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Bond Market Borrowing by Non-Financial Corporations

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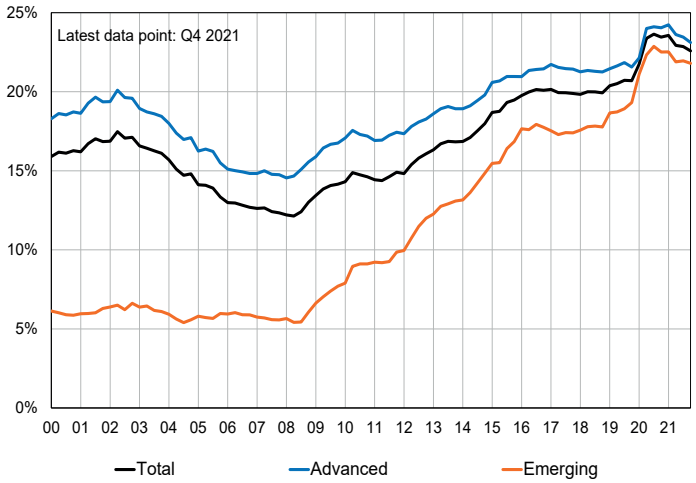
- When borrowing, non-financial corporations (NFCs) have the choice between contracting a loan and issuing bonds. Loans are obtained from a financial intermediary (usually a bank), whereas bonds are debt securities issued directly on the financial markets.
- At the global level, NFC bond debt has risen sharply since the 2008 crisis (see chart on this page). Over this period, bond debt as a proportion of GDP increased twice as fast in emerging market economies as it did in advanced ones, driven largely by China.
- Apart from the need for NFCs to diversify their financing sources, other factors may have contributed to the growth of the bond market since the 2008 crisis: (1) expansionary monetary policies in advanced economies supported both the supply and demand for bonds; and (2) stricter banking regulations may have led firms to replace bank loans with bonds.
- Issuing bonds is a way for NFCs to diversify their financing sources and ensure a stronger rebound in periods of economic recovery. However, it can also be a source of vulnerability for the global economy:
  - The ongoing normalisation of monetary policy could drive investors away from the bond market, particularly its riskier segments, making it difficult for NFCs to refinance.
  - A global economic slowdown could lead to rating downgrades and fire sales of NFC bonds.
  - As China opens up its bond market, now the world's second largest after the US market, it needs to address its vulnerabilities.

NFC bond debt (as a % of GDP)



Source: Bank of International Settlements (BIS), World Bank, Institute of International Finance, DG Trésor calculations.

1. The growth of the NFC bond market since the 2008 crisis

1.1 Differences between bank borrowing and bond borrowing

When borrowing, there are two main instruments that non-financial corporations (NFCs) can choose between: bank loans and bonds.[1] Bank loans are obtained from a financial intermediary (usually a bank). Bonds are debt securities issued by NFCs directly on the financial markets and purchased by investors. These bonds may then be traded between investors on secondary markets (either regulated or over-the-counter markets), where prices will fluctuate based on market conditions.

With bank borrowing, an NFC needs to have a good relationship with its lender and will pay intermediation and monitoring costs,[2] but this is offset by a lower cost of borrowing during periods of financial stress, as loan conditions can be renegotiated. Bonds tend to be held by a dispersed base of investors, which makes them difficult to renegotiate during periods of financial stress.[3] This difference can influence an NFC's choice of debt instrument depending on its situation.

Using a theoretical model, Fiore et al.[4] suggest that firms select their optimal borrowing source based on their initial productivity. According to the authors, banks are able to acquire costly information about a firm's initial productivity and the productivity shocks it faces, which allows them to adapt the terms of their loans accordingly. Conversely, bond financing relies on publicly available information. As a result, firms with higher productivity would be more inclined to opt for the bond route – which is less costly – as they are less likely to face financial stress; firms with intermediate productivity levels would opt for a bank loan; and those with very low initial productivity would abstain from borrowing.

Darmouni et al. (2020)[5] highlight another difference between bank borrowing and bond borrowing. In the euro area, the growth of NFC bond issuance since the 2000s is partly a result of first-time NFC issuers. Their entry into the bond market helped them extend the maturity of their total debt and resulted in an increase in their leverage, in exchange for higher interest rates on their total debt.

