

Business investment after the crisis and the impact of monetary policy

IN-DEPTH ANALYSIS

Abstract

Monetary policy can stimulate business investment in various ways, most directly by improving financing conditions. Despite the expansionary policy of the ECB, however, business investment in the euro area has not yet rebounded, following the strong declines it experienced during the Global Financial Crisis and the Sovereign Debt Crisis. We analyze the weakness in business investment in the euro area and the role of monetary policy along three aspects. First, we investigate which factors have been the most important impediments on business investment since the Global Financial Crisis. Second, we assess how business investment has developed compared to the historical experience with other financial crises. Third, we analyze how effective monetary policy is in stimulating business investment today.

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CONTENTS

EXECUTIVE SUMMARY	4
1. INTRODUCTION	5
2. DRIVERS OF INVESTMENT AND MONETARY POLICY: THEORETICAL CONSIDERATIONS	5
3. MAIN DRIVERS OF BUSINESS INVESTMENT SINCE THE GLOBAL FINANCIAL CRISIS	6
4. PATTERNS OF ECONOMIC ACTIVITY AND BUSINESS INVESTMENT DURING FINANCIAL CRISES	11
5. HOW EFFECTIVE IS MONETARY POLICY IN THE AFTERMATH OF FINANCIAL CRISES?	14
6. SUMMARY AND CONCLUSIONS	16
REFERENCES	17

EXECUTIVE SUMMARY

- Monetary policy can stimulate business investment in various ways, most directly by improving financing conditions. Despite the very expansionary policy of the ECB, however, business investment in the euro area has not yet rebounded, following strong declines during the Global Financial Crisis and the Sovereign Debt Crisis.
- Empirical studies suggest that the decline in economic activity has been the most important reason for the weakness in business investment in advanced economies since the Global Financial Crisis. According to these studies, high levels of economic uncertainty and unfavourable financing conditions also dampened business investment, albeit to a smaller extent.
- In the euro area, uncertainty has alleviated recently and financial conditions have improved. Business surveys suggest that, at the aggregate euro area level, financial constraints are not a major concern of firms anymore. Therefore, low economic activity currently also seems to be the most important factor behind weak business investment in the euro area.
- Experience with financial crises around the world suggests that they are usually associated with persistent declines in economic activity as they are accompanied by long-lasting balance-sheet adjustments in the private and/or public sector, reflecting inter alia serious capital stock distortions due to preceding malinvestments. Against this backdrop, economic activity and business investment in the euro area most likely will remain weak relative to the pre-crisis trend.
- The largest difference compared to other advanced economies that were also hit by the Global Financial Crisis is that the euro area was hit by a second financial crisis, the Sovereign Debt Crisis. This triggered a second recession, while business investment in other economies continued to grow, albeit at a relatively weak pace. However, the path of business investment in the euro area has still been fairly in line with historical experience from other financial crises.
- Given that economic policies, including monetary policy, were not systematically wrong during other financial crises, historical evidence suggests that monetary policy can only be of little help to further stimulate business investment in the euro area today. This argument is supported by studies that analyze the effectiveness of monetary policy during and in the aftermath of financial crises: Monetary policy indeed seems to be very effective in stabilizing the economy at the height of a crisis (e.g. by reducing uncertainty and restoring confidence). By contrast, monetary policy in general is less effective in the aftermath of a crisis since adjustment processes in the economy (e.g. deleveraging) harm important transmission channels.
- Altogether, business investment most likely will remain below its pre-crisis trend, which is a normal consequence of financial crises. While monetary policy may have significantly contributed to stabilize business investment at the beginning of the Global Financial Crisis and the Sovereign Debt Crisis in the euro area, at present there seems to be little scope for the ECB to further stimulate investment. Structural policies that improve potential output seem the most promising way to achieve a sustainable acceleration in investment activity.

1. INTRODUCTION¹

Business investment is a key driver of economic activity as it is pro-cyclical to GDP. At the same time, it is a key determinant of long run growth since it determines the capital stock that is available for future production. Business investment in the euro area strongly declined during the Global Financial Crisis and the Sovereign Debt Crisis and since then has shown little signs of a rebound towards its pre-crisis trend. Remarkably, this holds true against the backdrop of the very expansionary monetary policy stance of the ECB, which has also resorted to a set of unconventional monetary policy measures.

In this Briefing Paper, we analyze why the recovery in business investment in the euro area has remained weak despite the very expansionary stance of the ECB. We start by briefly describing the main theoretical determinants of business investment and discussing the transmission channels through which monetary policy can stimulate business investment (Section 2). Next, we review the literature on the most important factors holding back business investment in the euro area and other advanced economies since the Global Financial Crisis. We provide evidence of how these factors have recently developed in the euro area and discuss which of these factors seem to be particularly important for holding back business investment at the current juncture (Section 3). Given that the Global Financial Crisis and the Sovereign Debt Crisis seem to have played a crucial role for business investment in the past years, we proceed by discussing typical patterns in the aftermath of financial crises and check how recent trends in business investment in the euro area relate to these patterns. We discuss what this means for the prospects of business investment in the euro area and for monetary policy's prospects of further stimulating business investment (Section 4). We then proceed by debating how effective monetary policy generally is in stimulating economic activity during and in the aftermath of financial crises and draw conclusions for the current situation in the euro area (Section 5). Finally, we summarize our results and briefly discuss the outlook for business investment in the euro area (Section 6).

