FRANCE

FINANCIAL SECTOR ASSESSMENT PROGRAM

TECHNICAL NOTE—NONFINANCIAL CORPORATIONS AND HOUSEHOLDS VULNERABILITIES

October 2019

This Technical Note on Nonfinancial Corporations and Households Vulnerabilities on France was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on October 1, 2019.

Copies of this report are available to the public from

International Monetary Fund • Publication Services
PO Box 92780 • Washington, D.C. 20090
Telephone: (202) 623-7430 • Fax: (202) 623-7201
E-mail: publications@imf.org Web: http://www.imf.org
Price: $18.00 per printed copy

**International Monetary Fund
Washington, D.C.**

INTERNATIONAL MONETARY FUND

FRANCE

October 1, 2019

TECHNICAL NOTE

NONFINANCIAL CORPORATIONS AND HOUSEHOLDS VULNERABILITIES

This Technical Note was prepared in the context of an IMF Financial Sector Assessment Program (FSAP) in France in December 2018 and March 2019 that was led by Udaibir Das. Further information on the FSAP program can be found at http://www.imf.org/external/np/fsap/fssa.aspx

CONTENTS

Glossary

ACPR	Autorité de Contrôle Prudentiel et de Résolution
AMF	Autorité des Marchés Financiers
APL	*Aides Personnalisées au Logement*
BdF	Banque de France
BNP	Banque Nationale de Paris
BPCE	Banque Populaire Caisse d'Épargne
CDC	*Caisse des Dépôts and Consignation*
CEL	*Livret d'Epargne Populaire, Compte Epargne Logement*
CIT	Corporate Income Tax
CRD	Capital Requirement Directive
CRR	Capital Requirements Regulation
CSSP	Corporate sector purchase programme
DSTI	Debt-Service-to-Income
ECB	European Central Bank
EPA	Administrative public institution
ESRB	European Systemic Risk Board
EU	European Union
FCI	Financial Condition Index
FSAP	Financial Sector Assessment Program
GaR	Growth-at-Risk
GFSR	Global Financial Stability Report
HaR	*House Price at Risk*
HCSF	*Haut Conseil de Stabilité Financière*
HSBC	Hong-Kong and Shanghai Banking Corporation
ICR	Interest Coverage Ratio
IMF	International Monetary Fund
INSEE	*Institut National de la Statistique et des Études Économiques*
LDDS	*Livret de Développement Durable et Solidaire*
LEE	*Livret Jeune, Livret d'Epargne Entreprise*
LEP	*Livret d'épargne populaire*
LTV	Loan-to-Value Ratio
MFIs	Monetary and Financial Institutions
NACE	Nomenclature statistique des activités économiques dans la Communauté européenne
NFCs	Nonfinancial corporations
NPL	Nonperforming loans
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Square
PEL	*Plan Epargne Logement*
ROA	Return on assets (average assets)
RRE	Residential real estate
SMEs	Small- and medium-sized enterprises
SOeS	Service de l'Observation et des Statistiques

EXECUTIVE SUMMARY AND RECOMMENDATIONS

Nonfinancial private sector debt has risen in recent years in France and requires close monitoring:

- *Corporates.* The debt of French nonfinancial corporations has been on a rising trend in percent of GDP, especially in recent years, in contrast what is observed in peer European countries. This trend on non-consolidated data is mostly accounted for by bond issuances and loans among nonfinancial corporations (NFCs) while bank credit to NFCs has also grown but at a slower pace. While, across countries, French firms do not appear to be more indebted on average or to be more likely to have their debt-at-risk than their peers, there exists a tail of firms with debt-at-risk that has remained fatter than before the global financial crisis, despite the low interest rate environment. Moreover, some banks may have somewhat significant exposures to individual large indebted corporates. Stress tests show that under downside macrofinancial scenarios, corporate debt may increase significantly (up to around 11 percent of GDP in the broad sample of firms) but would remain broadly manageable. However, banks' large exposures to corporates with debt at risk would increase significantly under the adverse scenario and in aggregate would amount to a significant share of capital.

- *Households.* There is no clear evidence of vulnerabilities in households' balance sheets at an aggregated level. Households have continued to build their financial net worth by accumulating financial assets even faster than debt. Their saving rate is healthy, and they appear to invest their inflows primarily in safe assets. Household debt is not high in international comparisons. However, some households—lower income, younger—may have experienced a deterioration of their balance sheet along certain dimensions. Such potential pockets of vulnerabilities should be further studied when data are available. The residential real market appears to be broadly aligned with its supply-side and demand-side fundamentals, and there are limited near-term downside risks to housing prices. However, there is a need to remain prudent, because the likelihood of adverse price developments is sensitive to negative shocks to macrofinancial conditions.

Table 1. France: Recommendations for Nonfinancial Sector Sheets		
Recommendations	**Agency**	**Timing**
Enhance public communication on corporate risks including direct and indirect exposures to the financial system as a whole.	HCSF	I
Engage with ECB and other EU agencies on use of Pillar II measures to address bank-specific residual risk from concentration of exposures to large indebted corporates.	ECB, ACPR	I
Accelerate collection of more granular data to monitor and analyze housing loan trends and developments on households' balance sheets.	BdF and ACPR	I
Develop a framework for the potential use of targeted borrower-based instruments in case pockets of vulnerabilities deepen among groups of households.	HCSF	NT
Evaluate effects of the tools introduced to mitigate risks from corporate leverage.	HCSF	NT
Evaluate options to further incentivize corporates to finance through equity rather than debt.	HCSF	NT
Actively engage with the European Systemic Risk Board (ESRB) and others to Develop analytical framework for borrower-based measures for corporates.	ACPR, AMF, ESRB	NT
Study the structural and cyclical characteristics, determinants and use of loans among NFCs.	BdF, HCSF	NT
I: Immediate = within a year; **NT:** Near Term = 1 to 3 years.		

NONFINANCIAL CORPORATIONS[1]

A. Introduction

1.   This paper analyzes the structure of nonfinancial corporate financing in the French economy, potential vulnerabilities of the corporate sector, and their possible channels of transmission through interconnections with the financial system. The objective of this paper is to document the evolution of French corporate debt since the global financial crisis, analyze the riskiness of this debt, the quality of allocation of this debt, and uncover potential heterogeneity across sectors and firms which may have implications at the macroeconomic level. The paper undertakes various firm level panel regressions analysis on large sample of French firms including small- and medium-sized enterprises (SMEs), and on a cross-country sample of publicly listed firms to assess: (i) determinants of debt-at-risk, including the role of macrofinancial conditions; (ii) whether there are any France-specific factors that affect the capital structure of firms, or whether instead French firms are on average no more reliant on debt finance than peers; to develop empirical models used for the purpose of macrofinancial stress test scenarios and to characterize exposures of the financial system. Such a cross-country study is particularly timely, given the recent decisions by the *Haut Conseil de Stabilité Financière* (HCSF) to set a limit to banks' exposures to individual large indebted corporates and to activate the countercyclical capital buffer to 50 bps. This paper also complements existing studies by the *Institut National de la Statistique et des Études Économiques* (INSEE), the HCSF and the Banque de France by undertaking a cross-country comparative analysis.[2]

2.   The main findings of this paper are as follows:

- The debt of French nonfinancial corporations has been on a rising trend in percent of GDP, especially in recent years, in contrast what is observed in peer European countries. This trend on unconsolidated data is mostly accounted for by bond issuances and loans among NFCs while bank credit to NFCs has also grown but at a slower pace;

- This increase is mitigated by an increase in cash holding at the macro level. Moreover, the fall in interest rates has helped contain the debt service ratios;

- At the firm level, consolidated debt-to-asset ratios and interest-coverage-ratios are on average broadly in line with peer countries, and have been on a somewhat long-term declining trend, with an uptick for large firms in recent years. There is evidence that the stock in debt and its recent increase are concentrated in several sectors, as in other countries, while cash buffers,

---

[1] Prepared by Thierry Tressel with a contribution from Hiroko Oura. Tania Mohd Nor and Anvar Musayez provided excellent research assistance.

[2] The paper by the HCSF (2018) can be found at: https://www.economie.gouv.fr/hcsf. The paper by INSEE (2017) is published as a chapter of the *Note de Conjoncture* December 2017, available at: https://www.insee.fr/fr/statistiques/3292415. The paper by the *Banque de France* is a chapter of the *Banque de France* Bulletin No. 214 of November-December 2017. See also IMF Selected Issues Paper - 2018 Article IV for France.

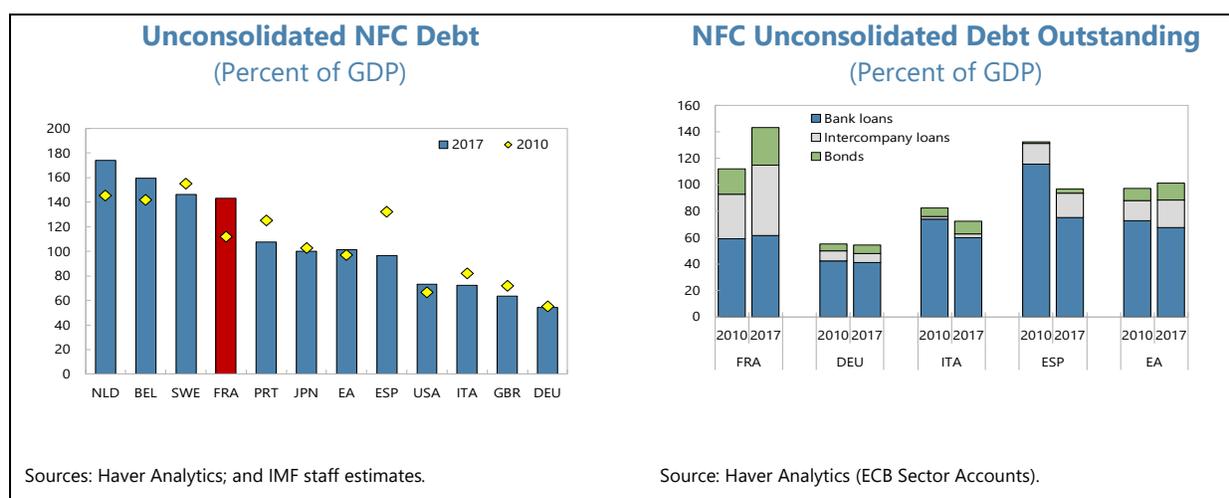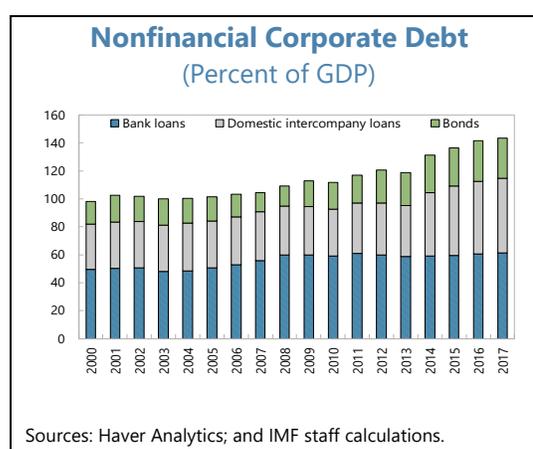which are good at an aggregate level, tend to be thinner among firms with debt-servicing difficulties;

- An empirical model developed on French firms shows that macrofinancial conditions impact firm average profitability as well as the likelihood that a firm may belong to the left tail of the distribution of debt-servicing capacity (debt-at-risk, defined as debt of firms with an interest coverage ratio below 1 or below 2), after controlling for various firm characteristics;

- The tail of the distribution of the number of firms with debt-at-risk has remained fatter than before the global financial crisis but the amounts are broadly similar, despite the low interest rate environment. While SMEs are more likely to experience debt servicing difficulties, large firms account for the lion's share of debt-at-risk at an aggregate level, reflecting the importance of large firms in the French business environment;

- Across countries, French firms do not appear to be more indebted on average or to be more likely to have their debt-at-risk than their peers. There are significant common time effects affecting leverage on average and the tail of the distribution across all countries; leverage has been on a rising trend since 2010 with the common factor impacting the tail of debt-at-risk have remained above the pre-global financial crisis;

- Empirical analysis suggests that corporate debt may be allocated efficiently across publicly listed companies, but the picture is less clear among non-publicly listed firms;

- Stress tests suggests that, under the France specific adverse macrofinancial scenarios with a severity calibrated based on the growth-at-risk (GaR) approach and comparable to the through of the global financial crisis, corporate debt may increase significantly (from around 8 percent of GDP up to around 11 percent of GDP in the broad sample of firms). Existing cash buffers would attenuate the impact of the shock, but their use may be constrained by liquidity needs and precautionary motives. In the cross-country adverse scenario targeting an unconditional 2 standard deviation shock to macrofinancial condition, debt-at-risk of French listed firms would be in the top half among peer countries in such scenarios and could reach up to 5 percent of GDP under an interest coverage ratio (ICR) threshold of 2, from 3 percent of GDP in 2017;

- The analysis of large exposures of individual banks to large indebted corporates shows that there is some risk in the balance sheet of individual banks related to total large exposures to individual large indebted corporates with debt-at-risk. Moreover, under the adverse stress scenarios, the expected number of large exposures at risk would increase for each individual bank and the total expected amounts of debt at risk would become a non-negligible share of bank capital; and

- Nonresidents hold 50–60 percent of debt or equity securities issued by resident sectors, reflecting the international integration of French capital markets. The role of the nonresident sector through debt and equity markets may not remain going forward if financial stress arises from a France specific shock and could even become destabilizing.

3.   The paper is organized as follows. Section B presents cross-country stylized facts on debt, while Section C characterizes macrofinancial conditions in France and the evolving structure of corporate debt financing. Section D studies the empirical determinants of debt-at-risk among French firms. Section E presents a cross-country comparative analysis of corporate debt-at-risk among publicly listed firms. Section F analyses the efficiency of allocation of debt financing among French firms. Stress test scenarios are presented in Section G. Section H studies the interconnections of French NFCs with the financial system, and section I uncovers large concentrated exposures of French banks. Section J concludes.

B.   Stylized Facts on Corporate Debt

4.   Unconsolidated nonfinancial corporate debt in France has increased by more than 25 percent of GDP between 2010 and 2017 and stands at 140 percent of GDP, among the highest in advanced countries.[3] This contrasts with developments in other large euro area countries which have experienced either a stabilization of their corporate debt (Germany) or a significant decrease (Italy and Spain).[4] The increase in French corporate debt as a share of GDP since 2010 can be explained mostly by an increase in debt claims within the French NFC sector and bond financing until 2015, while after 2015 bank credit and bond finance increased at a

Nonfinancial Corporate Debt
(Percent of GDP)

Sources: Haver Analytics; and IMF staff calculations.

Unconsolidated NFC Debt
(Percent of GDP)

Sources: Haver Analytics; and IMF staff estimates.

NFC Unconsolidated Debt Outstanding
(Percent of GDP)

Source: Haver Analytics (ECB Sector Accounts).

---

[3] Different statistical definitions of legal units across countries may affect the cross-country comparability of debt claims within the NFC sector. In France, the definition retained by INSEE is at the most granular level. This may inflate the macroeconomic estimates of debt claims within the NFC sector in France compared to other countries. Further work is needed to quantify the impact of the legal unit definition in explaining cross-country differences.

[4] In Spain, the decline reflects a correction after a pre-crisis credit boom.

similar pace.[5] A particularity of French firms' corporate debt is that bonds account for about half of nonfinancial companies' debt, consistent with the importance of large firms in the French business environment. This feature has been reinforced since the global financial crisis, with large firms substituting from bank credit to bonds, in particular in 2009–10.

5.   Netting out intercompany loans, consolidated corporate debt is lower at 89 percent of GDP, and more in line with peers. Nonetheless, it has still experienced an increase of some 11 percentage points of GDP since 2010, mainly resulting from net bond issuances. Subtracting cash holdings from consolidated debt, aggregate net consolidated debt has barely increased during the crisis and stands at 60 percent of GDP, close to the euro area average, suggesting that, in the aggregate, French firms used part of the proceeds to accumulate liquid financial assets, which also account for a larger share of their assets.[6]

Consolidated NFC Debt
(Percent of GDP)

Sources: Haver Analytics; and IMF staff calculations.

Net Consolidated Debt
(Percent of GDP)

Sources: Haver Analytics; and IMF staff calculations.
Note: Euro area latest value is from 2016.
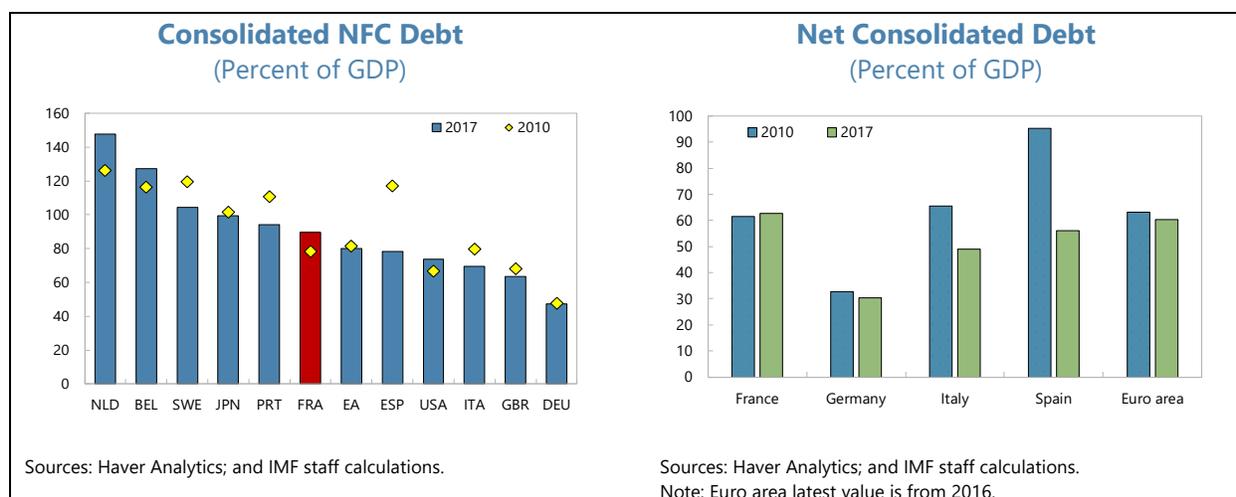
6.   As in other countries, the consolidated debt stock of listed firms as well as the post-crisis debt increase is concentrated in a few sectors (Figure 1). The manufacturing and utilities sectors account each for around 20 percent of the debt stock of listed firms in France and the transportation and retail sector each for about 10 percent. In Germany the manufacturing sector accounts for 60 percent of the debt stock, while network sectors account for over 60 percent of the debt stock in Italy and Spain. Similarly, the debt increase in the post crisis period was mainly caused by the transportation sector and, to a lesser extent, oil and gas, manufacturing, healthcare and retail sector in France, while the manufacturing and healthcare sectors were responsible for the debt increase in Germany. The construction and utilities sectors contributed to the decrease in debt in

---

[5] Part of the increase in debt claims within the NFC sector is explained by a statistical reclassification of 9 percent of GDP in 2014. In this chart, bank loans also include loans from the non-resident sector, following the classification adopted in the 2018 Article IV staff report for France; further breakdown is provided in Figure 4. Reclassifying cross-border loans as loans among NFCs would lower bank credit to 46.3 percent of GDP and increase loans to domestic NFCs to 53.3 percent of GDP in 2017.

[6] The measure of liquid assets includes only cash and deposits. Other liquid assets such as money market funds are not included.

Spain, while the utilities sector contributed to the decrease in debt in Italy. The concentration of debt to some extent reflects the distribution of assets and of output across sectors among listed firms.

Figure 1. France: Distribution of Debt Stock

The debt stock is concentrated in a few sectors ...

Sectoral Composition of Corporate Debt, 2017 (Percent)

... and the change in debt is also concentrated.

Growth in Debt, 2010–17 (Percent)

Sources: Worldscope; and IMF staff calculations.
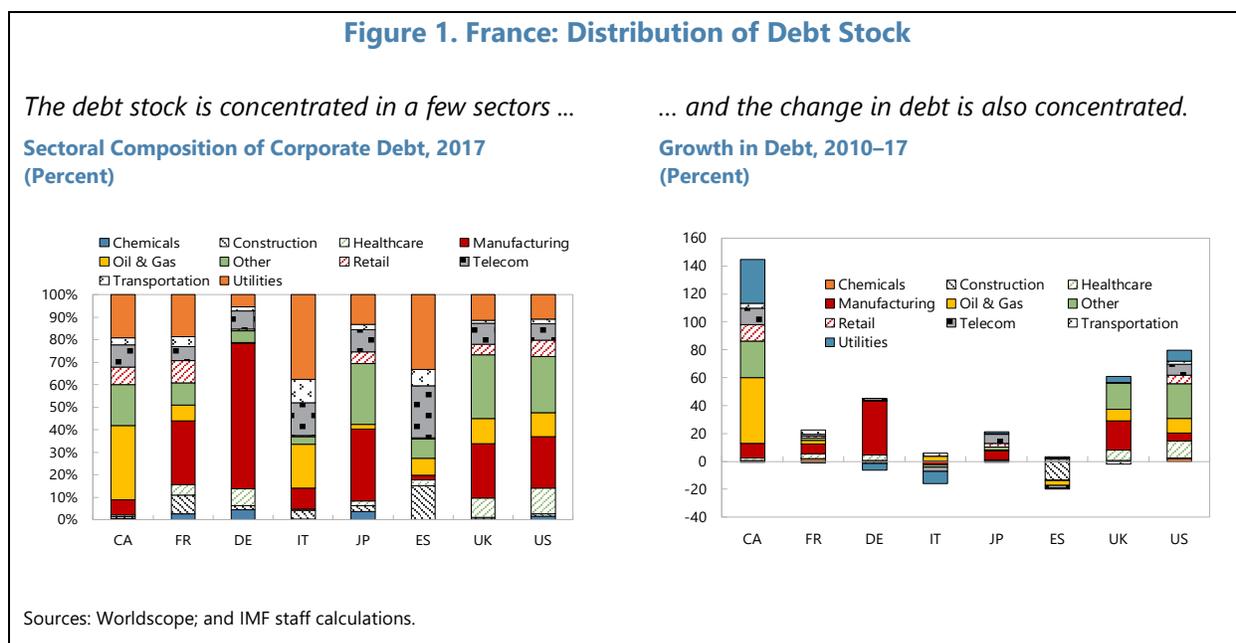
7.   While some sectors are more leveraged in general, there is no evidence that leverage of publicly listed firms is on average higher in France (Figure 2).[7] Sectoral debt to assets ratios constructed from aggregated firm-level data are not particularly high in France compared to peer countries, while network sectors tend also to be more leveraged in peer countries.[8] A particularity of France is that highly leveraged sector (utilities, retail, and telecom) have also a high debt to income ratio, suggesting a low capacity to service the debt despite the low interest rate environment. While cash buffers are high on average, they are not equally distributed among firms: firms with low ICR typically also have lower cash buffers. Moreover, evidence from simple averages of consolidated data show a long-term declining trend in consolidated debt-to-asset ratio—with however an increase in this ratio for large firms in recent years (text figure).

Average Consolidated debt-to-Asset Ratios (Percent)

Sources: Banque de France; and IMF staff.

---
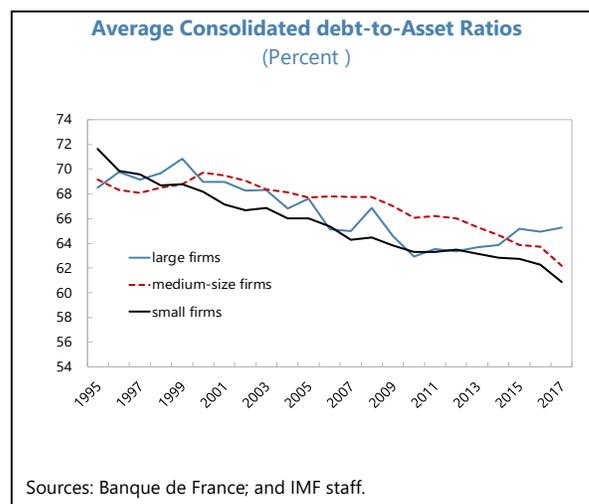
[7] Charts in this figure include the SNCF. In this chart, gross debt is defined as gross current and non-current liabilities. In charts based on firm level data from Worldscope, debt is defined as bank loans and bonds.

[8] Variables computed by the authorities in response to FSAP data request.

Figure 2. France: Leverage and Buffers of Publicly Listed Companies

Debt to assets is in line with peers ...

