SPILLOVERS

Research in Economics at Banco de Portugal • Biannual • Year VI • Spring 2018

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Overview

Providing a strong theoretical and empirical basis for policymaking is the primary reason for promoting research and economic studies in central banks. Economic research provides models, tools and analyses that allow Banco de Portugal to fulfil some of its strategic objectives.

After the establishment of the European System of Central Banks, composed of the ECB and the central banks of the European Union, it was clear that this body should be a promoter of high-quality research. The reason was not merely promoting the normal opportunities of collaboration in research teams and coordination of work focused on the same issues. Perhaps the main driver of improvement for most central banks within the ESCB, namely those of smaller size, was the advantage of having a decentralized research function leading to a healthy competition between institutions, spurring better ideas and outcomes. In addition to questions and areas of common interest to most central banks of the ESCB, different scopes of research across central banks also imply the existence of idiosyncratic missions and contexts, namely on the motives, design and evaluation of economic policies. This naturally gives rise to various ways of organizing research across national central banks and the ECB. This last point is even more important when there are no public or private institutions filling this role at the national level, as is the case in Portugal.

At Banco de Portugal, after a period when the focus was mostly directed by the specific advantages of human resources working at the bank, the Board felt that there would be gains in identifying research priorities, which could help organize, assess and communicate research. The internal discussions that lead to the production of a formal Research Agenda for Banco de Portugal began at the end of 2016 and were concluded in March 2018, with the formal approval of the document by the Board.

The Research Agenda is the reference document for the general orientation of the work of analysis and research to be developed at Banco de Portugal until 2020. It aims at mobilizing employees to the analysis and research topics considered most relevant to the achievement of Banco de Portugal's strategic objectives, regardless of the department of origin and the area of research.

The Research Agenda defines three topics of interest for understanding the current situation of the Portuguese economy and its future within the euro area. The development of methodologies applicable to the subjects of research is also emphasized. The Agenda proposes internal and external sharing of economic information. The three topics of research – explained and divided in sub-topics in the document (link) – are "New challenges to monetary policy and financial stability", "Growth of the Portuguese economy in the context of the euro area: constraints and sustainability", and "The future of institutions and public policies in Portugal and in the European Union".

Having some guidance about the main questions that are relevant to the bank in each moment is not equivalent to having a plan of activities describing the work of a particular economist every year. There has to be some discretion in the research activity. It is important to have highly prepared staff so as to interact fruitfully with the community of central bankers and with the academic world in today's complex economic language. This point is perhaps where the Agenda plays its most important role. For, if there is not enough freedom in the creative process, we cannot expect to get the right answers both for questions that were anticipated in the Agenda, but also for those that could hardly be anticipated. And then, as in normal times, we need to have good answers to the way policy tools should be used.

Banco de Portugal, as the other central banks of the ESCB, is cautious by nature. To follow a prewritten Research Agenda makes sense. However, we learnt from recent history that sometimes we have to be bold and creative. If and when conditions change faster than the normal process of refreshing the Agenda, we need to be prepared to write a new one.

Isabel H. Correia

In this issue

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BANCO DE PORTUGAL
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Interview

Javier Suarez is a Professor of Finance at CEMFI, Madrid. He is also a Research Fellow of the CEPR and a Research Associate of the ECGI. He earned a PhD in Economics at Universidad Carlos III, Madrid. His research and teaching activities cover mainly the areas of corporate finance and banking, with a special focus on the analysis of bank regulation, the linkages between macroeconomics and banking, and macro-prudential policies. He has numerous publications in top economics and finance journals. In 2013-2014 he served as an academic advisor to the Macro-prudential Research Network (MaRs) of the European System of Central Banks. Since March 2015 he is Vice-Chair of the Advisory Scientific Committee of the European Systemic Risk Board (ESRB).

Your research on banks has provided an outstanding contribution to the policy debate on many dimensions of bank regulation, including on capital requirements, their cyclicality, liquidity, systemic risk or macroprudential policy. Much of this research has been developed while policy makers were hurriedly taking decisions, especially in the aftermath of the global financial crisis.

In which areas do you feel that the decisions taken are not consistent with what theory and empirical evidence would advise us?

While I fully understand the political window of opportunity to redesign financial system regulation in the aftermath of the crisis, one of the implications of having such a relatively expeditious approach is that the cumulative impact of the many reforms, the interactions, and even the consistency between them were hard to assess. In particular, it was hard to provide rigorous cost-benefit analysis covering these aspects in a fully rigorous way. Therefore, performing such analysis whenever feasible, if only on an ex post basis, is a social duty. So, in my view, both researchers and policy institutions working in the affected fields of interest should commit efforts to this task, even if the payoff now may be lower, especially in terms of having an immediate impact on the regulatory process.

Your contribution to the policy debate did not limit itself to writing papers locked inside an office, but you very actively interacted with policymakers worldwide, so as to provide informed advice. What did you learn from that interaction? More generally, what can academics learn from policy makers?

This interaction was extremely interesting along several dimensions. As a researcher in a very specific field of Economics, I felt the involvement of academics like me in the discussions was justifying somehow the role of academics in society more broadly. Let me provide a possibly exaggerated metaphor based on an imaginary health crisis caused by a rare virus and the usefulness of having some researchers in some university department or research institute specialized in, say, the genetics of such virus. In normal times, having those researchers may look like a luxury but in crisis times involving them in crisis management and, later, in the redesign of crisis prevention mechanisms can be quite valuable. I personally found very encouraging that policymakers were really interested in hearing the views of academics. And, of course, the exchange was bilateral. Interacting with policymakers make researchers like me, with a preference for abstraction and simple analytical frameworks, realize that reality is complex, institutional backgrounds and limitations (legal, political, et cetera) matter a lot, and that, when turning to practice, evil is, as the adage says, in the details. So I learned that it is very important to hear or be briefed on the views of those that have first-hand experience in the topics under consideration (users, practitioners, supervisors, experienced policymakers) and not just academic colleagues with similar backgrounds and methodological preferences as one's own.