2. DRIVERS OF INVESTMENT AND MONETARY POLICY: THEORETICAL CONSIDERATIONS

Investment dynamics are driven by multiple factors. Early models highlight the effect of output growth on investment (the so-called “accelerator models”, see Clark 1917). However, whether or not net investment increases in response to changes in economic activity also depends on several other factors, such as the rate of capacity utilization, expectations of demand, and the level of economic uncertainty. Firms are more likely to invest if capacity utilization is high and they are less likely to invest if there is excess capacity. Since firms consider potential future sales when they make investment decisions, low expectations of demand in upcoming years might be a main cause of an investment slump. Related, high levels of uncertainty with respect to future output or potential policy changes might impede or postpone investment activity, because firms unable to gauge future developments are induced to take a wait-and-see strategy (see, amongst others, Bloom 2009, Julio and Yook 2012, EIB 2013).

The “neoclassical model of investment” – the typical macroeconomic textbook model – highlights the role of the cost of capital, in addition to output growth, for determining the level of investment (Jorgenson 1971). Accordingly, a decrease in the interest rate and, hence, a decline in the cost of capital makes a greater number of potential investments

¹ The authors thank Klaus-Jürgen Gern and Stefan Kooths for very useful comments and discussions.

profitable. The well-known Tobin's q measure, which is related to the neoclassical model (Hayashi 1982), stresses the link between investment decisions and stock price movements, which in principle should summarize all relevant information. Following this theory, a firm is encouraged to invest if the market value of its capital is higher than the actual replacement cost of its capital. Though often not considered in standard models, the extent of financing constraints is a further important factor of a firms' investment behaviour. Firms are prevented from making investments when they have insufficient internal funds and are unable to resort to (or have limited access to) external funds (e.g. bank loans).

Monetary policy can directly influence investment by affecting financial conditions. However, it could also influence investment indirectly, e.g., by stimulating economic activity, which in turn stimulates investment via accelerator effects. In this regard, the theoretical literature distinguishes several transmission channels (Mishkin 1996). The different channels interact with each other and their respective timing and relative importance also depend on the specific institutional environment and the structure of an economy. The most direct channel is the interest-rate channel: *ceteris paribus*, changes in the policy rate might influence interest rates that commercial banks charge to their customers. A decrease in commercial interest rate lowers the cost of borrowing and therefore encourages investments. At the same time, a decrease in interest rates discourages saving and stimulates overall demand for goods and services.

The so-called credit channel of monetary policy transmission can be divided into a bank-lending and a balance-sheet channel. According to the bank-lending channel theory, a monetary stimulus that increases bank reserves and bank deposits leads to an increase in loan supply which will have a positive effect on investment. This might especially hold true for (smaller) firms that are dependent on bank loans, as other sources of external and internal finance are not available (ECB 2005). The balance-sheet channel emphasizes information asymmetries in the credit market. By improving the firms' balance sheet positions, monetary policy might be able to reduce problems related to adverse selection and moral hazard and ultimately increase lending to finance investments.

Another transmission channel of monetary policy is the effect that interest-rate changes and other policy measures have on the prices of various assets. Following Tobin's q , if the market value of a firm increases as stock prices rise due to an interest rate cut by the central bank, firms might be encouraged to issue new shares and use these funds to start additional investment projects. Changes in asset prices also imply wealth effects: higher stock prices might lead to greater financial wealth and eventually to stronger demand.

Furthermore, monetary policy also works via affecting firms' expectations of future demand developments and financing conditions and thereby affecting current investment decisions. In a similar vein, monetary policy actions can help to reduce the uncertainty about the future path of the economy and thereby stimulate output growth.

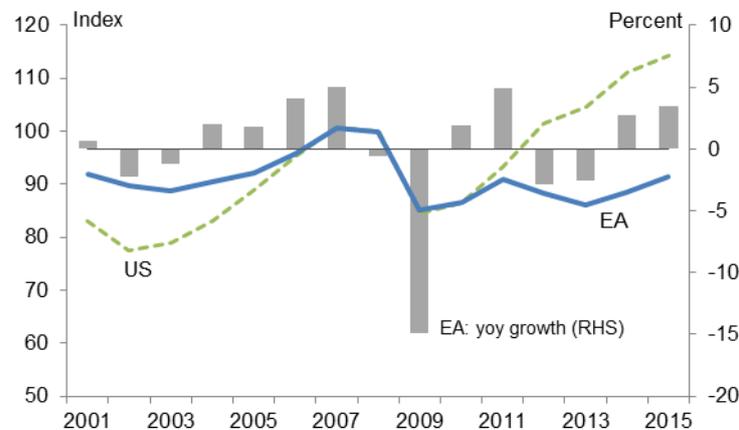
3. MAIN DRIVERS OF BUSINESS INVESTMENT SINCE THE GLOBAL FINANCIAL CRISIS

In the following, we first provide some stylized facts on business investment in the euro area since the Global Financial Crisis. We then review the literature on the key drivers of business investment in advanced economies, with a special focus on the euro area. Finally, we show how these key drivers have recently developed in the euro area.

