



Degree Program in Economics and Business

Course of Corporate Finance

The corporate bond market:  
the impact of the COVID-19 health crisis  
on issuers and market functioning

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## **ABSTRACT**

*The thesis examines the effects that the COVID-19 pandemic has had on financial markets, with particular reference to the market for issues by companies, the so-called corporate bond market. The analysis, after a brief description of the importance of the corporate bond market, along with its characteristics and structure, highlights the serious problems that manifested themselves when the pandemic spread internationally in a violent and sudden way. The study refers to the corporate bond market with particular regard to the North American market and the European financial markets, highlighting that the corporate bond market in the first months of the pandemic was strongly impacted in a negative sense, as trading on the market was significantly reduced, some operators stopped buying, giving liquidity to the market, while sales and spreads increased. In a nutshell, the market is as if it had jammed, and only thanks to the measures launched by the main central banks, have operating conditions been restored. These measures adopted in a short time have allowed corporate issuers to return to the market, and therefore to be able to issue debt instruments, in order to finance new investments and overcome the economic crisis induced by COVID-19.*

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## **1. INTRODUCTION**

At the end of 2019 and in the following years, as everyone knows, the world population has been negatively affected by the spread of the epidemic known as COVID-19, an acronym for Corona Virus Disease 19, an infectious respiratory disease caused by the SARS-CoV-2 virus belonging to the coronavirus family. The disease was first identified in December 2019 in Wuhan, China. It has rapidly spread around the world since January 2020, with the first official case recorded in the US on 21 January 2020, while in Europe it happened just three days later.

On 30 January 2020, the World Health Organization (WHO) declared the coronavirus epidemic in China a public health emergency of international concern. Subsequently, on 11 March 2020, the WHO – having assessed the alarming levels of spread and severity of coronavirus cases recorded outside China – officially declared COVID-19 a "pandemic". It is estimated that more than 200 million people have been infected and more than 3 million individuals have lost their lives due to COVID-19.

According to estimates by the International Monetary Fund (IMF), the world GDP fell by 3.3% in 2020, the strongest contraction of the economy since World War II. At the euro-area level, GDP contracted the largest since the start of the European monetary union.

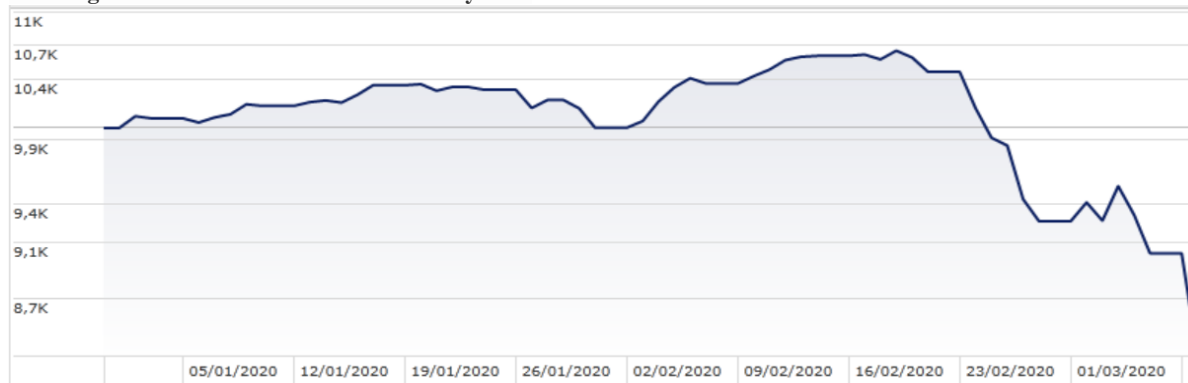
International trade, which was impacted by the restrictions imposed by the authorities on the free movement of people and the movement of goods, fell by about 9% in 2020. Exports recorded a sharp decline, especially in the first half of 2020, but then, in the final months of the year, they regained momentum and mostly reached pre-Covid levels (2019).

Italy's GDP recorded the heaviest decline since World War II, marking a decline of 8.99%, and, as reported by the Bank of Italy, the contraction of gross domestic product affected all geographical areas of the country but was more pronounced in the North, an area of the country that was hit the hardest by the first wave of infections. Consumptions fell by 10% and the Italian companies slowed down fixed investment, particularly the purchase of capital goods.

The virus and the strict health measures adopted in all countries of the world in order to deal with the epidemiological emergency, in addition to significantly entailing psychological consequences in many people (symptoms of depression, anxiety, changes in behavioral, social, emotional and cognitive processes), have had significant effects on the development dynamics, economic balances and the functioning of markets, including financial markets.

Regarding the impact of the pandemic on the financial sector, the COVID-19 pandemic significantly affected all financial markets, however, as stated by several researchers, not all markets and securities were hit in the same way.

### Morningstar Global Market Index since early 2002



Euro data as of 9 March 2020. Source: Morningstar Direct

As happened to stock markets worldwide, the euro-area bond market was not much affected by the news about the COVID-19 virus diffusion up to the last week of February 2020, when the first severe lockdown measures were taken in Europe.

Following the first severe lockdown measures, the issuance cost of securities for capital markets transactions suddenly increased in all market segments regardless of the business sector of the issuing corporation.

However, concerning the euro-area, it is estimated that the bonds eligible for the European Central Bank (ECB) corporate programme (CSPP) benefited from a more muted impact of around 40 basis points. In contrast to the 2008 crisis, the COVID-19 induced stress originated outside the financial system, and has been an unprecedented shock, affecting, as before stated, all aspects of the economy and across all jurisdictions.

It triggered a rapid response by authorities focused on easing monetary and fiscal policy to support demand and cover lost incomes associated with lockdowns to contain the spread of COVID-19<sup>1</sup>. Following the announcement of large-scale and coordinated intervention by authorities and central banks, indeed, market confidence and functioning were restored and, as a result, the most severe market disruption lasted only a few weeks.

Nonetheless, during those critical few weeks, the effects of the pandemic and the public health measures taken by governments to contain them led to a widespread need for liquidity and a severe disruption of the corporate bond markets.

In September 2019, the ECB announced a new wave of corporate asset purchases to reinforce the accommodative impact of the policy rates and ease euro-area corporations' financing conditions. In

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<sup>1</sup> See Financial Stability Board (FSB) report: COVID-19 Pandemic: Financial Stability Implications and Policy Measures Taken.

particular, following the experience of the first Corporate Sector Purchase Programme (CSPP), the purchases of bonds of eligible quality were expected not only to have a direct impact on targeted bonds, specifically regarding prices and quantities, but also to rebalance the portfolios of many institutional investors.

The present thesis furthers a brief analysis of the structure of the corporate bond market (Chapter 2), proposes to examine the effects of the pandemic on the functioning of the corporate bond market, with particular regard to liquidity, trading frequency, and institutional investor behavior (Chapter 3).

Finally, we will investigate the role of central banks and public institutions in addressing the COVID-19 shock (Chapter 4).

## 2. THE CORPORATE BOND MARKET

Corporate bonds are bond instruments issued by private commercial companies (issuers), which can be traded on a stock exchange (regulated market or multilateral trading facility – MTF) or, alternatively, on the over-the-counter (OTC) market.

Securities issued by corporations are debt securities where the holder of the bond becomes a creditor of the issuing company and is entitled to receive its repayment at maturity of the amount invested with coupons (interest) related to the bond. These instruments are primarily subject to the credit risk of the issuer.

With regard to the reasons that push companies to issue of corporate bonds, it is necessary to start from the consideration that one of the main objectives of the companies' top management is to identify the financial structure that maximizes the value of the company using the securities issued and the different sources of financing (banks, suppliers, equity, etc.). In order to achieve the ideal mix of funding sources, the company may use different combinations of financing or investment in order to identify the optimal level and composition of funding sources.

In 1958 Modigliani and Miller demonstrated how, under certain conditions, it is irrelevant for a company whether to choose to finance itself by issuing shares or debt securities. These conditions consist of the existence of an efficient market, with no taxation, no bankruptcy, and no information asymmetries. In presence of this, *Proposition I* of the Modigliani and Miller theorem states that "*the market value of any firm is independent of its financial structure*".<sup>2</sup>

However, companies are faced with a very different reality from that imagined by the two scholars in which these conditions are unrealizable.

In the current financial environment, characterized by high volatility and risks, and uncertainties due to the credit crunch, firms are diversifying their sources of financing.

In long-term financing, the main instruments used by companies are bank loans (mortgages) and the issue of bonds, normally placed, as will be said later, with institutional investors. Both types of financing can be customized by the company, which can decide, for example, the cut, the duration, the times, and the methods of repayment (amortization or bullet) according to its needs.

With the issuance of corporate bonds, the company asks the market for financial resources in the form of credit, going to raise credit capital from those savers who have no interest in taking a business risk by subscribing or buying the shares issued. Once issued and placed, corporate bonds oblige the

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<sup>2</sup> Franco Modigliani; Merton Miller, "The Cost of Capital, Corporate Finance, and the Theory of Investment," in *American Economic Review*, vol. 3, no. 48, June 1958.

company to repay the creditor at given intervals for interest payments and to repay the face value at maturity.

Savers who subscribe to corporate bonds are called bondholders and have the right to be satisfied with priority over shareholders, therefore, from this point of view, bonds are less riskier securities than shares.

The bondholder assumes the status of creditor with respect to the company issuing the bond loan whose repayment he demands, thus exposing himself to credit risk, even if lower than that carried by the shareholder. This risk, which unites the bondholder with the other social creditors, is mainly reflected in the event of bankruptcy of the company, as aforementioned, in which the bondholder must be satisfied with his credit reasons before the shareholders.

In this paper, we will turn our attention to corporate bonds traded on the capital market, and, as such, we are talking about securities that are freely transferable, as intended to be traded in a bond market. As aforementioned the bond entitles the bondholder to receive two types of cash flows, represented by the repayment of principal at maturity and interest at certain maturities in the form of coupons.

The coupon represents the portion of interest on the debt that is periodically paid to the investor, it is proportional to the nominal value of the security and calculated based on the coupon rate, which can be fixed or variable according to defined parameters.

Other typical characteristics of a bond are the issue price and redemption price, which are associated with issue fees and redemption fees. In the case in which the nominal value is equal to the issue price, the bond is said to be issued "at par", if the nominal value is higher it is said to be issued "above par", finally, if the nominal value is lower than the issue price it is said to be issued "below par". For the issuing company, the difference between the two values is called an issue surcharge. The issue price arises, almost always, from an auction that expresses the price that the market is willing to pay for the bond that is issued. Issuing costs are the costs incurred by the issuer in issuing the bond, and are represented, for example, by bank commissions, notary fees, or brokerage costs.

Due to the different needs of investors and companies, there are different types of bonds, which can be divided into numerous types, for example, according to the size, or the presence or absence of the right to receive interest during the investment.

According to this last characteristic, corporate bonds can only guarantee the repayment of the principal at maturity without there being any payments during the loan transaction. These bonds are called zero-coupon bonds and do not entitle bondholders to receive interest payments in the form of coupons throughout the life of the bond. Interest coupons may also be known a priori or may vary<sup>3</sup>.

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<sup>3</sup> A.Saunders, M.M.Cornet, M. Anolli, B. Alemanni, "Economia degli Intermediari Finanziari", IV edition, Mc Graw Hill.



In the first case, bonds are referred to as "fixed rate" or straight bonds. The chosen rate can be constant or take different values during the operation. In the event that the coupon rate increases over time, the bond is called step-up, which therefore guarantees a fixed and increasing interest remuneration. Conversely, for bonds with a fixed and decreasing remuneration, which thus offer a fixed and decreasing interest remuneration, the denomination of step-down bonds is used. In the second case, the bonds offer remuneration of interest through a floating rate note and, for these securities, the size of the coupons is not known a priori.

## **2.1 The breakdown of corporate bonds according to the degree of risk**

From this point of view, corporate bonds are divided into different types according to the degree of risk, measured by the rating issued by an international or national rating agency (e.g. Moody's, Standard & Poor's, Fitch). As a result, corporate bonds are normally distinguished between unrated bonds (in the jargon of "unrated" finance) and bonds with ratings. Within the latter, it is customary to distinguish between "Investment Grade" bonds and "High Yield" bonds.

The term Investment Grade (IG) bond refers to issues that have a rating higher than BBB in the rating scale used by Standard & Poors that are usually issued by large-cap companies with stable businesses and solid balance sheets, precisely because they represent a relatively safe and low-risk investment. High Yield (HY) bonds, unlike IGs, are bonds issued by companies with a rating below BBB- and typically between BB+ and CC: they are characterized by greater riskiness, as the risk of non-payment of the interest and of the principal at maturity to subscribers is noteworthy. Investment Grade bonds, therefore, enjoy higher creditworthiness and are thus considered by investors to be less risky bonds, to be understood in terms of the probability of not receiving, at the maturity of the bond, the principal lent to the issuer, and the contractual interest. High-yield investors, in the face of an expected higher yield, can witness the scenario in which credit risk increases further: investors who choose this type of issue, therefore, assume a higher risk of default as well as higher volatility of prices on the bond market during the life of these securities.

Given the relationship between risk and return on financial assets, the rating is a decisive factor in determining the return required by the market when companies decide to use it to finance their investments by issuing debt securities. The rating, as such, influences the issuance cost for the company during the first placement of the security on the market that is defined as primary. The lower

the rating, the higher the spread with respect to other financial instruments that the company must offer to investors to convince them to subscribe to the issue, thus providing the company with the necessary financial resources underlying the decision to finance itself through the issue of the bond. The rating is issued at the time of issue but is normally subject to updates; if a rating change occurs during the life of the security, there will be a variation in the market prices of the bond. The two variables (market price and rating) are directly related as the price fluctuation will be greater the wider the rating change. The factors that can influence the price of bonds are varied, and among the most important ones, for instance, a change in the interest rate offered on the market can be found, given by an increase in the rates offered by the US Fed or the European Central Bank, leading to a decrease in the bond price. Another reason that can cause the value of bonds to vary is the market's perception of the quality of the stock. For example, a deterioration in the creditworthiness of the bond means that investors are willing to recognize a lower price for that security and vice versa. Changes in the spread between risky and non-risky securities can also affect the price of bonds. This spread reflects investors' perception of the riskiness of corporate bonds compared to government bonds, and depends on five main factors:

- The probability of default of the issuing company
- The expected rate of recovery of the bond in the event of default
- The liquidity of the security on the secondary market
- The level of taxation to which investors are exposed
- The efficiency of the primary bond market.

The rating is, therefore, the main indicator of the creditworthiness of bond issuers, expressing an opinion, in the form of an alphanumeric indicator accompanied by a brief description of the assigned value, on the possibility that the issuing company may or may not repay the obligations assumed, regarding both the repayment of capital and the payment of interest. In addition, independent agencies and the main international rating agencies (Moody's, Standard & Poor's, and Fitch), which assign the rating, due to the crucial role they play in the proper functioning of the capital market, are subject to public scrutiny (in Europe they are supervised by ESMA).