Debt to Assets
(Percent)
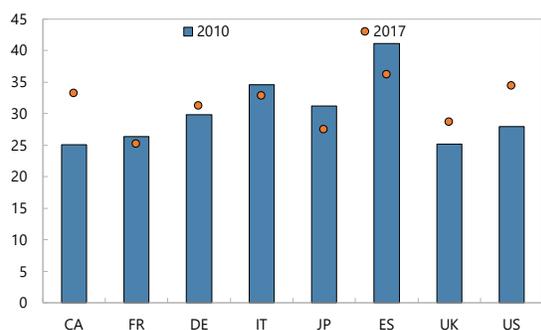
... but indebted firms in some sectors have a low capacity to repay.

Debt to Income Ratio
(Percent, avg across developed countries)
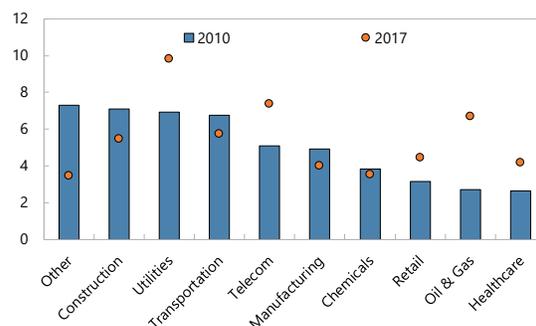
The debt to income ratio has increased but is not higher than in peer countries ...

Debt to EBIT
(Percent)
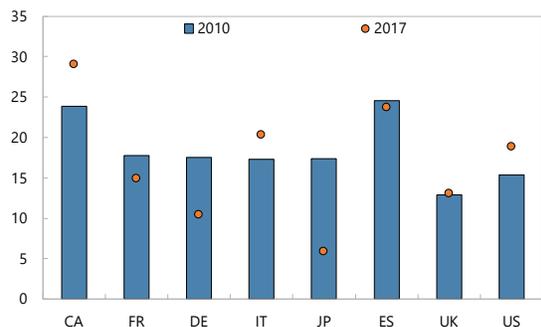
... and interest payments are on average well covered by earnings.

Interest Payments to EBIT
(Percent)
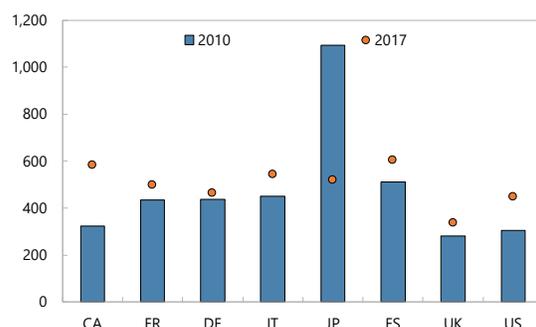
Cash buffers seem high on average ...

Cash to Debt
(Percent)
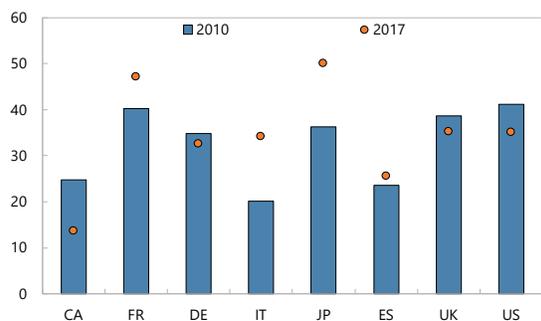
... and the current ratio has improved.

Current Assets to Current Liabilities
(Ratio)
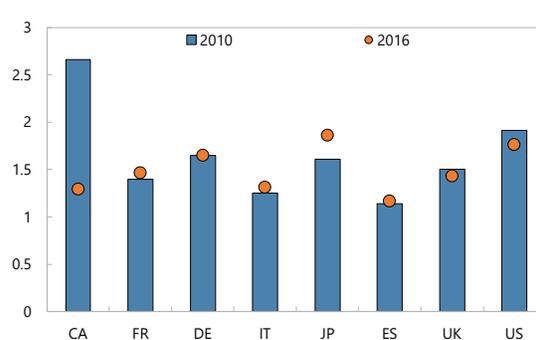
Sources: Worldscope and IMF staff calculations.

8. **A risk mitigating factor is that firms have used their debt to increase their buffers of liquid assets.** Aggregate data show that the ratio of total cash holdings to total consolidated debt is large in many countries. However, our firm-level dataset on listed firms shows that the aggregated cash to debt ratio among firms with debt-at-risk (ICR<2) in France is lower than the cash to debt ratio of nonvulnerable firms. In addition, this ratio has decreased recently for vulnerable firms while it has increased for nonvulnerable firms.

Cash to Debt Ratios
(Percent)

Sources: Worldscope and IMF staff calculations.

9. **A large share of debt in France is owed by firms which have a low interest coverage ratio and a high net debt to equity ratio.**[9] A high net debt to equity ratio may be the consequence of a financing choice of large firms which have ample access to cheap borrowing and does not necessarily reflect a risk to service its debt. However, a large net debt to equity ratio and at the same time a low ICR signals that the firm concerned has chosen a capital structure that could be vulnerable to shocks to interest rates and/or profitability. The share of debt owed by listed firms with a net debt to equity ratio above 100 percent is lower in France than in other large euro area countries.

Distribution of Total Debt
(Percent)

Sources: Worldscope and IMF staff calculations.

10. **The link between corporate taxation and firm capital structure is well established, and this effect, while declining as a result of recent reforms, has been significant in France.**[10] Recent research has confirmed that firm capital structures are sensitive to corporate taxation, among various factors.[11] Based on the Feld et al. (2013) study, the French authorities estimated that the marginal impact on the debt-to-asset ratio (compared to a neutral tax system) of the Corporate Income Tax (CIT) rate is 10.6 percentage points (respectively 7.5 percentage points) before

Marginal Impact of the CIT on the Debt-to-Asset Ratio

---

[9] A low ICR is defined as an ICR below 3 and a high net debt to equity ratio is defined as a net debt to equity ratio above 100. This is the definition of large indebted firms used by the HCSF in its macroprudential policy to limit banks' exposures to vulnerable firms.

[10] Recent reforms include the gradual decline of the corporate income tax to 25 percent by 2022 (2018 budget law), and various restrictions on the tax deductibility of interest rate payments passed in 2013 and the 2019 budget law. After the 2018 reform, the corporate income tax rate in France will be in 2022 slightly above the current average among OECD countries.

[11] See for instance Feld, Lars, Heckemeyer, and Michael Overesch, 2013, "Capital Structure Choice and Company Taxation: A Meta-Study," Discussion Paper No. 11–075, ZEW Center for European Economic Research. The authors find an elasticity of the debt-to-asset ratio with respect to the headline corporate tax rate of around 0.3.
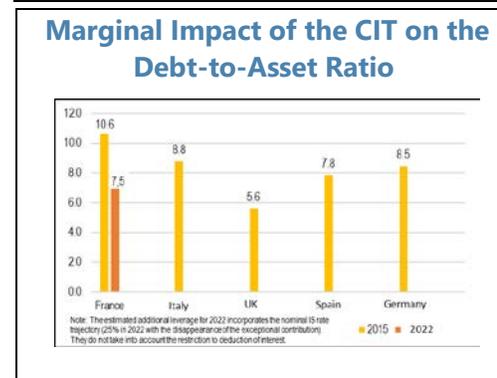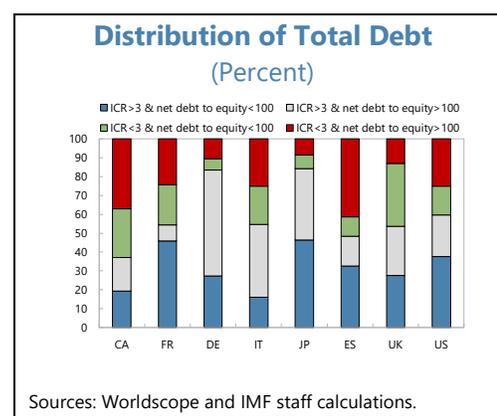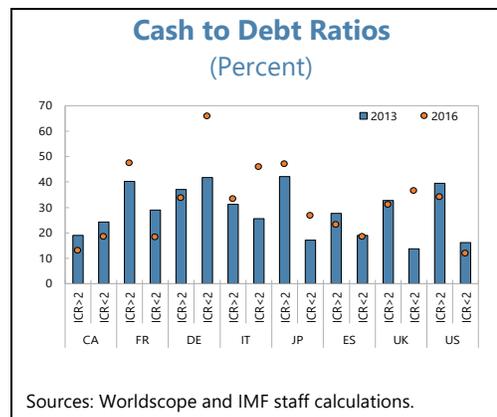
(respectively after) the 2018 budget law reform, and compared it to several peer European countries (text figure). Further incentivizing corporate to finance through equity rather than debt would help reduce firm's leverage and debt-at-risk.

C.   Macrofinancial Conditions and the Changing Structure of Debt Financing

11.   Borrowing conditions of NFCs has remained accommodative in recent years in an environment of sustained low policy interest rates and unconventional monetary easing (Figure 3). Banks have transmitted to nonfinancial corporations the low interest rate policy in an environment of generally loose financial conditions, while keeping spreads broadly stable. Financing conditions have also become more accommodative on the bond market across large advanced economies, while the share of bonds issued by non-investment grade borrowers has increased—suggestive of a search for yield in financial markets. The nonperforming loans (NPL) ratio for NFCs has been on a long-term declining trend; it increased modestly as a result of the global financial crisis to 2.4 percent and has dropped below 2 percent in recent years.[12]

12.   Domestic investment and outward FDI by French nonfinancial corporations are correlated with bank credit and overall corporate debt cycles, and bank credit seems to have played a stabilizing role (Figure 4). Over the longer term, there has been a clear trend of increasing reliance on nonbank debt, while bank credit to firms—the bulk of which finances SMEs and mid-tier firms—has remained broadly stable as a share of GDP. Bank credit tends to be less volatile than overall borrowing by firms, which appears associated with outward FDI cycles, suggesting that nonbank sources of debt financing are used to finance foreign activities of firms. At the macroeconomic level, the volatility of nonbank debt seems driven by loans within the NFC sector—suggesting that such debt linkages could potentially transmit financial conditions across firms, in particular between head offices of conglomerates and related companies, but also reflecting the possible double counting of some of these loans.[13] However, the cyclical and structural determinants and use of these loans within the NFC sector is not well studied. During episodes of financial stress (global financial crisis, euro area crisis) bank credit to NFCs seems to have played a stabilizing role, with loans for working capital purposes often adjusting the most but seemed to have contracted with a lag after these episodes. During such past episodes, gross bond financing inflows seemed broadly stable, and foreign investors have absorbed the largest share of these issuances.

---

[12] See for more details on corporate bond issuances, Selected Issues Paper 2018 France Article IV Consultation, IMF Country Report 18/244.

[13] For a theoretical analysis of the propagation and amplification of shocks in credit chains, see: Kiyotaki, Nobuhiro, and John Moore, 1997, "Credit Chains," University of Edinburgh.

Figure 3. France: Borrowing Conditions

France financial conditions have loosened in recent years.

Financial Condition Index for France
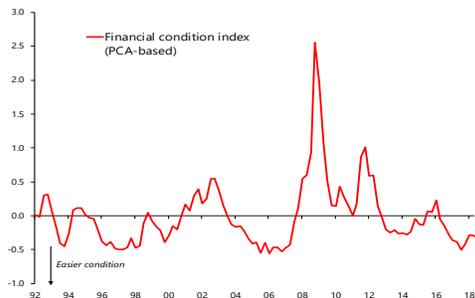
Source: IMF staff estimates.

Thanks to sustained low interest rate policy.

Average Deposit Rate in France and ECB Refinancing Rate
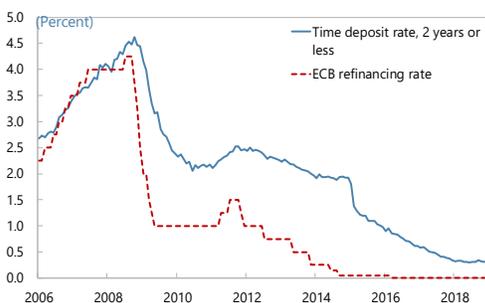
Sources: Haver Analytics; and IMF staff estimates.

Corporate bond yields have been low.

Corporate Bonds Average Yields at Issuance
(Percent)
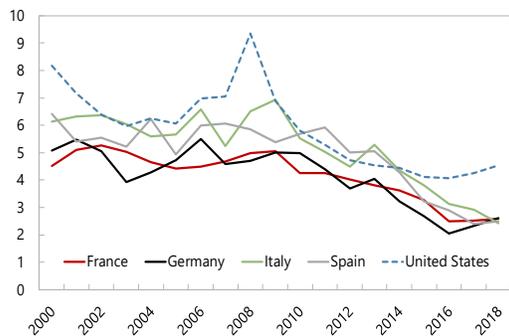
Sources: Dealogic; and IMF staff calculations.

And corporates' borrowing costs have been low in France.

Lending Rates, Deposit Rate and Yield on Corporate Bonds

Source: Haver Analytics.

The terms structure of interest rates has remained flat in France.

Term Structure of Interest Rates in France
(Percent)
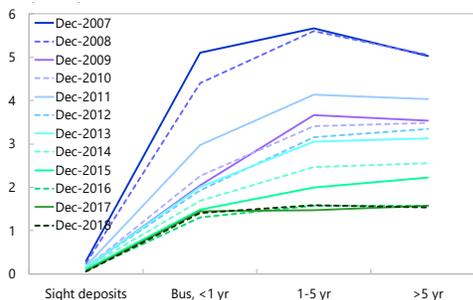
While the share of issuance by non-investment grade borrowers has increased.

New Nonfinancial Corporate Bond Issuances
(Percent)
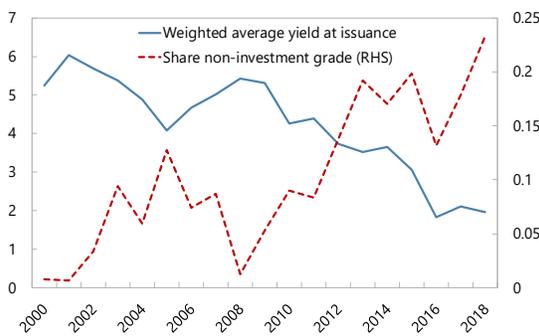
Figure 4. France: Macrofinancial Conditions

Corporate debt varies with the investment cycle.

Nominal NFC Investment, Credit, and FDI Growth (Percent)
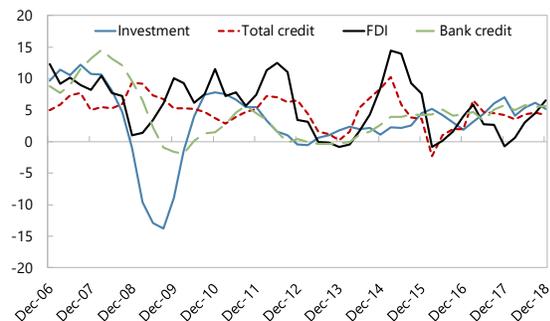
Sources: Haver Analytics; and IMF staff estimates.

NFC bank credit for working capital purposes is the most affected during downturns.

Credit to Nonfinancial Corporations (Percent contribution to private credit growth, y-y)
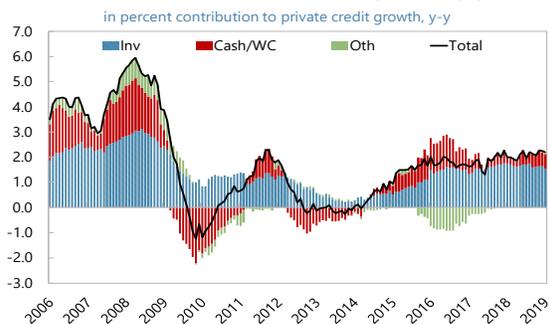
Source: Haver Analytics.

The bulk of bank credit goes to SMEs and mid-tier enterprises.

Bank Credit by Size of Firms (Billions of euros)
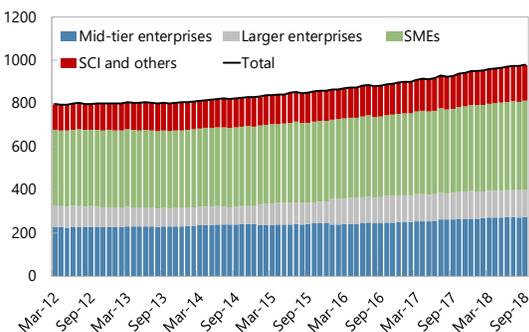
Sources: Banque de France; and IMF staff.

Nonbank borrowing has played an increasingly important role.

Credit to Nonfinancial Firms (Percent of GDP)
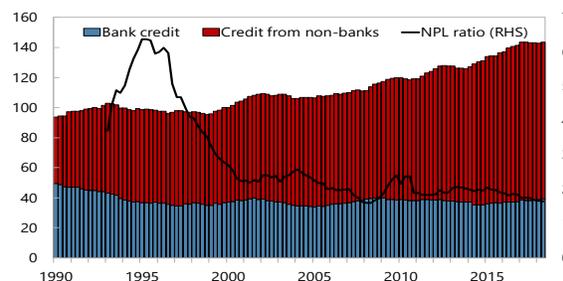
Sources: BIS; and Haver Analytics.

Recently domestic bank credit and loans within the NFC sector had the largest contributions to gross debt financing flows.

Debt Financing Flows to French NFCs (Contribution to yoy growth)
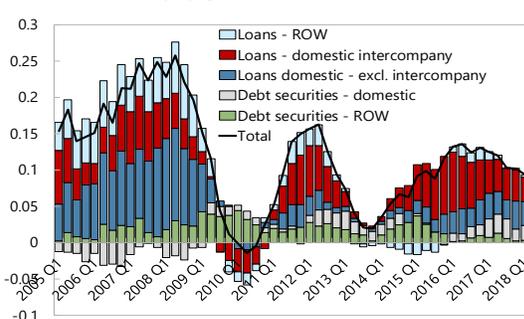
Sources: Sectoral financial accounts; and IMF staff calculations.

Large firms have been increasingly reliant on bond issuances.

Corporate Bond Gross Issuance Volume (Billions of US dollars)
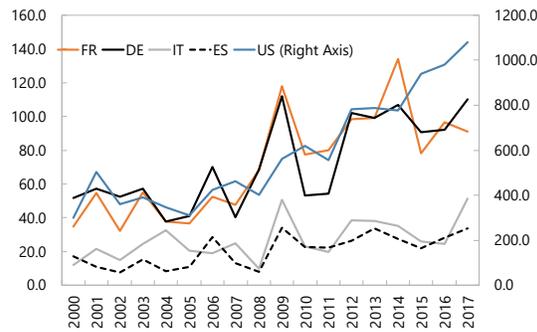
Source: Dealogic.

13.   Unconventional monetary policies, including quantitative easing programs, likely boosted the demand for corporate bonds. Corporate bond issuance has risen in euro area countries since the global financial crisis. The ECB's purchase of government bonds and asset-backed securities led investors into buying assets with similar characteristics but higher yields, such as corporate bonds, reducing the costs of bond financing. The ECB's corporate sector purchase programme (CSSP) initiated in mid-2016 brought corporate bond yields even further down.

14.   The secular decline in the share of bank credit in total firm debt financing reflects the combined growing importance of bond finance and loans among NFCs (Figure 5). Between 1991:Q1 and 2018:Q2, the cumulative flows of bonds issued reached more €500 billion and of loans among NFCs about €680 billion, compared to about€ 600 bn of credit from domestic banks. In the recent past, this tendency has continued, being supported by unconventional monetary policies implemented since the global financial crisis. This evolution of the structure of debt financing raises new questions about the transmission of shocks to and among French NFCs.

Figure 5. France: Evolution in the Composition of NFC Debt by Counterparty Sector and Instrument

Bond finance and intercompany loans have played a greater role over time.
Cumulative Flows of Debt Financing of NFCs (1995:Q4=0)
(Billions of euros)

The trend seems to have been reinforced by unconventional monetary policy.
Cumulative Flows of Debt Liabilities of NFCs (2008:Q2=100)
(Billions of euros)
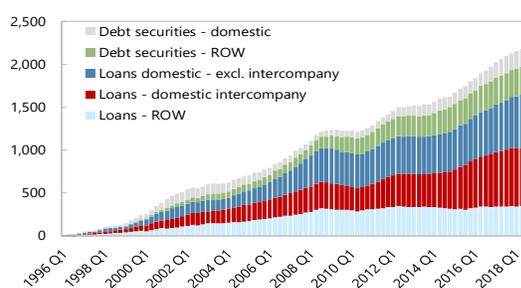
Sources: Sectoral financial accounts; Banque de France; and IMF staff calculations.
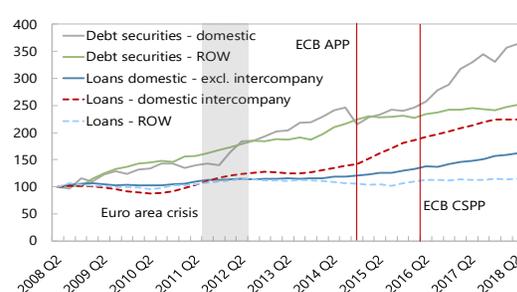
Sources: Sectoral financial accounts; and IMF staff estimates.

D.   Empirical Determinants of Debt at Risk among Nonfinancial Corporations

15.   This section presents an empirical model of debt at risk developed on firm level balance sheet and financial statement data. The model aims relates the analysis of firm level cash flows to firm level characteristics and macrofinancial conditions. The section illustrates the fit of the model—e.g., how it explains the tail of the distribution of firm level debt servicing capacity, and the evolution of predicted debt at risk in the baseline macrofinancial scenario.

Approach

16.   An econometric analysis is performed to assess the determinants of French firms' cash flow vulnerabilities (Box 1). The data source is ORBIS, covering around 180,000 firms incorporated in France over the period 2005–2015, after cleaning the data. In our sample, 61 percent of firms are SMEs and the rest are large firms. The data cleaning process closely follows the approach described in Kalemli-Ozcan et al (2015) and Gopinah et al. (2015). Our sample keeps only unconsolidated balance sheets. The main reason for selecting only unconsolidated firm balance sheet is to be able to include in our analysis not only consolidated debt but also trade credit.[14] In that respect, a particularity of ORBIS is that it includes a breakdown for debt to suppliers and contractors.[15]

Box 1. France Specific Empirical Models

The analysis aims to understand the extent to which firms' ability to service their debt are influenced by their characteristics and macrofinancial conditions. A panel Probit empirical model explains the likelihood that a nonfinancial firm could experience debt servicing difficulties:

$$P[Risk_{it} = 1] = A \cdot firm\_char_{it-1} + \delta \cdot macro\_financial_{t-1} + \varepsilon_{it} \quad (1)$$

Where $Risk_{it}$ is a binary variable taking a value of 1 if the interest coverage ratio $ICR < \overline{ICR}$ and zero otherwise, where $\overline{ICR}$ is a threshold level (1, or 2), $firm\_char_{it}$ is a vector of firm level characteristics. These include the debt-to-income ratio of the firm, a measure of the size of the firm (total assets), the turnover ratio (defined as operating revenues as a percent of total assets), the return on assets, asset composition (the ratio of net fixed assets to total assets), and the age of the firm since it was incorporated. The variable $macro\_financial_t$ synthetizes the state of macrofinancial conditions in the economy at date t (see below). ε_{it} is an error term which is assumed to be potentially correlated across firms in any given year, and thus clustered by year. In robustness tests, the error term is modelled to account for industry characteristics: $\varepsilon_{it} = \Delta \cdot \overline{industry\_char_{it-1}} + \gamma_{it}$ where $\overline{industry\_char_{it-1}}$ is a vector of time varying firm characteristics averaged at the industry level and year, and γ_{it} is clustered by year.[1]

We also consider an empirical model of the determinants of profitability. This model will allow assessing to what extent macrofinancial conditions have an impact of the profitability of French firms. Such effects will generate second round feed-back effects to the debt-at-risk of firms. Specifically, we consider the following empirical model:

$$ROA_{it} = \alpha \cdot ROA_{it-1} + A \cdot firm_{char_{it-1}} + \beta \cdot macro_{financial_{t-1}} + v_{it} \quad (2)$$

---
[1] We consider the four digits NACE sectoral classification. Results are robusts to including sector fixed effects at the NACE 1 classification.

---

[14] Among all firms, financial debt (bank loans plus bonds) is on average 13 percent of assets, while trade credit is 19 percent of assets. Among listed firms financial debt is relatively more important (16 percent of assets) and trade credit relatively less (10 percent of assets) than in the complete sample of firms.