Stylized facts on business investment in the euro area

Business investment declined sharply by about 10 percent during the Global Financial Crisis in 2009 (Figure 1).² After showing some signs of recovery, the euro area economy was hit by a second financial crisis (the Sovereign Debt Crisis); this triggered another recession, associated with another decline in business investment of more than 5 percent in 2012 and 2013. Since 2014 business investment has been growing again at relatively solid rates. The recovery is, however, widely perceived as being weak. This is due to the strong decline that investment has undergone during the two financial crises. In 2015, business investment was still about 10 percent lower than in 2008. If business investment continues to grow at the current pace over the next years, it will not be able to reach its pre-crisis trend. Thus, the financial crises would have led to a permanent decline in the level of business investment. Compared to other countries that were hit by the Global Financial Crisis, the most outstanding feature of the euro area is that it was hit by a second crisis in 2012. Before that crisis, the recovery in business investment was broadly in line with the recoveries in other economies. In fact, the path of business investment in the euro area between 2008 and 2011 was similar to the path of business investment in the United States. However, business investment in the United States and other advanced economies also remained weak compared to pre-crisis trends.

Figure 1: Business investment in the euro area and the US (2001-2015)



Notes: Annual data. Index: 2008=100. As data for business investment in the euro area is not provided by official sources, we calculate a proxy for real business investment by subtracting investment in dwellings and public investment from Gross Fixed Capital Formation. Real public investment in the euro area is computed by deflating the nominal series using the deflator for construction investment.

Source: AMECO; OECD; own calculations.

Key drivers of business investment since the Global Financial Crisis

Several studies (among them studies from different institutions, such as the European Commission, the IMF, and the BIS) have empirically analyzed the reasons behind the weak performance of investment in Europe and other advanced economies since the Global Financial Crisis. Overall, the weak performance of investment seems largely to be due to accelerator effects, meaning that sluggish economic activity has lowered the need for

² We focus on business investment due to its outstanding importance for economic activity and because it has contributed most to the decline in Gross Fixed Capital Formation (GFCF) since the Global Financial Crises. Clearly, housing and public investment have also sharply declined. Many of the arguments presented in this Briefing Paper would also apply to housing investment.

additional business investment and can explain the lion's share of subdued investment dynamics.

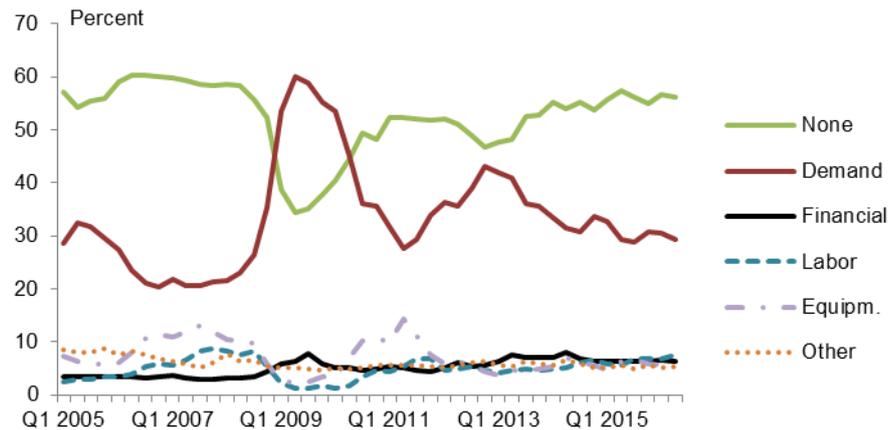
The European Commission (2015) argues that weak economic activity is a main driver of the slump in investment but also points to deleveraging pressures in the private sector. Low economic activity, as the most relevant driver holding back investment, has also been emphasized in analyses of the IMF (IMF 2015, Barkbu et al. 2015). The IMF (2015) states that little of the observed investment dynamics in a sample of advanced economies remains unexplained after the effects of changes in output are taken into consideration. The weakness in economic activity itself, however, might be the result of a multitude of different factors.

Several studies additionally stress the role of high uncertainty for investment decisions. Based on evidence for the G7 economies, the BIS (2015) concludes that economic uncertainty was a significant drag on investment growth. In contrast, a lack of funding does not seem to represent a substantial factor. Generally, financing constraints apparently only have been a serious concern for some firms and some countries (EIB 2013, IMF 2015). The Deutsche Bundesbank (2016) also finds that uncertainty has a notable role in explaining investment activity in large euro area countries in the wake of the Global Financial Crisis and the European Sovereign Debt Crisis, besides real economic shocks. More recently, however, uncertainty seems to play a minor role.

How key drivers of business investment have developed in the euro area

Empirical studies on the main determinants of business investment in advanced economies since the Global Financial Crisis have consistently identified low economic activity as the key driver of weak business investment, with financial constraints and uncertainty also playing some role. However, these studies usually only consider the period up to 2014 or earlier and many of them are based on a panel of advanced economies.

