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How will the COVID-19-crisis affect the trend in corporate saving?

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IW-Report 61/2020

How Will the COVID-19-Crisis Affect the Trend in Corporate Saving?

Markus Demary / Stefan Hasenclever / Michael Hüther

Köln, 30.11.2020

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JEL-Codes:

E32 – Business fluctuations, cycles

F32 – Current account adjustment, short-term capital movements

G32 – Capital budgeting, fixed investment and inventory studies, capacity

Abstract

In this paper we aim to shed light on the global trend in rising corporate saving over the last three decades and to discuss the effects that the Covid-19 crisis might have on companies' saving behaviour. To do so, we analyse the transition of the corporate sector from traditionally being a net borrower to becoming a net lender to the rest of the economy from a flow-of-funds perspective. In accordance with the literature, this analysis reveals that the trend in rising corporate saving is mostly pronounced in advanced economies that have been accumulating high and persistent current account surpluses, such as Germany, South Korea and Japan. In addition, we aim to analyse the various factors behind this trend by reviewing the literature. These range from the rise of uncertainty after the global financial crisis to the increased reliance on internal funding for research and development expenditures. To identify the potentially relevant factors for the German corporate sector we, subsequently, study the composition and development of Germany's aggregated corporate sector's balance sheet. We show that the rise in corporate saving is accompanied by an increase in equity capital and a reduction in the corporate sector's reliance on banking loans. Finally, we discuss the possible impact of the current Covid-19 crisis on the trend of rising global saving. We argue that the Covid-19 crisis is most likely to interrupt the trend in corporate saving in the short run due to the decline in revenues. Nonetheless, similar to the pattern observed in the aftermath of the financial crisis we conjecture that the Covid-19 shock will probably strengthen corporate saving in the long run, as corporates may well aim to restore their liquidity and equity capital buffers to be better prepared for future shocks. This will further unfold downward pressures on real interest rates and complicate the conduct of monetary policy.

1 Introduction

In this paper, we provide evidence on the global trend of corporate saving, which has led to an accumulation of liquid financial assets in the non-financial sector, and discuss how it might have been affected by the Covid-19 crisis. Over the last three decades, non-financial corporations' (NFC) gross and net saving activities have been rising on a global scale from a flow-of-funds perspective.¹ During the same time, corporates' investment expenditures have been remaining constant or have been declining. Altogether, the corporate sector has transitioned from being a net borrower to becoming a net lender to the rest of the economy. This trend of corporate saving has taken place in most countries, including the 10 largest economies, and it is pervasive across industries (Dao/Maggi, 2018; Chen et al., 2017). Thereby, the accumulation of corporate excess saving over investment has been adding to the large amount of international saving ('saving glut'). Hence, it has been unfolding downward pressure on real interest rates, which has been complicating the conduct of expansionary monetary policy.

To shed light on the rise in corporate saving we study this trend from a national account's perspective (section 2), as well as from the firm-level perspective (section 3). In a first step, we provide stylized facts by analyzing the cross-country differences of national accounting data (2.1). We show that the trend of corporate saving has been most pronounced in countries having large and persistent current account surpluses, i.e., Germany, Japan and South Korea. Second, we review the literature aiming at identifying the use of corporate saving and its determinants. Thereby we analyze the findings of the macroeconomic literature (2.2), and the corporate finance literature, which studies firm-level balance sheet data (3.1 and 3.2). The macroeconomic perspective reveals that the trend in corporate saving is mainly driven by increased profitability that has not been matched by proportional growing dividend distributions. In turn, the rise in profitability has been caused primarily by increases in value added and the simultaneous fall of the labor share and the real interest rate (Dao/Maggi, 2018; Chen et al., 2017). Importantly, the literature emphasizes that corporate net lending (also called excess saving, i.e., the amount corporate saving exceeds corporate investment) is mainly held in liquid assets, such as cash and currency, while a negligible amount is used for equity buybacks and deleveraging. In principal, the corporate finance literature provides a range of variables and motives driving corporate cash holding. Among these, heightened uncertainty and increases in research and development expenses appear to being particularly important factors.

In section 4, we study how the trend in corporate saving is reflected in the aggregated balance sheet of German companies, given the identified motives of cash hoarding, before we provide evidence in 3.2. that the rise in corporate saving is accompanied by an accumulation of equity

¹ As is common in the literature we focus on non-financial corporations since the saving behaviour of financial firms is, to a large extent, determined by regulatory standards. In the following, the term 'corporate' addresses non-financial corporations.

capital and liquidity buffers. As a result, we conjecture which factors might be relevant for the build-up of liquidity buffers in the German corporate sector. In section 5, we discuss the possible implications of the Covid-19 crisis on the accumulation of corporate saving in Germany. The Covid-19 crisis has hit the corporate sector badly leading to declining revenues and profits. In the short run, companies' liquidity buffers have been decreasing and many businesses have been drawing from banks' credit lines or emergency liquidity programs offered by the government as a response to the crisis. It is currently uncertain whether the Covid-19 crisis will attenuate or intensify the trend in corporate saving in the long run. We argue that the Covid-19 shock will strengthen corporates' willingness to rebuild their liquidity buffers to mitigate the adverse effects of future shocks, thereby leading to an even stronger trend in corporate saving in the long run.

