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Editor
Head of Research
Jouko Vilmunen
Monetary Policy and Research
Research Unit
research(at)bof.fi

Bank of Finland
PO Box 160
FI-00101 Helsinki
Phone +385 10 8311
<http://www.suomenpankki.fi/en/>

Head of Research (BOFIT)
Iikka Korhonen
http://www.suomenpankki.fi/bofit_en/

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EDITORIAL: Origin of aggregate shocks: size matters

Economists almost routinely postulate company-specific shocks that wash out in aggregation, leaving no effects on the macro economy. Underlying this thinking is a set of companies (or 'firms'), none of which, taken separately or together, is big enough to affect the macro economy, and which face uncorrelated idiosyncratic shocks that cancel out in aggregation. This logic implicitly constrains the size distribution of firm to the extent that no aggregate effects emerge from individual firms.

However, modern economies are dominated by large firms, so we would expect that shocks to these could lead to nontrivial aggregate effects. For example, Gabaix reports in a recent paper¹ that the top two firms in Korea, Samsung and Hyundai, together account for 22% of the country's GDP, while in Japan the top 10 firms account for 35% of the country's exports. Furthermore, in the United States the sales of the top 50 firms amount to 24% of GDP. Hence, since the largest firms represent such a large proportion of macroeconomic activity, understanding their actions provides a front seat view over the macro economy.

According to the *granular view* of aggregate fluctuations, which is well explicated in the above-mentioned article by Gabaix, it may not be the best approach to assume that economic fluctuations are mostly due to small diffuse shocks that directly affect all firms. Instead, more often than not these fluctuations cannot be reduced to such generating diffusions, but are 'attributable to incompressible 'grains' of economic activity, the large firms' (Gabaix, *ibid.* p. 734–5).

Consequently, shocks specific to the large firms can potentially have nontrivial aggregate effects and, via general equilibrium linkages, also affect other firms in the economy. What is perhaps one of the most important, and certainly one of the most interesting aspects of the granular view is that it offers micro foundations to aggregate shocks, in particular to the aggregate productivity shocks that are assumed to underlie business cycle fluctuations in many modern dynamic macroeconomic models.

¹ Gabaix, X (2011) 'The granular origins of aggregate fluctuations', *Econometrica* Vol. 79, No 3, p. 733–772.



Birger Kaipiainen: Relief, undated. Bank of Finland collection

One problem with such aggregate business cycle shocks is that it may be difficult to pin down precisely what they are. Instead of representing the degree of our ignorance, aggregate shocks are in fact generated by shocks to large firms and are, consequently, well defined. This is not the only implication of the granular view, as Gabaix (p. 735) also argues, so that the granular view offers a new and fresh approach to modelling and understanding the sources of aggregate fluctuations. Size distributions of firms matters after all.

Jouko Vilmunen

Securitization, low interest rates and business cycle fluctuations: a bumpy ride with the shadow banking system

There is an ongoing debate among economists and policymakers on the likely effects of persistently low interest rates on the overall economy and in particular on the optimal timing for the central bank to exit from the low interest rate regime. Many have actually suggested that the Federal Reserve kept short-term interest rates too low for too long in the early years of the new millennium, thus contributing to the credit boom that developed prior to the financial collapse of 2008 and the economic bust that followed.

But even if we accepted it as fact that monetary policy steering rates were exceptionally low, we would also need to appreciate that other factors at both the macro and micro level were certainly at play and interacting with low interest rates to create the potential for a boom-bust cycle of the type observed during the last ten years or so. At the macro level, we can think of those factors that sustained the extended period of stable economic growth and low inflation, which, in turn, strengthened

perceptions that growth without accelerating inflation would also continue in the future. In short, perceived macro risk premia appeared particularly low, thus justifying low interest rates. Financial globalization furthermore nourished the belief that the global financial system could manage widening current account deficits as well as the savings glut. At the same time, more micro level developments within the financial system – such as securitization, evolution of the shadow banking sector, financial innovation introducing new, exotic and increasingly complex financial products as well as misaligned incentive structures – contributed to a forceful propagation of the low interest rate policy, resulting in the build-up of imbalances that later proved inconsistent with sustainable economic developments.