Having a closer look at these drivers in the euro area suggests that financial constraints do not seem to constitute a major impediment for business investment in the euro area. The business survey of the European Commission on "factors limiting production" shows that, even though financial constraints are still higher compared to the period before the Global Financial Crisis, they are not an important impediment at the moment (Figure 2). Financial constraints are broadly as important as a lack of labour supply or equipment. Currently, a lack of demand is still the most important factor, with an increasing share of firms reporting that they do not face any constraints on production at all. This evidence is supported by other evidence from business surveys. For instance, large firms in the euro area have recently reported that financial constraints are the least important constraint (out of 14 possible constraints) for their investment plans (ECB 2015). The investment survey of the European Commission even indicates that financial factors are favourable at the current juncture (European Commission 2016). These factors, however, not only focus on financing conditions per se but also include expected profits as a determinant of investment plans. If anything, small- and medium-sized enterprises are still suffering from financial constraints in some regions. According to the "Survey on the Access to Finance of Enterprises in the euro area", however, small- and medium-sized firms in the euro area report that the "availability of external financing" has remarkably improved over the past years (ECB 2016).

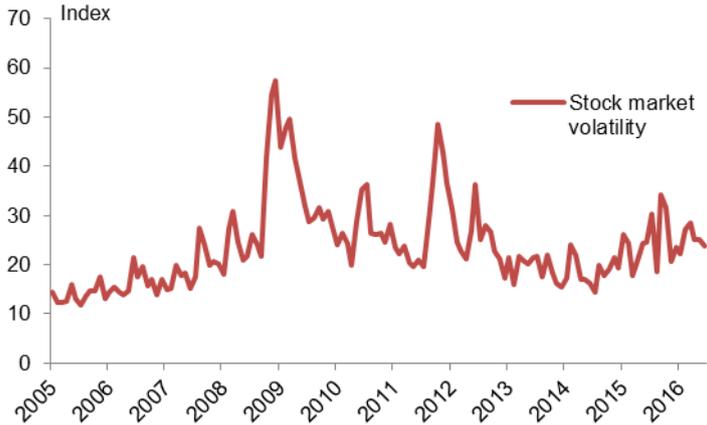
Figure 2: Factors limiting production, manufacturing sector (2005-2016)

Notes: Quarterly data. Shares of managers reporting individual limiting factors.
Source: European Commission.

Several empirical studies identify uncertainty as an additional important factor holding back business investment in advanced economies since the Global Financial Crisis. A commonly used proxy for uncertainty is stock market volatility. According to this measure, uncertainty in the euro area reached record-high levels during the Global Financial Crisis in 2009 and experienced another spike during the Sovereign Debt Crisis in 2012 (Figure 3). Thereafter, uncertainty alleviated before it has somewhat increased again in the second-half of 2015. However, the most recent increase in uncertainty was probably not due to euro area-specific developments but rather due to factors affecting uncertainty worldwide; these factors include concerns about potential growth in China or about economic turmoil in oil-exporting countries as a result of the slump in oil prices. Given that uncertainty is widely perceived to be a temporary drag on investment (or economic activity) only, followed by a rebound once it has alleviated (Bloom 2009), and given that uncertainty has been at relatively low levels compared to crisis periods, it is unlikely that uncertainty still constitutes an important factor behind the weakness in business investment in the euro area.

Monetary policy may have contributed to reduce financial constraints and uncertainty (and, hence, to stimulate business investment) but the previous findings suggest that monetary policy can do little to further stimulate business investment in this regard. Empirical studies usually do not find an important role for financial conditions on business investment at the aggregate level (see, e.g., BIS 2015). Though financial constraints may significantly harm investment activities, once the financial constraints have vanished, a further improvement of financial conditions, e.g. by a more expansionary monetary policy, is unlikely to additionally stimulate business investment. A similar argument can be made for uncertainty. Uncertainty is usually perceived to be a constraint on business investment (or economic activity) when it is far above normal levels. However, it is questionable whether a further reduction of uncertainty at its normal level will additionally boost business investment (or economic activity).

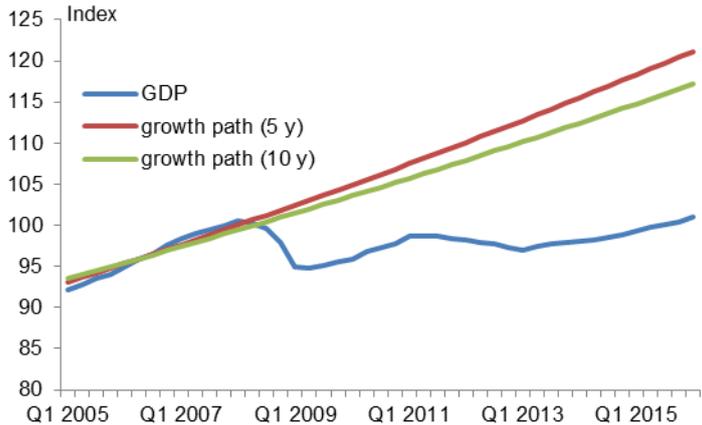
Figure 3: Uncertainty in the euro area (2005-2016)



Notes: Monthly data. Stock market volatility represents the volatility of the Eurostoxx 50 option traded on Eurex. Source: Stoxx.

