SPILLOVERS

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Research in Economics at Banco de Portugal • Biannual • Year IV • Autumn 2016

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Overview

Let me use this pulpit and occasion to point out some of the challenges that economists, both academics and policymakers, face these days.

In the welcome address at the first ECB Annual Research Conference, in September 2016, President Mario Draghi said the following: "…We had little choice but to conduct both policy and research in real time. In many cases we were operating in largely unchartered waters. But the important point is that, in each case, we were able to design effective monetary policies to cope with an unprecedented series of shocks. And we did so based on the best insights that research could provide at the time. But if our internal analysis has inevitably moved ahead of academia during the crisis, we are now eager for academia to catch up. We depend on both internal and external research to help us evaluate what we have done, to scrutinise the various measures we have taken, to offer insights and analyses that equip us for the future. Good policymaking can only benefit from such scrutiny, and we welcome it. And looking forward, we depend on research to help us in other ways, too. Perhaps most salient today is the theme of the interactions between monetary policy and other policies – what I have elsewhere called 'independence in interdependence'"

The really challenging part is this 'interdependence'.

While it is probably fair to say that the pre-crisis stability and growth was to a large extent explained by the then new monetary design, things have markedly changed since then. The success of the stabilisation policy in normal times and the widespread feeling that the big hero was monetary policy were bolstered by the image of the central bank as an independent institution with a very concrete goal (low inflation), a very precise instrument (the short-term policy rate), and a policy rule with clear communication governing the decisions on this instrument. Credibility came as a by-product of this institutional arrangement and its apparent success.

We find ourselves in this post-crisis period with a legacy that, in addition to quite special economic and financial conditions, is also characterised by the continued use of new policy tools and new experiments. The monetary toolkit had clearly been reinforced and new unconventional monetary policies have been implemented; these are still in place in many developed economies. However, if we can say that monetary policymakers entered a new world, this was not accompanied by a similar move in the fiscal sphere. Moreover, it is difficult to say whether the return to the old normal of higher policy interest rates will be attained in the near future. The theoretical developments of the last two decades would suggest more ambition and originality in the use of fiscal instruments. This would not just give additional room of manoeuvre to tackle the ongoing prolonged recovery but, perhaps more importantly, would allow us do so in a more efficient way compared with the current policy mix. This is my understanding of the 'independence in interdependence' as quoted in President Draghi's speech.

It is true that this would require a stronger coordination across institutions compared to the pre-crisis period. But it is also the case that the continuation of unconventional monetary policy has mechanisms very similar to those of fiscal policy and stronger redistributional effects; this implies that such coordination may prove necessary anyway.

In this scenario, keeping the research agenda updated as well as a strong dialogue between policy and research is more important than ever. This should be kept in mind when we approach our planning for next year!

Isabel H. Correia

Head of the Economics
and Research Department (DEE)

Also in this issue

Links

Economists | Publications
Conferences | Seminars

In every issue, we ask an expert to briefly present and discuss two papers written by staff members. In this issue, the guest is Prof. Aurora Teixeira.

Aurora Teixeira is an Associate Professor—and the President—of the Department of Economics of FEP – Faculdade de Economia, University of Porto. She is also affiliated with CEF.UP, INESC TEC and OBEGEF. From 2007 to 2015, she collaborated with IC² Institute of the University of Texas Austin (US) in the UTEN (University Technology Enterprise Network) program.

Her research interests include economic growth, human capital, innovation, international trade, structural change, entrepreneurship, bibliometrics/ scientometrics, and academic ethics.

Aurora has published in academic journals such as: *Cambridge Journal of Economics, China Economic Review, Ecological Economics, European Planning Studies, Industrial and Corporate Change, Journal of Evolutionary Economics, Portuguese Economic Journal, Regional Studies, Research Policy, Review of Managerial Science, Scientometrics, Social Indicators Research*, and *Structural Change and Economic Dynamics*. She has also co-authored books on: Structural Change, Competitiveness and Industrial Policy; Multinationals, Clusters and Innovation; Corruption, Economic Growth and Globalization.

Aurora has a PhD in Technology and Policy Studies from SPRU – Science Policy Research Unit, University of Sussex (UK), a Master and a Diploma in Economics from University of Porto.

