

A New World Post COVID-19

Lessons for Business, the Finance Industry and Policy Makers

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The Effects of the COVID-19 Pandemic Through the Lens of the CDS Spreads

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Abstract In this paper we are analysing the impact of the general lockdown measures imposed in Italy in the context of the COVID-19 pandemic on European banks' CDS spreads. Compared to the impact of the COVID-19 pandemic on sovereign risk, we find little evidence of increased bank risk following the event. However, investors' reaction was clearly negative in longer time frames. In addition, we quantify the feedback loop between sovereign and bank risk and document an increased interconnectedness between sovereigns and banks during the current health crisis, however with a smaller magnitude comparing to the sovereign debt crisis. Banks are now more resilient to shocks, being a direct consequence of the post-crisis regulatory framework.

Keywords COVID-19 pandemic. Bank risk. Country risk. Spillover effects.

Summary 1 Introduction. – 2 Related literature. – 3 Methodological aspects. – 4 Results and discussion. – 5 Conclusion.



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1 Introduction

The outbreak of the novel coronavirus, i.e. the SARS-CoV-2 and the disease it causes, i.e. the COVID-19, is a rare disaster that has affected the world economy in an unprecedented way. The severity of this global health crisis, which was declared a pandemic by the World Health Organization (WHO) on March 11, 2020, has been compared with that of the Great Influenza (Spanish Flu) from 1918-19 with up to 50 million worldwide fatalities (Boissay, Rungcharoenkitkul, 2020). At the time of writing, the total number of confirmed cases with COVID-19 is almost nine millions, whereas the global death toll is near 500,000 according to Johns Hopkins University.

Against the backdrop of highly globalised economies and integrated cross-border supply chains, the lockdown measures imposed in the majority of countries and the containment measures adopted to limit the spread of the virus have brought the global economy to a sudden stop, making this crisis *truly different*. Eichenbaum, Rebelo and Trabandt (2020) note that pandemics depress the real economy through a reduction in both supply and demand. As a consequence, governments around the world have stepped in with a mix of health, fiscal, monetary, macroprudential, microprudential and market-based stimuli in order to help households and businesses to have a quick recovery.¹ However, in the short run, these measures tend to boost the risk aversion of investors in government bonds, who are worried about the reduced fiscal capacity of countries that are too indebted (Andrieş, Ongena, Sprincean 2020).

We extend the analysis on European sovereign CDS spreads conducted in Andrieş, Ongena, Sprincean (2020) to European banks' CDS spreads, focusing on the sovereign-banks feedback loop during the global financial crisis from 2007-09, sovereign debt crisis in Europe (2010-13), and the current health crisis. We find that investors' reaction to the general lockdown measures imposed in Italy on March 9, 2020, which corresponds to the arrival of the pandemic in Europe, quantified through the abnormal performance of European banks' CDS spreads, is less pronounced than in the case of sovereign CDS spreads. However, on a longer time frame their concern increases. Our findings suggest that the spillover effects from sov-

¹ See the IMF Policy Tracker (<https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>) and the Global Policy Tracker from the Harvard Business School (<https://www.hbs.edu/covid-19-business-impact/Insights/Economic-and-Financial-Impacts/Global-Policy-Tracker>). From March to May 2020, the largest fiscal stimulus in Europe as a percent of 2018 GDP was implemented by Italy (25.15%), followed by Denmark (11.94%), Belgium (11.40%) and Switzerland (10.75%). On average, the fiscal announcements as a share of GDP for developed economies (6.66%) are twice as high as those announced by developing countries (3.64%).

ereigns to banks and vice versa, amplified following the COVID-19 shock. But their magnitude is smaller compared to other recent crisis episodes. This is the result of the solid position of the banks and their improved capacity to absorb losses due to stricter capital and liquidity regulation following the financial crisis of 2007-09.

2 Related Literature

European banks present specific features that substantially differentiate them from the US ones. If the latter recovered to the pre-crisis profitability level by 2013, the European banks still struggle to reach that level. This aspect is primarily explained by three factors (Carletti et al. 2020): (i) the European sovereign debt crisis which impacted severely especially the banks in peripheral countries (the GIIPS countries, i.e. Greece, Italy, Ireland, Portugal and Spain); (ii) the high level of non-performing loans: in the US, early government intervention helped banks to clear their balance sheets; and (iii) the macroeconomic environment: strong fiscal stimulus in the US compared to a sober approach (austerity measures) in Europe. Moreover, Europe's financial structure has become strongly bank-based, making it more prone to systemic risk (Langfield, Pagano 2016).