According to most empirical studies the crucial factor behind the weakness in business investment in advanced economies since the Global Financial Crisis is the weakness in overall economic activity (or GDP), which dampens business investment via accelerator effects. GDP in the euro area shows a similar pattern as business investment (Figure 4). While GDP has shown some signs of recovery since 2013, it is still far below its pre-crisis trend, as estimated on the basis on a five-year and ten-year period before the Global Financial Crisis, respectively.³

Figure 4: GDP and pre-crisis growth paths in the euro area (2005-2016)



Notes: Quarterly data, constant prices, seasonally adjusted; GDP: 2007Q4=100; growth paths: log-linear trend based on five-year or ten-year period before the crisis. Source: Eurostat; own calculations.

All in all, the comparison of different key drivers of business investment suggests that low economic activity constitutes the most important drag on business investment in the euro

³ These pre-crisis trends usually do not show the sustainable level of GDP but might be biased upwards to some extent since they are also based on years associated with an unsustainable boom. However, these trends are relevant because they may indicate which path of GDP was expected before the beginning of a crisis. In this regard, they are frequently considered as reference paths to calculate so-called “gaps” and to discuss appropriate policy measures.

area at the current juncture. Consequently, if GDP is unlikely to rebound to its pre-crisis trend, there might be less promising prospects that business investment will rebound to its pre-crisis trend in the coming years. To shed further light on these issues, in the next sections we further explore patterns of economic activity and business investment during financial crises as well as the effectiveness of monetary policy.

4. PATTERNS OF ECONOMIC ACTIVITY AND BUSINESS INVESTMENT DURING FINANCIAL CRISES

We look at historical experiences with recessions and financial crises to explore how business investment in the euro area has developed in past years, relative to typical patterns. In doing so, we address the question of whether business investment at the moment is unusually low in the euro area (e.g. whether there is an “investment gap”) or not. This is important for economic policy in several dimensions. Firstly, if business investment is unusually low, policy measures that provide temporary stimuli (such as monetary policy) may be appropriate to encourage business investment and overall economic activity. In contrast, if business investment is not unusually low compared to historical experiences or compared to the current level of GDP, such policies may not be successful in causing a sustainable acceleration in business investment. In fact, in this case structural policies that strengthen potential growth might be more appropriate. Secondly, if business investment in the euro area has developed in line with historical experience, and given that monetary or fiscal policy has not been systematically wrong during other financial crises, there is little scope for such policies to further stimulate business investment.

We analyze and compare the historical patterns in three steps: Firstly, we review the literature on the impact of financial crises on GDP and describe what these results may imply for the impact of such crises on business investment. Secondly, given that this literature does not deal with business investment, we estimate the typical impact of financial crises on business investment and compare our results with the path of business investment in the euro area since the Global Financial Crisis. Thirdly, we investigate how the ratio of business investment to GDP typically develops during financial crises and how this ratio has developed in the euro area over the past years; this allows us to assess how business investment has developed given the path of GDP.

Typical patterns of economic activity during financial crises

There is a large empirical literature on the impact of financial crises on GDP. This literature generally finds that financial crises come along with recessions that are deeper and longer than normal recessions, which are not associated with financial crises (Claessens et al. 2009). Moreover, recoveries following financial crises are usually much weaker and show no signs of a rebound in the level of GDP, while recoveries following normal recessions are much stronger and show signs of a rebound in the level of GDP (Boysen-Hogrefe et al. 2016). Overall, there is a large consensus that financial crises are associated with a significant and permanent decline in the level of GDP compared to the pre-crisis trend (IMF 2009, Reinhart and Rogoff 2009). While these studies do not focus on business investment, some of them also investigate the impact of such crises on GFCF (Claessens et al. 2009, Claessen et al. 2011, Jorda et al. 2013). Results for GFCF are similar to the results for GDP, even though the effects on GFCF are usually more pronounced. This indicates a strong permanent decline in the level of business investment in the aftermath of a financial crisis. Moreover, Furceri and Mourounage (2012), who find (in line with the results described

above) that financial crises come along with a permanent decline in potential output, additionally offer a decomposition of this decline into changes in potential employment, the capital stock, and Total Factor Productivity. They show that a financial crisis leads to a permanent decline in the capital stock of about 3 percent on average, while potential employment only declines by about 1 percent and Total Factor Productivity remains basically unchanged. Their results, thus, suggest that financial crises require long-lasting adjustment processes in the capital stock that may weigh on investment for several years. Factors behind the persistent decline in GDP following financial crises include the large built-up of private or public debt or boom-and-bust phases in investment (see, e.g., Jorda et al. 2016a and 2016b) that are associated with long-lasting adjustment processes like balance-sheet adjustments of private households, firms, and financial institutions. It is important to note that these factors usually are also associated with an unsustainable boom period featuring high growth rates in GDP and business investment. This suggests that pre-crisis trends do not measure the sustainable level of GDP and that a persistent decline of GDP below these trends is a normal consequence of a financial crisis.

Patterns of business investment during financial crises

Since there is only very rare direct evidence on the typical pattern of business investment during recessions and financial crises, we investigate this in more detail based on a panel of 22 advanced economies from 1970 to 2015, using an empirical approach that is commonly used in the relevant literature (Jorda et al. 2013). We find that business investment declines sharply for two years after the beginning of a banking crisis⁴ (Figure 5); thereafter business investment starts to increase again. However, it does not increase faster compared to the baseline that describes the path of business investment in the absence of a crisis and given an average growth rate. Hence, following a crisis, business investment shows no sign of a rebound in the level compared to the baseline. This result is in line with Jannsen (2015), who finds that recoveries following banking crises are usually weak and that the level of business investment exhibits a permanent decline. Following normal recessions, however, recoveries in business investment are stronger (the deeper the preceding recession, the stronger the subsequent recovery) and the level of business investment more or less rebounds to the baseline level.