## 2.2. The process of issuing corporate bonds

The financial market can be divided into two categories, primary market and secondary market. The primary market is the market on which securities are first issued by the issuer. The secondary market, on the other hand, includes instruments that are traded after the issue and that are already in circulation on the market for which, in fact, trading takes place. Therefore, the issue of a bond by an enterprise consists of making it possible for all investors to subscribe to and purchase debt securities issued by the company. The initial placement of securities on the primary market can take place in different ways depending on the security treated.

Corporate bonds are usually issued in two ways, "private placement" and "placement on predetermined terms". The *private placement* requires that the issuer and the subscribers define the characteristics of the transaction in advance. They set the quantity, duration, reimbursement, and conditions of return in a private negotiation under the guidance of an intermediary, usually an investment bank, which assists the negotiation in various ways. It helps the issuing undertaking and investors identify the most appropriate price for the bond in question, the target markets (potential investors) of the security or, in the event that these have been previously identified by the issuer or in any case they are known, it can act as a financial advisor.

In most cases, institutional investors who subscribe to securities through the "*private placement*" receive a higher rate of return than other financial product offerings, generally expressed as a spread on the rate of return of a government bond with similar maturity, to compensate for the low liquidity, due to the poor standardization of the corporate bond, which can make it unattractive on the secondary market.

In the grand operations of issuing a corporate bond, there are typically a dozen investors ready to buy the offered security. The issuer and its investment bank set the terms of the transaction, and, at this point, investors can decide whether or not to accept the proposed terms ("*take it or leave it*").

When, as in the case of a private placement, the number of investors is very limited, the issuer and its advisors negotiate the terms of the offer with the investors. In such a case, if one or more conditions of the offer are breached, the investor consortium may directly negotiate the resolution of the conflict with the issuer. Therefore, through *private placement*, investors can benefit from greater flexibility on the terms of the agreement.

The reasons for using this method are lower transaction costs, the possibility of subscribing to smaller amounts, and more flexible bargaining methods provided by private negotiation which, with the help of financial intermediaries, makes it possible to tailor the characteristics of the offer according to the needs of investors.

Placement consortia are groups of banks to which the issuer entrusts the task of constructing the issuance transaction, of dealing with the placement with customers, and, in certain situations, of covering the risk that the operation entails, often taking care of buying any unsold loan. The reason why banks come together in consortia to support the operation lies in the fact that, generally, a corporate bond issuance operation involves elevated risks, including reputational ones. Such risks could be the unsustainability of a single intermediary, whereby banks, usually investment banks, come together in consortia to differentiate the issuance risk and bear a lower loss in the case of unsold corporate bonds.

Generally, there are three types of consortia that differ from each other in the type of service offered: Consortium of simple placement: banks offer investors the bond issued according to a previously established distribution.

Guarantee consortium: the banks that are part of the consortium perform a guarantee function, taking care of the subscription of any securities that remain unsold.

Firm recruitment consortium: through this method, banks buy the debt directly from the issuer and then resell it to investors.

The total return on the issue, once the securities have been placed, will be divided between the issuer and the consortium.

The investment banks that are part of the consortium usually have an affiliated clientele, composed of their clients, both institutional and private. To expand their customers, banks try to include external companies or intermediaries in the consortium, forming a *selling group*.

### **2.3 Investors in the corporate bond market**

From the above, it is perceived that the corporate bond financial instrument, due to its characteristics, may not be easy to understand for a small saver.

For this reason, these financial instruments are normally aimed at institutional investors who possess the necessary skills and knowledge to assess the risks associated with the investment decision (purchase and/or sale) related to corporate bonds.

In addition to traditional institutional investors represented by mutual funds, pension funds, insurance companies, banks, and other financial institutions, the corporate market has more recently witnessed

entrants such as ETFs and a change in the structure of the markets due to an increased electronification of all markets where bonds issued by companies are traded.

Although electronification has increased, especially in the US, corporate bond trading yet remains mainly an OTC dealer-intermediated market, where intermediation is condensed in a tiny number of dealers.

Still on the demand side for corporate bonds, it should be noted that the financial intermediaries present on the market as dealers and market makers, generally remain present in a limited way in the various corporate bond markets of the most advanced financial countries, representing a weakness in the structure of corporate bond trading markets, which was particularly evident in March 2020 when the pandemic hit financial markets hard. The trading model and underlying structural features remain largely similar in nearly all jurisdictions.

As already stated, trading in these markets remains essentially institutional with little direct retail participation. Investors are essentially "buy-and-hold," with minimal trading in specific bonds beyond the first six months after issuance. This is stated from the turnover ratio of the financial markets focused on corporate bonds, which measures the volume of trading each day compared to the outstanding amount of corporate bonds, which is lower than publicly traded equities (between 0.5% and 1% in the US and less than 0.5% in the UK and Canada).

Following COVID-19, the largest group of investors in corporate bonds still remains long-term investors (i.e., such as insurers and pension funds) who predominantly are buy-and-hold investors because of their long-term liability and liability-matching investment strategies.

As a consequence, volatility and trading in corporate bond markets are comparatively low, not being able to attract short-term arbitrage-driven or quantitative strategy investors (in contrast to government bond or equity markets), such as hedge funds.

However, the growth of fixed-income ETFs has significantly affected the landscape, with some high-frequency traders entering the markets in some jurisdictions.

In conclusion, with regard to all corporate bond markets, it is necessary to state that corporate bonds tend to be traded less frequently than large-cap equities or core sovereign bonds.

## **2.4 The size of the corporate bond issue**

Even the minimum investment or the share of debt (the single bond) that can be subscribed is normally high (€100,000) and when corporate bonds can be purchased by *so-called retail* investors (small savers), it is necessary to publish a prospectus that contains all the information on the company and on the characteristics and risks of the bond loan, and its approval by a market supervisory authority financial (in Italy CONSOB).

Bonds normally have a large size (above €50 million) and issuers of these financial instruments also tend to return periodically to the capital market in order to finance new investments, which is why they are considered "serial issuers", using bonds as a stable source of funding.

In recent years, however, even smaller companies have begun to become familiar with this new financing instrument.

## **2.5 Issuers of corporate bonds**

The issuers are typically large companies (large capitalization), which are known to investors, and belong to more well-known industrial sectors (telecommunications, energy, automotive, banking, etc.). Traditionally, SMEs are largely or almost entirely dependent on bank credit, especially in Europe, where the level of dependence on banks is higher than in the United States.

However, this trend reversed with the onset of the 2008 crisis, which forced banks to reduce their level of exposure to firms.

Because of this phenomenon, there has been an increase in the use of financing through the issue of corporate bonds with a decrease in the size required for companies to access financing through the issue of corporate bonds, as evidenced, for instance, by the establishment of a market for mini-bonds in Italy.

In the market for corporate bonds, the number of distinct ISINs has risen significantly, with some corporations having hundreds of distinct bonds outstanding.

Primary and secondary corporate bond markets are closely interlinked with trading in secondary markets closely connected to conditions in primary markets. Concomitantly, primary issuance generally only occurs in a stable secondary market environment.

Secondary trading in corporate bonds differs from trading in other asset classes, such as equities, due to the features of the underlying instruments.

They are also often issued in large numbers of separate nonfungible bonds by an individual company. As will also be discussed later on the liquidity of the corporate bond markets, the diversity of issuers also impacts the relative illiquidity of corporate bonds markets; some bond lines, issuers, and sub-sectors are more liquid than others.

## **2.6 Growth in the corporate bond market**

Still, with regard to the presence of issuers in the corporate bond market, it should be noted that the size of the corporate bond markets has grown significantly since the Global Financial Crisis (GFC). The reasons for the growth are due to several factors, including benign economic conditions underpinned by accommodative monetary policies, banking sector deleveraging, supportive tax treatment of debt over equity, and the increased role of central banks in certain corporate bond markets, in conjunction with post-GFC reforms, which, in part by design, have shifted credit intermediation to the capital markets.

For example, in the US, the amount outstanding for corporate bonds increased from 2008 to Q1 2020 to almost \$10 trillion, by approximately 80%, while in the euro-area it rose to \$4 trillion, by one-third over the same period.

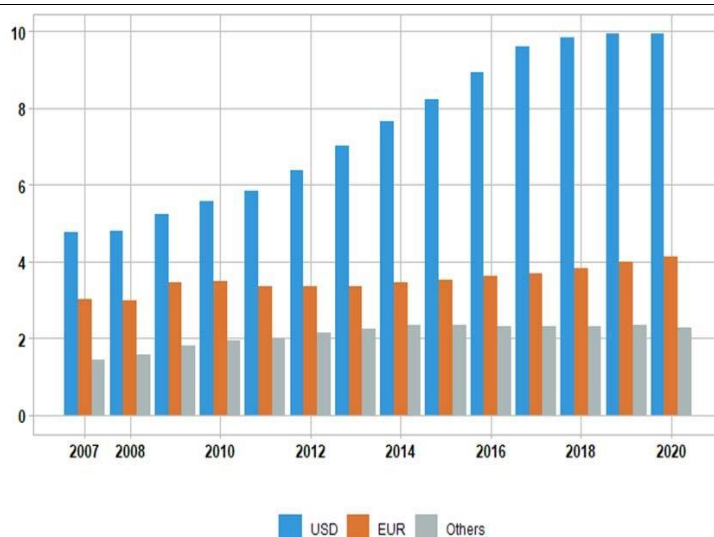
In the UK, outstanding GBP Investment Grade (IG) credit has doubled since 2008, rising from £300 billion to over £600 billion, and the GBP High Yield (HY) bond market has grown from a very low level prior to 2012 to around £50 billion in 2020.

In Brazil, an acceleration of issuance is observed in BRL of HY credit, almost tripling over the last 5 years up to 2019 but seeing a 1/3 decline in 2020 due to COVID-19.

Commensurate with the growth in outstanding volumes, the number of issuers and individual bonds have also expanded considerably.

**Figure 1 – Total outstanding corporate bonds**

In trillion \$



The growth in Investment Grade bonds over the past decade is concentrated in BBB-rated bonds, which has reduced the average credit quality of IG bonds.

For instance, in the US, in 2000, fewer than 30% of IG bonds were BBB-rated, compared to 2020, when BBB-rated issuances represented almost 45% of IG bonds.

Similarly, the share of bonds rated BBB– (the lowest IG rating) increased from 8% to 12% over the same period, due to investors reaching for a yield consistent with expectations of a long low-interest rate environment. In Europe, moreover, this may have been driven by central banks’ purchases with a minimum rating at BBB.

By contrast, average credit quality in sub-investment grades barely changed over the past decade, partly because low-rated issuers shifted to raising an increasing proportion of their debt in the leveraged loan market.<sup>4</sup>

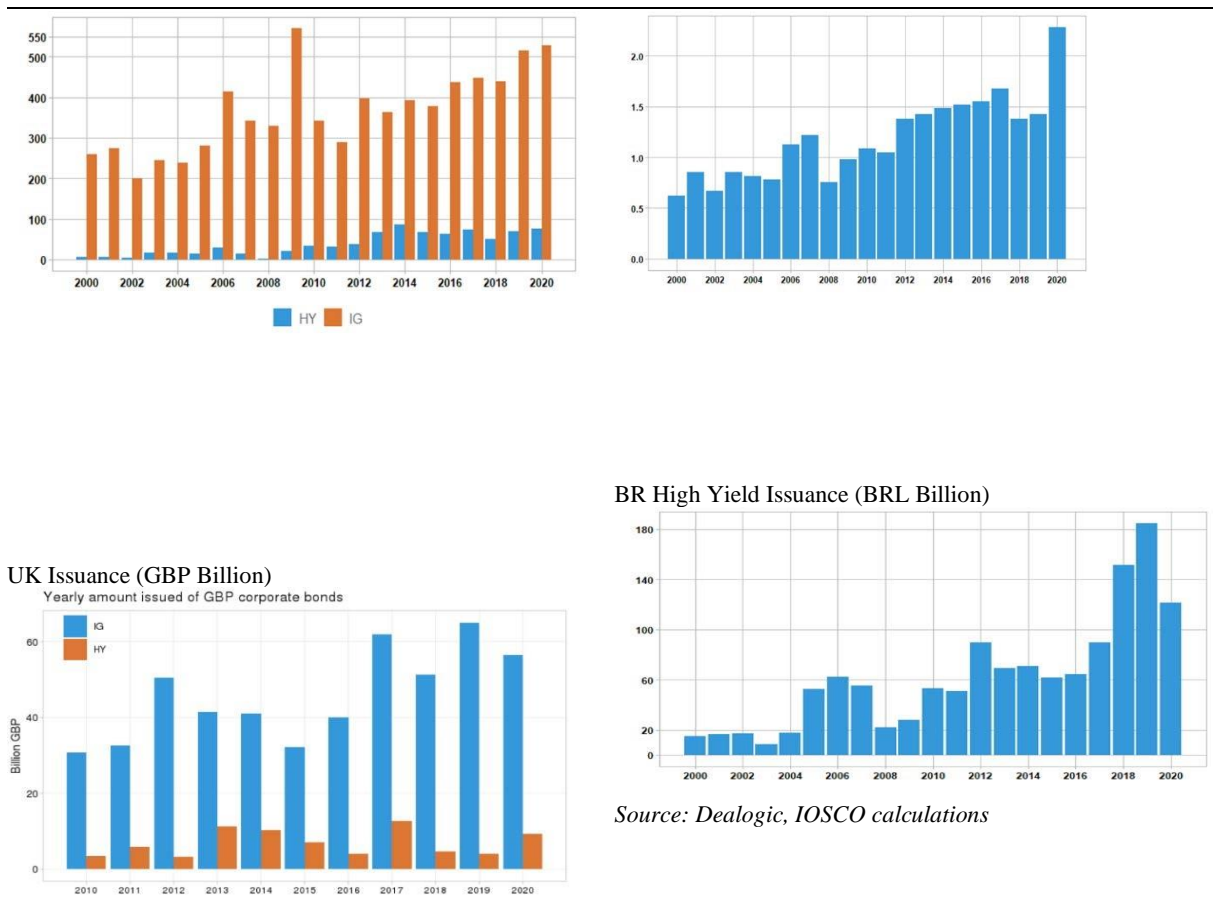
**Figure 2 – Issuances of corporate bonds**

European Issuance (EUR Billion)

US Issuance (USD Trillion)

<sup>4</sup> See FSB report: FSB report assesses vulnerabilities of leveraged loans and CLOs – Financial Stability Board-





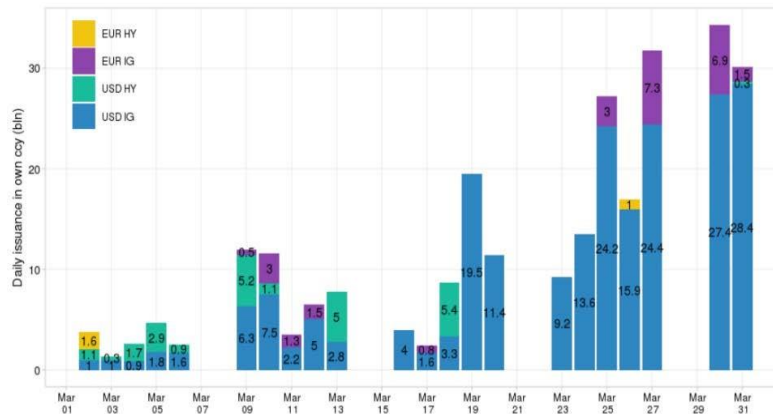
As noted above, dealers are key market makers and providers of liquidity in corporate bond markets. These markets are characterized as concentrated markets, where a small number of dealers execute most of the trades.

