

Financial Markets and Real Economic Activity

The current crisis has once more shown that financial markets and the real economy can strongly interact. This experience has sparked renewed interest in research on the linkages between financial markets and real economic activity. On September 28, 2012, the Oesterreichische Nationalbank hosted a workshop on this timely and important topic. This article provides a brief summary of the research that was presented at the workshop.

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Until recently, questions concerning the link between financial markets and the real economy were not a high priority on the research agenda of most economists. Policymakers and economists probably agree that massive distortions in financial markets can affect real economic activity. However, the smooth business cycles throughout the 1980s, 1990s and the beginning of the new millennium did not suggest that any serious trouble would originate from financial markets. This period of low output volatility, which is sometimes referred to as “the Great Moderation,” came to an abrupt end in 2007, when turbulences in the U.S. subprime mortgage market triggered the most severe economic crisis since the “Great Depression” of the last century.

The current crisis demonstrates forcefully that the real effects of distortions in financial markets can be very strong. This experience has stimulated new research on the interplay between financial markets and the real economy. How does financial market integration affect real economic activity? Does a high level of stock market volatility have an effect on the business cycle? How can information from financial markets be exploited to improve economic models and forecasts? How does the market structure of financial markets shape risk-taking behavior, and what are the consequences for systemic risk? These and related questions were discussed in a workshop held at the

Oesterreichische Nationalbank (OeNB) on September 28, 2012.

Peter Mooslechner (Director of the Economic Analysis and Research Department of the OeNB) noted in his opening remarks that much of the older research on the linkages between financial markets and the real economy has been downplayed or neglected by most economists. In this context, he emphasized two specific forces that were among many other causes at work in the recent crisis. The first would be over-optimism, a typical ingredient of every financial bubble. Subprime mortgages were written on the assumption that housing prices would steadily keep on rising. This assumption turned out to be wrong, of course. The second force that contributed to the crisis was over-confidence in the understanding of markets. Most financial economists believed that their models were basically accurate and that efficient financial markets would generate “correct” asset prices. Consequently, it was propagated that financial markets would work best when they are deregulated. Furthermore, innovative financial instruments that help to complete markets were to be welcomed. Accordingly, complex derivatives for trading credit risk were designed and the pricing of these financial instruments was based on standard models and assumptions. Unfortunately, standard models tend to break down in times of high market turbulence.

Mooslechner further pointed out that the assumption of entirely rational

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utility-maximizing agents is obviously useful in economic model building, and that much of the interaction between financial markets and real economic activity can be explained without relaxing standard assumptions. However, possible explanations are not always plausible explanations. In a search for more realistic explanations of how the economy works, Mooslechner argued, we need to pay closer attention to the many emotional factors that drive human behavior – such as fear, corruption, bad faith, confidence and concerns for fairness. It would also be useful to reexamine older ideas that fell out of fashion over the last few decades and combine them with new thoughts and the modern methods we have access to today.

Just like the recent crisis, Japan's Great Recession from 1990 to 2000 originated from a massive asset bubble. After a sharp rise in interest rates at the end of 1989 the bubble collapsed and a debt crisis followed – Japan's "Lost Decade" had begun. At the workshop, *Mathias Hoffman (University of Zürich)* presented his research on the cross-regional spread and the long run determinants of Japan's Great Recession. He argued that, after 1990, growth rates in Japan were significantly lower in prefectures with a large number of small credit-dependent manufacturing firms. Moreover, the financially least integrated and most strongly credit-dependent prefectures experienced the largest decline in lending by nationwide banks. Thus, the degree of financial integration is able to explain much of the regional differences in the development of the Japanese economy. Silk, historically Japan's most important export good in the mid-19th century, played an important role in regional financial development. The silk industry was heavily credit-dependent, but

silk reellers, being located in the mountainous regions of Japan, could not easily borrow from large Japanese banks. Instead, local banks and cooperatives provided the necessary credits. As a consequence of this regional banking model, silk regions were less financially integrated with the rest of the country even more than 150 years later at the onset of the Great Recession. Empirically, it turns out that less financially integrated regions were hit harder during the Lost Decade.

Capital inflows into an economy do not only have beneficial effects. Inflows can also fuel an asset price bubble and amplify financial instability. The Asian economies experienced a considerable capital drain at the height of the crisis in 2008. Interestingly, foreign capital returned quickly in 2009, and the capital inflow already exceeded its pre-crisis level in 2010. *Peter Tillmann (Justus Liebig University of Giessen)* focused on the impact of capital inflows on property prices and stock prices in Korea, Hong Kong, Malaysia, Thailand, Taiwan and Singapore. His empirical investigation is based on a panel Vector Autoregression (VAR) approach. In contrast to many other VAR studies, capital shocks are identified with sign restrictions. According to Tillmann, this identification strategy has the advantage that no arbitrary triangular identification schemes need to be imposed. The empirical results show that capital inflow shocks lead to significant house price appreciations and even stronger equity price appreciations. The response to a capital inflow shock is particularly strong in Hong Kong, Korea and Singapore. As a consequence, large capital inflows as well as sudden capital flow reversals may endanger financial stability in these economies. The empirical findings further suggest that the different responses

to capital shocks are not attributable to housing market characteristics but to differences in the conduct of monetary policy in these countries.

