

Confidence and Monetary Policy Transmission

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Abstract

Empirical results show that Keynes' state of confidence is an important monetary policy transmission channel in the eurozone. This confidence channel operates via the short-term interest rate rather than the Eurosystem balance sheet total and is most marked for investment versus private consumption and for industry compared to services. The findings are robust across alternative variables for monetary policy and for the confidences of borrowers and lenders, the addition of other transmission variables, and across sample period. Psychological motives among borrowers and lenders are thus important for monetary policy transmission and economic growth.

JEL: E12, E52, C32

Keywords

Keynes' state of confidence, monetary policy, economic growth, eurozone

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Introduction

There is a long tradition in macroeconomics that bouts of optimism and pessimism primarily drive business cycles (Beaudry et al., 2011). Psychological factors have been emphasized by economists as early as Pigou (1927) and Keynes (1936). Arthur Pigou (1927, p. 34) stressed the importance of varying expectations of business men, because they ‘*constitute the immediate cause and direct causes or antecedents of industrial fluctuations*’. When people are confident about the future, they may consume, invest, and work more in the present. John Maynard Keynes (1936, p. 161) also argued that confidence plays an important role in driving economic activity:

‘Our decisions to do something positive, the full consequence of which will be drawn out over many days to come, can only be taken as a result of animal spirits – of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities’.

The idea that animal spirits are essential for economic fluctuations increasingly gained attention in recent years, following *Animal Spirits: How Human Psychology Drives the Economy and Why it Matters for Global Capitalism* from the two Nobel price winners Akerlof and Shiller (2009, see also Barbaroux 2012). There is also a long tradition on the importance of confidence in finance for the business cycle. An early and interesting discussion was made by Walter Bagehot (1922, p. 151), arguing that the financial system is built on trust or confidence: ‘*The peculiar essence of our banking system is an unprecedented trust between man and man*’. All in all, it is thus important to consider confidence from the real as well as financial side.

Notwithstanding these long traditions, confidence has remained an understudied topic in economics as well as sociology (Swedberg, 2013). Despite Keynes studied the work of two well-known psychologists of the day in great and substantive detail, it has taken long for economists to recognize the key role of psychology in explaining economic behaviour (Barnett, 2015). Moreover, the importance of changes in confidences as important business cycle drivers has remained controversial in macroeconomics (Leduc, 2010). For example, Barsky & Sims (2012) argue that surprise movements in consumer confidence reflect information about future economic prospects rather than a channel from autonomous movements in sentiment to economic outcomes. In contrast, Angeletos et al. (2015) provide evidence for a strong role for confidence in explaining the business cycle. They integrate a confidence shock in standard dynamic stochastic general equilibrium (DSGE) models. Another US study also shows in a DSGE framework that consumer confidence is important for monetary policy transmission (Debes et al., 2014). Confidence as an amplifying factor for the business cycle in the US as well as in the eurozone can also be shown in a reduced-form

vector autoregression (VAR) framework (Aarle & Kappler, 2012). They confirm earlier findings that confidence is important for economic activity. For example, Taylor & McNabb (2007) show for four European economies that consumer and business confidence indicators are pro-cyclical and play a significant role in predicting cyclical turning points.

This study also relates to the vast literature on monetary policy transmission. Evidence for the eurozone and eurozone countries is overwhelming, see, among many others, Barigozzi et al. (2014). However, confidence is rarely considered in the analysis of the output effects of monetary policy. Exceptions are Debes et al. (2014) for consumer confidence and Rötheli (2000) for business confidence, i.e. producer expectations. In recent years monetary policy transmission studies deal also with the impact of non-standard monetary policy measures (Bowdler & Radia, 2012; Altavilla et al., 2014; Cova et al., 2015; Gern et al., 2015; Wieladek & Garcia Pascual, 2016; Boeckx et al., 2017). The latter is also known as quantitative easing (QE). It is interesting to note that Keynes argued in support of QE, see Tily (2006, p.662):

‘Perhaps a complex offer by the central bank to buy and sell at stated prices gilt-edged bonds of all maturities, in place of the single bank rate for short-term bills, is the most important practical improvement which can be made in the technique of monetary management’.

Tily (2006) bolsters the view that Keynes was concerned primarily with monetary and not fiscal policy. Similarly, Bertocco (2007) highlights the fundamental role of the credit market and of banks in Keynes’ analysis.¹

The main contribution of this interdisciplinary empirical analysis for the eurozone is that it examines in a monetary policy transmission context not only consumer and business confidence from a borrowers’ or real side perspective but also the confidence of the financial services sector as lenders. The latter is also known as Keynes’ state of credit. The idea is that confidence is a critical factor in the transmission of policy shocks into economic activity. An easing in monetary policy might signal a commitment to aggregate stability, thereby raising confidence, stimulating demand, and leading to economic growth. Given that there is no off-the-shelf work horse model for confidence or a widely accepted channel by which confidence might matter in the transmission of monetary policy, this study uses reduced-form VARs, which need a minimum of theoretical restrictions to identify monetary policy shocks and their growth effects.

State of Confidence

Theoretical Consideration

The confidence channel of monetary transmission is introduced by Keynes' state of confidence. Keynes denoted that we know that we don't know the future, but that we act as if we do, by relying on conventions. Keynes (1936, p. 148) also pointed out that these conventions can be held with varying degrees of confidence:

'The state of long-term expectation, upon which our decisions are based, does not solely depend, therefore, on the most preferable forecast we can make. It also depends on the confidence with which we make this forecast – on how highly we rate the likelihood of our best forecast turning out quite wrong'.

Keynes termed this the state of confidence. This state has two facets.

The first aspect is borrowers' beliefs about prospective yields from investment projects, hereafter referred to as "confidence of borrowers". It is the belief by consumers and enterprises as borrowers about prospective yields from labour and financial income and investment projects respectively. This approach can be extended to private consumption, as consumers' decisions about housing and consumer durable expenditure can be viewed as investment decisions. Moreover, there is a long tradition in studying the impact of consumer confidence on consumer expenditure (Ludvigson 2004; Nguyen & Claus 2013). The confidence of borrowers reflects the willingness to consume and invest.

The second facet is the state of credit, which is governed by the confidence that lenders have in financing borrowers ("confidence of lenders"). In the words of Keynes (1936, p. 158): *'Thus we must also take account of the other facet of the state of confidence, namely, the confidence of the lending institutions towards those who seek to borrow from them, sometimes described as the state of credit'*. The confidence of lenders depends on their perceptions of how well borrowers' incentives are aligned with their own and, relatedly, of how well borrower liabilities are secured. It is based on past history, on conventions, and on the mood of lenders at the time. The confidence of lenders mirrors the willingness to lend.²

Keynes concluded that a collapse in the confidence of either borrowers or lenders is sufficient to induce an economic downturn, but that a return to prosperity requires that both are in good repair. Typical for a crisis is a sudden change in one of the confidences from strong towards very weak. The way out of the crisis requires that both confidences are again strong. Or in the words of Keynes (1936, p. 158): *'But whereas the weakening of either is enough to cause a collapse, recovery requires the revival of both'*. Similarly, Alves et al. (2008, p. 415) state that: *'the beginning of the boom depends crucially on improved expectations about the economy's future prospects by non-bank and bank agents. As agents'*

state of confidence improves, overall perceptions of risks decline.' De Grauwe and Macchiarelli (2015) also stresses that banks intensify movements of optimism and pessimism, creating a greater scope for booms and busts. Banks do not create but amplify animal spirits.

Practical Application

In order to measure the state of confidence in the eurozone empirically, proxies for the confidences of borrowers and lenders are needed. This section presents one way of measurement, whereas the section on robustness considers alternative measures.

A natural candidate to approximate the confidence of borrowers is the economic sentiment indicator as released by the European Commission. This opinion indicator is constructed as a weighted aggregation of surveys addressed to representatives of the industry (weight 40%), services (30%), retail trade (5%) and construction (5%) sectors, as well as to consumers (20%). Gelper & Croux (2010) provide more details about its construction and its link to real GDP growth. De Bondt & Schiaffi (2015) show that this sentiment indicator matters for current real GDP growth in the eurozone, both in good and bad times.

The starting point for measuring the confidence of lenders is future business activity expectations of the financial services sector as reported by IHS Markit in their eurozone Purchasing Managers' Index (PMI) survey. It is the response to the question '*Whether business activity levels will be higher, the same or lower than current levels in 12 months' time*'. It is the only question in the PMI services survey that is opinion or confidence-based measurement rather than actual business conditions. It refers to business confidence in the financial services sector about the year ahead. The coverage of the broad financial sector is an advantage, because lenders can be banks as well as non-banks. The PMI financial services future business activity is regressed on actual financial services activity, as captured by the PMI financial services business activity index. In this way only the information entrenched in the PMI future business activity that is not already embedded in the PMI actual past activity is taken into account. The residual from this regression reflects the empirical proxy for the confidence of lenders. The PMI residual terms better approximate the confidence of lenders than the raw PMI financial services business confidence about the year ahead, because they do not contain information about actual financial services activity. Both PMI series are diffusion indices.³

Figure 1 plots the state of confidence. The PMI series starts in 1998Q1 for the eurozone. The two confidence measures often – but not always – move together. It is not necessarily the case that the degree of confidence with which borrowers and lenders make forecasts for the future is the same. Indeed, a likely outcome is that they will come to different conclusions. For example, the confidence of borrowers was above average in 1998H2 and 2015Q4, whereas the confidence of lenders was below. The opposite was the case in 2012Q4-2013Q2. In 2009 the confidence of borrowers dropped earlier than the confidence of lenders.

