



RESEARCH UPDATE

Fall 2020

PRIORITIES 2020-2024

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Welcome to the Banco de España Research Update

The Banco de España is pleased to announce the release of the Fall 2020 issue of its *Research Update*. The *Update* aims to inform both academic and policy-oriented economists and financial specialists about publications, conferences, and other research activities at the Banco de España.

For the first time, the Banco de España published the selected analysis and research subjects on which it will focus in the coming years. The aim is to tackle the challenges that the various changes in the economic and social environment pose for the functions entrusted to it in its capacity as the National Central Bank and as a member of the European System of Central Banks. As part of the internal overhaul it launched with its Strategic Plan for 2020-2024, the Banco de España is seeking to strengthen its analytical work, particularly on the key issues liable to influence Spanish citizens' economic well-being in the near future. The five priority subjects of analysis and research identified are: central bank policies and their interactions; long-term trends in the Spanish economy; risks and opportunities arising from the international environment; the aggregate consequences of the heterogeneity of individuals and firms and, new technologies and information sources: challenges for a central bank. On disclosing them, the Banco de España takes a further step in its policy of research activity transparency, seeking in turn to promote collaboration in these areas with academia and the community of economic analysts.

This *Update* includes also several feature articles summarizing policy-relevant findings from recent Banco de España projects in diverse areas of research. First, R. Blanco, S. Mayordomo, Á. Menéndez and M. Mulino analyse the Spanish non-financial corporations' liquidity needs and solvency after the COVID-19 shock. D. Leiva-Leon, G. Pérez-Quirós and E. Rots use the Global Weakness Index (GWI), a real-time measure of the status of the global economy, to gauge the immediate repercussions of the coronavirus (COVID-19) crisis. J. Galán studies the effects of macroprudential policy on GDP growth. R. González, D. Khametshin, J. L. Peydró and A. Polo argue that local central bank policies can attenuate spillovers from global financial cycles. Finally J. Martínez-Martín and E. Rusticelli propose an innovative world trade-cycle index by means of a dynamic factor model for short-term forecasts of trade growth of goods and services. Moreover, this *Update* reports on other research news, such as recent publications and conferences, and contains the profiles of four newly hired researchers who are joining the Banco de España.

We highlight these and other research developments at the Banco de España in hopes that they will interest the broader research community in Spain and internationally, and thereby contribute to an improved understanding of economic policy.

Óscar Arce
Olympia Bover
Ángel Estrada
Eva Ortega
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Research Committee,
Banco de España

Analysis and research priorities for the Banco de España: 2020-2024

For the first time, the Banco de España has just published the selected analysis and research subjects on which it will focus in the coming years.

The Banco de España enjoys long-standing status as a point of reference for quality economic analysis and research, with these functions helping underpin the pursuit of its remit. One of the priorities of the Banco de España under its Strategic Plan 2020-2024 is to strengthen its analytical work. The aim is to prepare it for the challenges that the various changes in the economic and social environment pose for the functions entrusted to it in its capacity as the National Central Bank and as a member of the European System of Central Banks. To this end, the main subjects of analysis and research on which a particular focus is to be placed in the coming years have been identified. On disclosing them in this [document](#), the Banco de España takes a further step in its policy of research activity transparency, seeking in turn to promote collaboration in these areas with academia and the community of economic analysts.

The COVID-19 crisis has abruptly disrupted the global economic and financial situation. The unprecedented national, European and global economic policy response will continue to require ongoing analysis over the coming years. A notable example of the consequences of the crisis meriting a particular analytical focus is the necessary transformation of the Spanish economy towards a more robust and sustainable growth model, based on the development of human capital, innovation and environmental sustainability. This transformation will call for an ambitious structural reform agenda and efficient R+D+i expenditure policies, which will in turn provide for the reduction of the imbalances built up during the crisis. Such imbalances include most notably increased unemployment, the deterioration of significant segments of the productive system and the shortfall in public finances.

The current crisis broke at a time of far-reaching global changes, with most significant economic and financial implications that require ongoing study, namely: the digitalisation of economies, climate change and the energy transition, population ageing, inequality and regional differences in population, among others.

In connection with the Banco de España's monetary policy competencies as a member of the Eurosystem, it has to contribute to the review in 2020 and 2021 of the monetary policy strategy of the European Central Bank (ECB), following several years marked by inflation rates systematically below their medium-term objective, i.e. below but close to 2%, and by very low or negative interest rates. This environment of low inflation and low interest rates likewise poses significant challenges for the banking industry and for prudential supervision and the oversight of financial stability, requiring in-depth study. Also, as the Banco de España has assumed new powers in the macroprudential area, it will be necessary to develop an advanced analytical framework enabling the early identification of risks and vulnerabilities, and a better understanding of monetary policy and micro- and macroprudential policy interdependencies. Ongoing digitalisation in the financial sector and the emergence of new competitors pose substantial challenges for prudential supervision, necessitating a significant analytical effort. Lastly, the efficiency of payment systems and the possible scenarios arising from the use of new technologies in this area raise important issues, such as the implications of digital currencies.

Against this background, a series of analysis and research priorities have been identified for the 2020-2024 horizon. A summary can be found below. Prioritising matters for analysis and research should enable us to improve the Banco España's decision-making and its ability to have a bearing on the main national and international economic debates.

The five themes deemed to be priorities for the coming years are:

1

Central bank policies and their interactions

Analysis of the impact and design of policies under the Banco de España's remit: 1) ECB monetary policy design and implementation, 2) supervision of the Spanish banking system along with the ECB, and 3) establishing and setting in place macroprudential measures for Spanish credit institutions.

Analysis of the implications of the ECB's monetary policy measures for the banking sector's intermediation capacity, for prudential supervision and for financial stability, against a background of low inflation and very low interest rates.

Analysis of the interactions between monetary policy and the new macroprudential tools.

2

Long-term trends in the Spanish economy

Analysis of the implications and consequences for the Spanish economy and the effectiveness of possible public policies resulting from the far-reaching processes of transformation worldwide:

1. The digitalisation of the economy.
2. Climate change and energy transformation.
3. Demographic changes: ageing and concentration of the population.
4. Economic and gender-based inequality.
5. Low trend inflation.

3

Risks and opportunities arising from the international environment

Closer focus on identifying, monitoring and assessing international economic developments with the most potential to impact, in terms of risks and opportunities, the Spanish economy.

Analysis of changes in economic structure, geopolitics and international relations, and their impact on the Spanish economy.

4

The aggregate consequences of the heterogeneity of households and firms

Development of tools enabling enhanced analysis of the aggregate implications of the heterogeneity of households and firms, and of their effects on public policy design and transmission.

5

New technologies and information sources: challenges for a central bank

Analysis of the digital transformation of the financial system and its effects on monetary policy, financial stability and the monitoring of bank risks.

Design and implications of introducing a central bank digital currency.

Launch of new avenues of research stemming from ongoing statistical innovation, including most notably:

- Analysis of the economy in real time for decision-making at times of stress.
- Early identification of investor and bank customer concerns, and analysis of the Banco de España's communication policies.