The size of such markets has increased significantly over the last decade, mirroring growth in corporate leverage.

Various factors have contributed to such growth, including relatively benign economic conditions driven by accommodative monetary policies, banking sector deleveraging, and the increased role of central banks in corporate bond markets in certain jurisdictions. Primary markets are more important to the overall market liquidity in bonds than is the case in equity markets. Equities are perpetual instruments that represent the riskiest end of the capital structure. By contrast, bonds are usually dated instruments with security or seniority against default risk. For these reasons, primary bond markets see more frequent issuance and regular refinancing.

**Figure 3 – Daily issuance of corporate bonds**

In USD billion



Source: Dealogic, IOSCO calculation

## 2.7 The liquidity of the corporate bond market

Following the Global Financial Crisis (GFC), financial regulation reforms shifted credit intermediation to capital markets.

There are currently limited alternative sources of liquidity with the outcome that corporate bond markets may be unable to absorb significant and sudden increases in selling pressure, such as those experienced under market stress in March 2020. The above determines, always with regard to the market liquidity, that corporate bond markets are less liquid than some other traded markets, and that the number of individual corporate debt securities that regularly trade is small.

Secondary trading in corporate bonds differs from trading in other asset classes, such as equities; bonds are heterogeneous securities compared to equities, with an interest rate component across different maturities, structures, and risk profiles. While large-cap equities trade thousands of times a day (or more), bonds – even the ones considered liquid – may not trade every day everywhere.

However, turnover ratios of corporate bonds (value traded over the amount outstanding) are not much lower than the ones for stocks, since when corporate bonds trade, the amounts are remarkable.

Although there is a high number of individual bonds outstanding, corporate bonds are traded infrequently in most jurisdictions relative to core sovereign bonds or large-cap equities. In addition, even bonds that are the largest in size and most traded do not match the liquidity and relatively narrow

bid-ask spreads of other financial instruments, such as agency mortgage-backed securities, Treasuries, or large corporate equity listings.

Corporate bonds normally trade in sizes of between USD 1 and 5 million or even larger-sized blocks, in particular in the US. By contrast, stocks typically trade in smaller sizes suitable for retail trading. Similarly, to what was noticed in the equity market, electronification and the usage of algorithmic trading have led to a reduction in trade sizes in the market for corporate bonds.

For what concerns the relationship between the primary and secondary market issues, they are closely interlinked with trading in secondary markets closely connected to conditions in primary markets, particularly when accommodating investors switch to new issues, rather than purchasing outright. Furthermore, primary bond markets are a barometer for a healthy market and are more important to the overall market liquidity in bonds than is the case in equity markets, since, when active, prime bond markets display positive sentiment for the asset class, provide an important component in price discovery and assessing credit spreads, and bestow depth on the offer side of the market on the buy-side.

We have therefore briefly looked at the supply side, represented by large companies, the intermediaries, and the liquidity present in the market, as well as the function performed and the relationship between the primary and secondary markets, and we can now turn our attention again to investors.

The biggest group of investors in corporate bonds remain long-term investors (i.e., for instance, insurers and pension funds) who mainly are buy-and-hold investors due to their long-term liability and liability-matching investment strategies.

As a result, volatility and trading in corporate bond markets are comparatively low which has not attracted short-term arbitrage-driven or quantitative strategy investors (in contrast to government bonds or equity markets).

Somewhat surprisingly, as we will argue in the next paragraph of this paper, this advantage instead disappeared in the period starting from mid-March 2020, characterized by the ECB launch of an extraordinary purchasing programme (PEPP) and policy measures of unprecedented magnitude by the domestic governments and the European Union.

The latter evidence can be explained by two circumstances: i) the change in the market composition; ii) the working of the portfolio rebalancing channel.

Concerning the market composition, the flight to safety phenomenon moved financial agents away from the riskier assets (i.e., bonds with a high yield rating) and towards the safer investment grade (IG) segment.

Regarding the rebalancing channel, after the start of the new pandemic programme in the second half of March 2020, a large share of the market became unavailable because of the ECB's increased demand.

As a consequence, investors rebalanced their portfolio towards assets of similar characteristics: IG bonds which were not eligible for ECB purchases. This, sequentially, generated a surge in the demand for non-eligible bonds which, raising the bond price, decreased the issuance cost and the difference with respect to eligible bonds.

In addition to the market segmentation along the bond grade and the eligibility to the ECB programmes, another source of risk detected in the pricing mechanism is the weak resilience to pandemic crises, where resilience is defined as the reliance on business models based on technologies and organizational structures that are robust to social distancing (those, for example, which can adapt considerably to teleworking or do not need close contact with customers).

Observers of the corporate bonds market understood that newly issued ("on-the-run") bonds are generally more heavily traded. Trading in secondary markets is closely connected to conditions in primary markets. Concomitantly, primary issuance ordinarily only occurs in a stable secondary market environment.

Primary markets constitute a monetary policy transmission channel for some central banks. As a result, the market dysfunction and resulting yield increases triggered rapid central bank interventions to restore market liquidity.

## **2.8 The role of the public entity in the corporate bond market**

The crucial role played by institutions in the development and smooth functioning of the corporate bond market has already emerged from the above.

The market for corporate bonds is a fundamental part of global capital markets and plays a key role in financing the real economy.

Due to this reason, the official sector plays an important role, because, given the potential for high returns, the distressed asset community took part, particularly in longer-duration IG bonds (which is not their typical investment strategy) and other traditionally safe sectors.

Opportunistic credit funds aim at investing in corporate debt as long as they recognize that the price at which the debt is trading does not reflect the company's fundamental credit situation.

Such opportunistic buyers usually consist of hedge funds that are not impacted by outflows and can exercise flexibility in deploying their capital in the market.

Hedge funds do not generally get allocated bonds in IG primary issues, being more reliant on the secondary market and being inclined to be opportunistic and to react to special situations. Official institutions (i.e., public sector) include mainly Government investments, FX reserves, sovereign wealth funds, and supranational treasury operations. They are significant investors in corporate bonds (outside of the US).

This is particularly the case in the EU, where they are the largest owners of euro-area corporate bonds. Corporate bond holdings by official institutions are primarily in highly rated bonds issued by financial corporations and agencies, which tend to purchase bonds in the primary market and buy and hold thereafter.

In Europe, the extension of the ECB's Asset Purchase Programme (APP) to include investment-grade EUR-denominated bonds began in 2016 and has influenced both the primary and the secondary markets, considering the scale of the activity and the buy-and-hold nature of these products.

There are limited data on the trading behavior of the official sector during the crisis. Based on the UK experience, it is observed that official institutions were net buyers of AAA credit throughout H1 2020, with a prominent peak in purchases over March. It is plausible that this was opportunistic buying during the sell-off in underlying government bonds and the March peak in Treasury yields.

This is significant given that official institutions tend to source liquidity in the primary markets, with large anchor orders that motivate opportunistic borrowers. There is no proof that GBP AAA bonds were sold to increase cash over March 2020. Any evidence of outright selling is subdued and appears post-intervention (in a recovering and lower-yielding backdrop). This mild selling would have been amid a strongly recovered primary market and could have been to accommodate new issuances.<sup>5</sup>

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<sup>5</sup> A new GBP deal or increase for a frequent issuer can be transacted intraday, often with the whole process - from the mandate to the execution - taking a matter of hours. Contrast this to other fixed income such as securitizations, which often takes 3-6 months to originate.

## **2.9 Transparency of the corporate bond market**

In addition to liquidity, market transparency should be examined to assess a securities market structure. According to market participants, access to the data on the corporate bond market is the key to price formation, trading, and liquidity.

At an international level, the US market is considered the most advanced in terms of availability and accessibility to data. In Europe, MiFID has implemented very important pre - and post-trade transparency, but, with regard to access to the data, market participants think that the corporate bonds market remains fragmented.

As to address the issue of the fragmentation of data, the UK and the EU institutions are currently considering changes to the regime of trade transparency.

Overall, over the last decade, the electrification of the financial markets, including those on which corporate bonds are traded, has made it easier and more efficient to trade because of the improved quality and quantity of the available data.

As we'll argue in the following sections of this paper, for the US corporate bond market, the data show remarkable resistance due to the sharp contraction in GDP caused by the COVID-19 pandemic crisis.

Three main effects have been achieved in the United States:

- (1) bond issuance raised suddenly as the contraction hit, while syndicated loan issuance was low;
- (2) Federal Reserve interventions increased bond issuance, whereas loan issuance also increased, but to a lesser degree; and
- (3) bond issuance was concentrated in the investment-grade segment for large and profitable issuers.

Similarly, as in previous crises and recessions of the US economy, the U.S. bond market has proved to be an important and resilient source of funding for corporations<sup>6</sup>.

Liquidity challenges affected some parts of the corporate bond market more severely than others. Trading was especially challenging for block trades.

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<sup>6</sup> See "The Resilience of the U.S. Corporate Bond Market During Financial Crises". May 2021 - Bo Becker and Ephraim Benmelech.

In most jurisdictions, initially, only shorter-dated and high-quality bonds were traded, mirroring investor liquidity needs, even though the market in those thinned out and the credit curve flattened or inverted, with liquidity being more robust in larger bond issues, particularly in the US. The markets rapidly recovered following central bank intervention, with issuance levels achieving record volumes in investment-grade bonds (albeit at a higher risk premium relative to before the crisis).

### **3. THE EFFECTS OF COVID-19 ON THE MARKET FOR CORPORATE BONDS**

As previously highlighted, the corporate bond market represents an important part of the global capital markets and plays a key role in financing the real economy.

The COVID-19-induced market stresses in March 2020 highlighted the potential systemic importance of liquidity dysfunction in corporate bond markets, providing regulators with the opportunity to examine and develop insights into how such financial markets operate under tough conditions.

In its 2021-22 work plan, IOSCO, through its Financial Stability Engagement Group (FSEG), established a Corporate Bond Market Liquidity (CBML) working group, which, following its establishment, assigned the analysis of the corporate bond market microstructure, resilience, and liquidity provision during the market stresses of March 2020 and following months.

IOSCO has previously undertaken work to better understand how the corporate bond market functions, including during periods of stress, such as when in 2017 it published a report on Secondary Markets examining liquidity in corporate bonds markets, and when in 2018 it published some recommendations to improve regulatory reporting and transparency for better development and functioning of the market. Furthermore, in 2019, IOSCO produced a report by its Committee on Emerging Risks (CER) which observed how liquidity in corporate bond markets may behave under market stress conditions.

The most important difference with respect to the 2008 crisis is that COVID-19 stress originated outside the financial system. The March 2020 shock was also unprecedented, affecting all aspects of the economy and across all jurisdictions, triggering a rapid response by authorities focused on easing monetary and fiscal policy to support demand and cover lost incomes associated with lockdowns to contain the spread of COVID-19.

Following the announcement of large-scale and coordinated intervention by authorities and central banks, market confidence and functioning were restored and, as a result, the most severe market disruption lasted only a few weeks.

Consequently, there remains considerable uncertainty around the potential impact on market liquidity – and ultimately the real economy – had policy intervention not occurred. Nonetheless, during those critical few weeks, the effects of the pandemic and the public health measures taken by governments to contain them<sup>7</sup> led to a widespread need for liquidity and a severe disruption of the corporate bond markets.

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<sup>7</sup> Including lockdown measures.



### **3.1 Corporate bond market liquidity during COVID-19**

During the COVID-19-induced market stresses of March 2020, as aforementioned, corporate bond markets faced a very relevant decreased liquidity.

It is challenging to assess whether the corporate bond market liquidity diminished mainly due to reduced liquidity supply by dealers, improved liquidity demand by investors, or a mixture of both – and what the greater contributor to the stresses was.

All in all, the broader corporate bond market exhibited reduced liquidity during the turmoil.

We have already observed that the March 2020 episode was a sharp and temporary market liquidity crisis caused by a shock originating from outside the financial system. Hence, it differed significantly from the Global Financial Crisis, a large-scale credit crisis endogenous to the financial system that unfolded over several months.

It is also considered very notable that liquidity challenges affected some parts of the corporate bond market more severely than others.

Trading was particularly challenging for block trades which are trading a large number of financial instruments.

In most jurisdictions, reflecting investor liquidity needs, initially, only shorter-dated and high-quality bonds were traded, although even the market in those thinned out and the credit curve flattened or inverted.

Liquidity was stronger in larger bond issues, especially in the US.

The markets rapidly recovered after central bank intervention, in line with issuance levels achieving record volumes in investment-grade bonds (even though at a higher risk-premium relative to before the crisis).

On the demand side, proof of the long-term investors' influence in corporate bond markets during the COVID-19 stress is mixed.

The volume of corporate bonds bought or sold by long-term investors varied across credit types and maturities and was dependent on the structure of the investor base and jurisdiction.

However, limitations in available data on long-term investor activity in corporate bonds make it difficult to assess long-term investors' relative influence on the financial market stresses of March 2020.

For the UK and EU markets, evidence, as well as available transaction data, show that trading activity during the peak of the March stress was largely unchanged and could suggest that long-term investors were not the main drivers of liquidity demand.

In principle, due to their long-dated liabilities and corresponding investment horizons, long-term investors face less pressure than other investors to liquidate tradable assets, such as corporate bonds, during periods of stress.

These characteristics of long-dated liabilities also imply that long-term investors may be able to buy assets being sold by other investors facing redemption or deleveraging pressures, which can help limit the magnitude of asset price falls.

The distressed asset community played an important role, particularly in longer-duration Investment Grade bonds (which is not their typical investment strategy) and other traditionally safe sectors.

The March turmoil offered opportunities for debt funds which typically focus on “mispriced” debt (i.e., debt that has dropped in price for “non-economic reasons” as investors feel pressure to sell due to liquidity concerns when markets are dislocated).

Liquidity in open-ended funds (OEFs) displayed that some OEFs caused selling pressure in some jurisdictions, driven by investor redemptions principally related to the flight-to-quality and the dash-for-cash.

In March 2020, many OEFs dealt with liquidity pressures, large outflows and deterioration in market liquidity.

It is possible to say that the structure of corporate bond markets also might contribute to the constraints in meeting the demand for liquidity during the COVID-19-induced market stresses of March 2020.

In Europe, corporate high-yield (HY) bonds faced cumulative redemptions of 5% of total net asset value (NAV) within a month.

From an ESMA sample, net outflows in Undertakings for the Collective Investment in Transferable Securities (UCITS) represented 5.9% of NAV, while alternative investment funds (AIFs) in the sample recorded small inflows from 17 February to 31 March.<sup>8</sup>

With regard to the level of activity varied across jurisdictions, secondary trading increased during the middle two weeks of March (prior to the 23<sup>rd</sup> March Federal Reserve Board intervention) in the US and liquidity remained healthier than in other core markets (e.g., the short-term funding markets) although bid-ask spreads increased as well.