At the macroeconomic level, there is evidence that NFCs' use of bond market borrowing as an alternative to bank loans works to their advantage in the wake of a crisis, particularly if the crisis affected the banking sector.[6] Replacement of bank loans with bonds during periods of economic recovery is a regular property of economic cycles,[7] and recoveries are stronger in economies with an initially higher share of bonds in total NFC debt.[8] The ability of NFCs to replace bank loans with bonds and the flexibility offered by banks on the terms of their loans are important for protecting the economy from the negative effects of a financial crisis.[9]

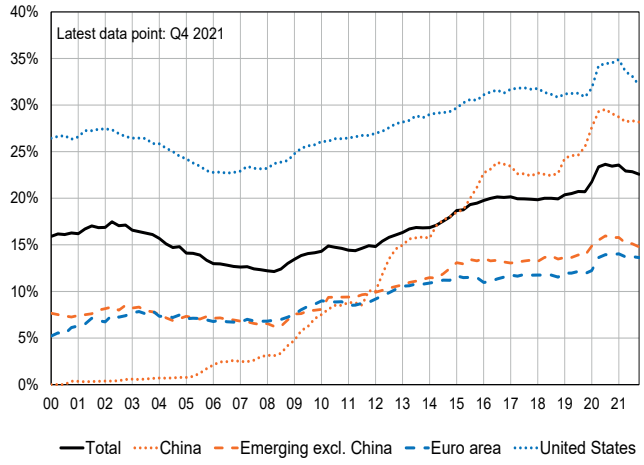
(1) In this paper, bond market borrowing includes both short-term debt securities (maturity < 1 year) and bonds. In cases where total outstanding bond volume is not available, it is calculated as the sum of the outstanding volumes of national and international issuances of a country's resident NFCs. For countries or periods not covered by the Bank of International Settlements (BIS), national sources are used (non-consolidated financial balance sheets by economic sector).
(2) A theoretical hypothesis that has been empirically verified based on US and European corporate data. See Crouzet N. (2021), "Credit Disintermediation and Monetary Policy", *IMF Economic Review,* vol. 69, p. 23-89 and Holm-Hadulla F. and Thürwächter C. (2021) "Heterogeneity in Corporate Debt Structures and the Transmission of Monetary Policy", *European Economic Review*, vol. 136, Article 103743.
(3) Crouzet N. (2021), op. cit.
(4) De Fiore F. and Uhlig H. (2011), "Bank Finance Versus Bond Finance", *Journal of Money, Credit and Banking*, vol. 43, p. 1399-1421.
(5) Darmouni O. and Papoutsi M. (2022), "The Rise of Bond Financing in Europe", *ECB Working Paper* No. 2022/2663.
(6) Note that the economic literature is not conclusive about whether market-based corporate financing is better for long-term growth than a bank-based model and vice-versa. See La Porta R., Lopez-de-Silanes F., Shleifer A. and Vishny R. (1997), "Legal Determinants of External Finance", *Journal of Finance*, vol. 52, p. 1131-1150 and Levine R. (2002), «Bank-Based or Market-Based Financial Systems: Which Is Better?», *Journal of Financial Intermediation*, vol. 11, p. 398-428.
(7) Grjebine T., Szczerbowicz U. and Tripier F. (2018), "Corporate Debt Structure and Economic Recoveries", *European Economic Review*, vol. 101, p. 77-100.
(8) Note that nearly 80% of the crises identified were banking crises.
(9) De Fiore F. and Uhlig H. (2015), "Corporate Debt Structure and the Financial Crisis", J*ournal of Money Credit and Banking*, vol. 47, p. 1571-1598.

The benefit of such substitution during economic recoveries may be explained by the relationship between the phenomenon of zombie firms (firms that are known to be unviable but are kept from default by their creditors) and the weaknesses of banks coming out of an economic crisis. In periods of financial stress, banks may be willing to extend loans to struggling corporate clients on overly favourable terms in order to avoid recording losses. That distorts the competitive environment, with a negative impact on other firms, in terms of labour and investment, and on the productivity of the economy as a whole.[10]

1.2 The growth of the corporate bond market

Between 2000 and the 2008 financial crisis, at the global level, NFC bond debt grew at a slower pace than GDP (see Chart 1), following the trend in the United States (see below), where more than 50% of the world's NFC bond market was concentrated at the time. Since then, NFC bond debt volumes have grown considerably, a trend that has continued throughout the COVID-19 crisis.

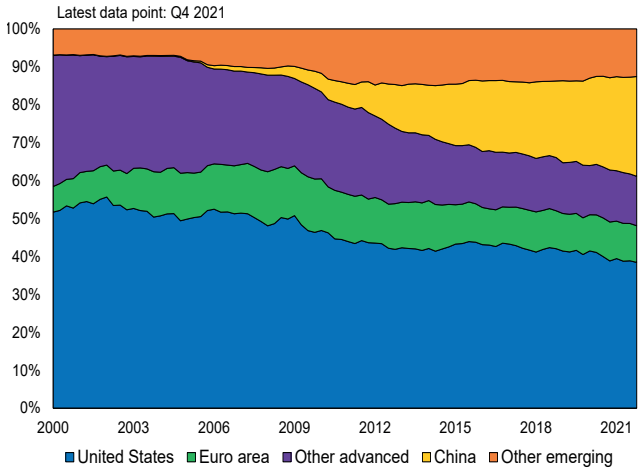
Chart 1: NFC bond debt (as a % of GDP)



Source: Bank of International Settlements (BIS), World Bank, Institute of International Finance, DG Trésor calculations.