2 Corporate saving – the national account's perspective

2.1 What is corporate saving and net lending?

The definition of saving seems to be trivial from an individual household's perspective, in which saving is the part of the after-tax income that is not spend on consumption. From a company's perspective, however, there is an important difference between gross saving and net lending/borrowing. From a flow-of-funds perspective, gross saving denotes retained profits, defined as:

$$\text{gross saving} = \text{gross profit} - \text{dividends} \quad (1)$$

For example, a company that distributes its entire profits to its shareholders has a gross saving of zero, i.e., a company can be profitable but at the same time not be a gross saver. Thus, for a company to be a gross saver, the company has to be (i) profitable, and (ii) distribute less than 100 % of its profits to its shareholders. Thus, gross saving equals the retained profits of the current year from a company's balance sheet perspective.

Net lending, on the other hand, is defined as the part of gross saving that exceeds investment expenditures:

$$\text{net lending} = \text{gross saving} - \text{capital formation} \quad (2)$$

When a company uses 100 % of its gross saving to purchase investment goods, its net lending is zero. Whenever a company purchases a higher volume of investment goods than it can finance with its retained profits, its net lending is negative. Thus, for a company to invest in a higher volume of funds than its gross saving, the company has to borrow money, i.e., the company

becomes a net borrower. If, however, the company purchases a smaller volume of investment goods compared to its retained profits, the company will become a net lender. In this case, its excess saving, i.e., the positive difference between gross saving and investment, has to be allocated to the purchase of financial assets and/or to the reduction of liabilities. Basically, whenever a company is a net lender over a certain period, it is accumulating financial assets and/or reducing its liabilities (see 3.1).

2.2 The global rise in corporate saving

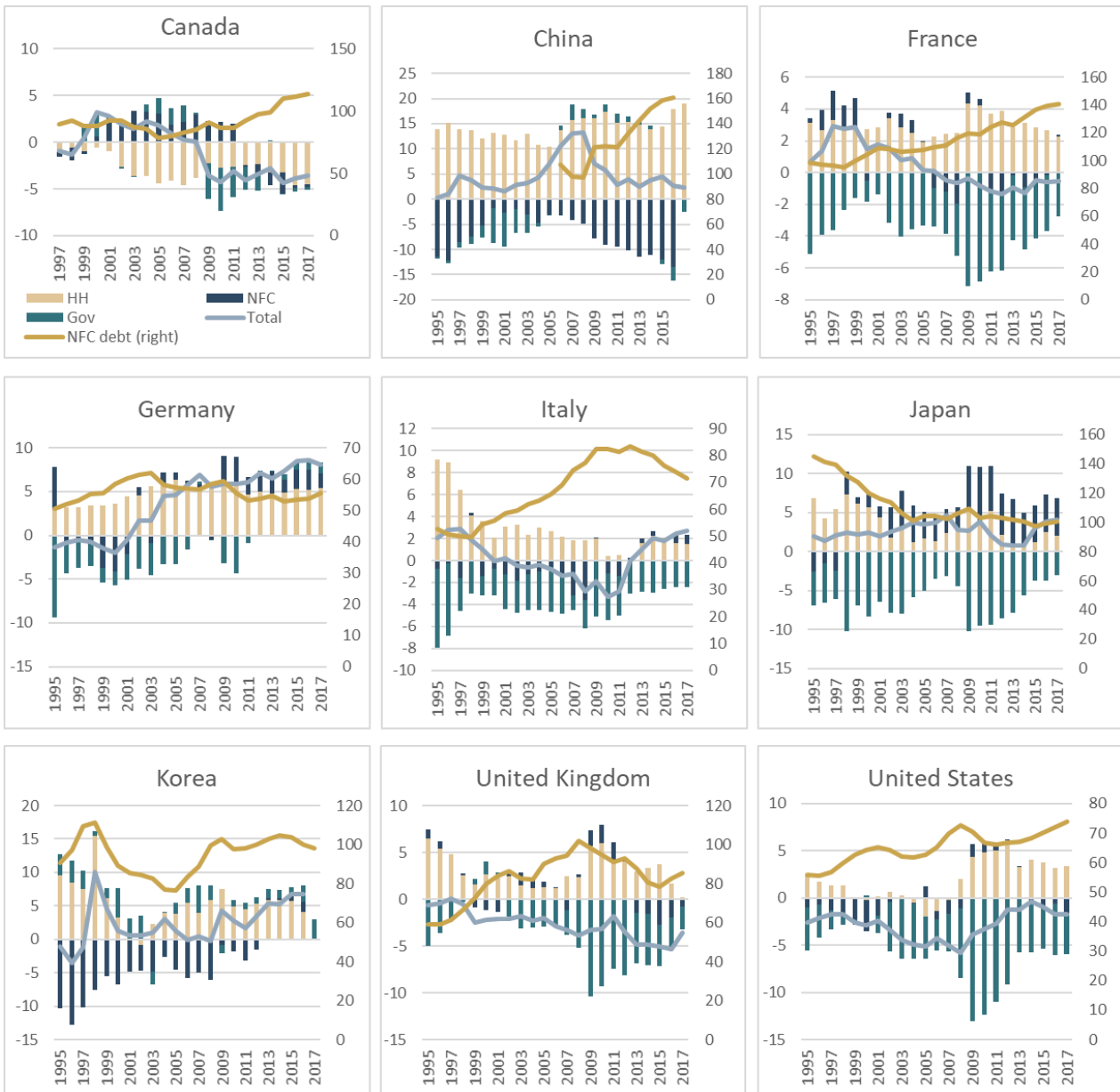
In this subsection we highlight the transition of the corporate sector from being a net borrower to becoming a net lender from the perspective of the national account. To do so, Figure 2-1 breaks down the net lending activities of the economy into its sectoral contributions. Note that the total net lending of the economy equals the current account balance represented by the grey line in Figure 2-1. In addition, the yellow line displays the corporate debt to GDP ratio. To be able to trace back the shifts in corporate net lending to the changes of its components, Figure 2-2 disentangles corporate net lending in accordance with equation (1).²

