

# ZEW policy brief

Marcus Kappler (ZEW), Frauke Schleer (ZEW), Willi Semmler (New School for Social Research), Timo Teräsvirta (Aarhus University and CREATES), and Peter Winker (University of Giessen)

## Financial Sector and Output Dynamics in the Euro Area Countries



### Essential Issues

The financial and economic crisis has drawn attention to the need for a better understanding of destabilising effects that arise in the financial sector and spill over to the real economy. In turn, weakening economic conditions are likely to feed back to the financial sector, thus giving rise to an adverse feedback loop.

The results of past studies indicate that financial stress—which is a reflection of vulnerability in the financial system—has a strong regime-specific impact on the real economy. Thereby, the literature distinguishes between high and low financial stress regimes. Almost all past studies have found that the financial sector exerts extremely negative effects after an increase of financial stress on economic activity in a distressed period and relatively small or even negligible negative effects in a low stress period. What has been lacking so far is research on financial sector and output dynamics as they may unfold over time. During some downswings the effect of financial sector instability on economic activity may be more severe than during others.

### Research Question and Relevance

- A shock to the financial sector—such as the Lehman Brothers collapse—can lead to a long-lasting negative response in economic activity. We document this effect for several euro area countries between September 2008 and January 2013. A high financial stress regime mostly amplifies negative effects on output.
- We find that with a largely bank-based financial sector, the recovery of the real economy after a financial sector shock takes longer. Furthermore, the shock has a more persistent impact on the real economy than in a market-based financial sector.
- However, we also show that financial stress does not always have a negative impact on output. This holds true specifically for the time before the Lehman collapse. After the crash, however, we observe the presence of strong amplification mechanisms. This suggests that events leading to a major economic breakdown are rare but large events, and they are related to a low-frequency financial cycle.

### Key Messages

### Analysis of Feedback and Amplification Mechanisms

## Research Question and Relevance

Recent studies incorporate financial market frictions such as credit constraints into theoretical models in order to analyse spillover mechanisms from the financial sector to the real economy. This new strand in the literature concentrates particularly on the banking sector as a source of business cycle dynamics. As a result, non-standard amplification mechanisms such as credit channels or financial stress are becoming more important in theoretical economic modelling. These studies examine the balance sheets of banks, showing that a downward spiral is triggered through overleveraging, financial interdependencies, and contagion effects. The new theoretical models are similar in that they highlight (1) the critical impact exerted by financial sector dynamics and (2) amplification and destabilising effects on economic activity.

In our work we pursue this line of research, analysing empirically for several euro area countries the feedback and amplification mechanisms that link financial sector dynamics to economic downturns.

### ZEW Financial Condition Indices

## Methods and Data

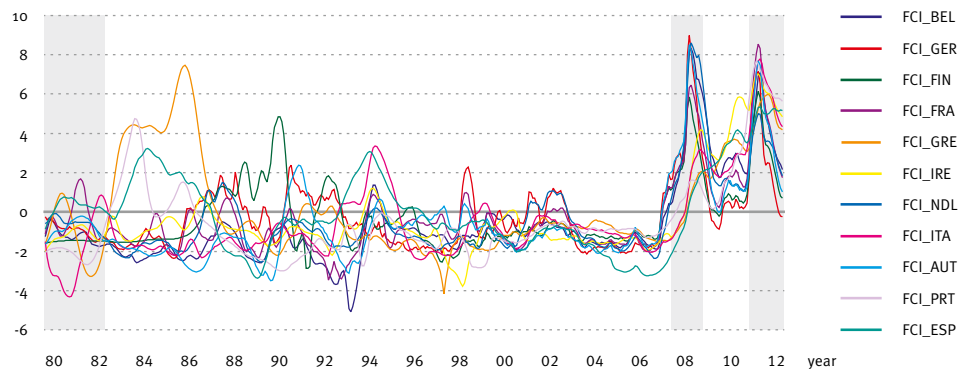
To analyse the relation between the financial sector and economic activity, we have developed indices to assess the status of financial markets in eleven euro area countries. These ZEW Financial Condition Indices (FCIs) measure stress levels in the financial sector. To model economic activity, we use data on monthly growth in industrial production, expressed in constant prices and seasonally adjusted.