[15] Intra-group loans are excluded from the analysis. In ORBIS, intra-group loans are included in a residual balance sheet variable called "other liabilities," and they cannot be derived for the purpose of analysis because they are grouped with other liabilities.

17. **The state of macrofinancial conditions in France is embodied in the predicted one-year ahead tail of the growth distribution in a GaR empirical model estimated in a first stage.** The premise of the GaR approach is that the distribution of growth outcomes is sensitive to shocks to financial conditions: an adverse shock to financial conditions tends to widen the distribution of growth outcome and increase the likelihood of adverse outcomes and is an indicator of the extent to which the financial system tends to amplify shock. We consider the one year ahead predicted GaR at the 5th percentile (lagged one year in the regression) as the state of macrofinancial conditions and of the related risks: a decline in the percentile of the predicted real GDP growth indicates a rise in the severity of financial stress tail events that would result in a sharp decline in real GDP growth. Such evidence can be seen as indicating that the financial system has become more likely to amplify shocks with a macroeconomic impact. In the second stage, we assess the extent to which heightened risk of financial volatility impacts firms' ability to service their debt and their profitability.

Findings

18. **Firm level characteristics play an important role in predicting the likelihood of cash flow difficulties at the firm level (Table 2).** Firms that are initially more leveraged, that are less profitable, that are younger, that have a higher proportion of fixed assets and have larger turnover, are more likely to be at risk of experiencing difficulties in servicing their debt. Most of these findings hold if we control for these characteristics averaged by industry-year, suggesting that we are not merely capturing industry effects. We also find that the 5th percentile of the predicted GaR is significant in many specifications, but significance drops in specifications based on an ICR threshold of 2: a fatter left tail of the growth distribution results in a higher likelihood of debt servicing difficulties at the firm level, after controlling for firm and industry characteristics.[16]

Table 2. France: Baseline Probit Estimations

Dependent variable: probability =1		ICR<100 percent			ICR<200 percent	
	(1)	(2)	(3)	(4)	(5)	(6)
TD/income (-1)	0.00181***	0.00155***	0.000744	0.00424***	0.00386***	0.00165*
Total assets (-1)	0	0**	-0***	0**	0***	-0
Turnover (-1)	0.000305***	0.000345***	0.000223	0.000559***	0.000514***	-0.000234
NFA/TA (-1)	0.00250***	0.00293***	-0.00321**	0.00380***	0.00479***	-0.0119***
ROA (-1)	-0.0466***	-0.0452***	-0.000638	-0.0468***	-0.0451***	-0.00707***
5th percentile of the predicted GaR	-0.0203***	-0.0207**	-0.00973*	-0.00175	-0.0145	0.0134
Age (-1)	0.00746***	0.00636***	0.000667	0.00787***	0.00649***	-0.00818***
Constant	-1.084***	-0.597***	4.028***	-0.969***	-0.492***	4.726***
Observations	2,109,956	2,109,956	2,109,956	2,109,956	2,109,956	2,109,458
Pseudo-R2	0.12	0.12	0.01	0.13	0.13	0.06
Industry controls (averages)	NO	YES	Fixed effects	NO	YES	Fixed effects

Sources: ORBIS; and IMF Staff.
Note: Note: error term clustered at the year level. Sectors with at least 300 firms included. Within Pseudo-R2 reported for regressions with fixed effects.
***; **; *: significant at the one percent (respectively 5 percent, and 10 percent) level.

---

[16] In robustness tests, we find that the GaR variable is significant in specifications 4 and 5 based on ICR<2 if we also control for labor intensity, and the coefficient has the same order of magnitude. The 5th percentile GaR is strongly correlated (correlation coefficient of 0.95) with the FCI relied upon in the quantile regression. Results of Probit regressions and OLS regressions of ROA are robust if we use the FCI instead of the 5th percentile GaR as an indicator of macrofinancial risks.

19. **The predicted probabilities of 'debt-at-risk' differentiate firms with ICR above and below the thresholds relatively well.** Table 3a reports moments of the distributions of the predicted probabilities that the ICR of a firm i falls below 100 percent during year t, based on specification (2), and Table 3b report frequencies of Type I and Type II errors. The model seems to perform relatively well in separating out firms with an ICR below 100 percent from firms with an ICR above 100 percent.

- *Among SMEs*, the average predicted probability of debt-at-risk is more than twice larger for those with an ICR below 100 percent (0.28) than for those with an ICR above 100 percent (0.13). 90 percent of SMEs with an ICR below 100 percent have a predicted probability of debt-at-risk above 0.1 while about ½ of those with an ICR above 100 percent have a predicted probability of debt-at-risk below 0.1. Conversely, about ½ of SMEs with an ICR below 100 percent have a predicted probability of debt-at-risk above 0.25, while about 90 percent of SMEs with an ICR above 100 percent have a probability of debt-at-risk below 0.27. Using as threshold the unconditional probability of selecting an SME with debt-at-risk (0.16), the frequency of Type I error (missed positive) is 0.2 (meaning that 80 percent of SMEs with debt-at-risk are correctly classified) and the frequency of Type II errors (false positive) is 0.3 (meaning that 70 percent of SMEs that do not have their debt-at-risk are correctly classified).

Table 3a. France: Distribution of Predicted Probabilities

	SMEs		Large firms	
Predicted Probabilities ICR < 1	ICR< 1	ICR> 1	ICR< 1	ICR> 1
10th percentile	0.10	0.01	0.06	0.02
25th percentile	0.17	0.05	0.11	0.05
Median	0.25	0.11	0.16	0.10
75th percentile	0.36	0.19	0.22	0.14
90th percentile	0.51	0.27	0.28	0.19
Average	0.28	0.13	0.17	0.11
Std. Dev.	0.17	0.12	0.09	0.07

Sources: ORBIS; and IMF staff.

Table 3b. France: Type I and Type II Errors

Model Performance (Error Frequency)	SMEs	Large firms
Type I errors	0.2	0.3
Type II errors	0.3	0.4

Source: IMF staff.
Note: Type I errors are missed firms with ICR<1, and type II are false positive. Threshold used is average frequency of firms with debt-at-risk, defined as firms with an ICR<1.

- *Among large firms,* the average predicted probabilities of debt-at-risk are smaller, reflecting the fact that large firms are on average less likely to experience low ICRs in any given year and/or may find it easier to exit a low ICR zone. For firms with ICR below 100 percent, the average probability of debt-at-risk is 0.17 compared to 0.11 for those with an ICR above 100 percent.

About ½ of firms with an ICR below 100 percent have a predicted probability above 0.16 while only ¼ of those with an ICR above 100 percent have a predicted probability above 0.14. Conversely, about ½ of firms with an ICR above 100 percent have a predicted probability below 0.1 while ¾ of those with an ICR below 100 percent have a predicted probability above 0.11. The frequency of errors are somewhat larger than for SMEs using the same definition of the threshold (0.11 for large firms): the frequency of Type I error (missed positive) is 0.3 (meaning that 70 percent of SMEs with debt-at-risk are correctly classified) and the frequency of Type II errors (false positive) is 0.4 (meaning that 60 percent of SMEs that do not have their debt-at-risk are correctly classified).

20.   The empirical model performs relatively well in tracking the aggregate tail of firms experiencing debt servicing difficulties (Table 4). First, the model is re-estimated separately for SMEs and for large firms, using the ICR threshold of one. Second the predicted probabilities of experiencing debt servicing difficulties, are averaged by year. The following patterns emerge:

- *First:* SMEs have on average a higher likelihood of having low ICR than large firms;

- *Second:* the tail of firms with debt-at-risk fattened at the time of the global financial crisis, and this change in the tail was more marked for SMEs (+0.8 pp. between 2007 and 2009) than for large firms (+0.3 pp.);

- *Third*: the tail of firms with debt-at-risk has remained somewhat above the pre-crisis level for SMEs and for large firms and was in 2015 was about the same as at the time of the global financial crisis; and

- *Fourth:* the model estimated probabilities of debt servicing difficulties track the actual tail of the distribution and its time evolution quite well.

Table 4. France: Macroeconomic Fit of the Model

	Observed shares of firms with debt at risk		Average predicted probability of debt at risk		Deviation	
	Large firms	SMEs	Large firms	SMEs	Large firms	SMEs
2005	0.11	0.15	0.10	0.13	-0.01	-0.01
2006	0.10	0.14	0.10	0.14	0.00	0.00
2007	0.09	0.12	0.09	0.13	0.00	0.01
2008	0.11	0.15	0.09	0.13	-0.02	-0.03
2009	0.12	0.20	0.11	0.18	-0.01	-0.03
2010	0.10	0.17	0.12	0.21	0.01	0.04
2011	0.10	0.17	0.10	0.17	0.00	0.00
2012	0.12	0.20	0.11	0.19	-0.01	-0.01
2013	0.12	0.19	0.12	0.21	0.00	0.02
2014	0.12	0.19	0.12	0.19	0.01	0.00
2015	0.12	0.18	0.13	0.19	0.01	0.01

Sources: ORBIS and IMF Staff.
Note: Computed for Interest Coverage Ratio < 100 percent.

21.   The amount of debt at risk appears to be macroeconomically significant in the baseline, and its extent mostly accounted for by large firms (Tables 5a and b). Overall, using the stricter definition of debt-at-risk (ICR<1), we find that the model tends to slightly underestimate at the aggregate level the level of financial debt-at-risk (bonds+bank loans), with a difference on average of 0.8 percent of GDP, but with the largest temporary underestimation in 2009. Depending on the definition adopted for debt at risk (interest coverage ratio below 100 percent, or below 200 percent), and the scope of corporate debt (only bank debt and corporate bonds, or also including trade credits), the estimated amount of corporate debt at risk in the baseline scenario varies between about 3 percent of GDP (under the most restrictive definition) and 9 percent of GDP (under the less strict definition). Nevertheless, this looser definition of debt includes intercompany loans that have a low economic meaning. It is noticeable, that, under the less restrictive definition of debt at risk—ICR < 200 percent—the amount of debt at risk has remained at levels not so different from the peak of the global financial crisis (with however a decline in 2015), despite a more favorable macrofinancial environment. About 80 percent of the debt at risk is usually accounted for by large firms, and about 20 percent by SMEs. This does not imply that the leverage and debt at risk of SMEs may not be important to consider: first, SMEs may have business relationships with related large firms; financing problems in large firms could cascade to SMEs through these links, making debt at risk correlated across such related firms, especially if SMEs is already significantly indebted; second, in recent years, lending to SMEs has been the most dynamic segment of bank credit—while large firms may be able to access bond markets—and account for a relatively larger share of bank credit than implied by firm level data.

Table 5a. France: Comparison Actual and Predicted Financial Debt at Risk

| | Debt-at-Risk (ICR < 100 percent) (Percent of GDP) | | | | | |
| | Actual | | | Predicted | | |
	Large Firms	SMEs	Total	Large Firms	SMEs	Total
2005	3.3	0.7	**4.0**	2.3	0.5	**2.8**
2006	3.6	0.6	**4.3**	2.4	0.5	**2.9**
2007	3.0	0.6	**3.7**	2.2	0.5	**2.7**
2008	2.8	0.7	**3.5**	2.3	0.5	**2.7**
2009	7.3	0.9	**8.2**	4.3	0.6	**4.9**
2010	3.9	0.6	**4.5**	2.7	0.6	**3.3**
2011	3.9	0.7	**4.6**	2.5	0.6	**3.1**
2012	3.4	0.9	**4.2**	2.6	0.7	**3.3**
2013	2.2	0.8	**3.0**	3.9	0.8	**4.6**
2014	1.8	0.7	**2.5**	3.3	0.7	**4.0**
2015	3.2	0.7	**3.8**	2.3	0.6	**2.9**

Sources: ORBIS; and IMF Staff.
Note: Debt include bank debt and bonds only.
Aggregation of actual debt at risk is the total debt of firms with CIR<1 during the year considered. Aggregation of predicted debt-at-risk based on sum of firm level debt weighted by the predicted firm level probability of ICR<1.

Table 5b. France: Model Predicted Corporate Debt at Risk

Baseline Predicted Debt at Risk (ICR < 100 percent)
(Percent of GDP)

	Bank Loans and Bonds Only			All Debt, Incl. Trade Credit		
	Large Firms	SMEs	Total	Large Firms	SMEs	Total
2005	2.3	0.5	**2.8**	3.5	1.2	**4.6**
2006	2.4	0.5	**2.9**	3.7	1.2	**4.9**
2007	2.2	0.5	**2.7**	3.6	1.2	**4.8**
2008	2.3	0.5	**2.7**	3.5	1.1	**4.6**
2009	4.3	0.6	**4.9**	5.9	1.3	**7.2**
2010	2.7	0.6	**3.3**	4.4	1.4	**5.8**
2011	2.5	0.6	**3.1**	3.9	1.4	**5.2**
2012	2.6	0.7	**3.3**	4.1	1.4	**5.6**
2013	3.9	0.8	**4.6**	5.6	1.6	**7.2**
2014	3.3	0.7	**4.0**	4.8	1.4	**6.3**
2015	2.3	0.6	**2.9**	4.4	1.3	**5.7**

Baseline Predicted Debt at Risk (ICR < 200 percent)
(Percent of GDP)

	Bank Loans and Bonds Only			All Debt, Incl. Trade Credit		
	Large Firms	SMEs	Total	Large Firms	SMEs	Total
2005	3.9	0.8	**4.7**	5.8	1.8	**7.6**
2006	4.2	0.8	**5.0**	6.2	1.9	**8.1**
2007	3.8	0.8	**4.6**	6.0	1.8	**7.8**
2008	3.6	0.8	**4.4**	5.6	1.7	**7.3**
2009	6.0	0.8	**6.8**	8.2	1.7	**9.9**
2010	3.9	0.8	**4.7**	6.1	1.8	**7.9**
2011	4.0	0.9	**4.8**	5.9	1.9	**7.9**
2012	4.0	0.9	**4.9**	6.1	1.9	**8.0**
2013	6.1	1.1	**7.2**	8.5	2.2	**10.7**
2014	5.6	1.0	**6.7**	7.9	2.1	**10.0**
2015	3.8	1.0	**4.7**	6.9	2.0	**8.9**

Sources: ORBIS; and IMF Staff.
Note: Debt include bank debt, bonds and trade credit. Financial debt excludes trade credit. Intragroup loans are excluded. Aggregation based on sum of firm level debt weighted by the predicted firm level probability of facing cash flow problems. Different empirical models are estimated for large firms and SMEs.

E.   Cross-Country Comparative Analysis of Debt at Risk Among Publicly Listed Corporates

22.   This section undertakes a cross-country comparative analysis of corporate debt for large firms listed on the stock market. The objective is, *first*, to assess how large French firms compare among their peers in other developed economies in term of their debt levels and likelihood of experiencing potential debt servicing difficulties, and *second*, to understand how macrofinancial conditions affect firms' debt servicing capacities of French firms and in peer countries. Focusing on listed firms makes sense given the findings of section D that most of aggregate debt at risk originates among these large firms.

23.   A cross-country econometric analysis is performed to assess the determinants of publicly listed firms' leverage, debt cash flow vulnerabilities and profitability (Box 2). Based data from Worldscope, we rely upon consolidated balance sheets and financial statement of publicly listed firms based on country of incorporation over the period 2005–2017, for eight countries: Canada, France, Germany, Italy, Japan, Spain, the United Kingdom, and the United States. In this analysis the focus is the group level debt and debt servicing capacity, thus netting out all debt claims among firms that belong to the same corporate group.

Box 2. Cross-country Empirical Models

As in the previous section, the analysis aims at understanding the extent to which firms' ability to service their debt are influenced by their characteristics and macrofinancial conditions. A panel Probit empirical model explains the likelihood that a nonfinancial firm could miss a debt payment:

$$P[Risk_{ijst} = 1] = A \cdot firm\_char_{ijst-1} + B \cdot Macro\_financial_{jt} + c_j + d_s + \varepsilon_{ijst} \quad (3)$$

Where $Risk_{ijst}$ is a binary variable taking a value of 1 if the interest coverage ratio of firm i in country j and sector s is such that $ICR_{ijt} < \overline{ICR}$ and zero otherwise, where $\overline{ICR}$ is a threshold level (1, or 2), $firm\_char_{ijst}$ is a vector of firm level characteristics. These include the debt-to-income ratio of the firm, a measure of the size of the firm (total assets), the turnover ratio (defined as operating revenues as a percent of total assets), the return on assets, asset composition (the ratio of net fixed assets to total assets). The vector representing the state of macrofinancial conditions $Macro\_financial_{jt}$ is captured by two country specific variables: a financial condition index and real GDP growth. ε_{ijst} is an error term which is assumed to be potentially correlated across firms in any country and year, and thus is clustered by country and year. We also include a full set of country fixed effects c_j and industry fixed effects d_s.

We also assess empirically the firm-level and macrofinancial determinants of firm profitability and leverage. Specifically, we consider the following firm level Ordinary Least Square (OLS) panel specification with standard errors robust of heteroscedasticity and clustered by country and year:

$$Y_{i,s,j,t} = \alpha \cdot Y_{i,s,j,t-1} + \Delta \cdot firm\_char_{ijst-1} + \Phi \cdot Macro\_financial_{jt} + C_j + D_s + v_{ijst} \quad (4)$$

Where we aim to explain firm profitability or leverage ($Y_{i,s,j,t}$) with its lag ($Y_{i,s,j,t-1}$), a set of firm level characteristics ($firm\_char_{ijt}$), macro financial conditions ($Macro\_financial_{jt}$) captured by a financial condition index and real GDP growth, and a complete set of country fixed effects (C_j) and industry fixed effects (D_s).

24.   Descriptive statistics of firms with debt-at-risk (ICR< 100 percent). In our sample of French firms, firms with debt-at-risk tend to be less profitable than others (and are often loss making), they have lower current assets relative to their current liabilities and have lower cash-to-debt ratios. In our entire sample of eight countries, firms with debt-at-risk also tend to be less profitable (and often loss making) than others, and also have lower cash buffers than other firms.

Findings

25.   Firms ability to service their debt is explained by a combination of firm level characteristics and macrofinancial conditions (Tables 6 and 7). Firms that are more indebted, less profitable, are smaller and have lower turnover tend to be more likely to experience difficulties to service their debt. Profitability, in turn, is positively associated with a capital structure relying relatively more on debt financing, with size, turnover and the share of fixed assets in total assets. Tighter financial conditions negatively impact firms' servicing

A. Entire Sample				
(Medians)	Firms with debt at risk		Other firms	
	2013	2016	2013	2016
ROA	**-8.5**	**-6.8**	**4.1**	**4.3**
Debt/total assets	28.3	27.8	18.6	18.8
Debt/equity	30.0	34.9	34.9	35.7
LT debt/total debt	68.3	80.9	64.2	66.4
Current ratio	**115**	**128**	**170**	**175**
Cash/total debt	**21.5**	**20.0**	**54.6**	**61.3**
Sales/total Assets	79.0	62.6	97.2	95.8
Fixed assets/Assets	17.6	19.2	24.7	23.8

B. French Firms				
(Medians)	Firms with debt at risk		Other firms	
	2013	2016	2013	2016
ROA	**-6.2**	**-4.0**	**4.4**	**4.7**
Debt/total assets	20.2	21.8	19.9	20.8
Debt/equity	49.2	73.0	47.1	50.1
LT debt/total debt	62.6	68.6	68.3	70.6
Current ratio	**112**	**124**	**147**	**147**
Cash/total debt	**33.3**	**25.5**	**38.1**	**48.0**
Sales/total Assets	97.6	72.9	102.9	89.1
Fixed assets/Assets	11.3	11.7	11.5	12.8

Source: Worldscope and IMF Staff.

capacity directly (Table 6) and with a lag through lower profitability (Table 7), while higher real GDP growth positively affect debt servicing capacity directly (Table 6) as well as with a lag through higher profitability (Table 7). The direct effect of financial conditions is likely to reflect the combination of higher financing costs (at large, e.g., including not only the cost of debt finance but also the cost of equity finance) and lower overall profitability. The lagged effect through past profitability likely reflects the fact that profitability tends to exhibit some persistence so that a shock to profits will exhibit some persistence over time.

Table 6. France: Baseline Probit Regressions

Probit	ICR < 100 percent				ICR< 200 percent	
	(1)	(2)	(3)	(4)	(5)	(7)
Debt/assets (-1)	0.0109***	0.0109***	0.00910***	0.00989***	0.0188***	0.0195***
Return on assets (-1)	-0.0491***	-0.0496***	-0.0445***	-0.0435***	-0.0447***	-0.0440***
Net fixed assets/total assets (-1)			0.000301	0.000728	0.000836	0.00145***
Total assets (-1)			-0.0131***	-0.0116***	-0.0131***	-0.0121***
Turnover (-1)			-0.000388**	-0.000216	-0.000377**	-0.000280
FCI	**0.364***		**0.189***	**0.192***	**0.215***	**0.218***
Real GDP growth		**-0.0391**	**-0.0513**	**-0.0515**	**-0.0478**	**-0.0482**
Constant	-1.249***	-1.200***	-0.857***	-1.025***	-0.907***	-1.053***
Country Fixed Effects	NO	NO	YES	YES	YES	YES
Industry Fixed Effects	NO	NO	NO	YES	NO	YES
Observations	52,744	52,744	50,969	50,969	50,969	50,969
Pseudo-R2	0.16	0.15	0.21	0.22	0.22	0.23

Sources: Worldscope; World Economic Outlook; and IMF Staff.
***; **; *: significant at the one percent (respectively 5 percent, and 10 percent) level.

Table 7. France: Baseline Profitability Regressions

Dep. Variable: ROA	(1)	(2)	(3)	(4)
Debt/assets (-1)	0.0109**	0.00939*	0.0161***	0.0144***
Return on assets (-1)	0.651***	0.654***	0.638***	0.630***
Net fixed assets/total assets (-1)	0.0109**	0.0116**	0.0152***	0.0165***
Total assets (-1)	0.0236***	0.0225***	0.0287***	0.0283***
Turnover (-1)	0.0102***	0.0104***	0.00967***	0.00883***
FCI	**-1.128***		**-0.785*	**-0.783*
Real GDP growth		**0.183***	**0.138**	**0.138**
Constant	-1.093***	-1.287***	-0.364	0.160
Country Fixed Effects	NO	NO	YES	YES
Industry Fixed Effects	NO	NO	NO	YES
Observations	46,699	46,699	46,699	46,699
R2	0.441	0.439	0.447	0.450

Sources: Worldscope; World Economic Outlook; and IMF Staff.
***; **; *: significant at the one percent (respectively 5 percent, and 10 percent) level.

26.   French large corporates are on average not more indebted than their peers and are on average not more likely to experience debt-service difficulties (Figure 6, right panel). This confirms and broadens the findings of the 2018 France Article IV Selected Issues Paper. Specifically, we find that, after controlling for firm and industry characteristics:

- Firms from Canada, Italy, Spain and the US have higher leverage than French firms on average, while those form Germany, Japan and the UK have lower leverage;[17] and

- The likelihood of debt servicing risk is higher for firms from Canada, the UK and the US and is lower for Japanese firms than for French firms; the difference with French firms is unclear for German, Italian and Spanish firms.

Figure 6. France: Year and Country Fixed Effects

Average leverage and likelihood of debt at risk follow common patterns …

Year fixed effects (2005 = 0)

… while French firms' leverage and debt-at-risk are not abnormally high after controlling for firm characteristics.

Country fixed effects (France is the omitted country)

Note: country fixed effects from panel regressions of ICR or leverage.
A * indicates 10 percent or lower significance level
Sources: Worldscope and IMF staff estimates

Sources: Worldscope; and IMF staff estimates.
Note: time fixed effects from firm level panel regressions of ICR and leverage.

27.   Average debt levels and tails of firms with debt servicing difficulties are affected by common shocks (Figure 7, left panel). We estimate versions of empirical models (2) and (3), replacing the country specific Financial Condition Index (FCI) and real GDP growth by time fixed effects. The estimated fixed effects show very clearly the presence of common time shocks that affect both the average firm leverage, and the likelihood of debt servicing difficulties. These findings are robust to controlling for firm characteristics, country fixed effects and industry fixed effects. Specifically, we find that, after controlling for firm characteristics and industry fixed effects:

- Average firm leverage and likelihood of debt at risk follow broadly similar evolutions over time;

- Average leverage and likelihood of debt at risk rose sharply at the time of the global financial crisis;

- Both declined in 2010;

---

[17] The difference with French firms is not significant for German and UK firms.