Between 2007 and 2021, the volume of bond debt as a proportion of GDP grew much faster in emerging economies than advanced ones (see Chart 1): emerging economies saw an increase of 18 points of GDP to stand at 22% at the end of 2021, approaching the same level as advanced economies (23%). The bond borrowing boom in emerging economies was largely driven by China, where outstanding volumes stood at 28% at the end of 2021 (an increase of 25 points of GDP over the period). The Chinese NFC bond market is now the second largest in the world The Chinese NFC bond market is now the second largest in the world (26% of global bond debt), behind the United States, which accounts for 38% (see Chart 2).

Chart 2: Geographic breakdown of outstanding global NFC bond debt (%)



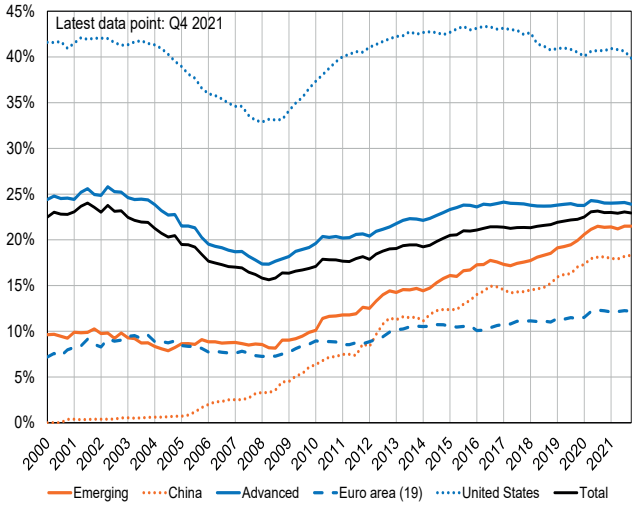
Source: Bank of International Settlements (BIS), World Bank, DG Trésor calculations

Note: Over the entire period, the euro area covers the group of 19 countries belonging to it since 2015.

(10) Acharya V., Crosignani M., Eisert T. and Steffen S. (2022), "Zombie Lending: Theoretical, International, and Historical Perspectives", *NBER Working Paper.*

Since the end of 2007, the share of bonds in NFC debt[11] has grown in economies where bank borrowing has traditionally been predominant, although it generally remains a minority, for instance in China (18% at end-2021, an increase of 15 points since 2007) and the euro area (12% at end-2021, an increase of 5 points since 2007, see Chart 3). The share of bonds in NFC debt also grew in the United States to stand at a level close to where it was in the early 2000s (40% at end-2021 vs 42% at the start of 2000). The decrease seen in the US between 2004 and 2008 can be explained by a sharp increase in outstanding loan volumes[12] (up 14 points of GDP) in relation to the proliferation of leveraged loans in the years leading up to the 2008 financial crisis.[13]

Chart 3: Share of bonds in outstanding NFC debt (%)



Source: Bank of International Settlements (BIS), World Bank, DG Trésor calculations.

In addition to aggregate developments, the statistics available for various large geographic areas reveal some characteristics of the market:

- In advanced economies, NFC bond issuance is highly concentrated in a few sectors, although to a lesser extent in countries with more developed capital markets, like Canada, France, the United Kingdom and the United States.[14] With the exception of Belgium and Germany, network sectors account for at least a quarter of bond issuance over the 2010-2017 period.
- Since the 1980s, at the global level, the average quality of NFC bond issuance has been trending downwards, as measured by the OECD's global rating index.[15] This aggregate-level decline is the result of lower ratings amongst bond issuers of the highest credit quality segment (investment-grade), which has not been fully offset by higher ratings among bond issuers of the lowest quality (high yield) segment. Among investment-grade NFC issuances, the proportion of lowest-rated bonds has risen significantly, growing from under 20% in the 1990s to more than 50% in 2019.
- China stands out among emerging economies for having a very low share of NFC bonds denominated in US dollars. Although, at the aggregate level, the share of foreign-denominated NFC bond issuance in emerging economies is similar to that in advanced economies (20%), this figure is much higher when China is excluded (50%).[16]

(11) The share of bonds in total debt is calculated as the ratio of bond debt as a percentage of GDP (BIS data for outstanding bond volumes and World Bank data for GDP) to total debt as a percentage of GDP (Institute of International Finance).
(12) Loan volumes cover all loans, insurance, pension, and standardised guarantees, and other accounts payable, regardless of maturity.
(13) A leveraged loan is a loan granted to a firm that is already carrying a considerable debt load or has a poor credit history. Leveraged loans are considered to be riskier (there is a higher risk of default) and therefore come with higher interest rates.
(14) De Almeida L.A. and Tressel M.T. (2020), "Non-Financial Corporate Debt in Advanced Economies, 2010-17", *IMF Working Paper.*
(15) Çelik S., Demirtaş G. and Isaksson M. (2020), "Corporate Bond Market Trends, Emerging Risks and Monetary Policy", *OECD Capital Market Series*.
(16) Çelik S., Demirtaş G. and Isaksson M. (2019), "Corporate Bond Markets in a Time of Unconventional Monetary Policy", *OECD Capital Market Series*.