The nexus between the risk profile of banks and countries has been addressed in various studies, and is mainly attributed to four channels that interact with each other: (i) the sovereign exposure channel; (ii) the safety net channel; (iii) the collateral channel; and (iv) the sovereign downgrade channel (BIS 2011; De Bruyckere et al. 2013; Dell'Ariccia et al. 2018). Banks hold in their balance sheets a significant amount of public debt, averaging 30% in developed markets and 45% in emerging markets (Arslanalp, Tsuda 2014). According to Basel Accords, banks have to maintain capital buffers with regulatory risk weights that depend on their asset exposures. However, European banks do not hold capital against their European debt exposures, i.e. they have zero-risk weight (Keddad, Schalck 2020). As a consequence, European banks are undercapitalized if a negative shock hits countries and sovereign risk increases (Kirschenmann, Korte, Steffen 2019). In empirical analyses sovereign risk is found to influence banks' risk, especially in the context of the global financial crisis and sovereign debt crisis in Europe (Alter, Schüler 2012; De Bruyckere et al. 2013; Gibson, Hall, Tavlás 2016; Keddad, Schalck 2020).

The second transmission channel, the safety net channel, reflects the explicit and implicit guarantees provided by governments and central banks, especially for too-big-to-fail financial institutions, to support financial stability. When the fiscal position of countries worsens, the value of public guarantees to the banking system reduces, resulting in spillover effects from sovereign to bank risk (Alter,

Schüler 2012; Bertay, Demirgüç-Kunt, Huizinga 2013; Avino, Cotter 2014). In the same vein, banking crises activate backstops, guarantees and other resolution policies that affect public finance sustainability, resulting in spillover effects from bank to sovereign risk (Yu, 2017; Dell’Ariccia et al. 2018).

The third transmission channel is the collateral channel that operates against the backdrop of the reduced value of collateral that banks hold in the form of sovereign debt, affecting borrowing costs of banks in the interbank market, private repo markets and other types of transactions (BIS 2011; Correa et al. 2012; De Bruyckere et al. 2013). Finally, the last channel deals with sovereign rating downgrades that can affect banks’ borrowing capacity, leading to the downgrade of domestic banks. These channels have been investigated, among others, by Arezki, Candelon, Sy (2011) and Gibson, Hall, Tavlás (2016). The latter (2016) document that during the sovereign debt crisis in Europe the decline in commercial banks’ equity prices reflected direct and indirect linkages with the sovereigns. Dell’Ariccia et al. (2018) also mention the macroeconomic channel, i.e. the three-sided relationship between banks and government sector and real economic activity.

3 Methodological Aspects

We extend the analysis of Andrieş, Ongena, Sprincean (2020) to the European banking sector, investigating the impact of the COVID-19 pandemic on banks’ CDS spreads. Similarly to Andrieş, Ongena, Sprincean (2020), we employ an event study methodology to assess the reaction of investors in bank bonds to: (1) general lockdown measures imposed in Italy on March 9, 2020; (2) the pandemic intensity (the country specific day when the number of cases totalled 100, the growth rate climbed to 30 cases a day, and the death rate surpassed 10); (3) and some dates related to the stringency of the containment measures, such as restrictions on internal movement and general workplace closing. Further, we measure spillover effects from sovereigns to banks and vice versa during three crisis periods: (i) the global financial crisis of 2007-09; (ii) the euro area debt crisis of 2010-13; and (iii) the current health crisis, comparing their magnitude across and within groups. We follow the approach of Billio et al. (2012) and analyse the interdependencies between sovereigns and banks through Granger-causality networks. For banks from the same countries, we construct equally-weighted CDS indices. We use the 5-years CDS contracts denominated in Euro with modified-modified restructuring, written on senior obligations. The source of the data is Thomson Reuters DataStream.

