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Corporate debt structure and economic recoveries: a cross-country analysis

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The recovery after the 2008 crisis was faster in the United States than in the euro area. Some authors argued that the US financial system's capacity to replace bank financing with corporate bond financing contributed to the faster recovery. This Rue de la Banque *summarises an empirical investigation of the business-cycle behaviour of corporate debt structure in 23 countries over the period 1989-2013. The results highlight two interesting facts. First, the substitution of loans for bonds in recoveries is a regular property of business cycles. Second, economies with a high share of bond financing and significant bond-loan substitution recover faster from recessions. These findings support the Capital Markets Union project which includes the diversification of funding sources for European firms.*

The structure of US corporate debt shifted from bank debt to market debt during the Great Recession. This time-varying composition of corporate debt has been stressed by Adrian et al. (2012) and Becker and Ivashina (2014) as essential to understanding the transmission of the financial crisis to the non-financial sector. Indeed, the issuance of market debt helped firms to mitigate the contraction in the supply of bank debt by troubled banks. In line with these findings, the European Commission (2014) advocates developing markets for corporate debt securities to replace impaired bank lending during recessions.[1] However, besides the recent US experience, macroeconomic evidence on the cyclical behaviour of corporate debt structure and its role in recovery is relatively scarce.[2] This *Rue de la Banque* is based on Grjebine, Szczerbowicz and Tripier (2018) who provide a first cross-country analysis of the behaviour of corporate debt structure along the business cycle.

Corporate debt structure varies across countries

Before turning to the business cycle analysis, we present a cross-country overview of the structure of corporate debt. To do so we construct a ratio – referred to as the "bond share" – that compares the amount of bonds issued by non-financial corporations to the total credit provided to them.[3] The "bond share" is a homogeneous measure of corporate debt structure in 23 advanced and emerging economies – for most of them since 1989. On average, debt securities account for 17% of the total credit provided to non-financial corporations over the period covered. In the United States, bond financing is particularly significant: bonds already accounted for more than 50% of total corporate debt

1 *European Commission (2014), page 8: "*Policy effort is needed in Europe to diversify financing channels. European capital markets are on average relatively underdeveloped and are currently insufficient to fill the funding gap created by bank deleveraging*".*

2 *One exception is De Fiore and Uhlig (2012) who show the substitution between bond finance and bank finance in the euro area during the recent crisis.*

3 *"Bond share" is constructed using Bank for International Settlements (BIS) series: total debt securities issued by non-financial corporations and total credit provided to non-financial corporations.*

in the 1950s and exceeded 70% after the recent crisis. The second country to rely significantly on bond finance is Singapore, with a mean value of 40%, followed by the United Kingdom, with a mean value of 22%. The share of bond financing in the euro area is much smaller and heterogeneous. On average, bond financing accounts for 18% of corporate debt in France compared with only 6% in Germany, 5% in Italy, 4% in Spain and 1% in Ireland.

Firms substitute bonds for loans in recoveries

After the 2008 crisis, bank debt and market debt in the United States moved in opposite directions. Whether this substitution process is specific to the recent US financial crisis or a regular feature of the business cycle remains an open question. To investigate this issue, we first define the turning points in the business cycles for each country, and then analyse the behaviour of corporate debt around these points.

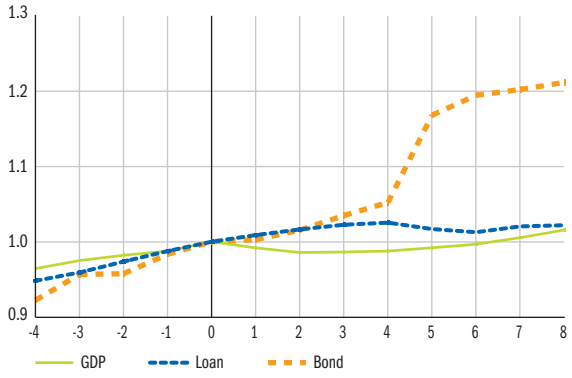
We apply the algorithm of Harding and Pagan (2002) to identify peaks and troughs in the log-levels of real GDP in each country in our panel. We detect 75 recessions and 70 recoveries. A recession lasts on average 4 quarters and a typical recovery takes 3.9 quarters. Therefore, in what follows, we focus on the years after the peaks and interpret the first year as the recession phase and the second year as the recovery phase.