Figure 1.

Method

The starting point to assess monetary policy transmission via the state of confidence is a reduced-form VAR model. This approach sidesteps the need for structural modeling by treating every endogenous variable as a function of the lagged values of all of the endogenous variables in the system. The mathematical representation of a VAR is:

$$Y_t = A_1 Y_{t-1} + \dots + A_k Y_{t-k} + \varepsilon_t$$

where Y_t is a vector of endogenous variables, A are matrices of coefficients to be estimated and ε is a vector of innovations. The latter may be contemporaneously correlated but are uncorrelated with their lagged values and uncorrelated with all of the right-hand side variables. The coefficient estimates are obtained by applying ordinary least squares to each equation of the system separately and the estimate of the disturbances is given by the sample covariance matrix of the residuals.

The VAR in this study consists, in the order of mentioning and in line with Debes et al. (2014), of an economic growth variable, two monetary policy variables, confidence of borrowers and confidence of lenders. The first monetary policy variable is the inverted short-term interest rate, i.e. the three-month Euribor. It captures monetary policy in a conventional way. The short-term interest rate is inverted in order to reflect an easing in monetary policy by an increase in both monetary policy model variables. The second non-standard monetary policy variable is the Eurosystem balance sheet growth. It is part of the VAR system, because QE has become an active monetary policy instrument in the latter part of the sample period. A lag of two quarters is applied based on various criteria to select the VAR lag order.⁴ The VAR provides a simplified description of monetary policy transmission via the state of confidence, but it contains at least the minimum set of variables that are crucial for any discussion of a confidence channel.

Figure 2 plots the short-term interest rate in reverse order and the Eurosystem balance sheet total that starts in 1998Q4. It shows swings in the short-term interest rate as well as in the Eurosystem balance sheet total. The latter gradually increased in the first part of the sample period and rose sharply to about EUR 2000 billion at the end of 2008 and then fluctuated around that level till the third quarter of 2011. It rose again strongly to around 3000 billion in 2012 and fell back to 2000 billion in the second half of 2014. Since then it has risen again steadily.

Figure 2.

The next two sections report impulse response functions and forecast error variance decompositions for up to 16 quarters in order to investigate the interrelationship within the VAR model. The impulse responses trace out the reaction of current and future values of each of the variables to a specific impulse. The latter economists usually call a shock. The shocks considered are the error terms in the monetary policy equations, respectively, the confidence equations. The size of the shock equals a one standard deviation increase in the current value of one of the VAR errors, assuming that this error returns to zero in subsequent periods and that all other errors are equal to zero. The forecast error decomposition is the percentage of the variance of the error in forecasting a variable due to a shock at a given horizon. The variance decomposition indicates the amount of information each variable contributes to the other variables in the autoregression. It uses the conventional recursive Cholesky ordering for the variables in the earlier mentioned order.

Confidence Channel in Practice

Monetary policy transmission via confidence is empirically analyzed by examining first whether the state of confidence rises after a monetary policy easing and second whether the state of confidence affects economic growth. The former is viewed as evidence supportive of a confidence channel that is operative through borrowers as well as lenders and the latter that this transmission channel is macroeconomic relevant. The results show that the state of confidence channel operates via the short-term interest rate rather than the central bank balance sheet. The confidence channel is found to be macroeconomic relevant, immediately significantly for the confidence of borrowers and with a delay for the confidence of lenders.

Confidence Channel Operative through Borrowers and Lenders

Figure 3 sheds light on the estimated expansionary monetary policy shocks for the eurozone. The estimated accumulated short-term interest rate response following an interest rate shock peaks after three to five quarters at 60 basis points (left panel). The balance sheet growth response to a balance sheet shock amounts to 6%-9% (right panel). It is more persistent than the short-term interest rate response and broadly equals the asset purchase program (APP) of the ECB: 6% of 3000 billion = 180 billion a quarter, which is 60 billion a month. The balance sheet growth rates as seen since the APP announcement in March 2015 were 11% in 2015Q2 and 6% in 2015Q3 and 2015Q4.

Figure 3.

Figure 4 displays the effects of monetary policy on the confidences of borrowers and lenders. It shows that a short-term interest rate shock steadily and significantly affects the

state of confidence, but not a balance sheet growth shock. The accumulated impact of the short-term interest rate shock is up to 13 points on the confidence of borrowers and up to 2.4 points on the confidence of lenders. In both cases it peaks after 11 quarters. This finding suggests that the confidence channel is operating via the short-term interest rate and with a transmission lag of two to three years.

Figure 4.

Table 1 reports the importance of each innovation in affecting the two confidence variables in the VAR. Around 15% of the variance of the error in the forecast of the confidence of borrowers (left panel) and 8% of the variance in the confidence of lenders (right panel) is attributed to the short-term interest rate shock at longer horizons. The balance sheet growth does not play a role at all: at all horizons at most a negligible 3%. About 14% of the error in the confidence of borrowers is ultimately attributed to the confidence of lenders, which is somewhat less than of the confidence of borrowers itself. Vice versa this is 8%, which is the same percentage as attributed to the short-term interest rate. These findings are in support of a interplay between the two confidence variables in line with the thoughts of Keynes about the state of confidence.

Table 1.

Confidence Channel Macroeconomic Relevant

Figure 5 plots the accumulated responses of real GDP growth to the two confidence shocks. A shock to the confidence of borrowers is found to significantly affect economic growth up to four quarters and a shock to the confidence of lenders between four to seven quarters. The growth impact of a shock in the confidence of lenders takes thus longer to materialize than a shock in the confidence of borrowers. In both cases the growth impact peaks close to 0.5 percentage points.

Figure 5.

A variance decomposition of real GDP growth shows that the explanatory role of the state of confidence is high. About 20% of the variance in real GDP growth is attributed to both confidence variables after four quarters, slightly higher than that of both monetary policy variables (Table 2).

Table 2.

Looking at other measures of economic activity than real GDP, it is found that the confidence channel is strong for investment compared to private consumption and for industry value added compared to services value added. The top panel of Figure 6 displays that real private consumption growth responds modestly positively, i.e. about 0.25 percentage points, to the shocks in the confidences of borrowers and of lenders. The former is in this case approximated by consumer confidence. The bottom panel of Figure 6 shows that real investment growth responds more strongly. The response is 0.5 percentage points to a shock in the confidence of borrowers, in this case approximated by industrial confidence, and 0.75 percentage points to a shock in the confidence of lenders. Real services value added growth responds significantly to a shock in the confidence of borrowers and lenders by up to 0.5, respectively, 0.4 percentage points, whereas the maximum accumulated impact is twice as large for real industrial value added growth (see Figure 7).

Figures 6. and 7.

Robustness

The robustness of the key finding that monetary policy influences the state of confidence, which, in turn, affects economic growth, is analyzed in four ways:

- other monetary policy variables;
- alternative measures for the state of confidence;
- the addition of other transmission variables;
- sub-sample results.

Results for a sample starting in 2007 are presented, because the findings for the non-standard monetary policy are expected to be sample dependent, because QE was not an active policy instrument during the first part of the sample period. The supporting information in the Appendix reports the robustness results.

Overall, the robustness analysis shows that the key finding that the state of confidence channel is operative and macroeconomic relevant holds irrespective of the measures used for monetary policy and confidences, the addition of other transmission variables as well as the sample period considered.

Other Monetary Policy Variables

The first type of robustness check considers other variables for monetary policy. The EONIA (Euro OverNight Index Average) is taken as the relevant monetary policy rate instead of the three-month Euribor. The findings for the expansionary monetary policy shocks remain the same (Figures S1 and S2 in the Appendix). A shock to the EONIA results in an up to 15

points higher confidence of borrowers and up to three points higher confidence of lenders. A shock to the balance sheet growth results in insignificant responses of both confidence variables.

A similar finding is found by taking the quarterly change in the Eurosystem balance sheet total in percentage of GDP instead of the quarterly growth in the balance sheet total (Figures S3 and S4). The non-standard monetary policy shock now equals about 2% of GDP. The confidences of borrowers and lenders rarely change, following a shock to the quarterly change in the balance sheet total in percentage of GDP.

Alternative Measures for the State of Confidence

The second type of robustness check concerns alternative measures for the state of confidence. Another empirical proxy for the confidence of borrowers is the average of consumer and industrial confidence instead of the economic sentiment indicator. The impulse responses are similar to those from the basic model (Figure S5).