Banks may face increasing loan losses, capital losses, or may for some other reason change their willingness to lend. Such a change in lending behavior could create an economic shock due to frictions in the credit supply. Shocks triggered by banks could be momentous enough to have an impact on the business cycle. *Timo Wollmershäuser* (*Ludwig-Maximilians-University of Munich; ifo Institute*) presented his research on the macroeconomic consequences of loan supply shocks in the euro area during the recent crisis. The aim of this research is to quantify the macroeconomic effects of negative loan supply shocks. As in the case outlined above, loan supply shocks are identified by means of a panel VAR model which uses sign restrictions and takes aggregate demand and supply shocks as well as monetary policy shocks into account. The empirical findings suggest that an important part of the decline in output in the euro area during the crisis can be attributed to loan supply shocks. Furthermore, there is considerable heterogeneity in the timing and magnitude of the shocks across the euro area countries. For a group of countries including Austria, Finland and Italy, the effects of loan supply shocks were particularly severe in 2008, whereas for the other euro area countries the negative effects did not occur until 2009 and 2010. Wollmershäuser argued that the heterogeneous responses may be explained by the different timing in the raising of new equity to improve the stability of the banking sector across countries.

There is a strong link between the bond market and real economic activity because the bond market is important

for large corporations and governments in financing their planned expenditures and investments. The latest research on the term structure of interest rates therefore incorporates macroeconomic factors into its models. At the same time, dynamic stochastic general equilibrium (DSGE) models try to integrate the financial sector. An important issue in this context is how to link macroeconomic and financial data in a consistent way. *Olaf Posch* (*University of Hamburg*) proposed a new macro-based model for the term structure of interest rates which takes the dynamics of macroeconomic factors into account. Using a general equilibrium approach, the model extends standard term structure models by including consumption and production variables. In this model, bond yields are linear in the short rate and in inflation, and macroeconomic variables provide information about structural parameters in the bond pricing equation. The new approach yields an analytically tractable model that can be estimated using standard affine term structure methods.

Stock market volatility is usually low in good times and high in bad times. This empirical observation suggests that stock market volatility may help to forecast future economic activity. Moreover, a high level of stock market volatility may reflect or sometimes even create uncertainty about the future course of the economy. This uncertainty may in turn lead economic agents to delay planned investment projects. If uncertainty is high, it may pay to wait until the uncertainty has been resolved. *Antonio Mele* (*University of Lugano; Swiss Finance Institute*) presented empirical results about the ability of U.S. stock market volatility to predict industrial production growth and probabilities of recessions for the U.S. economy. A slowly changing measure of stock market

volatility is used to capture long-run uncertainty in the capital markets. It turns out that this measure is successful in out-of-sample experiments where real economic activity is predicted over six month and one year ahead. The inclusion of stock market volatility improves forecasts of real economic activity based on traditional leading indicators and other financial variables, such as corporate bond spreads and term spreads. Long-run stock market volatility combined with the term spread predicts the business cycle particularly well. The question whether stock market volatility just anticipates or indeed drives the business cycle remains unsolved, however.

The near bankruptcy of Bear Stearns and the bankruptcy of Lehman Brothers in 2008 were cases in which counterparty risk (i.e. the risk arising from a counterparty's default or bankruptcy) had a very serious impact on financial markets. Stock market volatility skyrocketed and the global economic shock resulting from the Lehmann bankruptcy triggered a number of bank

failures and eventually forced governments and central banks to adopt rescue measures of an unprecedented scale to prevent a total collapse of the financial system. *Dale Rosenthal (University of Chicago)* compared how bilaterally cleared and centrally cleared derivatives markets differ in their reaction to bankruptcies on the basis of network models. His results suggest that even small bankruptcies may temporarily increase volatility. When a large initial bankruptcy occurs in a bilateral over the counter (OTC) market, counterparties may either be unable to save themselves, or an incentive to drive weaker survivors into follow-on bankruptcy may arise. Counterparty risk may then severely increase systemic risk. Moreover, volatility is higher in bilateral OTC markets than in centrally cleared markets. Rosenthal argues that bilateral markets encourage financial innovations due to the low startup costs involved, but when a financial instrument becomes more mature it may be beneficial to move on to centralized clearing.