Apart from Canada, Figure 2-1 displays the well-known pattern of households and governments net lending activities. That is, households accumulate net saving to smooth consumption intertemporally while the government sector borrows to finance its expenditures. Differences can be found in Korea and also partly in China, Germany and Canada. Regarding the development of corporate net lending, the advanced economies can be split into two groups. In the first group the countries' corporate net lending activities have been improving constantly over time until the corporate sector has become a net lender. This group comprises Germany, Japan, Korea and possibly Italy. The second group includes France, Canada, the United Kingdom (UK) and the United States (US). The corporate net lending activities of these countries have not been following a certain pattern but have been volatile. Apart from France, the corporate gross saving rate of these countries has neither been explicitly trending upwards, as in the US and Canada, nor been declining, as in the UK (Figure 2-2). Consequently, the US and the UK corporate sectors have become net lenders caused by common downward trends in investment expenditures rather than in upward trends of gross saving.

Figure 2-1: Sectoral net lending and outstanding corporate debt

In percent

² Deviations between net lending and the net of its component arise due to capital transfers.



Source: Eurostat and Bank of International Settlement (BIS).

Note: HH = Households; NFC = Non-financial corporations; Gov= Government; Total = Current account balance

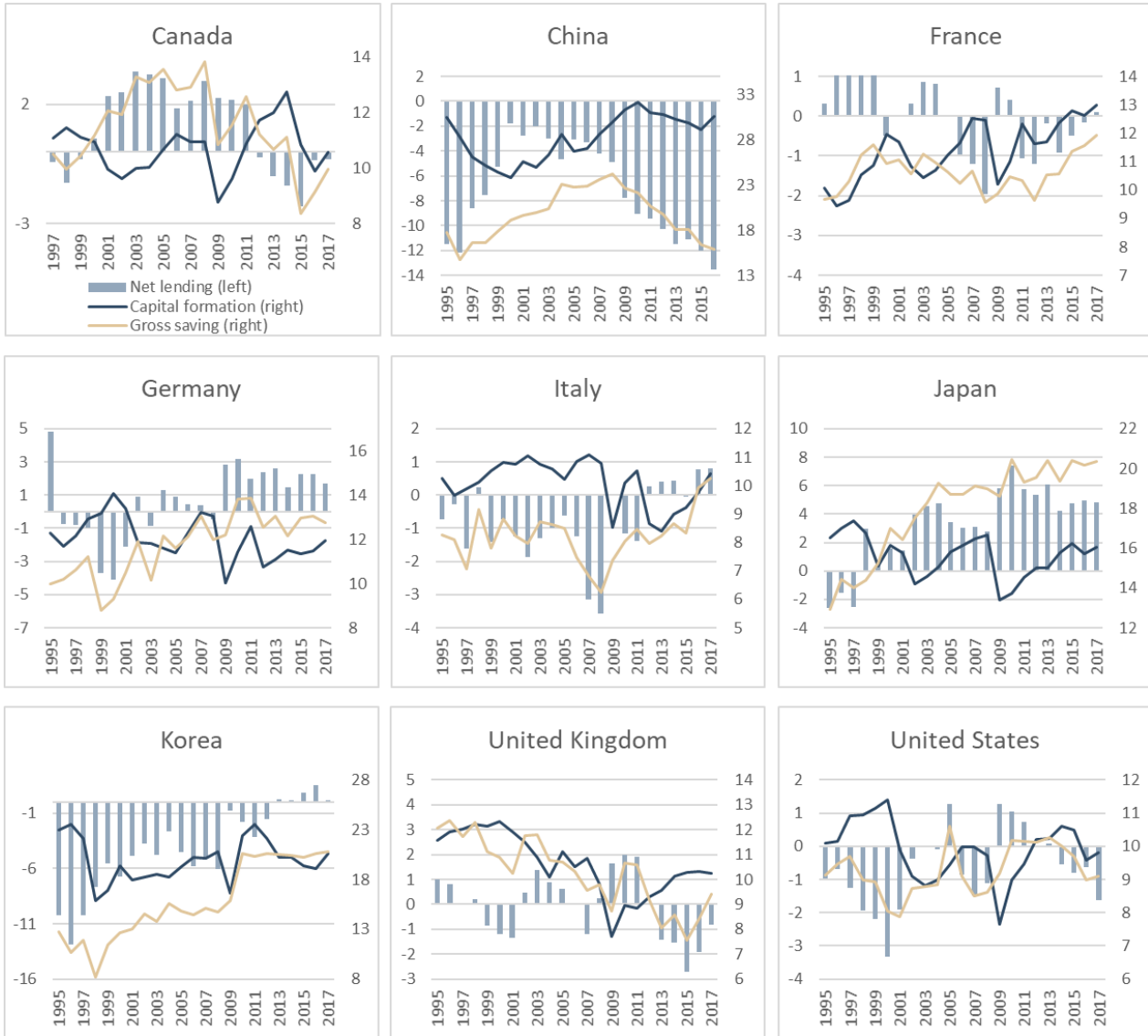
The opposite can be observed for the countries in the first group. The corporate sector of Germany, Korea and Japan have distinct upward trends in gross saving while investment expenditures have either remained constant or declined slightly. For example, in Germany (Japan), the corporate gross saving rate has increased by roughly 2.8 (5.5) percentage points between 1995 and 2017, peaking at 12.7 % (20.3) percent of GDP in 2017.³ For Italy, a constant

³ In Germany, the weak economic development around the turn of the millennium, the resulting deteriorated propensity to invest, and the structural need to strengthen the equity position, all interacted. After the GFC, the risk assessment of the real economy concerning the financial sector and the associated uncertainty about access to lending had such an impact that even more saving have been accumulated (see section 4).

upward trend in corporate saving rate might also have occurred after the global financial crisis (GFC).

