

Swiss Finance Institute Practitioner Roundups

Special Issue Debt—Growth—Resilience

Editorial



Credit is the engine of growth, but can excessive debt reduce the economy's resilience to shocks? This Special Issue of SFI's Practitioner Roundups examines recent trends in the demand and supply of debt and their consequences for the overall economy. Drawing on finance research and practice, it offers a nuanced, evidence-based perspective on several topics that figure prominently in public discussion, such as the sustainability of government debt levels, the effect of debt on entrepreneurial activity, and the unintended consequences of certain banking regulations. A number of fresh insights emerge, which sometimes run counter to conventional wisdom. For example, research suggests that the ratio of government debt-to-GDP is not the main determinant of the sustainability of government debt, that debt financing can stimulate innovation by fostering the creation of entrepreneurial firms, and that increases in liquidity and capital ratio requirements may adversely affect the financial exposure of banks, and their ability to finance the corporate sector.

We wish you an enjoyable read.

A blue ink signature of Prof. François Degeorge, consisting of stylized initials 'F. Degeorge'.

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Managing Director and SFI Senior Chair

A blue ink signature of Prof. Jean-Charles Rochet, consisting of stylized initials 'JCR'.

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Maximum Sustainable Government Debt

Prof. Jean-Charles Rochet, SFI Senior Chair and Professor of Banking at the University of Geneva.

What is the current magnitude of general government debt?

J.-C. Rochet: Data from the International Monetary Fund show that general government debt for all the G7 countries combined exceeded USD 43 trillion in 2017. To put this figure into perspective, this represents 117 percent of their overall annual GDP, or USD 56'500 of government debt per citizen. Despite broad similarities between these advanced economies, large contrasts exist regarding their government debt. In 2017, government debt-to-GDP ratios range from 64 percent for Germany to 237 percent for Japan—or, from USD 28'600 of government debt per German citizen to USD 91'100 per Japanese citizen. But the country currently of the highest concern with regard to sovereign debt among the G7 countries is not Japan, but Italy, with a debt-to-GDP ratio of 132 percent and a credit rating only one notch above junk territory—a situation that can, at least partially, be explained by Italy and Japan's different scope for fiscal maneuver.

How has the general government debt-to-GDP ratio evolved over time?

J.-C. Rochet: The general government debt-to-GDP ratio tends to evolve for both cyclical and structural reasons. At the cyclical level, the key factor is economic activity: when the economy expands, governments typically generate a surplus, which allows them to reduce their debt, whilst when the economy shrinks, governments tend to step in and increase spending to stabilize output, and subsequently a deficit appears and debt rises. At the structural level, political decisions regarding the size and social role of the state are the main factors that influence both deficit and debt. History has provided multiple diverse scenarios. The UK government debt-to-GDP ratio, for example, was 181 percent in 1950, 73 percent in 1970, 27 percent in 1990, and 88 percent in 2017; at these same milestones, the government debt-to-GDP ratio for Italy rose from 30 percent to 37 percent to 92 percent to 132 percent. The Great Recession of 2008 caused a strong increase in debt in all G7 countries—except Germany. In the case of Switzerland, data from 1983 to 2017 show more moderate swings: the lowest value in government debt-to-GDP ratio was 28 percent, in 1989, and the highest was 59 percent, in 2004. The Great Recession left general Swiss government debt largely unaffected.

What is it that defines maximum sustainable government debt and default probability?

J.-C. Rochet: Maximum sustainable government debt depends primarily on how much money lenders are willing to provide. Lending behavior has been shown to be influenced by four factors. First, a country's primary expected sustainable surplus; second, its average growth rate; third, its growth rate volatility; and fourth, how much debt the government is expected to be able to raise in the future to finance today's debt. Lenders are more willing to finance debt when primary expected surpluses, average growth rates, and governmental capacity to raise debt are high, and less willing when growth rates are more volatile and risk-free interest rates are low. Once maximum sustainable debt, maximum sustainable borrowing, and actual debt are determined, one can forecast a nation's probability of defaulting. Governments that operate below their threshold of maximum sustainable debt face low interest rates and very low probabilities of default—governments that operate above their threshold of maximum sustainable debt face very rapid increases in their debt interest rates and their probability of defaulting.

What does historical data show us regarding differences in maximum sustainable government debt and default probability?