Spanish non-financial corporations' liquidity needs and solvency after the COVID-19 shock

ROBERTO BLANCO, SERGIO MAYORDOMO, ALVARO MENÉNDEZ AND MARISTELA MULINO

Summary of Banco de España Occasional Paper no. 2020

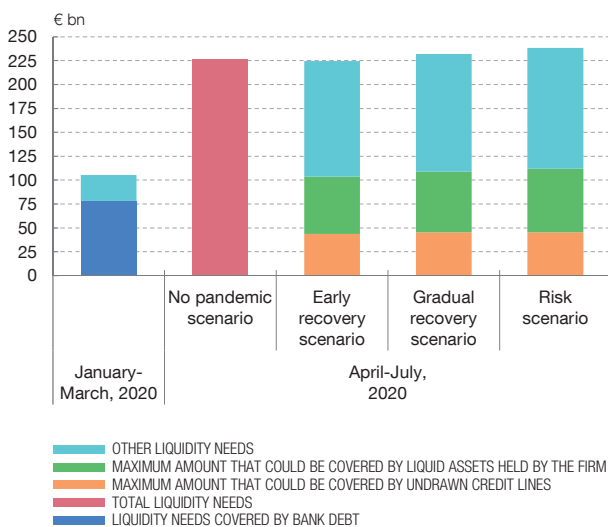
The COVID-19 pandemic is exerting an unprecedented adverse impact on economic activity and, in particular, on firms' income. In some cases this means firms' income is insufficient to meet payments to which they have committed. This article presents the results of an exercise simulating Spanish non-financial corporations' liquidity needs for the four quarters of this year. Liquidity needs, between April and December, might exceed €230 billion. It is estimated that, through the public guarantee programmes for lending to firms, almost three-quarters of this shortfall might be covered. To finance the remainder, companies could use their liquidity buffers and/or resort to new unsecured debt.

Further, despite the unprecedented fall in business turnover, a significant percentage of companies (around 40%) is estimated to have been able to withstand this situation without undergoing a downturn in their financial position. However, at the remaining companies, the fall-off in activity has led to significant increases in their level of financial vulnerability, doing so more sharply within the SME segment and especially among the firms in the sectors most affected by the pandemic, such as tourism and leisure, motor vehicles, and transport and storage.

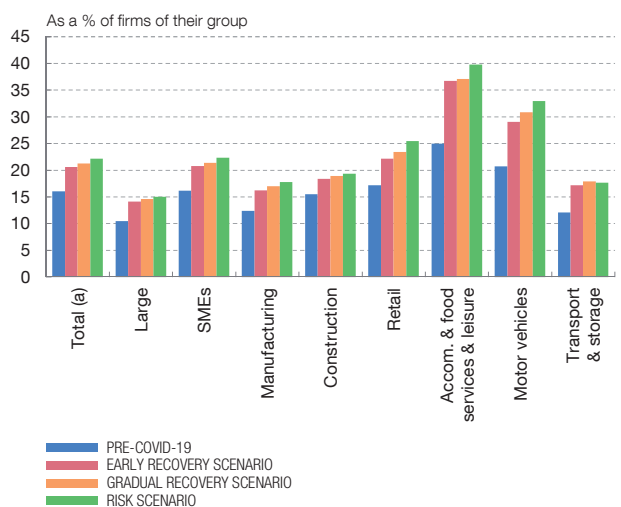
The shutdown of much of economic activity because of the COVID-19 pandemic containment measures is causing a sharp reduction in revenues for a very high proportion of Spanish firms. According to the results of the simulation exercises made for this analysis, in 2020 Q1 61% of firms would not have generated sufficient revenues to meet current payments and those derived from investments in fixed assets and from debt repayments (see Chart 1.1). The overall amount of these firms' liquidity needs is estimated to be around €105 billion, 75% of

Chart 1

1 FIRMS' LIQUIDITY NEEDS AND COVERAGE CAPACITY (a)



2 FIRMS WITH NEGATIVE EQUITY



SOURCE: Banco de España.

a Excludes holding companies and financial services.

which had been covered by the resort to bank lending (including the drawdown of financing available through credit lines), and the remaining had been covered through the drawdown of liquid assets or non-bank financing.

In addition, from April to December 2020, 67%-69% of Spanish nonfinancial corporations (depending on whether the scenario envisaged is that of early recovery or that of risk) would have liquidity needs. The percentages, compared with those that would have been obtained under a scenario in which there had been no pandemic, would be 8-10 pp higher in terms of the number of firms affected. The overall amount of these liquidity needs stands at €224-238 billion, depending on the scenario considered (see Chart 1.2), and a prominent portion of those would be generated by companies with a high or very high probability of debt default. The breakdown by sector highlights the fact that tourism and leisure, motor vehicles, and transport and storage would be those sectors with a higher proportion of companies with liquidity shortfalls.

If firms make full use of their liquid assets and of their credit lines, they could at most cover somewhat less than half their liquidity needs. As it does not in any event seem very realistic that firms will fully exhaust their liquid assets, and given that only companies of a certain size can tap the capital markets, the bulk of the funds needed to cover the shortfall would foreseeably be routed essentially through recourse to bank lending, as the data to May have shown. Moreover, both the Eurosystem's liquidity support measures and the Government's guarantee programmes, through the ICO lines, are helping banks and ensuring they have the additional resources to finance the private sector.

The results of the simulations also indicate that, despite the possible unprecedented fall in earnings as a result of the COVID19 crisis, more than 40% of firms could continue to generate operating surpluses and make new investment, with no deterioration in their financial position. These results may be explained by the flexibility that enables firms to adjust their personnel costs when faced with a temporary fall in activity levels, and by the strong

starting position of their balance sheets following the lengthy period of deleveraging of recent years. In any event, as a result of the pandemic, the proportion of firms in a more vulnerable financial position measured by the level of equity is expected to increase. Thus, as a consequence of the losses built up in 2020, the proportion of firms with negative equity would increase by between 5 pp and 6 pp, up to 21%-22% (see Chart 1.2). The breakdown by firm size again reflects a more marked deterioration in the SME segment. By sector of activity, the proportion of firms with negative equity would increase across the board, but most sharply in the tourism and leisure sector and, albeit to a lesser extent, in the motor vehicle sector.

Real-time weakness of the global economy: a first assessment of the coronavirus crisis

DANILO LEIVA-LEON, GABRIEL PEREZ-QUIROS AND EYNO ROTS¹

Summary of Banco de España Working Paper no. 2015

The Global Weakness Index (GWI) is a real-time measure of how weak the global economy is. We use this index to assess on the spot how the repercussions of the coronavirus (COVID-19) crisis are playing out. After the release of certain soft indicators on 2 March 2020 the GWI increased sharply – much faster than in the 2008 crisis. And at the time of writing it remains at a record high.

INTRODUCTION

The COVID-19 crisis has once again shown how important it is to be able to assess economic conditions in real time. Although it has been clear since early March that some economies are sliding into recession, until very recently the standard measures – based on low-frequency indicators with publication delays – were silent about the increasing probability of recession in most advanced and emerging economies.

In order to solve this problem, various researchers have developed non-linear models based on several timely indicators. Unlike many other models, the Markov-switching dynamic factor (MSDF) models introduced by Chauvet (1998) have been successfully used to account for co-movements and non-linearities across several economic indicators. These models have widely shown their ability to identify turning points fast.