And the reverse: in which areas do you think that researchers made a more meaningful contribution to policy making?

Researchers are good for thinking "out of the box", hopefully in a useful manner. In a sense this is very natural given the way we get rewarded throughout our career: for publishing original but rigorous contributions in our fields of research. I would argue that we are used to think "out of the box" because this increases the likelihood of being original either in terms of methodology or in terms of substance. The crisis came as big surprise to most people, including academics and economists at policy institutions. Many mechanical ways of judging the working of the economy or the healthiness of the financial system failed, and we all felt systematically disconcerted for a while.

Some researchers were key to provide first a narrative and then the theoretically or empirically based analytics of what was going on, and hence the basis for understanding what had to be done and how the financial system had to be fixed to prevent crises of such magnitude in the future. The connections between the shadow banking system and the core banking system, the idea that liquidity spirals and funding spirals may feed each other and the older idea that self-fulfilling prophecies may have large destructive power were key to our collective understanding of the crisis and were mainly put on the table by researchers. Likewise, on the what to do front, the initial ideas about bail-in, contingent convertibles, the need and ways to combat pro-cyclicality or the various alternatives available to regulate liquidity risk in banking were put forward by academics with an active research profile.

The European Systemic Risk Board (ESRB) has a very unique model, where academics and policy makers sit together to discuss risks and take decisions, through the Advisory Scientific Committee. What are your views on this model? Should it be replicated in other policy making institutions?

The ESRB is quite unique in the European and, I would say, global landscape by having an Advisory Scientific Committee (ASC) mainly made up of active researchers from non-official institutions. It is one of the two advisory bodies in the structure of the ESRB (the other one is comprised by financial stability officers from the institutions –most prominently central banks– that compose the ESRB membership) and reports to its General Board. It can elaborate reports on specific topics at the request of the General Board, contribute with commentary and academic advice to ongoing policy discussions, and raise new issues and submit its insights on them to the General Board in different formats. The importance given to the ASC in the governance of the ESRB is also quite unique: the chair and two vice-chairs of the ASC are voting members of the ESRB, thus treated very similarly to independent directors in a corporate board. Having academics in the advisory and governing bodies of private and public institutions is somewhat common, but having an explicit ASC so much involved in the working of the organization is quite unique. In my view, it contributes to have the policy debate subject to academic scrutiny, to bring ideas from research into policy discussions and to avoid that some form of excessively complacent official view about how things are managed lead to, for example, inaction bias in relation to the prevention of a future crisis.

Researchers at central banks sit somewhere in the middle of these two "battle fields", pursuing research while also contributing to policy making. There are many organizational models across central banks and incentives are not always clear. How can things become better?

Without having thought much about this difficult question, what I can say is that I firmly believe in the complementarity between economic and financial research and policy making at central banks. The exact form in which such complementarity is exploited may differ across central banks and I am not sure I know what the perfect model is. A model in which some pure researchers never talk to policy makers and some pure policy makers never talk to researchers is possibly not good. The ideal degree of commitment to policy-related activities of a researcher may depend on his or her skills and preferences and, quite importantly, the stage in his or her career. Researchers with the capacity to produce publications of high scientific quality should have the opportunity to develop such capacity. So, instead of distracting them with routine time-consuming tasks that others could do similarly well, their contribution to the central bank might consist on more punctual consultations, on providing advice to teams of less research-oriented economists or on their involvement in longer run projects needing high doses of depth and innovation. In any case, top quality research production is risky and personally very demanding, so career design at the central bank should also provide opportunities to (and be able to benefit from the talent of) those prior researchers that eventually prefer or can be more valuable performing tasks not so related to research.

Going forward, in which areas do you feel that this interaction between academics and policy makers needs to be taken further?

At the risk of being biased by my own experience and specialization, I think macroprudential policy is one such area. First, because we are in a learning phase in which concepts, models, data, policy challenges, and policy experiences are accumulating all at the same time, so dialogue and collaboration between the involved parties can be very fruitful. Second, because understanding systemic risk requires combining knowledge and mechanisms previously enclosed in fields such asset pricing, market microstructure, banking, financial regulation, and macroeconomics that, before the crisis, did not communicate much with each other. So there is need to actively encourage such cross-field work and collaboration. Central banks, given their own stake in macroprudential policy, are in a unique position to undertake, support and coordinate part of the efforts.

By Diana Bonfim, Economics and Research Department.

In every issue, we ask experts to briefly present and discuss two papers written by staff members. In this issue, the guest is Prof. Sandra Sequeira.

Sandra Sequeira is an Associate Professor of Development Economics at the London School of Economics. She is an applied microeconomist who studies topics in development economics and empirical industrial organization. Sandra's expertise is in labor economics, international trade, the political economy of state capacity and consumer behaviour. Her research has been published in leading journals in economics such as the American Economic Review, The Review of Economics and Statistics, and the Journal of International Economics. She is Lead Academic for Mozambique at the International Growth Centre, an affiliate of STICERD and NOVAFRICA, and a Research Affiliate of the CEPR. She is currently leading research projects on migration and labor market integration; active labor market policies; state capacity; and on the political economy of consumer behavior. She holds a PhD from Harvard, an MA from the Fletcher School and a Licenciatura from Universidade Nova.

Featured published paper

Antunes, A., D. Bonfim, N. Monteiro and P.M.M. Rodrigues. 2018. "Forecasting banking crises with dynamic panel probit models", International Journal of Forecasting, Volume 34, Issue 2, Pages 249-275. (JEL Classification: C5, G21).

