Economic Watch

Europe

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Economic Analysis

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Bank lending and business cycle in EMU: a slow and fragile recovery

• **The evidence shows that the recent eurozone recession has not been an exception to the norm of other recessions generated by financial and real estate crises:** they have been deeper and longer than usual, while the subsequent recoveries are more dependent on the improvement of the financial sector.

• **In this note, in order to evaluate the perspectives of the eurozone economy,** we disentangle the role of the banking sector lending behaviour from other explanatory factors in the recent performance of consumption and investment, using an improved version of the DSGE model with banking and credit originally developed by Gerali, Neri, Sessa and Signoretti (2010).

• **The results using data for the period 1998Q1-2011Q1 are consistent with the interpretation that financial shocks were the most important cause of the fall of both consumption and investment in 2008 and 2009.** The results also reveal that the deterioration of banks' credit supply stopped at the beginning of 2010 and that it has timidly begun to recover in recent quarters. In particular, financial shocks have already contributed positively to output growth since the second half of 2010.

• **However, the positive contribution of financial shocks in the recent recovery could be ephemeral** and revert quite rapidly if the current sovereign debt crisis intensifies.

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The key role of the banking system in the recent recession in the eurozone requires new quantitative macroeconomic models with a representation of the banking system

As shown in Figure 1, the economic crisis that took place in 2008 presents some contrasting features with respect to previous economic downturns. In particular, the falls in activity and employment have been sharper and the recovery pace much more moderate than in previous recessions. The financial crisis and the greater interdependence between financial and real economic variables have been at the centre of the recession, changing the transmission mechanism of macroeconomic policies as well as possibly introducing new rigidities in the economy.

In fact, available data show that private sector credit contracted over the crisis, while the pace of expansion afterwards has been very timid (see Figure 2). However, in principle, the stagnation or decline in credit aggregates observed in Europe could be the consequence of simultaneous credit demand and credit supply shocks. To disentangle these shocks, we need to use quantitative models that allow us to determine the relative importance of credit supply and demand shocks in a statistically rigorous manner.

Notwithstanding this, the development of appropriate quantitative tools to analyse the role of banking behaviour in business-cycle fluctuations has only started recently. DSGE models are the most reliable tool to separate the sources of business cycles and to determine the impact of monetary and fiscal policies on such fluctuations (see Smets et al., 2010, and the references therein). Hoewever, until recently they did not incorporate the financial sector in an explicit and rich enough way to allow to identify the role of financial factors in explaining the evolution of macroeconomic variables. The following analysis rests on a DSGE model for EMU which overcomes this deficiency by incorporating banking behaviour and services. The model is an improved version of the DSGE with banking and credit recently developed by Gerali Neri, Sessa and Signoretti (2010, GNSS henceforth).
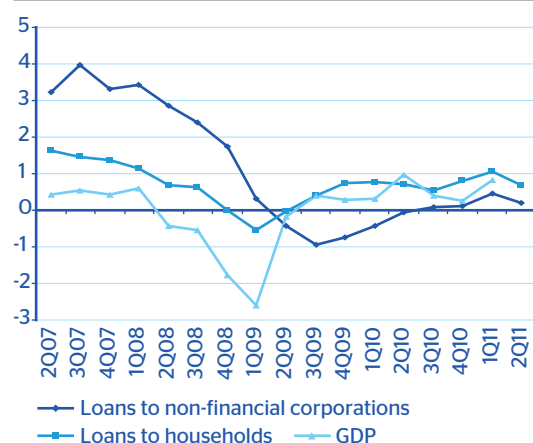
Chart 1
**Eurozone: GDP cycles
(Index, T=100; T= start of the recession)**

Legend: 1974, 1980, 1992, 2001, 2008, Average 1973-2002
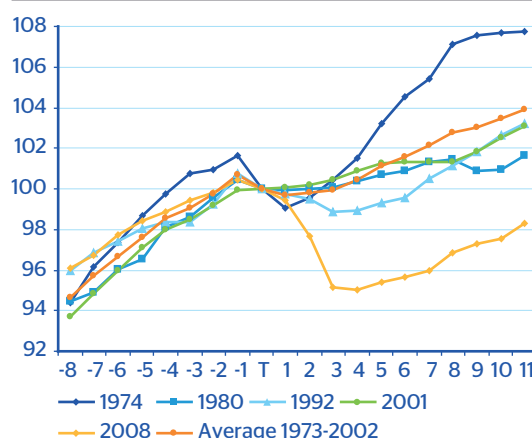
Source: Eurostat and BBVA Research