In MSDF models, the economy is assumed to switch between expansions and recessions with constant probabilities. Expansions and recessions are respectively

¹ The authors gratefully acknowledge the comments of Michael Ehrmann, Alberto Martin, Zoë Sprokel and the excellent research assistance of Romain Aumond.

characterised by high and low growth rates of the various activity indicators. Conditional on being in each state, the indicators, including GDP, move around these high/low growth rates.² Following Hamilton (1989), previous MSDF models have assumed that these two growth rates are the same for all the expansions and recessions in the sample.

This article explains how Leiva-Leon, Perez-Quiros and Rots (2020) estimate such a model using timely indicators but considering that recessions might differ in depth. To allow for this possibility has two advantages. First, allowing for the mean to vary across recessions is helpful because, once an economy has suffered a “severe” recession, such as the Global Financial Crisis, the model might not be able to identify an upcoming “mild” recession. This lack of sensitivity of the model comes from the fact that the estimated growth rate of recessions might be too low to capture “mild” recession periods. Second, as the growth rate of every recession is different, the model delivers real-time estimates of the depth of every recession, which provides valuable information to rapidly design and implement the necessary policy responses. This is especially important in the deep COVID-19 recession that we are currently experiencing.

DATA, SAMPLE AND TECHNICAL FEATURES OF THE MODELS

A MSDF with recessions of varying depth is estimated independently for twelve of the largest economic regions of the world, which together account for more than seventy percent of world GDP. Six are advanced and six are emerging economies.

We use supply-side variables (usually, industrial production), internal demand variables (imports or sales), external demand (exports) as well as one additional variable, specific to each economy, usually a soft indicator such as the PMI.

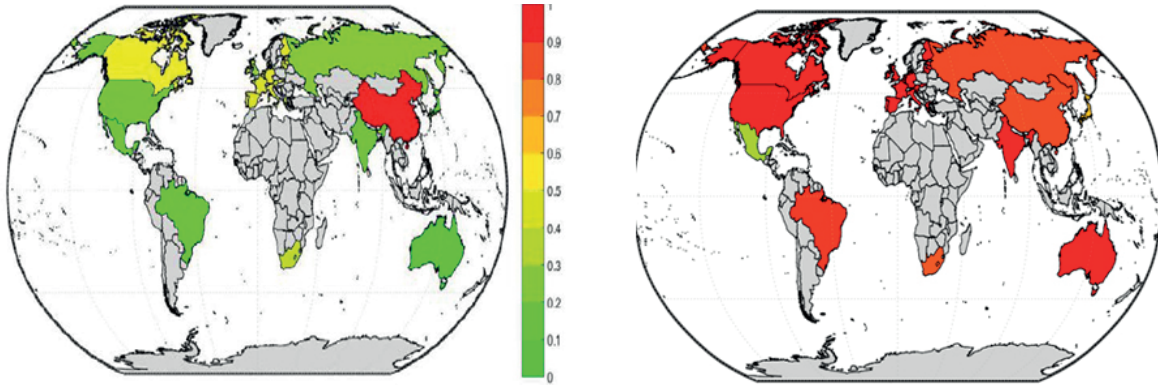
² Indicators are transformed to be stationary. Depending on the indicators, they are used in growth rates, first differences or levels. GDP is included in growth rates but, given that the model is constructed in monthly frequencies, its relation to the factor is a weighted moving average of monthly activity.

Chart 1

RECESSION PROBABILITIES ACROSS COUNTRIES

1 2 MARCH 2020

2 14 MAY 2020



NOTE: The heatmap of the world plots the overall pattern of the probabilities of the low economic activity regime for specific dates. The darker (lighter) the area, the higher (lower) the probability of recession. The animated sequence of world heatmaps, from April 2003 until February 2020 can be found at: https://sites.google.com/site/daniloleivaleon/global_weakness.

All of these variables are monthly. In addition, the models contain GDP as a quarterly variable.³

Table 1
ECONOMIES

Advanced economies	Emerging market economies
United States	China
Euro Area	India
Japan	Russia
United Kingdom	Brazil
Canada	Mexico
Australia	South Africa

The main advantage of relying exclusively on real variables is that we capture all types of recessions, whether they originate in the financial sector, energy prices, a pandemic

³ This choice follows the original approach of Stock and Watson (1991), Chauvet and Piger (2008) or Camacho et al. (2018). Those papers show that such a small set of variables reliably captures current conditions of the economy and comprises most of the information relevant for inferring recessions in real time.

or any other cause. Whatever is its origin, as long as there is an effect on the economy, the effect will be reflected in these variables.

For every economy, both the probabilities of recessions and the depth of every recession are endogenously estimated. No external dating is used. Chart 1 plots recession probabilities for the different regions in 2 March 2020, the first day in which the model captured a serious increase in global weakness, and in 14 May 2020, the day of the writing of this article.

GLOBAL WEAKNESS INDEX

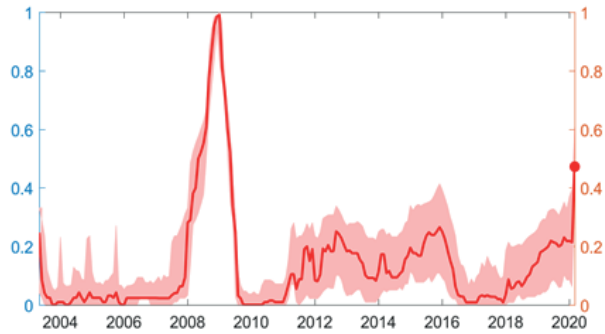
The information contained in Chart 1 can be summarised in an index – the Global Weakness Index (GWI). It is a weighted average of the probabilities of recession in different economies.⁴ The weights depend on the GDP of each region in every quarter. Chart 2 plots the GWI computed on the same dates shown in Chart 1. As the chart shows, there is a

⁴ Technically, the researchers weight the individual draws obtained by Bayesian methods in each country. Therefore, they produce the density function of the distribution of GWI in every time period.

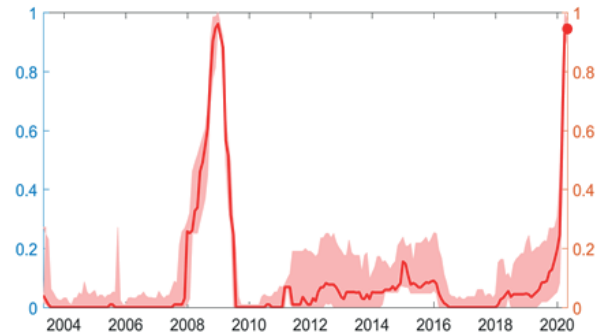
Chart 2

GLOBAL WEAKNESS INDEX

1 2 MARCH 2020



2 14 MAY 2020

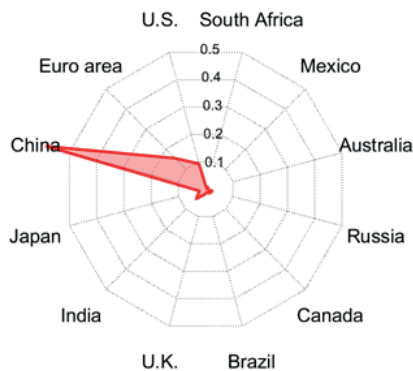


NOTE: The figure shows the Global Weakness Index, which is constructed as a weighted average of the probabilities of the low economic activity regime across economies. It is weighted by the size of the corresponding economies. The red area represents the credible set based on the 16th and 84th percentiles of the posterior distribution.