J.-C. Rochet: Empirical data covering 23 OECD countries between 1980 and 2010 show that primary expected surpluses, growth rates, and the ability to raise debt to finance debt all play a central role in setting the maximum amount of sustainable debt and the probability of default. France, Greece, and Portugal's low primary surpluses played against them regarding their overall maximum sustainable debt capacity, whilst Korea and Sweden's ability to repeatedly rely on future borrowing to repay present borrowing increased their maximum borrowing capacity. Regarding the probability of default, estimates show that the situation is highly asymmetrical. Greece's government debt-to-GDP ratio increased from 53 percent in 1987 to 89 percent in 1990, and to 127 percent in 2009—its probability of defaulting, at those same points in time, rose from less than 1 percent to a little more than 1 percent to more than 85 percent. It is the probability of defaulting, not the debt-to-GDP ratio, that explains sovereign yield spreads best.

At the outbreak of the 2008 crisis, many governments faced the dilemma of needing to spend money to stimulate their economies whilst facing difficulties in servicing their debt. What have we learnt?

J.-C. Rochet: The Great Recession left many governments with growing deficits and exposed—what some considered to be—unsustainable spending levels. This conundrum led several European countries to adopt austerity measures. Such austerity measures, some of which are still in play today, proved to not only be unpopular with large parts of the population but also largely controversial from an economic perspective. Research has since shown that short-term government stimulus is actually compatible with a longer-term balanced government budget.

With a potential recession now on the horizon, what should governments do? Spend and invest to diversify? Or save and brace for impact?

J.-C. Rochet: Interest rates are at an all-time low—several 10-year government bonds in Europe and Asia are currently offering yields below zero percent and US rates are hovering at around 1.5 percent. Governments should take advantage of this availability of "inexpensive" money to borrow and invest in infrastructure and green projects. Such investments make sense from both a financial and an economic perspective as they typically provide large financial returns, help diversify economic output, support economic growth through government intervention, and help accelerate the transition toward a green economy. In a nutshell, governments need to take action today to ensure that the economy is more resilient when the next crisis occurs.





Corporate Debt, Innovation, and Growth

Prof. Erwan Morellec, SFI Senior Chair and Professor of Finance at the Ecole Polytechnique Fédérale de Lausanne.

Prof. Steven Ongena, SFI Senior Chair and Professor of Banking at the University of Zurich.

What are the different types of corporate financing and who are the main providers of corporate debt?

E. Morellec: Corporations can obtain financing through two general classes of securities: equity and debt. On the one hand, equity within a given firm is a largely standardized instrument that typically bears a single price. On the other hand, debt contracts within a given firm can differ based on numerous characteristics. Large corporations are typically financed by dozens, if not hundreds, of bonds and loans, which are characterized by differing face values, rates, seniorities, maturities, and covenants. Data from the Institute of International Finance show that corporate debt in nonfinancial firms has been growing at a steady pace worldwide and has nearly tripled since the Great Recession. In late 2018, corporate debt reached an all-time record of 92 percent of the world's GDP. In the case of the US, corporate debt, including small and medium-sized

enterprises, family businesses, and non-listed corporations, adds up to more than USD 15 trillion—approximately 75 percent of US GDP.

S. Ongena: Over the past decade there has been an interesting shift in the landscape of debt providers, as large nonfinancial corporations have gradually moved away from relying on bank financing and gradually obtained more and more funding through the bond market, private investors, and specialized finance companies. For example, in the US, large corporations now rely on banks for approximately only one-third of their funding, compared to nearly one-half a decade earlier. A similar shift away from bank financing toward non-bank financing has also occurred in the euro area and Japan. However, this shift is much less pronounced for small and medium-sized enterprises, which tend to rely on bank financing for their growth.



Does corporate debt financing support firm innovation and growth?

E. Morellec: Over the past decades, the US economy has grown largely thanks to innovation. Public firms, for example, now spend twice as much on R&D as on capital expenditures, and fixed assets fell from 34 percent to less than 20 percent of total assets between 1975 and 2016. Data show that small, medium, and large-sized innovative firms rely heavily on debt financing and that when start-ups and mid-market businesses are not able to obtain traditional bank lending they seek direct lending from non-banks. Research shows that the effects of debt financing on firms' innovation and investment vary depending on whether the focus is on incumbents, that is, firms that are already active in a given market, or on entrepreneurs and entrants, that is, firms with the ambition to provide new products and services. For incumbents, debt financing generally leads to underinvestment in R&D and physical capital due to a debt overhang effect and to an increase in business closures. By contrast, debt financing stimulates innovation by the creation of entrepreneurial firms. This increase in entrepreneurship stimulates innovation and creative destruction at the aggregate level, with innovating incumbents and newcomers developing new products to replace existing ones.

What are the main differences between traditional bank lending and direct lending?