The ZEW FCIs cover three categories: the banking sector, the securities market, and the foreign exchange market. Our data set is comprehensive in terms of broadness of financial stress categories and country coverage. While some of these variables are neglected in the existing indices, in our view they play an important role in describing financial market stress and the way it has unfolded, for example, after the Lehman collapse. Many of the existing indices focus predominantly on price variables, like TED or interbank rate spreads. Our index, however, also tracks market volumes, particularly within the banking sector. Clearly, there are strong interdependencies between the banking sector and the performance of both the financial sector and the real economy. For this reason, we believe the inclusion of banking-related factors with a strong link to the economic downturn improves the accuracy and performance of our indices. Furthermore, some of our additional measures incorporate the insights of recently developed theoretical models, including the annual growth rate of assets over liabilities, which represents available bank collateral; the ratio of short- over long-term debt securities issued by banks; and the annual growth rate of bank lending to the private sector. The latter two indicators particularly mirror credit conditions as well as banking sector liquidity and confidence. If financial intermediaries lend more in the short term and less in the long term, this indicates higher uncertainty and increasing mistrust of market conditions and participants. We would like to emphasize that it is not sufficient to only construct an aggregate euro area indicator. Such an index would not adequately take into account the heterogeneity of the financial sector in individual euro area states.

The FCIs are available for Belgium, Germany, Austria, Finland, France, Greece, Ireland, Italy, the Netherlands, Portugal, and Spain from January 1980 to January 2013 on a monthly basis (see figure on page 3). The FCIs for the euro area countries properly capture country-specific as well as euro area-wide stress periods. This means that they accurately indicate financial stress in response to experienced financial market and banking turmoil. They also properly reflect the risk associated with the financial market breakdown in Europe in 2008, as well as the sovereign debt crisis that began to unfold in 2011. The ZEW FCIs are negatively correlated with the growth rates of industrial production

## FCLs of euro area countries

periods of recessions dated by CEPR Business Cycle Dating Committee in grey



in each respective country. We therefore believe that the ZEW FCLs can furnish valuable new insights into the link between financial sector turmoil and economic dynamics in several euro area countries.

## Research Results in Detail

Drawing on the ZEW FCLs and industrial production growth rates as a measure of economic activity, we explore the nexus between the financial sector and the real economy, examining how it has evolved over time. In most countries, a shock in the financial market leads to a long-lasting negative response in economic activity. This shock is particularly harmful to the real economy if it takes place during a period of high financial market stress. Under a high stress regime, the financial system of a country is under strain. Under a low stress regime, the system is more or less free from adverse pressure. Moreover, recessions are more severe and recovery takes longer when shocks emanate from bank-based rather than market-based financial sectors.

Nevertheless, outcomes depend crucially on the time period under study. Our data show that the dynamics of the link between the financial sector and output vary over time in euro area countries. There have been systematic changes in the amplification mechanisms over time, as can be seen for Germany in the table below. After September 2008—when Lehman Brothers collapsed and the financial markets in most advanced economies crashed—the response of industrial production was

### Exploring the Nexus Between Financial Sector and Real Economy

#### Mean of accumulated response of industrial production after normalized shock in FCI, Germany

	full sample		pre-crisis sample		crisis sample	
	low stress	high stress	low stress	high stress	low stress	high stress
6 months	-0.26%	0.00%	-0.24%	-0.14%	-0.33%	-0.49%
12 months	-0.34%	-0.03%	-0.31%	-0.15%	-0.47%	-0.62%
18 months	-0.37%	-0.04%	-0.33%	-0.15%	-0.51%	-0.65%
24 months	-0.38%	-0.04%	-0.34%	-0.15%	-0.51%	-0.66%