The confidence of lenders is alternatively empirically approximated by the inverted expected net tightening of credit standards as reported in the Bank Lending Survey (BLS) from the European Central Bank (Berg et al., 2005; de Bondt et al., 2010; Köhler-Ulbrich et al., 2016). It is the net percentage of senior loan officers that expect a tightening in credit standards to loans to enterprises, loans to households for house purchase, and consumer credit. These credit standards are defined as the internal guidelines and criteria that reflect a bank's loan policy. They are viewed as the key 'supply' response from the BLS, because credit standards capture the willingness of banks to lend. Impulse responses show that a positive shock to the inverted expected credit standards from the BLS boosts real GDP growth (Figure S6). This impact peaks at about one percentage point after seven to eight quarters, confirming a significant, albeit delayed, real GDP growth response to a shock in the confidence of lenders.

Addition of Other Transmission Variables

The third robustness check adds other transmission variables to the VAR model. An obvious candidate to add in the VAR system is the long-term interest rate. The findings for the variance decomposition hardly change. The short-term interest rate still attributes almost 15% of the error in the forecast of the confidence of borrowers and 5% to the confidence of lenders (Table S1). The latter is a bit lower than for the basic model without the long-term interest rate. For real GDP growth the explanatory role of the state of confidence changes little, remaining slightly above 20% (Table S2). The findings also remain unchanged when besides the long-term interest also the quarterly change in the real effective exchange rate is added to the VAR model (Tables S3 and S4).

Sub-Sample Results

The fourth and final robustness check is to test whether the results are sensitive to the sample period. The importance of balance sheet growth innovations for the state of confidence as well as for real GDP growth are similar for the second half of the total sample to those from the total sample (Tables S5 and S6). The balance sheet growth is found to have played a limited explanatory role since 2007. Similarly, the responses of the state of confidence to monetary policy shocks as well as the responses of real GDP growth to both confidence shocks are similar for the sample starting in 2007 to those using the total sample. Most notable sub-sample finding is a stronger explanatory role for the confidence of lenders. This finding can be explained by a stronger importance of the confidence of lenders during financial crisis times. Responses of the state of confidence to a balance sheet growth shock remain insignificant, although they are more positive for the sub-sample and only somewhat below the responses following a short-term interest rate shock (Figure S7). Real GDP growth immediately and significantly responds to a shock in the confidence of borrowers, while the GDP response to a shock in the confidence of lenders takes some time (Figure S8). These findings are in line with those from the total sample. The accumulated real GDP growth impact to a shock in the confidence of lenders is somewhat higher for the sub-sample than the total sample: 0.75% versus 0.5%.

Conclusion

No doubt, the topic of this study on economics and psychology from a Keynesian perspective falls outside the domain of contemporary mainstream economics. Today, professional economists still tend to ignore the economic role of psychology in society. Inspired by a renewed attention in economics for human psychology and animal spirits, this study empirically shows that the state of confidence is an important channel through which monetary policy affects economic growth in the eurozone. This finding is found to be robust across proxies for monetary policy and for the state of confidence, the addition of other transmission variables in the VAR, and across sample period. The confidences of borrowers and of lenders significantly respond to monetary policy changes, at least as measured by short-term interest rates. Moreover, shocks to the state of confidence significantly positively affect real economic growth, most pronounced investment and industrial value added. Real GDP growth is found to respond immediately to a shock in the confidence of borrowers and with a delay to a shock in the confidence of lenders.

The presented empirical analysis has its limitations. It is hard to assess how well the confidence measures used capture the economy-wide state of psychological factors. In addition, the modeling strategy can be viewed as too narrow. The reported VAR results provide at least sensible estimates of some causal connections. This data driven exercise is presented in the spirit of promising evidence on the importance of psychological factors from households, firms as well as financials at the aggregate economy level. I hope that my work

will inspire others for further analysis. One could think of other empirical ways to include psychological factors in economics at the macro level as well as applying other methods and techniques. Another extension is to consider other countries like the US, Japan and the UK.

Notwithstanding the limitations, the main conclusion has important implications for the day-to-day work of analysts and policy makers. It stresses that economic growth is not only about economic fundamentals, but also about psychology. The state of confidence helps in explaining the business cycle. Analysts and policy makers should thus closely monitor swings in sentiment of households and firms as well as in the financial sector to ensure sufficient insight in the shape of the economy. Private and public decision-makers should contribute to an environment that causes positive shifts in the state of confidence in order to boost economic growth.

Notes

1. An opposite view on the importance Keynes attached to confidence and budgetary discipline can be found in Considine and Duffy (2016).
2. Wolfson (1996) provides some thoughts on a theoretical model on a broad conception of credit ration that includes the state of confidence of lenders. He also refers to Keynes' notion of borrower's risk and lender's risk (Keynes, 1936, p. 144) from the perspective of fundamental uncertainty about the future and asymmetric information as well as asymmetric expectations between borrowers and lenders. Other suggestions for further reading are Bhaduri (2011) and Swedberg (2013). The former constructs theoretical models on financial confidence through the interaction between the real and the financial sector. The latter conceptualizes the role of confidence in finance by focusing on a situation of a sign of a hidden financial loss.
3. The "higher" and "the same" response shares in the population are averaged with weights of 1 and 0.5 respectively. Say if 50 percent of the managers answer higher future business activity and 10 percent that it will remain the same the diffusion index would be 55.
4. The sequential modified likelihood ratio test, the final prediction error test, the Akaike and Hannan-Quinn information criterion all indicate a lag order of two. The Schwarz information criterion suggests a lag order of 1, but the criterion value with respect to two lags is close to the smallest value.

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TABLES

Table 1. Variance Decomposition of the State of Confidence in %

Confidence of borrowers						Confidence of lenders					
Period	Real GDP growth	Short-term interest rate	Balance sheet growth	Confidence of borrowers	Confidence of lenders	Period	Real GDP growth	Short-term interest rate	Balance sheet growth	Confidence of borrowers	Confidence of lenders
1	30	6	3	61	0	1	2	0	0	3	94
2	46	2	3	49	0	2	2	3	0	4	91
3	53	4	2	38	3	3	11	3	0	3	83
4	53	7	1	31	8	4	18	3	3	5	71
5	51	10	1	27	11	5	21	4	3	8	64
6	49	13	1	24	13	6	23	6	3	8	61
7	47	15	1	23	14	7	23	7	2	8	60
8	46	16	1	23	14	8	22	8	2	8	60
9	46	16	1	23	14	9	22	8	2	8	59
10	47	16	1	23	13	10	22	8	2	8	59
11	47	16	1	23	13	11	23	8	2	8	59
12	48	16	1	22	13	12	23	8	2	8	59
13	48	16	1	22	14	13	23	8	2	8	58
14	48	15	1	22	14	14	23	8	2	8	58
15	48	15	1	22	14	15	24	8	2	8	58
16	49	15	1	21	14	16	24	8	2	8	58

Table 2. Variance Decomposition of Real GDP Growth in %

Period	Real GDP growth	Short-term interest rate	Balance sheet growth	Confidence of borrowers	Confidence of lenders
1	100	0	0	0	0
2	78	2	12	8	0
3	69	6	9	11	6
4	63	9	8	9	11
5	60	11	7	9	12
6	59	11	7	9	13
7	59	12	7	9	13
8	59	12	7	10	13
9	59	11	7	9	13
10	59	11	7	9	13
11	60	11	7	9	13
12	60	11	7	9	13
13	60	11	7	9	13
14	60	11	7	9	13
15	60	11	7	9	13
16	60	11	7	9	13

FIGURES

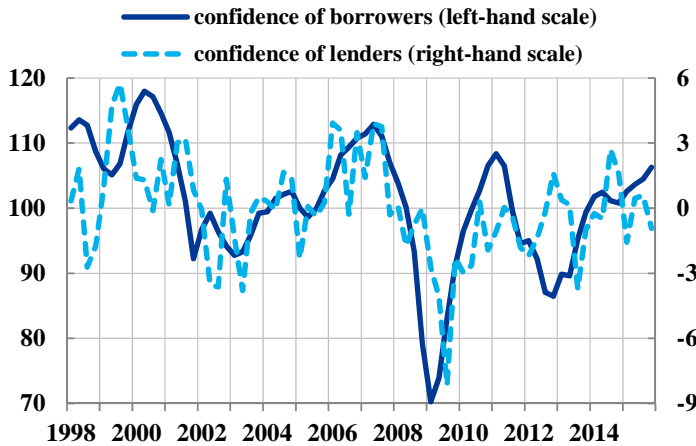


Figure 1. The State of Confidence in the Eurozone

Note: Confidence of borrowers refers to the European Commission economic sentiment indicator (quarterly average of monthly data, percentage balances, long-term average = 100) and confidence of lenders to the PMI financial services business activity expectations conditional on past business activity (using quarterly average of monthly data).