The upper panel in Chart 1 depicts the average deviations of real GDP, bonds and loans for all the peaks in our sample (black vertical line). The loan and bond deviations follow a similar pattern in the four quarters before the peaks but diverge strongly in the aftermath of recessions. The cumulative growth of loans in the two years after the peak is close to 1% whereas the cumulative growth of bonds reaches 20% during the same period. While the divergence in the recession phase (first four quarters after the peak) seems relatively small, in the recovery period bonds and loans take entirely different paths. The lower panel of Chart 1 shows that the "bond share" increased by 15% two years after the peak and that the major shift occurred in the second year after the peak. In this *Rue de la Banque*, we only comment graphically on the evolution of the series. In the paper (see Grjebine et al., 2018) we show with panel data regressions that the bond share increase in recoveries is statistically significant but that this is not the case in the recession period. These results confirm that the substitution of bonds for loans that occurred after the Great Recession in the United States is robustly observed in other recoveries in our panel.

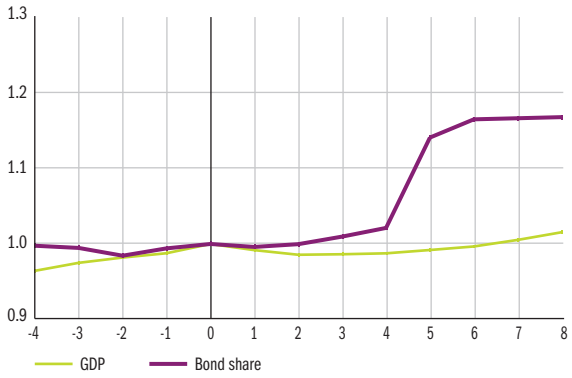
C1 Real GDP and corporate debt during recessions and recoveries

(x-axis: quarters after the peak [0])

a) GDP, bank and bond debts



b) GDP and share of bond debt in total debt



Source: Grjebine, Szczerbowicz and Tripier (2018).
Note: Deviations with respect to GDP peak. Average values for the 75 recessions. Series are normalised to 1 at the peak period (0).

High bond financing is associated with stronger recoveries

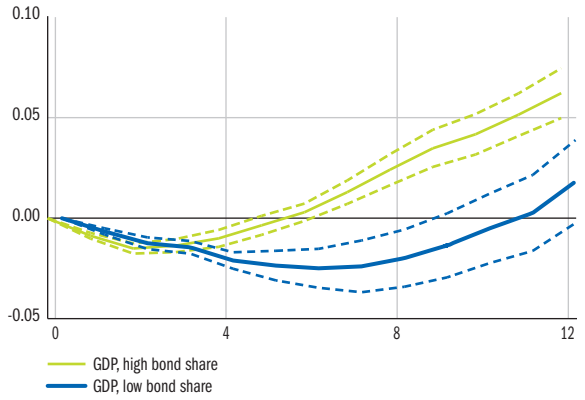
In Grjebine et al. (2018), we highlight the existence of a link between the structure of corporate debt and the strength of the recovery.

Our panel data regressions show that the recoveries are stronger for economies characterised by a high bond share and high bond-loan substitution.