Chart 2
Eurozone: GDP and loans to private sector (% q/q)

Legend: Loans to non-financial corporations, Loans to households, GDP

Source: ECB, Eurostat and BBVA Research

Our DSGE model helps to understand how shocks originated in the supply side of the credit market are transmitted to the real economy, contributing to business cycle fluctuations

DSGE models are the most reliable statistical tool to unravel the causal direction of effects among macroeconomic variables in the short and medium term. The model used here incorporates the financial sector and financial decisions of both households and firms with sufficient detail to account for the significant impact of credit on investment and private consumption, as well as for the various demand and supply factors that underlie the dynamics of credit.

The model incorporates the following features to capture the stylized facts of the recent EMU downturn:

1. Imperfections and rigidities that characterize the functioning of the banking system, good and labour markets, and its dynamics.

2. Restrictions on access to credit by households and firms due to changes in the value of their assets used as collaterals.

3. Minimum capital (prudential and legal) requirements faced by banks, as well as the costs associated to the degree in which these requirements are being met.

4. Banks' balance sheet identities and, in particular, the possibility of events that will force a rapid restructuring of balance sheets.

The aforementioned features give the model enough flexibility to capture realistically, in the European context, the significant interdependence between the real and the financial side of the economy, and in particular the link between the banks' balance sheets and the business cycle. In addition, the model also captures several factors that affect both credit demand (willingness to borrow by households and firms) and supply (willingness to lend by banks) as well as the dynamic adjustment of different economic variables, both real and financial.

The structure and transmission channels of the model are as follows. The economy is populated by "patient households", who save part of their income each period and own the banks and firms in the economy, and by impatient households and entrepreneurs, who borrow money each period to spend more than their income. Both impatient households and entrepreneurs borrow money from lending retail banks (which allows to differentiate between types of credit), while patient households buy deposits from deposit retail banks. Deposit retail banks transfer their deposits to a wholesale bank which provides the funds to lending retail banks, taking care to satisfy the balance sheet identity and accounting for the costs of deviating from the optimal value of the banking capital ratio (banking capital/banking assets), which is given exogenously. Additionally, there exist a production and a commercial sector which employ labour services from households in exchange for wages, which are monopolistically fixed by labour unions. The interest rates are also fixed monopolistically.

Overall, the model, once adjusted to EMU data, allows us to decompose the rates of growth of different macroeconomic variables in terms of the following categories of shocks:

1. Financial shocks: those forces that restrict or expand bank's credit supply.

2. Macroeconomic shocks: those forces, not linked to the banking sector, which affect households' consumption and spending and firm's investment. These shocks ultimately determine the credit demand by these agents.