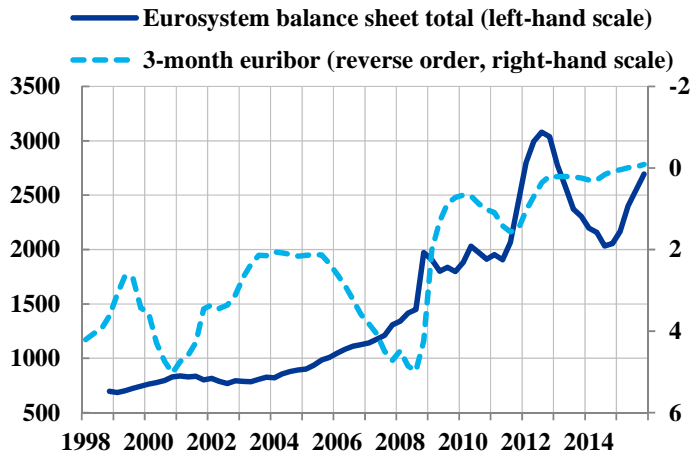


Figure 2. Eurozone Short-Term Interest Rate (in %) and Eurosystem Balance Sheet Total (quarterly average of weekly data in EUR billion)

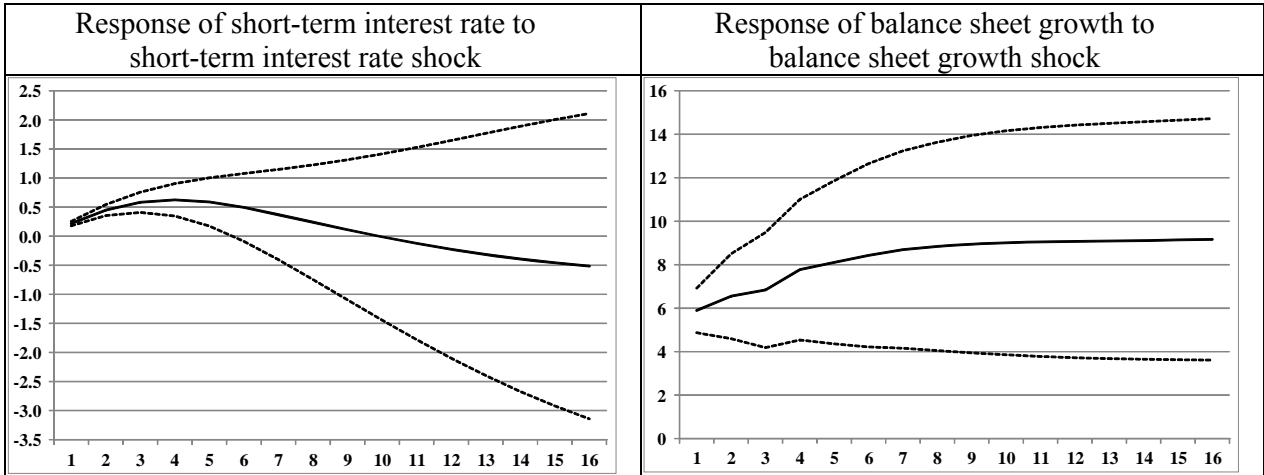


Figure 3. Accumulated Responses of Monetary Policy Variables to Expansionary Monetary Policy Shocks

Note: Dotted lines refer to a two standard error confidence interval.

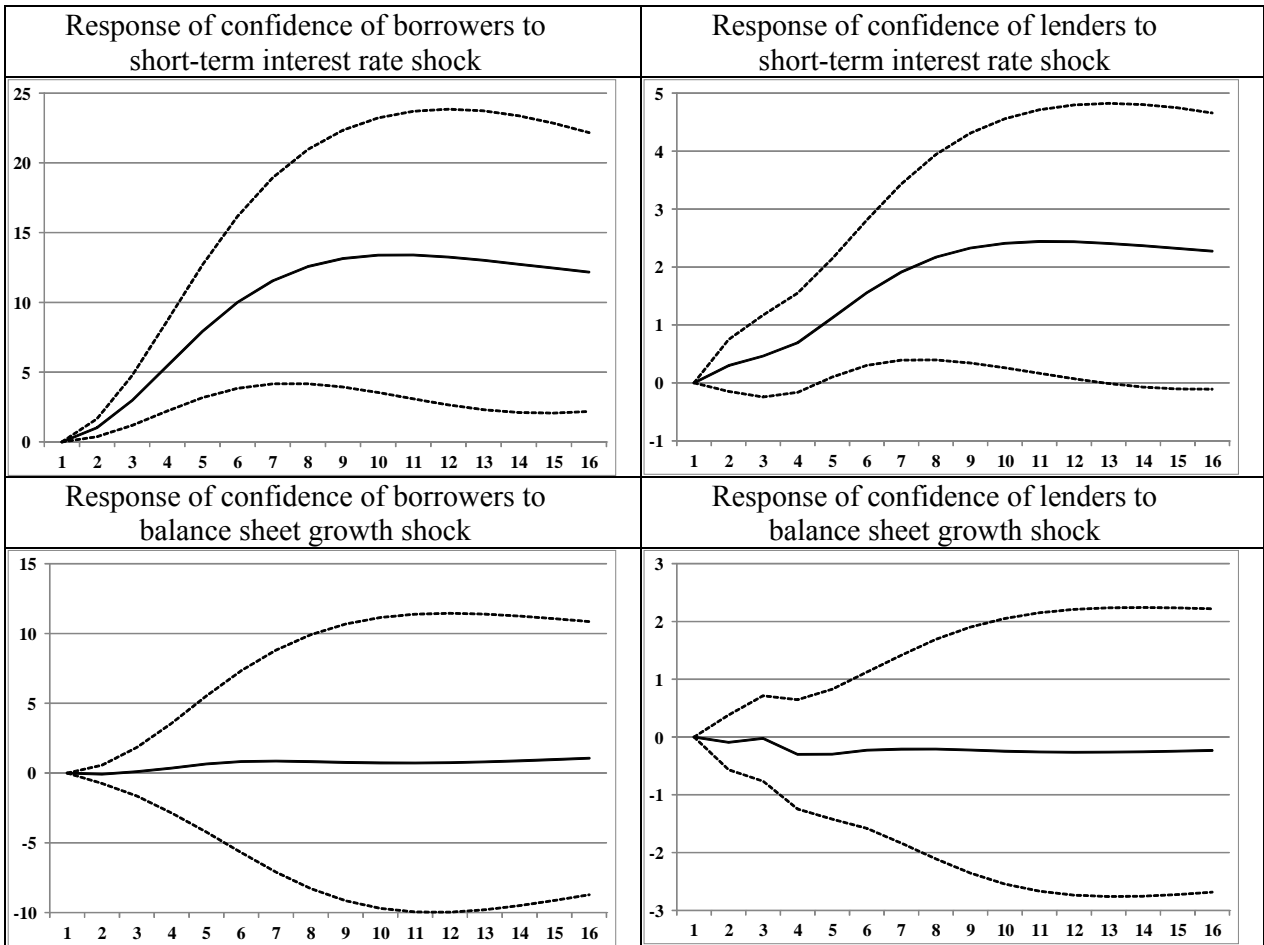


Figure 4. Accumulated Responses of Confidence to Expansionary Monetary Policy Shocks

Note: Dotted lines refer to a two standard error confidence interval.

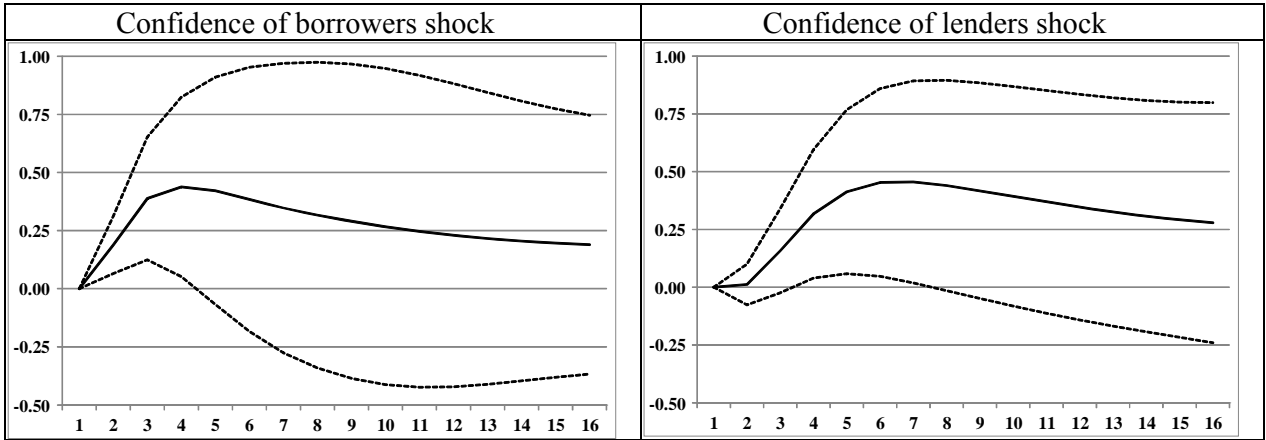


Figure 5. Accumulated Responses of Real GDP Growth to Confidence Shocks
 Note: Dotted lines refer to a two standard error confidence interval.