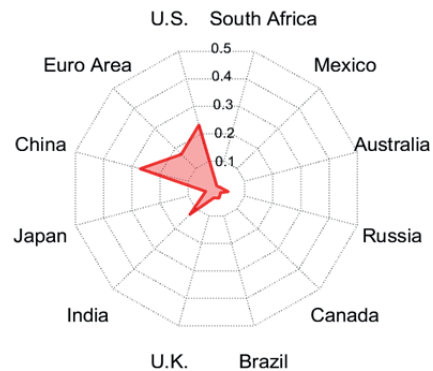
Chart 3

CONTRIBUTORS TO THE GWI

1 2 MARCH 2020



2 14 MAY 2020



NOTE: The radar chart shows the relative contribution of each economy to the GWI. The contributions are normalised to sum up to one.

sharp increase as early as March 2, which is confirmed by the latest numbers of May 14, where the GWI ends up close to 1. The index can be interpreted as the proportion of the world economy that is currently in recession.

Given that the index is computed as a weighted average of the individual economies, it can be broken down by the individual

contributors. Each economy's contribution depends on the weight of that economy in world GDP and the probability of that economy being in a recession. The contribution of the different economic areas can be seen in Chart 3. It shows that, at the beginning of March, only China was clearly in a recession, but recently the United States and the euro area have also been large contributors to the high level of the index.

All in all, the GWI as an indicator has four key benefits. It is (i) updatable in real time; (ii) broken down by regional contributions; (iii) useful for quantifying risks; and (iv) simple to interpret.

EXTENSIONS

Our model includes GDP as one of its indicators, so it can be used to provide forecasts for GDP. As a matter of fact, computing the probability of negative growth or two quarters of negative growth, i.e. the probability of a recession according to its classical definition, is quite straightforward. In the case of the euro area, the latest figures suggest that the probability of a classical recession has reached 100%.

CONCLUSIONS

We present a new indicator of global economic weakness which uses real-time information available to estimate the proportion of the world economy that is in a recession. The indicator is based on the estimation of a dynamic non-linear factor model for individual economies which considers recessions of different depths. Leiva-Leon et al (2020) show the excellent real-time forecasting properties of this model for individual economies.

As this article illustrates, the indicator already pointed to clear signs of economic weakness as early as 2 March 2020. This weakness was confirmed by official statistics on 4 May 2020, when Q1 GDP data for most countries were released. Therefore this indicator helps provide early warnings of a downturn that can be crucial for a fast policy response.

REFERENCES

- Camacho, M., Perez-Quiros, G. and P. Poncela (2018). "Markov-switching dynamic factor models in real time", *International Journal of Forecasting*, Elsevier, vol. 34(4), pp. 598-611.
- Chauvet, M. (1998). An econometric characterization of business cycle dynamics with factor structure and regime switches. *International Economic Review* 39 (4), 969-996.
- Chauvet, M. and J. A. Piger (2008). "A comparison of the real-time performance of business cycle dating methods", *Journal of Business and Economic Statistics*, vol. 26, pp. 42-49.
- Hamilton, J. (1989). "A new approach to the economic analysis of nonstationary time series and the business cycles", *Econometrica*, vol. 57, pp. 357-384.
- Leiva-Leon, D., Perez-Quiros, G. and Rots, E. (2020). "Real-time weakness of the global economy: a first assessment of the coronavirus crisis" Banco de España Working Paper 2015.

The benefits are at the tail: uncovering the impact of macroprudential policy on growth-at-risk

JORGE E. GALÁN

Summary of Banco de España Working Paper no. 2007

I uncover heterogeneous effects of macroprudential policy on the GDP growth distribution by bringing together the literature on the impact of macroprudential policy and recent developments on the use of quantile regressions to identify effects on growth-at-risk. I identify important benefits of macroprudential policy on the left-tail of the GDP growth distribution, which contrast with the negative effects found in the median. I find that the impact of macroprudential policy is highly dependent on the position in the financial cycle, the direction of the policy, the type of instrument, and the time elapsed since its implementation. Tightening capital measures during expansions may take up to two years in evidencing benefits on growth-at-risk, while the positive impact of borrower-based measures is rapidly observed. This suggests the need of implementing capital measures early enough in the cycle; while borrower-based measures can be tightened in more advanced stages. Conversely, in downturns the benefits of loosening capital measures are more immediate, while those of borrower-based measures are limited. Overall, this study provides a useful framework to assess the impact of macroprudential policy in terms of GDP growth and to identify the term-structure of specific types of instruments.

The global financial crisis has evidenced the high costs of the accumulation of financial imbalances for the real economy. Aikman *et al.* (2019) estimate that financial vulnerabilities built-up during the previous years to the great recession explain around three-quarters of the subsequent output loss in the US. Moreover, they identify that the magnitude of the negative impact could have been significantly reduced by the active use of macroprudential policies. Certainly, macroprudential policy is aimed at increasing the resilience of the financial sector to negative

shocks, limiting the incentives for risk-taking and taming the financial cycle. This allows preventing and mitigating severe negative effects of systemic risk on economic growth, which is considered as the ultimate objective of macroprudential policy (FSB-IMF-BIS, 2011; ESRB, 2015).

Against this background, most of previous studies have identified benefits of macroprudential policy in different dimensions such as curbing credit and house prices growth (Claessens *et al.*, 2013; Cerutti *et al.*, 2017), reducing the probability of systemic crises (Dell'Ariccia *et al.*, 2016), increasing the probability of survivor of firms in a crisis (Jiménez *et al.*, 2017), or decreasing the probability of banks' default (Altunbas *et al.*, 2018). However, the few studies measuring the impact of macroprudential policy on GDP growth, have identified negative effects. Kim and Mehrotra (2018) identify a negative impact of macroprudential policy on output after analysing an aggregation of many different instruments in Asian economies. Richter *et al.* (2019) find that borrower-based measures have negative effects on output growth over a four-year horizon. Noss and Toffano (2016) identify a negative impact of tightening capital measures on GDP growth in the short-run. These negative effects have been associated to the costs of macroprudential policy.