Figure 2-2: Corporate net lending, gross saving and gross capital formation

In percent of GDP



Source: Eurostat. Discrepancies occasionally occur due to capital transfers.

It is worth noting that the countries with the most pronounced increase in corporate gross saving and the most persistent improvement in net lending activities also exhibit high and persistent current account surpluses, namely Germany, Korea, and Japan. In Germany, this connection is particularly revealed in the simultaneous shift of the current account and the corporate financial balance into positive territory in 2002. A similar co-movement can be observed in Italy in the years following the GFC. Altogether, one pattern of corporate net lending is shared among all advanced economies, i.e., its (temporary) improvement during and after the GFC.

The development of China's corporate net borrowing reminds one of an inverted U-shape, covering improvements before the GFC and subsequent deteriorations. However, China appears to be the only country that incorporates persistent current account surpluses in combination with persistent negative corporate sector lending activities. Together with the high investment rates of up to 32 % of GDP, the latter may reflect China's status as an emerging economy, which implies high investment needs and rents.

The corporate debt to GDP ratio roughly covers the adjustments in corporate net lending. Except for Japan, Germany and Italy, the improvements in the corporate financial balance have not yet resulted in a sustainable deleveraging of the corporate sector (see Dao/Maggi, 2018). In contrast, the corporate indebtedness has been rather following an upward trend in several countries such as Canada, China, France, Italy, the UK, and the US. In Germany, the corporate debt ratio had been rising until the beginning of the 2000s, years before it has been declining simultaneously with the accumulation of excess saving. As will be discussed in section 4, empirical evidence of the Bundesbank (2017) supports this conjecture. Apart from that, in an international comparison, Germany's corporate debt to GDP ratio is quite low, reaching 55 % of GDP in 2017, i.e., the lowest level across all countries under consideration. In contrast, the corporate sectors of Canada, China (2016) and France have been indebted at over 100 % of GDP in 2017, respectively.

2.3 Drivers of corporate saving from the national account's perspective

The analysis of the national account data revealed that the global rise in corporate net lending is attributable to increasing gross saving and constant or declining investment expenditures. According to equation (2), the expansion of corporate gross saving in turn can be caused by increasing gross profits and/or decreasing dividends. According to André et al. (2007), the IMF (2006), Chen et al. (2017) and Dao and Maggi (2018), the rise in gross saving has been driven by the sharp rise in corporate profitability in recent decades, which has outperformed the growth of dividend distributions. Against this background it is not surprising that the corporate sectors of Germany, Korea, and Japan have experienced the highest increases in profitability, as they also show the strongest rise in gross saving (Dao/Maggi, 2018). The rise in corporate profits, on the other hand, can be traced back to improvements in companies' gross value added and market power, as well as to the simultaneous decline of expenses such as interest payments and labor costs.⁴ As with dividends, the increase in the corporate tax burden also remained below the growth in profits, which additionally boosted the rise in profits and the accumulation of saving (Chen et al., 2017; Dao/Maggi, 2018).

⁴ For Germany and Europe, this is consistent with the observation that the Phillips curve has increasingly flattened out, or at least the traditional relationship has broken (see Deutsche Bundesbank 2016 and 2016a).

Klug et al. (2018) investigate the relationship between Germany's large and persistent current account surpluses and the rise in corporate saving. They show that net exports and corporate saving similarly respond to macroeconomic shocks such as labor supply and technology shocks. Gruber and Kamin (2016), on the other hand, attribute the rise in excess saving to the dramatic plunge of investment expenditures after the GFC. Though corporate net lending has (temporarily) improved after the GFC across all countries, as discussed in subsection 2.1, their approach lacks explaining the increase in corporate saving prior to the GFC. Finally, Armenter and Hnatkovska (2017) apply a general equilibrium model to show that companies' uncertainty about their future ability to obtain external funding drive their need to accumulate saving. Thus, this paper emphasizes the **precautionary motive** of corporate saving (see e.g., Alfaro et al., 2018). Finally, recent work of the IMF (2019) hypothesizes that the rise in corporate saving reflects and reinforces wealth and income inequality in Germany since corporate ownership is highly concentrated. Thus, the underlying increase in profitability has boosted the assets of the companies' owners while the labor share has been declining due to wage restraints.

3 Corporate saving – the firm-level perspective

Apart from the macroeconomic literature on corporate saving, there is a large strand of literature capturing the company-level perspective. This literature aims at identifying firm characteristics and motives associated with corporate net lending by drawing empirical evidence from companies' balance-sheet data. These studies focus exclusively on US firms, apart from the contributions of Dao and Maggi (2018) and Pinkowitz et al. (2006) who study international business behavior. Before we discuss the determinants of corporate net lending identified by this literature (3.2), we first provide more detailed evidence on the use of net lending (3.1).