- Although highly rated issuers have been able to extend the maturity of their bonds over the post-2008-crisis period, the same cannot be said for lower-quality issuers (high-yield issuers in advanced economies and emerging-market issuers).[17]

- In terms of bondholder profile, the proportion of non-residents in outstanding NFC bond debt differs across countries (see Table 1). In 2018, in advanced economies, the proportion of non-resident investors was above 50% in some European countries (United Kingdom, France, Germany) and was lower in the United States, Japan and the euro area taken as a whole.[18] China stands out for having a low proportion of foreign investors. In advanced economies, among resident investors, insurance companies and pension funds are major investors (more than one-third in the euro area, Japan and the United Kingdom, and nearly half in the United States in 2018). The proportion of other financial sector investors (investment funds, monetary financial institutions, etc.) differs between advanced economies (see Table 1). In China, financial sector investors make up the very large majority (above 90%) with collective investment undertakings very highly represented (roughly 60%).

1.3 The role of public policy in the growth of the NFC bond market

The expansionary monetary policies adopted by advanced economies after the 2008 crisis resulted in increased supply from NFC bond issuers, due to significantly lower issuance costs and increased demand from investors looking for returns. This phenomenon supported the growth of the NFC bond market in both advanced and emerging economies.

In advanced economies, expansionary monetary policy supported firms' propensity to borrow on the bond market:

- The asset purchase programmes of some central banks (European Central Bank, Bank of England, Bank of Japan, US Federal Reserve) directly targeted corporate bonds. De Santis et al. (2018)[19] show that, in the euro area, the ECB's corporate

Table 1: Profile of NFC bondholders (2018)

	Euro area	United Kingdom	Japan	United States	China
Non-resident investors	18%	56%	17%	28%	< 1%
Resident financial sector investors	76%	43%	71%	62%	90%
- *Insurance companies and pension funds*	29%	14%	26%	35%	
- *Monetary financial institutions*	19%	14%	41%	5%	
- *Investment funds*	25%	4%	3%	20%	
- *Other financial sector investors*	3%	11%	2%	1%	
Government	2%	0%	3%	1%	2%
Non-financial corporations	2%	0%	3%	0%	4%
Households	2%	0%	5%	9%	2%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Çelik S., Demirtaş G. and Isaksson M. (2020), «Corporate Bond Market Trends, Emerging Risks and Monetary Policy», OECD Capital Market Series.

Note: For China, data on resident investors is from 2016. An estimate of China's proportion of non-resident investors is taken from Longmei Z. and Yuchen W. (2019), "Credit Bonds" in The Future of China's Bond Market, International Monetary Fund, Washington, D.C. For the euro area, "resident" refers to an investor from a country belonging to the monetary union.

(17) Çelik S., Demirtaş G. and Isaksson M. (2020), op. cit.

(18) Since European countries have significant cross-border participation in their bond markets, the proportion of outstanding NFC bond debt held by non-resident investors is low when looking at the euro area on aggregate, but significantly higher when considering euro area countries individually.

(19) De Santis R.A., Geis A., Juskaite A. and Cruz L.V. (2018), "The Impact of the Corporate Sector Purchase Programme on Corporate Bond Markets and the Financing of Euro Area Non-financial Corporations", *ECB Economic Bulletin*, Issue 2/2018, vol. 3.

sector purchase programme (CSPP) led to: (1) an increase in corporate bond issuance on the primary market, particularly among firms eligible for the programme, (2) an extension of the maturities of the bonds issued by these firms and (3) a narrowing of the spreads between corporate bond yields (from both eligible and non-eligible firms) and interbank rates.

- Without necessarily targeting corporate bonds, asset purchase programmes may have spurred the growth of NFC bond debt. By lowering interest rates all along the yield curve,[20] they affected investors' risk perception and tolerance, leading them to take on a higher proportion of risky assets in their portfolios. This channel of monetary policy transmission is described by Albrizio et al. (2019),[21] who show that between 2008 and 2016, further to an accommodative monetary policy shock from the Fed on future interest rates, issuance of lower-rated high-yield NFC bonds grew compared to that of higher-rated investment-grade NFC bonds, and the spreads between these two bond categories narrowed.

Expansionary monetary policy in advanced economies, particularly measures announced by the Fed, given its central role in the international monetary system, influences financing conditions in emerging economies. Such policy caused risk premiums to shrink and reduced volatility on the global financial markets. On the supply side, that led to an increase in corporate bond issuance. On the demand side, investor demand grew for high-yield bonds, particularly emerging market bonds that were perceived by investors as being of higher risk. Duca et al. (2016)[22] estimate that without quantitative easing by the Fed, the volume of NFC bond issuance in emerging markets between 2009 and 2013 would have been cut in half.