Featured published paper

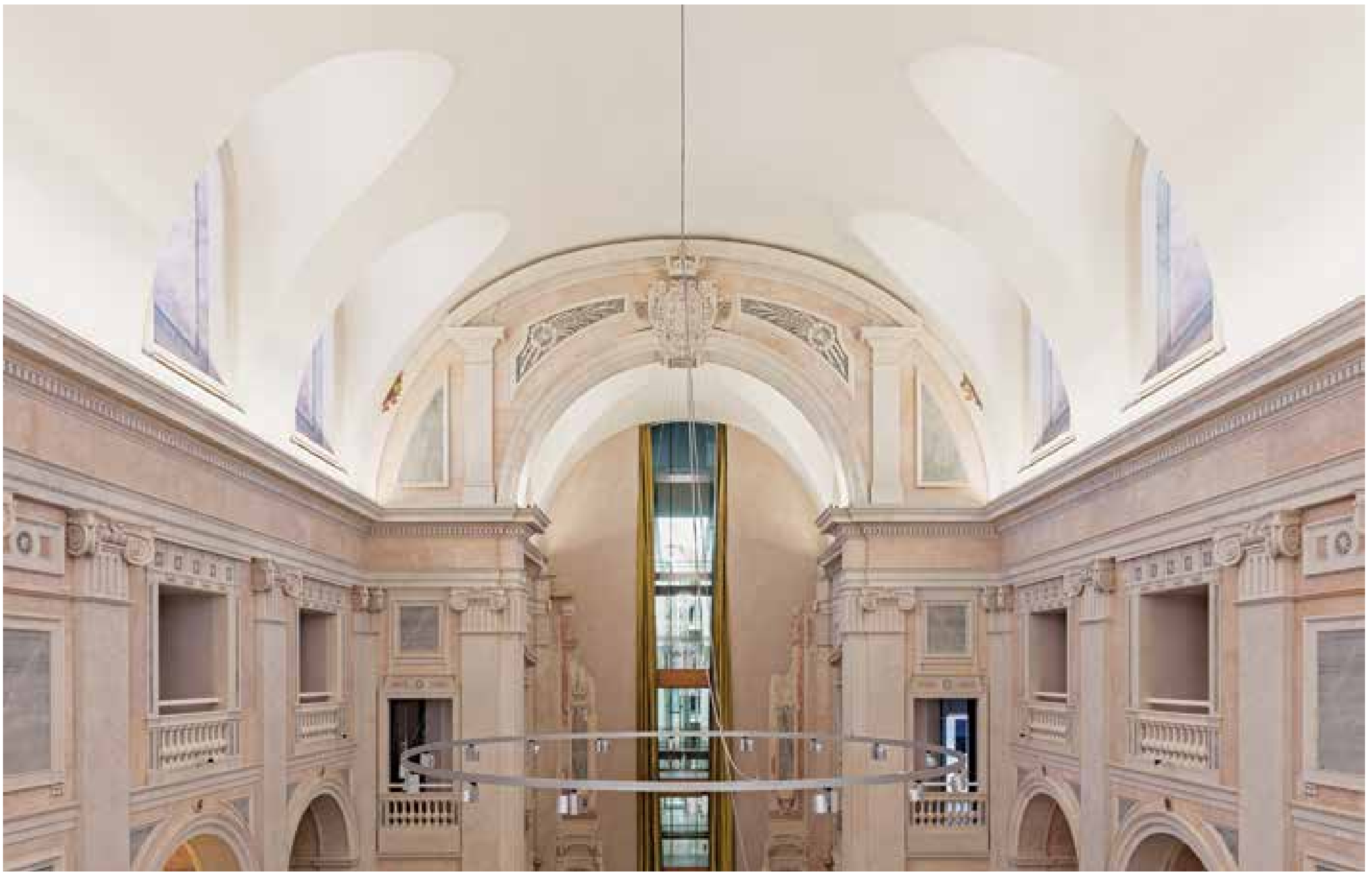
A review of Bobeica, E., Esteves, P. S., Rua, A. and Staehr, K. 2016. "Exports and domestic demand pressure: a dynamic panel data model for the euro area countries", *Review of World Economics*, Springer, Vol. 152, No. 1, 107-125.

The dynamics of a country's exports is of great concern for academic researchers, managers, and policy-makers for a wide variety of reasons: exports are a source of demand with beneficial impacts on countries' product and employment; they contribute for the improvement of the trade balance and alleviate external deficits; exports are associated with enhanced companies' organizational, technological and innovation capabilities, which, in turn, generate additional resources that boost the companies' survival and performance. In this context, a solid understanding of exports dynamics is in great demand.

Traditional determinants of exports dynamics include the external demand and price/cost competitiveness, with the latter being usually the focus of public policies. Other, less direct, but apparently rather significant, determinants have been overlooked. This is the case of internal/domestic demand. The relevance of domestic demand for exports dynamics has been particularly heightened with the advent of the economic and financial crisis.

The latest economic and financial crisis put a lot of pressure on the majority of European Union (EU) countries, in particular those where the related sovereign debt crises were most acute, forcing the implementation of public austerity plans which, in conjunction, induced strong declines in domestic demand. Facing negative shocks in internal/domestic market demand, companies reacted by entering and/or increasing their presence in external/foreign markets, despite the uncertainty and the noticeable costs such strategy entails. Taking the Portuguese situation as an example, in the period 2011-2013, which coincided with the implementation of troika's austerity measures, domestic demand collapsed (private and public consumption decreased, on average, more than 3% per year, whereas investment declined at a disturbing rate of 12.4% per year), which contrasted with the astonishing growth of exports (almost 6% per year, on average).

Addressing in a novel and rigorous way the potential substitution effect between domestic and external markets, Elena



Bobeica, Paulo Esteves, António Rua and Karsten Staehr, in their study "*Exports and domestic demand pressure: a dynamic panel data model for the euro area countries*", published in *Review of World Economics*, analyse, from a macroeconomic perspective and using quarterly data, the linkage between domestic demand pressures and the evolution of exports in eleven European Union countries over the period 1995-2013.

Two main results of the study are worth highlighting given the policy and managerial implications they convey. First, as the authors demonstrate, resorting to dynamic panel data estimations, there is definitely a substitution effect between domestic and external demand. In a nutshell, in times of sluggish domestic demand, exports are a powerful engine of economic growth – increased exports tend to compensate the downfall in internal demand. Second, the referred substitution effect is asymmetric, i.e., is much stronger in periods of recession, when domestic demand decreases, than in periods of expansion, when domestic demand upsurges. This means that the efforts to entering and/or increasing presence in the external market in times of crisis pay off in terms of economic growth and are likely to persist as the (negative) impact of the domestic demand on external demand in time of expansion is not significant.

Summing up, from a managerial point of view, the above mentioned results emphasize that companies' strategies involving business re-orientation and/or diversification towards the external markets constitute an effective channel that guarantees businesses survival. From a macro and policy perspective, it is proved that domestic demand dynamics play a dual role, not only through imports but also exports, in the adjustment of external imbalances.

Departing from the valuable contribution of the present study, a potential interesting and challenging research avenue would be to assess which type of government policies (e.g., fiscal incentives to exports; export finance supported line of credit; business intelligence support through export promotion agencies) is likely to enhance the asymmetric effect of domestic demand pressures.

Featured article from *Banco de Portugal Economic Studies*

Antunes, António R., Pedro Prego and Homero Gonçalves. 2016. "Firm Default Probabilities Revisited", *Banco de Portugal Economic Studies*, April.

Given the pervasive credit risk among corporations that emerged with the advent of the economic and financial crisis, the ability of statistical credit rating systems to improve decision-making in the financial sector have extensively attracted researchers and practitioners.

In this context, the study by António Antunes, Pedro Prego and Homero Gonçalves, "Firm Default Probabilities Revisited", is timely and useful. The authors propose and describe a method to assess the creditworthiness of the Portuguese non-financial companies, estimating the probability of a company to be in default towards the banking system, which constitutes a basis for the computation of a synthetic indicator ('credit rating') of a company's capability to honor its financial obligations.