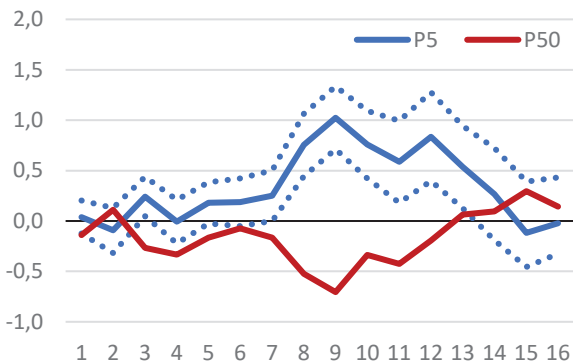
Nonetheless, those studies have focused on the impact on the conditional mean of GDP growth, but if macroprudential policy effectively reduces systemic risk, one could expect that these benefits are observed in a reduction of the downside risk rather than on the mean. Thus, I extend the recent proposal by Adrian *et al.* (2019) on the use of quantile regressions of GDP growth conditional on financial conditions in order to identify the effects of macroprudential policy on the shape of the GDP growth distribution, and particularly, on growth-at-risk. The concept of growth-at-risk makes reference to the economic growth rate that would be observed under an adverse scenario that occurs with a low probability. Thus, it represents a low quantile of the GDP growth distribution, usually the 5th percentile, as it is also defined in this study. For this purpose, I use a broad sample of 27 EU countries over the period 1970-2018 to estimate fixed effects panel quantile regressions of GDP growth conditional on financial

Chart 1

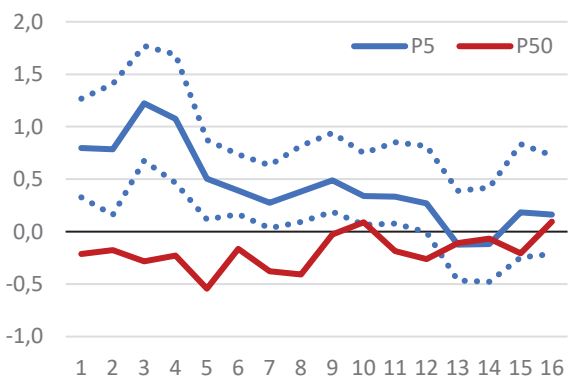
RESPONSE OF GROWTH-AT-RISK (5th PERCENTILE) AND MEDIAN GROWTH (50th PERCENTILE) TO THE IMPLEMENTATION OF CAPITAL AND BORROWER-BASED MEASURES OVER THE CYCLE

1 TIGHTENING IN EXPANSIONS

1.1 CAPITAL MEASURES

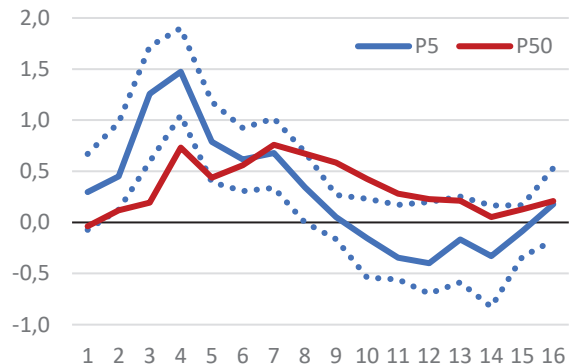


1.2 BORROWER-BASED MEASURES

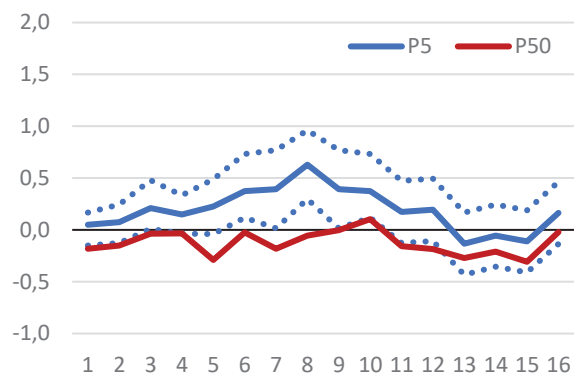


2 LOOSENING DURING FINANCIAL CRISES

2.1 CAPITAL MEASURES



2.2 BORROWER-BASED MEASURES



NOTE: The blue and red lines represent the estimated coefficients of the MPI on quantile regression at the 5th and 50th percentiles on the conditional GDP growth distribution from 1 to 16 quarters ahead. The dotted lines represent the 95% confidence bands obtained using bootstrapped standard errors with 500 replications.

stress, cyclical risk, macroprudential policy and its interaction with the financial cycle.

Results confirm large heterogeneous effects of macroprudential policy on the different quantiles of the GDP growth distribution and uncover important benefits of macroprudential policy on growth-at-risk. Moreover, the direction of the policy and the position in the financial cycle have a relevant role on determining the magnitude and speed of the effects of macroprudential policy on the downside risk of GDP growth. In particular, the benefits of

tightening macroprudential policy during expansionary phases of the financial cycle are only observed in the mid-term, while loosening measures have a more immediate positive effect on growth-at-risk during crises.

I also identify differences depending on the type of macroprudential instrument implemented. While the benefits of borrower-based measures on growth-at-risk are manifested very rapidly and tend to be persistent, the positive effects of capital measures present a lag of around 8 quarters (see Chart 1). These results have important policy

implications. Although, both types of measures are found to be effective on reducing the downside risk of GDP growth, capital measures should be implemented early enough in the cycle, while borrower-based measures could be tightened also in advanced stages given that their benefits are perceived more rapidly. Conversely, during crises the benefits of releasing capital buffers are more immediate, while those of loosening borrower-based measures are very limited. Certainly, releasing capital buffers during busts allow banks to increase their resilience immediately, while softening caps on lending standards may not have real effects given that banks have incentives to tight their credit conditions due to the unfavourable macrofinancial environment.

Overall, this study uncovers the benefits of macroprudential policy on growth-at-risk by bringing together the literature on the impact assessment of macroprudential policy and recent developments in the use of quantile regressions to identify effects on growth-at-risk. The findings suggest the importance of timing in macroprudential policy. Moreover, the presented framework has very useful implications for taking macroprudential policy decisions over the cycle and for a complete assessment of these policies in terms of GDP growth.

REFERENCES

- Adrian, T., N. Boyarchenko, and D. Giannone (2019). Vulnerable Growth, *American Economic Review*, 109(4): 1263-89.
- Aikman, D., J. Bridges, A. Kashyap and C. Siebert (2019). Would Macroprudential Regulation Have Prevented the Last Crisis?, *Journal of Economic Perspectives*, 33(1): 107-130.
- Altunbas, Y., M. Binici and L. Gambacorta (2018). Macroprudential policy and bank risk, *Journal of International Money and Finance*, 81: 203-220.
- Cerutti, E., S. Claessens and L. Laeven (2017). The use and effectiveness of macroprudential policies: New evidence, *Journal of Financial Stability*, 28: 203-224.
- Claessens, S., S. Ghosh and R. Mihet (2013). Macro-prudential policies to mitigate financial system vulnerabilities, *Journal of International Money and Finance*, 39: 153-185.
- Dell'Ariccia, G., D. Igan and L. Laeven (2016). Credit booms and macro-financial stability, *Economic Policy*, 31: 299-355.
- European Systemic Risk Board (ESRB) (2015). Annual Report 2014. Frankfurt am main, July.
- Financial Stability Board (FSB), International Monetary Fund (IMF) and Bank of International Settlements (BIS) (2011). Macroprudential Policy Tools and Frameworks. Progress Report to G20, October.
- Jiménez, G., S. Ongena, J. L. Peydró and J. Saurina (2017). Macroprudential Policy, Countercyclical Bank Capital Buffers, and Credit Supply: Evidence from the Spanish Dynamic Provisioning Experiments, *Journal of Political Economy*, 125(6): 2126-2177.
- Kim, S. and A. Mehrotra (2018). Effects of Monetary and Macroprudential Policies-Evidence from Four Inflation Targeting Economies, *Journal of Money, Credit and Banking*, 50(5): 967-992.
- Noss, J. and P. Toffano (2016). Estimating the impact of changes in aggregate bank capital requirements on lending and growth during an upswing, *Journal of Banking and Finance*, 62: 15-27.
- Richter, B., M. Schularik, and I. Shim (2019). "The Costs of Macroprudential Policy." *Journal of International Economics*, 118: 263-282.