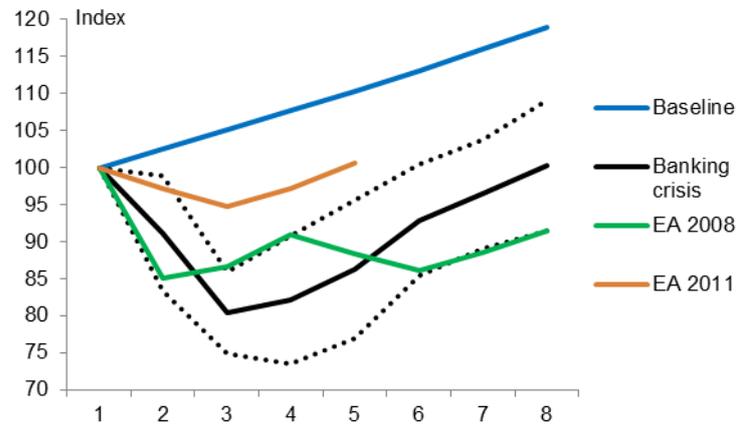
When addressing the question of whether the path of business investment in the euro area since 2008 is in line with historical experience it is crucial to define the relevant baseline for the euro area, i.e. to answer the question of how business investment would have evolved in the absence of the Global Financial Crisis and the Sovereign Debt Crisis. Obviously, this question cannot be answered exactly. Based on historical evidence business investment is likely to grow broadly in line with potential output or even slightly faster. Given that potential output in the euro area has grown by about 2 percent on average during the last twenty years, we assume as a baseline that business investment would have grown by 2.5 percent per year.⁵ It turns out that business investment in the euro area is somewhat below the typical path of business investment after banking crises. However, taking into account the uncertainty surrounding such estimates, business investment has by and large developed in line with what could have been expected based on historical evidence. Moreover, it is important to take into consideration that the euro area was hit by two financial crises. In fact, the occurrence of the second crisis might largely explain why business investment is somewhat below the typical path. Interestingly, during each of the

⁴ Financial crises include several types of crises, such as banking crises, currency crises, or sovereign debt crises. As it has been frequently done in the literature, we use banking crises as a proxy for financial crises.

⁵ Our results remain similar when using slightly higher or lower rates.

two financial crises business investment in the euro area has actually performed relatively well compared to historical patterns.

Figure 5: Business investment during banking crises and in the euro area



Notes: Annual data. Index=100 in the year before a crisis starts. Baseline: Path of business investment without a crisis, assuming a constant growth rate of business investment of 2.5 percent per year. EA 2008: Path of business investment since 2008 (Global Financial Crisis). EA2011: Path of business investment since 2011 (Sovereign Debt Crisis). Banking crisis: Estimates based on a panel of 22 advanced economies using the Local Projections Method (Jorda et al. 2013); banking crises in the euro area since 2008 are excluded from the estimation. Dotted lines indicate two-standard error bands.

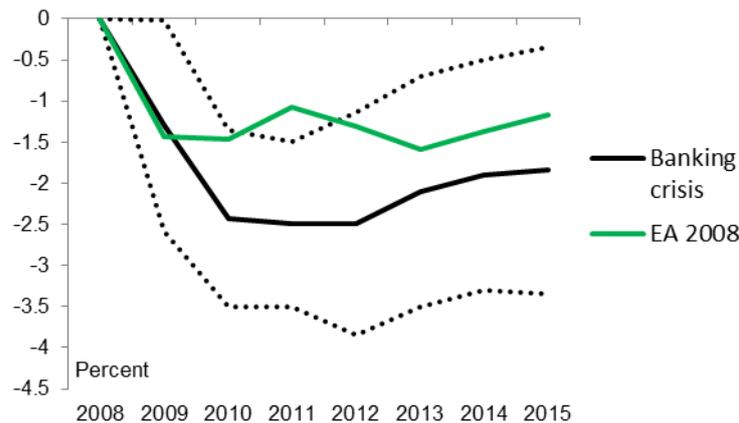
Source: OECD; Laeven and Valencia (2013); own calculations.

Patterns of the business investment-GDP ratio during financial crises

In a next step, we perform a similar empirical exercise – using the same data set and the same empirical method – but look at how the business investment-GDP ratio typically evolved during banking crises in the past.⁶ If this ratio declines, business investment grows slower (or declines faster) than GDP. We find that this ratio declines sharply in the first two years after a banking crisis and moderately recovers thereafter (Figure 6). Comparing this typical path with the actual ratio of business investment to GDP in the euro area since 2008 reveals, firstly, that this ratio declined by far less during the Global Financial Crisis than it did during other banking crises and, secondly, that it moderately recovered in 2014 and 2015. These results suggest that business investment has developed relatively well, compared to overall economic activity. The results therefore strengthen the evidence that it is mainly weak overall economic activity that represents the crucial factor behind the weakness in business investment in the euro area and not the other way around.