3. Monetary policy shocks: unexpected changes in interest rates determined by the monetary authority.
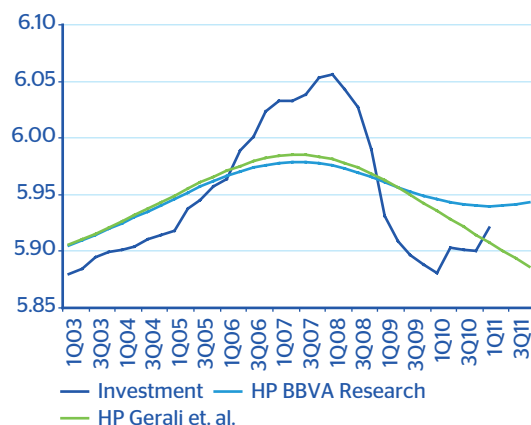
Chart 3
Model structure
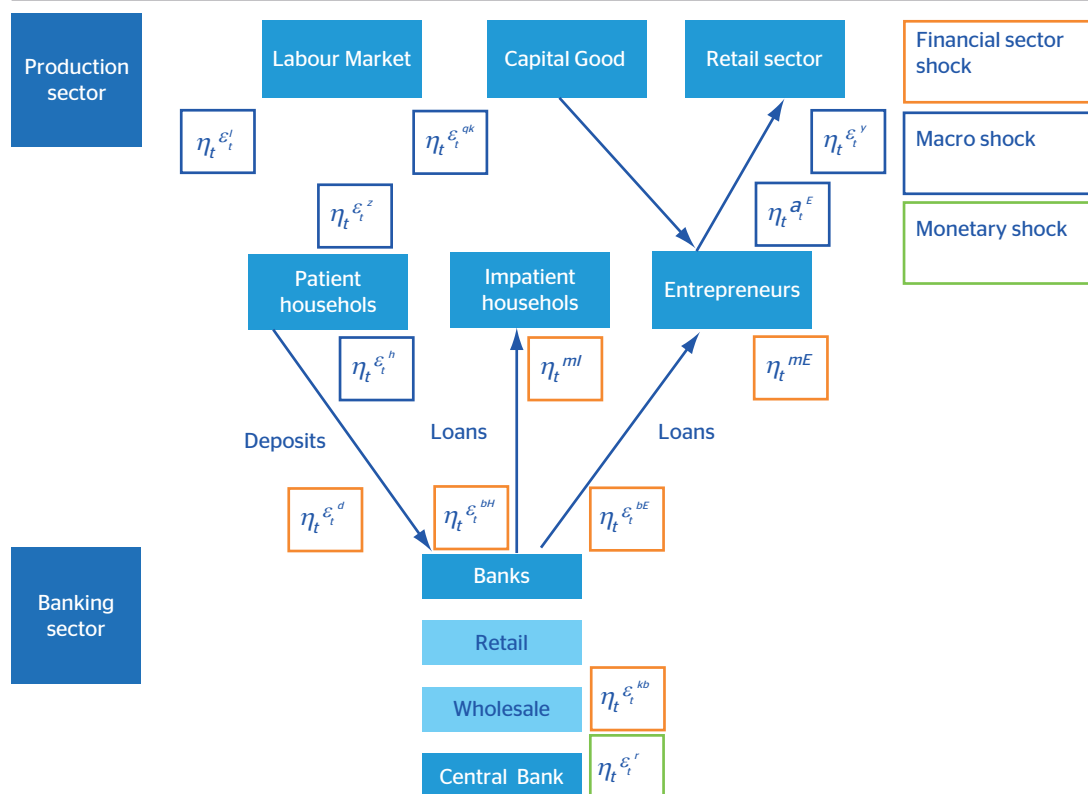
Fuente: BBVA Research

It should be noted that the model, given its simplification, still has some limitations, which constitute lines of future research. In particular, the model assumes that banks have unlimited access to finance at the policy rate from a lending facility at the central bank. This may be valid to describe the most recent downturn, but was not in the past and will probably not be in the medium-term. In its current state, the model also omits the increase of risks in financial markets, the freezing up of money markets, and explicit fiscal and external shocks.

Our model has the same structure of GNSS' model, described above, but differs in the way we remove long-run trends from the macroeconomic and financial time series to extract the business-cycle component, which is the object of interest (i.e., the component explained and forecast by the model). Specifically, GNSS use the standard Hodrick-Precott (HP) filter, a methodology excessively sensitive to the last observations of the time series analysed. Especially in the recent recession due to the deep recession of 2009, the HP filter may produce a distorted picture of the business-cycle behaviour of the EMU macroeconomic and financial variables. We correct this problem along the lines suggested by Mise, Kim and Newbold (2005) by adding our long-run forecasts to the historical observations of the time series before extracting the trends with the HP filter.

As an illustration of the difference between both methodologies, Figure 4 shows the trend component of the standard HP filter (labelled HP GNSS) and our forecast-augmented HP filter (labelled HP BBVA), applied to the level of aggregate investment in EMU. The standard filter attributes a huge portion of the contraction of investment in the last years to the trend component, to the point that the cyclical component becomes positive in the first quarter of 2011, when the standard measure of industrial capacity utilization in EMU was negative (Figure 5). In contrast, the forecast-augmented HP filter yields a more reasonable picture, which is also more consistent with the widespread view that the cyclical component has begun to reverse in the last quarters but not long enough as to closing the gap between the current level of investment and its trend component.