Hedger of last resort: Evidence from Brazilian FX interventions, local credit, and global financial cycles

RODRIGO BARBONE GONZALEZ,
DMITRY KHAMETSHIN, JOSÉ-LUIS PEYDRÓ
AND ANDREA POLO

Summary of Banco de España Working Paper no. 2014

We show that local central bank policies can attenuate spillovers from global financial cycles. We analyze global shocks triggered by the US monetary policy and Brazilian interventions in foreign exchange (FX) derivatives. We show that after U.S. Federal Reserve Taper Tantrum, Brazilian banks with larger ex-ante reliance on foreign debt reduced credit supply. However, a large FX intervention program supplying derivatives against FX risks – hedger of last resort – halved the negative effects. We obtain similar results in a larger panel dataset.

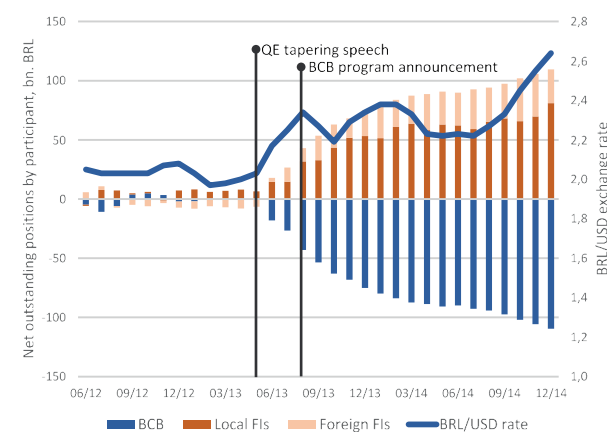
Recent research has demonstrated the importance of Global Financial Cycle (GFC) for local credit markets in emerging market economies (EMEs), and that the US monetary policy is one of the drivers of GFC (Rey, 2013; Gourinchas and Obstfeld, 2012; Jordà et al., 2013; Shin, 2016). We contribute to this literature by analyzing whether local central bank policies can attenuate the negative spillovers of GFC.

In particular, we analyze the reaction of credit supply in Brazil to tightening of the unconventional monetary policy in the US, as well as the ability of the local central bank (Banco Central do Brasil, BCB) to mitigate its negative effects by intervening in the FX derivatives markets. The main GFC shock we exploit took place following May 22, 2013, when the Chairman of the US Federal Reserve, Ben Bernanke raised the possibility of tapering its security purchases. The unexpected announcement of potential tightening of the unconventional monetary policy led to massive depreciation of the EMEs currencies. The BCB responded by setting up a program of sales of non-deliverable currency forwards to the private sector, and

later, in August 2013, by committing to increase the program's size and time span. By supplying FX derivatives, the BCB provided the markets insurance against further depreciation of the local currency, with the aim of satisfying the high demand for hedging, and therefore acting as a *hedger of last resort*. The August announcement of the program caused appreciation of the Brazilian Real relative to other EMEs currencies (Chamon et al., 2017). Fig.1 illustrates the magnitude of interventions and exchange rate fluctuations. The open positions of the BCB interventions reached almost 7% of the Brazilian GDP (or 30% of its International Reserves) in the peak of the program in 2015.

The literature on FX interventions has focused on sterilized interventions. The evidence on the effectiveness of these tools is mixed, with some recent results suggesting that interventions may stabilize exchange rates (Blanchard et al., 2015), and affect the provision of credit (Hofmann et al., 2019). In this paper, we focus on a different form of intervention in derivatives market. When borrowing from abroad, local banks frequently hedge FX risks off balance sheet. Large GFC shocks can disrupt the supply of hedging instruments by the global players. Hence, local banks relying on foreign debt may reduce their credit supply whenever rolling over of their positions in FX derivatives becomes too costly. The results of this paper suggest that public intervention in FX derivatives can be used as a policy tool.

Chart 1
**NET OUTSTANDING POSITIONS IN FX DERIVATIVES
AND BRL/USD EXCHANGE RATE**



SOURCE: BCB, own calculations.

For estimation of the effects of the GFC shock and BCB's intervention policy, we exploit three matched administrative registers: bank credit to firms, foreign credit flows to banks, and employer-employee. To isolate the supply side, we analyze how change in the composition of credit provided by different banks to the same firm is related to banks' reliance on foreign funding (Khawaja and Mian, 2008). We adopt a difference-in-difference methodology around two consecutive shocks related to the US tapering speech and the announcement of the BCB intervention program in the FX derivatives market.

We find that after the tapering speech by Bernanke, local banks with larger ex-ante foreign debt reduce credit supply to firms as compared to the other banks. One standard deviation in banks' foreign debt leads to 2.2pp lower quarterly credit growth. However, this reduction in credit is partially reversed following the announcement of the intervention by the BCB. Furthermore, we find that the employment at the firm level follows a similar pattern as for the firm credit, albeit economically the magnitude of this reduction is smaller.

In the last part, we analyze the effects of changes in the FX market conditions using a quarterly panel dataset over 2008-2015 and controlling for other macro variables, both local and related to the GFC. We show that despite large fluctuations in the FX market conditions, their effect on the supply of credit is smaller after the BCB intervention. Therefore, results suggest that the policy of supplying FX derivatives mitigates the spillovers of global financial conditions on EMEs local economy.

The strategy by the BCB to act as a hedger of last resort, however, has potential limitations. First, it works insofar as economic agents believe currency convertibility risk is negligible. This has not been an issue in Brazil, because of its large international reserves. Second, there are fiscal costs (or gains) since margin payments between the BCB and the market affect the country's fiscal balance. Third, hedger of last resort policy can hypothetically increase moral hazard and incentivize domestic banks to take up riskier foreign funding than they otherwise would.

REFERENCES

- Blanchard, O., G. Adler, I. de Carvalho Filho. (2015). "Can Foreign Exchange Intervention Stem Exchange Rate Pressures from Global Capital Flow Shocks?" IMF WP 15/159.
- Chamon, M., M. García, and L. Souza (2017). "FX interventions in Brazil: a synthetic control approach". *Journal of International Economics*, Vol. 108, pp. 157-168.
- Gourinchas, P. O., and M. Obstfeld (2012). "Stories of the twentieth century for the twenty-first". *American Economic Journal: Macroeconomics*, 4(1), pp. 226-65.
- Hofmann, B., H. Song Shin, and M. Villamizar-Villegas (2019). "FX intervention and domestic credit: Evidence from high-frequency micro data." BIS WP 774.
- Jordà, O., M. Schularick, and A. M. Taylor (2013). "When credit bites back". *Journal of Money, Credit and Banking*, 45(s2), pp. 3-28.
- Khawaja, A. I., and A. Mian (2008). "Tracing the impact of bank liquidity shocks: Evidence from an emerging market". *The American Economic Review*, 98(4), pp. 1413-1442.
- Rey, H. (2013). Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence. NBER WP 21162.
- Shin, H. S. (2016). "The bank/capital markets nexus goes global". Speech at London School of Economics and Political Science, 15 November 2016.