Chart 2 summarises the links between corporate debt structure and real GDP growth established by our regressions. It shows the change in real GDP after a peak in activity, depending on whether the share of bond financing is high (above average, green line) or low (below average, blue line). At the beginning of the recession, the trend is similar: in the first three quarters, the two curves

C2 Recoveries according to the share of bond financing

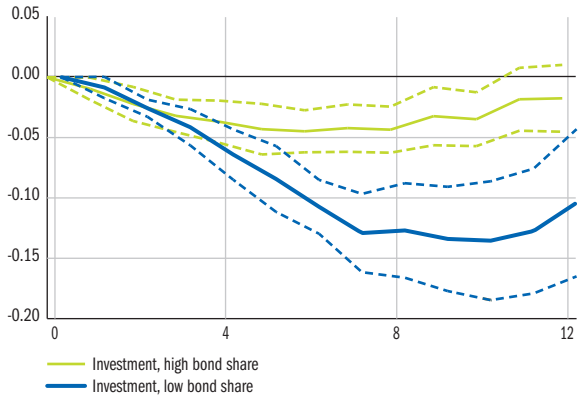
(x-axis : quarters after the peak [0])



Source: Grjebine, Szczerbowicz and Tripier (2018).
Note: "GDP" is the deviation of real GDP with respect to its level at the peak (in log, average value). The dotted curves represent the 90% confidence intervals.

C3 Investment after the peak according to the share of bond financing

(x-axis : quarters after the peak [0])



Source: Grjebine, Szczerbowicz and Tripier (2018).
Note: "Investment" is the deviation of real investment with respect to its level at the peak (in log, average value). The dotted lines represent the 90% confidence intervals.

are closely aligned. Subsequently, the two curves diverge. The recovery starts earlier in the countries where the share of bond financing is high – on average three quarters after the peak, compared with six quarters in the economies with a low share of bond financing – then the gap widens. Economies where the share of bond financing is high return to pre-recession GDP levels five quarters after the peak, while economies with a low share of bond financing only reach such levels eleven quarters after the peak. At this date, the real GDP of the economies where the share of bond financing is high exceeds its pre-recession value by 5%. The positive relationship between recovery dynamics and the level of the initial bond share exists irrespective of the nature (financial or non-financial) of the crisis.[4] It is maintained when we exclude the United States and the 2008 recession from the sample. We also control for structural differences between economies using country fixed effects, firm size distribution, the development of financial markets and the quality of institutions, with no change in the main results.

If bond share interacts with output by affecting the amount of credit in the economy, it is sensible to expect that bond share will interact equally with investment since new credit is used by non-financial corporations as an external source of investment financing. In Grjebine et al. (2018), we reproduce our main regressions by considering the deviation of real investment instead of real GDP. We find that economies with a large share of bond financing and with high bond-loan substitution experience not only higher GDP but also higher investment (see Chart 3).

The evidence on bond-loan substitution is relevant for corporate finance theory

In the theoretical literature on the composition of corporate debt, banks monitor firms, which can alleviate the problem of asymmetric information, but at a cost that makes bank finance more expensive than bond finance. Firms with good characteristics have access to cheaper market debt because the agency issue is less severe for firms with a good reputation, as in Diamond (1991), or a high level of publicly observable capital, as in Holmstrom and Tirole (1997). The ECB (2013) emphasises the limits of the literature in explaining the shift from bank debt to bond debt during the Great Recession. Because an economic crisis leads to a deterioration in firms' fundamentals, for example in their net worth, fewer firms should have access to the bond market, leading to a shift from market debt to bank debt during bad times and not the opposite.

4 *It should be noted however, that bond-loan substitution is much stronger after recessions triggered by a bank crisis. Therefore, while the bond share level before the recession is associated with higher GDP growth in recoveries, irrespective of whether or not a bank crisis has occurred, we find that bond-loan substitution correlates significantly with GDP growth only during recoveries that follow a bank crisis.*