E. Morellec: Traditional bank lending takes place through financial institutions and therefore operates with considerable regulatory oversight. Direct lending is provided by hedge funds, private-equity firms, pension funds, insurers, and cash-rich corporations, and therefore operates in the shadows in terms of banking regulation. Direct lending is convenient in today's economy as it allows non-bank investors to find yield in a low-return environment and provides corporations with financing. The main issue here is that the direct lending part of the financing industry is handling the hazier part of the business and that this extra risk, lower diversification, reduced liquidity, and higher leverage may put a damper on future growth and recovery. Some market specialists are forecasting that some non-bank lenders may disappear during a future economic downturn, because of the lower-quality loans they have on their books, which may ultimately leave some corporations fully "stranded" in terms of—both traditional and direct—lending.

Financial development seems to have a positive effect on growth, but what type of financing—bank- or market-based—works best?

S. Ongena: There are two opposing schools of thought at work here. On the one hand, the bank-based approach claims, for multiple reasons, that bank activity is better than stock market development for economic growth. The arguments here are that well-developed markets swiftly reveal information in public markets and reduce individual investors' requirements to spend resources to acquire information and identify innovative projects; market liquidity allows investors to inexpensively sell their shares without consistent and thorough monitoring; and market developments may hold back corporate control and national productivity. On the other hand, the advocates of the market-based view stress the deficiencies of the banking system. They contend that banks acquire expensive information to extract large rents and reduce corporations' incentives to undertake high-risk and high-return projects; have an inherent bias toward low-risk, low-return projects, which retards innovation and growth; and may collude with corporate managers against other investors, which is detrimental to competition, innovation, and economic growth. Empirical data covering 48 countries during 35 years show that general financial development—bank-based and market-based—had a large positive and time-consistent effect on firm creation, industrial expansion, and economic growth. In-depth analysis shows that both the financial market and bank-based approaches have played a prominent and complementary role in fueling economic growth over the past decades.

Bank Resilience and Regulatory Measures

Prof. Erwan Morellec, SFI Senior Chair and Professor of Finance at the Ecole Polytechnique Fédérale de Lausanne.

Prof. Steven Ongena, SFI Senior Chair and Professor of Banking at the University of Zurich.

How has the funding structure of the banking sector evolved since 2008?

E. Morellec: Data show that financial sector debt, within developed economies, represented more than 130 percent of GDP ten years ago—figures from last year show that this value has dropped and sits below 110 percent. Regulatory developments, implemented in the aftermath of the Great Recession, are key in explaining this decrease. In 2008, insufficient liquidity buffers and high debt levels led to the collapse of some major banks and triggered a ripple effect through the world economy. Regulators have since focused on reining in the risk that banks represent to the economy via two distinct sets of measures. First, a set of liquidity measures that require banks to increase their buffer of liquidity reserves in order to be capable of facing short-term losses in the illiquid assets they hold, and to preclude them having to take the time-consuming and costly route of raising capital. Second, a set of capital measures that require banks to increase their overall equity ratio, and therefore lower their overall leverage ratio, with the objective of increasing the loss absorbing capacity of banks.

What does research predict regarding the effectiveness of liquidity and capital regulatory measures?

E. Morellec: Research on the effects of micro-prudential banking regulations provides three theory-based learnings. First, minimum liquidity requirements tend to decrease the magnitude of losses when firms are in default. However, such constraints may also increase the overall likelihood of default by reducing the value of a bank's equity. Second, increases in capital requirements increase shareholders' willingness or capacity to absorb losses and reduce the likelihood of default. In effect, capital requirements reduce financial leverage and limit the corresponding increase in risk. Third, the combined effects of increases in liquidity and in capital requirements reduce both the magnitude of losses when in default and the likelihood of default. Regulatory measures, such as those of Basel III, can only be effective if requirements are imposed on both liquidity and capital to make the banking sector and economy more resilient. Of course, such regulations come with a cost for banks.

Do we have any empirical evidence on the effectiveness of liquidity and capital measures?

S. Ongena: The Basel III agreement was fully implemented only this year, with the overall goals of increasing the amount and the quality of bank capital, enhancing risk capture, containing leverage, improving liquidity, and limiting procyclicality. One of the key features of this stringent reform is to increase minimum capital

requirements by 50 percent and require banks to increase their risk-based capital ratios. Banks can reach this target either by increasing the amount of regulatory capital they hold or by decreasing the quantity of risk-weighted assets they finance, or a combination of both. Today, it is still too early to assess how banks will truly adjust to Basel III, but the European Banking Authority (EBA) capital exercise of 2011 can nonetheless already provide some insights. In 2011, the EBA conducted a capital exercise by unexpectedly requiring certain European banks to increase their regulatory capital ratio. Research reveals that the financial institutions that were involved in the exercise reduced the amount of assets they financed by essentially lowering their corporate and household credit exposure, but did not seek to increase their amount of regulatory capital. If one believes that the findings around the EBA capital exercise can be generalized to take in the entire financial industry, then it may be worthwhile for regulators to consider adjusting policies in a way that both strengthens the banking sector and avoids penalizing corporate business.