For predicting the 'default event' (when a company "completes its third consecutive month" with "2.5 per cent or more of its total outstanding loans overdue"), and based on a multi-criteria system, the authors selected, from a pool of variables encompassing financial (e.g., leverage, profitability, liquidity, capital structure, dimension) and macro (e.g., GDP growth, total credit growth, aggregate corporate default rate) indicators, the variables to be included in the ten estimated Logit models (comprising two companies' size categories – micro vs. small, medium and large -, and 5 industries – manufacturing, mining and quarrying; construction and real estate activities; wholesale and retail trade and the primary sector; utilities, transport and storage; services).

The Logit models' estimates, referring to the period 2005-2014, convey that, excluding construction and real estate activities, the default ratio for micro companies is, on average, higher than that of small, medium and large companies group (ranging, respectively, from 4.32% to 5.17% and 3.17% to 3.96%). Construction and real estate activities present the highest default ratios, 5.54% for the micro companies and 6.62% for larger ones. Additionally, adopting a semiparametric approach, the authors estimated credit default rates by class of credit quality, industry and size. Three main results can be highlighted: 1) very few observations exist in the highest credit quality classes (less than 0.2 per cent, out of the 740 thousand firm-year observations); 2) about 45 per cent of the observations are concentrated in the lowest credit quality classes; 3) micro companies and companies operating in construction and real estate activities are over-represented in the lowest credit quality classes and have no presence in the highest credit quality classes.

Notwithstanding the rigor adopted and the detail presented in the description of the methods and models proposed, a discussion on alternative methods for predicting companies' default as well as a more solid argumentation on the variables to be included in the models are on demand. For instance, in addition to financial and macroeconomic indicators, corporate governance indicators (e.g., board structure, ownership structure) have been found to be an important type of variable for predicting businesses default. Moreover, the partition of companies into two size groups, 'micro' versus 'small, medium and large', lacks clarification, namely regarding the size criterion (e.g., employees, turnover) and the threshold used to separate the two groups. Finally, it would be informative to undertake a robustness exercise considering a more frequently used size categorization: 'micro'; 'small and medium'; 'large' companies.

Recently published

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

Mathematical and quantitative methods

Bobeica, E., Esteves, P. S., Rua, A. and Staehr, K. 2016. "Exports and domestic demand pressure: a dynamic panel data model for the euro area countries", *Review of World Economics*, Springer, Vol. 152, No. 1, 107-125.

Forthcoming

Duarte, C., P.M.M. Rodrigues and A. Rua. 2016. "A Mixed Frequency Approach to Forecast Private Consumption with ATM/POS Data", *International Journal of Forecasting*, Elsevier.

Carvalho, M. and Rua, A. 2016. "Real-time Nowcasting the US Output Gap: Singular Spectrum Analysis at Work", *International Journal of Forecasting*, Elsevier.

Microeconomics

Dias, D. A., Marques, C. R. and Richmond, C. 2016. "Misallocation and productivity in the lead up to the Eurozone crisis", *Journal of Macroeconomics, Elsevier*, Vol. 49, pp. 46-70.

Forthcoming

Amador, J. and Soares, A. C. 2016. "Markups and bargaining power in tradable and non-tradable sectors", *Empirical Economics*, Springer.

International economics

João Amador and Sónia Cabral. 2016. "Global Value Chains: A Survey of Drivers and Measures". *Journal of Economic Surveys*, USA: John Wiley & Sons Ltd, Vol. 30, No. 2, pp. 278-301.

Financial economics

Panetti, E. 2016. "Market Participation in a Two-Sector Diamond-Dybvig Economy". *Studies in Economics and Finance*.

Karmakar, S., 2016. "Macroprudential Regulation and Macroeconomic Activity", *Journal of Financial Stability*, Volume 25, pp. 166-178.

Labor and demographic economics

Cardoso, Ana Rute, Paulo Guimarães and Pedro Portugal. 2016. "What Drives the Gender Wage Gap? A Look at the Role of Firm and Job-Title Heterogeneity", *Oxford Economic Papers*, Oxford: Oxford Journals: Volume 68, Issue 2, pp. 506-524.

Forthcoming

Addison,John T., Pedro Portugal and Hugo Vilares. 2016. "Unions and Collective Bargaining in the Wake of the Great Recession: Evidence from Portugal", *British Journal of Industrial Relations*.

Economic development, innovation, technological change, and growth

Andraz, J. and P.M.M. Rodrigues. 2016. "Monitoring tourism flows and destination management: Empirical evidence for Portugal", *Tourism Management*, Vol. 56, pp.1-7.

Urban, rural, regional, real estate, and transportation economics

Romão, J., J. Guerreiro and P.M.M. Rodrigues. 2016. "Tourism growth and regional resilience: The "beach disease" and the consequences of the global crisis of 2007", *Tourism Economics*, Vol. 22(4), pp. 699-714.

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Mathematical and quantitative methods

A Wavelet-Based Multivariate Multiscale Approach for Forecasting • António Rua – BP WP 12/2016

In an increasingly data rich environment, factor models have become the workhorse approach for modelling and forecasting purposes. However, factors are non-observable and have to be estimated. In particular, the space spanned by the unknown factors is typically estimated via principal components. Herein, it is proposed a novel procedure to estimate the factor space resorting to a wavelet based multiscale principal component analysis. Through a Monte Carlo simulation study, it is shown that such an approach allows to improve both factor model estimation and forecasting performance. In the empirical application, one illustrates its usefulness for forecasting GDP growth and inflation in the United States.

Forecasting Banking Crises with Dynamic Panel Probit Models • António R. Antunes • Diana Bonfim • Nuno Monteiro • Paulo M.M. Rodrigues – BP WP 13/2016

Banking crises are rare events, but when they occur their consequences are often dramatic. The aim of this paper is to contribute to the toolkit of early warning models available to policy makers by exploring the dynamics and non-linearities embedded in a panel dataset covering several countries over four decades (from 1970Q1 to 2010Q4). The in-sample and out-of-sample forecast performance of several dynamic probit models is evaluated, with the objective of developing a common vulnerability indicator with early warning properties. The results obtained show that adding dynamic components and exuberance indicators to the models substantially improves the ability to forecast banking crises.