Full sample refers to January 1980 – January 2013, the pre-crisis sample to January 1980 – August 2008 and the crisis sample to September 2008 – January 2013.

clearly negative, whereas it had varied around zero before. Moreover, our results suggest counterintuitively that prior to the crisis, impacts on output were stronger during low than high stress periods. The outcomes do not confirm the argument that the financial crisis was only an unusually large shock

## Stronger Amplification Mechanisms after the Lehman Collapse

that resulted in macroeconomic fluctuations similar to those expected during normal times, since we control for the shock size. Accordingly, the change in the dynamics and intensity of the negative impact on the real economy is not solely driven by the size of the shock.

The stronger amplification mechanisms arising after the Lehman collapse reflect asymmetric behaviour on the part of the financial sector output link that may not have been present or had perhaps been rather weak previously. The underlying ZEW FCI for Germany also captures euro area and, to some extent, global risk. Hence, the financial sector shock may be seen as a source of the financial and economic crisis, but the severe economic downturn may then have been reinforced by global effects influencing one another and interdependencies between financial markets. This then resulted, among other outcomes, in an export slump in Germany. The outlier event “Lehman Brothers collapse” and the subsequent euro area crisis constitute situations of greater real economy sensitivity to financial market fragility. While it would be possible to have a period of high stress without consequences for the real economy if the amplification effects are weaker, the recent crisis points to systematic changes in output fluctuations and financial sector dynamics when compared to previous periods. Our findings suggest a financial cycle interpretation: events, such as the financial market collapse in 2008, that lead to a major economic breakdown appear to be related to a financial cycle that is of low frequency. Accordingly, these events have a rare but large impact on economic downturn.

## Project Profile

### Researchers

- **Marcus Kappler**, ZEW Mannheim
- **Frauke Schleer**, ZEW Mannheim
- **Willi Semmler**, New School for Social Research, New York and ZEW research associate
- **Timo Teräsvirta**, Aarhus University and CREATES
- **Peter Winker**, University of Giessen and ZEW research associate

### Contact

Frauke Schleer, Centre for European Economic Research (ZEW), P.O. Box 103443, 68034, Mannheim, Germany, Phone: +49/621/1235-164, E-mail: [schleer@zew.de](mailto:schleer@zew.de)

### Funding

Research has been supported by the SEEK Research Programme of the Centre for European Economic Research (ZEW).

### Website

<http://www.zew.de/en/forschung/projekte.php3?action=detail&nr=1203>

### Publications

**Frauke Schleer and Willi Semmler** (2013), Financial Sector and Output Dynamics in the Euro Area: Non-linearities Reconsidered, ZEW Discussion Paper No. 13-068, Mannheim.

**Frauke Schleer** (2013), Finding Starting-Values for Maximum Likelihood Estimation of Vector STAR Models, ZEW Discussion Paper No. 13-076, Mannheim.

**Marcus Kappler and Frauke Schleer** (2013), How Many Factors and Shocks Cause Financial Stress?, ZEW Discussion Paper No. 13-100, Mannheim.



Zentrum für Europäische  
Wirtschaftsforschung GmbH  
Centre for European  
Economic Research

#### ZEW policy brief series

**Publisher:** Centre for European Economic Research (ZEW), Mannheim  
L 7, 1 · 68161 Mannheim · P.O. Box 10 34 43 · 68034 Mannheim · Germany · Internet: [www.zew.de](http://www.zew.de) · [www.zew.eu](http://www.zew.eu)  
President: Prof. Dr. Clemens Fuest · Director of Business and Administration: Thomas Kohl

**Editorial responsibility:** Prof. Dr. Clemens Fuest

**Quotes from the text:** Sections of the text may be quoted in the original language without explicit permission provided that the source is acknowledged.

© Zentrum für Europäische Wirtschaftsforschung GmbH (ZEW), Mannheim, 2013