There is a second factor that could explain the rise in bond debt, particularly in advanced economies. It is possible that the stricter banking regulations that came out of the 2008 crisis adversely affected the supply of bank loans and led to their substitution by bonds.[23]

The increased share of bonds in NFC debt in the euro area and in China is also consistent with the objective of these economies to deepen their capital markets. The European Commission's first Capital Markets Union (CMU) action plan, announced in 2015 and followed by a second plan in September 2020, sought to deepen and better integrate the Union's capital markets in order to diversify corporate financing sources. In China, Premier Li Keqiang has repeatedly mentioned the government's desire to develop a multi-level capital market and foster the growth of the bond market in order to gradually reduce dependence on the banking system, which is dominated by State-run banks, as well as the potential risks it poses to financial stability (see Schipke et al., 2019).[24]

(20) The yield curve is a graphical representation of the returns offered by the bonds of a single issuer at different maturities, from shortest to longest.
(21) Albrizio S., Conesa M., Dlugosch D. and Timiliotis C. (2019), "Unconventional Monetary Policy and Productivity: Evidence on the Risk-Seeking Channel From US Corporate Bond Markets", *OECD Productivity Working Papers*.
(22) Duca M.L., Nicoletti G. and Martinez A.V. (2016), "Global Corporate Bond Issuance: What Role for US Quantitative Easing?", J*ournal of International Money and Finance*, vol. 60(C), February 2016, p.114-150.
(23) Aramonte S., Schrimpf A. and Song Shin H. (2022), "Non-bank Financial Intermediaries and Financial Stability", *BIS Working Papers* No. 972.
(24) Schipke A., Rodlauer M. and Zhang L. (2019), "The Future of China's Bond Market", *IMF Working Paper*.

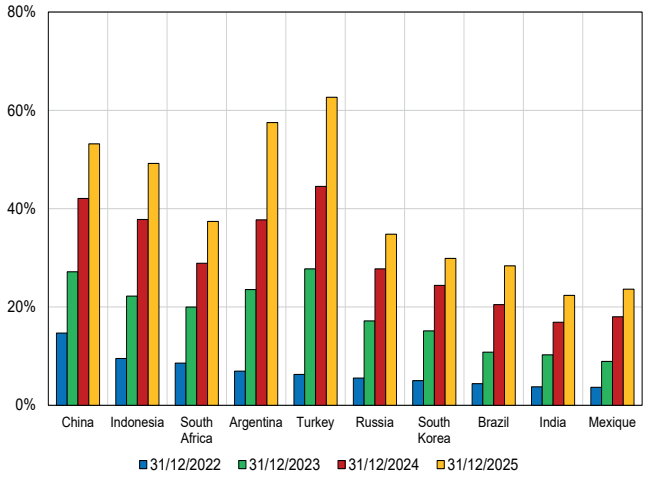
2 Vulnerabilities associated with NFC bond debt

2.1 Vulnerability to inflationary pressures

The NFC bond market is almost exclusively fixed rate,[25] in advanced and emerging economies alike, even for the lowest-rated bonds. Against this backdrop, the expansionary monetary policies adopted by advanced economies since the 2008 crisis supported the growth of NFC bond debt (see above). The normalisation of monetary policy currently underway, undertaken in response to inflationary pressures that were themselves exacerbated by the consequences of Russia's invasion of Ukraine, could drive investors away from the bond market, particularly its riskier segments, making it difficult for NFCs to refinance in the event of a disorderly exit.[26] Deteriorating bond values on the balance sheets of some investors could also spark concerns, with contagion risks depending on their interconnections with the rest of the financial system.

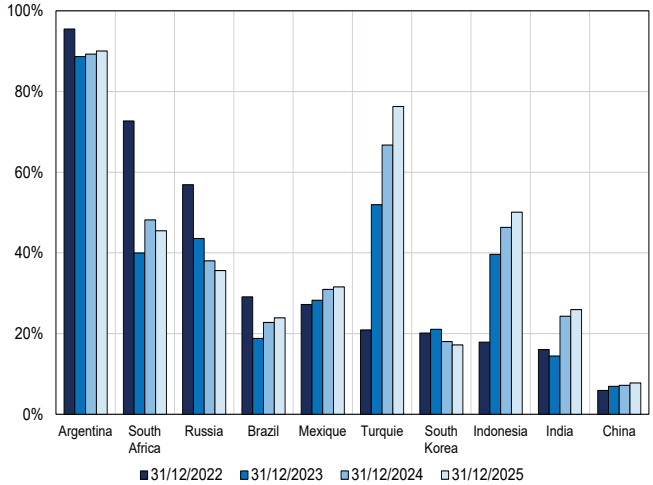
The effect of higher interest rates on the cost of borrowing for NFCs mostly comes down to the timing of bond maturities. NFCs have considerable needs for short-term refinancing, particularly in emerging economies – a need that has grown since the 2000s.[27] By the end of 2022, roughly 10% of NFC bonds will be maturing in China, Indonesia and South Africa (see Chart 4). Between now and the end of 2025, the biggest need for refinancing will be in Turkey, Argentina and China, with more than 50% of NFC bonds coming up to maturity. Complicating these refinancing needs is the fact that a significant proportion of maturing bonds is USD-denominated, with the notable exception of China (see Chart 5). More than 90% of bonds maturing by the end of 2022 are USD-denominated in Argentina, more than 70% in South Africa and nearly 60% in Russia. In Turkey and Argentina, where NFCs are faced with high refinancing needs between now and the end of 2025, a significant share of that debt (more than 70%) is USD-denominated.