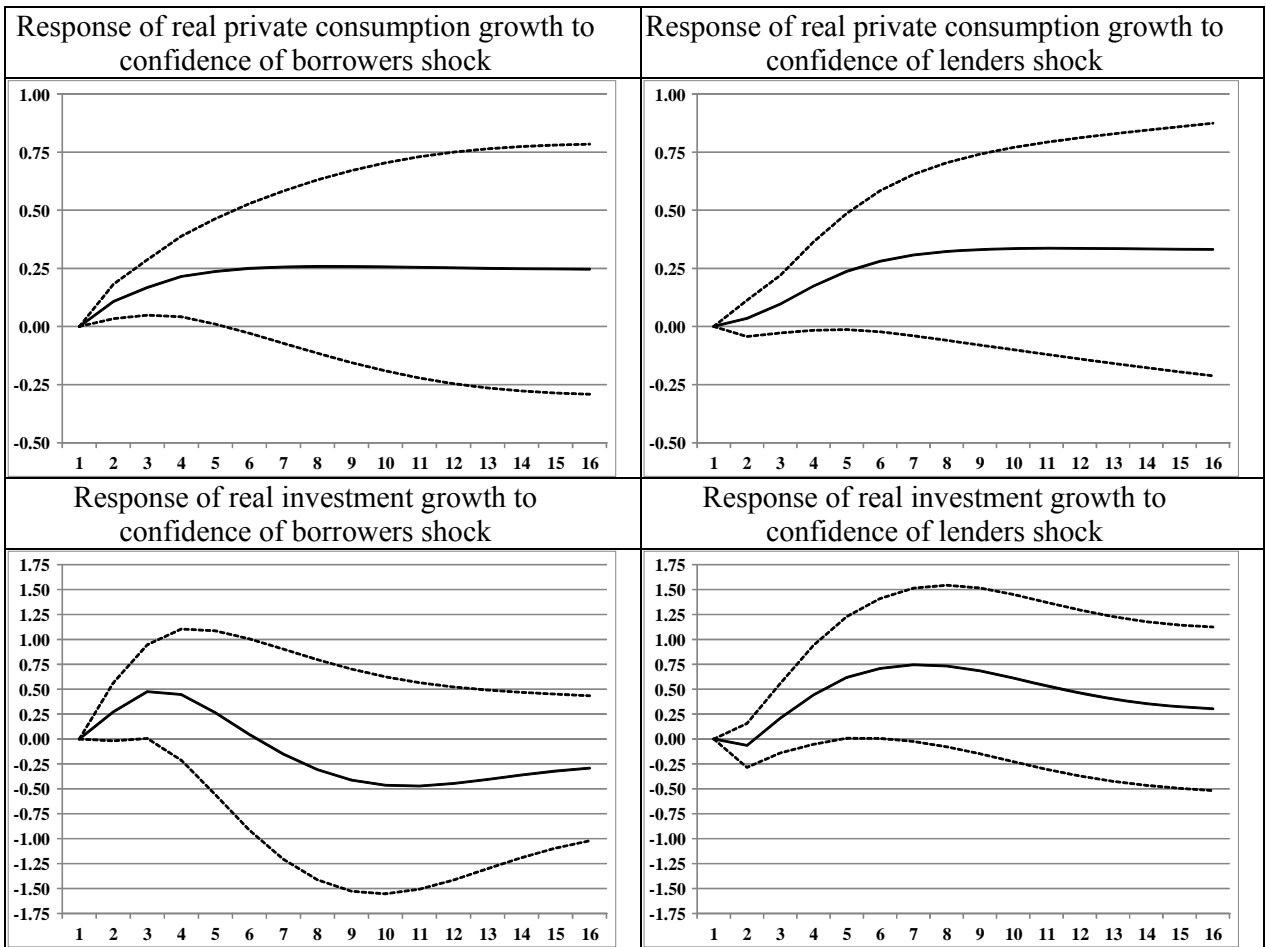


Figure 6. Accumulated Responses of Real Private Consumption and Investment Growth to Confidence Shocks
 Note: Dotted lines refer to a two standard error confidence interval.

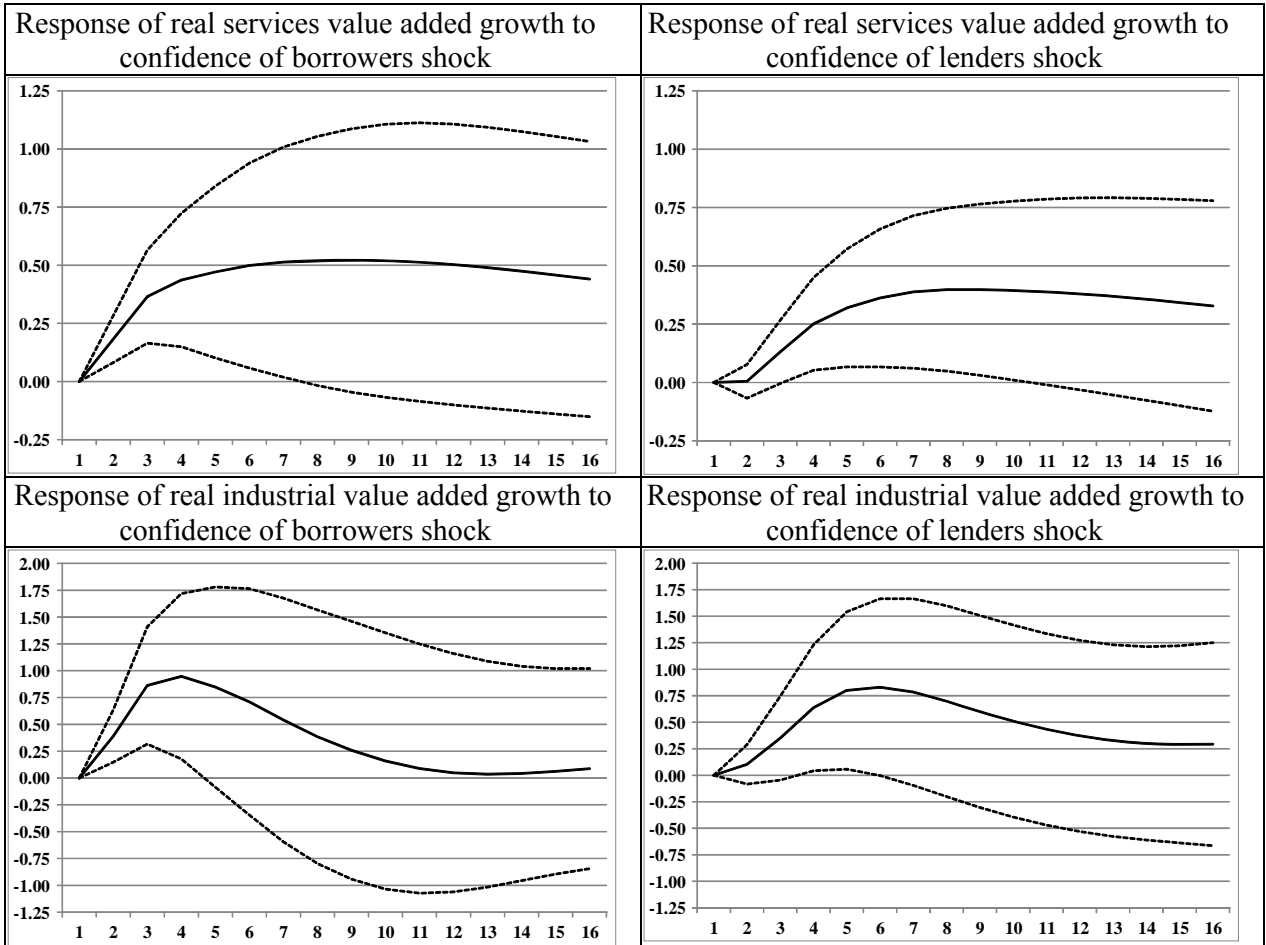


Figure 7. Accumulated Responses of Real Services and Industrial Value Added Growth to Confidence Shocks

Note: Dotted lines refer to a two standard error confidence interval.

Appendix S1: Robustness Results
EONIA instead of Short-Term Interest Rate

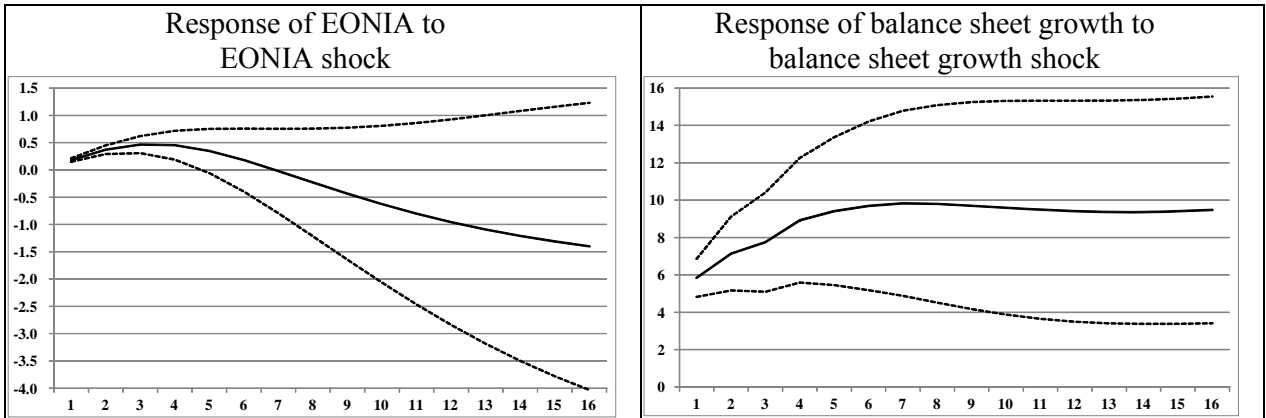


Figure S1. Accumulated Responses of Monetary Policy to Expansionary Monetary Policy Shocks
 Note: Dotted lines refer to a two standard error confidence interval.