There was also reported an unchanged level of activity.

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<sup>8</sup> UCITS - Undertakings for the Collective Investment in Transferable Securities. This refers to funds that are under the UCITS regulatory framework of the European Commission which creates a harmonized regime throughout Europe for the management and sale of mutual funds.

In fact, data show that trading activity in Euro-denominated bonds remained mostly unchanged, although the overall liquidity in terms of market price impact dropped substantially<sup>9</sup>.

For instance, in Canada, the volume and frequency of corporate bond trading were affected little by the March 2020 turmoil, and the Japanese corporate bond market, consisting mostly of IG bonds, observed a small impact on liquidity during the March turmoil.

We have already acknowledged that, with regard to the level of activity across types of bonds, liquidity challenges impacted some parts of corporate bond markets more severely than others.

Trading was extremely demanding for large trades and block trades, with the usual relationship between transaction costs and trade size being inverted, since trading large parcels turned out to be more expensive than trading smaller parcels. According to the “dash for cash”, market participants claimed that in most jurisdictions, at first only short-term and high-quality bonds could trade. As a consequence, the credit curve flattened and inverted, as spreads on shorter-term bonds increased compared to longer-term bonds. As we will argue in the next paragraph, the level of activity was impacted by the central bank interventions.

After the central banks’ intervention, markets experienced increased frequency, volume, trade size, and breadth of corporate bond trading.

Academic research and market participants noted that the impact on liquidity was felt immediately after the Fed announcement and before any purchases under the Secondary Market Corporate Credit Facility (SMCCF).<sup>10</sup> The improvement in liquidity after the announcement of the SMCCF has been ascribed to a mixture of factors, such as decreased selling pressures, expanded capacity and willingness of dealers to supply liquidity, and a reduction in expected credit losses. These results mirror the significance of the Fed’s signal of its aim to provide a liquidity backstop to the market for corporate bonds.

Research shows that the COVID-19 liquidity dry-up in the markets for corporate bonds can be imputed to both the supply and the demand functions, even though it also indicates changes in supply that had a much bigger impact on risk premiums than changes in demand.<sup>11</sup> While bond investments through open-ended mutual funds and ETFs have grown, a large proportion of fixed-income assets are held by other types of long-term investors such as pension fund managers and insurers. For instance, it is

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<sup>9</sup> See liquidity metrics on: [The-European-investment-grade-corporate-bond-secondary-market-and-the-COVID19-crisis-280520v2.pdf](#) (icmagroup.org) and [Market data and commentary on COVID-19 Information Hub](#) (icmagroup.org).

<sup>10</sup> Sharpe, Steven A., and Alex X. Zhou (2020). “The Corporate Bond Market Crises and the Government Response,” FEDS Notes. Washington: Board of Governors of the Federal Reserve System, October 07, 2020, <https://doi.org/10.17016/2380-7172.2769>. <https://www.federalreserve.gov/monetarypolicy/smccf.htm>.

<sup>11</sup> Chikis, C., & Goldberg, J. (2021). “Dealer Inventory Constraints in the Corporate Bond Market during the COVID Crisis (FEDS Notes). Board of Governors of the Federal Reserve System”.

evaluated that US insurance companies, registered investment companies (such as open-ended funds and exchange-traded funds), and pension funds owned 31%, 19%, and 9% of outstanding bonds, respectively. Long-term investors were particularly exposed to the March turmoil in terms of solvency risk, profitability risk, and reinvestment risk.<sup>12</sup>

Conversely, insurers and pension funds are impacted by the reduction in the value of their investments due to the sudden increase in risk premia and in default risk, that could trigger large-scale rating downgrades impacting capital requirements.

For UK long-term investors, available data indicate that trading activity during the March stress was largely unchanged. In the EU, daily transaction data on identified UK pension and insurance firms trading in the EU, as well as identified EU firms trading on UK venues, also indicates limited changes in overall trading activity. Some long-term investors commented that it would have been a good strategy to buy during the March stress, but also reported that, in practice, it was a hard period to trade, with the prevailing unpredictability making them careful and making them prefer a strategy of “wait and see”.

Research shows that even well-capitalized insurers stayed away from the market because of concerns over potential downgrades. Data from the EIOPA show that insurers’ trading behavior was not altered during the first quarter of 2020.<sup>13</sup> In fact, long-term investors acquired €146 billion of corporate bonds in Q1 2020 versus an average per quarter of €149 billion over the previous 5 years’ average. Similarly, they sold €82 billion of corporate bonds during Q1 of 2020 versus €80 billion in the previous quarters<sup>14</sup>. Long-term investors also sold lower-rated or downgraded bonds, or at the minimum slowed down their purchase of lower-rated corporate bonds.

Normally, insurers sell vulnerable credits in order to reduce their exposure to credit risk in anticipation of potential downgrades. They also typically sell downgraded bonds, because of capital requirements’ considerations or other reasons such as investment mandates. This pattern was also true during the COVID-19-induced market stresses. For example, according to the EIOPA analysis<sup>15</sup>, EU insurers significantly reduced the purchase of BBB bonds (from €6.5 billion before the COVID-19 outbreak to

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<sup>12</sup> US and foreign corporate bond US capital market see SEC’s Staff Report, Division of Economic and Risk Analysis, *US Credit Markets Interconnectedness and the Effects of the COVID-19 Economic Shock*, available at [https://www.sec.gov/files/US-Credit-Markets\\_COVID-19\\_Report.pdf](https://www.sec.gov/files/US-Credit-Markets_COVID-19_Report.pdf)

<sup>13</sup> Vulnerabilities and resilience in insurance investing: studying the COVID-19 pandemic by Patrick M Liedke.

<sup>14</sup> UK data, although less complete than the EU-wide data since it only includes insurance companies directly managing their assets (i.e., not considering delegated mandates), shows a similar trend, i.e., UK insurers were consistent net buyers of better-rated longer and shorter-dated GBP. It is also unsurprising how high volumes in longer-dated credit in May/June 2020, when credit was rallying and yields were falling and high sales of EUR-denominated shorter higher rated bonds immediately after the announcements, perhaps consistent with portfolio rebalancing to take advantage of the buoyant primary market.

<sup>15</sup> Source: EIOPA Financial Stability Report July 2020

approximately €2.0 billion) in Q1 and Q2 2020, probably in consideration of the fact that the risk of rating downgrades was high. Some long-term investors also sold some corporate bonds to reduce certain risk exposures, such as in sectors most impacted by the COVID-19 shock.

### **3.2 The behavior of long-term investors after the peak of the stress**

Regarding long-term investors after the peak of the stress, in general, long-term investors resumed their buying of corporate bonds soon after central banks announced interventions – particularly the US Fed’s corporate bond buying programs announcement on 23 March 2020, coexisting with an easing in liquidity pressures and greater transparency in pricing, since dealers reprised their market-making activities. Buying activity by long-term investors was initially focused on investment-grade bonds and in sectors less exposed to COVID-19. However, buying activity broadened out over subsequent weeks, especially following the announcement of the extension of the US Fed’s bond purchase program to high-yield ETFs on 9 April 2020. Asset purchases by long-term investors also accelerated once the primary markets re-opened, due to the fact that post-intervention primary issues were priced with remarkable new issue premiums (such as with yields well above similar bonds trading in the secondary markets). The COVID-19-induced market stresses of March 2020 revealed that some Open-Ended Funds ascribed to selling pressure in some jurisdictions, caused by investor redemptions principally related to the flight-to-quality and dash-for cash.

With regard to the role of distressed buyers, given the potential for high returns, the distressed asset community played an important role, particularly in longer-duration IG bonds (which is not their typical investment strategy) and other traditionally safe sectors. Opportunistic credit funds aim at investing in corporate debts where they recognize that the trading price does not mirror a company’s fundamental credit situation, with opportunistic buyers usually consisting of hedge funds not impacted by outflows and able to exercise flexibility in placing their capital in the market.

Hedge funds do not normally get assigned bonds in IG primary issues; hence they are more subject to the secondary market and tend to be opportunistic and react to exceptional situations. The March turmoil provided debt funds with opportunities focusing on “mispriced” debt (that is debt that has declined in price due to technical reasons as investors feel strained to sell because of liquidity concerns when markets are disjoint).

Even though data are sporadic, the working group's UK data validate that distressed buyers were net buyers of longer credit over the last quarter of 2019/ first quarter of 2020, turning sellers after March 2020 (or in June 2020 in the case of BBB/BBB- bonds as soon as the initial intervention-induced recovery culminated). Hedge funds were net buyers of shorter credit over most of the first half of 2020 as well, but turned sellers towards May when intervention was reaching the greatest effect. This looks to underpin the idea that most opportunistic credit specialists buy into weakness and sell into strength. Market participants noted that given the brevity of the dislocation in March due to the rapid central bank intervention, hedge funds struggled to raise capital in time to take advantage of the pricing changes. It was reported that there was a scramble to launch new distressed debt and special situations funds. Like long-term investors, distressed buyers accelerated their bond purchases after the central bank interventions and the re-opening of the primary market. Some market participants also noted that given the post-GFC regulatory reforms, hedge funds can no longer rent balance sheets from banks on demand, thereby limiting the funds' ability to bid in a dislocated market<sup>16</sup>. In contrast to the GFC, banks entered into the market stresses induced by COVID-19 with lower inventories and stronger capital and liquidity positions because of the post-GFC reforms and did not face the same funding pressures on their liquidity positions as compared to going into the GFC. As such, banks did not contribute to selling pressure in the way they did during the GFC.

However, to the extent that dealers did not expand their market-making activities to meet increased liquidity demands during the peak phase of the turmoil and were inclined to reduce pre-trade transparency to the market, their behavior had little dampening effect. Generally, large dealers chose to refocus market-making activities on their core client relationships, whilst risk managing their positions more closely due to the prevailing uncertainty and market volatility.

Evidence suggests that smaller/regional dealers, as well as local operations of foreign dealers, were less able to offer liquidity and more inclined to step out of the market altogether, probably because of reduced market visibility. This resulted in a higher concentration of bond trading activities among larger dealers during the stress period. In a few cases, there was a more severe decrease in market-making activity by dealers during the March turmoil. The cost of liquidity provision by dealers was severely impacted, as evidenced by bid-ask spreads three times higher on average than in the previous month.

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<sup>16</sup> The IOSCO CER report on "Liquidity in corporate bond markets under stress conditions" reported: "market participants noted that, because a general increase in risk aversion in the banking sector has led to a strong reduction in lending to hedge funds, both the number of hedge funds operating in corporate bond markets and their degree of leverage have decreased sharply, causing them to curtail their provision of liquidity in the corporate bond market. Due to the insufficient passage of time, it is difficult to discern whether this is a temporary (cyclical) or a permanent (long-term) phenomenon".

In most jurisdictions, corporate bond bid-ask spread broadened significantly; some dealers explained that the unique way to conserve market-making was to bid low and at a price where they could sell the bonds more easily to opportunistic buyers. In doing so, they provided liquidity but at a much higher cost for clients. Even though trading flows were one-sided, dealers authenticated that they found willing buyers in the end, albeit it took a week longer than it would have otherwise taken. Such buyers included, pension funds, insurance companies, and distressed-asset funds, who saw attractive opportunities in a falling market, especially after central bank announcements removed a considerable amount of uncertainty from the market. Most dealers shifted further towards a riskless principal client facilitation model where bonds were bought from clients contingent on an exit strategy which would mostly take the form of a matched sale.

As a result of this shift, it took more time on average to execute a trade, further reducing the depth of available market liquidity.

The willingness of dealers to make markets varied across the types, sizes, and credit ratings of bonds, with them not making markets equally across sectors and market segments. Some market participants noted that some dealers shied away from those most affected by the pandemic (e.g., airline, leisure, and hospitality), indicating the dealers' greater selection in the type of business they were willing to make. Dealers' willingness to trade in large sizes also decreased (from a \$5 million to a \$2-3 million average ticket in the US), with market participants noticing a hesitancy by some dealers, mainly non-bank affiliated or smaller dealers, to make markets in high-yield or lower-rated corporate bonds, and to offer indicative quotes on bonds. However, dealers turned out to be more willing to make markets in bonds where they could more readily sell them, such as shorter maturity, more recent and larger issuances, higher credit quality bonds, or central bank-eligible collateral.

In the peak of the turmoil, granting pricing across electronic platforms was too risky for dealers, who, as a result, became less stimulated to diffuse information that might rapidly become old in fast-moving markets.

Hence, participants observed that most trading for the time being shifted to phone trading, with less transparency in the market, further hindering liquidity.

No single factor can explain dealer behavior in March 2020, but a few factors stand out, the most important of which are large one-sided flows, internal risk tolerance and management of balance sheet limits, and utmost uncertainty making risk management especially hard. Dealers were disinclined to intermediate large flows for which they could not find a counterparty rapidly enough, since most market participants were aiming at selling their corporate bond holdings during the "dash for cash". The increased use of riskless principal trading in recent years, combined with these one-way flows, may have limited dealer intermediation.

The spike in volatility led to mechanical increases in value-at-risk (VaR), which impacted internal risk limits. Members indicate that such limits were “elastic” to reflect the mechanical increase, but dealers focused on the size of their positions, riskiness of individual exposures (e.g., sector, credit rating, duration), and a restricted set of clients with whom they had important relations when deciding where to provide liquidity.

Foreign bank branches might have been affected by their headquarter strategy, given that risk limits are often set at a firm-wide level, depending on organizational structure and internal risk approval processes. The high uncertainty on future developments with the pandemic, coupled with the lack of clarity on whether central banks would intervene, is suggested to have been a very important factor in limiting the risk appetite of dealers. This changed once it became clear that central banks would intervene, allowing dealers to expand intermediation activities.

The structure of corporate bond markets also contributed to the constraints in meeting the demand for liquidity during the COVID-19-induced market stresses of March 2020. Trading in corporate bond markets remains essentially institutional with little direct retail participation. Although corporate bond ETF market participation and growth are altering these dynamics, there remains a large buy-and-hold component to investment in these markets, with minimal trading in specific bonds beyond the first six months after issuance. For example, the turnover ratio (measured by trading volume divided by outstanding debt) has declined over the last decade and remains low. Contrarily to equity markets and centrally cleared derivatives, corporate bond markets have experienced almost no standardization. Moreover, the number of distinct ISINs has risen remarkably, with some corporates having hundreds of distinct bonds outstanding. Although there has been some increased electronification, corporate bond trading has still remained mostly an OTC dealer-intermediated market, with intermediation focused on a small number of dealers. All-to-all trading and portfolio trading have grown but remain a small proportion of total trading and trading is mostly through RFQ.

### **3.3 The issuance of corporate bonds on the market**

As already known, corporate bond primary market activity was significantly curtailed from February to mid-March 2020, with most markets effectively closed for two weeks in early March.