Microeconomics

A Tale of Two Sectors: Why is Misallocation Higher in Services than in Manufacturing? • Daniel Dias • Carlos Robalo Marques • Christine Richmond – BP WP 14/2016

Recent empirical studies document that the level of resource misallocation in the service sector is signicantly higher than in the manufacturing sector. We quantify the importance of this difference and study its sources. Conservative estimates for Portugal (2008) show that closing this gap, by reducing misallocation in the service sector to manufacturing levels, would boost aggregate gross output by around 12 percent and aggregate value added by around 31 percent. Differences in the effect and size of productivity shocks explain most of the gap in misallocation between manufacturing and services, while the remainder is explained by differences in firm productivity and age distribution. We interpret these results as stemming mainly from higher output-price rigidity, higher labor adjustment costs and higher informality in the service sector.

Macroeconomics and monetary economics

EAGLE-FLI – A Macroeconomic Model of Banking and Financial Interdependence in the Euro Area • N. Bokan • A. Gerali • Sandra Gomes • P. Jacquinot • P. Pisani – BP WP 10/2016

We incorporate financial linkages in EAGLE, a New Keynesian multi-country dynamic general equilibrium model of the euro area (EA) by including financial frictions and country-specific banking sectors. In this new version of the model, termed EAGLE-FLI (Euro Area and GLobal Economy with Financial LInkages), banks collect deposits from domestic households and cross-country interbank market and raise capital to finance loans issued to domestic households and firms. In order to borrow from local (regional) banks, households use domestic real estate as collateral whereas firms use both domestic real estate and physical capital. These features – together with the full characterization of trade balance and real exchange rate dynamics and with a rich array of financial shocks – allow to properly assess domestic and cross-country macroeconomic effects of financial shocks. Our results support the views that (1) the business cycles in the EA can be driven not only by real shocks, but also by financial shocks, (2) the financial sector could amplify the transmission of (real) shocks, and (3) the financial/banking shocks and the banking sectors can be sources of business cycle asymmetries and spillovers across countries in a monetary union.

Labor and Demographic Economics

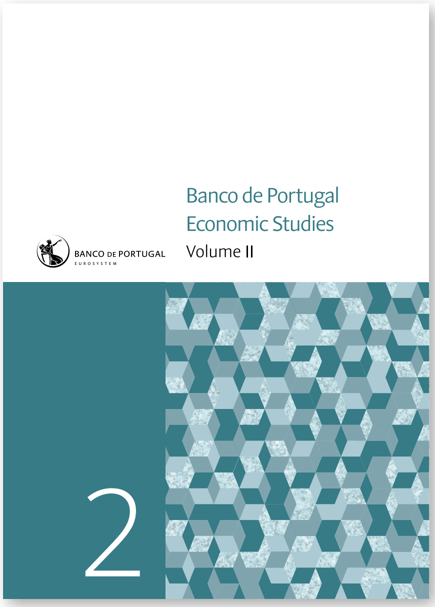
Temporary Contracts' Transitions: the Role of Training and Institutions • Sara Serra – BP WP 11/2016

Despite recent reforms, labour market segmentation is still a marked feature of several European countries. This work empirically analyses transitions out of temporary contracts, by means of a discrete duration model, with a particular focus on human capital features, labour market protection and their interaction. Transitions to open-ended contracts with the same or with a new employer are considered separately, as well as transitions to joblessness, based on data for ten European countries taken from the European Community Household Panel. Conclusions suggest that firm training policies are more relevant for intra-firm transitions, while worker characteristics are more determinant for inter-firm transitions. Labour market regulation plays a signicant role in what concerns transitions to open-ended contracts, but not to joblessness, particularly in strongly segmented labour markets. In countries characterized by this type of labour market institutions, human capital features assume an increased relevance, and firm provided training may reduce the influence of the strictness of labour market regulations on the conversion of temporary contracts into open-ended.

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.

Banco de Portugal Economic Studies, April 2016



How can the Phillips curve be used for today's policy? • Pedro Teles • Joana Garcia

Simple observation seems to suggest a downward shift of the Phillips curve to low levels of inflation for countries such as the US, Germany, France and Japan. A cloud of inflation-unemployment data points can be read as a family of short run negatively sloped Phillips curves intersecting a vertical long run Phillips curve. How can the evidence on these families of Phillips curves be used for policy? How can it be used to induce higher inflation in today's low inflation context?

Firm default probabilities revisited • António R. Antunes • Pedro Prego • Homero Gonçalves

This article describes a tool to assess the creditworthiness of the Portuguese non-financial firms. In its design, the main goal is to find factors explaining the probability that any given firm will have a significant default episode vis-à-vis the banking system during the following year. Using information from the central credit register for period 2002--2015 and a comprehensive balance sheet data set for period 2005--2014, we develop a method to select explanatory variables and then estimate binary response models for ten strata of firms, defined in terms of size and sector of activity. We use this methodology for the classification of firms in terms of one-year probability of default consistent with typical values of existing credit rating systems, in particular the one used within the Eurosystem. We provide a brief characterisation of the Portuguese non-financial sector in terms of probabilities of default and transition between credit rating classes.

The sources of the gender wage gap • Ana Rute Cardoso • Paulo Guimarães • Pedro Portugal • Pedro S. Raposo

In Portugal, over the last two decades, the proportion of women among employed workers increased from 35 to 45 percent. This evolution was accompanied by a sharp fall in the gender wage gap from 32 to 20 percent. The improvement in the wage outcome of the women, however, is fully accounted by the catching up of their skills in comparison to males, after two decades of human capital investments. By 2013 women already possess observable characteristics that enhance productivity identical to their male counterparts. This means that gender discrimination remained roughly constant over the 1991-2013 period. In this study, we investigate the sources of the wage gender gap and conclude that sorting among firms and job-titles can explain about two fifths of the wage gender gap.