3.1 The use of gross saving

Following Dao and Maggi (2018), corporates' gross saving can be used as follows:

$$\text{gross saving} = \text{capital formation} + \text{net lending} \quad (3),$$

whereby

$$\text{net lending} = \Delta \text{financial assets} - \Delta \text{financial liabilities} \quad (4).$$

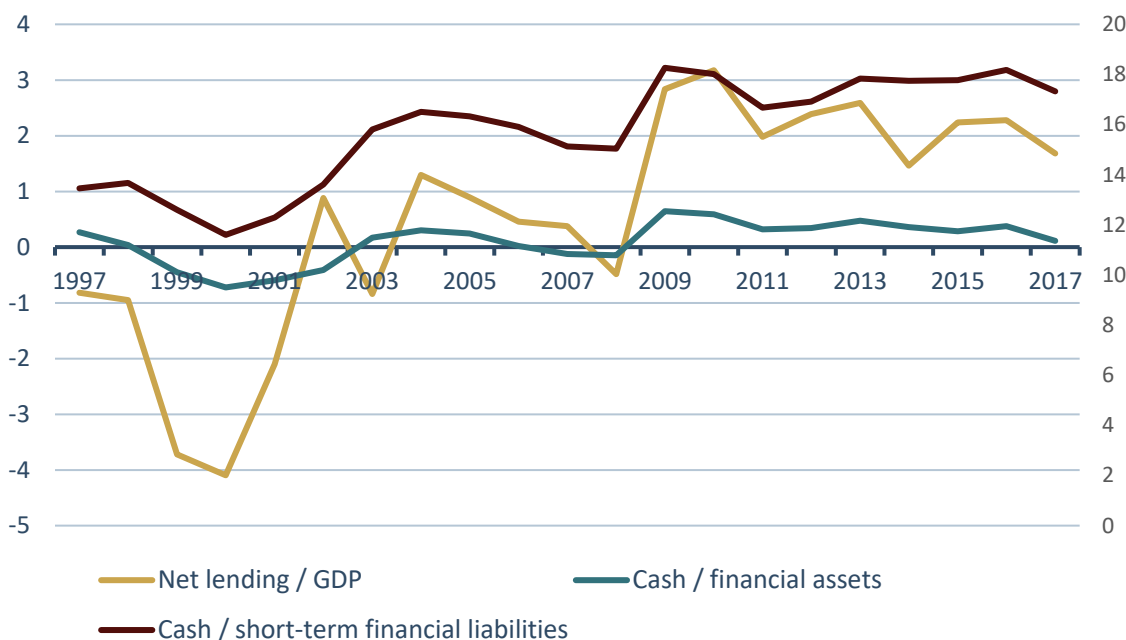
This definition implies that firms' net lending is primarily used for improving their liquidity position by increasing their financial assets and/or decreasing their financial liabilities. However, net lending can in principle also be used for equity buybacks. Evidence provided by Chen et al. (2018) and Dao and Maggi (2018) show that equity buybacks can only explain a negligible part of the rise in corporate net lending, except for US firms. A report by Deutsche Bundesbank

(2019) supports this finding for the use of corporate saving in Germany, even though an increased number of large companies have recently bought back shares.⁵

Apart from that, Dao and Maggi (2018) identify a small effect of debt reductions on driving excess saving across a panel of advanced economies. In contrast, by analyzing the data of German companies, the Deutsche Bundesbank (2019) finds a significant effect of deleveraging activities on German corporate net lending. These results confirm the conjectures made in section 2, that the deleveraging of the corporate sector has only been sustainable in a few countries, including Germany.

Figure 3-1: Net lending and cash ratio of German companies

In percent of GDP (left), in percent of financial assets, in percent of financial liabilities (both right)



Source: Deutsche Bundesbank, Eurostat, own calculations

However, by considering a panel of advanced countries, the findings of Dao and Maggi (2018), and also those of Chen et al. (2018) for the US, strongly suggest that excess saving are mainly held in liquid assets such as deposits or currencies. Thereby, in most countries corporate net lending has been accompanied by rises in liquid financial assets that outperformed the growth in liabilities.⁶ Dao and Maggi (2018) draw this conclusion, inter alia, from the strong correlation

⁵ DAX and MDAX companies experienced the highest buyback volume in 2008 (EUR 17 billion). With the financial crisis, this came to an almost complete standstill, while shares were bought back for EUR 5 billion in the first four months of 2020 alone. In the USA, the Trump tax reform of 2017 has given the share buyback a powerful boost: in 2018 alone, it was for USD 806 billion; in 2019 it was over USD 700 billion. Concerned that the Covid-19 crisis could develop into a major banking crisis, the US Federal Reserve banned share buybacks and dividend increases for big banks, initially for three months and subsequently until the end of 2020.

⁶ In Germany and Italy, the growth in liabilities has been slowing down over time, while in Japan liabilities have been declining since 1995. Both developments reflect the deleveraging processes of these countries' corporate sectors described in subsection 2.1 (see Dao/Maggi, 2018).

between corporate cash holdings over total assets and corporate excess saving, which is evident across all of the countries under consideration. Dao and Maggi (2018) emphasize that this correlation is particularly strong for German companies, which is reflected by a correlation coefficient of 0.84 (see Figure 3.1). Since the rise in corporate net lending in Germany is accompanied by rising cash holdings and debt reductions, the amount of cash on short-term liabilities (cash ratio) has, unsurprisingly, also been rising over time. The cash ratio also strongly correlates with the corporate excess saving, as expressed by a correlation coefficient of 0.92.