The paper "Forecasting banking crises with dynamic panel probit models" (Antunes et al. 2016) offers an empirical assessment of the predictability of banking crises from both macroeconomic variables (e.g. private credit, house prices, equity prices, GDP, debt service ratio), and of banking sector variables (e.g. income, capital and reserves, leverage ratio, total assets). The paper is particularly concerned with the possibility of establishing "early warning" signals of banking crises. To this end, the authors examine the predictability of macro and banking variables from 1 to 3 years ahead, and from 3 to 5 years ahead. The authors also allow for a dynamic component to the crisis dummy, so that the occurrence of a crisis in the past can shape the likelihood of a crisis today. Finally, to allay concerns about the endogeneity of crises to policy responses, the model seeks to predict both actual and potential crises, namely episodes of "heightened vulnerability" of the banking sector of 22 European countries.

The evidence suggests that equity prices and debt to service ratio are early predictors of crises, while credit-to-GDP ratio is predictive within a 3-year horizon. The latter result is consistent with a growing literature that documents that large increases in credit issuance predicts subsequent tightening of credit constraints and an economic contraction (Lopez Salido, Stein, Zakrasjek 2017), and is associated with an increased likelihood of a bank collapse (Baron and Xiong 2017). The results also show that taking into account past crises, while clearly a reduced-form approach, significantly improves the fit by reducing the percentage of missed crises and increasing the percentage of those that are correctly predicted. The underlying mechanism, however, is unclear, in particular because the predictability coefficient takes different signs at different lags.

In their assessment of the results, the authors take the reasonable view that missing a crisis is more costly than calling one that ends up not occurring. Under a threshold that solves this trade-off, the model produces up to 90% of correctly predicted crises and 27% of missed crises. The paper also offers two interesting out-of-sample exercises by removing separately one of two prominent examples of banking crises (the 2008 financial crisis and the Nordic crisis of the 1990s). Performance drops, but the role of the dynamic model is more important here than in sample. There has recently been enormous interest in understanding the drivers of financial crises, since such an understanding may entail an ability to manage and perhaps prevent crises through policy. Establishing which easily observable variables have predictive power is an important part of this agenda. Much of this work has come to focus on excessive lending perhaps driven by "sentiment" or overconfident expectations (Lopez Salido, Stein, Zakrasjek 2017). The authors' findings on exhuberance, defined as extreme realizations of the macro or banking variables considered, are an important contribution to this literature.

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Featured article from *Banco de Portugal Economic Studies*

Amador, João. Opromolla, Luca David. 2017. "Trade Margins and Cohorts of Traders in Portugal".

A well-established empirical literature has documented the extensive and intensive margins of international trade. Our ability to dissect aggregate economic shocks into their firm-level trade effects remains, however, far more limited. This research has to date been constrained by the lack of dynamic firm-level panel data (particularly on imports) and by the endogeneity of the economic shocks that can affect firm behavior. The paper "Trade margins and cohorts of traders in Portugal" by João Amador and Luca Opromolla represents a step in the right direction. The authors analyse a rich database that tracks importing and exporting firms for an extended period between 1995 and 2015. The paper begins by reporting that several of the empirical regularities observed for exports also extend to firm importing behaviour namely the fact that continuing traders represent about 90% of import flows, with entering and exiting firms representing a small share of imports. In terms of cumulative growth, the paper finds that nominal exports grew by 89% during the 1996-2014 period and the cumulative extensive and intensive margins increased by 23 and 55 per cent, respectively. Similarly, nominal imports of goods grew by 80 per cent, while the overall extensive and intensive margins grew by 27 and 45 per cent, respectively. These findings suggest that while the extensive margin is relatively small on a yearly basis, it is important in cumulative terms.

The paper then turns to an analysis of the impact of two different economic and financial shocks on firms' trading behaviour: the global trade collapse of 2008 and the implementation of Portugal's economic and financial assistance program between 2011 and 2014 in the aftermath of the sovereign debt crisis in the euro area. The authors find that the great trade collapse reduced exports' intensive margin while the Portuguese economic and financial assistance program mostly reduced the imports' intensive margin. A cohort analysis suggests positive selection in the cohorts of traders established in 2008 and 2011. This suggests that firms that start to export in crisis years and manage to survive are also more likely to successfully enter into international markets.

These findings suggest that an important future line of inquiry should try to further our understanding of how different types of economic shocks can cause heterogeneous trading responses across firms and sectors. This would require both exogenous variation in firm or sector-level exposure to shocks and a detailed understanding of how characteristics such as the age of the firm, years of experience, baseline sectoral competition and the depth and breadth of firm-level existing trading relations can determine firms' responses to international trade shocks. This remains an exciting area of future research.

Recently published

Our economists publish in a wide range of economic and finance journals and scholarly books.

Mathematical and Quantitative Methods

- Antunes, A., D. Bonfim, N. Monteiro and P.M.M. Rodrigues. 2018. "Forecasting banking crises with dynamic panel probit models", International Journal of Forecasting, Volume 34, Issue 2, Pages 249-275. (JEL Classification: C5, G21) https://doi.org/10.1016/j.ijforecast.2017.12.003.
- Azevedo J. Valle and A. Pereira. 2018. "Macroeconomic Forecasting using Low-Frequency Filters", Oxford Bulletin of Economics and Statistics, Vol. 80(1), February 2018, pp. 39-64 (JEL Classification: C14, C32, C51, C53).
- del Barrio Castro, T., P.M.M. Rodrigues and A.M.R. Taylor (2017) "Semi-parametric seasonal unit root tests", Econometric Theory (JEL Classification C12 C22) doi.org/10.1017/S0266466617000135.
- Dias, F., M. Pinheiro and A. Rua. 2018. "A bottom-up approach for forecasting GDP in a data rich environment", Applied Economics Letters, vol. 25, nr. 10, 718-723. (JEL Classification C22, C53).