Chart 4
Investment

Source: Eurostat and BBVA Research

Chart 5
Eurozone: current level of capacity utilisation
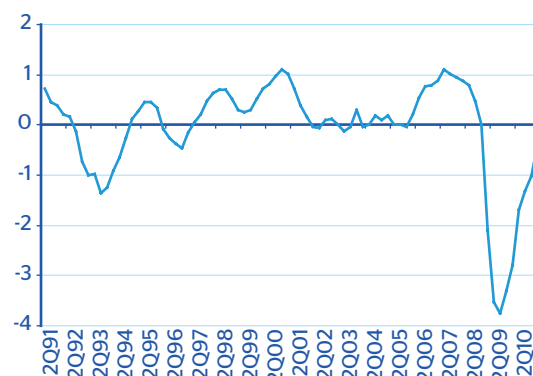
Source: Standardized data

Shocks originating in the banking sector explain the largest fraction of the fall of output in 2008, while other macroeconomic shocks played a smaller role

The results from the model are in line with the conventional interpretation of the recent European crisis: tensions in financial markets and banks' losses from subprime credit exposure and from significant write-offs on asset-backed securities caused a widespread credit restriction, which in turn triggered a severe economic downturn. This view is also supported by the evidence provided by the Bank Lending Survey from the European Central Bank. As we can observe in Figures 6 and 7, credit standards tightened since the start of the recession, mainly driven by the increasing costs related to banks' capital as well as by difficulties to access financial markets.

We use the historical shock decomposition produced by the DSGE model to quantify the importance of each shock on the dynamics of the main macro and financial variables in the eurozone. In particular, the historical decomposition shows that both financial and macroeconomic shocks were the main drivers of the economic expansion over 2006-2008, but financial shocks explained most of the fall in the recent downturn.

Chart 6
Credit standards
(Cumulated answer, deviation from the average)
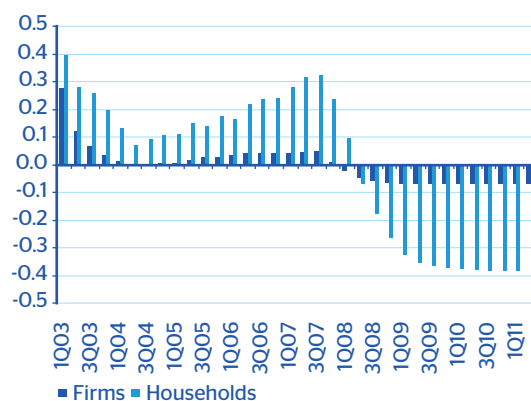
Source: BBVA Research

Chart 7
Bank´s determinants on loan supply. Firms
(Cumulated answer, deviation from the average)
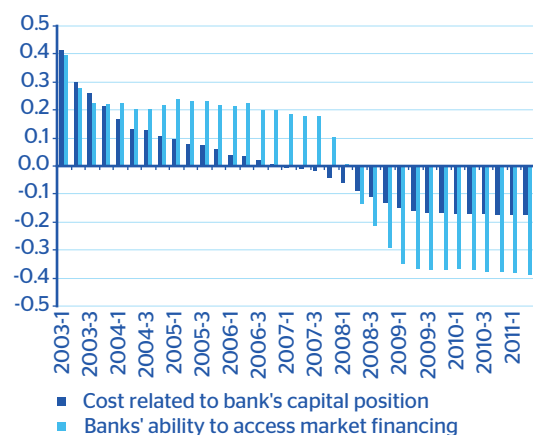
Source: BBVA Research

Financial shocks have the largest impact on investment (Figure 8). In particular, the two main financial shocks were those related to firm's loan-to-value ratios, along with, to a lesser extent, mark-ups charged by banks as a consequence of the high uncertainty in the economy, which result in a reduction of loans to companies. However, macroeconomic shocks were the main drivers of the contraction of loans to households, resulting from lower demand for both housing services and consumer goods. In short, the reduced availability of credit in the economy appears to be due to a combination of both supply (affecting investment) and demand factors (in the case of credit to households).

By mid-2009, the eurozone economy started to recover, although at a much slower pace than in previous upswings. The good news is that the negative impact of financial shocks dampened over the second half of 2009, contributing positively to annual growth rates in recent quarters, partly because banks have not continued tightening credit requirements and partly due to the incipient recovery in domestic demand. The non-standard liquidity measures implemented by the ECB partially restored the normal functioning and the stability of financial markets, providing liquidity into the economy. As long as financial shocks started to affect positively the economy and policy makers began to withdraw expansionary fiscal policies taken to boost the economy, macroeconomic shocks also ended up hampering economic activity (Figure 10). Regarding monetary policy, the sharp reduction in the ECB policy rate resulted in an expansionary monetary policy that supported economic growth.