3.2 Drivers of corporate saving from the firm-level perspective

The corporate finance literature identifies the following factors as drivers of corporate liquidity:

- Dao and Maggi (2018) and Bates et al. (2009) provide evidence for the **precautionary motive of saving** from the firm specific perspective. They show that companies facing higher idiosyncratic uncertainty accumulate more liquidity. In addition, Dao and Maggi (2018) also exhibit that aggregate uncertainty, proxied by the economic uncertainty index (EPU), drives firms' cash hoarding.
- Dao and Maggi (2018) and Bates et al. (2009) also find evidence for the **transactions motive** as they show that larger firms tend to accumulate less saving than small companies. According to this motive, large businesses face economies of scale when transforming non-financial assets into cash, which in turn reduces the need for liquidity.
- From another point of view, Begenau and Palazzo (2016), Booth and Zhou (2013) and Graham and Leary (2017) show that the rise in corporate saving reflects changes in the **composition of companies**. Since the 1980s and 1990s more high-tech and R&D-intensive businesses have entered the US stock market which have been more willing to hold cash compared to incumbent companies. However, Dao and Maggi (2018) show that the trend of more R&D-intensive companies entering the US stock market only lasted until the early 2000s and has reversed subsequently. In accordance, Chen et al. (2017) also emphasize the pervasiveness of the rise in corporate saving across industries.
- Falato et al. (2014) highlight the increased importance of **intangible assets** in value added. They argue that the ability of pledging intangibles as collateral for external funding is constrained. Consequently, corporates need to accumulate liquidity to have enough internal resources to finance future investments. Supporting this argument, Bates et al. (2009), Pinkowitz (2015) and Dao and Maggi (2018) find evidence that companies with higher research and development (R&D) spending tend to hold more cash.
- Della Seta (2011), Morellec et al. (2014) and Lyandres and Palazzo (2016) draw attention to the role of heightened intensity in product market **competition**. Given financial market

restrictions, enhanced competition increases firms' reliance on internal funds to finance investment necessary for the survival of the company.

- According to Chen et al. (2017) and Mao and Daggi (2018), another determinant of cash accumulation is **foreign income**. Chen et al. (2017) underline that this relationship does not reflect the lower tax payments of multinationals realized by profit shifting to tax havens. In contrast, they argue that this finding rather expresses the larger profitability of export-orientated firms. On the contrary, Foley et al. (2007) argue that US multinationals' saving activities can partly be explained by the intention to avoid tax costs associated with the repatriation of foreign income (**tax motive**).
- Jensen's (1986) work emphasizes the **agency motive** of cash holding, which predicts that firms with entrenched managers and no good investment opportunities are reluctant to pay out dividends. The results of Dittmar et al. (2003), Kalcheva and Lins (2007), Pinkowitz et al. (2006) and Dao and Maggi (2018) confirm the importance of agency problems for cash holding.

4 Corporate saving in Germany: An analysis of aggregated balance sheet data

Before we analyze how the trend in corporate gross saving affected German corporates' equity capital and other balance sheet positions, we first show how saving is allocated on a firm's balance sheet in principal. According to equation (1), gross saving is defined as retained profits. If the company's profit is retained, it can be used to increase the company's equity capital at the end of the fiscal year:

$$equity\ capital(t) = equity\ capital(t - 1) + retained\ profit(t) \quad (5)$$

Thus, we would expect that a longer period of corporate saving activity results in higher equity capital buffers.

Given the definition of gross saving and net lending provided by equation (3) and (4), respectively, we can express the change in equity capital as:

$$\begin{aligned} \Delta equity\ capital \\ = capital\ formation + \underbrace{\Delta financial\ assets - \Delta financial\ liabilities}_{net\ lending} \end{aligned} \quad (6)$$

According to this equation, the increase in equity capital can be used to purchase capital goods, to increase financial assets and/or to decrease financial liabilities.

In the last two decades, the composition of investment and funding has changed, which can be inferred from the development of the asset side and the liability side of the aggregated firms balance sheet:

- Physical assets have gradually declined from 30.7 % of total assets in 1997 to 22.5 % in 2017, which is in line with the findings of studies covering the US (e.g., Falato et al., 2014).⁷ However, in contrast to the US, the corporate sector in Germany has not significantly increased its share of intangible assets (see Figure 4-1).
- Although, while intangible assets have become more important for the corporate sector in the USA, acquisitions have become more relevant for the German corporate sector. These have increased in Germany from 9.9 % of total assets in 1997 to 19.4 % of total assets in 2017 (see Figure 4-1). Nevertheless, results of a study from Deutsche Bundesbank (2019) provide evidence that acquisitions of foreign firms are not significantly related to corporate gross saving, though the retained earnings of foreign subsidiaries count as both gross saving and direct investment for the German parent company. On the other hand, targeted acquisitions of domestic companies could have been an important driver for the accumulation of liquidity.