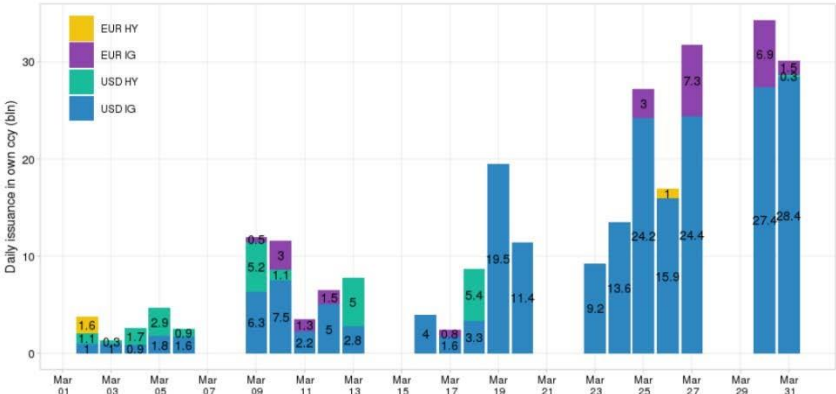
Some corporates were able to delay scheduled issuances to wait for the markets to settle, while others drew on their bank credit facilities to make up for their short-term liquidity needs.



There are, however, insufficient data to assess how many corporates attempted to issue bonds during this period but were unable to do so given prevailing market conditions.

**Figure 3 – Daily issuance of corporate bonds**

In USD billion



1

Source: Dealogic, IOSCO calculation

On the demand side, proof of the effect of long-term investors in the market for corporate bonds during the COVID-19 stress is varied, since their behavior changes significantly by jurisdiction, because of the nature of their investment strategies, and of the noteworthy speed of the crisis and subsequent recovery.

The volume of corporate bonds bought or sold by long-term investors varied across credit types and maturities and was dependent on the structure of the investor base and jurisdiction. Limits in accessible data on long-term investor activity in corporate bonds imply that it is challenging to effectively determine long-term investors’ relative impact on the COVID-19-induced market stresses of March 2020. For the UK and EU markets, anecdotal evidence, as well as available transaction data, show that trading activity during the peak of the March stress was largely unchanged, indicating that long-term investors were not the principal drivers of liquidity demand.

However, such data may not be fully emblematic of the long-term investor base, since it does not grasp trading activity from long-term investors that have transferred their portfolio management to asset managers. In general, because of their long-dated liabilities and corresponding investment horizons, long-term investors cope with less pressure than other investors to liquidate tradable assets, like corporate bonds, during times of stress.

These characteristics of long-dated liabilities also imply that long-term investors may be able to buy assets being sold by other investors facing redemption or deleveraging pressures, which can help to limit the magnitude of asset price falls. Following the announcement of coordinated central bank intervention in March 2020, market confidence and functioning were restored and, as a result, the most severe market disruption lasted only a few weeks.

Nevertheless, throughout those few weeks, the outcomes of the pandemic and of the public health measures by governments to restrain them led to widespread uncertainty.

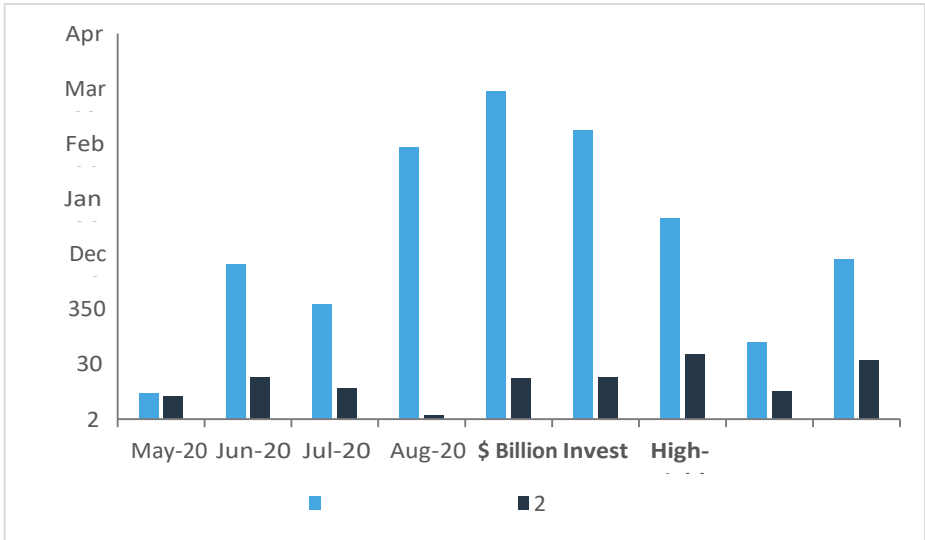
With regard to the major corporate bonds market worldwide, the COVID-19 pandemic shook the U.S. economy and the financial market in unparalleled ways.

As already stated, the corporate bond market was no exception.

In the first quarter of 2020, there was a remarkable but modest rise in monthly issuance as companies needed cash, until after March 2020, when the market saw corporate bond issuance surge in months. Monthly corporate bond issuance during the COVID-19 pandemic reveals that investment-grade bonds achieved a record \$300 billion in new issuance in April 2020 alone.

For high-yield bonds, that momentous moment came in June with over \$58 billion in new issuance.

**Figure:** Monthly Corporate Bond Issuance During COVID-19 Pandemic



Source: Corporate Bond Issuance Series, SIFMA.

<https://www.sifma.org/resources/research/us-corporate-bond-issuance/>

### 3.4 The effects of COVID-19 on corporate issuance returns

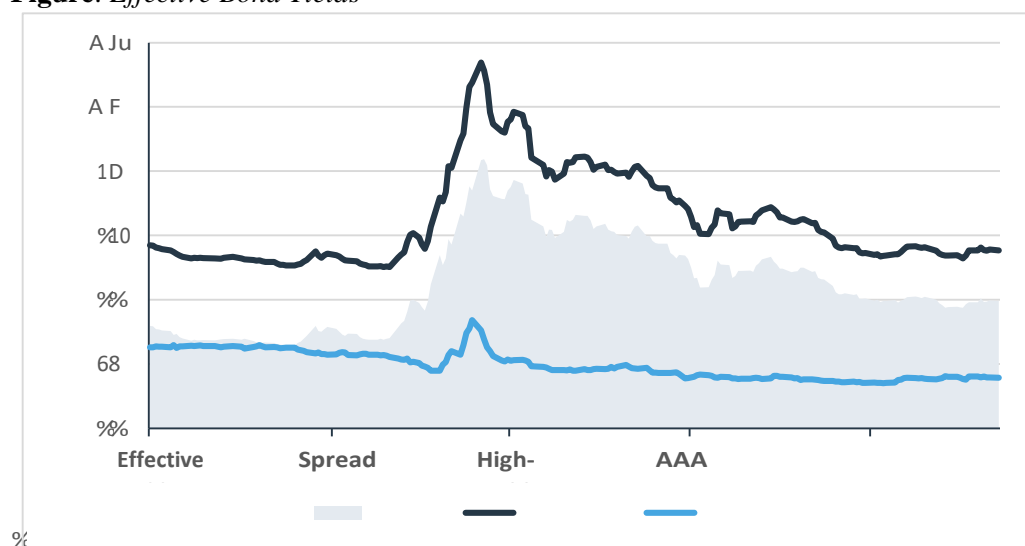
The COVID-19 pandemic has also affected the yields of corporate bonds, especially high-yield bonds.

The yield of high-yield bonds, on the other hand, still remains higher than early 2020 levels.

As a result, the yield spreads between AAA and high-yield corporate bonds have increased during the COVID-19 pandemic, going from 2% in the first quarter of 2020 to 4% throughout the third quarter of 2020.

The market seems to have placed a higher price tag on supplementary risks carried by high-yield bonds.

**Figure:** *Effective Bond Yields*



Source: Corporate Bond Issuance Series, *SIFMA*.

<<https://www.sifma.org/resources/research/us-corporate-bond-issuance/>>

Market observers are also forecasting a rising default rate for high-yield bonds.

According to a Moody's report, the default rate for high-yield U.S. corporate bonds climbed from 2.4% in August 2019 to 6.2% in July 2020<sup>17</sup>.

<sup>17</sup> "Default Trends- Global: August 2020 Default Report." *Moody's Investor Service* (Sep 9, 2020)

<<https://www.moody's.com/creditfoundations/Default-Trends-and-Rating-Transitions-05E002>> (accessed Sept. 16, 2020).

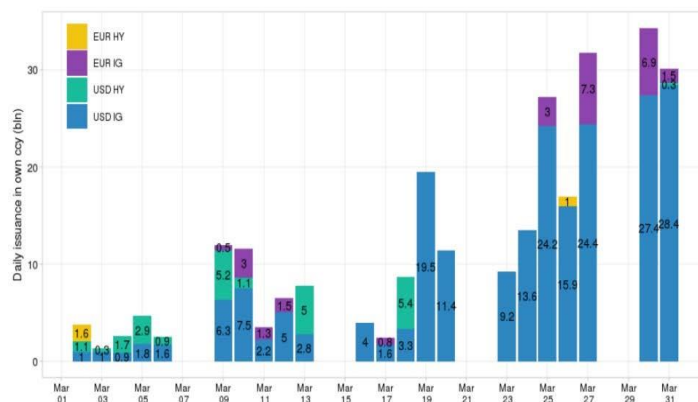
Standard & Poor’s anticipate in a recent report that 12.5% of high-yield corporate bonds will default by March 2021.<sup>18</sup>

Relating to the level of bond issuance in the primary markets, overall, nearly all jurisdictions experienced a severe drop in primary issuances, and a spike in credit spreads and bid-ask spreads. Trading activity was more peculiar, but most jurisdictions witnessed an increased or sustained level of trading activity.

Corporate bond primary market activity was considerably restrained from February to mid-March 2020, with most markets closed for two weeks at the beginning of March.

**Figure 3 – Daily issuance of corporate bonds**

In USD billion



Source: Dealogic, IOSCO calculation

As for the US corporate bond market, the data show remarkable resistance due to the sharp contraction in GDP caused by the COVID-19 pandemic crisis.

Market participants claimed that data access was key to price formation, trading, and liquidity. The US market is regarded as the most advanced in terms of availability and accessibility of data thanks to the implementation of TRACE. In Europe, MiFID has implemented pre-and post-trade transparency, but access to the data remains fragmented. The UK and the EU are currently considering changes to their

Default Rate Is Likely to Reach 12.5% By March 2021.” *S&P Global Ratings* (May 28, 2020) <<https://www.spglobal.com/ratings/en/research/articles/200528-default-transition-andrecovery-the-u-s-speculative-grade-corporate-default-rate-is-likely-to-reach-12-5-11509206>> (accessed Sept. 17, 2020).

regime and the appropriateness of a consolidated tape to address the fragmentation of data. Generally, electronification has made it simpler and more efficient to trade due to the improved quality and quantity of the data relative to 2008. However, market participants also noted that transparency can increase risks of information leakage, which might have adverse effects on market liquidity, suggesting that markets appraise how much and what type of trading takes place on electronic platforms, besides transparency hinged upon individual market characteristics and dynamics. This may explicate the diminished usage of electronic trading during the peak of the crisis when price information was most valuable.

Three main effects have been achieved in the United States:

- (1) bond issuance increased as soon as the contraction hit, while syndicated loan issuance remained low;
- (2) Federal Reserve interventions raised bond issuance, whereas loan issuance also increased, but to a lesser degree; and
- (3) bond issuance was concentrated in the investment-grade segment for large and profitable issuers.

Similarly, as in previous crises and recessions of the US economy, the U.S. bond market has proved to be an important and resilient source of funding for corporations.<sup>19</sup>

In contrast to the effects of the shock on supply and demand in the corporate credit market, as shown by empirical surveys carried out during the global financial crisis of 2008 – 2009, the COVID-19 pandemic crisis bond issuance increased significantly whereas loan origination did not.

This indicates that the two markets have different roles in meeting corporate demand for financing a crisis.

In the US, in terms of aggregate issuance, between March and June 2020, \$502 billion of corporate bonds were issued, compared to \$151 billion in 2019, \$204 billion in 2018, and \$157 billion per year on average throughout the period 2009–2019.

In contrast, during the same period, the origination of syndicated loans stayed below the 2010– 2019 average in loan numbers and total loan amounts originated.

Similarly, during the Global Financial Crisis, the number of bonds issued reverted to the pre-crisis average, while the loan amounts issued increased significantly and remained high for the remainder of the crisis.

In contrast, syndicated loan origination remained below average during the same period.

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<sup>19</sup> See “The Resilience of the U.S. Corporate Bond Market During Financial Crises”. May 2021 - Bo Becker and Efraim Benmelech.

From what has been said above, it is highlighted the fact that the US market for corporate bonds has been tougher than the syndicated loan market.

As for the reasons justifying this difference between the two corporate bond markets compared to syndicated loan originations, these can be, in the first place, sought in the higher quality of bond issuers (with investment-grade ratings) on the market compared to companies applying for credit which, more commonly, do not have ratings.

In times of crisis, the so-called fly-to quality favors the demand on the corporate bond market.

Another explanation may be given by the substantial difference between the operators present in the credit market, the commercial banks, and the bond investors, such as insurance companies, mutual funds, and pension funds.

During a crisis, commercial banks, being weighed down by the exposures they have to debtors who have become insolvent due to the crisis itself (non-performing loans and unlikely to pay), have fewer resources to allocate to new loans.

In contrast, the bond market does not suffer from such a problem since institutional bond investors, such as pension funds and insurance companies, are long-term investors that are less sensitive to balance-sheet shocks.

The "fly to quality", in a serious recessionary crisis such as that of COVID-19, becomes a "fly to safety" as mutual funds increase the collection by savers who feel a greater risk and, to investing in credits, prefer bond issuance while they tend to sell assets perceived as risky and to purchase safe assets, like corporate bonds with different characteristics in terms of the issuance date, maturity date, coupon yield and type (floating or fixed), principal amount, credit rating, issuers publicly listed or not. The above may partly explain the resilience of bond markets during financial crises.

#### **4. MEASURES TAKEN BY CENTRAL BANKS**

In contrast to the 2008 crisis, the COVID-19-induced stress originated outside the financial system. As previously mentioned, the March 2020 shock was unprecedented, affecting, as before stated, all aspects of the economy and across all jurisdictions.

It triggered a rapid response by authorities<sup>20</sup> focused on easing monetary and fiscal policy to support demand and cover lost incomes associated with lockdowns to contain the spread of COVID-19.

We already argued that, following the announcement of large-scale and coordinated intervention by authorities and central banks, market confidence and functioning were restored and, as a result, the most severe market disruption lasted only a few weeks.

Nonetheless, during those critical few weeks, the effects of the pandemic and the public health measures taken by governments to contain them led to a widespread need for liquidity and a severe disruption of the corporate bond markets.

In September 2019, the European Central Bank announced a new wave of corporate asset purchases to reinforce the accommodative impact of the policy rates and ease euro-area corporations' financing conditions.

In particular, following the experience of the first Corporate Sector Purchase Programme (CSPP), the purchases of bonds of eligible quality were expected not only to have a direct impact on targeted bonds, concerning both prices and quantities, but also to trigger the portfolio rebalancing channel, the mechanism through which also bonds of lower quality, typically associated with small and medium enterprises (SMEs), are able to benefit of a reduced cost of issuance.