4 Results and Discussion

Figure 1 exhibits the evolution of sovereign CDS spreads and banks' equally-weighted CDS indices for four European countries that have been heavily affected by the pandemic (Italy, Germany, France and Spain), over the January 1-April 20, 2020 period [fig. 1]. The vertical lines from each graph represent our main event date, i.e. March 9, 2020. We can note that, with the exception of Germany, all sovereign CDS quotes increased following the announcement of general lockdown measures imposed in Italy. The same is true for banks' CDS spreads, including German banks. Thus, investors reacted to this announcement by requiring higher premia to invest in bonds issued by these European sovereigns or by the banks headquartered in these countries.

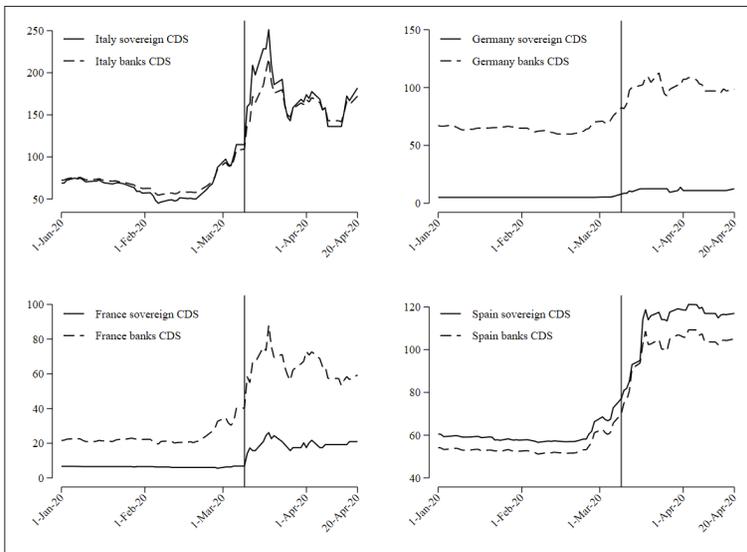


Figure 1 The evolution of sovereign CDS spreads and banks' CDS spreads (equally-weighted indices) for Italy, Germany, France and Spain from January 1, 2020 to April 20, 2020 (in basis points). Note: the vertical lines represent March 9, 2020

Next, we present the findings from the event study with March 9, 2020 as the main event date table 1.² The event study is conducted over the event windows: [0; 0], [-1; 1], [-5; 5], and [0; 30] days. Thus, we analyse the market reaction for short and longer time frames. The results show little evidence in favour of a negative reaction of inves-

² See Table A1 from the Annexes with the list of the banks used in our analysis.

tors in bonds issued by European banks on the event day, quantified through an increase in cumulative average abnormal change (CAAC)³ of CDS spreads by 94.22 basis points only. Only one test out of four (generalised sign test) shows statistical significance of CAACs on the event day. The findings for sovereign CDS spreads, however, indicate a clear negative effect on March 9, 2020 of 503.85 basis points boost in CAAC. Thus, the market reaction is more pronounced in the case of sovereign risk than bank risk. However, the harmful effect of containment measures to curtail the spread of the virus is present for banks over longer periods, especially for [-5; 5] days event window with an increase in CAAC by 4787.67 basis points, being highly statistically significant.

In terms of pandemic intensity, unreported results show that the highest risk from investors' in both sovereign and bank bonds is associated with a rapid increase in daily confirmed cases (i.e. 30 cases a day), whereas the general restrictions on internal movement worry more investors in bank bonds than those in sovereign bonds. Nonetheless, according to investors in European sovereign debt the economic channel of non-pharmaceutical interventions⁴ dominates that of coordination where people purposely reduce their consumption and labour supply to reduce the spread of the virus and the risks associated with the pandemic (Correia, Luck, Verner 2020).

3 Cumulative average abnormal change for CDS spreads is the analogue of cumulative average abnormal return (CAAR) from equity prices. We compute the change in CDS spreads as the natural logarithm of CDS quote at time t over CDS quote at time $t-1$. In event studies, the abnormal return (AR) is the difference between the actual and the expected return, the latter being calculated based on specific models. The AR can be averaged across all firms in the sample to get the average abnormal return (AAR) for each t . In the end, one can sum the AARs over specific time intervals to get the cumulative average abnormal return, which can capture the aggregate effect of the abnormal returns.