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- Andraz, J.M.L., R. Guerreiro and P.M.M. Rodrigues (2017) "Persistence of Travel and Leisure sector Equity Indices", Empirical Economics (JEL Classification C22, G21, G32) doi.org/10.1007/s00181-017-1276-8.
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Macroeconomics and Monetary Economics

- Adão, Bernardino and André C. Silva. 2018. "Real transfers and the Friedman rule", Economic Theory, JEL Classification: E52 E62.
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Forthcoming

- Bonfim, Diana and Carla Soares. 2018. "The Risk-taking Channel of Monetary Policy: Exploring All Avenues" Journal of Money, Credit and Banking (JEL Classification: E44, E5, G21).
- Ercolani, V. and J. Valle e Azevedo. 2018. "How Can the Government Spending Multiplier be Small at the Zero Lower Bound?" Macroeconomic Dynamics, (JEL Classification: E32, E62).
- Rua, A. 2018. "Modelling currency demand in a small open economy within a monetary union", Economic Modelling, (JEL Classification: C32, E41, E50).

Financial Economics

- Blanchard, Olivier and Pedro Portugal. 2017. "Boom, slump, sudden stops, recovery, and policy options. Portugal and the Euro," Portuguese Economic Journal, Springer; Instituto Superior de Economia e Gestão, vol. 16 (3), pages 149-168, December. (JEL Classification: E3, E6).
- Bonfim, Diana, Qinglei Dai and Francesco Franco. 2018. "The number of bank relationships and borrowing costs: The role of information asymmetries", Journal of Empirical Finance, Volume 46, Pages 191-209. (JEL Classification: G21, G32).
- Gambacorta, L. and S. Karmakar. 2017. "Leverage and Risk Weighted Capital Requirements", International Journal of Central Banking. (JEL Classification: G21, G28, G32).

Forthcoming

- Bonfim, D. and M. Kim. 2018. "Liquidity risk and collective moral hazard", International Journal of Central Banking. (JEL Classification: G21, G28).
- Pereira, J. and A. Rua. 2018. "Asset Pricing with a Bank Risk Factor", Journal of Money, Credit and Banking. (JEL Classification: G12, G21).

Industrial organization

- Amador, João and Ana Cristina Soares. 2018. "Competition in the Portuguese economy: insights from a profit elasticity approach," Empirica, Springer;Austrian Institute for Economic Research;Austrian Economic Association, vol. 45(2), pages 339-365, May. (JEL Classification: L10, L60, O50).

International Economics

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Forthcoming

- Amador, João, Sónia Cabral, Rossana Mastrandrea and Franco Ruzzenenti .2018. "Who's Who in Global Value Chains? A Weighted Network Approach", Open Economies Review, (JEL Classification: F14, C67) https://doi.org/10.1007/s11079-018-9499-7.
- Guimarães, Paulo and José Mata. 2018. "Temporary investment incentives and divestment by foreign firms", Oxford Economic Papers, (JEL Classification: F23,O25).

New titles in the *Working Papers* series

Technical working papers intended for publication in leading finance and economic journals. Find here the complete list of working papers.

Real Effects of Financial Distress: The Role of Heterogeneity • **2018** • Francisco Buera, Sudipto Karmakar

To better understand unemployment dynamics it is key to assess the role played by job creation and job destruction. Although the U.S. case has been studied extensively, the importance of job finding and employment exit rates to unemployment variability remains unsettled. The aim of this paper is to contribute to this debate by adopting a novel lens, wavelet analysis. We resort to wavelet analysis to unveil time and frequency-varying features regarding the contribution of the job finding and job separation rates for the U.S. unemployment rate dynamics. Drawing on this approach, we are able to reconcile some apparently contradictory findings reported in previous literature. We find that the job finding rate is more influential for the overall unemployment behavior but the job separation rate also plays a critical role, especially during recessions.

The returns to schooling unveiled • **2018** • Ana Rute Cardoso, Paulo Guimarães, Pedro Portugal, Hugo Reis

We bring together the strands of literature on the returns to education, its spillovers, and the role of the employer shaping the wage distribution. The aim is to analyze the labor market returns to education taking into account who the worker is (worker unobserved ability), what he does (the job title), with whom (the coworkers) and, also crucially, for whom (the employer). We combine data of remarkable quality exhaustive longitudinal linked employer-employee data on Portugal with innovative empirical methods, to address the homophily or reflection problem, selection issues, and common measurement errors and confounding factors. Our methodology combines the estimation of wage regressions in the spirit of Abowd, Kramarz, and Margolis (1999), Gelbach's (2016) unambiguous conditional decomposition of the impact of various omitted covariates on an estimated coefficient, and Arcidiacono et al.'s (2012) procedure to identify the impact of peer quality. We first uncover that peer effects are quite sizeable. A one standard deviation increase in the measure of peer quality leads to a wage increase of 2.1 log points. Next, we show that education grants access to better-paying firms and job titles: one fourth of the overall return to education operates through the rm channel and a third operates through the job-title channel, while the remainder is associated exclusively with the individual worker. Finally, we unveil that an additional year of average education of coworkers yields a 0.5 log points increase in a worker's wage, after we net out a 2.0 log points return due to homophily (similarity of own and peers' characteristics), and 3.3 log points associated with worker sorting across firms and job titles.