Banco de Portugal Economic Studies, July 2016

A Bottom-Up approach for forecasting GDP in a data rich environment • Francisco Dias • Maximiano Pinheiro • António Rua

In an increasingly data-rich environment, the use of factor models for forecasting purposes has gained prominence in the literature and among practitioners. In this article, we extend the work of Dias, Pinheiro and Rua (2015) by assessing the forecasting behaviour of factor models to predict several GDP components and investigate the performance of a bottom-up approach to forecast Portuguese GDP growth. We find supporting evidence of the usefulness of factor models and noteworthy forecasting gains when conducting a bottom-up approach drawing on the main aggregates of GDP

Portugal: trends, cycles, and instability in output and unemployment over 2008-2012 • José R. Maria

This article presents a trend-cycle decomposition of Portuguese Gross Domestic Product and unemployment over 2008–2012. Results show that product and labour markets were primarily marked by low frequency movements in the trend component, and less so by cyclical factors. Economic policy should therefore not neglect the structural properties of these markets, resting solely centered around standard business cycle objectives. Okun's law—the negative correlation between the output and unemployment gaps—remained empirically relevant, but not without noteworthy trend instability. All results are based on a semi-structural model with rational expectations, tailored for a small economy integrated in a credible monetary union.

Bank runs: theories and policy applications • Ettore Panetti

In the present paper, I review the foundations of bank runs, and of the incentives of the economic agents to join them, as a base for discussing possible regulatory interventions to alleviate their effects. To this end, I study both self-fulfilling as well as fundamental runs, and propose a reconciliation of the two approaches, via the introduction of "global games". My policy conclusions highlight the role of competition and liquidity requirements to tame self-fulfilling runs. Moreover, market incompleteness and the increasing complexity of modern financial systems justify the imposition of liquidity requirements, in the presence of systemic aggregate liquidity risk.

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.

March 29th | 2016

The Long-term Effects of Conditional Cash Transfers on Child Labor and School Enrollment

Pedro Cavalcanti Ferreira • Fundação Getulio Vargas

April 11th | 2016

Unemployment Fluctuations, Match Quality and the Wage Cyclicality of New Hires

Antonella Trigari • Università Bocconi

April 18th | 2016

Testing Cointegration in Large VARs

Alexey Onatskiy • University of Cambridge

April 21st | 2016

World Economic Outlook Chapter on the Macroeconomic Effects of Product and Labor Market Reforms in Advanced Economies

Romain Alexandre Duval • Davide Furceri • Internacional Monetary Fund

May 2nd | 2016

Time-Consistent Institutional Design

Martin Ellison • University of Oxford

May 4th | 2016

The Role of Human Capital in Shaping Immigrants' Earnings

Rodolfo Manuelli • Washington University St. Louis

May 9th | 2016

Intangible Capital and Measured Productivity

Ellen McGrattan • University of Minnesota

May 30th | 2016

Using Elasticities to Derive Optimal Bankruptcy Exemptions

Eduardo Dávila • New York University

June 6th | 2016

Supervisory Incentives in a Banking Union

Elena Carletti • Università Bocconi

June 14th | 2016

Liquidity Traps and Monetary Policy: Managing a Credit Crunch

Juan Pablo Nicolini • Federal Reserve Bank of Minneapolis

June 27th | 2016

Coordinating Business Cycles

Edouard Schaal • New York University

July 8th | 2016

Accounting for Mathematics Performance of High School Students in Mexico: Estimating a Coordination Game in the Classroom

Petra E. Todd • University of Pennsylvania

July 11th | 2016

Estimating Group Effects Using Averages of Observables to Control for Sorting on Unobservables: School and Neighborhood Effects

Joseph G. Altonji • Yale University

July 20th | 2016

Trade, Relative Prices, and the Canadian Great Depression

Pedro Amaral • Federal Reserve Bank of Cleveland

September 19th | 2016

Currency Wars or Efficient Spillovers? A General Theory of International Policy Cooperation

Anton Korinek • Johns Hopkins University

September 20th | 2016

Quantitative Easing in Joseph's Egypt with Keynesian Producers

Jeffrey R. Campbell • Federal Reserve Bank of Chicago

September 29th | 2016

Features and experiences of using the DSGE model (Aino 2.0) in policy simulations and forecasting at the Bank of Finland

Juha Kilponen • Bank of Finland

Courses

March 21st/24th | 2016

Lectures in Theoretical Banking

Anjan Thakor • Washington University in St. Louis

Banco de Portugal organized the course, "Lectures in Theoretical Banking", by Prof. Anjan Thakor, between 21st and 24th of March 2016. The principal objective of the course was to introduce the literature on theoretical banking with special focus on topics such as reasons for existence of financial intermediaries, deposit contracts and bank liquidity creation, role of bank capital, and financial crises.

The course commenced by asking the fundamental question, why do banks exist? The most common explanation is that banks reduce transaction costs in the economy by bringing together savers and investors. However, there is much more than what meets the eye. Ramakrishnan & Thakor (1984) shows that financial intermediaries can improve social welfare if informational asymmetries are present. Bhattacharya & Thakor (1993) concretizes this result and addresses a number of other pertinent questions related to credit allocation/rationing. It states that banks can increase the amount and quality of aggregate investment by monitoring. It however can ration credit if borrowers can make undetectable choice of assets. Use of collateral and loan commitment agreements can help ameliorate the situation. Next, Diamond (1984) emphasizes the role of banks in minimizing the cost of monitoring which is useful in solving incentive problems between borrowers and lenders. The paper shows that diversification within an intermediary can help reduce such costs, even in a risk neutral setup. Lastly, Coval & Thakor (2005) presents a model where differences in opinions may suffice to give rise to financial intermediation. In this model, banks arise endogenously to act as a "beliefs bridge" between optimistic and pessimistic agents.

The next topic focused on, arguably, the most important role of banks i.e. deposit contracting and liquidity creation. The seminal work of Diamond and Dybvig (1983) was the first to be discussed. This paper shows that liquidity providing deposit contracts can lead to multiple equilibria – one of which is a bank run. Such an equilibrium causes real economic damage. The paper discusses contracts that can prevent such runs and also studies conditions under which government intervention can lead to superior contracts. The next couple of papers highlighted the role of demand deposits in banking. Jacklin studies the role of demand deposits in risk sharing and shows that demand deposits coupled with restricted trading can provide greater risk sharing than free equity trading. However, the removal of trading restrictions makes deposits lose this advantage over equity as they provide similar risk sharing outcomes. Calomiris & Kahn (1991) highlights that demand deposits provide incentive compatible intermediation. The fact that depositors can force liquidation prevents the bank managers from acting against the interests of the uninformed depositors.