Adrian et al. (2012) and De Fiore and Uhlig (2015) are two recent theoretical contributions that solve this puzzling behaviour in corporate debt structure. De Fiore and Uhlig (2015) assume an increase in the information acquisition costs of banks that makes indirect finance more expensive and leads some firms to shift away from the banking sector and either abandon production or seek direct financing. In Adrian et al. (2012), it is the leverage of banks that plays a key role in the time-varying composition of corporate debt. The supply of bank credit falls during a recession because banks have to reduce their exposure to the rising risk of default due to the Value-at-Risk constraint. Grjebine et al. (2018) provide an extension of this model which is consistent with the idea that corporate bond share plays a role in economic recovery. Numerical simulations of the model show that bond share increases, not only in recessions, as in Adrian et al. (2012), but also during recoveries due to financial losses which limit the supply of bank credit. The recovery is slower in a bank-based economy than in a market-based economy. In this set-up, the substitution of bond debt for bank loans that occurs during a recovery phase reflects banks' difficulty in meeting companies' demand for credit (as observed by Becker and Ivashina, 2014, using micro-data for the US economy). Access to bond markets as an alternative source of financing increases investment and thus accelerates the recovery.

The link between bond share and recovery supports the case for a diversification of financing sources

Economies with a higher share of bonds in corporate debt and higher bond-loan substitution experience stronger recoveries. These findings are relevant for economic policy design, especially in the euro area where corporate debt markets are less developed. More specifically, they support the case for a Capital Markets Union (CMU) project aimed at deepening and further integrating capital markets in the 28 European Union (EU) Member States. One of the Commission's stated priorities is to reduce reliance on bank credit in financing growth, for example by reducing the critical size at which companies can access bond financing – at present, bond financing is the preserve of the largest companies in Europe. Diversifying firms' external finance reduces the risk of a credit crunch in the event of banking sector disruption. It also contributes to better capital allocation and more investment, complementing other CMU initiatives such as the strengthening of equity financing and support of venture capital funds. Finally, one should bear in mind that the development of bond markets also carries risks, as described by Krishnamurthy (2010) for the Great Recession. For instance, in the context of a financial crisis, market liquidity can drop suddenly, making it harder to roll over corporate debt. This uncertainty can have an immediate impact on corporate expenditure. To prevent such adverse effects, bond markets should be subject to adequate regulation.

References

Adrian (T.), Colla (P.) and Shin (H.-S.) (2012)
"Which financial frictions? Parsing the evidence from the financial crisis of 2007 to 2009", *NBER Working Paper*, No. 18335.

Becker (B.) and Ivashina (V.) (2014)
"Cyclicality of credit supply: firm level evidence", *Journal of Monetary Economics*, Vol. 62, pp. 76-93.

Calvo (G. A.), Izquierdo (A.) and Talvi (E.) (2006)
"Sudden stops and phoenix miracles in emerging markets", *The American Economic Review*, Vol. 96, No. 2, pp. 405-410.

De Fiore (F.) and Uhlig (H.) (2015)
"Corporate debt structure and the financial crisis", *Journal of Money, Credit and Banking*, Vol. 47, No. 8, pp. 1571-1598.

Diamond (D.) (1991)
"Monitoring and reputation: the choice between bank loans and directly placed debt", *Journal of Political Economy*, Vol. 99, No. 4, pp. 689-721.

European Central Bank (2013)
"Corporate finance and economic activity in the euro area: structural issues report 2013", *ECB Occasional Paper,* No. 151.

European Commission (2014)
Communication from the Commission to the European Parliament and the Council on long-term financing of the European economy, /* COM/2014/0168 final */.

Grjebine (T.), Szczerbowicz (U.) and Tripier (F.) (2018)
"Corporate debt structure and economic recoveries", *European Economic Review*, Vol. 101, pp. 77-100.

Harding (D.) and Pagan (A.) (2002)
"Dissecting the cycle: a methodological investigation", *Journal of Monetary Economics*, Vol. 49, No. 2, pp. 365-381.

Holmstrom (B.) and Tirole (J.) (1997)
"Financial intermediation, loanable funds, and the real sector", *Quarterly Journal of Economics*, Vol. 112, No. 3, pp. 663-691.

Krishnamurthy (A.) (2010)
"How debt markets have malfunctioned in the crisis", *Journal of Economic Perspectives*, American Economic Association, Vol. 24, No. 1, pp. 3-28.

Laeven (L.) and Valencia (F.) (2013)
"Systemic banking crises database", *IMF Economic Review*, Vol. 61, No. 2, pp. 225-270.

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