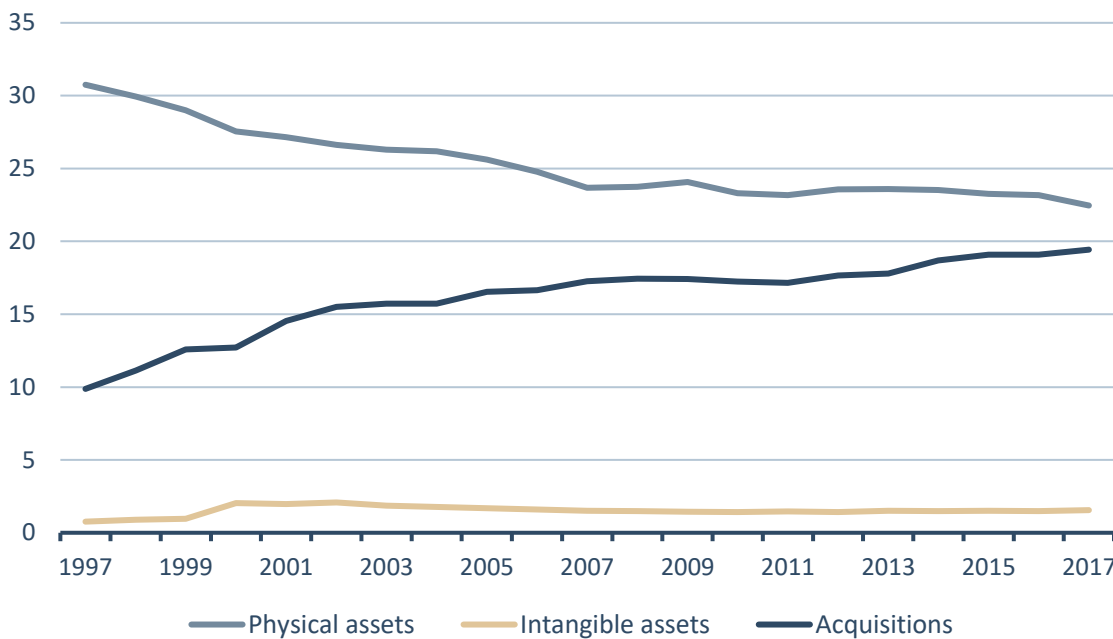
On the liability side of the corporate sector's balance sheet we see an increase in equity capital from 20.4 % in 1997 of total assets to 31.2 % of total assets in 2017 (equity capital ratio, see Figure 4-2).⁸ In line with the discussion in 2.1 and 3.2, bank loans have been declining, from 19.3 % of total assets to 10.5 % of total assets, despite the low interest rate environment. While the reduction in bank loans probably reflects the deleveraging associated with the rise in corporate saving in Germany, it may also reflect the substitution of bank loans by inter-company loans. Taking the trends of the balance sheet's liability and asset side together, the rise in liquidity hoarding and deleveraging together with the increase in corporate saving has resulted in growing equity capital.

⁷ Across 24 OECD countries, the share of investments in machinery and equipment has decreased by one percentage point (median, in relation to GDP) between 1995 and 2020. In contrast, corporate investment in intellectual property increased by almost 1.5 percentage points.

⁸ Except for the expansion during the dot-com boom, the issuance of new capital has remained more or less stable over the period (see Bundesbank, 2012).

Figure 4-1: Physical and intangible assets, and acquisitions of German companies

In percent of total assets



Source: Deutsche Bundesbank, own calculations

Given these structural changes in the composition of Germany's aggregated corporate balance sheet, we aim to analyze the importance of the drivers that have been identified as relevant in the literature (3.2):

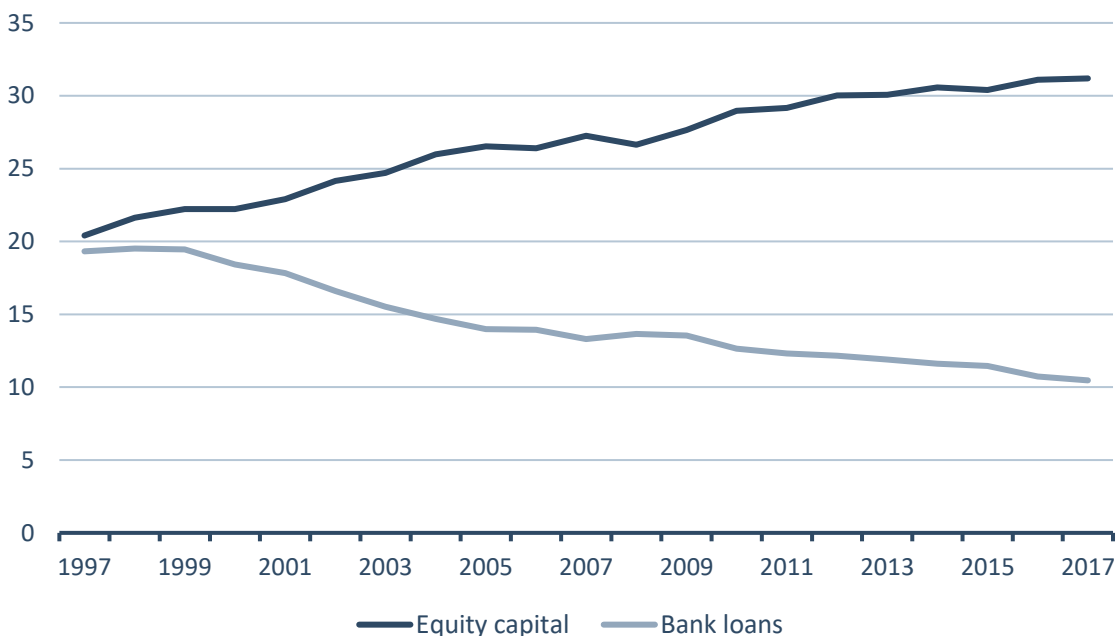
- The decline in physical assets in percent of total assets could be due to a heightened importance of intangible assets that might be associated with larger cash holdings, as discussed before. However, it seems unlikely that German companies have increased their saving to provide financing for future expenditures on intangibles. Firstly, the share of intangibles on total assets is modest, e.g., 1.5 % in 2007, and secondly, it has been declining since the early 2000s for a substantial period. Nevertheless, German corporates may have been holding cash for the realization of targeted acquisitions.
- Before the tax reform in 2000 retained profits were taxed at a higher rate than distributed profits, leading companies to operate with lower equity capital ratios. With the reform, tax rates were harmonized to an equal rate, which increased the incentive for companies to retain profits and increase their equity capital ratios. Though, the Deutsche Bundesbank (2019) does not find evidence that the harmonization of the tax rates affected corporates retained earnings significantly (tax motive).
- After the two sharp recessions in 2001 and 2008, companies experienced that having a stronger balance sheet makes them more resilient to economic shocks, particularly financial shocks, which have a negative effect on external funding. Therefore, companies may have

been raising their equity capital buffers as well as their liquidity buffers, i.e., they became gross savers as well as net lenders. Additionally, the heightened uncertainty associated with these recessions might have increased firm’s willingness to hold cash and so be better prepared for future shocks, i.e., the precautionary motive of saving.