The next topic of discussion was the process of liquidity creation by banks. Donaldson et. al. (2015) studies a model of warehouse banking and shows how banks create liquidity by issuing loans and in the process create demandable deposits. It rationalizes the existence of banks even in an environment without risk or asymmetric information. Diamond & Rajan (2001) highlights that fragility in the banking system is essential for creating liquidity. The possibility of depositors running on a bank makes the banker use her human capital in collecting loans and thereby creating liquidity.

After having studied the need for banks and their most important functions, we moved on to study the recent financial crisis. Thakor (2015) discusses the pre-crisis scenario, the crisis triggers, the main events, the real effects of the crisis, and the policy responses. Thakor (2012) develops a model of incentives of financial innovation and financial crisis. The paper shows that new financial instruments may have higher returns but there may also be sufficient ambiguity over their returns. This uncertainty about project quality can lead investors to withdraw funding at an interim stage and cause a financial crisis. Next, Thakor (2015) presents a model based on the "availability heuristic". This paper argues that following a sequence of favorable events, the agents' beliefs about the bankers' ability to manage risks are excessively biased upwards. This leads to banks underestimating the true risk and the market size of high-risk products become disproportionately large. As a result, when the agents learn about the true risk in the system, liquidity dries up rapidly and a financial crisis ensues. Gennailoli et. al. (2015) also provides an explanation for the cause of the financial crisis based on financial innovation and neglected risks. The core message is that new financial instruments are created by neglecting the true underlying risks and when investors become aware of the risks, the flight to safety triggers a financial crisis, owing to the sheer size of the market. Finally, Allen & Gale (2000) develops a model of financial contagion among banks located in different regions and having liquid claims on each other. A small liquidity preference shock in one region can spread by contagion to the whole economy, especially if interbank claims structures are incomplete.

The last section of the course focused on the role of bank capital and financial stability. Mehran & Thakor (2011) develops a dynamic model of bank capital structures. They show that total bank value and equity capital are positively correlated in the cross section. The paper also tests this prediction empirically by using data on acquisitions. Holmstrom & Tirole (1997) was the next paper to be discussed. This seminal work essentially shows how the distribution of capital across differently informed firms, intermediaries and investors can affect investment, interest rates, and the intensity of monitoring. Thakor (2014) presents an extensive review on the research that analyzes whether higher bank capital is associated with greater financial stability. This paper essentially highlights the debate, in the theoretical literature, on the desirability of raising capital requirements to enhance bank stability, and also suggests avenues for future research. The last paper to be discussed was Song & Thakor (2015) which develops a model of bank culture. This paper highlights the fact that the choice of growth vs. safety is a fundamental choice that shapes all bank activities and strategies.

The course, despite being theoretical, was replete with ideas for empirical research, thereby offering food for thought for theorists and empiricists alike. It was definitely a great learning experience for me.

By Sudipto Karmakar

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May 30th/June 2nd | 2016

Open Economy Macroeconomics

Stephanie Schmitt-Grohé • Columbia University

Between May 30th and June 2nd the Economics and Research Department of Banco de Portugal organized a course on "Open Economy Macroeconomics", lectured by Professor Stephanie Schmitt-Grohé, from Columbia University. The course delved into some hot topics that have become increasingly important in recent years, mostly related with business cycle amplification.

Stephanie started by arguing that financial frictions do not trigger important amplification effects in business cycle fluctuations, a result which contrasts with a general view in the literature. The key point of the argument is that individuals have incentives to build precautionary savings that keeps them away from hitting the collateral constraint, since such outcome is extremely painful. Hence, an amplification of business cycle fluctuations can only occur in largely indebted economies facing an extremely severe slump capable of triggering a dynamics that leads the collateral constraint to actually bind. Numerical simulations suggest that such event rarely occurs. In a context of multiple equilibria, an amplification effect may result alternatively from a self-fulfilling prophecy wherein pessimistic agents, behaving accordingly, drive the value of the collateral down and force the collateral constraint to bind. Such equilibrium triggers a contraction in aggregate demand, Fisherian deflation, and a fire sale, coexisting with an alternative equilibrium in which the collateral constraint is not binding and therefore no amplification effect takes place.

Stephanie then showed that nominal rigidities are also able to trigger powerful amplification effects in business cycle fluctuations in open economies with currency pegs. The argument is simple. A boom-bust cycle leads to nominal wage growth and real appreciation during the boom phase, but to involuntary unemployment and insufficient real depreciation during the bust phase. Intuitively, when nominal wages are downwardly rigid and the exchange rate is fixed, the real wage fails to fall following a decline in labour demand, causing persistent involuntary unemployment. A similar result holds under nominal price rigidity: in this case the economy will suffer from unemployment due to weak demand.

Though agents understand the nature of these mechanisms, they are too small to internalize the fact that individual expenditure decisions cause large inefficiencies at the aggregate level. Hence, the course naturally moved on towards welfare improving government intervention. Though a Pigouvian type tax/subsidy does the job at achieving the first best allocation, Stephanie focused on another type of policy instrument, viz capital controls. These are very attractive from a policy-making point of view, since they can be implemented under the umbrella of financial stability regulations and first-best fiscal instruments are not always available to policy makers. Capital controls are a second-best instrument: they are prudential and able to reduce unemployment, at the cost of distorting the intertemporal allocation of consumption. Intuitively, a capital control policy stabilizes the absorption of tradable goods over the cycle and thus unemployment, but alters the privately perceived after-tax interest rate. Nevertheless, evidence suggests that policy-makers rarely change capital controls over the business cycle.

Another topic covered in the course was sovereign default.

My opinion is that the audience benefited a great deal from the course, as it addressed some hotly debated issues among economists. I found particularly interesting the topic on nominal rigidities and business cycle amplification, important in the aftermath of the financial crisis and the sovereign debt crisis in Europe. As a suggestion, possibly for a future follow-up course, I would be interested in exploring business cycle amplifications driven by balance sheet channels and not solely by collateralized borrowing.