Keeping track of global trade in real time

JAIME MARTÍNEZ-MARTÍN AND ELENA RUSTICELLI

Summary of Banco de España Working Paper no. 2019

We build an innovative composite world trade-cycle index by means of a dynamic factor model for short-term forecasts of world trade growth of both goods and (usually neglected) services. Trade indicators are selected using a multidimensional approach, including Bayesian model averaging techniques, dynamic correlations, and Granger non-causality tests in a linear vector autoregression framework. The dynamic factor model is extended to account for mixed frequencies, to deal with asynchronous data publication, and to include hard and survey data along with leading indicators. Nonlinearities are addressed with a Markov switching model. Pseudo-real-time empirical simulations suggest that: (i) the global trade index is a useful tool for tracking and forecasting world trade in real time; (ii) the model is able to infer global trade cycles very precisely and better than several competing alternatives; and (iii) global trade finance conditions seem to lead the trade cycle, a conclusion that is in line with the theoretical literature.

The unexpectedly large collapse in trade flows, both in the aftermath of the Global Financial Crisis of 2008–09 and, to a lesser extent, at present, has led to huge shocks to economic agents. Policymakers and scholars alike seemed to learn the lesson and highlighted the need for new tools able to monitor trade developments accurately in real time, owing to the strong association between trade and economic growth. However, in times of uncertainty, when interest in predicting trade is greatest, it remains extremely difficult to project trade conditions frequently. Indeed, tracking global trade in real time is challenging since trade data are published with a considerable lag given the need for input from a large number of countries in order to estimate world trade. The lack of timeliness in releasing this kind of indicator makes it hard to track and predict unexpected and significant shifts in international trade.

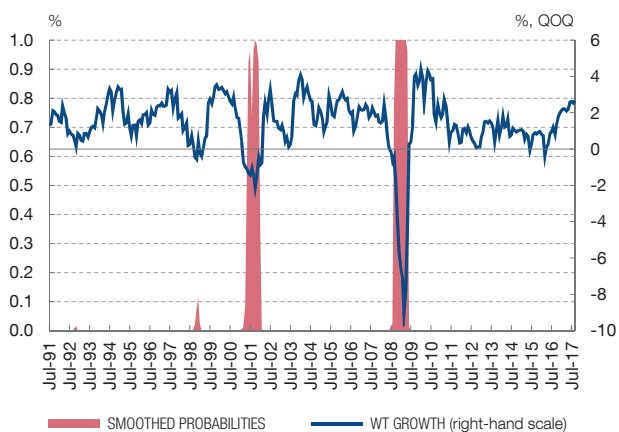
Our study makes a number of contributions to the literature on short-run forecasts of developments in world trade. First, we tested the potential usefulness and flexibility of a small-scale DFM that accounts for mixed frequencies and deals with asynchronous data publication, to predict short-term forecasts of trade growth in real time. We employed the derived common factor to build an innovative composite world trade-cycle index (WTI). In contrast to most existing literature, our model accounts for the trade of both goods and services. Second, we formally tested a large set of trade predictors under an agnostic and multidimensional approach by means of: (i) Bayesian model averaging (BMA) techniques; (ii) Granger non-causality tests under a linear vector autoregression (VAR) framework; and (iii) dynamic correlations. Third, we examined whether it is worth enlarging the single index DFM with leading indicators. To this end, the baseline model was extended to include both leading and coincident indicators, after Camacho and Martínez-Martin (2014).

The dynamic properties of the DFM follow the lines proposed by Aruoba and Diebold (2010), who extended the single-index DFM suggested by Stock and Watson (1991). The main methodological advantages of our new linear DFM with respect to the previous literature are that: (i) it can incorporate information from different series regardless of frequency and publication dates; and (ii) it converts the information in the macroeconomic indicators (and leading indicators) into inferences of the state of the global trade cycle. Hence, it is possible to create a WTI that is easy to interpret and can be automatically updated in a timely fashion.

In the recent past, however, world trade growth has shown signs of nonlinearity, possibly due to major structural breaks (e.g. the latest global financial crisis) and to the asymmetric dynamics that characterize the uneven sequence of cyclical expansions and recessions. To this extent, the WTI itself was tested for the presence of a regime switch. Turning-point detection was assessed through a non-linear extension, namely, a Markov-switching model (Hamilton, 1989). To assess whether the WTI performs well at predicting turning points, the forecasting quadratic probability score (FQPS) was computed. It ranges from 0 to 2, with a score of 0

Chart 1

PROBABILITIES OF WORLD TRADE GROWTH CONTRACTIONS FROM THE COMMON FACTOR



NOTE: Shaded areas refer to (monthly) probabilities of a global trade contraction from the WTI, based on in-sample estimation from 1991-2016. World trade growth refers to the quarterly growth rate on a monthly basis.

corresponding to perfect accuracy. The obtained value of $FQPS = 0.21$ indicates that the WTI performs relatively well at predicting turning points. This is confirmed by the high correlation between the probability of contraction as indicated by the WTI and actual world growth contractions, as shown in Chart 1.

Summing up, in our empirical analysis we find that the WTI explained more than 92% of the variance of world trade growth of goods and services, demonstrating the potential of the small-scale DFM to track world trade growth. Second, the pseudo-real-time analysis showed that our DFM clearly outperformed a number of competing models, especially when forecasting the next unavailable figure of trade growth. This confirmed that monthly real and survey data provide useful and forward-looking information to forecast current world trade growth. Finally, among the insights that emerged from our in-sample analysis, it is worth highlighting that global credit and trade finance conditions were significant leading indicators of the world trade cycle in the recent past; this is in line with the theoretical literature.

REFERENCES

Aruoba, B., and F. Diebold (2010). Real-time macroeconomic monitoring: Real activity, inflation, and interactions, *American Economic Review: Papers & Proceedings*, 100, 20–24.

Camacho, M., and J. Martinez-Martin (2014). Real-time forecasting US GDP from small-scale factor models. *Empirical Economics*, 49(1), 347–364.

Hamilton, J. (1989). A new approach to the economic analysis of nonstationary time series and the business cycles. *Econometrica*, 57, 357–384.

Stock, J. H., and M. Watson (1991). A probability model of the coincident economic indicators. In K. Lahiri, & G. Moore (Eds.), *Leading economic indicators: New approaches and forecasting records* (pp. 63–89). UK: Cambridge University Press.

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**SOVEREIGN DEFAULT, DOMESTIC BANKS
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CAPITAL MARKETS**

DOMINIK THALER

Economic Journal

Recent conferences

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VI BANCO DE ESPAÑA SEMINAR IN ECONOMIC HISTORY

Madrid, 8 October 2020

The annual Seminar in Economic History of the Banco de España aimed to bring together scholars from all over the world to discuss current academic work. The programme aimed to contribute to the progress of the discipline, providing new insights in several historical periods and areas of investigation.

Conference program

WORKSHOP ON “MACROECONOMICS IN SOUTH EUROPE SINCE THE EURO”

Workshop In honor to Loukas Karabarbounis, winner of the 19th edition of the German Bernacer Prize.

