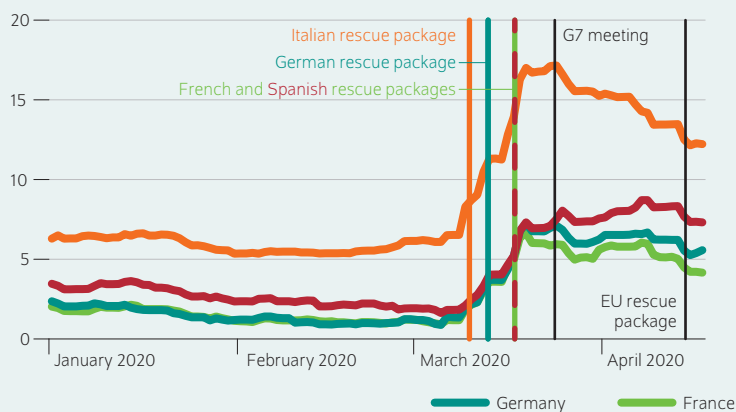
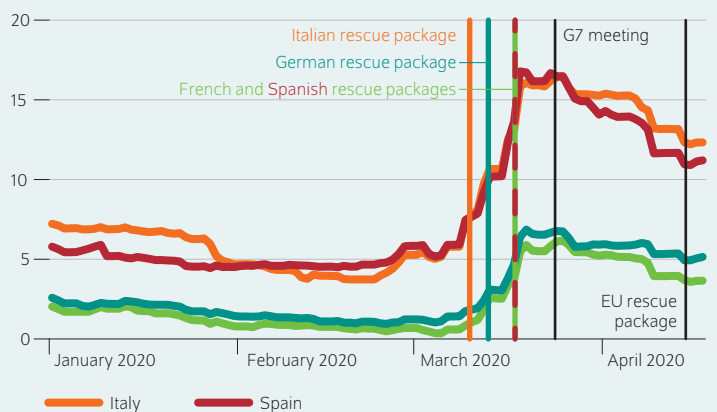
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The ECB's Pandemic Emergency Purchase Programme markedly stabilized corporate bond yields in all countries.

Figure 5

Monetary policy interventions in the euro area

Bond yields of non-financial corporations and of financial corporations with a five-year yield curve in percent

Non-financial corporations**Financial corporations**

Source: Bloomberg; authors' own calculations.

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The German and EU rescue packages were the only programs able to stabilize the yields in all four countries temporarily. The G7 meeting did not affect Spain's non-financial corporations.

the EU rescue package, which was comparable in size to the German rescue package, was able to partly restore financial market participants' confidence. The G7's pledge to collaborate at all costs had a similar effect. Our analysis shows that European countries must take monetary and fiscal policy

actions together, not alone, and that an adequate fiscal policy response must be well-coordinated with all European countries on board. Possible fiscal policy options could be a Europe-wide economic stimulus package or Europe-backed lending to companies.

CORONA AND THE FINANCIAL MARKETS

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