By Paulo Júlio

Conferences

June 3rd/4th | 2016

New Trends and Developments in Econometrics

The complex environment in which banks nowadays operate, the complexity of financial instruments, the functioning of markets and institutions, and the important challenges central banks have to face require adequate analytical tools for analysis. To contribute to this discussion the Banco de Portugal organized its 3rd conference in Econometrics, which focused on New Trends and Developments in Econometrics, and which was held in Lisbon, on June 3-4, 2016. This conference provided an

important forum of discussion of new developments and assessment of econometric methods for use in banking, empirical finance, macro and microeconomics, with special emphasis on problems of modelling and prediction.

A large number of very interesting papers was submitted to the conference, of which the Scientific Committee for the Conference composed by Matei Demetrescu (University of Kiel), Jesús Gonzalo (Universidad Carlos III), Paulo Guimarães (Banco de Portugal), Michele Lenza (ECB), Anders Rahbeck (University of Coppenhagen), Paulo M. M. Rodrigues (Banco de Portugal), António Rua (Banco de Portugal) and João Santos Silva (University of Surrey), selected the ones to be included in the conference program.

The invited keynote speakers were Uwe Hassler (Goethe University Frankfurt), Rustam Ibragimov (Imperial College London), Helmut Lutkepohl (DIW Berlin and Freie Universitaet Berlin), Tassos Magdalinos (University of Southampton) and A.M. Robert Taylor (Essex Business School, University of Essex), all renown internationally for their important contributions to the field.

The relevance of the topic brought together 46 participants from Europe (Germany, UK, Italy, Luxemburg, Portugal and Spain) and the US, covering a variety of topics such as: new panel data methods, new results factor and dynamic factor models, structural vector autoregressions with smooth transition in variances to understand the interaction between U.S. monetary policy and the stock market, VARs and the empirical validation of DSGE models, the importance of fat tails and copulas in the context of portfolio diversification, persistence dependence in empirical relations e.g. the velocity of money and the usefulness of moment inequalities for testing for optimal monetary policy. Overall, a very successful and fruitful event for researchers and economists.

By Paulo M.M. Rodrigues

Hassler, U. *"Ratio Tests under Limiting Normality"*.

Ibragimov, R. *"Fat tails and copulas: Limits of diversification revisited"*.

Luetkepohl, H. *"Structural Vector Autoregressions with Smooth Transition in Variances: The Interaction Between U.S. Monetary Policy and the Stock Market"*.

Magdalinos, T. *"Robust Econometric Inference in Systems of Cointegration and Predictive Regressions"*.

Taylor, A.M.R. *"Testing for Co-integration Rank in Heteroskedsastic VAR Models in the presence of possible Trend Breaks"*.

Meet our researchers

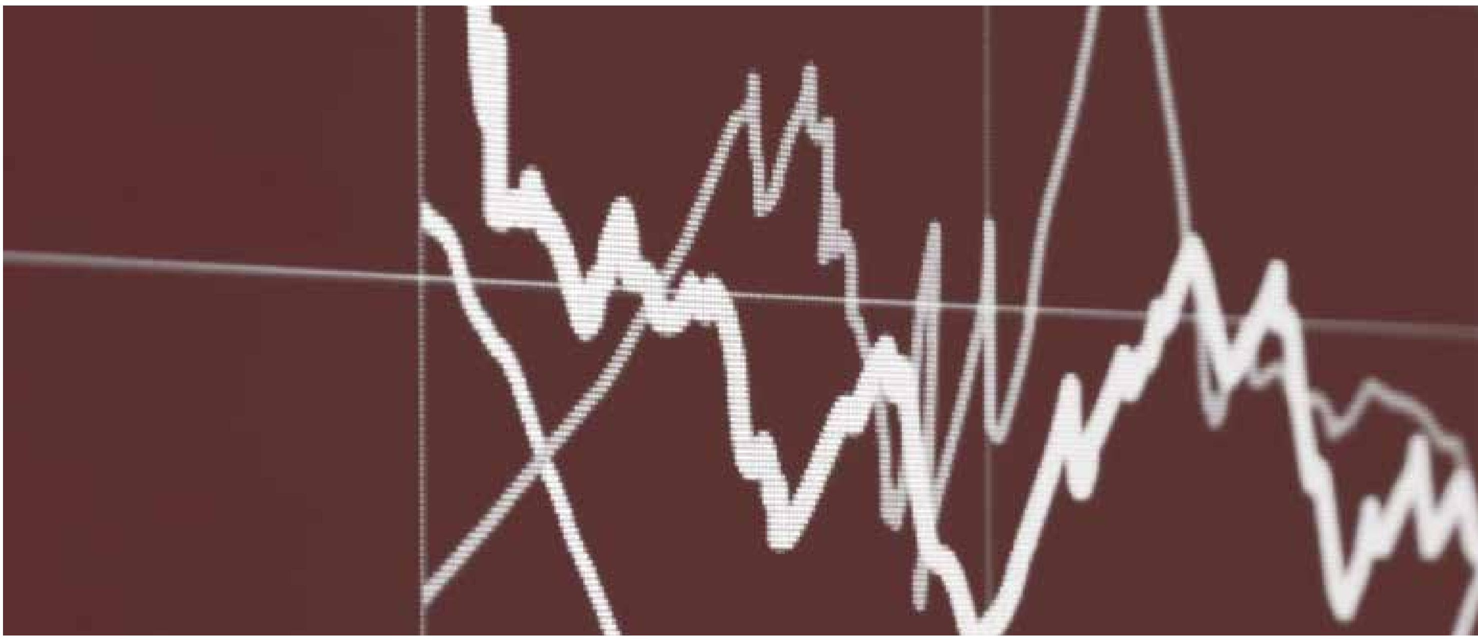
In this issue we present two members of our research staff.

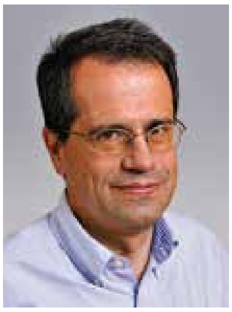
João Amador has been working at the Economics and Research Department of Banco de Portugal since 2001. He holds a degree and a PhD in Economics from Nova School of Business and Economics, where he is Invited Assistant Professor.