Given the topicality of the potential effects of persistently low interest rates on the dynamic stability of the macro economy and financial markets – where the latter, in addition, incorporates an important role for securitized funding – surprisingly little systematic research has been published using quantitative dynamic macroeconomic models to explore the issues involved. But relevant research does exist. The recently published Bank of Finland discussion paper *(Un)anticipated monetary policy in a DSGE with a shadow banking system* by Fabio Verona, Manuel M. F. Martins and Inês Drumond (BoF DP 6/2013) is a case in hand. In their paper, the authors construct a dynamic stochastic general equilibrium (DSGE) model extending two versions of the well known state-of-the art reference model by Christiano, Motto and Rostagno (CMR, 2010)² to include a non-trivial role for securitized funding via the shadow banking sector. One version to the CMR model incorporates the well-known financial accelerator, while the other one does not and corresponds closely to Smets and Wouter (2003).³

After demonstrating that the two above-mentioned DSGE model versions cannot generate financial boom-bust cycles, the authors focus on their extension, which features a shadow banking sector. More specifically, their model includes a bond market populated by investment banks that contribute to financing part of the activity in the entrepreneurial sector. An additional interesting aspect of the model is that the calibration distinguishes between normal times and times of over-optimism: the calibration is done on the basis of the cyclical sensitivity of the spread in bond finance over the long run and during the boom that preceded the financial collapse of 2007–2008. Hence, the model allows for behavioural biases to affect macroeconomic fluctuations. The motivation for introducing such a behavioural bias is that, by combining excessive optimism with a persistently low interest rate regime, the model succeeds in generating a boom-bust cycle in the price of capital, investment and output. In addition, the model simultaneously produces a strong rise in leverage alongside a fall in the bond finance spread. Verona *et al* also simulate the dynamic effects of both anticipated and unanticipated policy, concluding that the latter produces a more realistic dynamic pattern of the boom-bust cycle.

The authors define a policy of persistently low interest rates or a policy of interest rates that were too low and for too long as a constant key policy rate below the steady state level, lasting for six quarters, not responding to economic conditions and, hence, deviating from the

Photo: Kaisa Ahomaa-Krogell



² Christiano L. J., Motto R. and Rostagno M. (2010), 'Financial factors in economic fluctuations', *European Central Bank, Working Paper Series no. 1192*.

³ Smets F. and Wouters R. (2003), 'An Estimated Stochastic General Equilibrium Model of the Euro Area', *The Journal of the European Economic Association* 1(5), p. 1123–75.

interest rate that would result from an active interest rate feedback rule. The argument for choosing six quarters suggests that it is too long, in the sense that, during its course, real activity revives and inflation picks up, which in more normal times would trigger a response from the central bank as dictated by its policy rule. As far as unanticipated policy is concerned, on the other hand, the authors design the simulation experiment so that the short-term interest rate is kept constant and away from its steady state level for some periods by means of a sequence of unanticipated policy shocks. In economic terms, the set up mimics a situation where agents do not know the length of the period of monetary ease. Anticipated policy corresponds to credible policy projections, where the central bank pre-announces a path for the policy interest rate. The economic interpretation of this policy experiment is a transparent announcement by the central bank for credibly committing to a pre-specified path for the policy interest rate. While not detailing the mechanism through which credible commitment is made feasible, the authors assume that the private sector believes the central bank announcement and acts accordingly.

Verona *et al* summarize their main conclusion by, first, noting that, in line with the relevant background literature, anticipated periods of persistently low interest rates generate a much larger and sharper boom in real activity and asset prices than corresponding unanticipated policy. Secondly, it is not financial frictions per se that are of utmost importance for boom-bust cycles after persistently low interest rates, as state-of-the-art DSGE models with financial frictions fail to generate them. Thirdly, incorporating securitized funding via a shadow banking system into a DSGE model provides a powerful propagation mechanism for persistently low interest rates, with the additional feature that the simulated dynamic patterns seem to be more realistic for unanticipated policy. Finally, the interaction between persistently low interest rates and optimism gives rise to excessive leverage, driven by the increase in bonds issued by the set of entrepreneurs seeking finance from the shadow banking sector, who experience a fall in their bond spreads during the boom. This last implication highlights the importance of spreads for the transmission of monetary policy.

The line of research pursued by Verona *et al* is extremely important, as it combines new, important institutional features observed in the financial sector during the latest boom-bust cycle with DSGE modelling to continue the practice followed in e.g. many central banks of producing quantitative estimates of the macroeconomic effects of different structural features and behavioural characteristics of financial markets, while at the same time providing a macroeconomic framework for interpreting the (most often simulation) results in an internally consistent way. A key feature of their model is, by and large, the interaction between persistently low interest rates, securitized funding and behavioural biases that from the systemic point of view is a source of fragility and of policy concern. Further research is clearly needed and, while projects that dig deeper into these issues are high-risk projects, the high returns should justify the effort.