The Effect of Firm Cash Holdings on Monetary Policy • **2018** • Bernardino Adão, André C. Silva

Firm cash holdings increased substantially from 1980 to 2013. The overall distribution of firm cash holdings changed in the same period. We study the implications of these changes for monetary policy. We use Compustat data and a model with financial frictions that allows the calculation of the monetary policy effects according to the distribution of cash holdings. We find that the interest rate channel of the transmission of monetary policy has become more powerful, as the impact of monetary policy over real interest rates increased. With the observed changes in firm cash holdings, the real interest rate takes 3.4 months more to return to its initial value after a shock to the nominal interest rate.

Sub-Optimality of the Friedman Rule with Distorting Taxes • **2018** • Bernardino Adão, André C. Silva

We find that the Friedman rule is not optimal with government transfers and distortionary taxation. This result holds for heterogeneous agents, standard homogeneous preferences, and constant returns to scale production functions. The presence of transfers changes the standard optimal taxation result of uniform taxation. As transfers cannot be taxed, a positive nominal net interest rate is the indirect way to tax the additional income derived from transfers. The higher the transfers, the higher is the optimal inflation rate. We calibrate a model with transfers to the US economy and obtain optimal values for inflation substantially above the Friedman rule.

Are asset price data informative about news shocks? A DSGE perspective • **2018** • Nikolay Iskrev

Standard economic intuition suggests that asset prices are more sensitive to news than other economic aggregates. This has led many researchers to conclude that asset price data would be very useful for the estimation of business cycle models containing news shocks. This paper shows how to formally evaluate the information content of observed variables with respect to unobserved shocks in structural macroeconomic models. The proposed methodology is applied to two different real business cycle models with news shocks. The contribution of asset prices is found to be relatively small. The methodology is general and can be used to measure the informational importance of observables with respect to latent variables in DSGE models. Thus, it provides a framework for systematic treatment of such issues, which are usually discussed in an informal manner in the literature.

Calibration and the estimation of macroeconomic models • **2018** • Nikolay Iskrev

We propose two measures of the impact of calibration on the estimation of macroeconomic models. The first quantifies the amount of information introduced with respect to each estimated parameter as a result of fixing the value of one or more calibrated parameters. The second is a measure of the sensitivity of parameter estimates to perturbations in the calibration values. The purpose of the measures is to show researchers how much and in what way calibration affects their estimation results – by shifting the location and reducing the spread of the marginal posterior distributions of the estimated parameters. This type of analysis is often appropriate since macroeconomists do not always agree on whether and how to calibrate structural parameters in macroeconomic models. The methodology is illustrated using the models estimated in Smets and Wouters (2007) and Schmitt-Grohé and Uribe (2012).

From the *Banco de Portugal Economic Studies*

Banco de Portugal Economic Studies aims to publish theoretical and applied studies prepared by economists at Banco de Portugal, often co-authored with external researchers. All articles are signed and are of the sole responsibility of their respective authors. The articles aim to contribute to an informed and high-quality debate on the Portuguese economy, in line with those published in the *Economic Bulletin* until 2014. The journal intends to be a reference publication in that debate, and is directed to a relatively specialized public on economic issues.

How long does it take to enforce a debt in the Portuguese judicial system? • **2018** • Manuel Coutinho Pereira, Lara Wemans.

Is the Phillips curve dead? - Results for Portugal • **2018** • Sara Serra.

Forecasting exports with targeted predictors • **2018** • Francisco Dias, Nuno Lourenço, António Rua.

Term premia dynamics in the US and Euro Area: who is leading whom? • **2018** • Nikolay Iskrev.

GDP-linked bonds: design, effects, and way forward • **2018** • Diana Bonfim, David Pereira**.**

The distribution of wages and wage inequality • **2018** • Pedro Portugal, Pedro S. Raposo, Hugo Reis.

House prices in Portugal - what happened since the crisis? • **2017** • Rita Fradique Lourenço, Paulo M.M. Rodrigues.

Understanding the Basel III Leverage Ratio Requirement • **2017** • Dina Baptista, Sudipto Karmakar.

Trade Margins and Cohorts of Traders in PortugalV • **2017** • João Amador, Luca David Opromolla.

Seminars

DEE regularly invites experts in various fields of economics to present their latest research. Banco de Portugal staff, as well as researchers from other central banks, Portuguese and foreign universities are invited to attend. The following is a list of the seminars that were organized during the last six months. See the seminars' webpage for a list of past and next seminars.

2017

Oct. 30 **Disappearing Routine Jobs: Who, How, and Why?** • Nir Jaimovich • University of Zurich

Nov. 15 **Leveraged Buyouts and Credit Spreads** • Peter Feldhütter • Copenhagen Business School

24 **Dispersion in Financing Costs and Development** • Cezar Santos • Fundação Getulio Vargas

27 **The Public Finance Approach to Optimal Stabilization Policy** • Bas Jacobs • Erasmus University Rotterdam

Dec. 11 **(Mis)Allocation of an Overpaid Public Sector** • Tiago Cavalcanti • University of Cambridge

12 **Optimal Austerity** • Juan Carlos Conesa • Stony Brook University

18 **Are Lemons Sold First? Dynamic Signaling in the Mortgage Market** • Manuel Adelino • Duke University

2018

Jan. 10 **What's Driving the Decline in Entrepreneurship?** • Nicholas Kozeniauskas • New York University

12 **Persuasion in Global Games with Application to Stress Testing** • Alessandro Pavan • Northwestern University

15 **Gross Capital Flows and International Diversification** • Hyunju Lee • University of Minnesota

19 **Unemployment, Entrepreneurship and Firm Outcomes** • João Galindo da Fonseca • University of British Columbia

22 **Wall Street or Main Street: Who to Bail Out?** • David Zarruk • University of Pennsylvania

24 **Pricing of Idiosyncratic Equity and Variance Risks** • Elise Gourier • Queen Mary University of London