- Leverage has been on a rising common trend since 2010; and

- The average likelihood of debt at risk has remained above pre-crisis levels since 2010.[18]

Comparative Debt-at-risk Estimates

28.   The empirical model provides relatively good estimates of debt-at-risk under the baseline macrofinancial scenario for France, but with differences across countries. The estimated likelihoods of debt service difficulties are based on equations (4) of models (3) and (4) as reported below.[19] In particular the estimates take into effect the additional impact through lagged profitability. The model provides a good baseline estimate of debt-at-risk for French firms at around 2 percent of GDP with an ICR threshold of 100 percent. It also provides a good estimate for Japanese firms and US firms. It tends to under-predict the aggregate debt

	Likelihood of Debt at Risk		Debt at Risk (Percent of GDP)	
	Actual	Predicted	Actual	Predicted
Canada	0.39	0.33	9.1	6.4
France	0.16	0.13	1.9	2.0
Germany	0.10	0.13	2.8	1.5
Italy	0.12	0.13	2.0	0.9
Japan	0.03	0.04	0.5	0.5
Spain	0.16	0.10	1.9	1.6
United Kingdom	0.19	0.19	0.9	0.6
United States	0.18	0.20	2.2	2.2

Sources: Worldscope; and IMF Staff.
Note: Estimates based on an ICR threshold of 100 percent and for 2017 (or 2016 due to data availability).

at risk for Canadian, German, Italian and UK firms. If we use a threshold of 200 percent, the actual debt-at-risk of large French firms is about 5 percent of GDP, and the predicted one at about 3 percent of GDP.

F.   Is Corporate Debt Well Allocated in France?

29.   This section complements the previous analysis of debt at risk by taking a different approach and assesses whether debt financing has been well allocated across French firms in the recent past (Box 3). A surge in debt financing may not be fundamentally a concern for financial stability if it is well allocated and it results in productive investments and higher profits that would firms to repay their debt. However, a surge in borrowing that would be misallocated and used relatively more to finance less-productive investments could add to financial stability risks down the road. Such patterns could occur when lending standards have been loosening for a sustained period of time and in situations of easy financial conditions—as is to some extent the case in the euro area. For instance, Chapter 2 of the Spring 2018 Global Financial Stability Report finds that the extent to which borrowing is well allocated across firms (the riskiness of debt allocation) is another indicator of downside risk to growth, and of the probability of financial stress, beyond early warning standard indicators of leverage and aggregate credit growth.

---

[18] The end annual point in 2017 is included for completeness but, due to important data gaps in the firm sample, should be interpreted with caution.

[19] The actual likelihood of debt-at-risk is the proportion of firms with an ICR below 100 percent, and the predicted likelihood of debt-at-risk is the average of firm level predicted probabilities of having an ICR below 100 percent. The actual debt-at-risk is the sum of the debt of firms with an ICR below 100 percent. The predicted debt at risk is the weighted sum of the debt of firms, using the predicted probability of ICR below 100 percent used as weight.

Box 3. Empirical Methodologies

To assess the allocation of borrowing across French firms, we rely on two empirical methodologies:

Riskiness of debt borrowing allocations comparing vulnerabilities between firms with large increase in debt and firms with small increase (or decline in debt). Following the methodology developed in Chapter 2 of the Spring 2018 Global Financial Stability Report (GFSR), we construct indicators of the riskiness of corporation borrowing allocation for France firms based on several firm level variables (interest coverage ratio, profitability, debt-to-income, debt-to-assets, and the market-to-book ratio for firms listed on the stock market). For each of these firm level indicators of vulnerability, an index ranging 0-10 is created based on its distribution of the indicator in the sample of firms, with a lower (respectively higher) value meaning higher (respectively lower) vulnerability. Second, each firm is assigned to a quintile of the distribution of the change in its debt level over the past three years (scaled by initial total assets). Third, the average difference in the value of the indicator is computed between firms with large increase in debt and firms with small increase (or decline) in debt. A higher (positive) value on this difference is consistent with the hypothesis of good allocation of corporate debt. A smaller (and negative) value is consistent with the hypothesis of a misallocation of corporate debt.[1]

Regression analysis of profitability and total factor productivity growth on changes in corporate debt. Specifically, we consider the following panel firm level specification:

$$Y_{i,t} = \alpha \cdot Y_{i,t-1} + \beta \cdot \frac{\Delta Debt_t}{Assets_{t-1}} + \Sigma \cdot firm\_char_{it-1} + \Phi \cdot Macro\_financial_t + D_{st-1} + v_{ijst} \quad (5)$$

Where $Y_{i,t}$ is either profitability or TFP growth, $\frac{\Delta Debt_t}{Assets_{t-1}}$ is the change in total indebtedness

between date t and date $t-1$ scaled by total assets at date $t-1$, with a set of firm level characteristics

($firm\_char_{ijt}$), macro financial conditions ($Macro\_financial_t$) as controls and industry controls (D_{st-1}

$=\overline{industry\_char_{it-1}}$).

_____

[1] See GFSR Chapter 2, Box 2.1 for a detailed description of the methodology.

Findings

30.   Indicators of riskiness of debt allocation across firms do not suggest that there could be some misallocation of corporate debt in the broad sample of firms, or among publicly listed companies (Figure 7):

- There is no definitive evidence that corporate debt allocation (including trade credit) is related to firm performance in the broad sample of firms. There is evidence that firms that experienced the largest increase in debt during 2013–2015 have somewhat relatively less strong ratios (profitability, debt-to-asset ratio and debt-to-income ratio) than firms that experienced the smallest increase (or a decline) in debt (tope left chart of Figure 7). This is consistent with stylized facts from earlier periods (2005–2007; 2010–2013). The exception during 2013–2015 is the ICR indicator which reflects slightly lower vulnerability among the top quintile than in the fifth quintile, as indicated by a positive differential. However, when we look at the actual characteristics of the median firm in the top quintile of the debt change distribution, we find that the various indicators (ICR, return on assets (ROA), debt-to-assets and debt-to-income) did not display clear vulnerabilities (bottom left table in Figure 7).

- *Corporate debt does not appear be misallocated among publicly-listed companies during 2015-2017.* Among publicly-listed companies, firms that are at the top of the distribution of debt issuance appear to be more vulnerable in term of leverage, but they also have higher profitability, higher ICR and higher market-to-book ratios than firms at the bottom of the distribution of the change in debt. Moreover, for the median firm, the various ratios (ROA, ICR, leverage and market-to-book ratio) improved in 2017 relative to previous periods.

Figure 7. France: Indicators of the Riskiness in the Allocation of Corporate Debt

All firms (unconsolidated balance sheets).

**Riskiness in the Allocation of Corporate Debt
(Top quintile minus bottom quintile of the debt distribution)**

Publicly listed companies only (consolidated balance sheets).

**Riskiness in the Allocation of Corporate Debt
(Top quintile minus bottom quintile of the debt change distribution)**
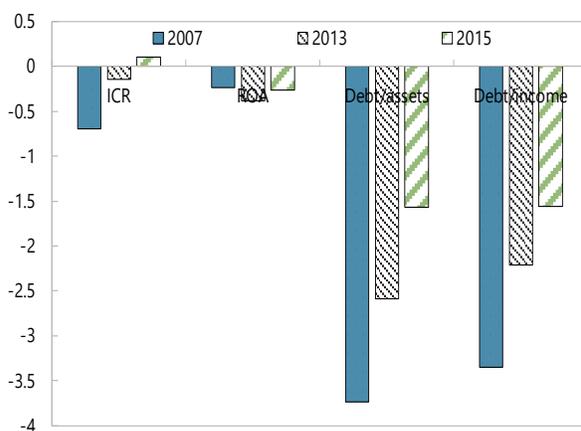
Sources: ORBIS; and IMF staff estimates.
Note: The charts above show the average of the top quintile minus the average of the bottom quintile in the distribution of change in debt level over three years.

Characteristics of top quintile (all firms).
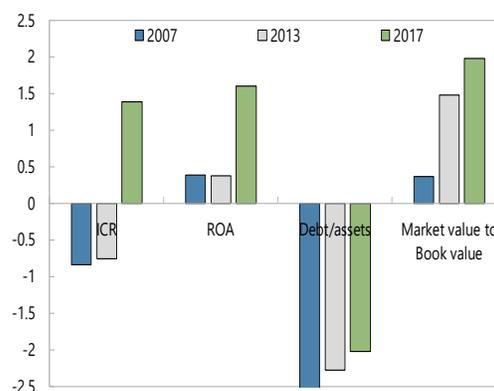
Sources : Worldscope; and IMF staff estimates.

Characteristics of top quintile (listed companies).

Firms in the Top Quintile of the Debt Change Distribution

(Median)	2007	2013	2015
ICR	5.8	5.8	9.0
ROA[1]	7.0	5.2	5.7
Debt/assets[1]	49.4	43.5	38.2
Debt/income[1]	26.5	23.4	21.5

Sources: ORBIS; and IMF staff.
[1] In percent.

Firms in the Top Quintile of the Debt Change Distribution

(Median)	2007	2013	2017
ICR	3.5	3.4	10.1
ROA[1]	4.8	3.5	5.3
Debt/assets[1]	30.8	24.9	33.1
Market value / book value	2.2	1.7	2.7

Sources: Worldscope; and IMF staff
[1] In percent.

31.   The regression analysis however is suggestive that more productive and profitable firms increase their debt by less than others in a broad sample of firms, but there is no clear pattern among publicly listed companies (Table 8). Among non-listed firms, there is evidence that firms that increase their indebtedness tend to be less profitable than other firms, after controlling for past profitability, size, turnover, the share of fixed assets in total assets and the age of the firm. The effect is economically significant: firms that increased their indebtedness by one standard deviation more than others experienced a decline in profitability of 0.8 percentage points relative to others (given an average profitability of 8 percent).[20] In contrast, there is no evidence of any association between the change in firm indebtedness and profitability in the sample of firms that are publicly listed on the stock market.

Table 8. France: Allocation of Debt Among Firms

|	Listed Firms		Non-Listed Firms	
	Panel A. Dependent Variable: ROA			
	(1)	(2)	(3)	(4)
ROA (-1)	0.701***	0.710***	0.537***	0.641***
(Debt-Debt (-1))/ Assets (-1)	-0.00281	-0.00818	-0.0341***	-0.0473***
(Debt (-1)-Debt (-2))/ Assets (-2)		-0.00260		0.00846***
(Debt (-2)-Debt (-3))/ Assets (-3)		-0.00183		-0.00167
(Debt (-3)-Debt (-4))/ Assets (-4)		-0.00593		0.00101
Total assets (-1)	0	0	-9.51e-11***	-6.70e-11***
Turnover (-1)	0.00758***	0.00625**	0.00260***	0.00362***
NFA/TA (-1)	-0.00199	-0.00225	-0.0102***	-0.00663***
5th percentile of the predicted GaR	0.134**	0.113*	0.193**	0.184**
Age (-1)	-0.000852	-0.000176	-0.0303***	-0.0183***
Constant	2.568***	2.315**	0.0352	0.109
Observations	3,916	2,348	2,076,255	1,106,746
R2	0.583	0.588	0.363	0.452
Industry controls (averages)	YES	YES	YES	YES
	Listed firms		Non-listed firms	
	Panel B. Dependent Variable: Labor Productivity Frowth			
	(1)	(2)	(3)	(4)
Labor productivity growth (-1)	-0.0341	-0.0416	-0.109**	-0.130**
ROA (-1)	0.151*	0.106	0.136***	0.121***
(Debt-Debt (-1))/ Assets (-1)	-0.0583	-0.137**	-0.272***	-0.333***
(Debt (-1)-Debt (-2))/ Assets (-2)		-0.131*		-0.142***
(Debt (-2)-Debt (-3))/ Assets (-3)		-0.0270		0.0269
(Debt (-3)-Debt (-4))/ Assets (-4)		0.0513		0.0197
Total assets (-1)	6.06e-11	5.46e-11	1.38e-10	2.05e-10
Turnover (-1)	0.00132	-0.000932	0.0101***	0.00879***
NFA/TA (-1)	-0.0245	-0.0251	0.00735	7.62e-05
5th percentile of the predicted GaR	-0.882	-0.840	-0.332	-0.330
Age (-1)	0.00895	-0.0262	-0.00930	-0.0144
Constant	-4.269	3.729	4.621	5.453
Observations	2,086	1,463	543,675	410,905
R2	0.019	0.041	0.065	0.085
Industry controls (averages)	YES	YES	YES	YES

Sources: ORBIS; and IMF staff estimates.
***; **; *: significant at the one percent (respectively 5 percent, and 10 percent) level.

---

[20] The results are robust if we also control for the lag leverage. The standard deviation of the change in debt to lagged total asset is 24 percent.

G. Scenario Analysis

32.   To assess how the left tail of the corporate debt distribution responds to shocks, stress scenarios are designed, accounting for shocks to growth and financing conditions (Figure 8). Second round effects on the ICR could materialize through a decline in profitability and an increase in debt burden under specific assumptions on the structure of the balance sheet. Each scenario's output is based upon individual firms' predicted ROA and probabilities of missing cash flow payments under stress under different thresholds (ICR of 100 percent or ICR of 200 percent). The

Figure 8. France: Stress Scenarios Models
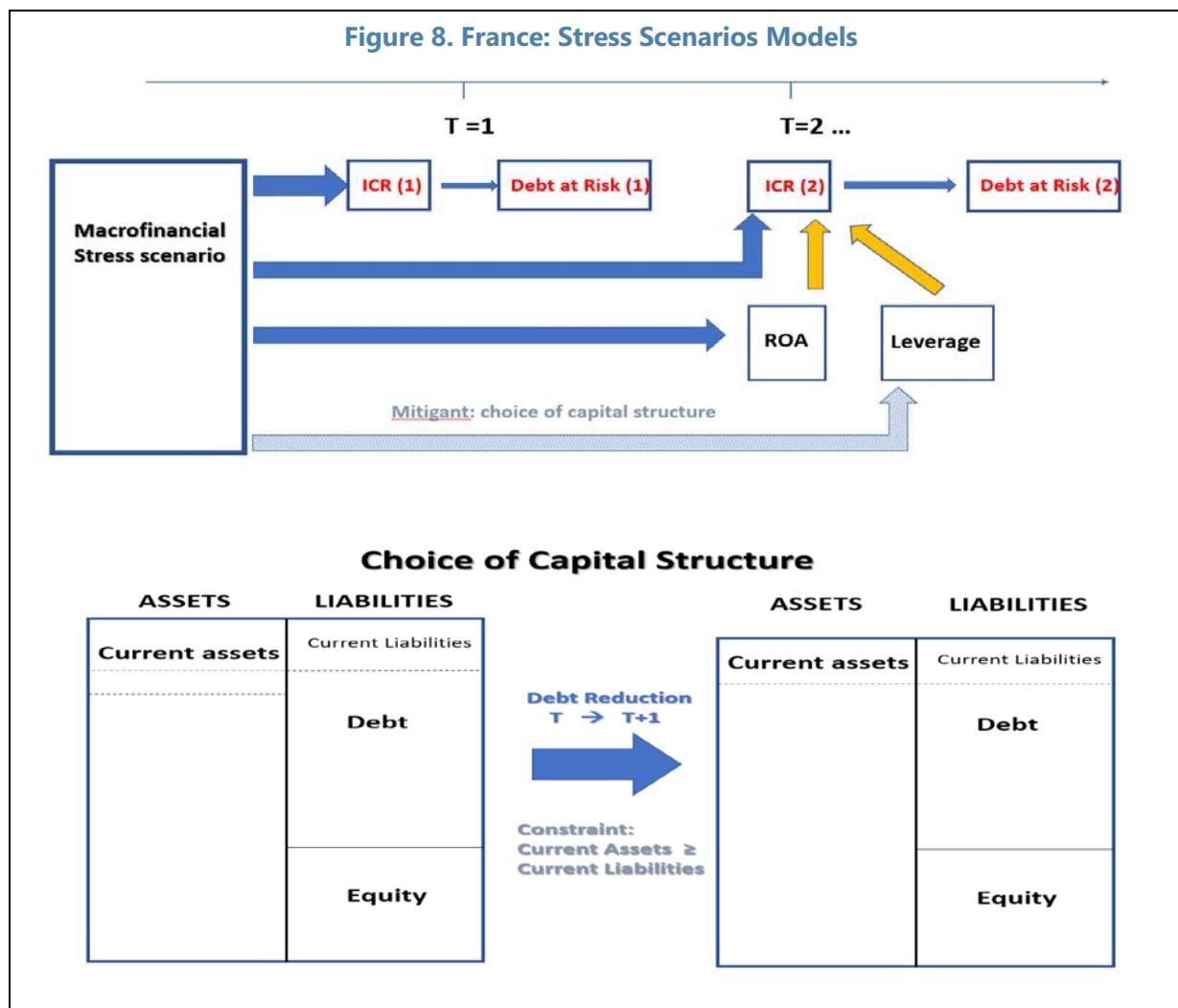
scenarios also allow taking into account potential cash buffers that could be used to reduce the debt burden subject to liquidity constraints (assuming that liquid assets cannot be fall below short-term liabilities). This section presents aggregate debt-at-risk and its distribution among firms of different characteristics with for instance a breakdown between large firms and SMEs. In contrast to the banking stress tests, the shocks are temporary (occurring at date t) and the output of the stress tests presents aggregate debt-at-risk at date t+1.

- **France specific scenario:** The sample includes all firms (including firms not listed on the stock exchange) of the ORBIS sample, with 2015 as the base year, and firm debt includes not only bank credit and bonds, but also intercompany trade credit. The scenarios are designed based on models (1) and (2). Stress scenarios rely on the 5 percent GaR during past stress events (including the Euro Area crisis and the global financial crisis) to calibrate the shock to firms' balance sheets.[21] The scenario is calibrated on the shock occurring at the time of the global financial crisis, which is similar but slightly more severe to the growth shock considered in the bank solvency stress test (where growth falls to -2.0 percent compared to -2.8 percent in this scenario. An additional scenario allows firms to adjust their leverage by making use of cash buffers.

- **Cross-country stress scenarios:** The sample includes firms at a consolidated level and publicly listed on the stock market in Canada, France, Germany, Italy, Japan, Spain, the UK and the US. The empirical models (3) and (4) allow to shock both real GDP growth and an index of financial conditions. The scenarios based on a shock to growth assume a decline in real GDP growth from the 2017 (or 2016 for countries with incomplete firm data in 2017) of 2 standard deviation.[22] The scenarios considering a shock to financial conditions assume a shock to financial conditions of about ½ of the level reached at the end of 2008 at the height of the global financial crisis. As in the France specific analysis, the additional scenario takes into account the possibility that firms rely on their cash buffers to reduce their leverage subject to a liquidity constraint.

33. **The France specific scenarios show that corporate debt-at-risk can rise substantially in the event of stress, and that cash buffers can help mitigate the debt servicing challenge (Table 9).** Depending on the ICR threshold considered, the amount of unconsolidated debt-at-risk rise to about 8 or 11 percent of GDP, but the largest share of debt-at-risk located in large firms. However, in a second round, cash buffers can help reduce leverage and the amount of debt-at-risk particularly among large firms to between 5 and 7 percent of GDP, taking into account liquidity constraints. However, the decision to use cash buffers under the stress event may also be impacted by precautionary motives.

Table 9. France: Specific Scenarios

(percent of GDP)	ICR < 100 Percent			ICR < 200 Percent		
	Baseline	Stress Senario	With Use of Cash Buffers	Baseline	Stress Scenario	With Use of Cash Buffers
Large firms	4.4	5.6	3.6	6.9	8.9	5.2
SMEs	1.3	2.3	1.7	2.0	2.7	1.9
Total	**5.7**	**8.3**	**5.2**	**8.9**	**11.5**	**7.2**

Sources: ORBIS; and IMF staff estimates.

---

[21] Specifically, the 5th percentile predicted GaR fell to -11 percent in France at the height of the Global Financial Crisis.

[22] For France, this assumes that annual real GDP growth falls to -1.15 percent.

34. **In the cross-country stress scenario applied to the consolidated balance sheet of publicly listed companies, the debt-at-risk of French corporates appears to be in the top half of the sample (Table 10).** French firms, together with Canadian, Spanish and US firms appear, in aggregate to hold the largest amounts of debt at risk. A combination of shocks to real GDP growth and financial conditions bring the total amount of debt at risk to around 4 percent of GDP. The use of cash buffers can help mitigate the vulnerabilities but to a relatively small extent at the consolidated level. This is consistent with the stylized fact established in section II that cash buffers are more likely to be located among firms that are less likely to be vulnerable to cash flow difficulties.

Table 10. France: Cross-Country Stress Scenarios

Panel A: ICR < 100 Percent

(percent of GDP)	Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Canada	6.4	8.9	9.2	11.1	10.8
France	2.0	2.7	2.4	3.5	3.3
Germany	1.5	1.5	2.0	2.4	2.2
Italy	0.9	1.1	1.0	1.5	1.4
Japan	0.5	0.7	0.7	1.2	1.0
Spain	1.6	1.8	2.2	2.6	2.5
United Kingdom	0.6	0.9	1.0	1.3	1.3
United States	2.2	3.7	3.3	4.5	4.0

Panel B. ICR< 200 Percent

(percent of GDP)	Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Canada	10.0	12.2	12.3	14.5	13.8
France	3.1	3.8	3.2	4.7	4.2
Germany	3.1	3.1	3.6	4.1	3.4
Italy	1.7	1.8	1.7	2.3	2.1
Japan	0.8	0.9	0.9	1.5	1.0
Spain	4.6	4.9	5.1	5.8	5.5
United Kingdom	1.1	1.6	1.6	2.1	2.1
United States	3.7	5.3	4.7	6.2	5.3

Sources: Worldscope; and IMF estimates.
Scenario 1: scenario with shock to financial conditions only.
Scenario 2: scenario with shock to real GDP growth.
Scenario 3: scenario with combined FCI and real GDP growth shock.
Scenario 4: scenario with combined FCI and real GDP growth shock and use of cash to reduce debt level under the constraints of a current ratio greater or equal to 100 percent.

H. Interconnections of Nonfinancial Corporations with the Financial System

35.   This section examines interconnections of the NFC sector with the financial system and other sector, and finds that:

- The NFC sector may be the most interconnected sector of the French economy. This is mainly because of linkages through equity claims, but loans and debt securities also play an important role.

- In the past, the nonresident sector has played a stabilizing role in time of financial stress. While banks continued to supply loans to NFCs, nonresidents purchased debt securities issues by French corporates while loans among NFCs contracted (in particular around the time of the euro area crisis).

- Banks do not appear to have excessively large concentrated exposures to indebted firms with debt-at-risk.