Generally, the announcement of central bank interventions, along with fiscal support in late March 2020, had an instant effect on market sentiment, leading to the re-opening of the primary markets, and the re-institution of market confidence by decreasing selling pressures coming by institutional investors and other market participants – thus rapidly contributing to unroll the liquidity supply/demand imbalance.

According to dealers' perspective, the interventions played a part in providing liquidity to the market and in restoring risk appetite, allowing dealers to unload some of the positions gathered during the turmoil.

Nevertheless, it is hard to extricate the role and the relative effect of the various policy measures, due to the fact that many of them were implemented throughout a narrow window of time. Market

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<sup>20</sup> See Financial Stability Board (FSB) report: COVID - 19 Pandemic: Financial Stability Implications and Policy Measures Taken.

participants noted that announcements in late March 2020 of the measures had an instant effect on sentiment even if the operationalization of some measures took time to complete.

Purchases of domestic assets by central banks in their own jurisdiction, together with the Secondary Market Corporate Credit Facility (SMCCF) and its dollar liquidity swap lines with other central banks, are typically underlined as the most relevant announcements/interventions for the resumption of trading activity.

Other regulatory involvements, like prudential actions to ease the employment of capital resources for market-making, are typically seen as relatively less impactful.

In addition, the normalization of conditions in core markets, such as those resulting from large-scale interventions in the government bond markets, likely had a consequential beneficial impact on corporate bond market functioning, using the government bond yield curve as a crucial reference benchmark for longer-dated corporate debt pricing.

Since March 2020, market-making activity by dealers has mainly restarted to pre-pandemic levels of pricing and activity, even though the longer-term impact of central bank interventions remains confusing.

In the second quarter of 2020, the situation swiftly resumed to normal, although corporate bond markets in certain jurisdictions have not totally returned to pre-pandemic levels.

Recovery was unequal across assets, depending on whether corporates were in a sector less affected by the pandemic, or assets were eligible as collateral.

Some reported that dealers did not materially change their involvement in the bond market since the COVID-19 stress, though some dealers have adopted more cautious risk management practices and simplified their books.

This may be largely attributable to a general change in risk-taking where positions are more systematically hedged or where an exit strategy is prearranged.

Furthermore, the longer-term effects of the interventions are still unclear. For example, several dealers report that the central bank intervention, although necessary to deal with the turmoil, may create moral hazard in that it may have changed dealer behaviour in the long term.

The consequences on corporate bond markets and dealer intermediation, when government support measures have come to an end, across jurisdictions remain to be observed.



#### **4.1. The Federal Reserve and ECB response**

The Federal Reserve responded to the Covid-19 pandemic with several credit programs, based on the quantitative easing (QE) programs carried out after the Global Financial Crisis, with the main difference being that they included new asset classes, such as corporate bonds.

The QE interventions in the time frame 2009–2014 were also meant to affect the market for corporate bonds, but indirectly.<sup>21</sup> Unlike the 2020 experience, the announcement of QE policies at the end of November 2008 was not associated with increased bond or loan issuance. The issuance cost immediately raised in all market segments, regardless of the business sector of the issuing corporation. However, it is estimated that the bonds eligible for the ECB Corporate Sector Purchase Programme (CSPP) benefited from a more muted impact of around 40 basis points. Such an advantage, however, disappeared from mid-March 2020, a period marked by the ECB launch of the Pandemic Emergency Purchase Programme (PEPP) and policy measures of unparalleled magnitude by the domestic governments and the European Union.

This evidence can be elucidated by two circumstances, namely the change in the market composition, and the working of the portfolio rebalancing channel.

Concerning the former, the right-to-safety phenomenon moved financial agents away from riskier assets (HY bonds) and towards the safer IG segment, thus making the bond market more homogeneous (also all eligible bonds are all IG).

Regarding the latter, after the start of the purchases under the PEPP, a large share of the market became unavailable because of the ECB demand, thus investors rebalanced their portfolio towards similar assets: IG bonds which were non-eligible to the ECB purchases. This in turn generated an endogenous surge in the demand for non-eligible bonds, which, increasing the bond price, reduced the cost at issuance and offset the difference with respect to eligible bonds.

While from the perspective of IG corporations, the ECB intervention can be considered effective in protecting their bonds from the sudden deterioration in price conditions, the expected second-round

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<sup>21</sup> Analysis of the asset market impact of asset purchase programs is provided by Krishnamurthy and Vissing-Jørgensen (2012) for the QE programs following the Global Financial Crisis and by Gilchrist et al. (2020) and O'Hara and Zhou (2020) for the Covid-period programs.

effect through the portfolio rebalancing channel did not materialize for the HY bonds for which the cost at issuance has skyrocketed after the Covid spreading.

## **4.2. The role of the official sector**

Official institutions, that is the public sector, consist principally of Government investments, foreign exchange reserves, sovereign wealth funds and international treasury operations, being significant investors in corporate bonds outside of the US, and particularly in the EU, where they are the largest owners of euro-area corporate bonds.

Official institutions' corporate bond holdings are mostly in highly rated bonds issued by financial corporations and agencies, purchased in the primary market.

In Europe, the augmentation of the ECB's Asset Purchase Programme (APP) to include investment-grade EUR-denominated bonds occurred in 2016 and has influenced both the primary and the secondary markets, considering the scale of the activity and the buy-and-hold nature of these products.

In response to the COVID-19-induced market stresses, the ECB's APP raised its corporate bond holdings from €200 billion in the pre-COVID-19 period to €350 billion as of November 2021.

While these additional interventions took place initially in the primary market (62% of the Pandemic Emergency Purchase Program (PEPP) volume between March and May 2020), current purchases are mainly in the secondary market, also accounting for 62% of the amounts bought<sup>22</sup>.

There is limited data on the trading behaviour of the official sector during the crisis.

For what concerns the UK experience, it is noticed that official institutions were net buyers of AAA credit throughout the first half of 2020, with an important peak in purchases over March.

It is likely that this was opportunistic buying during the sharp sell-off in underlying Government bonds and the March peak in Treasury yields.

This is significant given that official institutions tend to source liquidity in the primary markets, with large anchor orders that motivate opportunistic borrowers<sup>23</sup>.

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<sup>22</sup> ECB announced that purchase under the PEPP would be lessened until its end in March 2022. The principal payments from maturing securities purchased under the PEPP will continue to be reinvested until at least the end of 2024. In the meantime, ECB will temporarily increase the volumes of the APP bonds purchase program, but then reduce them back to their previous levels in October 2022.

<sup>23</sup> A new GBP deal or increase for a frequent issuer can be transacted intraday, often with the whole process - from mandate to execution - taking a matter of hours. Contrast this to other fixed income such as securitisations, which often takes 3-6 months to originate.

There is no evidence that GBP AAA bonds were sold to raise cash over March 2020. Any evidence of outright selling is subdued and appears post-intervention (in a recovering and lower-yielding backdrop). Such a mild selling would have taken place in a vigorously recovered primary market and could have been done to accommodate new issuances.

There are similar outcomes in non-AAA high-grade GBP credit, with limited evidence of selling over March 2020. Any selling pressure emerges in early summer 2020 as soon as markets recovered and primary markets were achieving record issuance levels.

Not all official institutions diverge from AAA/AA-rated products, but, the ones that do stray out, often the sovereign wealth funds, are material investors of corporate bonds for peripheral markets.

As reported by the global database on central banks' monetary responses to Covid-19,<sup>24</sup> central banks have responded quickly, on a massive scale.

The unequalled health shock of the COVID-19 pandemic and its economic repercussions have been observed worldwide, affecting simultaneously demand, supply and financial conditions.

During spring 2020, lockdowns forced to curtail the spread of the virus, led to a widespread unexpected stop, severely constricting productive activities. Containment and social distancing measures contributed to a sharp reduction in demand for many goods and services – particularly in sectors like recreation, food services and travel.

The abrupt contraction in workers' income and firms' cash flow due to the pandemic increased the risk of delinquency on mortgages and loans to consumers and businesses, raising concerns about the health of the financial system.

Moreover, as the pandemic spread, uncertainty rose and equity markets came under stress. Overall, central banks around the world reacted quickly and on a massive scale to the pandemic – often in tandem with fiscal authorities.

In advanced economies (AEs), their goal was double.

First, and early during the pandemic, monetary policy measures aimed at stabilising financial markets and preventing the pandemic from turning into a renewed financial crisis.

Public assets' purchases and liquidity provisions under favourable conditions were the main tools of such an intervention.

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<sup>24</sup> Carlos Cantú, Paolo Cavallino, Fiorella De Fiore and James Yetman: Bank for International Settlements - BIS Working Papers No 934.

The response of central banks in emerging market economies (EMEs) mirrored certain specific factors faced by those economies, with an important aspect being that in early 2020, most EMEs were at a low point of the business cycle and their aggregate demand below potential.

Moreover, broad and strong actions by central banks in AEs during spring restrained the appreciation of the US dollar and unwinded the turmoil in global financial markets; the following easing of financial conditions in EMEs made their central banks orient monetary policy towards domestic targets, that is the support of aggregate demand – in spite of large capital outflows and sharp currency depreciations. In some countries, EMEs' central banks ventured into uncharted territory and complemented interest rate reductions with asset purchase programmes.

The BIS database provides helpful information on the announcements of monetary policy measures from the initial outburst of the pandemic and the Central banks' responses to Covid-19 in Advanced Economies and Emerging Markets Economies.

The number of announcements from the various central banks achieved a peak in early March, but shows a long tail right to the end of our sample period, partly exhibiting the fine-tuning of the policy responses, because of policymakers learning from each other and from the markets' reactions to their policies.

The nature of the announced measures changed over time. The immediate goal of central banks was to cushion the contraction in economic activity by ensuring the smooth functioning of the financial system.

The initial policy announcements thus mostly involved the policy rate.

As lockdown measures began to be implemented, central banks growingly resorted to lending operations. These measures provided liquidity to banks to facilitate lending to firms affected by the containment measures.

In the meanwhile, central banks, especially in EMEs, reported foreign exchange operations to mitigate exchange rate pressures and decrease exchange rate volatility.

As time advanced, asset purchase announcements acquired prominence.

In the initial phase of the crisis, central banks focused on improving market functioning, while at later stages the focus changed to facilitate the financing of both private and public sectors. Throughout the sample period, central banks resorted to reserve policies to free liquidity restricted by prudential regulation.

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Central banks' policy measures (announcements and instruments)

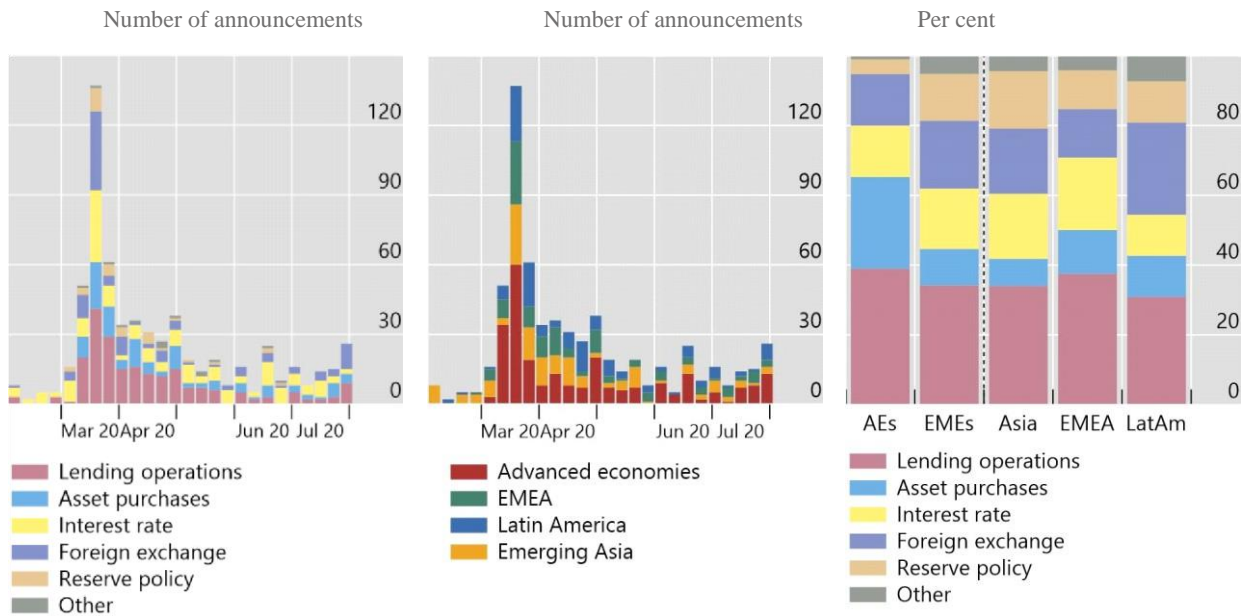
February to July 2020

Graph 3

Weekly announcements of policies by category

Weekly announcements of policies by region

Share of policy instruments by region



Advanced economies = AU, CA, CH, DK, EA, GB, JP, NO, NZ, SE and US; Emerging Asia = CN, HK, ID, IN, KR, MY, PH, SG, TH and VN; Europe, the Middle East and Africa = AE, CZ, DZ, HU, IL, KW, MA, PL, RO, SA, TR and ZA; Latin America = AR, BR, CL, CO, MX and PE.

<sup>1</sup> “Other” category contains announcements on loan guarantee programmes, technical changes to facilities and changes to central banks’ law.

Source: Central bank websites; BIS calculations.

The time frame of declared measures reflects the diffusion of the virus by region (Graph 3, central panel). As the virus spread through Europe and arrived in America, central banks there responded promptly and strongly.

By the third week of March, most countries had enforced strict lockdown measures, simultaneously with the pinnacle in policy announcements. Among EMEs’ central banks, the most common category of policy action was also lending operations (35%).

But the proportions and rankings of other policy categories differed between EMEs and AEs. EMEs implemented more interest rates (20%), foreign exchange (20%) and reserve policies (15%) and fewer asset purchases (10%). There were also subtle differences by region. For instance, in Latin America central banks took part proportionately more in foreign exchange operations, while in Eastern Europe, Africa and Asia central banks engaged in interest rate policies.

As aforementioned, following the outburst of Covid-19, the first measure for many central banks was a reduction of policy rates to ease funding costs and support aggregate demand. With the exception of Japan and the euro area, in which they were already negative, rates have been cut and in many Advanced Economies, they rapidly achieved zero (Graph 4, left panel), in many cases to historic minimums. For example, the Central Bank of Turkey cut rates by 300 basis points, the largest interest rate reduction in all countries. The central banks of Brazil, Mexico, Peru and South Africa reduced rates by more than 200 bp, and those of Chile, Colombia, the Czech Republic, Hong Kong, Israel, India, the Philippines, Poland, Russia, Singapore, United Arab Emirates and Vietnam by more than 100 bp.