Jouko Vilmunen

Correlation in the business cycles of emerging and advanced economies

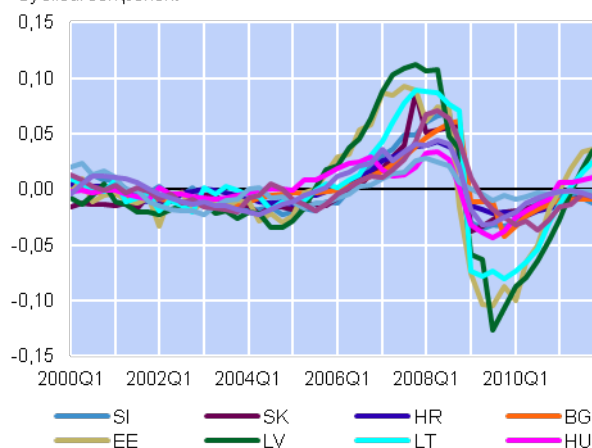
The growing global weight of the emerging economies has increased debate over whether the business cycles of the OECD countries and the faster-growing among the emerging economies have begun to diverge. In other words, how fast can the emerging economies grow in the context of sluggish economies in the OECD countries? BOFIT has published several studies on the congruence of different countries' business cycles, and further studies on this topic are currently in hand.

In 'No coupling, no decoupling, only mutual inter-dependence: Business cycles in emerging vs. mature economies' (BOFIT DP 17/2012), Pierre L Siklos examines the similarities in the pace of GDP growth in 1980 and 2010. His results show that in most regions of the world cyclical fluctuations in economic activity have become increasingly aligned with those of the largest economies (United States, Japan and China). For most country groups, the correlation in GDP growth was already beginning to strengthen towards the end of the 1990s. The economic crisis of 2008 and 2009 weakened the correlation in the cycles for some countries, but since then it would appear to have returned to its previous, strong level. The correlation between the business cycle in China and in the ASEAN countries remained strong throughout the economic crisis, but the correlation with EU countries weakened markedly in 2009. In contrast, the cyclical correlation between EU countries and the United States remained strong through the economic crisis, due partly to the pursuit of similar economic policies.

In their study 'Business cycle convergence or decoupling? Economic adjustment in CESEE during the crisis' (BOFIT DP 3/2013), Martin Gächter, Aleksandra Riedl and Doris Ritzberger-Grünwald examine the cyclical similarities between the countries of Central and Eastern Europe, on one hand, and the euro area, on the other, as well as internally between countries within the euro area.

Individual CESEE (11) Country Cycles

Cyclical component

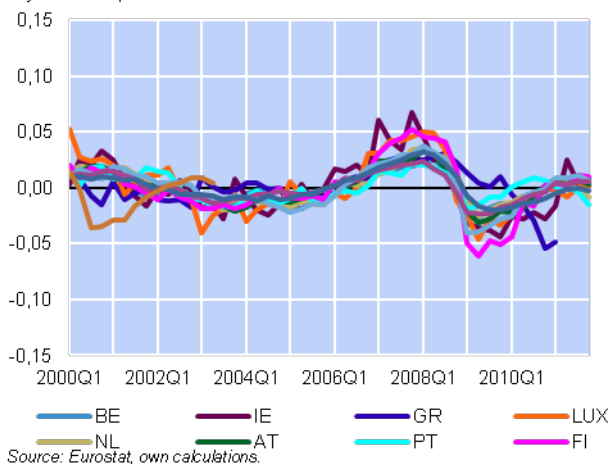


Source: Eurostat, own calculations.

In the first half of the first post-millennium decade the fluctuations in the business cycle were very similar, although the average pace of growth was certainly faster in the poorer countries. After the onset of the global economic problems, the business cycle fluctuations in the countries of Central and Eastern Europe, in particular, differed considerably from each other. Admittedly, inside the euro area, too, economic developments began to take on a different pace than previously. It is nevertheless worth noting that this outcome is partly due to the large number of small countries in the data. Cyclical fluctuations are typically strongest in small countries, where production can be highly dependent on just a single sector.