4 Strategies carried out by people and communities to limit the spread of the virus, besides vaccination and medical treatment (pharmaceutical interventions), such as social distancing and public hygiene.

Table 1 Banks' CDS spreads reaction to the general quarantine measures imposed in Italy

CDS CAACs 9 March 2020 (b.p.)				
Event window	[0; 0]	[-1; 1]	[-5; 5]	[0; 30]
29 European banks	94.22	2176.44	4787.67	3853.68
Significance tests				
Adjusted-Patell test	1.07	8.13***	10.09***	12.87***
BMP test	1.33	7.10***	8.40***	8.74***
Generalised sign test	-2.87***	3.46**	3.84***	4.21***
GRANK test	-0.57	2.36**	2.61**	2.83***

Note: this table exhibits the cumulative average abnormal changes (CAACs) in basis points of European banks' CDS spreads considering the following event windows: [0; 0], [-1; 1], [-5; 5], and [0; 30] days. The event refers to March 9, 2020. The estimation window is 250 days and the model employed to compute the expected change is the market model with DataStream Banks Europe 5Y CDS index as the market index (see Andrieş, Ongena, Sprincean 2020 for details). The table also reports the statistics of the tests used to assess the significance of CAACs: two parametric tests (Adjusted Patell and BMP tests) and two non-parametric tests (Generalised sign and GRANK tests). ** and *** denote statistical significance at the 5% and 1% level, respectively.

Further, we quantify the dynamic interconnectedness between sovereigns and banks in a Granger-causality framework. Considering our data, changes in sovereigns' CDS quotes can *Granger-cause* changes in banks' CDS spreads if information contained in the past values of sovereigns' CDS and in the past values of banks' CDS is better at predicting the value of banks' change in CDS than the information based only on the past values of banks' change in CDS (for details, see Andrieş et al. 2020). Following Billio et al. (2012) we compute the Dynamic Causality Index (DCI) which is based on Granger-causality relationships. An increase in the Dynamic Causality Index is associated with enhanced spillover effects between sovereign and bank risk.

Being constrained by the availability of data, our analysis starts on November 10, 2008. From figure 2, which depicts the evolution of the DCI index over time, we can note three spikes: two during the sovereign debt crisis, and one during the current health crisis [fig. 2]. The highest magnitude of the Dynamic Causality Index is reached during the European sovereign debt crisis indicating an increased feedback loop between sovereign and bank risk. The DCI is constantly raising during the global financial crisis. However we do not capture the Lehman Brothers event. Contrary to the Great Recession and sovereign debt crisis episodes, now banks are more resilient to shocks, being better equipped with capital and liquidity buffers and have lower incentives of excessive risk-taking as a direct consequence of the post-crisis regulatory environment. However, due to disruptions in

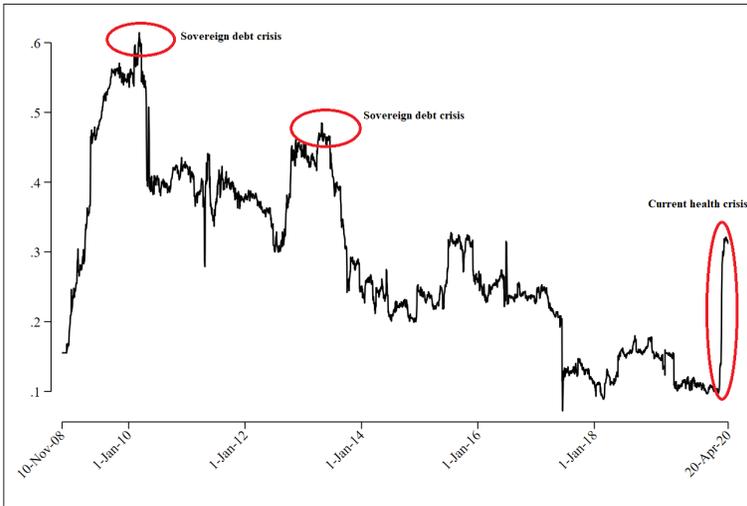


Figure 2 The evolution of Dynamic Causality Index over the November 10, 2008-April 20, 2020 period

the global supply chains and reduction in demand caused by the lockdown measures, banks could rapidly face a surge in non-performing loans amplified by the default of firms, notably small and medium-sized enterprises that depend on bank funding as their primary source of borrowing.⁵ Carletti et al. (2020) point-out four challenges that banks' business models will face in the post-COVID-19 era: (i) a prolonged period of low interest rates; (ii) increased credit risk; (iii) digitalisation; and (iv) stricter bank regulations.