How well do countercyclical capital buffers operate?

S. Ongena: Countercyclical capital buffers provide the possibility to require banks to increase capital buffers during booms and decrease them during crises. The Basel III agreement includes such a measure, within its broad set of capital measures, with the possibility to introduce an increase of between 0 and 2.5 percent of additional equity. Such buffers not only help protect against negative externalities during credit crashes, they also cool down credit-led booms as additional credit during such periods comes with a higher cost. General countercyclical capital buffers have been at work in Spain for nearly 20 years and have been adjusted—both upward and downward—several times already, showing positive effects in terms of resilience. Empirical results show that such measures of dynamic provisioning have helped mitigate credit supply cycles and have supported the economy in being more robust, as these countercyclical buffers had strong positive effects on credit, employment, and firm survival during crisis periods, and no longstanding negative effects during boom periods. Targeted countercyclical capital buffers seem to have a more nuanced overall effect. Indeed, Swiss data reveal that the countercyclical measures targeting domestic residential loans in 2012 had a substantial impact on the target activity, but also caused spillover effects in other credit sectors such as commercial lending.

What other solutions are available, which would be both growth-oriented and resilient?

S. Ongena: Regulatory measures, such as those found in Basel III, are increasingly complex and costly to implement. Research results show that increasing the cost of leverage can offset the distortions induced by capital requirements in the frequent case where regulatory risk weights do not perfectly reflect the risk of each asset. Such an increase in the cost of leverage could be achieved through taxing debt or subsidizing equity. Empirical data, based on different tax reforms implemented across the euro area between 2005 and 2012, provide some insightful alternatives to today's set of inflexible, ratio-based regulations. For example, the introduction of a tax that increases the fiscal cost of leverage would lead banks to further deleverage, induce them to focus more on lending to corporations and to divest from securities, and as a whole decrease total risk. Also, from a practical perspective, a single tax rate could be a simple and cost-effective alternative to implementing and monitoring the complex series of regulatory ratios set out in Basel III.

How have regulatory decisions helped improve the resilience of the banking sector and the economy? Are there any weak spots?

E. Morellec: The recent injection of liquidity by the Fed shows that balance sheet constraints, imposed by regulators on banks, can make liquidity scarce at times and prevent efficient interbank lending. However, the main risks now do not seem to come from the regulated banking sector but rather from other sectors that expanded significantly during the past decade when picking up the many activities that had become too costly, in terms of capital costs, for regulated banks. Regulation may actually have pushed financial risks to the side, where they are currently less visible. It is therefore important to know how central and connected these less visible players are in the financial network, and what risks they represent. While banks have indeed become safer and stronger since the financial crisis, it is unclear whether other players, such as institutional investors and shadow banks, retain a strong link to the banking sector and could inflict losses at banks during market disruptions.

S. Ongena: On the one hand, increases in capital requirements have undoubtedly made banks less fragile. On the other hand, increases in liquidity requirements have, however, pushed banks to hold more and more sovereign bonds, which may not always be fully beneficial when seeking to reduce banks' financial exposure.



A Banker's Perspective on Debt, Growth, and Resilience

Prof. Axel P. Lehmann, President UBS Switzerland and Member of the Group Executive Board.

How has the corporate debt market evolved since the Great Financial Crisis—worldwide and specifically in Switzerland?

It is fair to say that the Great Financial Crisis marked a watershed moment in global finance and specifically in the credit markets—yet that watershed may have turned out somewhat differently than anticipated. Before the crisis, corporate credit was relatively easy to obtain, both from direct and securitized sources. After the Crisis, analysts and academics expected a significant deleveraging of public, corporate, and private balance sheets—in particular given that the Crisis had its origins in an arcane corner of the debt market. However, the past couple of years have seen a noticeable re-leveraging on all levels and markets, doubtless also driven by the accommodative stance of central banks around the world.

Switzerland may be a bit of an exception here in that it has always had rather low levels of corporate debt compared to other countries, in particular among small and medium-sized enterprises. In fact, recent academic research distilled in a paper by the State Secretariat for Economic Affairs finds that close to two-thirds of all small and medium-sized Swiss companies have no leverage at all and are thus fully financed by equity. On the market side, we have seen a gradual decline in the Swiss-franc denominated bond market for foreign issuers while the domestic corporate bond market has posted solid growth over the past few years—also supported by stable domestic growth. So, to everyone's relief, the tales of the Great Financial Crisis killing the debt market—and thus economic growth—were much exaggerated.