Chart 4: Share of outstanding NFC bond volume coming up to maturity in emerging economies (%)



Source: Bank of International Settlements (BIS), Institute of International Finance, DG Trésor calculations.

Chart 5: Share of outstanding USD-denominated NFC bond volume coming up to maturity in emerging economies (%)



Source: Bank of International Settlements (BIS), Institute of International Finance, DG Trésor calculations.

(25) Çelik S., Demirtaş G. and Isaksson M. (2020), op. cit.
(26) However, with rising rates, investors who had eschewed NFC bonds in favour of riskier assets could return to them, which could at least partially offset the flight of investors toward assets less risky than NFC bonds.
(27) De Almeida L.A. and Tressel M.T. (2020), "Non-Financial Corporate Debt in Advanced Economies, 2010-17", *IMF Working Paper*, July.

2.2 Vulnerability to an economic slowdown

The financial system can also be vulnerable to fire sales, when financial institutions are forced to sell assets at prices below their fundamental values, which can create a vicious cycle of selling and price drops. This risk could materialise if a wave of NFCs see their ratings downgraded following an economic shock. If an NFC is downgraded from the lower end of the investment-grade segment to the high-yield category – becoming what is known as a "fallen angel" – it will lose a large group of investors all at once. Some investors face limitations as to what they can hold when it comes to bonds in the lowest-rated high-yield category, whether due to regulatory restrictions (the case for insurance companies, for example) or internal investment allocation rules (mutual funds, pension funds, etc.), which means they can be forced to sell corporate bonds downgraded to high yield status.

There are two main factors influencing the likelihood of this happening and the severity of the risk: (1) bond ratings, since the lowest-rated bonds within the investment-grade category are more exposed, and (2) bondholder profile, in that different types of investors will behave differently vis-à-vis forced selling.

- Since the 2008 crisis, NFC bond ratings changes have led to a greater risk of fire sales. The proportion of the lowest-rated bonds within the investment-grade category – the group most exposed to fire-sale risk – stood at more than 50% in 2019.[28] Moreover, Acharya et al. (2022)[29] show that growth since 2009 in the segment of NFC bonds rated just above the high-yield category in the United States has come from NFCs likely to be swiftly downgraded in the event of a negative shock.

- Many investors in the NFC bond market are likely to exhibit passive fire sale behaviour in the event of a ratings downgrade. Insurance companies, which along with pension funds represent the main resident investors in the NFC bond market (see above) in the United States (35%) and the euro area (29%), could exhibit fire sale behaviour due to regulatory restrictions on high risk portfolio holdings, even if they have been long-term investors. Investment funds, which account for the second largest share of resident investors after insurance companies and pension funds in the United States, are divided between those whose investments are passively managed, like exchange traded funds (ETFs),[30] which are likely to exhibit fire sale behaviour, and those that use an active management strategy. Among financial sector investors in NFC bonds, the proportion of ETFs has increased since 2008 but remains low. However, generally speaking, a large proportion of NFC bonds rated just above the high-yield category are held by investors likely to exhibit fire sale behaviour. For example, in Europe, half of such bonds are held by investment funds and a third by insurance companies.[31]

At the onset of the COVID-19 crisis, fire sale risk began to materialise (see Box 1) with numerous NFC ratings downgrades in the United States and Europe (three times as many as in 2008), and firms were faced with steep increases in their cost of borrowing. For now, monetary policy measures have managed to contain the fallout.