36.   The NFCs sector has the largest stock of gross financial liabilities or gross financial assets, exceeding those of the banking system, suggesting that it could be the most interconnected sector of the French economy (Table 11 and Figure 9). At the end of 2018:Q2, total gross financial liabilities of NFCs reached about €11 trillion, about €1.7 trillion more than the banking system. Out of these €11 trillion, about €6 trillion are financial liabilities vis-à-vis other institutional sectors, compared to €7 trillion for the banking system. About €2.4 trillion are liabilities vis-à-vis the rest of the world (which includes related firms established abroad), compared to €3.2 trillion for resident banks and €1.9 trillion for the general government. The NFC sector appears to be the domestic sector the most interconnected with itself in the French economy, with liabilities vis-à-vis itself of €5.3 trillion. Intra-sectoral claims are mostly accounted for by equity claims followed by loans. Of all sectors, the NFC sector has by far the largest stock of equity liabilities (€1.8 trillion) among which €600 billion vis-à-vis the rest of the world. Its stock of debt securities liabilities is about €600 billion, about half of which held by nonresidents, compared to €1.2 trillion for the banking system and about €2.3 trillion for the sovereign (which has about €1.2 trillion held by nonresident investors). Monetary and Financial Institutions (MFIs) hold €70–80 billion of corporate debt securities and insurance companies €140–150 billion.
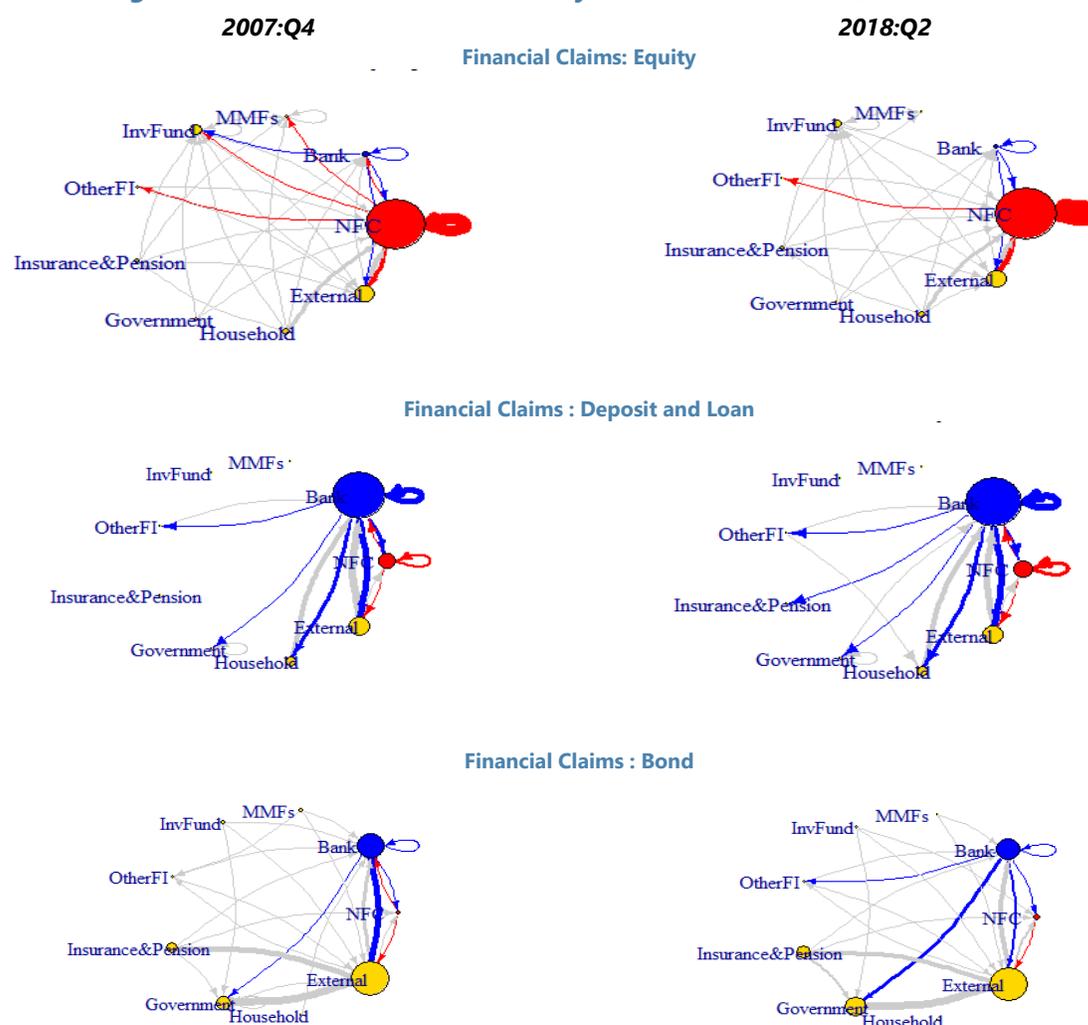
Table 11. France: Interlinkages Among Institutional Sectors in France, 2018:Q2
(All instruments, in billions of euros)

			Liabilities of:									
			Domestic sectors									
		(All instruments, in billions of euros)	Non-financial corps.	MFIs (excl. MMFs)	MMFs	Non-MMF IFs	OFIs	Insurance & pension funds	General government	Households 1/	Rest of World	Total
Assets of:	Domestic sectors	Non-financial corporations	5,346	957	51	53	159	77	214	109	2,075	9,041
		MFIs (excl. MMFs)	1,426	2,693	26	57	411	85	787	1,256	3,175.3	9,917
		MMFs	28	139	33	0	4	-	0	0	152.1	355
		Non-MMF investment funds	241	122	69	174	15	2	35	5	748.1	1,410
		Other financial institutions	271	263	6	8	22	0	1	120	190.9	882
		Insurance and pension funds	293	226	99	538	31	163	455	1	916.2	2,722
		General government	344	246	16	101	1	29	356	145	151.3	1,391
		Households 1/	992	1,784	8	228	40	2,140	139	10	165.9	5,506
		Rest of World	2,404	3,225	48	311	265	55	1,282	-	-	7,589
		Total	11,344	9,654.9	355.0	1,468.9	948.8	2,550.8	3,269.4	1,646.9	7,574.9	**38,814**

Sources: Banque de France; Sectoral Financial Accounts; and IMF staff.
¹ Also includes non-profit institutions serving households.

Figure 9. France: Interconnections by Instruments: 2017:Q4 and 2018:Q2

2007:Q4   *2018:Q2*

Financial Claims: Equity

Financial Claims : Deposit and Loan

Financial Claims : Bond

Source: Banque de France, Sectoral Financial Accounts.

37.   When examining flows of debt liabilities across sectors during periods of financial stress, it appears that bond financing from nonresidents and intercompany loans complemented loans supplied by the domestic banking sector (Table 12a and b):

- *Global financial crisis (2007:Q4–2009:Q4).* NFCs obtained loans, among which ⅔ *coming* from domestic resident banks and ⅓ from nonresidents (which could be foreign offices of French Banks). They issued debt securities which were in aggregate all held by nonresidents, while residents reduced their holdings of corporate bonds.

- *Euro area crisis (2011:Q2–2012:Q4).* NFCs obtained debt financing for about €150 billion as loans (with domestic banks providing only €38 billion, or about ¼ of the total) and €70 billion as debt securities held by nonresidents (about ½ of the total) and domestic insurance companies (about 40 percent).

Table 12a. France: NFCs Intersectoral Debt Flows During Episodes of Financial Stress: Global Financial Crisis

(In billions of Euros)	Instrument: **Loans**	Banks	Insurance Companies	Corporates	Government	Households and NPISH	Total
Cumulative Assets of:	Banks	-4.9	-17.5	85.6	28.4	104.3	195.9
	Insurance companies	0.0	2.0	0.7	0.0	-0.7	1.9
	Other domestic	99.4	3.9	0.9	-2.1	17.6	119.6
	Rest of the world	0.6	1.5	47.2	-0.9	0.0	48.5
	Total	95.2	-10.2	134.3	25.4	121.2	365.9

(In bilions of Euros)	Instrument: **Debt Securities**	Banks	Insurance Companies	Corporates	Government	Households and NPISH	Total
Cumulative assets of:	Banks	55.2	0.3	-5.9	75.4	0.0	124.9
	Insurance companies	5.8	0.0	8.9	19.9	0.0	34.6
	Other domestic	-27.0	0.0	-6.3	-1.3	0.0	-34.5
	Rest of the world	83.3	1.0	70.0	228.1	0.0	382.3
	Total	117.3	1.3	66.6	322.1	0.0	507.3

Sources: Banque de France; and IMF Staff.

	Table 12b. France: NFCs Intersectoral Debt Flows During Episodes of Financial Stress: Euro Area Crisis						

Instrument:	Cumulative Flows of Liabilities of:						
(in billions of Euros) **Loans**	Banks	Insurance companies	Corporates	Government	Households and NPISH	Total
Cumulative Assets of: Banks	0.2	-3.4	37.8	3.2	66.4	104.3
Insurance companies	0.0	1.1	0.6	0.0	-0.1	1.5
Other domestic	7.8	1.4	87.8	9.0	1.8	107.8
Rest of the world	1.1	-0.7	24.8	29.5	0.0	54.7
Total	9.1	-1.6	151.0	41.8	68.0	268.3

Instrument:	Cumulative Flows of Liabilities of:						
(In billions of Euros) **Debt Securities**	Banks	Insurance Companies	Corporates	Government	Households and NPISH	Total
Cumulative Assets of: Banks	12.4	3.0	-5.1	82.7	0.0	93.1
Insurance companies	35.3	-0.9	28.7	39.7	0.0	102.8
Other domestic	9.8	-0.3	10.1	-29.1	0.0	-9.5
Rest of the world	-34.7	0.1	36.7	14.3	0.0	16.4
Total	22.8	1.8	70.4	107.6	0.0	202.8

Sources: Banque de France; and IMF Staff.

38.   Going forward, corporates would be more vulnerable to financial stress than in the past in the event that nonresidents become reluctant to hold corporate bonds. The shock could be transmitted through bond market but also through the equity market, given the large proportion of nonresident investors. Firms not directly relying on financial market financing could also be indirectly impacted as the shock would likely be transmitted from large related companies or head offices of corporate groups through the web of intercompany loans.

39.   Given their international reach, large French banks hold corporate exposures diversified geographically outside of France, including in the US, the UK, Belgium, and Italy. The domestic corporate loan market of the five largest banks appears to be broadly equally split among them. Among the four large international banks, two are more directly exposed to corporates, which account respectively for 39 percent and 24 percent of their total credit exposures, compared to 23 percent and 14 percent for the other two banks which are relatively more exposed to retail loans.[23] Several banks have substantial corporate exposures in the US, the UK but also in Italy where some corporate debt may be at risk (see paragraphs 30, Table 8 and lower-right chart of Figure 10).
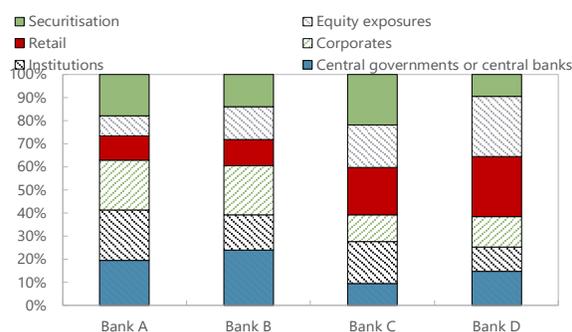
---

[23] Note however that some loans to SMEs may be classified as retail.

Figure 10. France: Individual Banks' Exposures to Corporates

Corporate Credit in France
(Shares among largest banks)

- Bank A
- Bank B
- Bank C
- Bank D
- Bank E

0.156552573   0.17881154

0.23597347   0.157080478

0.271083808
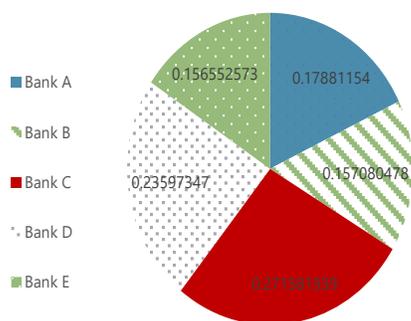
Credit Exposures per Category

- Securitisation
- Retail
- Institutions
- Equity exposures
- Corporates
- Central governments or central banks

Source: EBA Transparency Exercise 2018, original corporate exposures; SA; and IRB.

Source: EBA Transparency Exercise 2017.

Geographical Distribution of Corporate Credit
(Truncated at 5 percent)
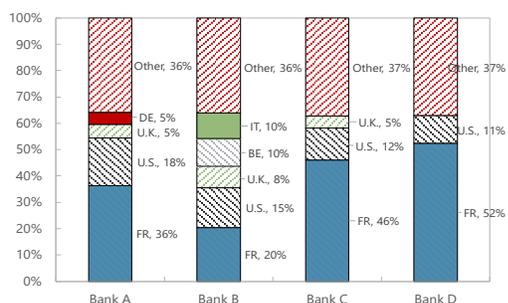
French Banks Exposures to Corporates

Source: EBA Transparency Exercise 2017.

Sources: 2018 EBA Transparency Exercise; and IMF staff.

I.   Concentrated Exposures of Individual Banks to Large Indebted Corporates

40.   This section analyzes the large exposures of French domiciled banks to large indebted corporates. The objective is to understand whether individual banks may be subject to residual risks arising from their concentrated exposures to large indebted corporates. First, we assess the extent which individual banks may have large exposures to one or several large indebted corporates. Second, to examine how banks' large exposures to indebted publicly listed corporates may evolve under the cross-country stress scenario described in section G, as more corporates may have their debt at risk.

41.   Based on data provided by the authorities, large French banks' total exposures to large indebted corporates have declined in percent of bank capital in recent years. Based on data consistent with the HCSF definition of large indebted corporates based on an ICR<300 percent, the exposures in percent of capital of the five largest banks reached about 20 percent in 2015 and declined in 2016 and 2017 to 13 percent in 2017. If the sample is further restricted to firms with a debt-to-equity ratio above 100 percent, the exposures is 5.4 percent of capital in 2017.[24]

Large Banks' Exposures to Large Firms with Cash Flows at Risk (ICR<3), including with Debt-Equity>100 percent
(Percent of bank common equity)
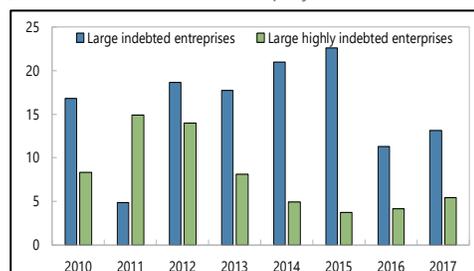
Sources: ACPR; SNL; and IMF staff.
Note: Banks include BNP-Paribas, BCPE, Groupe Credit Agricole, Societe Generale and Credit Mutuel Group.

42.   To further assess residual risks that may arise from concentrated exposures to large indebted corporates, we match firm level data with supervisory data on large exposures. We consider publicly listed corporates from Belgium, France, Germany, Italy, the Netherlands, Spain, the United States, and the United Kingdom. Firm level consolidated balance sheets and financial statements are for 2017, or when unavailable for 2016. Banks included in the sample include BNP-Paribas, Banque Populaire Caisse d'Épargne (BPCE), Société Générale, La Banque Postale, Crédit Mutuel Group, and HSBC France. We consider their large exposures as of 2017:Q4. Large exposures of French banks are matched manually to the firm level data. Out of 600 large bilateral exposures amounting

	Large exposures	Matched
# of firm-bank links	600	237
bn. euros	293	157

	French NFCs	Foreign NFCs
# of firm-bank links	159	78
bn. euros	93	64

	ICR<100	ICR<200
# of firm-bank links	23	41
bn. euros	16	33

Sources: ECB COREP Large Exposure reporting; Worldscope; and IMF staff.

to €293 billion, 237 were matched to the list of publicly listed companies considered, for a total exposure amount of €157 billion, so a match rate of 53 percent. Among the 237 bilateral exposures, 67 percent are to French corporates (total exposures of €93 billion) and 33 percent to foreign corporates (total exposures of €64 billion); and €16 billion. (respectively €33 billion.) are to corporates with an ICR below 100 percent (respectively 200 percent). We consider two additional splits of corporates: (i) firms with a debt-to-equity ratio above 100 percent; (ii) French corporates with state participation.[25]

43.   The stress scenario considered is the cross-country scenario described in section G combining a tightening of financial conditions and a decline in real GDP growth. The model
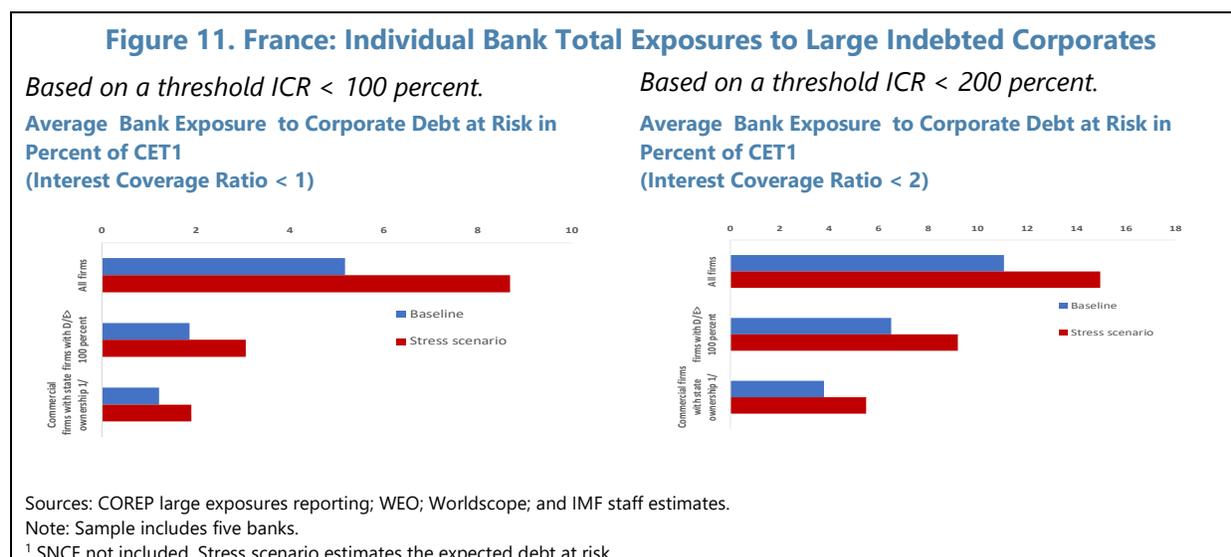
---

[24] For the sample of large firms included within the scope of the measure activated in the context of Art. 458 of the CRR, the exposures of banks in 2017 would be slightly smaller.

[25] The list of firms with state ownership can be found at: https://www.economie.gouv.fr/agence-participations-etat/Les-participations-publiques.

captures a channel through which concentrated exposures could worsen under stress: as macrofinancial conditions deteriorates, the number of corporates with debt-at-risk would increase, thus aggravating concentration risks on the balance sheets of banks. The scenario allows for use of cash buffers and some deleveraging by corporates to contain their debt service. Their use of cash buffers must meet a liquidity constraint, e.g., that the current ratio remains above 100 percent.[26] Given the probabilistic nature of the model, we can compute the *expected* exposure under stress of each bank to each individual corporate that was matched to its large exposure file.

44.   At the end of 2017, individual bank large exposures to corporates with debt-at-risk were already significant for several banks (Figure 11). On average, for the sample of the 5 largest banks, total concentrated exposures to large indebted corporates reached on average around 5 percent of CET1 using an ICR threshold of 1, and 11 percent of CET1 using an ICR threshold of 2. If in addition, we restrict to corporates with debt-to-equity ratios above 100 percent, total concentrated exposures are 2 percent of CTE1 for an ICR threshold of 1, and 6.5 percent of CET1 for an ICR threshold of 2. Large exposures to vulnerable corporates with state ownership reach almost 4 percent of CET1 for an ICR threshold of 2.

45.   Banks' total large exposures to individual corporates with debt-at-risk would increase significantly under the adverse scenario (Figure 11). Under an ICR threshold of 1, the total expected large exposures of individual banks to corporates with debt-at-risk would rise to almost 9 percent of CET1 on average, and to about 15 percent of CET1 under an ICR threshold of 2. Total expected large 'debt-at-risk' exposures to French firms with state participation would reach 5.5 percent of CET1 on average and expected large 'debt-at-risk' exposures to firms with a debt-to-equity ratio above 100 percent would reach about 9 percent of CET1 on average.

Figure 11. France: Individual Bank Total Exposures to Large Indebted Corporates

Sources: COREP large exposures reporting; WEO; Worldscope; and IMF staff estimates.
Note: Sample includes five banks.
[1] SNCF not included. Stress scenario estimates the expected debt at risk.

---

[26] The current ratio is defined as the ratio of current assets to current liabilities.

46.   At of the end of 2017, most individual large exposures of French banks to vulnerable corporates remained small (Table 13). Under an ICR threshold of 2, one exposure was already slightly above 4 percent of CET1 for one bank, and seven other exposures were above 2 percent of CET1 for three banks. Under a stress situation with more difficult access to market borrowing, each of these corporates might require to increase their borrowing beyond existing credit lines. To anticipate such possibilities, the authorities should ensure that the macroprudential measure remains counter-procyclical.

Table 13. France: Individual Large Exposures to Corporates with Debt-at-Risk

Exposures to individual corporates with an ICR<1.

	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5
1	1.01%	0.81%	0.74%	0.92%	2.08%
2	0.89%	0.43%	0.73%	0.60%	1.88%
3	0.69%	0.27%	0.68%	0.53%	1.41%
4	0.57%	0.20%	0.50%	0.33%	1.10%
5	0.45%	0.00%	0.43%	0.17%	1.02%
6	0.38%	0.00%	0.36%	0.00%	0.76%
7	0.31%	0.00%	0.32%	0.00%	0.70%
8	0.00%	0.00%	0.31%	0.00%	0.70%
9	0.00%	0.00%	0.23%	0.00%	0.66%
10	0.00%	0.00%	0.16%	0.00%	0.65%

Exposures to individual corporates with an ICR<2.

	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5
1	1.38%	2.80%	2.21%	1.79%	4.22%
2	1.33%	2.44%	2.05%	0.92%	2.82%
3	1.16%	1.30%	1.62%	0.53%	2.82%
4	1.01%	0.55%	0.85%	0.47%	2.08%
5	0.75%	0.41%	0.73%	0.33%	1.65%
6	0.57%	0.29%	0.69%	0.22%	1.53%
7	0.45%	0.00%	0.66%	0.17%	1.48%
8	0.31%	0.00%	0.50%	0.00%	1.02%
9	0.25%	0.00%	0.36%	0.00%	0.79%
10	0.00%	0.00%	0.32%	0.00%	0.76%

Sources: Worldscope; COREP large exposure reporting of French banks; WEO; and IMF Staff.
Note: Each column reports, for a given bank, its 10 largest exposures to individual corporates with debt-at-risk.
*** Highlighted cells indicate debt-to-equity above 100 percent.

J. Conclusion

47.   Corporate debt has increased significantly in France since the global financial crisis, in contrast to many peer countries. The increase in corporate debt as a share of GDP can be explained to a significant extent by an increase in intercompany loans and bond financing. The increase in debt is concentrated among several sectors as in peer countries. Firms have used their borrowing to invest in physical capital, to accumulate financial assets (mainly equity and cash) and to extend intercompany loans. The average debt-to-asset ratio has been more stable over time, but the left tail of the distribution of debt-at-risk has remained above its pre-global financial crisis level despite the low interest rate environment.

48.   Regression analysis shows that, after controlling for firm and sectoral characteristics and time fixed effects, macrofinancial conditions affect the left tail of the distribution of corporate debt (debt-at-risk). While SMEs are more likely to have their debt-at-risk, they account for a much smaller proportion of aggregate debt-at-risk than large firms. While the increase in corporate debt seems to have been appropriately allocated among publicly listed companies, this does not appear to be as clear among firms that are not listed on the stock market.

49.   Stress tests scenario suggests that, under tighter financial conditions or/and low real GDP growth comparable to the global financial crisis, debt-at-risk would rise to levels observed at that time, despite the use of cash buffers. A combination of lower real GDP growth and tighter financial conditions would cause an increase in debt-at-risk above 11 percent of GDP.

While cash buffers could be used to mitigate the impact of the shock, their use as a deleveraging mechanism could be further constrained by potential liquidity and borrowing constraints. Under such scenarios, the aggregate debt-at-risk of publicly listed firms would be slightly above the average among peer countries but would seem manageable.

50.   The authorities should remain vigilant and prevent the build-up of imbalances in the corporate sector that could have spillovers to the banking system. They should consider:

- Building buffers in the banking system to limit potential spillovers. The decision to limit bank exposures to large indebted corporates and the activation of the countercyclical capital buffer are welcome decisions. They should be reviewed periodically and pro-actively, and further action—such as further tightening of the large exposure limit—should be taken if it appears that there is additional procyclical build-up of concentration risk;

- Engaging with the ECB the possible use of Pillar II measures to address bank specific residual risks arising from concentrated corporate exposures;

- Enhancing communication on corporate risks with the public to raise awareness of market participants;

- Further reducing incentives favoring debt finance relative to equity, going beyond the recent reforms including of the corporate income tax that brings the level to 25 percent by 2022;[27]

- Advocating at the European Union (EU) level for bank-based macroprudential instruments targeting specific sectors (such as large corporates, or SMEs), such as: sectoral risk weights and a sectoral systemic risk buffer in the context of Capital Requirement Directive (CRD) V, and for a discussion of macroprudential tools for nonbanks; and

- Studying the structural and cyclical characteristics, determinants and use of loans among NFCs.

HOUSEHOLDS AND RESIDENTIAL REAL ESTATE MARKET[28]

A. Introduction

51.   Over the past 10 years since the Global Financial Crisis, French households' debt has continued to rise. This is raising concerns of vulnerabilities that could have accumulated in their balance sheet, in the context of a low interest rate environment, declining but still high unemployment, and high debt in the balance sheet of the public sector and of nonfinancial corporations. In spite of the increase in indebtedness, aggregate households' balance sheets seem solid because households have in the meantime continued to accumulate financial assets at a faster pace. To further understand the evolution of households' balance sheets and whether pockets of vulnerabilities may be developing, we rely upon survey data and study the balance sheets of

---

[27] For details see Technical Note "Macro-prudential Policy Framework and Tools."