30 **The Labor Share in the Service Economy** • Luis Díez Catalán • University of Minnesota

Feb. 2 **The Macroeconomic Effects of Employment Protection on Human Capital and Jobs** • Joaquin Garcia-Cabo • University of Minnesota

5 **Shocks and the organization of the firm: who pays the bill?** • Alessandro Sforza • London School of Economics

7 **Adverse Selection, Risk Sharing and Business Cycles** • Marcelo Veracierto • Federal Reserve Bank of Chicago

8 **The Effects of Moral Hazard on Wage Inequality in a Frictional Labor Market** • Árpád Ábrahám • European University Institute

14 **Unemployment Insurance Reform: the Origin of the German Labor Market Miracle** • Alexandra Solovyeva • University of Minnesota

Mar. 16 **Tax Progressivity, Performance Pay, and Search Frictions** • Árpád Ábrahám • European University Institute

28 **The Young, the Old, and the Government: Demographics and Fiscal Multipliers** • Omar Rachedi • Banco de España

Apr. 6 **Collateral, Rehypothecation, and Efficiency** • Charles M. Kahn • University of Illinois

9 **Everything all the time? Entry and Exit in U.S. Import Varieties** • Roc Armenter • Federal Reserve Bank of Philadelphia

11 **Fiscal Origins of Monetary Paradoxes** • Dejanir Silva • University of Illinois at Urbana – Champaign

18 **The Nature of Firm Growth** • Peter Sedláček • Univesity of Oxford

May 2 **Ethics and Talent in Banking** • Anjan Thakor • Washington University in St. Louis

7 **Inferring Inequality with Home Production** • Loukas Karabarbounis • University of Minnesota

9 **Exporting Uncertainty: The Impact of Brexit on Corporate America** • Murillo Campello • Cornell University

15 **Modelling yields at the lower bound through regime shifts** • Oreste Tristani • European Central Bank

16 **Firms' Choice of Wage-Setting Protocols in the Presence of Minimum Wages** • Christopher Flinn • New York University

23 **Market Discipline and Systemic Risk** • Alan Morrison • Said Business School

30 **Efficient Weighting: A More Powerful Test for Cross-Sectional Anomalies** • Michael Wolf • University of Zurich

Courses

2017

Nov. 20-23 **Causal Inference in Corporate Finance** • Daniel Paravisini • London School of Economics

The main objective of this course was to provide an introduction to common empirical methods used, most frequently, in corporate finance research. The econometric techniques taught also have widespread applications in other fields such as financial development, banking, corporate governance, consumer finance etc. The course commenced with the introduction of the basic inference problem in corporate finance followed by some of the problems/biases that might arise if one runs a completely agnostic regression, e.g., the omitted variable bias. The next couple of topics focused on causality in regressions and demonstrated how including bad controls can lead to unreliable estimates. The last two topics dealt with two of the most widely used econometric techniques: differences-in-differences and the instrumental variable methodology.

The first topic discussed in class, with respect to running the agnostic regression, was the conditional expectation function: definition, properties and the relation with the linear regression. The related problems of omitted variable bias and non-clustered standard errors were extensively discussed. To clarify concepts, a couple of applications involving determinants of firms' sales and capital structure were also demonstrated. The second part of the course introduced the important issue of causality in regressions. It highlighted how the introduction of "bad controls" may lead to unreliable estimates and in this regard, the theory of propensity score matching was also discussed. The last topic in this part was the regression discontinuity design, which was covered at length with a number of applications.

The last couple of topics were the important ones of difference-in-difference and the instrumental variable methodologies. The theory, the application methodology and the common errors committed were discussed, by means of an array of applications. Important issues like verifying the parallel trends assumption and the properties of the Wald estimator were given special attention. The course ended with a discussion of the instrumental variable methodology for heterogeneous potential outcomes and the local average treatment effect theorem. These techniques are particularly useful if we expect the treatment effects to be heterogeneous rather than homogenous, as commonly assumed.

Overall, I quite enjoyed the course, which was a great mix of theoretical rigor and intuitive applications from seminal papers and recent research. The topics covered were highly relevant and are used regularly in empirical research. It was a great learning experience for me.

By Sudipto Karmakar

Dec. 18-21 **Topics in Macro and Financial Markets** • Guillermo L. Ordoñez • University of Pennsylvania

This course focused on studying the role of financial markets, and in particular financial intermediaries, in macroeconomics. Its aim was to try answering some of the most important open questions in macroeconomics. What is the role of financial markets and financial intermediaries for the aggregate economy? Do financial markets spur growth and development? Do they trigger and spread painful crises? Which policies can improve the positive effects of financial markets in terms of long-run growth, and reduce their negative ones in terms of short-time fluctuations?

To answer these questions the course was divided in three broad topics:

- Micro Foundations – theoretical explanations of why financial intermediation exists and what makes financial institutions and financial markets so special. The growth and decline of the so-called "shadow banking", critical in the understanding the recent financial crisis and the new financial landscape.
- Macro Implications – review theoretically the role of financial markets for economic development and economic volatility. Models in which financial markets magnify volatility and models in which financial markets generate volatility.
- Empirical Patterns – review empirically the role of financial markets for economic development and economic volatility. The recent global financial crisis.

2018

Jan. 15-19 Building models to assess bank capital and liquidity regulation • Javier Suarez • CEMFI

Banco de Portugal organized the course "Building models to assess bank capital and liquidity regulation" by Prof. Javier Suarez, between 15th and 19th of January 2018. The course covered topics that are central to the assessment of recent regulatory reforms, notably the role and consequences of new capital and liquidity regulations.