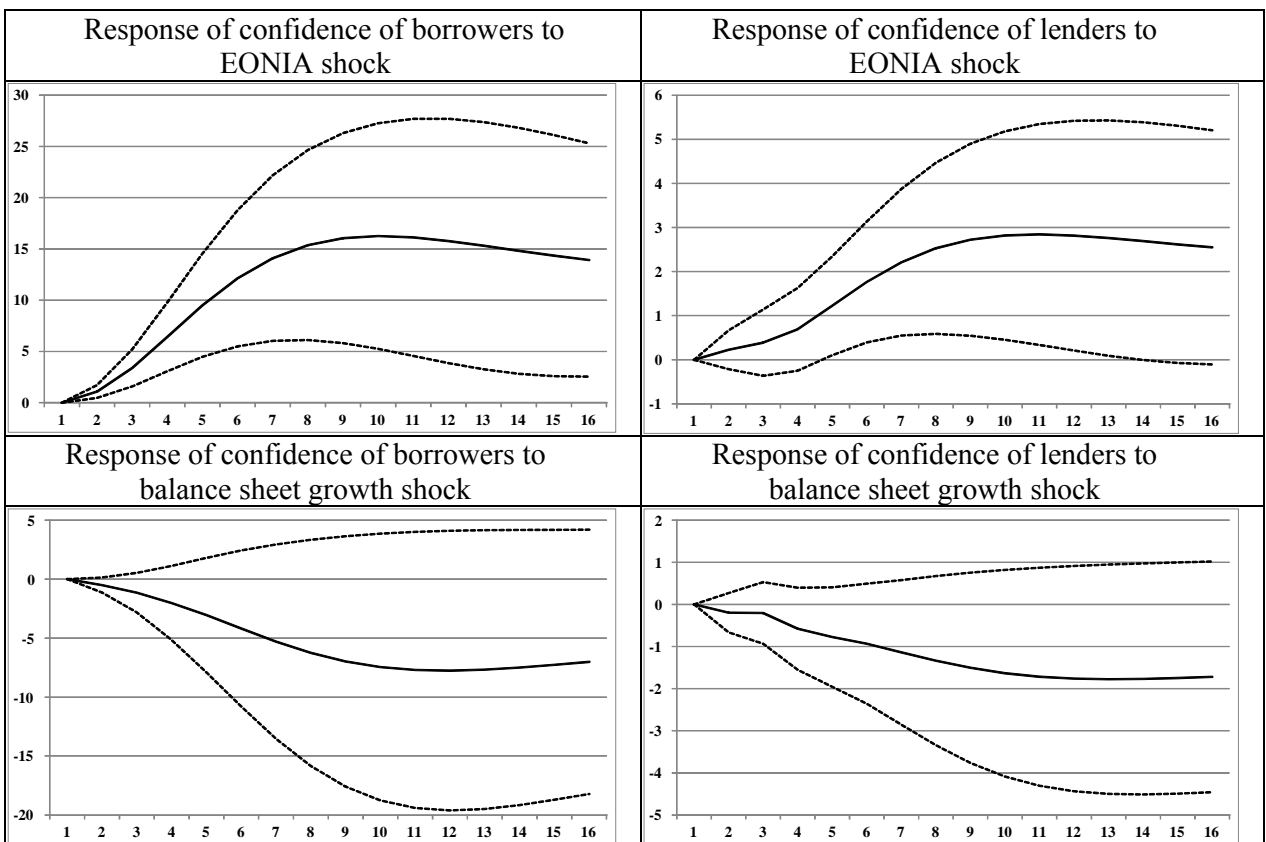


Figure S2. Accumulated Responses of Confidence to Expansionary Monetary Policy Shocks
 Note: Dotted lines refer to a two standard error confidence interval.

Balance Sheet Total in % GDP instead of Balance Sheet Growth

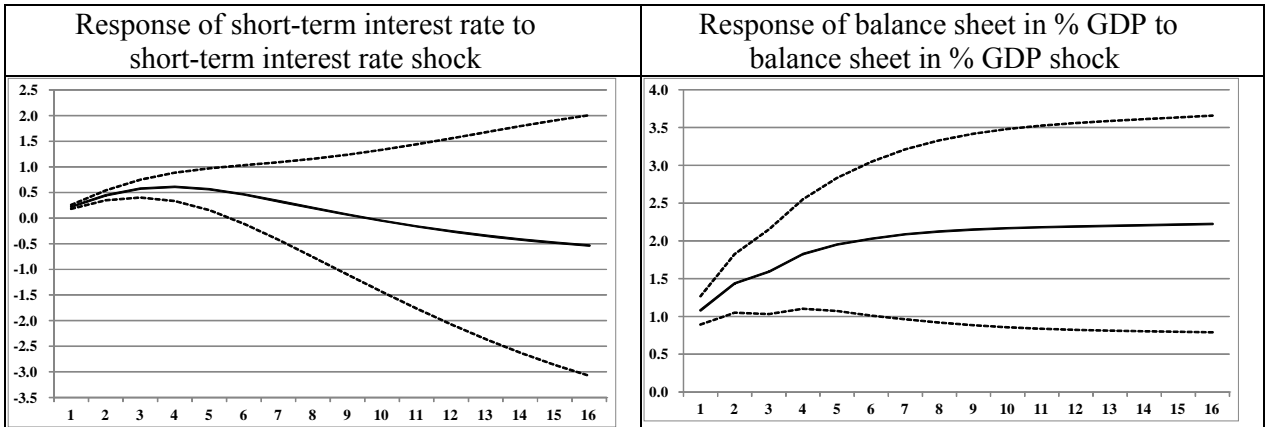


Figure S3. Accumulated Responses of Monetary Policy Variables to Expansionary Monetary Policy Shocks

Note: Dotted lines refer to a two standard error confidence interval.

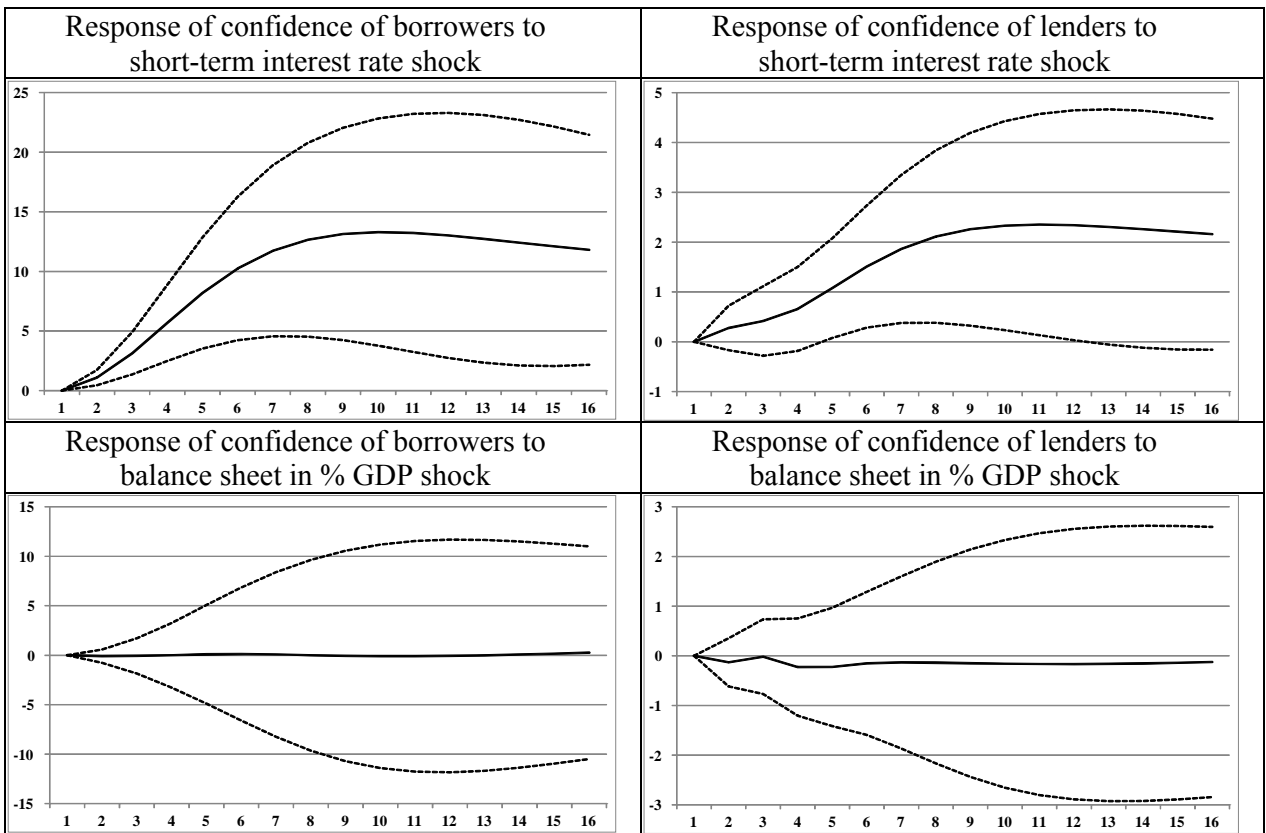


Figure S4. Accumulated Responses of Confidence to Expansionary Monetary Policy Shocks

Note: Dotted lines refer to a two standard error confidence interval.