- Since the bank regulation known as Basel II from 2004, the access to credit has been more restrictive, resulting in companies having an incentive to increase their equity capital ratios to gain creditworthiness. This hypothesis is consistent with the developments of the liability side of the balance sheet of the corporate sector.

Figure 4-2: German companies’ equity capital and bank loans

In percent of total assets



Source: Deutsche Bundesbank, own calculations

5 Will the Covid-19 crisis change the trend in corporate saving?

Currently, the key question arises whether the Covid-19 crisis will substantially change the trend in corporate saving. Since the Covid-19 shock has negatively affected the revenues of companies and thereby led to a deterioration of their liquidity and equity capital buffers, there is the question as to how this development affects the saving behavior of companies.

The immediate effects of the Covid-19 shock on companies’ balance sheets are:

- a decline in gross saving since profits have declined or turned into losses;

- a decline in the liquidity buffers of firms since they have to continue payments, while revenues have stopped or declined;
- decreasing equity capital buffers due to declining profits and/or declining liquidity;
- increasing short-term debt to cover costs in times of deteriorating revenues;
- a decline in net lending since financial assets have been reduced and financial liabilities have increased.

In the short-term, the Covid-19 shock may have mitigated corporate saving activities due to a decline in revenues and profits. However, many governments have responded quickly and appropriately by using instruments to secure liquidity. These instruments, e.g., short-time working allowance, tax deferrals, loan guarantees and grants, are aimed at bridging the escalation phase of the crisis to enable companies to continue their businesses during and after the crisis without serious loss of liquidity and equity. Even if there will not be a wave of insolvencies, which will put the banking system under pressure (Demary/Hüther, 2020), considerable consequences will continue to have an impact on companies' capital adequacy, such as the slack of demand and heightened uncertainty about the future course of the Covid-19 crisis.

Regarding the long-term effects of the pandemic on corporate saving behavior, we assume that the precautionary saving motive will have a strong effect on corporate saving in the future. In this vein, we expect that companies will restore their liquidity and equity capital buffers in the aftermath of the Covid-19 crisis due to the following most probable developments:

- In the medium-term, company revenues will normalize, leading to rising profits. Uncertainty associated with the medium-term course of the Covid-19 crisis could then lead to rising corporate saving. In addition, many firms might have realized that the build-up of liquidity buffers in the past has strengthened their financial position and made them more robust against adverse shocks. Hence, companies might have an incentive to build up their liquidity buffers in order to be prepared for the next recession, if possible, even beyond the level before the Covid-19 crisis.
- If banks suffer from credit losses during the recession, they will probably more restrictive in their lending. This will particularly affect companies with low equity capital buffers. Companies will therefore most likely aim to restore their equity capital buffers in order to secure their access to external funding.
- Companies will have to repay their short-term debt before they can apply for new loans to purchase new investment goods.

Given these scenarios, companies will most likely have to strengthen their balance sheets before they can engage in new investments. This means that the period after the Covid-19 shock will probably be characterized by companies deleveraging, i.e., a period of low investment and increasing profits, which translates into rising corporate saving. As a result, the precautionary motive of saving, as described above, will probably be reinforced by the general perception of risk, which is likely to continue to rise as it has after other serious crises since the turn of the Millennium, e.g., the Dot-com bubble, 9/11, the Iraq war, the GFC and the Eurozone debt crisis.

Taken together, we expect the Covid-19 shock to decrease corporate saving in the short-term, but to strengthen it in the long run, eventually to a higher level.

6 Conclusion and outlook

In recent decades, the corporate sectors in most advanced economies have transitioned from being a net borrower to becoming a net lender to the rest of the economy. Thereby, the rise in corporate profits was not accompanied by proportionally increasing dividends and investment expenditures, which has led to an accumulation of excess saving on a firm's balance sheet, mostly in the form of liquid financial assets.

At the beginning of the Covid-19 crisis companies experienced a fast decline in revenues. While for large corporates the breakdown of trade relationships was a cause for the decline in revenues, for others, like hotels and restaurants, social distancing has led to a worsening financial position. In the short-term, the Covid-19 shock has increased households' saving but has interrupted or mitigated the trend in rising corporate saving.

The corporates' build-up of liquidity buffers has helped them to mitigate the short run effects of the Covid-19 shock, though many companies had to increase their short-term indebtedness to cover their running costs. Thus, the Covid-19 crisis has not only interrupted the process of corporate saving, but has also increased corporate indebtedness without increasing investment, which has worsened companies' balance sheets. We conclude that companies will probably be engaged in a debt-deleveraging process in the aftermath of the Covid-19 crisis, i.e., reducing debt levels and improving balance sheets might become more relevant for companies than investing. During this period of suppressed investment, companies will probably use their profits to restore their equity capital buffers and liquidity buffers and thus restore the corporate sector's creditworthiness.

Altogether, we assume that the Covid-19 crisis has dampened the trend of corporate saving in the short run. However, in the long run the Covid-19 shock will most probably strengthen corporate saving activities, since companies have experienced that having higher equity capital and liquidity buffers can be beneficial in crises during which liquidity dries up.

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