The first day commenced by analyzing the different views on the role of capital requirements: the buffer view, the incentive view and the Pigovian view. After presenting the single risk factor model underlying the internal ratings-based approach (IRB), the impact of the latter on the loans market was analyzed following the static partial equilibrium model presented in Repullo and Suarez (2004). Despite the small effect on prices, the article highlights that the regulatory system favors low risk firms borrowing from IRB banks and high risk firms borrowing from banks adopting the standardized approach. The fact that only a very high social cost of bank failure could justify IRB capital charges was also pointed out as an inconsistency. The course then progressed into the analysis of the procyclical effects of bank capital regulation. It is well known that, during recessions, banks take significant losses which often deplete their capital buffers. A credit crunch may follow if banks are not able to raise new capital to meet regulatory standards. The following related questions were raised: can endogenously-determined capital buffers neutralize the inherent procyclicality of bank capital regulation? What are the normative trade-offs involved in the attempt to correct this procyclicality? These questions were analyzed with the help of Repullo and Suarez (2013) model, a dynamic partial equilibrium model where banks voluntarily hold costly capital in excess of regulatory requirements in order to satisfy future loan demand. It is argued that under Basel II banks voluntarily hold a higher capital buffer than under Basel I in order to deal with the increase in risk weights during recessions. This increase is however not sufficient to avoid an increase in procyclicality under Basel II. Banks are nevertheless safer under Basel II resulting in higher welfare for reasonable social costs of bank failure. The welfare maximizing arrangement would feature, like Basel III, higher but less cyclical-varying capital requirements.

In the second day of the course, the dynamic general equilibrium model underlying Martinez-Miera and Suarez (2014) was presented with the objective of understanding banks' contribution to systemic risk and the macroprudential role of capital requirements. In this model banks voluntarily expose themselves to systemic risk as result of standard risk shifting incentives. Higher capital requirements mitigate these incentives by reducing the traditional leverage effect and through the so-called last bank standing effect by which surviving banks are able to earn higher scarcity rents after systemic risk materialization. Capital requirements however make bank capital effectively scarcer at all times prompting less credit in the economy and a lower level of economic activity.

In the third day of the course, some of the previously referred questions were analyzed again under the lights of Mendicino-Nikolov-Suarez-Supera (2018), a fully-fledged DSGE model with four types of agents: saving households, borrowing households, entrepreneurs, and bankers. The model features three key distortions: i) banks operate under limited liability and benefit from safety guarantees in the form of insured deposits; ii) uninsured bank debt is not priced according to the bank risk profile; and, lastly, iii) all external financing is subject to costly state verification frictions. These result in banks with excessive leverage and loose lending standards. Equity financing is nevertheless limited by endogenously generated net worth. Regulation must then choose the optimal capital level trading-off its consequences on bank fragility and investment. In this model, capital requirements are Pareto-improving up to a point (all agents benefit from the reduction in bank fragility and the

social costs of bank defaults) and redistributive (from borrowing households to saving households) after that. The latter occurs because the tightening of lending standards strongly penalizes borrowers but benefits bank equity holders. Calibrating the model to the euro area, it is found that: i) increasing capital requirements above Basel II levels is optimal; and ii) capital requirements should be less responsive to time variation in default risk than what point-in-time estimates of the probability of default imply under the internal ratings based formula of Basel II (because the volatility in lending standards tends to destabilize borrowers' consumption).

The last two days of the course were mostly devoted to liquidity regulation. We started by looking at models that emphasize the negative externalities associated with banks' refinancing needs during crises. These emerge from banks not internalizing the system-wide effects of the refinancing risk they incur whenever they increase credit rapidly based on short term market sources. The main paper of this session was Perotti and Suarez (2011). In this article the authors argue that the optimal liquidity regulation depends crucially on banks' characteristics. When banks differ only in their capacity to lend profitably, a simple flat-rate tax on short-term funding is shown to be optimal. This allows better banks to lend more without requiring regulators to be able to identify them. Quantity-based instruments such as the liquidity coverage ratio and the net stable funding ratio are distortionary. In contrast, when banks differ mostly on their risk shifting incentives, quantity constraints are more effective because gambling incentives are not properly deterred by levies.

Following the paper from Santos and Suarez (2018), the last day of the course elaborated on the usefulness of liquidity requirements as a "time-buying tool" and their interaction with lending of last resort (LOLR) facilities and capital requirements. The referred article considers a model where a bank facing rollover risk must decide its allocation to liquid and illiquid assets. Whenever the bank is subject to a run, the LOLR must decide whether to support the bank, which is only efficient in the case the bank is solvent. In this model assessing the financial condition of the bank in real time is difficult. As result, it is optimal for the LOLR to postpone his decision. Banks, however, whenever they expect only a uniformed LOLR to give support, may prefer to opportunistically hold less liquidity than what would be socially optimal increasing the chances of effectively receiving support. This paper emphasizes the fact that, unless capital requirement fully remove the risk of bank runs, capital regulation cannot substitute liquidity requirements as a "time buying tool".

By Nuno Silva, Economics and Research Department

References

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Repullo, R., & Suarez, J. (2013). The procyclical effects of bank capital regulation. *Review of Financial Studies*, 26(2), 452-490.

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Mar. 5-8 and 19-22 Course on Matlab and applications • António Antunes • Banco de Portugal

In March, the Economics and Research Department organised a short but immersive MATLAB course. The course was taught by Professor António Antunes and had participants both from the department and from the Statistics, Financial Stability, Risk Management, Markets and Reserve Management and Banking Prudential Supervision departments. I believe this showcases the increased relevance of MATLAB for a variety of domains.

The course consisted of interactive lab sessions that covered both basic commands and more complex tools such as indexing, loops, functions and graphs. As such, it gave us the toolbox we need to write our scripts autonomously.