Consumer and Industrial Confidence instead of Economic Sentiment Indicator

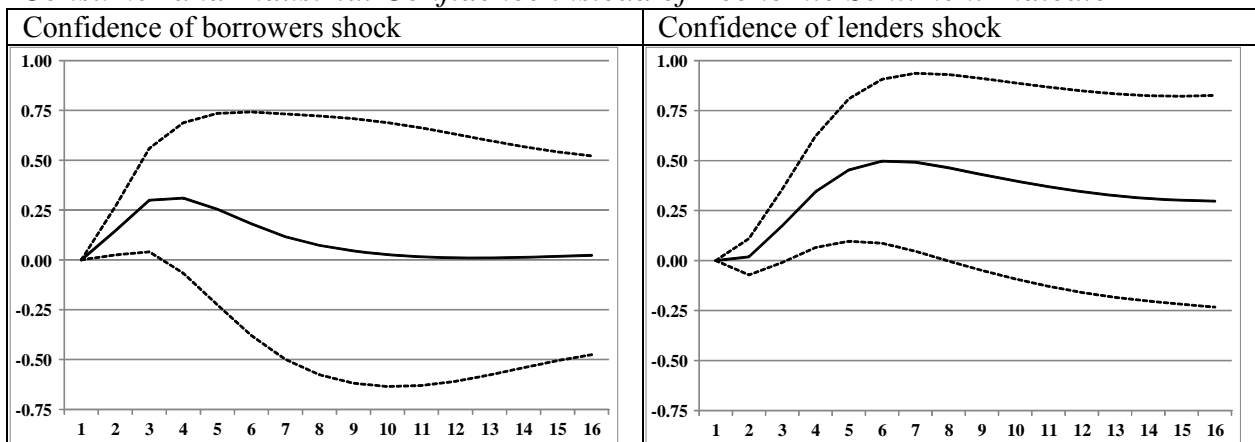


Figure S5. Accumulated Responses of Real GDP Growth to Confidence Shocks

Note: Dotted lines refer to a two standard error confidence interval.

Inverted Expected Credit Standards from the BLS instead of PMI Financial Expectations

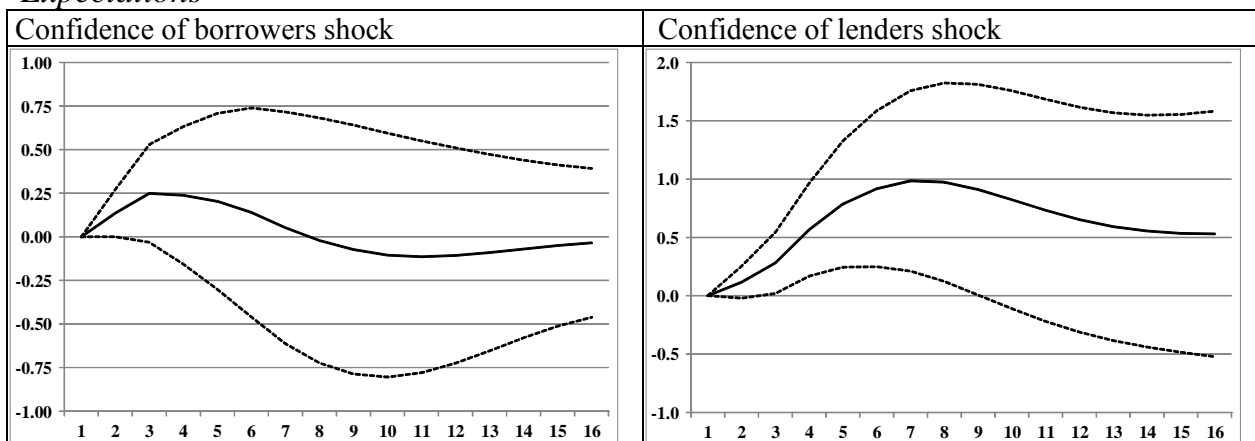


Figure S6. Accumulated Responses of Real GDP Growth to Confidence Shocks

Note: Dotted lines refer to a two standard error confidence interval.

Addition of Long-Term Interest Rate

Table S1. Variance Decomposition of the State of Confidence in %

Confidence of borrowers							Confidence of lenders						
Period	Real GDP growth	Long-term interest rate	Short-term interest rate	Balance sheet growth	Confidence of borrowers	Confidence of lenders	Period	Real GDP growth	Long-term interest rate	Short-term interest rate	Balance sheet growth	Confidence of borrowers	Confidence of lenders
1	30	10	5	2	54	0	1	3	0	0	0	4	93
2	47	5	2	2	44	0	2	3	0	2	0	4	90
3	53	3	3	1	36	4	3	13	1	2	0	4	79
4	53	2	6	1	29	9	4	21	1	2	3	6	67
5	50	2	9	1	25	13	5	23	1	2	3	9	61
6	48	2	11	1	23	15	6	24	2	3	3	10	58
7	47	2	13	1	22	16	7	24	2	4	3	9	57
8	46	3	14	1	22	16	8	24	3	5	3	9	57
9	46	3	14	1	21	16	9	24	3	5	3	9	57
10	46	3	14	1	21	16	10	24	3	5	3	9	56
11	47	3	14	1	21	15	11	24	3	5	3	9	56
12	47	3	13	1	21	15	12	25	3	5	3	9	56
13	47	3	13	1	21	16	13	25	3	5	3	9	55
14	48	3	13	1	20	16	14	25	3	5	3	9	55
15	48	3	13	1	20	16	15	26	3	5	3	9	55
16	48	3	13	1	20	16	16	26	3	5	3	9	54

Table S2. Variance Decomposition of Real GDP Growth in %

Period	Real GDP growth	Long-term interest rate	Short-term interest rate	Balance sheet growth	Confidence of borrowers	Confidence of lenders
1	100	0	0	0	0	0
2	80	1	2	10	7	0
3	68	1	6	8	10	8
4	62	1	9	7	9	13
5	59	1	10	6	8	15
6	58	1	11	6	8	15
7	58	2	11	6	8	15
8	58	2	11	6	8	15
9	58	2	11	6	8	15
10	58	2	11	6	8	15
11	59	2	11	6	8	15
12	59	2	11	6	8	15
13	59	2	11	6	8	15
14	59	2	11	6	8	15
15	59	2	11	6	8	15
16	58	2	11	6	8	15

*Addition of Long-Term Interest Rate and Effective Exchange Rate Change***Table S3.** Variance Decomposition of the State of Confidence in %

Confidence of borrowers							Confidence of lenders								
Period	Real GDP growth	Exchange rate change	Long-term interest rate	Short-term interest rate	Balance sheet growth	Confidence of borrowers	Confidence of lenders	Period	Real GDP growth	Exchange rate change	Long-term interest rate	Short-term interest rate	Balance sheet growth	Confidence of borrowers	Confidence of lenders
1	30	1	10	5	1	53	0	1	2	0	0	0	1	4	92
2	47	1	5	2	1	44	0	2	3	1	0	2	2	4	88
3	54	0	3	3	1	35	4	3	12	1	1	2	2	4	78
4	53	0	2	6	1	29	8	4	20	1	1	1	4	6	66
5	50	1	2	9	1	25	12	5	23	1	1	2	4	9	60
6	48	1	2	11	1	23	14	6	24	1	2	3	3	9	58
7	46	1	2	13	1	22	15	7	24	2	2	4	3	9	56
8	45	2	3	13	1	21	15	8	23	2	3	4	3	9	56
9	45	2	3	14	1	21	15	9	23	2	3	5	3	9	55
10	45	2	3	14	1	21	14	10	23	2	3	5	3	9	55
11	46	2	3	13	1	21	14	11	24	2	3	5	3	9	55
12	46	1	3	13	1	21	14	12	24	2	3	5	3	9	55
13	47	1	3	13	1	20	14	13	24	2	3	5	3	8	54
14	47	1	3	13	1	20	14	14	25	2	3	5	3	8	54
15	47	1	3	13	1	20	15	15	25	2	3	5	3	8	54
16	47	1	3	13	1	20	15	16	26	2	3	5	3	8	53