[28] Prepared by Thierry Tressel and Shiyuan Chen, with excellent research assistance from Tania Mohd Nor.

households at a more granular level including by income group and by age. We find that, as for other income groups, the debt-to-service ratio of lower income households with a housing loans has increased while their financial buffers declined. Moreover, the debt-to-income ratio of younger households seem to have increased. [29]

52.   The note analyzes conditions in the residential real estate (RRE) market and potential risks to the French market going forward. Given that housing loans are typically the dominant, if not the only one, financial liability of households, while real estate account for a large share of their assets, it is important to understand the evolution of the French residential housing market, its characteristics, and its outlook.[30] Indeed, signs of overvaluation would not bode well for new borrowers, as it would suggest their "overpaid" real estate relative to other assets, which could stretch their balance sheets. To analyze developments in the real estate market and understand risks going forward, we adopt two approaches:

- First, by relying on a battery of indicators and an empirical model, we assess whether the residential real estate market is aligned with fundamentals at the current juncture or whether there are signs of overvaluation. At this juncture, the residential real estate market does not appear to be excessively dynamic or overvalued at the national level, and the recent price inflation seems related to specific local conditions, in particular around Paris. Housing affordability seems to have on average improved in recent years despite the observed moderate increase in household's debt to income ratios and the higher loan-to-value ratios since the Global Financial Crisis.

- Second, we study potential downside risks to the real estate market going forward, following the methodology of the Spring 2019 GFSR Chapter 2 which applies the growth-at-risk framework to RRE prices. In particular, we study future downside risks at various horizons, and find that they are limited. We also characterize the impact of macrofinancial shocks to the distribution of residential real estate prices.

53.   The paper is organized as follows. Section L establishes stylized facts on households' balance sheets at the macroeconomic level. Section M analyzes recent developments in the credit market and the evolution of the structure and lending standards for housing loans. Section N tackles the question whether residential real estate prices are aligned or not with their fundamentals. Section O presents the analysis of downside risks to the real estate market. Section P focuses on distributional issues, housing policies and related state intervention through the financial system. Section Q concludes.

---

[29] These findings are based on the surveys available at the time the analysis was done, e.g., the 2015 Household Finance and Consumption Survey of the ECB and the 2015 Enquête Patrimoine of INSEE.

[30] Housing loans account for about 80 percent of loans to households.

B.   Household Balance Sheet and the Structure of Savings

54.   At the aggregate level, French households' balance sheets appear reasonably solid in international perspective (Figure 12). French households have on average accumulated a net worth of 553 percent of their net disposable income, above the Organization for Economic Co-operation and Development (OECD) average of 440 percent, and about at the same level as Italian and Danish households. In the past 10 years, this ratio has increased by about 18 percent. Household debt was at about 120 percent of net disposable income in 2017, which is just below the average for OECD countries, and at 58.4 percent of GDP in 2018:Q1, close to the European average. The ratio of debt to disposable income has risen quite significantly since 2007, by some 20 percentage points, in contrast to what happened in other large European countries—as a comparison, German households, which started at about the same level of debt close to 100 percent of disposable income in 2007, have experienced a decline in their indebtedness by 9 percentage points of their net disposable income.

Figure 12. France: International Comparisons of Households' Balance Sheets

Households have relatively high net worth …

Household Net Worth, 2018 or Latest Available (Percent of net disposable income)

… and their debt is at the OECD average.

Household Debt/Net Disposable Income, 2017 (Percent of net disposable income)

Source: OECD.

Source: OECD.
Note : Latest available data for Japan, Poland, and Switzerland is 2016.

55.   French households on average tend to save a relatively large share of their income. The households' saving rate has been broadly stable, at almost 14 percent of gross disposable income. This is below the saving rate of German households (which is at almost 18 percent), but above the saving rates of households in Italy, Spain, the UK or the US. French households' saving rate net of the increase in indebtedness stands at about 4.5 percent of disposable income, implying that the financial net worth of households continues to rise at an aggregate level—this net saving rate is below German households' net saving rate of about 8 percent, but above that of households in Italy, Spain, the UK or the US who have net saving rates below 2 percent.[31]

56.   While real estate continues to account for the lion's share of households' assets, the composition of financial assets has shifted toward safe, fixed income products (Figure 13). About 60 percent of households' assets are accounted for by land and dwellings (and about

---

[31] See for instance, Banque de France, Stat Info, Placements et patrimoines financiers des ménages.

60 percent of households own a property), and the remaining 40 percent are financial assets.[32] In 2017, listed shares and other equity accounted for 30 percent of total financial assets, compared to 34 percent in 2007 and 38 percent in 2000. At the end of 2018:Q3, household financial assets amounted to €5.1 trillion, about 30 percent in bank deposit/saving accounts, 35 percent in life insurance and 25 percent in equities.[33] The share of liquid or low-risk assets (life insurance, bank saving and deposit accounts) in households' total financial assets has increased in the context of the low interest rates environment, while the share of stocks has declined over time.[34] Households' debt is almost matched by liquid bank accounts, suggesting that, in the aggregate, the household sector's balance sheet does not appear to be vulnerable to shocks affecting debt service.

Figure 13. France: Evolution and Structure of Households' Assets

Life insurance and deposit and saving accounts have grown over time.
Household's Financial Balance Sheet (Percent of GDP)
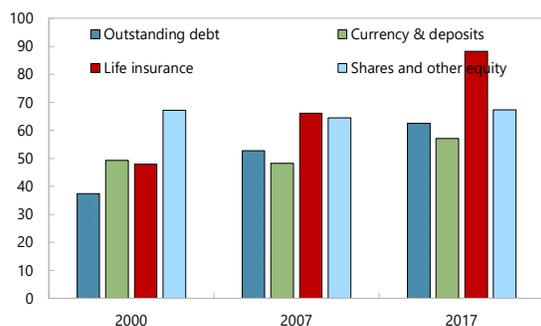
Source: Haver Analytics.

Real estate, life insurance, currency and deposits are the main assets of French households.
Structure of Household Assets at End-2016 (Billions of euros)
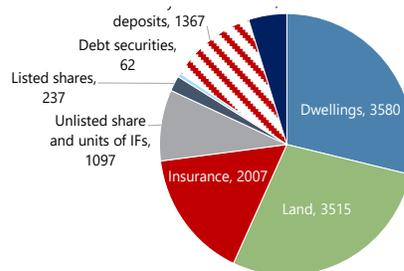
Sources: AMF 2018 Markets; and Risk outlook.

57. **Two features of the structure of savings stand out and play a role in the financing of the economy through the financial system: the importance of regulated saving accounts, and the small (and declining) share of stocks held by French households:**

• *Regulated savings* which are guaranteed by the state, represented €733 billion at the end of 2017, 14.6 percent of households' financial assets, or about ½ of deposit and savings accounts. Among these accounts, two are particularly important: (i) the *Plan Epargne Logement (PEL)*, with outstanding amounts of €270 billion in 2017 and 276 billion in 2018, offers guaranteed returns set at the time the account is opened, and set at 1 percent since August 1, 2016, but restricts

[32] AMF 2018 Markets and Risk Outlook.

[33] About 80 percent of life insurance contracts are fixed income guaranteed capital products, with rates of return adjusted on an annual basis, and the remaining 20 percent are unit-linked products. Listed shares account for only €285 billion (or 5.6 percent) of total financial assets. The bulk of equities held by French households are unlisted shares, equities indirectly held through unit-linked insurance contracts or investment funds' shares.

[34] The rate of direct stock ownership has declined from 13.8 percent in December 2008 to 7.5 percent in March 2018 (AMF Household Observatory Letter, N. 29, July 2018).

conditions for withdrawals; (ii) the Livret A, with outstanding amounts of €257 billion, with an annual rate of return currently set at 0.75 percent. The Livret A and other similar account are very popular (with a rate of participation above 80 percent in 2018), and the outstanding stocks of savings are partly channeled through the *Caisse des Dépôts and Consignation* (CDC) to finance social housing (see Box 4).

- Direct stocks holdings by French households are not only relatively small amounts (about 5–6 percent of total financial assets), but they have been declining significantly over time, and are dwarfed by holdings of stocks by the nonresident sector.[35] The rate of participation of households is low (only 15 percent of households held stocks in 2018) and has declined significantly since the global financial crisis.[36] Several explanations for the limited (and declining) participation of French households in the stock market include: (i) gaps in financial literacy; (ii) high risk aversion (that has risen since the global financial crisis), and (iii) a collapse in the expectation of future rates of return on stocks since the global financial crisis.[37] As a comparison, the nonresident sector holds about 3 times more listed shares of French NFCs than resident households as of 2018:Q2 according to the sectoral financial accounts of France.

Household Rate of Participation by Asset Class
(Percent)

	2004	2018
Real estate	**60.5**	**61.6**
Financial assets	**90.2**	**88.7**
Livret A and similar	83.2	83.8
PEL and CEL	41.3	33.2
Life insurance and retirement saving	36.9	45.6
Stocks	24.2	15.6
Employee saving accounts	16.7	13.9
Other	2.1	3.7
Entrepreneurial wealth	.	14.9

Source: INSEE.

---

[35] Stocks amounted to 16 percent of financial assets in 2008.

[36] Source: https://www.insee.fr/fr/statistiques/3658937. Indirect stock ownership may have increased as a result of increased participation in unit-linked life insurance products. See: AMF Household Observatory Letter, N. 29, July 2018.

[37] *Lettre de l'Observatoire de L'Epargne* N.19, AMF, June 2016, and : Darpeix, Pierre-Emmanuel, and Natacha Mosson, 2018, *Performances Comparées de Différentes Stratégies d'Epargne sur Support Français*, Risques et Tendances, AMF, Février 2018. Arrondel Luc, and André Masson (2016). *Les épargnants français dans la « Grande Récession » : Préférences, anticipations et choix de portefeuille*, document de travail, Paris School of Economics.

Box 4. Regulated Savings in France

Definition. Regulated savings products account for about half of total saving and deposit accounts.
With the exception of the PEL which is less liquid, they take the form of interest-bearing bank deposits, with additional specific criteria concerning caps, conditions of use, detention and/or withdrawals, associated taxation, and regulated remuneration rates. Regulated accounts are the following: *Livret A* (and remaining *Livret Bleu*), *Livret de Développement Durable et Solidaire* (LDDS), *Livret d'Epargne Populaire*, *Compte Epargne Logement* (CEL), PEL, *Livret Jeune*, *Livret d'Epargne Entreprise* (LEE).[1]

Stock of Regulated Savings, 2017
(Billions of euros, interest rate paid in brackets)

Other, 58.3 (0.63%)
LEP, 44.1 (1.25%)
LDDS, 103.9 (0.75%)
Livret A, 256.7 (0.75%)
PEL, 270.1 (2.72%)

Source: Banque de France.
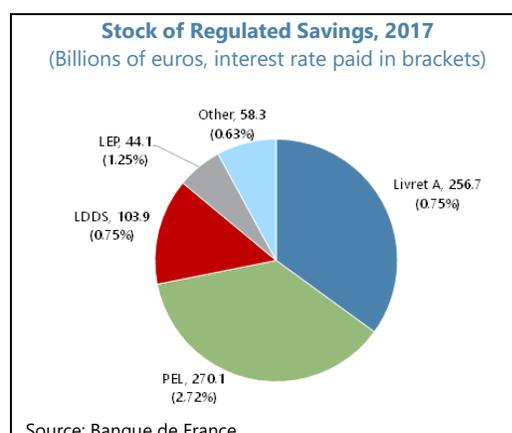
The use of regulated savings. A share of the
Livret A, the Livret d'épargne populaire (LEP) and the LDDS funds is centralized to the "Savings Fund," which is operated by the CDC to finance mainly for social housing. The centralization rate has been set at about 60 percent for the deposits on the Livret A and LDDS and at 50 percent for the deposits on the LEP. Centralization rates are set such that the Savings Fund of the CDC has resources at least 25 percent larger than the amount of loans granted by the Savings Fund for social housing and urban policy and 35 percent larger than the total amount of loans granted by the Savings Fund plus equity and funds for general banking risks. Regulated savings are guaranteed by the State and also benefit, those with deposit account characteristics, from the deposit guarantee scheme.

Rates of return. The rate for the Livret A and has been set at 0.75 percent since August 1, 2015. Following a reform of the formula linked to inflation and overnight interest rates, it was decided that it will remain at this level until January 31, 2020 in accordance with the ministerial decree of November 27, 2017 on the rates mentioned in Banking Regulation Committee Regulation 86-13 as amended.[2] The rate for new PELs has been stable at 1 percent since August 1, 2016. The PEL regulation changed on January 1, 2018. For PEL opened before that date and if they are held for less than 12 years, the interest received is tax free, while, if they have been opened since 2018, they are subject to the minimum of the *Prélèvement Forfaitaire Unique* (flat tax of 30 percent) or the sum of the household income marginal tax rate and social contributions.

_____

[1] A detailed description of each scheme, is available in French, in the appendix to the Annual Report of the Regulated Savings Observatory. PELs are home savings plans (one per individual). The PEL was initially created partly to stimulate home ownership by providing the possibility for complementary housing loans at interest rates lower than market rates. Savings allocated to a PEL are blocked and can be withdrawn as a one-off lump-sum at closure of the account. They allow the account owner to earn interest, access loans at a preferential rate and obtain a state bonus (the bonus was ended for PEL opened since 2018).

[2] This decree also suspends until 31 January 2020 the possibility for the Minister in charge of the Economy to revise rates, on a proposal from the Governor of the Banque de France, in exceptional circumstances or if the Banque de France considers that the changes in inflation or markets is very important.

C. Credit Market Developments and Characteristics of Housing Loans

58.   The French banking system has over time transmitted well the accommodative monetary policy to the housing loan market (Figure 3). The retail credit market is dominated by

Credit Agricole, BPCE and other large French banks. As the ECB refinancing rate declined after the global financial crisis, interest rate paid on time deposits (which partly reflect rates regulated saving accounts), started to decline, initially at a slower rate (opening a positive gap between the return on time deposits and market rates between 2010 and 2015) and later, as the policy rate hit the zero lower bound, progressively caught up. Rates on new housing loans also started to decline after the global financial crisis, but at a slower pace than deposit rates, resulting in a significant spread that only gradually declined and became compressed in recent years.

Retail Credit in France
(Shares among Largest Banks)

- Bank A
- Bank B
- Bank C
- Bank D
- Bank E

9%
9%
21%
25%
35%

Source: EBA Transparency Exercise 2017.
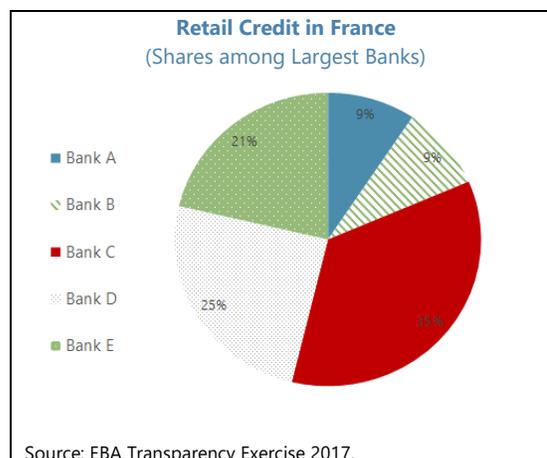
59.   While a large share of new issuance has accounted for refinancing existing loans up to 2017:Q1, the quality of housing loans has remained stable (Figure 14). In recent years, credit for housing purchase has grown at around 5–6 percent year-on-year, slightly below the rate of growth of the period 2010–2012 when housing credit growth peaked at around 7 percent. Outstanding amounts of real estate loans are growing at around 5–6 percent. However, a particularity of the ongoing credit expansion is that housing loans for refinancing of existing loans account for a larger share than in the past (23–35 percent of the total), as households have taken advantage of the low interest rate environment to lock in housing loans at very low fixed rates. In the meantime, the share of doubtful loans in total loans remains low and has stabilized at or slightly below its 2014 peak of 1.5 percent. Banks provisioning rate has been on a long-term declining trend and has stabilized since 2011. Evidence from the Banque de France Household Over-Indebtedness Survey show that the number of over-indebtedness applications and the total debt of overindebted households have declined since 2014. The outstanding amount of debt of overindebted households stood at €6.6 billion in 2018 or about 0.5 percent of the total outstanding amount of housing loans and consumer credit.

Figure 14. France: The Housing Loan Market in France

Time deposit rates have progressively declined as the ECB refinancing rate converged to the zero bound …

Average Deposit Rate and ECB Refinancing Rate
(Percent)
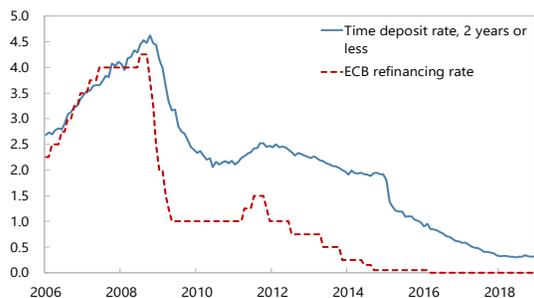
Sources: Haver Analytics; and IMF staff estimates.

… the impulse was transmitted to borrowers and banks' spreads on housing loans progressively became compressed.

Lending Rates and Average Deposit Rate
(Percentage points)
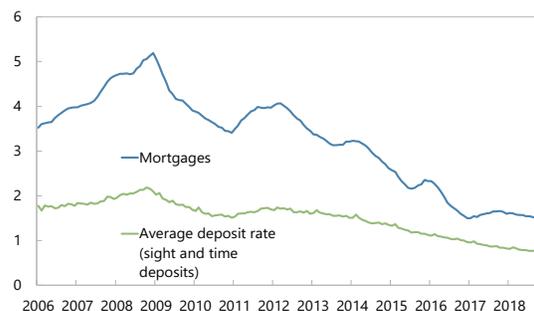
Source: Haver Analytics.

Credit for housing has had a large contribution to overall credit growth …

Credit to the Private Sector
(Percent contribution, y-y)
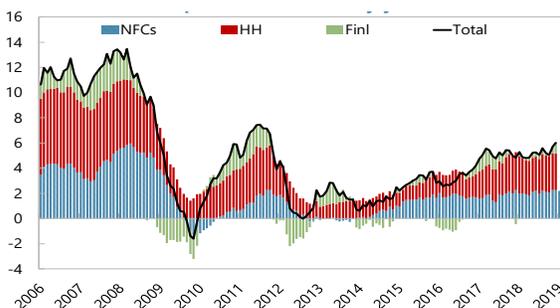
Source: Haver Analytics.

… and refinancing of housing loans took off in 2015.

New Mortgage Production
(Billions of euros)
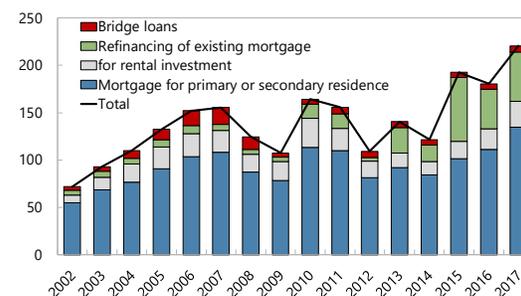
Source: ACPR-Banque de France "Le Financement d'Habitat en 2017," December 2018.

Loan quality is good and has stabilized while provisioning has declined …

Quality of Housing Loans
(Percent)
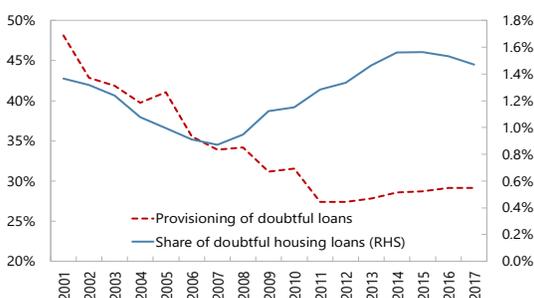
… housing loans benefit from risk-pooling among credit institutions or guarantees from insurance companies.

Nature of Guarantees on Housing Loans
(Percent)

Source: ACPR-Banque de France "Le Financement d'Habitat en 2017," December 2018.
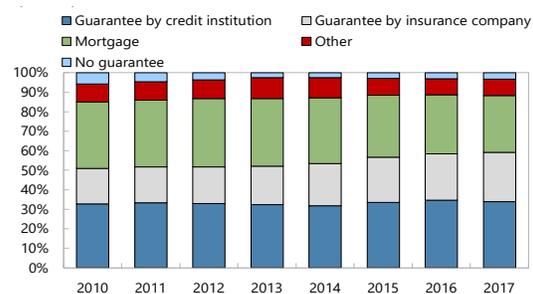
60.   A particularity of the French market is that most housing loans are not directly backed by real estate collateral—instead they benefit from a guarantee scheme from a credit institution or an insurance company. Guarantees on housing loans ensure that the credit institution that originated the loan will be repaid fully in case of default by the borrower. The credit institution leading the market for guarantees on housing loans is *Crédit Logement*, a credit institution supervised by the Autorité de Contrôle Prudentiel et de Résolution (ACPR), which guarantees about one of three housing loans, and which shareholders are French banks.[38] Thus, this mechanism amounts to a pooling of default risk among French banks. and of centralizing expertise in the valuation of recovered real estate. A remaining ¼ of housing loans are guaranteed by insurance companies and 30 percent are backed by the property as collateral (e.g., are standard mortgages).

61.   There is limited evidence that the decline in interest rates may have resulted in a worsening of lending standards (Figure 15). On the one hand, households have become more leveraged: the average loan-to-value ratio (LTV) on new loans has moderately increased in the past 10 years, from around 80 percent to close to 90 percent. This trend is explained by a growing share of housing loans with LTVs above 95 percent.[39] On the other hand, new housing loans seem easier to service as the average debt-service-to-income (DSTI) and the share of loans with a DSTI above 35 percent have moderately declined from the peak reached in 2009, to respectively around 30 percent and 20 percent.

Figure 15. France: Lending Standard on New Housing Loans

Households have become more leveraged on new housing loans ...

... but debt service relative to income has improved since 2009–2010.

LTV Composition of New Mortgages (Share)

DSTI Composition of New Mortgages
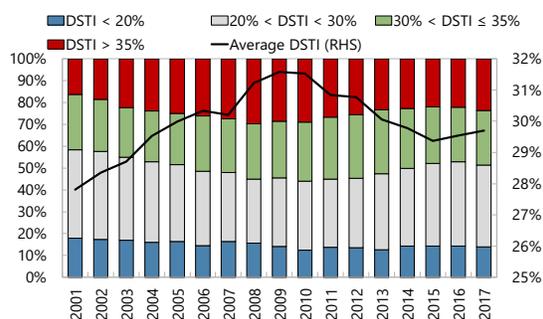
Source: ACPR-Banque de France "Le Financement d'Habitat en 2017," December 2018.

---

[38] Credit Agricole holds 33 percent of the capital of Crédit Logement, and BNP Paribas, Société Générale, and BPCE each hold 16.5 percent of its capital.
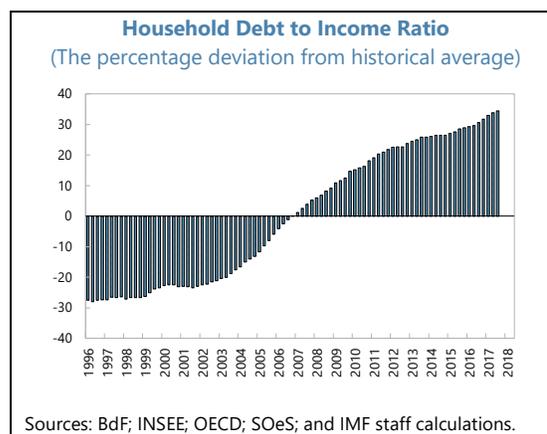
[39] The rise of loans with LTV ratios above 95 percent seems to a large extent to be driven by rental investments (ACPR Analyses et Synthèses, le Financement de l'Habitat en 2017, Juillet 2018). Such investments are typically undertaken by higher income households with good repayment capacity and very low default risk.

D. The Residential Real Estate Market

62.   RRE prices have grown very substantially over the past decades, raising questions of affordability and related vulnerabilities of households' balance sheets (Figure 16). Prices are on average 90 percent higher than they were about 20 years ago. The phenomenon has been broad-based: In Ile-de-France, prices have doubled; in province, they have on average increased by 85 percent, with some disparities across regions.[40] The evolution over time has been different between Ile-de-France (e.g., Paris) and other regions. Before the global financial crisis, the overall price increase was generalized, but it was even stronger in Province than in Ile-de-France. Since the global financial crisis, prices have continued to rise (with some fluctuations) in Ile-de-France, while they have remained stable or even declined in Province. In Ile-de-France, the recent price increase seems to have been driven exclusively by the price of apartments in Paris while prices of apartments remained stable in the suburbs. A likely explanation is that prices in Paris may be affected also by global developments and foreign demand which creates a degree of real estate price synchronization across big cities.[41] From a supply perspective, there was a strong pick-up of new dwellings built after the mid-2000s. The global financial crisis brought a halt to construction activity, but it has picked up since 2012, and has remained strong since then.