A strong emphasis was given to programming style, something that we as economists (not computer scientists) tend not to pay enough attention to. Professor António instilled us with core programming principles allowing us to be more elegant and efficient, increasing the scalability and readability of our code. I was particularly convinced by how much more efficient it is to use matrix functionalities instead of loops. A key takeaway from the course is therefore that a program that "runs" is not necessarily a good program.

By Joana Garcia, Economics and Research Department

Meet our researchers

In this issue we present two members of our research staff.

Sara Serra is an economist at the Economics and Research Department of Banco de Portugal since 2004, where she has worked mostly in the Portuguese economy analysis and forecasting unit. She holds a BA and a PhD from NOVA School of Business and Economics. Her research interests comprise econometrics, macroeconomics and the labour market.

Please, tell us about the research you are carrying on at DEE

My research has been targeted to improving and extending the set of tools available for forecasting and understanding the Portuguese economy. Recently I have worked on assessing the impact of uncertainty on the Portuguese economy, and currently I am working with Philips curves and their application to Portuguese data. Another line of research, more general, is related with labour market modelling, namely search and matching models. This research also includes an empirical analysis focused on Portugal and the segmentation of its labour market, and an application to a DSGE model of the Portuguese economy is a future project.

José R. Maria is an economist working at the Banco de Portugal since 1994. He started out by examining monetary, capital and foreign exchange movements, and gradually redirected his interests towards other topics, particularly after moving to the Economics and Research Department (DEE). Currently he is highly interested in Dynamic Stochastic General Equilibrium models. He had temporary assignments with other institutions, including with the European Central Bank. He holds a BA from Instituto Superior de Economia e Gestão.

Please, tell us about the research you are carrying on at DEE

My current agenda has several vectors. Please let me highlight three on them. An important research vector is to understand the Portuguese economy in the light of Dynamic Stochastic General Equilibrium models. This has required not only developing adequate structural features, but also worrying about estimation issues. The current challenge is to augment standard models with a rich financial sector, including banking frictions, alternative funding options, etc, and to improve our understanding of how financial and real variables interact.

Another important research vector is to create, estimate, and maintain proper semi-structural models, with unobserved components, where the main goal is to disentangle trends from cycles in output and labour markets. This requires an evaluation of several alternatives. Some models solely rely on adaptive expectations, others include forward-looking expectations; some ignore the constraints imposed by the participation in a monetary union, while others address this topic explicitly.

A third vector of my agenda is to continue on discussing international cross-country comparisons on a range of subjects, particularly across Member States of the euro area. The discussions include fiscal policy, labour market developments, structural reforms, or an evaluation of alternative modeling possibilities after the international financial crisis.

Finally, I must highlight the invaluable help of my co-authors. Throughout the years they converted research intentions into attainable objects.

Visiting fellows

Banco de Portugal offers cash grants to support research projects in the field of Economics, with a view to promoting inter-change between the scientific and academic communities and the Bank, and to contributing towards the improvement of theoretical and applied research in Portugal.

Applicants wishing to develop research projects in the Economics and Research Department must hold a Doctorate degree or be about to finalise their Doctorate degree. Preferred topics include monetary and labour economics, financial intermediation, banking, and studies on the Portuguese economy.

Application instructions are available. Applications are invited from all interested parties.

Further information may be obtained via email: conferences@bportugal.pt.

April 27 to May 11 Farzad Saidi • Stockholm School of Economics

Visiting Researchers

Edoardo Accabi • Harvard Business School

Andrea Alati • London School of Economics

Francesca Barbiero • European Central Bank

Inês Black • University Autònoma de Barcelona

Laura Blattner • Harvard Business School

Filipe Caires • Nova School of Business and Economics

Laura Coroneo • University of York

Luca Deidda • University of Sassari

Pedro Freitas • Nova School of Business and Economics

Filomena Garcia • Indiana University

Andrew Garin • Harvard Business School

Robert Hill • University of Graz

Artashes Karapeytan • Norwegian Business School

Chiara Maggi • Northwestern University

Paulo Santos Monteiro • University of York

Susana Peralta • Nova School of Business and Economics

Pedro Raposo • Católica Lisbon School of Business and Economics

Birgitte Ringstad • Nova School of Business and Economics

Alexandro Ruiz • CEMFI

João Pereira dos Santos • Nova School of Business and Economics

Consultants

Manuel Adelino • Duke University

Rui Albuquerque • Boston College

Miguel Gouveia • Católica Lisbon School of Business and Economics

Miguel Portela • University of Minho

Steven Ongena • University of Zurich and the Swiss Finance Institute

Upcoming events and announcements

Seminars 2018

Jun. 4 **Optimal Monetary Policy in Production Networks** • Jennifer La'O • Columbia University

6 **Interest Rates, Market Power, and Financial Stability** • David Martinez-Miera • Universidad Carlos III de Madrid

8 **Designing a Simple Loss Function for Central Banks: Does a Dual Mandate Make Sense?"** • Ricardo Nunes • Federal Reserve Bank of Boston

Jul. 23 **The Refinancing Channel and State Dependency in Monetary Policy** • Martin Eichenbaum • Northwestern University

Sep. 12 **The Origins of Firm Heterogeneity: A Production Network Approach** • Kalina Manova • University of Oxford

19 **To be annouced** • Sergio A. Correia • Board of Governors of the Federal Reserve System

26 **To be annouced** • Michael Koetter • Halle Institute for Economic Research

Conferences 2018

Jun. 22-23 **2nd Conference New Trends and Developments in Econometrics**

Correspondence to the editor

Luca David Opromolla
Economics and Research Department, Banco de Portugal
spillovers@bportugal.pt

This newsletter, as well as other online information about Economic Research at Banco de Portugal is available here.

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