Table S4. Variance Decomposition of Real GDP Growth in %

Period	Real GDP growth	Exchange rate change	Long-term interest rate	Short-term interest rate	Balance sheet growth	Confidence of borrowers	Confidence of lenders
1	100	0	0	0	0	0	0
2	82	1	1	1	8	7	0
3	70	1	1	6	6	10	7
4	62	2	1	8	5	8	13
5	60	3	1	10	5	8	14
6	59	3	1	10	5	8	14
7	58	3	2	10	5	8	14
8	59	3	2	10	5	8	14
9	59	3	2	10	5	8	14
10	59	3	2	10	5	8	14
11	59	3	2	10	5	8	14
12	59	3	2	10	5	8	14
13	59	3	2	10	5	8	14
14	59	3	2	10	5	8	14
15	59	3	2	10	5	8	14
16	59	3	2	10	5	8	14

Sub-Sample Results

Table S5. Variance Decomposition of the State of Confidence for Sample Starting in 2007Q1 in %

<i>Confidence of borrowers</i>						<i>Confidence of lenders</i>					
Period	Real GDP growth	Short-term interest rate	Balance sheet growth	Confidence of borrowers	Confidence of lenders	Period	Real GDP growth	Short-term interest rate	Balance sheet growth	Confidence of borrowers	Confidence of lenders
1	32	0	5	62	0	1	6	0	1	10	82
2	42	7	5	45	1	2	7	0	2	9	82
3	39	14	3	36	8	3	11	0	2	9	78
4	32	20	2	28	18	4	16	1	4	10	69
5	26	22	2	23	27	5	17	4	3	11	65
6	23	22	3	20	32	6	15	7	3	10	65
7	23	22	3	20	32	7	15	8	4	9	65
8	24	21	4	20	31	8	15	8	4	9	64
9	25	21	4	20	31	9	16	8	4	10	63
10	26	20	4	20	31	10	16	8	4	10	62
11	26	19	4	19	32	11	17	7	4	10	62
12	26	19	4	19	33	12	17	7	4	10	62
13	26	18	4	18	34	13	17	7	4	9	62
14	26	18	4	18	35	14	17	7	4	9	62
15	26	18	4	18	35	15	17	7	4	9	62
16	26	18	4	17	36	16	17	7	4	9	62

Table S6. Variance Decomposition of Real GDP Growth for Sample Starting in 2007Q1 in %

Period	Real GDP growth	Short-term interest rate	Balance sheet growth	Confidence of borrowers	Confidence of lenders
1	100	0	0	0	0
2	71	1	13	14	0
3	48	14	11	11	16
4	40	15	11	9	25
5	38	15	11	9	27
6	38	14	11	10	26
7	39	14	11	10	26
8	39	14	11	10	26
9	39	13	11	10	27
10	38	13	11	10	28
11	38	13	11	10	29
12	38	13	10	10	29
13	37	13	10	10	30
14	37	13	10	10	30
15	37	13	10	10	30
16	37	13	10	9	30

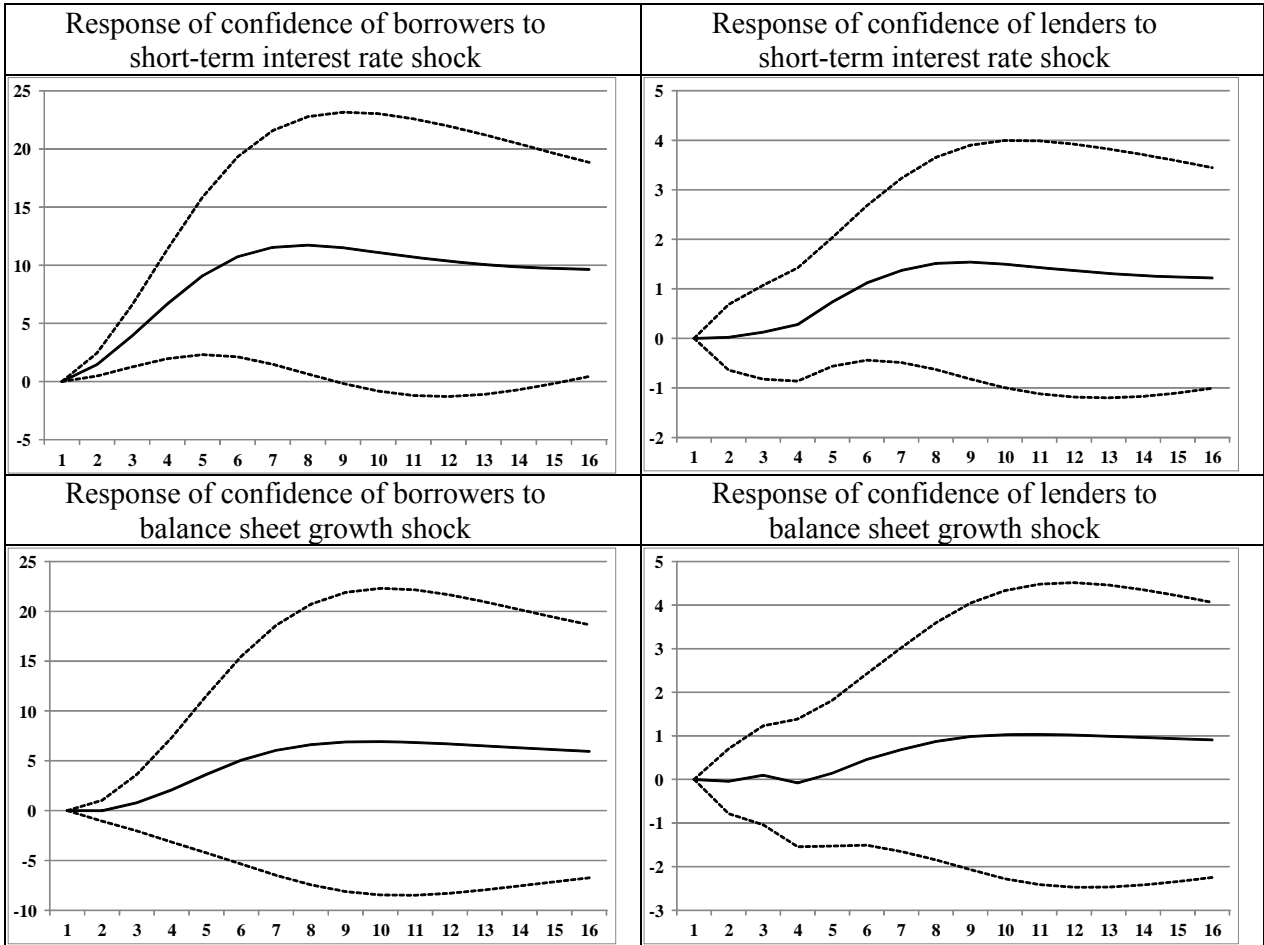


Figure S7. Accumulated Responses of Confidence to Expansionary Monetary Policy Shocks for Sample Starting in 2007Q1

Note: Dotted lines refer to a two standard error confidence interval.

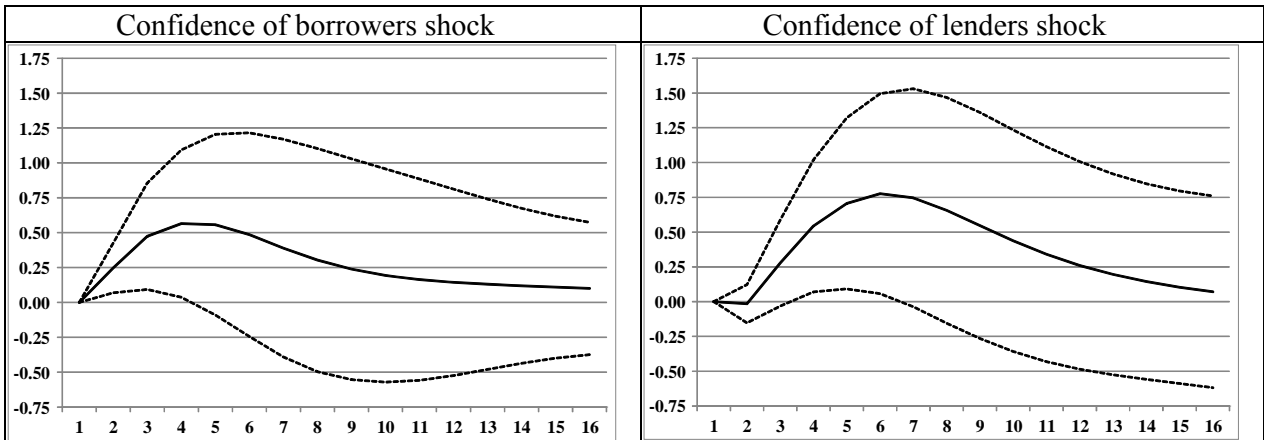


Figure S8. Accumulated Responses of Real GDP Growth to Confidence Shocks for Sample Starting in 2007Q1

Note: Dotted lines refer to a two standard error confidence interval.