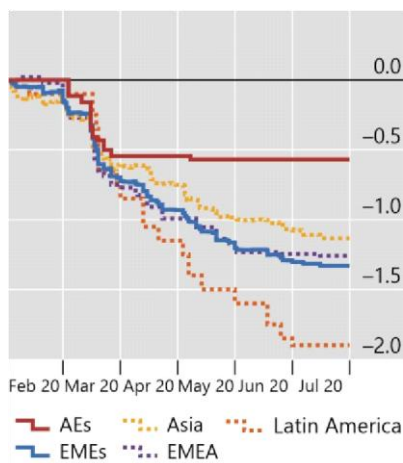
The interest rate policy response in EMEs was different from other crisis episodes. Previously, central banks' target to lower rates was moderated by concerns about capital outflows in the event of the exchange rate's depreciation. As a result, it was common to observe increasing EMEs' policy rates during crises.

By contrast, during the Covid-19 crisis, EMEs' central banks were able to follow AEs' central banks and cut interest rates. Two factors were at play.

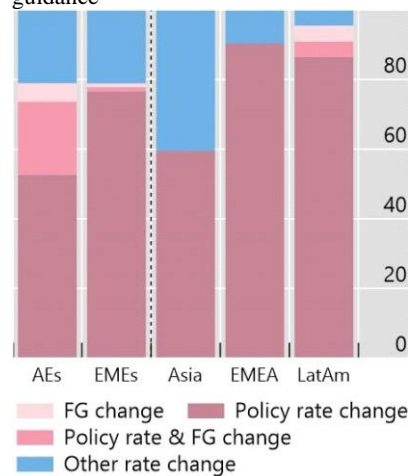
First of all, the cyclical position of EMEs gave ample discretion for unwinding monetary policy, while structural changes enhanced the stabilisation of inflation's expectations and maintained a lid on exchange rate pass-through. Secondly, the quick monetary policy easing by the Fed and other AEs' central banks soothed global financial conditions. Such policies curbed the appreciation pressures on the US dollar, an EME risk factor, and bestowed greater room to cut rates on EMEs.

As rates achieved zero, AEs' central complemented cuts on policy rates with guidance to indicate that rates would stay low for a broadened period. Central banks introduced different languages to signal a prolonged period of accommodative stance in around 30% of their interest rate changes (Graph 4, central panel). In other cases, central banks altered their forward guidance without making any adjustments in the policy rate (5% of interest policy announcements). In EMEs, the Central Banks of Brazil and Chile also introduced forward guidance in their policy statements. Brazil was a special case, since the monetary policy committee chose to change their forward guidance statements on three occasions without reducing their policy rate despite having room to cut (the minimum policy rate reached was 2%). One possible justification is that the central bank did not intend to risk having a sharp currency depreciation or capital outflows by a further reduction in the interest rate.

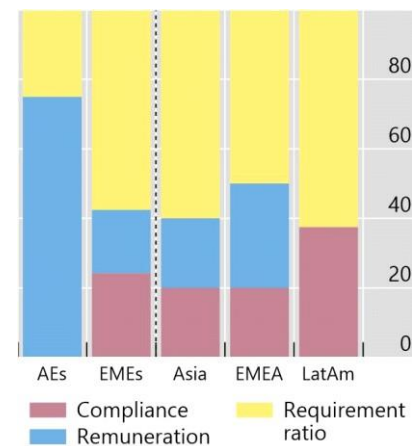
Cumulative policy rate changes <sup>1</sup>



Interest rate changes and forward guidance



Reserve policy



<sup>1</sup> Simple average of interest rate changes by region. AR is excluded.

Source: Central bank websites; national data; BIS calculations.

With low policy rates, central banks also implemented changes in reserve policy to quickly free up liquidity to financial institutions (Graph 4, right panel). We distinguish three categories of reserve policy: compliance, remuneration and requirement ratio.

Regarding AEs, only three countries (Australia, China and the US) applied changes to their reserve policy and most of those measures dealt with changes in remuneration. The use of reserve policy in EMEs was more widespread. In most cases, it involved changes in requirement ratios. Liquidity quickly injected into the system was considerable. For example, the Central Bank of Brazil injected around BRL 68 billion (\$12 billion) by reducing reserve requirements on time deposits from 25% to 17%. In other cases, the reduction in reserve requirements was subject to restrictions. China decreased required reserves by 200 basis points, contingent on banks meeting inclusive finance targets, and rural banks supporting smaller borrowers.

Some other countries adjusted the remuneration of their reserve policy. For example, the Central Bank of the Republic of Turkey lowered remuneration rates on required reserves in liras from 10% to 0% but only for some banks. Some countries, instead, announced measures related to compliance, that is changes on instruments counting as reserves, like the Central Bank of Argentina, which permitted the usage of central bank debt instruments, and the Central Bank of Malaysia, which allowed government bonds.

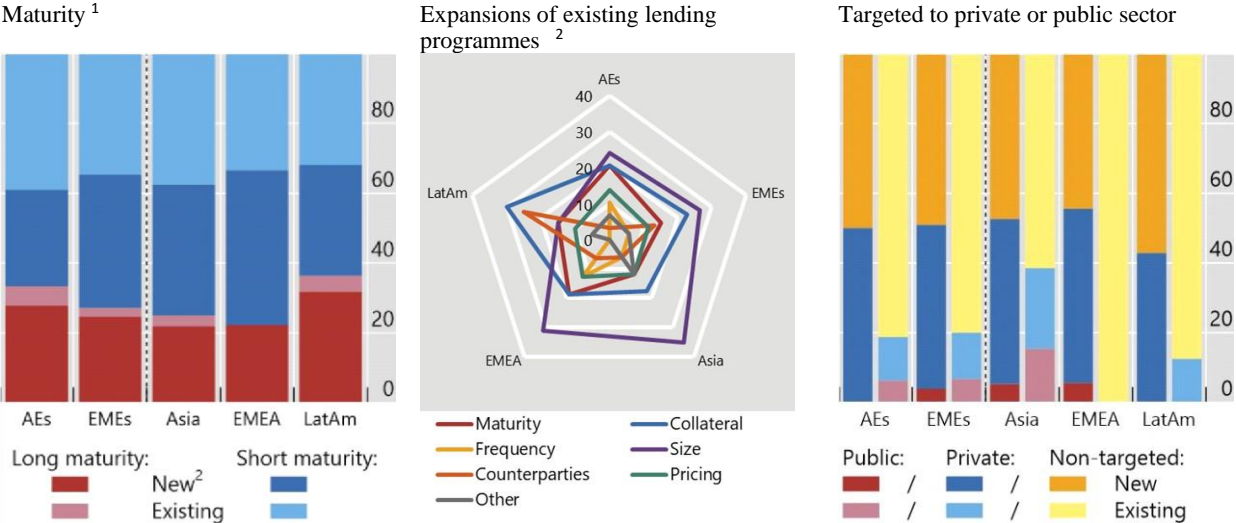
Regarding liquidity assistance and credit provision (ending operations), the core component of the crisis response was the deployment of a wide range of balance sheet policies. In both AEs and EMEs, around 60% of lending operations policies entailed newly established programmes, rather than the

continuation of previous ones (Graph 5, left panel). More than half of these programmes, whether new or existing, had a short-term maturity (one year or less). Regarding existing programmes, central banks expanded their lending operations mainly in terms of the size of the facilities, eligible collateral and the maturity of the instruments (Graph 5, central panel). We provide examples of policies implemented in different regions to illustrate the changes and operational framework. These examples are not exhaustive.

Lending operations

In per cent; February to July 2020

Graph 5



<sup>1</sup> Long = Over one year; short = up to 12 months. Lending programmes offering both long and short-maturity instruments are classified as long maturity for the purposes of this panel.

<sup>2</sup> Expressed as a share of all expansions to programmes active pre-crisis, a single programme can be adjusted in multiple dimensions.

Source: Central bank websites; national data; BIS calculations.

In AEs, central banks established non-targeted lending operations in the first months of the pandemic to address liquidity shortages and prevent market freezes. The Fed, the Bank of Canada, and the Bank of Japan raised the amount of their repurchase agreements and extended their maturities. The Fed also reported lending programmes targeted to definite financial market segments. For instance, it intervened to prevent funding strains for primary dealers, by lending against investment-grade debt, and for money market mutual funds, by lending to depository institutions against assets purchased from those funds. Moreover, it reactivated the Term Asset-Backed Securities Loan Facility (TALF), established in 2008 – to underpin the issuance of asset-backed securities.



The ECB modified the maturity of existing loans by conferring bridge liquidity operations on banks, until the June allotment of the Targeted Long-Term Refinancing Operation (TLTRO III). It also instituted additional Pandemic Emergency Longer-Term Refinancing Operations (PELTRO). The Bank of England and the Bank of Canada activated their Contingent Term Repo Facilities (CTRFs) for the first time since their establishment, in 2014 and 2015 respectively, and lengthened the maturity of the lending operations with repos of up to two years' maturity.

In EMEs, central banks expanded their existing liquidity facilities by lowering rates, broadening eligible collateral and increasing eligible counterparties. In Latin America, the Central Bank of Brazil reduced the spread of the liquidity-levelling window. The Central Bank of Chile included corporate bonds as eligible collateral for its liquidity facilities. It also restored a term liquidity facility (FCIC), used during the Great Financial Crisis, but with larger scope and scale, and activated a supplementary liquidity credit line. The Central Bank of Colombia extended access to repo auctions and its liquidity window to pension funds, several funds' managers and national savings funds. The central bank also extended the maturities of repo auctions to 90 days for corporate debt and up to 60 days for public debt. The Bank of Mexico reduced the rate of its Ordinary Liquidity Facility (FLAO) from 2.2 to 1.1 times the policy rate, extended eligible collateral and granted development banks access to the facility. In emerging Asia, the Bank of Korea adopted unlimited fixed-rate 91-day repo operations and expanded the scope of eligible collateral and the range of institutions eligible for borrowing funds through reverse repo transactions. The central banks of China, Indonesia and Malaysia raised non-targeted liquidity injections through the use of reverse repos. The Reserve Bank of India eased commercial banks' overnight borrowing limits under its marginal standing facility and, along with the Bank of Thailand, instituted measures to support the liquidity needs of mutual funds. The maturity of liquidity operations was raised to one year in Indonesia, whereas the Reserve Bank of India targeted some three-year repo operations to calm the pressures on non-banking finance companies and microfinance institutions.

In Eastern Europe, the Czech National Bank permitted insurance companies and pension funds to take part in their repo operations; the repos increased in frequency, had an extended maturity and allowed the usage of mortgage bonds as collateral. The Magyar Nemzeti Bank and the Bank of Israel expanded eligible collateral to include corporate loans.

One main difference between existing and new lending policies was that a large share of new policies targeted the private sector (Graph 5, right panel). Central banks in AEs deployed long-term lending measures to support the flow of credit to households and non-financial corporations.

The Federal Reserve, the Bank of Japan and the Bank of England set up targeted lending programmes aimed at providing funds to banks at favourable terms, conditional on loan extensions to small and medium-sized enterprises (SMEs). The Federal Reserve established the Paycheck Protection Program Liquidity Facility (PPPLF) to provide liquidity against payroll loans guaranteed by the Treasury and covered the last mile to reach SMEs throughout the COVID-19 crisis with the Main Street Lending Program, which offered four-year loans to firms in good financial standing before the crisis.

Latin American central banks also implemented several programmes that channelled credit to SMEs. In most cases, these programmes resulted from the collaboration of the central bank and the Ministry of Finance. For example, the Central Bank of Brazil managed an emergency funding line that helped firms cover wages and other expenses. The government contributed 85%, while banks covered the remaining 15%. In Peru, the government ratified a national government guarantee programme (Reactiva Peru), according to which financial institutions could use their credit portfolio to get a guarantee and carry out repo operations with the central bank. Finally, the Bank of Mexico generated two different facilities to bestow financing on SMEs. The variance was that one of them authorized financial institutions to use as collateral credits to non-financial corporates with high credit ratings. In Eastern Europe and Africa, lending operations to the private sector were characterized by distinct forms. The Hungarian National Bank proposed a long-term collateralised lending facility of limitless total amounts at fixed interest rates.

The Bank of Israel provided banks with loans at a fixed interest rate of negative 0.1 per cent, against loans that banks extend to SMEs, provided that the interest rate on the loans does not exceed +1.3 per cent the prime rate.

The South African Reserve Bank allowed businesses with an annual turnover of less than R300 million to apply for a guaranteed loan. Firms could make use of these funds for operational expenses, like wages, rent and lease agreements, and contracts with suppliers.

Provisions to channel credit to SMEs were also widespread in Asia. The Bank of Thailand provided “soft loans” via banks to SMEs, with the government partially compensating banks for losses and subsidising interest payments for the first six months. In China, re-lending and re-discounting facilities were extended to assist, at low interest rates, manufacturers of medical supplies, micro, small and medium-sized enterprises (MSMEs) fabricating daily necessities, and the agricultural sector. At the same time, China’s policy banks raised credit to boost private, micro and small enterprises with preferential interest rates.

The Monetary Authority of Singapore set up a Singapore dollar liquidity facility to underpin lending by financial institutions to SMEs according to the government’s loan guarantee schemes, to facilitate

credit conditions for such companies, while Korea and Malaysia also increased the size of existing facilities targeting SMEs, and lowered interest rates applied to these facilities.

At last, some central banks in emerging Asia lowered some debt instruments' issuance to increase market liquidity; in Thailand and Hong Kong, the issuance of Bank of Thailand Bonds and Exchange Fund Bills decreased respectively, and the Monetary Authority of Singapore modified their daily money market operations to warrant that more liquidity persisted in the banking system.

### **4.3. Market functioning: asset purchases and bond swaps**

Another class of policy responses enacted regularly by central banks in EMEs and AEs was asset purchase programmes, even though intended for divergent goals in different countries. For AEs, asset purchase programmes played a key role – perhaps of equal importance to the funding and liquidity provision policies outlined above – in the crisis management phase.

In EMEs, on the other hand, their role seems to have been more restricted.

In AEs, only 40% of asset purchase programmes were new, whereas in EMEs the portion of new programmes was over 90% (Graph 6, left panel). One common characteristic across regions was that asset purchase programmes largely involved long-term instruments (more than 70% of all policies).

In AEs, existing programmes were expanded mainly in size but to a lesser extent also in terms of frequency and type of assets purchased. In EMEs, only two programmes existed before the current crisis: the Hungarian bond funding for growth scheme programme and the Colombian government securities swap programme.

Private asset purchase programmes accounted for half the total.

In AEs, central banks launched these programmes to directly assist the flow of credit to non-financial firms. Most programmes involved either commercial paper or corporate bonds (Graph 6, central panel). Other classes of assets involved were covered bonds, equities and asset-backed or mortgage-backed securities.