Individual EA (12) Country Cycles

Cyclical component



In one study currently in hand, Iikka Korhonen, Jarko Fidrmuc and Jitka Poměnková are examining the factors behind the correlation between the business cycle fluctuations of China and the OECD countries. The study analyses the cyclical fluctuations using wavelet methodology, which reveals that the correlation has been positive only over the medium term. It would also appear that the impact on the correlation of trade between the countries is different when analysing cycles of different lengths, and taking the average figures it is hard to demonstrate any impact from international trade on the correlation between the business cycle fluctuations of different countries.

Iikka Korhonen

Events

Conferences

Banking after regulatory reforms – business as usual?

June 13, 2013, Helsinki

In response to the global financial crisis and the large trading losses at many banks, the regulatory reform agenda to limit excesses in banks' risk taking and to make banks more easily resolvable has grown quite ambitious. The Euro crisis has also strengthened the need for an overhaul. In addition to the Basel III reform and the plans to create or strengthen resolution and recovery frameworks for banks, structural reforms have been adopted or proposed, led by the Liikanen Group, Vickers Report and Volcker Rule of the Dodd-Frank Act.

The aim of the regulatory reform agenda should be to improve banks' resilience and to correct for distorted risk-taking incentives, arising from explicit and implicit public safety nets. Prerequisites for stable long-term economic growth should hence be improved. However, significant short-term costs might be involved, arising from the transition and increased uncertainty as regards the final form of the reforms. What will bank business models ultimately look like? Will safety, economic efficiency and true risk-awareness actually improve?

The Bank of Finland-SUERF one-day conference will address these issues in Helsinki on 13th June 2013. All conference speakers will be invited from among leading experts and academic researchers on banking, regulation and supervision.

For further information, please visit the conference site

http://www.suomenpankki.fi/en/tutkimus/konferenssit/konferenssit_tyopajat/Pages/SUERF2013.aspx

Renminbi and the global economy

May 23–24, 2013, City University of Hong Kong, Hong Kong

Contemporary issues related to the Chinese renminbi and the global economy were discussed at a conference organized by the City University of Hong Kong, the Department of Economics and Finance, and Research Center for International Economics, and the Bank of Finland Institute for Economies in Transition (BOFIT).

Possible topics include, but are not necessarily limited to, the following:

- China's exchange rate policy and global imbalances
- China and international monetary architecture
- The international roles of the renminbi – current status and future prospects
- Policies on internationalizing renminbi
- Renminbi internationalization and its implications for China, the global economy, financial market integration, and financial stability

We would like to strike a good balance between academic rigor and practical relevance, and offer alternative viewpoints on the international roles of the renminbi in the global economy

For more information please visit

<http://www.cb.cityu.edu.hk/ef/events/upcoming/Conference%20on%20Renminbi%20and%20the%20Global%20Economy/>

Seminars

Bank of Finland Research Seminars

6 Jun 2013

Assoc. Prof. Berthold Herrendorf, Arizona State University
The allocation of time in the US and continental Europe

Research seminars organized by the Bank of Finland's research unit are held on the first Thursday of the month at 13.30–15.00 in Rauhankatu 19, 3rd floor big meeting room (unless indicated otherwise). Research seminars are open to all interested parties. Please register in advance at seminars@bof.fi by noon of the preceding day. For further information please visit the [seminar site](#).

BOFIT Seminars

4 June 2013

Yifan Zhang (Lingnan University, Hong Kong)
[FDI and the diffusion of culture: Evidence from gender inequality in China](#)

11 June 2013

Carsten Holz (Stanford University, USA / Hong Kong University of Science and Technology)
[Wage determination in China](#)

19 June 2013

Jian Guang Shen (Mizuho Securities Asia)
[China's painful adjustment to avoid the middle income trap](#)

BOFIT seminars, open to all interested parties, are held on Tuesdays at 10.30 in Rauhankatu 19, 3rd floor big meeting room (unless indicated otherwise). Please register in advance via India Roland (firstname.lastname@bof.fi). For further information please visit the [seminar site](#).

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Iftekhar Hasan – Matej Marinč: [Should competition policy in banking be amended during crises? Lessons from the EU](#)

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Sami Oinonen – Maritta Paloviita – Lauri Vilmi: [How have inflation dynamics changed over time? Evidence from the euro area and USA](#)

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Fabio Verona – Maik H. Wolters : [Sticky information models in Dynare](#)

4/2013

Fabio Verona – Manuel M. F. Martins – Inês Drumond: [\(Un\)anticipated monetary policy in a DSGE model with a shadow banking system](#)

3/2013

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