Which factors are shaping the current competitive landscape in the debt market?

The past couple of years have seen a gradual disintermediation of the debt market and the emergence of new market participants. We see three major factors driving this ongoing trend.

First, regulation: Balance sheet restrictions for banks have resulted in a gradual rise of private debt markets and alternative lenders such as private debt and insurance companies, to mention but a few. They are able to operate with fewer regulatory and operational restrictions than those imposed upon bank lenders.

Second, negative interest rates and the resulting "search for yield" have put pressure on business models and in particular on margins. With rates expected to be "lower for longer", pressure on pure bank lenders and investors is mounting, requiring them to invest in order to avoid negative interest charges from central banks. This has

resulted in expanding lending volume and increasing risk. We see this in the increase in appetite for loans with higher risk profiles and in reduced protection of so-called covenants. Also, financing multiples have increased to match the current market environment. More diversified financial services providers, on the other hand, may think about client risk and revenue management in a much more holistic way.

... but surely technology also plays its part, as it does in most other parts of our society?

Yes, indeed, technology is the third factor I would like to mention, because it has given rise to completely new forms of debt, both on and off exchanges: from crowd lending to ICOs to blockchain-based solutions, technology has become an additional important driver of disintermediation, with its own champions emerging. But technology is important for another reason: it also allows a much more controlled distribution of risk and a more efficient servicing of debt. When a company sold a bond a century ago, the number of debtors and their share equaled the number of bonds issued and remained the same until maturity. Today, crowd lending allows debt to be broken up into infinitely small fractions, and innovative debt platforms directly connect lenders with borrowers, thereby reducing intermediaries' risks. Overall, this has had beneficial effects on corporate lending volumes—and consequently on economic growth. Corporate debt is the blood of the economy as it helps companies expand at home and abroad and facilitates investments in innovation and people. Any ways of deblocking or even extending those arteries of capital should be welcomed.

Against the backdrop of all these changes, how do you see the future of corporate lending?

If we want economic growth, we need corporate debt. From our perspective as the world's biggest wealth manager and the leading Swiss universal bank, balance sheet lending will remain important. While regulatory restrictions and negative interest rates are likely to put pressure on margins and bank lending volume, such lending will remain the bread and butter of the business model, especially for complex corporate and wealth management-linked lending arrangements. We also see the Swiss capital market remaining attractive for both domestic and foreign issuers, mainly due to the stable Swiss-franc and low interest rates.

Yet there are two trends that we think will considerably shape future debt markets. First, we will see more ESG-focused lending, where credit is linked to achieving certain environmental, social, or governance

goals. Green Bond volumes have surged over the past years, both in Switzerland and abroad. Given the increasing focus on sustainability, this once peripheral part of the debt market will slowly, but inexorably, move to center stage—with all the benefits green bonds bring to society. Second, disintermediation will continue, helped by technology. Platforms such as UBS's Atrium may focus on one particular type of credit first—for example, institutional real estate financing—but then may expand into adjacent parts of the financial value chain, e.g. mortgages for private clients, office leasing, etc. This will—please pardon the pun—give lending a new lease of life.

Finally, with many markets in bubble territory, does one need to be cautious?

There is no doubt about it, low interest rates have buoyed markets, including credit, both commercial and private. For various institutional reasons (e.g. debt brake), Switzerland has maintained a very low level

of government debt, which is reflected in its favorable international borrowing rates. However, private household debt per capita is rather high in international comparison. This is mainly due to high mortgage levels, driven by increasing real estate prices. While we need to remain cautious, also with regard to income-producing real estate, strict lending and affordability criteria have kept undue risk at bay. On the corporate side, we have seen the search for yield resulting in an increase in the demand for the financing of long-term and unrated projects.

To sum up, similar to other markets, the debt market is prone to "irrational exuberance", so a word of caution is warranted. However, debt and equity markets are the left and the right heart chambers of the economy, supporting innovation, economic growth, and ultimately welfare. So let us look after our heart so it remains in sync with the market pulse.



Swiss Finance Institute

Swiss Finance Institute (SFI) is the national center for fundamental research, doctoral training, knowledge exchange, and continuing education in the fields of banking and finance. SFI's mission is to grow knowledge capital for the Swiss financial marketplace.

Created in 2006 as a public-private partnership, SFI is a common initiative of the Swiss finance industry, leading Swiss universities, and the Swiss Confederation.

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