⁶ We construct this ratio using price adjusted business investment and real GDP.

Figure 6: Business investment relative to GDP during banking crises and in the euro area



Notes: Annual data. EA 2008: Change in business investment relative to GDP since 2008 (Global Financial Crisis). Banking crisis: Estimates based on a panel of 22 advanced economies using the Local Projections Method (Jorda et al. 2013); banking crises in the euro area since 2008 are excluded from the estimation. Dotted lines indicate two-standard error bands.

Source: OECD; Laeven and Valencia (2013); own calculations.

5. HOW EFFECTIVE IS MONETARY POLICY IN THE AFTERMATH OF FINANCIAL CRISES?

One reason why the accommodative monetary policy of the ECB may not have triggered a rebound in business investment could be that monetary policy is generally less effective in stimulating economic activity or business investment during or in the aftermath of financial crises. The question of whether the effectiveness of monetary policy depends on the state of the economy has frequently been investigated in the literature. Studies that compare the effectiveness of monetary policy in expansions and recessions come to mixed results. While earlier studies found that monetary policy is more effective during recessions than during expansions (Weise 1999, Garcia and Schaller 2002, Peersman and Smets 2002, and Lo and Piger 2005), these results have been challenged by more recent studies that found that monetary policy is less effective during recessions (Tenreyro and Thwaites 2015).⁷ After the onset of the Global Financial Crisis in 2007, some studies more specifically addressed the question of whether the effectiveness of monetary policy is different during financial crises and in their aftermath.

From a theoretical perspective, the effectiveness of monetary policy in the aftermath of a financial crisis is ambiguous. It could be less effective because financial crises (specifically banking crises) are usually associated with several characteristics that may harm some of the transmission channels through which monetary policy stimulates economic activity and business investment. Banking crises are usually preceded by periods of a large build-up of private debt and associated with boom-and-bust cycles in the housing market followed by significant turmoil in the financial sector. As a consequence, important transmission channels of monetary policy, such as the credit and the interest-rate channel, could be impaired during and in the aftermath of banking crises. Credit demand may react less to changes in monetary policy because private households and firms seek to reduce their high

⁷ Related studies that investigate the effectiveness of fiscal policy tend to find that fiscal policy is more effective during recessions, when the economy is not operating at full capacity (see, for instance, Auerbach and Gorodnichenko 2012).

debt levels and because they are less creditworthy due to their high debt levels and the devaluation of collateral that they can offer. Credit supply may react less to changes in monetary policy because financial institutions face high credit default risks, seek to repair their balance sheets, and may face liquidity constraints. Moreover, even in the absence of credit constraints residential investment, which is a particularly interest-rate-sensitive component of GDP, could react less to impulses from monetary policy; this could be due to oversupply of housing that has been created during the preceding boom in the housing market. Finally, monetary policy could be less effective because financial crises are usually associated with periods of very high uncertainty and very low confidence. In such periods uncertainty and confidence may become the dominant determinant of investment decisions, making investment less sensitive to changes in monetary policy.

However, there are also theoretical arguments why monetary policy could be more effective during financial crises than during normal times. While liquidity constraints on financial institutions, low confidence and high uncertainty may weigh on the effectiveness of monetary policy, they also directly have an adverse impact on economic activity. To the extent that monetary policy is able to reduce these liquidity constraints and uncertainty and to lift confidence it could be more effective than in normal times. For example, there is evidence that uncertainty only weighs on economic activity in phases when it has reached very high levels (or when it has passed specific thresholds).⁸ While a reduction of uncertainty could stimulate economic activity in such phases, it is unlikely that a further reduction of uncertainty has significant effects on economic activity when uncertainty is at normal levels.

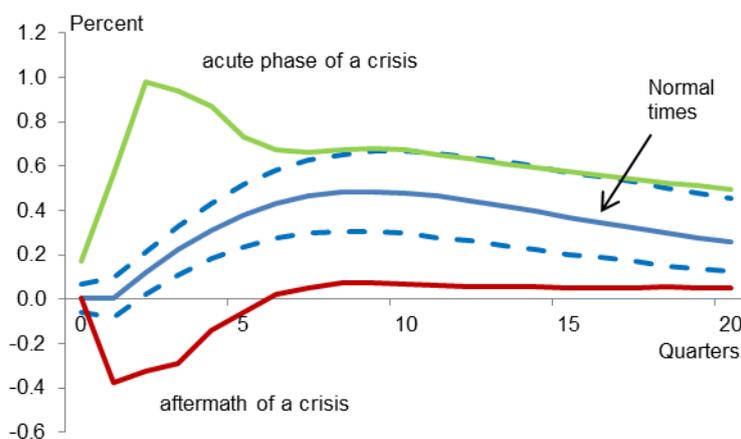
Given the mixed theoretical predictions, the question of how effective monetary policy is during as well as in the aftermath of financial crises remains largely an empirical one. While this question has not been finally answered yet, empirical studies so far have suggested that monetary policy is more effective at the beginning (or at the acute phase) of a crisis, in which uncertainty is high, confidence is low and the economy is in deep recession. However, monetary policy seems less effective or even not effective at all, in stimulating economic activity in the aftermath of financial crises. Ciccarelli et al. (2013) analyze the effectiveness of monetary policy in the euro area between 2007 and 2011 and find that monetary policy became more effective in the first years of the Global Financial Crisis. Dahlhaus (2016) provides evidence that, in the United States, monetary policy is more effective in periods of high financial stress. Usually, periods of high financial stress are observed at the beginning of financial crises. However, Bech et al. (2014) show that monetary policy has no significant effect on the strength of the recovery following financial crises; by contrast, it has significant effects on the strength of recoveries following normal recessions (not associated with financial crises). Jannsen et al. (2015) reconcile these results using a panel of 20 advanced economies. They also find that monetary policy is more effective at the beginning of financial crises, while it is not effective in the aftermath of financial crises (Figure 7). During the acute phase of a crisis monetary policy may have strong effects by reducing uncertainty and restoring confidence.