New Housing Supply
(Number of units)

Sources: BdF; INSEE; OECD; SOeS; and IMF staff calculations.
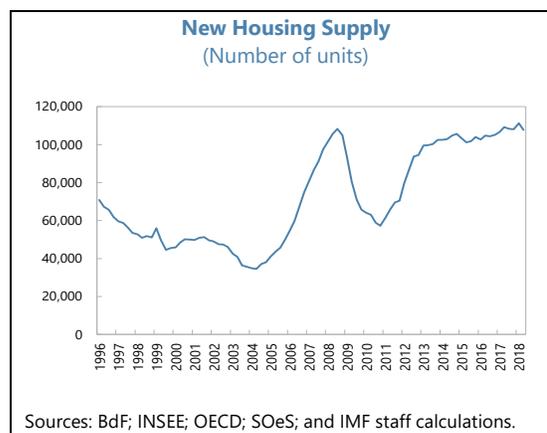
63.   Compared with peer countries, RRE prices do not seem excessively far from their historical average. In 2018:Q2, the price-to-income ratio and the price-to-rent ratio were respectively 24 percent and 29 percent above their 1990–2018 average. This is significant and very close to the peak attained by these two ratios for France, but it does not seem excessively high compared to peer countries. Most of these deviations relative to average regarding affordability of owning housing and the equilibrium of the rental market seem to have taken place during the years that preceded the global financial crisis, and the two ratios have remained broadly stable and have even slightly declined since then. However, the household debt to income ratio has steadily continued to increase.
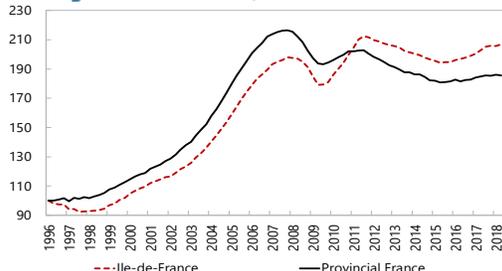

Household Debt to Income Ratio
(The percentage deviation from historical average)

Sources: BdF; INSEE; OECD; SOeS; and IMF staff calculations.

---

[40] For instance, the regions Provence-Alpes-Côte d'Azur and Rhône-Alpes have experienced an overall percent price increase similar to Ile-de-France.

[41] See Global Financial Stability Report, April 2018, chapter 3: "House Price Synchronization: What Role for Financial Factors?."

Figure 16. France: Stylized Facts on the Residential Real Estate Market

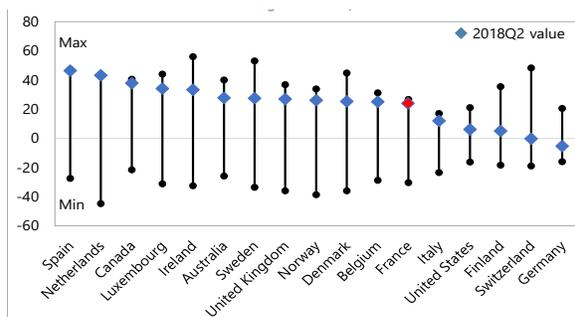*Since the global financial crisis, housing prices have continued to rise in the Paris region …*
Real Housing Price Index
(Percentage, 1996:Q1 = 100)

… driven to a large extent by the price of apartments in Paris.
Real Housing Price Index of Apartments
(Percentage, 1996:Q1 = 100)

Sources: BdF; INSEE; OECD; SOeS; and IMF staff calculations.

Sources: Banque de France; and IMF staff calculations.

The average price-to-income ratio is close to its historical high level but does not appear excessively far from its average compared to peer countries …
Price to Income Ratio
(Percent deviation from the average over the period 1990:Q1–2018:Q2)
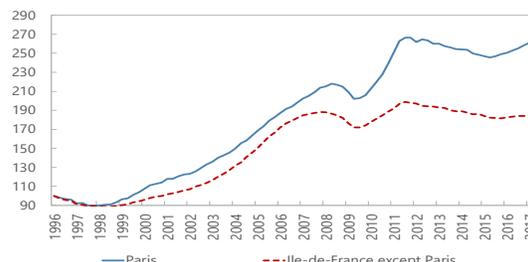
… and so does the price-to-rent ratio.
Price to Rent Ratio
(Percent deviation from the average over the period 1990:Q1–2018:Q2)

Source: OECD.

Most of the increase in the price-to-income ratio took place before the global financial crisis and in the following years …
Housing Price to Income Ratio
(Percent deviation from period average)
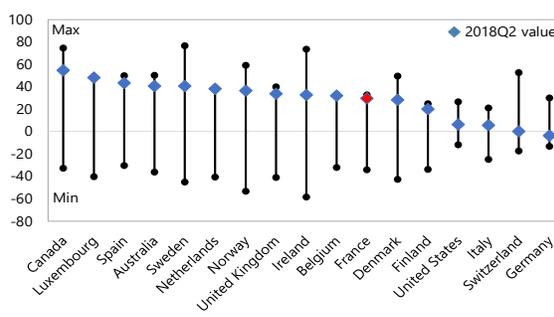
… and the same evolution is visible for the price-to-income ratio.
Housing Price to Rent Ratio
(Percent deviation from period average)

Sources: OECD; and IMF staff calculations.
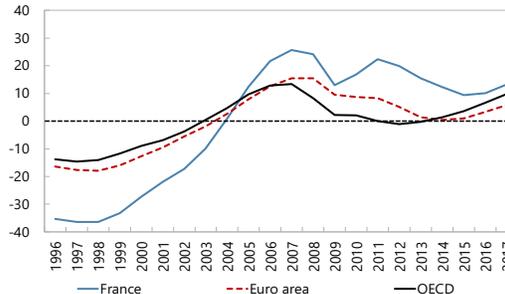
64. **Both supply and demand factors help explain the dynamics of real housing prices in France (Box 5 and Table 14).** Real house prices increase with population, construction costs, and affordability, and decline with the real interest rate, and an increase in new housing supply. The coefficient of the global financial crisis dummy variable is negative and statistically significant. The estimated effects of these variables are economically large: a one standard deviation in population growth, construction costs, the log of real prices to income, the real interest rate and new housing is associated with a change in real house price growth respectively of 3.4 percent, 2.1 percent, -2.4 percent, -2.5 percent and -1.3 percent—compared to a mean real house price growth of 3.2 percent and standard deviation of 5.5 percent for the sample period.

Box 5. Empirical Model of the Residential Real Estate Market

An empirical model is developed to analyze the determinants of real housing price in France and derive estimates of potential misalignment relative to fundamentals. The dependent variable is the growth rate of the real housing price index. Explanatory variables include: (1) an indicator of affordability proxied by the housing price to income ratio index; (2) population growth as another indicator of demand; (3) indicators of supply such as the real construction cost index and an indicator of new dwelling built; and (4) the real interest rate on housing loans and a dummy variable equal to one between 2008:Q3 and 2009:Q2 as an indicator for the global financial crisis. The housing price index is collected from INSEE, and explanatory variables data is collected from the OECD, the Banque de France, INSEE, and the Service de l'Observation et des Statistiques (SOeS) from the Ministry of Environment. Price data are deflated by the CPI and are seasonally adjusted, and growth rates are year-on-year.

The baseline model is:

$$P_t = \alpha + \beta_1 A_t + \beta_2 B_t + \beta_3 S_{t-4} + \beta_4 C_t + \beta_5 I_t + \beta_6 D_t + e_t \quad (1)$$

where P_t is the growth rate of the real housing price index during quarter t, A_t is the natural log of the housing price to income ratio at time t, B_t is the growth rate of the population at time t, S_{t-4} is the fourth lag of the growth rate of new housing built at time t, C_t is the growth rate of the construction cost index at time t, I_t is the real interest rate on new housing loan at time t, D_t is the dummy variable that proxies the global financial crisis, and e_t is the error term. In some variations on the model, the log of housing price to income ratio is replaced with its first lag, and the growth rate of housing loans is added as a control variable. We also consider different dependent variables, besides the national real housing price index, such as the price index of apartments, the price index of dwellings in the Paris region (Ile-de-France) and the price of dwellings in Province (the rest of France, excluding the Paris region).

---

65. **The model suggests that house prices are on average not misaligned at the current juncture at the national level, in Ile-de-France or in Province (Figure 17).** We consider the empirical model of Table 1, and, as robustness, an alternative specification in which we also control for housing loans growth—a control variable sometimes used in the literature. Whether we should control for credit growth is debatable as credit growth is highly endogenous and is determined by demand and supply factors that also impact demand for real estate. Our baseline model implies that

end 2017, real estate prices at the national level were close to equilibrium (small overvaluation of 1.5 percent). This followed a period of very moderate undervaluation between 2012 and 2015, and in 2010. There was a small overvaluation in the years preceding the global financial crisis, between 2 and 6 percent, between 2005 and 2008. As expected, the model including housing loans shows little evidence of misalignment. At the regional level, our model implies very similar gaps between actual and predicted residential real estate prices, both in Ile-de-France and in Province.

Table 14. France: Regression Results

Dependent variable: real housing price growth	(1) Aggregate	(2) Apartment	(3) House	(4) Ile-de-France	(5) Province
The log of housing price to income ratio (t-1)	-11.771***	-7.499***	-16.817***	-4.437*	-15.196***
	(2.091)	(1.996)	(2.252)	(2.384)	(2.217)
Population growth	24.400***	26.916***	21.772***	19.889***	26.288***
	(3.827)	(3.729)	(4.299)	(3.891)	(3.991)
New housing supply growth (t-4)	-0.061***	-0.081***	-0.033	-0.098***	-0.045***
	(0.014)	(0.012)	(0.021)	(0.015)	(0.015)
Construction cost growth	1.004***	1.134***	0.926***	1.283***	0.888***
	(0.175)	(0.157)	(0.200)	(0.190)	(0.178)
Real interest rate on new housing loan	-1.728***	-1.700***	-1.814***	-1.187***	-1.977***
	(0.317)	(0.319)	(0.375)	(0.350)	(0.333)
Global financial crisis dummy	-4.441***	-3.674***	-4.923***	-5.307***	-4.030***
	(0.951)	(0.920)	(1.110)	(1.002)	(1.000)
Constant	48.404***	27.978***	72.540***	15.682	63.785***
	(10.349)	(9.959)	(10.995)	(11.659)	(10.914)
Observations	82	82	82	82	82
Adjusted R-squared	0.818	0.847	0.771	0.803	0.811
F-test P-value	0.000	0.000	0.000	0.000	0.000

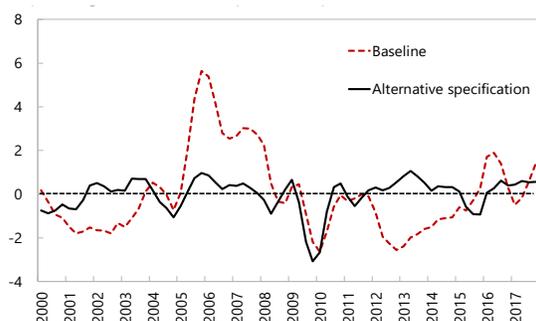Sources: INSEE; Haver Analytics; WEO; and IMF Staff.
***; **; *: significant at the one percent (respectively 5 percent, and 10 percent) level.

Figure 17. France: Estimates of Misalignment

At the national level, house prices do not appear misaligned ...
Housing Valuation
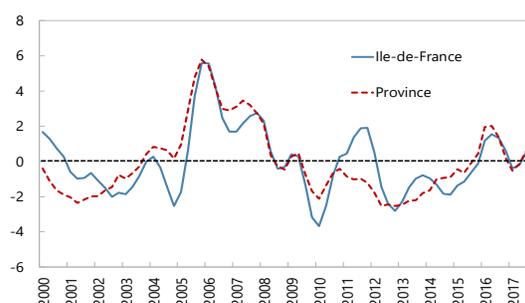**(The percentage deviation of actual price from equilibrium level)**

... and are at similar levels in their cycles in Ile-de-France and Province respectively.
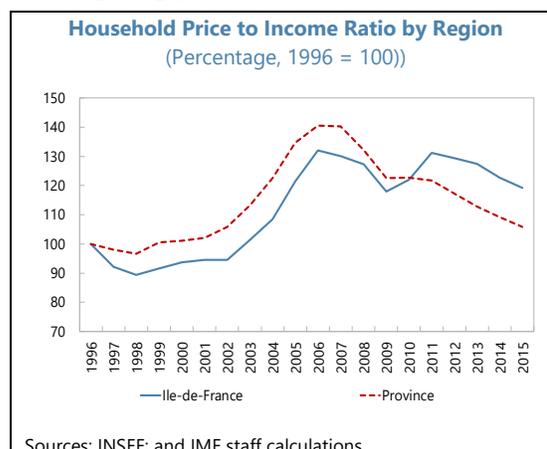**Housing Valuation – Ile-de-France and Provincial France**
(The percentage deviation of actual price from equilibrium level)

Source: IMF Staff Estimates.

Source: IMF Staff Estimates.

66.   Zooming in on Ile-de-France, it appears that the ongoing price increase is not driven
by fundamental demand pressures such as overall
population growth, while an affordability gap
remains with the rest of France. Over the past 20
years, population in Ile-de-France has grown by
around 12 percent, about the same as in Province on
average, and there are no indications of any recent
acceleration in population growth. Looking at
affordability, there has been a loss of affordability in
Ile-de-France in recent years, of about 15 percent
relative to the rest of France, suggesting that on
average income gains are not driving the recent RRE
price increase. Last, it is notable that affordability of
housing seems to have improved in Province on average since the global financial crisis.

Household Price to Income Ratio by Region
(Percentage, 1996 = 100))

Sources: INSEE; and IMF staff calculations.

E. Downside Risks to the Residential Real Estate Market

67.   This section applies to RRE prices a model of quantile regressions to assess potential
downside risks to house prices. Following the methodology of the Spring 2019 GFSR Chapter 2,
the growth-at-risk framework from the October 2017 GFSR is applied to RRE prices to study
downside risks to house prices at various horizons. In the spirit of the value-at-risk framework, the
chapter identifies downside risks to future house price (henceforth House price at Risk, HaR) with
the low quantiles of its conditional distribution, typically its fifth percentile.

68.   The panel model of the Spring 2019 GFSR is applied to identify where France RRE are
in the distribution of downside risks to house prices in the past and at the current juncture,
relative to other countries (Figure 18). The main findings of the panel model are that:

- In the years leading to the global financial crisis, future house prices appeared to be at risk in
  France compared to other countries. The predicted fifth percentile of future house prices in
  France rapidly shifted to the left of the distribution of all countries. By September 2006, it had
  fallen below the bottom quartile of the distribution, both at the one year and three-year
  horizons. The change was quite rapid as, in 2004, there were little evidence that house prices
  were at risk, compared to other countries as the fifth percentile of future house prices was still
  above the top quartile of its distribution among countries.

- *In the sample of countries, house prices in France seem to have remained at risk until mid-2013.*
  The fifth percentile of the predicted distribution remained below the bottom quartile of the
  cross-country distribution until 2013:Q2 at the one-year horizon, and until 2012:Q2 at the three-
  year horizon.

- *In recent years, house prices in France have shifted toward the less risky group of house prices*
  across countries. Since mid-2016 (or 2016:Q4) at the three-year horizon (respectively one-year
  horizon), the predicted fifth percentile of house prices in France has moved up to the less risky

¼ of the distribution, as the predicted fifth percentile has continuously improved, both comparatively and in absolute terms, since it reached a low point in 2011–12 at the time of the euro area crisis.

Figure 18. France: House Prices at Risk in Cross-Country Comparative Analysis

One-year HaR.

House Price Growth at Risk One Year Ahead (5ᵗʰ percentile)

Three-year HaR.

House Price Growth at Risk 3-year-Ahead (5ᵗʰ percentile)

One-year ahead, house prices have low risk.

And so three-year ahead.

Source: IMF staff.
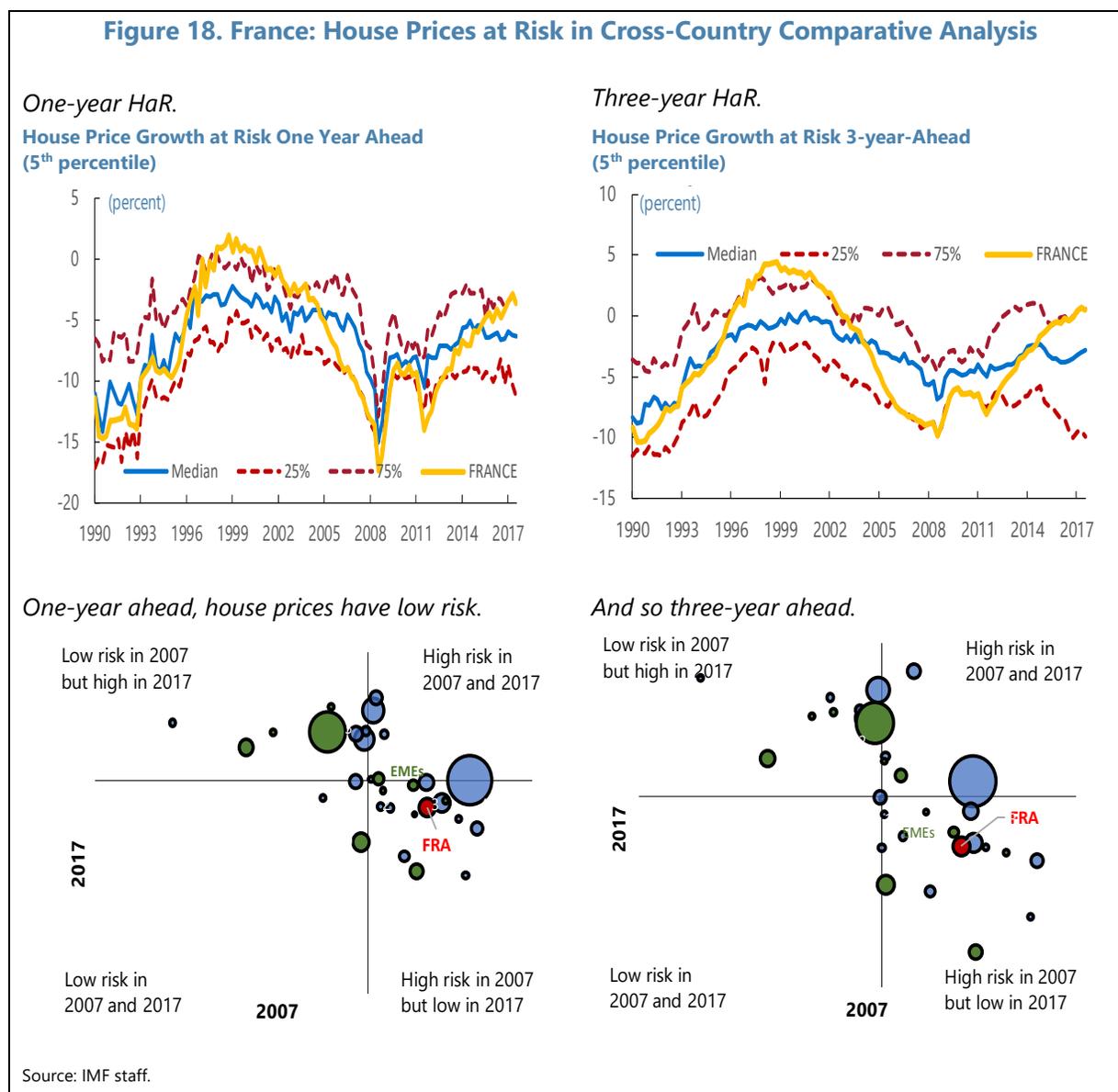
69.   The HaR quantile regression framework is applied to France to better understand the role of France specific factors in determining future downside risks to house prices. The time series empirical model is estimated on quarterly data covering the period 2001:Q1–2018:Q2. The explanatory variables considered included indicators of demand: real GDP growth (lagged eight quarters), household's leverage (the debt-to-income ratio, lagged one quarter), the growth rate

of population (lagged one quarter); and indicator of the cost of expanding supply (the growth rate of construction costs, lagged one quarter); and the current level of the financial condition index, which impacts both supply and demand. The coefficients on each variable and R2 of the quantile regressions suggest that the model is performing reasonably well—with the exception of construction costs coefficients that are less precisely estimated (Figure 19). In 2018:Q4, the predicted one-year ahead fifth percentile of the distribution of real house price growth is estimated to be close to zero percent annually, and a mean of around 1 percent.

Quarterly T-skew quantile fit for 06/30/2018 growth rate forward 4
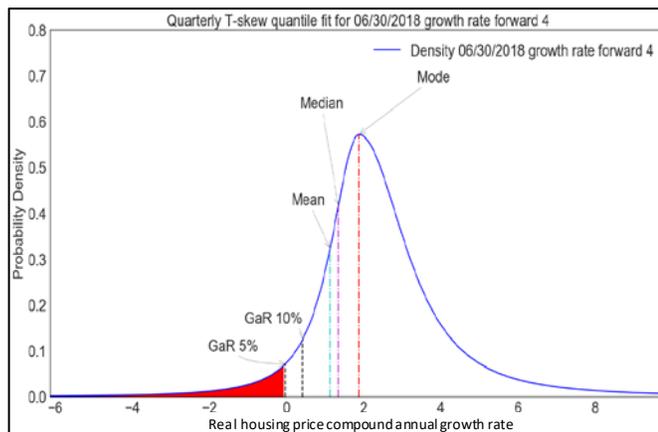
Figure 19. France: Quantile Regression Coefficients

Quantile regressions are performing reasonably well.

Quantile regressions coefficients
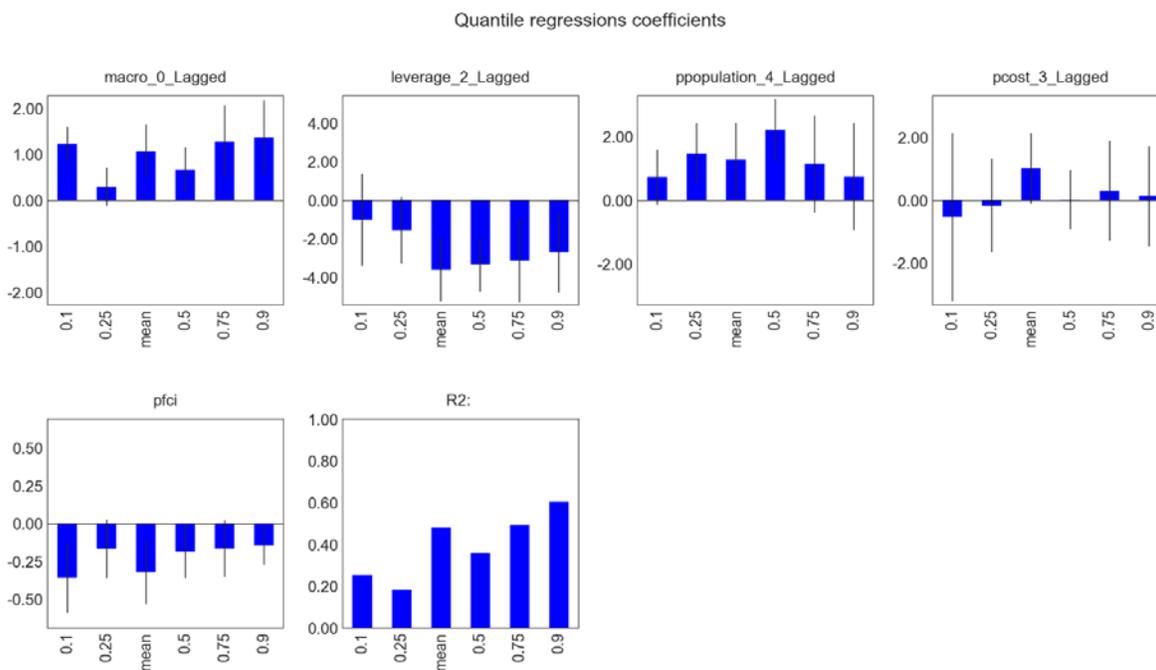
Source: IMF Staff.