Madrid, 21 October 2020

The Observatory of ECB and Banco de España honored Loukas Karabarbounis, with a workshop in which he presented his research on “Macroeconomics in South-Europe since the Euro” followed by a panel discussion in which leading economists and European policy makers discussed his contribution to our understanding on capital flows, productivity and macroeconomic performance in South Europe.

More information

NEW FACES

**JORGE ABAD**

Monetary Policy Division

Jorge Abad joined the Monetary Policy Division at the Banco de España in September 2020. He holds a PhD in Economics and a Master in Economics and Finance from CEMFI, as well as a BA in Economics from Universidad Complutense de Madrid. He also has held visiting student positions at New York University and Maastricht University. During his studies, he was a teaching assistant in Mathematics and in Economics at the graduate level. Before that, he has held various temporary positions at the European Central Bank and the Bank of England, among others.

Jorge does research at the intersection between macroeconomics and finance, with special interest in topics such as financial crises and banking regulation. In one of his papers, “Breaking the Sovereign-Bank Nexus,” he proposes a dynamic general equilibrium model that analyzes the mutually reinforcing effects

between sovereign and banking crises. Motivated by the policy debate in the aftermath of the European sovereign debt crisis, the paper provides a quantitative assessment of the effects of imposing stricter capital regulation on the balance sheet exposures of banks to sovereign debt. The findings of the paper suggest that tighter regulatory requirements make banks safer and crises less likely, at the cost of constraining the aggregate supply of credit.

Previously, Jorge has worked on topics such as the financial stability implications of loan loss provisioning requirements for banks, the structure of the European over-the-counter derivative markets, and the exposure of European banks to shadow banking entities. In his future research, he plans to analyze the interaction between monetary policy and macroprudential regulation.

**JAVIER QUINTANA GONZÁLEZ**

Sectoral Analysis Division

Javier Quintana joined the Sectoral Analysis Division at the Banco de España in September 2020. He holds a PhD in Economics from Bocconi University (Milan), a Master in Economics from CEMFI (Madrid), and a B.A. (Licenciatura) from Universidad Carlos III de Madrid. During his PhD, he also did a visiting stage at the University of California, Los Angeles.

His research is at the intersection of international trade, labor economics, and economic geography. His current research aims at understanding the effects that contemporaneous challenges like globalization and technological change have on labor markets and inequality in developed countries. In particular, has a special focus on the spatial component of inequality and economic dynamics.

In his work “Import competition, Regional Divergence, and the Rise of the Skilled City” he documents that the sharp rise in imports of Chinese manufacturing goods had a significant effect on the spatial skill polarization and the divergence of college wage premium among US metropolitan areas. The effects of the manufacturing import competition were systematically different

depending on the skill intensity of local services. Among regions with skill-intensive services, a higher exposure to import competition in manufacturing increased the number and wages of college-educated workers. The negative effects of the China shock concentrated in exposed regions with a low density of college-educated workers. The heterogeneous effects of import competition explain one third of the spatial skill polarization and one fourth of the divergence in college wage premium. He shows that the contribution of the trade shock operates through the reallocation of workers across sectors and regions. High human capital regions exposed to the China shock undergo a faster transition from manufacturing to skill-intensive service industries.

Additionally, he took part in the project “Labor Composition and Productivity Measures in Europe” with coauthors Diego Comin, Tom Schmitz, and Antonella Trigari. This work is part of the FRAME project, sponsored by the European Union’s Horizon 2020 research programme. They provide novel measures of Total Factor Productivity and study the implications of job dynamics for productivity growth during the Great Recession in US and several European countries.



FLORENS ODENDAHL

Euro Area Economy Division

Florens Odendahl joined the Euro Area Economy Division of the Banco de España in September 2020. He holds a Ph.D in Economics from Universitat Pompeu Fabra (October 2018), as well as an MSc in Economics from the Barcelona Graduate School of Economics and a BSc in Economics from the University of Bonn. Previous to his employment at the Banco de España, he worked for two years at the Monetary Policy Division of the Banque de France.

Florens does research in the area of time series econometrics, with a focus on Bayesian Vector Autoregressions, forecasting techniques, and forecast comparisons. In one of his projects, Florens (jointly with Gergely Ganics) investigated how survey predictions from the ECB Survey of Professional Forecasters can

be used to improve forecasts of benchmark econometric models. They find that one-year-ahead and two-year-ahead survey predictions can help to improve the model-based forecasts for shorter horizons. The second result of their work suggests that the incorporation of survey forecasts via moment conditions mitigates the impact of parameter breaks on the forecasting performance of econometric models.

In one ongoing project (jointly with Barbara Rossi and Tatevik Sekhposyan), he developed a test to detect non-linearities in relative forecasting performances. In a second ongoing project, Florens broadened his research agenda and investigates whether public remarks of Federal Reserve officials about financial stability concerns carry information for upcoming interest rate decisions.



SALOMÓN GARCÍA VILLEGAS

Macroprudential Policy Division

Salomón García joined the Macroprudential Policy Division at the Banco de España in October 2020. He holds a Ph.D. in Economics from the University of Minnesota (May 2020) and a master's in economics from the University of Chile. Prior to his graduate studies, Salomón obtained his BA in economics from the Polytechnic University of the Coast (ESPOL) in Ecuador. During his studies at the University of Chile and the University of Minnesota, he was a teaching assistant of time series econometrics, microeconomic theory, and instructor of financial economics.

Salomón's research interests lie in the intersection of macroeconomics and finance. His research makes use of General Equilibrium models to answer policy-oriented questions in the fields of banking, business cycles, and international macro. In one

of his projects, he develops a novel heterogeneous agents' model of banking and uses it to quantify the role of liquidity and information frictions in accounting for fluctuations in mortgage lending to households. He finds that the liquidity dry up arising from the collapse of the securitization market accounted for thirty percent of the contraction of mortgage lending during the Great Recession in the United States. This paper was the winner of the 2019 AREUEA Homer Hoyt Doctoral Dissertation Award. In a separate paper, "State Tax Competition in the United States" (joint with José Casco from the University of Minnesota), Salomón studies how tax competition among tax authorities affects the evolution of capital flows between U.S. states. In his future research, Salomón plans to focus on studying the effects of macroprudential policies in the financial stability of the banking sector as well as its distributional implications on households.

JOB OPENINGS FOR PhD ECONOMISTS

The Banco de España is hiring in the job market. The Bank is interested in individuals with strong modeling and empirical skills to conduct high-quality policy-oriented research, to produce reports for the Bank's senior management and to write for the Bank's publications. The application deadline is 20 November 2020.

[Job posting](#)

Upcoming conferences

[Link to conferences page](#)

II ENCUESTRO RED INVESTIGADORES INTERNACIONALIZACIÓN BANCO DE ESPAÑA

Madrid, 5 November 2020

La Dirección General de Economía y Estadística del Banco de España organizará, de forma conjunta con la Cátedra Global Nebrija Santander en Internacionalización de empresas, el II Encuentro del la Red Investigadores Internacionalización Banco de España. El acto reunirá a investigadores del ámbito universitario y del Banco de España promoviendo el debate y análisis del impacto de la Covid-19 sobre la economía internacional.

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