Overall, the empirical evidence suggests that monetary policy significantly contributes to a stabilization of economic activity during the acute phase of a financial crisis but it is by and large ineffective in the aftermath of a financial crisis. Given the strong nexus between economic activity and business investment, these results should also apply to business investment. While this evidence is relevant for all advanced economies, the euro area is a special case because it was also hit by the Sovereign Debt Crisis later on, which was especially severe in some member countries. This led to a double-dip recession and a

⁸ See, e.g., van Roye (2014) who provides evidence for threshold effects of financial stress on economic activity. Financial stress usually exhibits a high positive correlation with uncertainty.

further decline in business investment. To the extent that the same arguments that seem to apply to banking crises also apply to sovereign debt crises, the empirical evidence suggests that European monetary policy was effective in stabilizing economic activity and business investment in the acute phase of the crisis (e.g. by reducing financial fragmentation or by reducing uncertainty with regard to potential sovereign defaults) but has been much less effective in the aftermath (e.g. because high sovereign debt levels may weigh on the effects of monetary policy on economic activity).

Figure 7: Effects of monetary policy on GDP in different states of the economy



Notes: Response of real GDP to an expansionary monetary policy shock (interest rate decrease of 100 basis points) during normal times, the acute phase of a crisis, and during the aftermath of a crisis. Dotted lines indicate 90 percent confidence intervals.

Source: Janssen et al. (2015).

6. SUMMARY AND CONCLUSIONS

Business investment in the euro area is currently far below the level it had reached before 2009. While recovering from the Global Financial Crisis, the euro area economy was hit by a second financial crisis, the Sovereign Debt Crisis. Until the beginning of the Sovereign Debt Crisis, the recovery in business investment was in line with typical recovery paths of other advanced economies such as the United States. Besides, during the past two years business investment in the euro area has grown again at solid rates. The overall recovery, however, is widely perceived to be disappointingly weak. This is mainly due to the large losses business investment experienced during both crises, leaving the level of business investment far below trends that were expected before 2008.

Empirical studies suggest that low economic activity is the most important determinant of weak business investment in advanced economies since the Global Financial Crisis. These studies find that high levels of economic uncertainty and unfavourable financing conditions also weigh on business investment, albeit to a smaller extent. Looking at the current situation in the euro area reveals that uncertainty has alleviated and that, according to survey data, financial constraints do not represent an obstacle to business investment at the aggregate level. Monetary policy has contributed to reduce uncertainty and financial constraints. However, given that uncertainty and financial constraints are no important impediments of business investment anymore, any further reduction of uncertainty or

further improvements of financial conditions will hardly provide significant additional stimuli to investment.

Though economic activity in the euro area has slightly recovered, it is far below trends estimated before the Global Financial Crisis, suggesting that low economic activity is the most important drag on business investment at the moment. Historical experience shows that a persistent decline below pre-crisis trends is a typical consequence of financial crises. If economic policies, such as monetary policy, were not systematically wrong during crises in the past, this result suggests that currently monetary policy can do little to further stimulate economic activity and investment.

Business investment in the euro area has developed broadly in line with historical patterns. In conjunction with the evidence mentioned before, this indicates that currently business investment is rather at normal levels and there is no significant “investment gap”, which can be closed by economic policy measures that only bring about temporary stimulus. A comparison of the path of economic activity and business investment after the Global Financial Crisis even suggests that business investment has been relatively robust compared to other financial crises, given the low level of economic activity.

Evidence on the effectiveness of monetary policy during and in the aftermath of financial crises also suggests that monetary policy can do little to further stimulate economic activity and business investment. Even though monetary policy is typically very effective at the beginning of financial crises by reducing uncertainty and financial constraints, it is likely to be ineffective in the aftermath of crises since these are usually associated with specific characteristics that hamper important transmission channels, such as private indebtedness, long-lasting balance-sheet adjustment processes, and boom-and-bust cycles in investment.

Altogether, business investment will likely remain weak for some time to come and stay below its pre-crisis trend. This seems to be a normal consequence of a financial crisis. Monetary policy may have significantly contributed to stabilize business investment at the beginning of the Global Financial Crisis and the Sovereign Debt Crisis in the euro area; at present, however, there seems to be little scope for the ECB to further stimulate investment. Consequently, structural policies aiming at improving potential output seem the most promising way in order to achieve a sustainable acceleration in investment activity in the future.

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