70.   A stress shock to financial conditions suggests that there would be downside risks to house prices in case macrofinancial shocks occurred.[42] A two-standard deviation shock to the financial conditions index is associated with a shift of the density distribution to the left, with the one-year ahead predicted fifth percentile of the distribution of annual house price growth that reaches -1.8 percent and the tenth percentile reaching -1.1

percent. This suggests that a sudden tightening of financial conditions arising from unexpected monetary policy tightening in the US, from trade tensions or geopolitical risks would be with a high probability associated with a downturn in the housing market in France by affecting both demand and supply of housing loans.
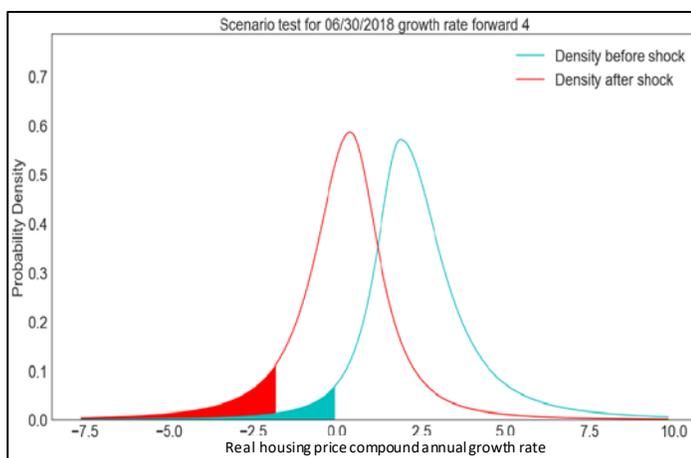
71.   A negative shock to real GDP growth in France would be associated with a larger impact on risks to house prices than a shock to financial conditions. We consider a two-standard deviation shock to real GDP growth. Such a shock would be associated with a significant shift of the density distribution to the left and a widening of it, with the one-year ahead predicted fifth percentile of the distribution of annual house price growth that reaches -

14.4 percent, the tenth percentile reaching -13.2 percent and a mode of the distribution at -5 percent. While this analysis does not address endogeneity concerns, the findings suggest that the risks to house prices arising from a shock to macroeconomic performance would be much larger than the risks arising from a shock to financial conditions. It could be explained by the fact that households with fixed interest rate housing loans are insulated from interest rate shocks while a negative shock to real GDP growth would cause in decline in the demand for housing loans from new borrowers as income declines or stagnates.

---
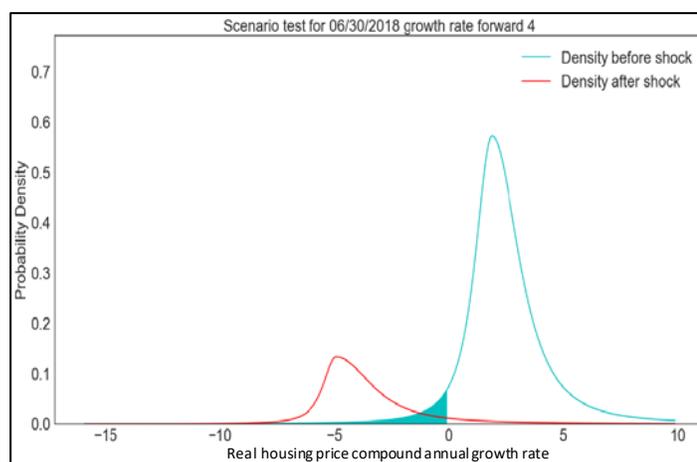
[42] This analysis does not address potential endogeneity concerns and therefore reflects statistical associations, not causality.

**72.   A combined shock to financial
conditions and real GDP growth would
generate significant downside risks to
house prices in France.**[43] An illustrative
combined two-standard deviation shock to
real GDP growth and to the financial
condition index result in a significant shift of
the density distribution to the left, and the
resulting one-year ahead predicted fifth
percentile of the distribution of house price
growth is at -15.3 percent and the 10th
percentile is at -14.4 percent.
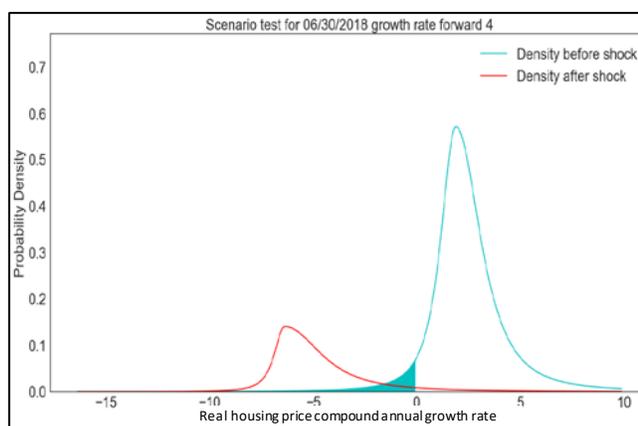
**73.   In sum, our preliminary analysis suggests they might be sensitive to macrofinancial
developments.** Risks to house prices appear to be more sensitive to shocks to macroeconomic
developments than to shocks to financial conditions that are orthogonal to growth. Such a finding is
consistent with some characteristics of the real estate market and housing loans in France, such as:
(i) almost all housing loans are fixed rate, and so interest rate risks are pooled in the banking system
instead of on the balance sheet of individual households; (ii) the legal impossibility to borrow
against home equity, which help limit additional build-up of leverage among households in addition
to the initial loan at the time of purchase; (iii) origination of housing loans based primarily on an
assessment of the ability to repay.

F.   Microeconomic Analysis of Household Balance Sheets and Housing Policies

**74.   This section assesses potential vulnerabilities in specific groups of households and
reviews existing housing policies in place to address affordability concerns.**[44] While
households' balance sheets do not appear vulnerable at an aggregate level despite growing
leverage, some pockets of vulnerabilities could, in principle, still be present in groups of households.
Moreover, while RRE prices do not seem overvalued, downside risks to these prices can be sensitive
to macrofinancial conditions. Macrofinancial shocks could impact some households' ability to repay
if income is affected, as well as the equity resale value of their residence, creating potential feed-
back effects to the real economy.

**75.   Between 2010 and 2014, the balance sheets of various household groups deteriorated
(Figure 20).** The DSTI increased among most income groups, including among low income
households (the bottom decile of the distribution) resulting in average DSTI that may be almost at
par with the average more well-off households. Moreover, while the increase in leverage (the debt-

---

[43] This illustrative combined shock is consistent with the story line of the banking solvency stress tests and the
corporate stress tests. It assumes that euro area monetary policy would not become more accommodative.

[44] The last household survey relied upon in this section is based on 2014 data, as the 2019 survey was not available at
the time of analysis. Thus, this section cannot analyze more recent developments.

to-income ratio) was the largest among upper-middle households, lower income households experienced a decline in their net financial asset buffers but higher income households did not experience such a loss of financial buffers. The increase in the DSTI or the DTI also occurred among the younger age cohort, among which presumably the largest share of first-time buyers is found.

76.   When compared to other households in peer countries, French households do not appear to have excessively high DSTIs or DTIs (Figure 21). Among lower income households, DSTI, DTI and debt-to-financial asset are lower in France than in Italy, Spain or the Netherlands, but they are higher than in Germany. However, among lower income households the proportion of high LTV loans is higher in France than in other peer countries with the exception of those in the Netherlands. It may be useful to note that French banks' originations of housing loans rely primarily on households' repayment capacity rather than their LTV.

77.   The growing home ownership affordability problem that is stretching lower income households' balance sheets is somewhat mitigated by state interventions in the rental market (Figure 22). The median-housing cost for owners with housing loans is relatively high in international perspective, in particular for upper-middle income households who spend about 30 percent of their income on housing costs, but also for low income households where the ratio is at 46 percent, at similar levels as in Southern European countries and Mexico. In contrast, the median housing cost for rentals is relatively low compared to other countries, in particular for households at the bottom quintile of the income distribution where housing costs stand at 30 percent of disposable income. This (relatively) low cost of rental housing may be explained by a combination of factors. First, large amounts are spent on rental subsidies, the *Aides Personnalisées au Logement* (APL). At about 1 percent of GDP the level of spending is well above levels of housing subsidies observed in other OECD countries. However, research has shown that these subsidies are not effective in alleviating affordability problems, and instead have resulted in rent inflation with only about 20 percent of the subsidy ultimately benefiting the renter.[45] Second and more importantly, France enjoys a large supply of social housing which account for 17 percent of the stock of primary residence, and for 42 percent of the stock of rental units (from 39 percent in 1987). Eligibility conditions to access social housing are not very restrictive in theory, and rents paid on social housing units are means-tested.[46]

---

[45] See Fack, G. (2006), "Are housing benefit an effective way to redistribute income? Evidence from a natural experiment in France," *Labour Economics*, 13(6), and Grislain-Letrémy C. et C. Trévien (2014), "The Impact of Housing Subsidies on the Rental Sector: the French Example," *Insee working paper*, G2014/08.

[46] The income ceiling for eligibility is such that in principle about 80 percent of households would be eligible to the less restrictive type of social housing.

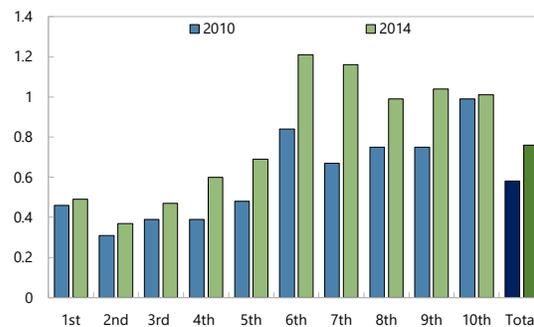## Figure 20. France: Households' Housing Loans Vulnerabilities

The DSTI has increased over all income groups …

Debt Service to Income Ratio, by Income Decile (Percent)
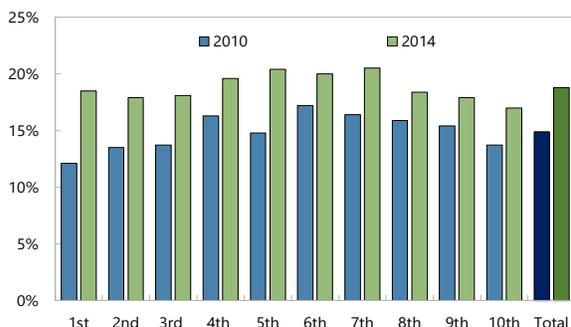
… while the increase in leverage is larger among upper-middle income groups.
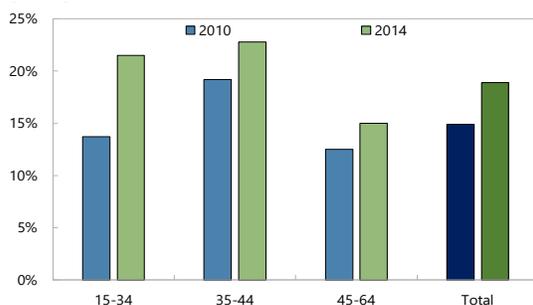
Debt-to-Income Ratio by Income Decile (Ratio)

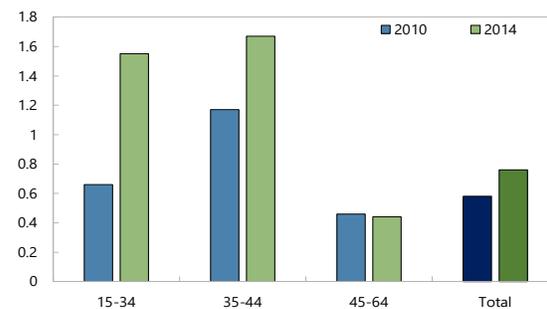Sources: INSEE Enquête Patrimoine, French Treasury and IMF Staff.

Debt service to income has particularly increased among younger age cohorts.

Debt Service-to-Income Ratio by Age Cohort (Percent)

… and so has leverage, which has remained stable in relatively older cohorts.

Debt-to-Income Ratio by Age Cohort (Ratio)

Sources: INSEE Enquête Patrimoine, French Treasury and IMF Staff.

The share of high LTV housing loans is the highest among middle income groups and has increased in the bottom half of the income distribution …

Proportion of Households with Loans-to-Value Ratios > 90 Percent
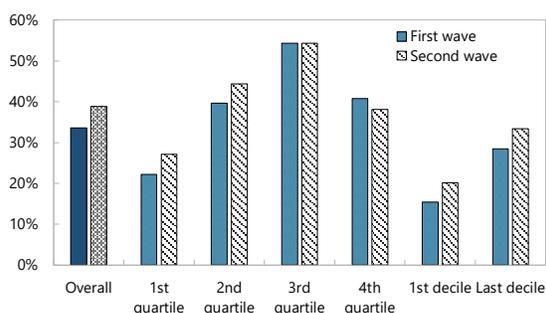
… the bottom half of the income distribution (including the lowest decile) has experienced a worsening of its financial net worth.

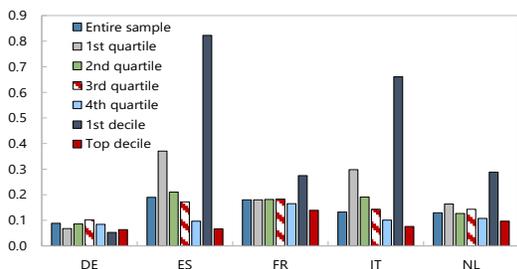**Median Debt to Financial Assets by Percentile of Income Distribution**
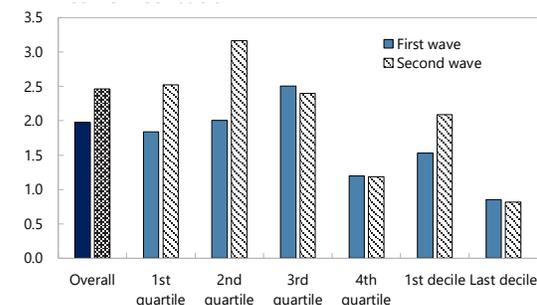
Sources: ECB Household Finance and Consumption Surveys; and IMF staff calculations.

Figure 21. France: Household Housing Related Vulnerabilities: Cross-Country Comparisons
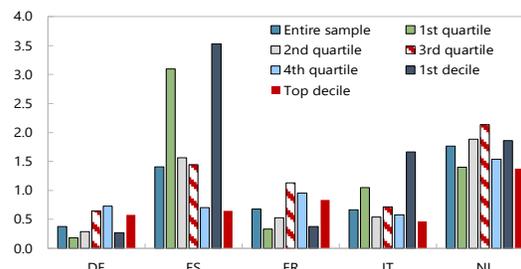
DSTI ratios in France are not high among lower income households compared to peer countries ...

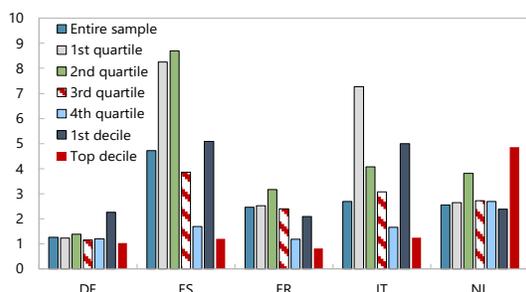**Median Debt Service to Income Ratio by Income Group (Ratio)**

... the same holds for DTI ratios ...

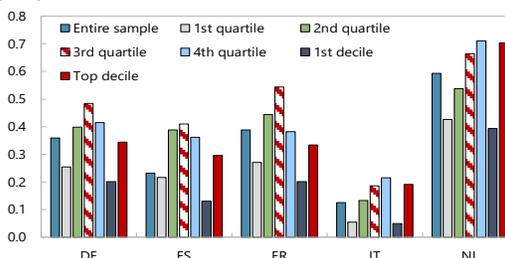**Median Debt to Income Ratio by Income Group (Ratio**

... or the debt to financial asset ratio ...

Median Debt to Financial Asset by Income Group (Ratio)

... however the proportion of relatively high LTVs is on the high side compared to peers for low income households.

**Proportion of Households with LTV > 90 percent by Income Group (Share)**

Sources: 2015 ECB Household Finance and Consumption Survey; and IMF staff calculations.
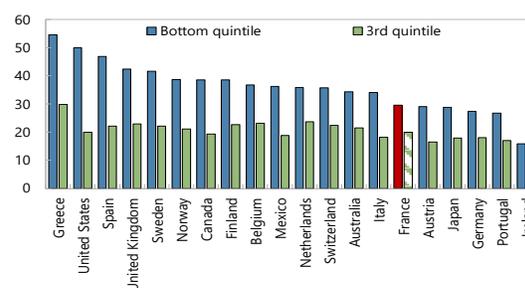
Figure 22. France: Housing Affordability

In cross-country perspective, housing costs are relatively high for home owners with housing loans ...
**Median Housing Costs (Owners with Mortgage) (Percent of disposable income)**
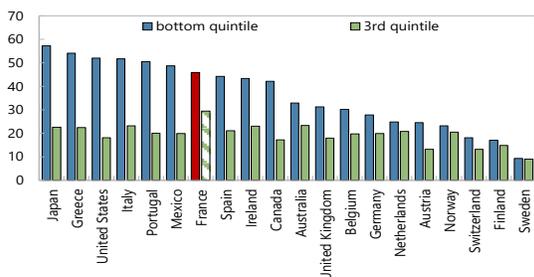
... but the rental market remains relatively affordable.
**Median Housing Cost (Rent, Private and Subsidized) (Percent of disposable income)**

especially among lower income households benefiting from subsidized rents ...
Share of Population in Bottom Quintile of the Income Distribution Spending > 40 percent of Disposable Income on Housing Costs (Percent)
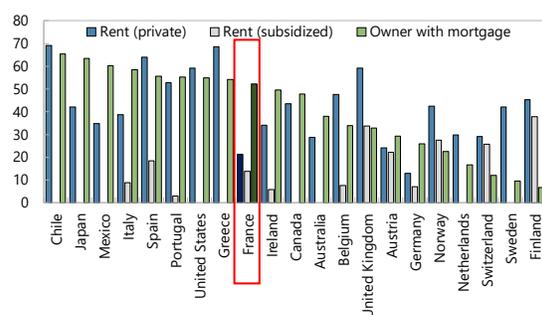
... including thanks to a large supply of social housing.
Social Housing (Percent of total housing stock)
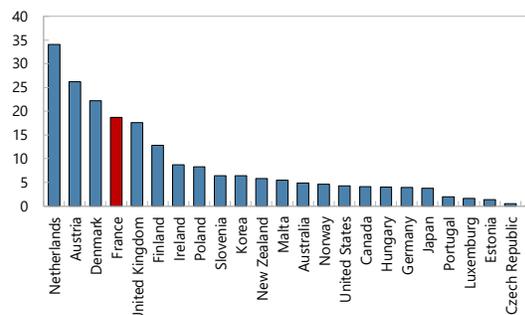
Source: OECD.

78.   Financing of social housing is mostly achieved by state intervention in the financial system, through the CDC, and various tax and subsidies schemes. A social housing operation is financed by three main sources: (a) loans from *CDC, Action Logement* and commercial banks; (b) subsidies from various public entities (local governments, the central government or EU funds); and (c) the equity of landlords. [47] In 2017, the break down was 79.3 percent of loans (69 percent of subsidized loans, 4.4 percent of loans from *Action Logement*), 8.5 percent of subsidies (2.4 percent from the state and 5.1 percent from local government), and the remaining 12.2 percent from landlord's own funds. The vast majority of financing of social housing comes from subsidized loans

[47] *Action Logement* is a source of funding specific to social housing. It is funded by a contribution from companies levied on their wage bills (Employers' Participation in the Housing Effort (PEEC)). This contribution can be used for loans to social landlords, or to employees of contributing companies. The funds are collected and distributed by a financing company managed by social partners (trade unions and employers).

from the CDC: between 2004 and 2013, CDC loans accounted on average for 70 percent of the financing of new construction and for 56 percent of rehabilitation (see Box 6).


Box 6. Financing of Social Housing and the Role of the CDC

Overview of CDC. The CDC is a public autonomous agency, under the supervision and guarantee of the Legislative Authority since its creation in 1816. The group acts through investment and lending in various areas of public interest (social housing financing, business development, infrastructure, ecological and energy transition), and as a long-term investor in various sectors (infrastructure, transportation, insurance, banking, real estate, leisure).

Balance sheet. CDC derives the resources with which it finances social housing loans and urban policy from the "Savings Fund," which is mainly funded by centralized regulated savings deposits. As of end 2017, the outstanding amount of Livret A, LDDS and LEP centralized in the Savings Fund amounted to €245 billion, and the Savings Fund had €159 billion in outstanding loans to the social housing and urban policy sector (87 percent of Savings Fund loans are devoted to social housing and urban policies). CDC other activities are funded from its main balance sheet 'section Générale.'

Bilan simplifié du fonds d'épargne
(en milliards d'euros)
Au 31 décembre 2017

Actifs de taux 67 (*)
Actions 12 (*)
Prêts logement social et politique de la ville 159
Autres prêts 26
Autres passifs 20
Dépôts centralisés 245

(*) Y compris les intérêts courus non échus (ICNE) et provisions.
Note : En raison des écarts d'arrondis, la somme des actifs et celle des passifs peuvent ne pas être exactement égales.
Source : Caisse des dépôts, fonds d'épargne.

Loan supply. Each year, the Ministry of Finance determines the maximum volume of loans that may be granted by the CDC, as well as their conditions (such as: purpose, pricing, duration, and eligible borrowers). Loans are typically of very long duration, and their pricing depends on the social character of the project and of the borrower. The financial soundness of the borrower and the guarantor (each loan to the social housing sector is guaranteed) are carefully evaluated by the CDC before the loan is granted. In the absence of a guarantee from local authorities, an administrative public institution (EPA), can guarantee regulated loans granted by the CDC to social landlords.

Supervision and governance. CDC is a *sui generis* public entity. Whereas it is not a credit institution and is explicitly excluded from the scope of application of the Capital Requirements Regulation (CRR) and CRD IV EU legal framework, it is subject to an *ad hoc* prudential framework, defined by the national law, and mainly based on CRR regulatory provisions. Governance is split between the CDC's executive committee, a supervisory committee and the Group Management Committee. Under the Loi Pacte recently passed into law, the prudential supervision of the CDC is to be transferred to the ACPR.
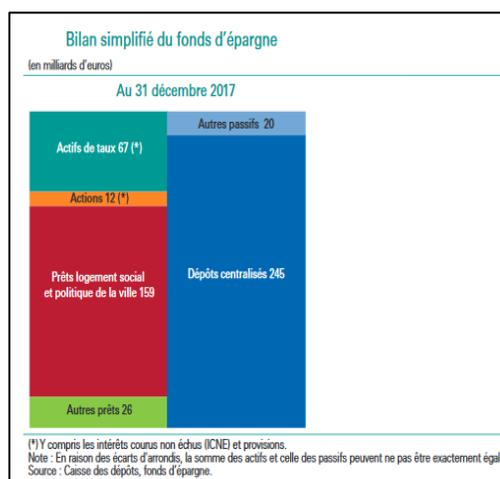
G. Conclusion

79.   In spite of a rising trend of household indebtedness, there is no clear evidence of vulnerabilities in households' balance sheets at an aggregated level. Households have continued to build their financial net worth by accumulating financial assets even faster than debt. Their saving rate is healthy, and they appear to invest their inflows primarily in safe assets. Household debt is not high in international comparisons. However, some households—lower

income, younger—may have experienced a deterioration of their balance sheet along certain dimensions.[48] This could be a concern, including if downside risks materialized.

80.   The residential real market appears to be broadly aligned with its supply-side and demand-side fundamentals, and the recent price increase seems limited to more local markets, in particular Paris. Affordability seems to have improved on average in recent years, and there is also an improvement in the return on the rental market, despite the large share of subsidized housing. The price-to-income ratio and the price-to-rent ratios are above their long-term averages, but France does not particularly stand out in this respect compared to other OECD countries.

81.   A model of house-price-at-risk suggests that near-term risks to the residential real market are negligible at this juncture. According to the model the left tail of the house price distribution has moved up, both in absolute terms and relative to other countries. This implies that the likelihood of any negative future development in the residential market has declined.

82.   However, there is a need to remain prudent, for several reasons. First, in the current context of decelerating growth, it is important to note that the analysis also suggests that the likelihood of adverse developments in the residential real estate market is sensitive to negative shocks to macrofinancial conditions. Such shocks would stretch the repayment capacity of households, even if the prevalence of fixed rate housing loans and the relatively low conditional unemployment likelihood protect home-owners with a housing loan. The materialization of downside risks would create feed-backs to the financial system by impacting housing loan demand and would also impact bank profitability through direct exposures and indirect exposures via loans offered to nonfinancial firms operating in sectors related to real estate. Second, in absence of recent disaggregated data from household surveys, there are limits to our understanding of the extent to which specific groups of households—lower income, younger—may have accumulated vulnerabilities in their balance sheets in recent years. The analysis of the 2019 Household Finance and Consumption Survey is going to be timely in that respect.

83.   Although not warranted at this stage, it may be useful to consider in the future the use of targeted borrower based macroprudential instruments on housing loans if granular analysis were to reveal that pockets of vulnerabilities are developing among some groups of households. The household surveys that will be soon published by the INSEE and the ECB will allow to uncover whether balance sheets of lower income groups have become stretched in recent years, as would be indicated for example by high DSTIs. If this happens to be the case, the authorities should consider the use of borrower-based macroprudential instruments to dampen some demand pressures.

---

[48] This trend would need to be further ascertained with more recent household survey data.