Still, the fire sale risk faced by NFC bonds remains considerable, given the less healthy state of NFCs compared to their pre-COVID positions. Authorities are closely monitoring the risk of a wave of corporate downgrades and fire sales. For example, an early 2021 Fed Note stated that, considering the three factors that influence fire sale risk (holder profile, credit quality and market liquidity), NFC debt has become more vulnerable to this risk since the COVID-19 crisis, to a greater degree than household debt.[32]

(28) Çelik S., Demirtaş G. and Isaksson M. (2020), op. cit.
(29) Acharya V., Banerjee R., Crosignani M., Eisert T. and Spigt R. (2022), "Exorbitant Privilege? Quantitative Easing and the Bond Market Subsidy of Prospective Fallen Angels", BIS Working Papers no. 1002.
(30) The objective of an exchange-traded fund is to reproduce the movements of a stock index in real time.
(31) European Systemic Risk Board (2020), "Issues Note on Liquidity in the Corporate Bond and Commercial Paper Markets, the Procyclical Impact of Downgrades and Implications for Asset Managers and Insurers", *ESRB Reports*.
(32) Cai F., Kang G., Kara G.I., Swem N. and Zikes F. (2021), "Household and Business Debt: A Fire-Sale Risk Analysis", *FEDS Note*.

Box 1: Financial turbulence at the onset of the COVID crisis[a]

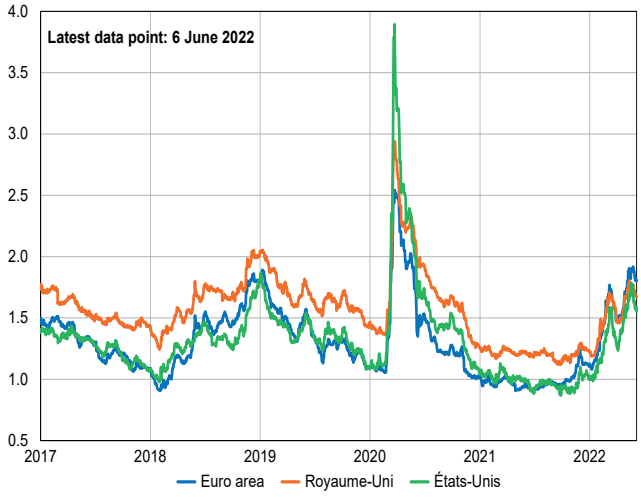
At the onset of the COVID crisis, between February and the end of March 2020, the NFC bond market faced intense pressures. During this period, investor demand for high-risk assets like private bonds fell in favour of safer assets like US treasury bonds. That drove up the cost of borrowing for firms (see Chart 6) as their credit ratings were being downgraded. These disruptions affected all bond segments across all emerging and advanced economies.

There are two mechanisms that contributed to exacerbating the tensions: margin calls on derivatives and outflows from investment funds.

- In a derivative contract, the financial intermediary requires the investor to put up a certain amount of collateral (assets such as NFC bonds) to cover their risk exposure. In the event of a market downturn, a drop in the price of the assets used as collateral could trigger a margin call, which is when the investor is required to supply additional assets or cash to restore the initially required level of collateral. To honour a margin call, the investor may be required to liquidate some assets, potentially leading to a self-reinforcing spiral of decline in asset prices.
- Investment funds generally give unit holders the option to withdraw their investment at any time, while themselves investing in relatively illiquid assets (such as high-yield NFC bonds). To deal with significant investor outflows, investment funds can find themselves having to sell these illiquid assets at discounted prices, passing on the cost of the sale to their remaining investors. This arrangement creates a first-mover advantage, incentivising investors to exit to avoid suffering the consequences of the assets held by the fund being sold and downgraded in the event of a market downturn.[b]

These disruptions were first and foremost quelled by monetary policy measures. The central bank response (asset purchases, liquidity injections) was massive (G7 central bank balance sheets increased by $7tn, compared to $3tn after the Lehman Brothers collapse) and swift, helping to normalise financing conditions for NFCs. Also supporting this normalisation effect was the introduction of sovereign-guaranteed loans in many countries.

Chart 6: Spreads between investment-grade 7- to 10-year corporate bond yields and sovereign yields (percentage points)



Source: Refinitiv, DG Trésor calculations.

Note: For the euro area, German sovereign yields have been used.

a. Box 1 summarises the conclusions of the Financial Stability Board in its report entitled "Holistic Review of the March Market Turmoil" (November 2020), focusing on the corporate bond market. Other sources are cited as used.

b. Note, however, that investment fund regulations are designed to reduce the first-mover advantage, by requiring fund managers to build liquidity risk management policies using tools that penalise redemptions when liquidity is scarce.

2.3 Vulnerability to sovereign debt pressures

Europe's sovereign debt crisis[33] revealed that risk premia (the excess return that investors expect in compensation for the risk they are exposed to) on corporate bonds, all else equal, would appear to vary based on issuers' countries of origin. It seems that the difference in the cost of borrowing between bonds based on the issuer's country of residence, known as financial fragmentation, reached high levels in 2012 – as much as 400 bps in Portugal and 110 bps in Italy as compared to similar German corporate bonds – before the ECB returned to conventional measures.[34] With monetary tightening in 2022, similar trends are being observed, for instance in Italy where private bond spreads peaked at 60 bps against German bonds of equivalent quality and maturity in late July. That said, as in 2012, the yield spreads on corporate bonds remain narrower than those on sovereign bonds.[35]