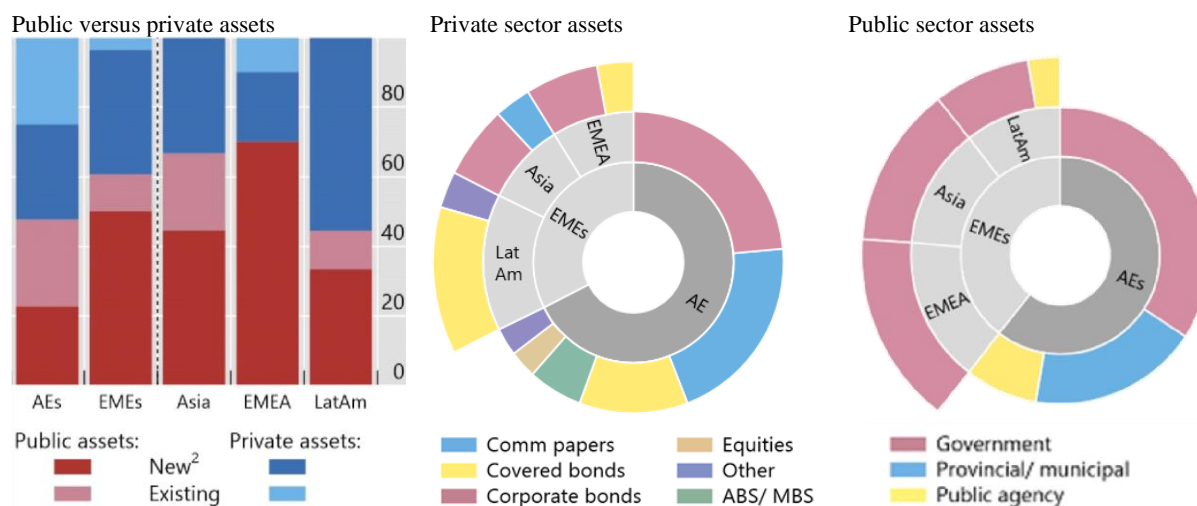
All five largest AEs' central banks established or increased the size of their commercial paper and corporate bond purchase programmes, while the ECB extended eligibility to nonfinancial commercial paper. The Federal Reserve purchased investment-grade bonds for the first time and later extended eligibility to subsequently downgraded bonds – the so-called “fallen angels” – either directly or through exchange-traded funds (ETFs).

The ECB, similarly, expanded eligibility to downgraded bonds against proper haircuts. The Bank of Japan quadruplicated its acquisitions of commercial paper (CP) and corporate bonds (CBs), while the Bank of England reported that at least 10% of the £200 billion of additional purchases under its Asset Purchase Facility (APF) would deal with corporate bonds.

Asset purchases: by type of asset<sup>1</sup>

Per cent, February to July 2020

Graph 6



<sup>1</sup> For the purposes of this graph any asset purchases announcement that includes more than one asset class is treated as a separate announcement.

<sup>2</sup> Programmes first introduced as a response to the Covid episode in 2020.

Source: Central bank websites; national data; BIS calculations.

For EMEs, asset purchase programmes were new territory, hence there was less variety in the type of assets. In Latin America, only Chile and Colombia engaged in private-sector asset purchase programmes, and these were restricted to commercial bank bonds. In Chile, the programme amounted to \$8 billion and in Colombia up to COP 4 trillion (USD 1 bn). In Chile, the central bank introduced two supplementary asset purchase programmes to lower the financial effects of a reform that permitted withdrawals from pension funds. The first programme coped with the spot purchase and forward sale of bank bonds, whereas the second was a bank deposit purchase programme.

In Emerging Asia, the Bank of Thailand attempted to stabilise corporate bond markets with its Corporate Bond Stabilisation Fund, which conferred bridge financing on firms by purchasing investment-grade bonds maturing during 2020–21 at penalty rates. The Magyar Nemzeti Bank launched a mortgage bond purchase programme and expanded the Bond Funding for Growth Scheme. The Bank of Israel set up a corporate bonds purchase programme.

The other half of asset purchase programmes regarded government assets. Besides government bonds, central banks broadened their purchases to cover public agency assets, and provincial and municipal bonds (Graph 6, right panel). In the United States, public sector asset purchases were instrumental in ensuring the smooth functioning of the US Treasury market and preserving its key role in the pricing of financial assets.

Similarly, ECB purchases contributed to preserving the efficacious transmission of monetary policy by limiting the widening of euro area sovereign spreads. An additional purpose of purchase programmes was to restore confidence and set the conditions for a quick rebound of aggregate demand at the end of the lockdown.

The Federal Reserve and Bank of Japan announced unlimited purchases of government bonds, while the Bank of Canada entered an asset purchase programme for the first time, specifying a lower bound of CAD 5 billion for purchases per week.

The ECB expanded the ongoing Asset Purchase Programme (APP) by committing to purchase an additional €120 billion in private and public assets by the end of 2020. Later, it allotted €1.35 trillion to private and public asset purchases under the new Pandemic Emergency Purchase Programme (PEPP).

The Federal Reserve and the Bank of Canada established purchase programmes for assets issued by municipal entities and local public authorities for the first time. In Asia, Eastern Europe and Africa, central banks actively bought government bonds.

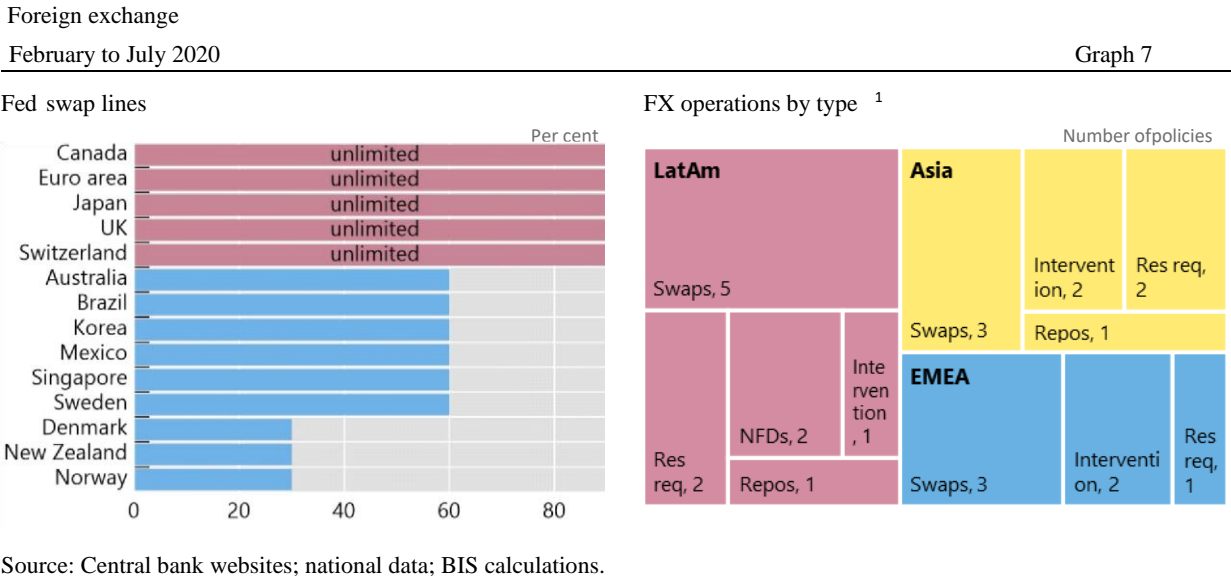
The central banks of India, Korea, the Philippines and Thailand acquired government securities utterly in the secondary market, while Bank Indonesia acquired bonds in the primary market to assist government measures for mitigating the pandemic and to boost the economic recovery. The central banks of Hungary, Israel, Poland, Romania and South Africa bought government securities in secondary markets to reinstate their liquidity and reinforce the monetary policy transmission mechanism.

EMEs' central banks in Latin America were typically wary about enforcing public debt purchase programmes. In the past, central banks financing government debt had led to long periods of uncontrollable hyperinflation. Colombia bought public debt in the secondary market (up to COP 2 trillion or \$500 million).

The Central Bank of Brazil and the Central Bank of Chile called for legal amendments from their respective legislative branches to allow them to acquire public bonds, but neither central bank implemented this policy in the period considered; this being said, the central banks of Brazil, Colombia and Mexico took up twist-type transactions, integrating duration from the market by purchasing long-term securities and selling short-term ones. Finally, Chile implemented a special asset purchase programme that involved Central Bank of Chile bonds.

#### 4.4. Liquidity and funding in USD: foreign exchange operations

Foreign exchange liquidity provisions played a fundamental role in unwinding strains in foreign currency markets. Increasing dollar liabilities, combined with an appreciating US dollar, left the market for dollar funding under tight pressure. The Federal Reserve responded by reducing the cost and extending the maturity of standing swap lines with five central banks. Later, it reestablished swap lines with nine other countries that were activated during the Great Financial Crisis (Graph 7, left panel). A matching measure that raised the accessibility of US dollars for economies without access to swap lines, while conferring a backstop on the US Treasury sell-off, was the FIMA Repo Facility, in which foreign and international monetary authorities could get dollars by pledging US Treasuries as collateral. Authorities in Korea, Mexico and Singapore drew down on swap lines with the US Federal Reserve, while the Hong Kong Monetary Authority made use of the Federal Reserve’s FIMA Repo Facility to ensure liquidity.



The use of FX intervention instruments was more varied in EMEs (Graph 7, right panel). During the COVID-19 crisis, EMEs’ central banks intervened in FX markets to improve liquidity and limit exchange rate volatility. The augmented demand for USD funding, a shortage of sufficient foreign exchange hedges and the liquidation of portfolio positions by foreign investors all conducted to high volatility in foreign exchange markets.

These conditions created an adverse feedback mechanism between capital flows, exchange rates and bond prices. Financial risks related to exchange rate volatility became even stronger as firms had to fulfil international debt service payments while their USD income declined. Most banks and firms were somewhat hedged by FX derivatives, but not sufficiently to fully cover the sharp depreciation.

In Latin America, the preferred instruments for foreign exchange intervention were represented by foreign exchange derivatives. The central banks of Brazil, Chile, Colombia and Peru expanded their FX swap programmes, while the central banks of Chile, Colombia and Mexico engaged in operations using non-deliverable forwards. In both cases, the objective was to provide market participants with exchange rate hedges to reduce their exposure to currency risk.

In Emerging Asia, many central banks also intervened in foreign exchange markets to alleviate likely destabilising exchange rate dynamics. In the case of Indonesia, the central bank intervened in FX spot and domestic non-deliverable forward markets. The Central Bank of Malaysia implemented targeted foreign exchange intervention to lighten excessive exchange rate volatility and guarantee sufficient foreign exchange liquidity, while the Bank of Thailand used “verbal and two-sided FX intervention” to cope with excessive FX movements.

At the same time, the Monetary Authority of Singapore reported a re-centring of the exchange rate band with a 0% appreciation rate, estimating that the equilibrium level of the real exchange rate had dropped due to the Covid-19 outbreak. By contrast, Hong Kong faced the opposite problem: interventions were automatically triggered under their Linked Exchange Rate System when the value of the Hong Kong dollar appreciated to the strong side of the target range of 7.75-7.85 HKD per USD.

Supplementary measures were also taken by some central banks to secure sufficient dollar liquidity. The Reserve Bank of India provided sell/buy swaps via auctions, while Bank Indonesia increased the frequency of FX swap auctions for 1-, 3-, 6- and 12-month tenors from three times per week to daily. The European Central Bank and the central banks of Hungary and Romania agreed to launch a repo line arrangement to supply euro liquidity to domestic financial institutions. The Central Bank of the Republic of Turkey and Qatar Central Bank arranged a swap line with a value of USD 15 billion.

## 5. CONCLUSION

The present work aims at examining the economic effects caused by the global spread of the pandemic on the functioning of a very important market for economic development such as the corporate bond market.

The reference period is between the end of 2019 - the beginning of 2020, when the virus spread first in China and then in the rest of the world, until the re-establishment of market operating conditions similar to those before Covid.

In addition to the serious health consequences (the World Health Organization (WHO) estimated that more than 200 million people have been infected and more than 3 million individuals have lost their lives due to COVID-19), the pandemic has had a particularly significant impact on the economic cycle and financial markets.

According to estimates by the International Monetary Fund (IMF), the world GDP fell by 3.3% in 2020, the strongest contraction of the economy since World War II.

At the euro-area level, GDP contracted the largest since the start of the European Monetary Union.

International trade, which was impacted by the restrictions imposed by the authorities on the free movement of people and the movement of goods, fell by about 9% in 2020.

Exports recorded a sharp decline, especially in the first half of 2020, but then, in the final months of the year, regained momentum and mostly reached pre-COVID levels (2019).

Italy's GDP recorded the heaviest decline since World War II, marking a decline of 8.99%, and, as reported by the Bank of Italy, the contraction of gross domestic product affected all geographical areas of the country but was more pronounced in the North, an area of the country that was hit the hardest by the first wave of infections.

Following the first severe lockdown measures, the issuance cost of securities for capital markets transactions suddenly increased in all market segments regardless of the business sector of the issuing corporation.

In contrast to the 2008 crisis, the COVID-19-induced stress originated outside the financial system and has been an unprecedented shock, affecting, as before stated, all aspects of the economy and across all jurisdictions.

It triggered a rapid response by authorities focused on easing monetary and fiscal policy to support demand and cover lost incomes associated with lockdowns to contain the spread of COVID-19. Following the announcement of large-scale and coordinated intervention by authorities and central banks, indeed, market confidence and functioning were restored and, as a result, the most severe market disruption lasted only a few weeks.



Nonetheless, during those critical few weeks, the effects of the pandemic and the public health measures taken by governments to contain them led to a widespread need for liquidity and a severe disruption of the corporate bond markets.

This thesis furthers a brief analysis of the structure of the corporate bond market, taking into account the effects of the pandemic on the functioning of the corporate bond market, with particular regard to liquidity, trading frequency, and institutional investor behavior.

It triggered a rapid response by authorities focused on easing monetary and fiscal policy to support demand and cover lost incomes associated with lockdowns to contain the spread of COVID-19.

The programs were based on the quantitative easing (QE) programs implemented after the Global Financial Crisis, with the difference that they included new asset classes, including corporate bonds.

Of course, the QE interventions in 2009–2014 were also intended to affect the corporate bond market, but indirectly.

Generally, the announcement of central bank interventions along with fiscal support in late March 2020 had an instant effect on market sentiment.

It led to the re-opening of the primary markets, and the restoration of market confidence by substantially reducing selling pressures from institutional investors and other market participants – thereby helping to quickly unwind the liquidity supply/demand imbalance.

From the dealers' perspective, the interventions helped by providing liquidity to the market and by restoring risk appetite, thereby allowing dealers to offload some of the positions accumulated during the turmoil.

However, it is difficult to disentangle the role and the relative impact of the different policy measures because many of them occurred in a narrow window. Market participants noted that announcements in late March 2020 of the measures had an instant effect on sentiment even if the operationalization of some measures took time to complete.

In addition, the normalization of conditions in core markets, such as those resulting from largescale interventions in the government bond markets, likely had a consequential beneficial impact on corporate bond market functioning given the government bond yield curve's use as a key reference benchmark for pricing longer-dated corporate debt.

Since March 2020, market-making activity by dealers has mostly resumed to pre-pandemic levels (of pricing and activity), though the longer-term impact of central bank interventions remains unclear.

In the second quarter of 2020, the situation rapidly returned to normal, even though corporate bond markets in some certain jurisdictions have not totally reverted to pre-pandemic conditions.

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