Based on pairwise Granger-causality relationships between sovereigns and banks one can construct the Granger-causality network, being defined as a set of nodes (sovereigns and banks) connected by edges. If changes in sovereign i 's CDS spreads *Granger-cause* changes in bank j 's CDS quote, than these two nodes will be connected by a straight line with the arrow coming from sovereign i . Otherwise, there will be no connection. The arrow can also come from bank j to sovereign i if changes in bank j 's CDS spreads *Granger-cause* changes in sovereign i 's CDS quote. Unreported results show that linkages within groups (sovereign-sovereign and bank-bank) are more pronounced than linkages across groups (sovereign-bank and bank-

5 The main macroprudential measures adopted at the European level to mitigate the negative effects of COVID-19 pandemic and avoid a credit crunch consist of relaxation of regulatory capital buffers, such as capital conservation buffer, countercyclical capital buffer, and systemic risk buffer. For more details, see the database from the ESRB: <https://www.esrb.europa.eu/home/coronavirus/html/index.en.html>.

sovereign), and the Italian banks are the most exposed to shocks that propagate through the network.

5 Conclusion

The COVID-19 pandemic is a rare disaster that has affected the global economy in an unprecedented way. Governments around the world have stepped in by making use of health, fiscal, microprudential, macroprudential, monetary, or market-based measures in order to mitigate the negative effects of the health crisis and to avoid a credit crunch in the banking sector. We analyze the impact of the general lockdown measures imposed in Italy in the context of the COVID-19 pandemic on European banks' CDS spreads. Compared to sovereign risk, we find little evidence of increased bank risk following the event, which also corresponds to the commencement of the pandemic in Europe. However, investors' reaction was clearly negative in longer time frames. In addition, we quantify the feedback loop between sovereign and bank risk and document an increased interconnectedness between sovereigns and banks during the current health crisis, but with a smaller magnitude as compared to the sovereign debt crisis in Europe. Banks are now more resilient to shocks, being better equipped with capital and liquidity buffers and have lower incentives to excessive risk-taking as a direct consequence of the post-crisis regulatory framework.

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Table A1

List of the banks used in the analysis

Nr. crt.	Name of the bank	Country of origin
1	ERSTE GROUP BANK AG	Austria
2	BAWAG PSK	Austria
3	DANSKE BANK A/S	Denmark
4	BNP PARIBAS SA	France
5	SOCIETE GENERALE	France
6	CREDIT AGRICOLE SA	France
7	DEUTSCHE BANK AG	Germany
8	BAYERISCHE LANDESBANK	Germany
9	COMMERZBANK AG	Germany
10	LANDESBANK BADEN-WÜRTTEMBERG	Germany
11	IKB DEUTSCHE INDUSTRIEBANK AG	Germany
12	LANDESBANK HESSEN-THÜRINGEN GIROZENTRALE	Germany
13	ALLIED IRISH BANKS	Ireland
14	UNICREDITO ITALIANO SPA	Italy
15	MEDIOBANCA SPA	Italy
16	BANCO COMERCIAL PORTUGUES SA	Portugal
17	BANKINTER SA	Spain
18	BANCO DE SABADELL	Spain
19	BBV ARGENTARIA SA	Spain
20	CAJA DE AHORROS DEL MEDITERRÁNEO	Spain
21	SVENSKA HANDELSBANKEN AB	Sweden
22	SWEDBANK AB	Sweden
23	SKANDINAVISKA ENSKILDA BANKEN AB	Sweden
24	CREDIT SUISSE GROUP	Switzerland
25	UBS AG	Switzerland
26	LLOYDS BANK	United Kingdom
27	BARCLAYS BANK PLC	United Kingdom
28	THE RBS GROUP PLC	United Kingdom
29	HSBC BANK PLC	United Kingdom