2.4 Vulnerabilities of China's NFC bond market

China, which is currently the world's second largest NFC bond market, has some specific vulnerabilities:[36]

- China's state-owned enterprises (SOEs) account for a disproportionate share of bond market issuance compared with their weight in the real economy (80% of bond issuance, versus <15% of employment and <20% of industrial sales), and investors understand there to be an implied State guarantee on these bonds. This leads to a pricing distortion: for similar economic fundamentals, SOEs pay roughly 100 basis points less than private NFCs on their bonds. This suggests a risk of poor capital allocation among Chinese NFCs.
- The Chinese market also has an unreliable rating system when it comes to NFCs. At the end of 2020, 80% of bond issuance was rated AAA- or better, compared to just 7% in the United States.[37] The reason is two-fold. On the supply side, in determining the risk of default, rating agencies factor in the perception of an implied government guarantee (whether by the central or local government). On the demand side, most investors can only purchase very high-quality assets for prudential reasons.
- There is very little liquidity in China's NFC bond market compared to advanced economy markets. NFC bonds are traded on the secondary market scarcely once a year, the average trade volume on the secondary market is low, and the bid-ask price spread is relatively wide. This is due to a highly segmented market, as well as different regulations for NFC bonds and a high concentration of investors that hold onto NFC bonds until maturity, mostly for prudential reasons.

The Chinese State has adopted a strategy of gradually opening up its financial sector, aiming to make more use of market mechanisms and address the three above-mentioned vulnerabilities in order to clean up its financial system. Among the most notable recent changes is a move to gradually eliminate the implied State guarantee for SOEs. To improve the risk ratings assigned by market participants and the accountability of NFC executives, the State is allowing a growing number of SOEs to default (some 50% of bond defaults were by SOEs in China in 2020). The gradual elimination of State guarantees could yield changes in NFC credit ratings, making them more accurate and reliable. However, for these reforms to effect

(33) Zaghini A. (2017), "A Tale of Fragmentation: Corporate Funding in the Euro-Area Bond Market", *International Review of Financial Analysis*, 49, p. 59-68.
(34) Horny G., Manganelli S. and Mojon B. (2018), "Measuring Financial Fragmentation in the Euro Area Corporate Bond Market", *Journal of Risk and Financial Management*, 11(4), 74.
(35) European Parliament (2022), "10 Years After 'Whatever It Takes': Fragmentation Risk in the Current Context", *Compilation of Papers*.
(36) Schipke A., Rodlauer M. and Zhang L. (2019), op. cit.
(37) Çelik S., Demirtaş G. and Isaksson M. (2020), op. cit.

real change, China still needs to build a liquid market of high-yield credit, on both the supply and demand sides. The elimination of the implied State guarantee for SOEs is being done gradually; as a hastened move could lead to a wave of NFC defaults, with a risk of major disruptions to China's financial system.

Recent developments, with China's second largest property development company Evergrande defaulting on foreign-held bonds in December 2021 and the subsequent easing of some regulations that had been constraining the sector, suggest it will be difficult for China to clean up its financial sector without increasing systemic risk.[38] For the time being, the NFC bond market is mostly closed to foreign investors[39] (see above), which limits the risk that the vulnerabilities of China's bond market might directly spill over onto global financial markets. Still, a financial crisis in China would trigger a global economic slowdown via its impact on the real Chinese economy.

There are multiple challenges facing NFC bond market borrowing. In advanced economies, there are risks posed by the current tightening of monetary policy in response to inflation and, to a lesser extent, by increased volatility and bouts of renewed risk aversion in financial markets in relation to economic and geopolitical developments. Rising interest rates could also cause some firms with low credit ratings to be downgraded to speculative-grade status, at the same time causing their borrowing costs to go up even further and increasing their risk of bankruptcy in the event of an economic slowdown. In emerging economies, there is the additional risk posed by unfavourable refinancing options, with a large and growing portion of NFC debt up for refinancing in the short term and a significant volume of it denominated in foreign currency.

(38) See Carre T., Chalmel L., Villani E. and Yang J. (2022), "China's Dependence on the Property Sector as an Engine of Growth", *Trésor-Economics* No. 311.

(39) The bond debt data used in this study is based on a residency criterion and therefore does not include offshore bonds – bonds of resident NFCs issued via a financial arrangement by an offshore affiliate. The offshore bond debt of Chinese NFCs is the highest in the world, accounting for nearly 4% of GDP at the end of 2020, as compared to 29% for onshore bond debt. See Aldasoro I., Hardy B. and Tarashev N. (2021), "Corporate Debt: Post-GFC Through the Pandemic", *BIS Quarterly Review*, June. Since 2021, defaults on offshore NFC bonds have risen sharply in China, the prime example being the 2021 Evergrande default. Whereas offshore markets are now mostly closed to Chinese property developers, onshore markets remain open to select developers with either close government ties or very high credit ratings.

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