Chart 8
Investment (%, y/y)
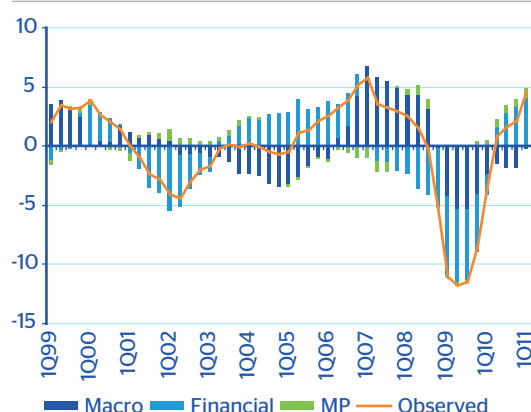
Source: BBVA Research

Chart 9
Consumption (%, y/y)
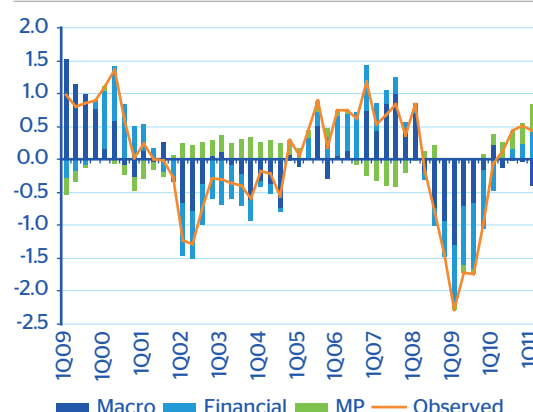
Source: BBVA Research

Nonetheless, despite this recovery, the eurozone is still far below its potential trend. As a consequence, the output gap is still negative (Figure 11). In addition, the negative impact of both financial and macroeconomic shocks as well as some unresolved problems in the banking sector and higher capital requirements suggest that the economy is still far form reverting to the output path prevalent before the crisis. In particular, the deleveraging process of the private sector could weigh on the recovery in domestic demand. The latter could be one of the main differences with previous recoveries, where a sound financial sector would have provided the credit necessary to sustain the expansion of economic activity.

Finally, it is worthwhile to note that the positive contribution of financial shocks in the recent recovery could be ephemeral and could revert rapidly if the current sovereign debt crisis intensifies (for example, as in the case of a disorderly debt restructuring of the Greek economy), and EMU lives again a Lehman-like global financial shock.

Chart 10
Out put (%, y/y)
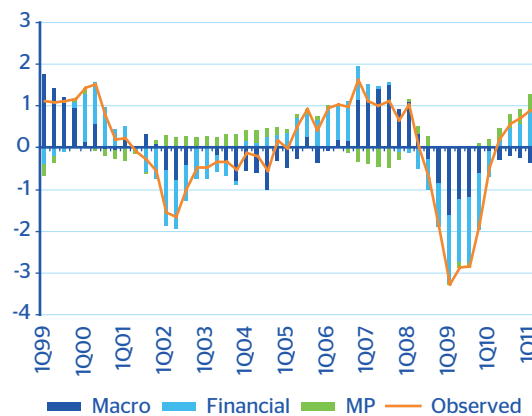
Source: BBVA Research

Chart 11
Eurozone: output, trend and shocks
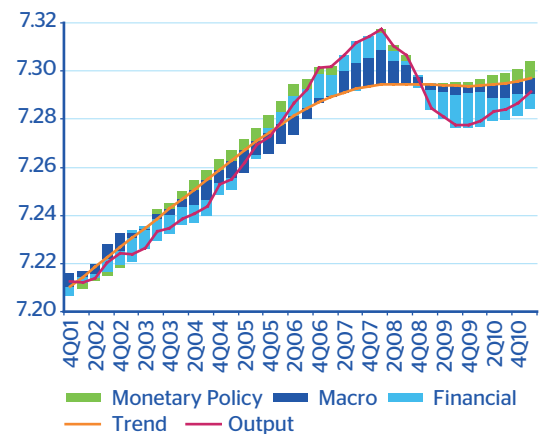
Source: BBVA Research

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