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

In the recent years my research has focused primarily on international trade, with a focus on global value chains. This strand of research, where it is key to explicitly consider input-output linkages, has been evolving in theoretical and empirical terms, notably with the utilization of firm and transaction-level data, as well as tools of network theory. Indeed, the awareness that input-output linkages are the driver for the propagation of shocks with an impact at the aggregate level is pushing for a revision in macro models. In addition, I have conducted research in empirical industrial organization, notably in terms of markups and productivity issues for Portugal. Furthermore, in the interface with financial issues, I have looked at the identification and impact of bank shocks in firm-level decisions. Moreover, I am interested on the macroeconomic developments of the Portuguese economy and have looked at its growth accounting in a stochastic frontier setup. Finally, I am interested on public finance issues, notably in what regards fiscal policy in monetary unions.

At present, I have coordination and external representation duties in the department, as well as participation in the reporting of developments for the Portuguese economy, mostly in its structural dimensions. Therefore, I am left with very limited time to pursue my research agenda. Nevertheless, the symbiotic combination of policy work and research has always been an indelible trait of the Economics and Research Department of Banco de Portugal.





Bernardino Adão is an economist at the Economics Research Department of Banco de Portugal since 1995. At the Bank he has worked in the Financial Intermediation and in the Monetary Policy Divisions. Simultaneously, he has taught various courses in economics at Instituto Superior de Economia e Gestão, Instituto Superior Técnico and Universidade Católica de Lisboa. He holds a Licenciatura in Economics from Universidade Nova de Lisboa and a PhD in Economics from University of Minnesota in Minneapolis, USA.

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

My areas of expertise are macroeconomics and finance. I started in the Financial Intermediation Division of DEE, where I did applied work with co-authors. Various were the topics covered, among others I did work on the Treasury bill market in Portugal, the Portuguese yield curve, on the estimation of the ex-ante real interest rates for Portugal, extracting information from options premia, and the escudo exchange markets. In the last fifteen years I have been in the Monetary Policy Division and the focus of my research has shifted towards monetary economics. Together with Isabel Correia and Pedro Teles, I have investigated the properties of monetary policy rules and studied optimal stabilization policy. In the last four years I have been working with André Silva, from Universidade Nova de Lisboa, in a new project. In this project we study the role of monetary policy in a model where non-neutralities of money arise because of endogenous market segmentation. This segmentation arises because there is a cost of trading in the financial markets. Agents trade bonds for money infrequently because there is a cost to transfer money from the asset market, where agents trade bonds for money, to the goods market, where agents trade goods. Market segmentation implies that the number of agents that participate in the open market operations changes with the economic conditions, in particular with the interest rate. We obtain a slow response of prices and money, and a decrease in the quantity of money after interest rate shocks. These shocks are modelled as unexpected increases in the nominal interest rate and the results are in line with the quantitative estimates in the literature.

Visiting Fellows

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

Filomena Garcia is an Assistant Professor in the Department of Economic of Indiana University, and an Assistant Professor with tenure (on leave) at ISEG (School of Economics and Management) of the University of Lisbon. She earned her PhD in Economics from Université Catholique de Louvain (Belgium) – Center of Operations Research and Econometrics (CORE) with a thesis on network effects and strategic complementarities. She has a Master of Philosophy in Economics from the University of York and a Master of Science in Economics and Finance from Universitat Pompeu Fabra (Barcelona), on top of a BA in Economics from Universidade Nova de Lisboa. Her fields of interest are Industrial Organization, Game Theory, Matching, Networks, and Banking. Her work has been published in the *Journal of Economic Theory*, *Economic Theory*, the *B.E. Journal of Theoretical Economics*, the *Journal of Economics and Management and Strategy*, *Economics Letters*, the *Manchester School*, the *International Journal of Economic Theory*, and the *Review of Network Economics*, among others. Filomena was a visiting scholar at Harvard University, and is the founder of the UECE Lisbon Meetings in Game Theory and Applications.

Filomena's collaboration with Banco de Portugal during the past summer was focused on three main topics: the role of heterogeneity in the establishment of a deposit insurance scheme, the propagation of productivity shocks, and the innovative contracts that are established by firms and banks for financing of R&D activities. Regarding the first topic, Filomena collaborated with E. Panetti and is currently writing a research paper titled "Optimal deposit insurance with heterogeneous depositors". In this paper, depositors realistically assumed as heterogeneous have complementarities in their actions: upon the presence of a financial shock, if all depositors decide to withdraw their money, then it is optimal for an individual depositor to also withdraw, and vice versa. It is clear that such behavior exacerbates financial shocks and generates fully-fledged crises. We solve for the banking contract and optimal deposit insurance, and compare different financing schemes (for example, country-specific versus one-size-fits-all) in search for the policy intervention that minimizes the endogenous probability of a run and maximizes global welfare and financial stability.

This project finds its motivation in the recent debate on the introduction of a common deposit insurance scheme in the European Union (EU).

Regarding the second topic, Filomena has been working on the paper "Inter-sectoral propagation of productivity shocks: The role of credit and input markets" (with L.D. Opromolla and S. Karmakar), in which they explore the linkages between the real and the financial sides of the economy. This paper studies how a productivity shock in a non-financial sector propagates to the other sectors of the economy through the market for credit and through the market for intermediate inputs."

Finally, Filomena collaborated with L.D. Opromolla on the research paper titled "Patents as collateral – start-up financing of R&D".They have determined the optimal contracts offered by venture capitalists or banks to start-ups who have no collateral to offer, but have the possibility of patenting innovation in a mid-project step. This paper is still work-in-progress but some preliminary results point towards a diffusion of early patenting that actually may be deterrent for the actual development of the innovation.

Visitors

Doug Woodward • University of South Carolina, USA

Arne Nagengast • Deutsche Bundesbank

Marina Spaliara • Glasgow University

Serafeim Tsoukas • Glasgow University

Hans Degryse • KU Leuven

Beatriz Mariano • Cass Business School

Steven Ongena • University of Zurich

Manuel Adelino • Duke University

Laura Blattner • Harvard University

Andrew Garin • Harvard University

John Caglianese • Harvard University

Upcoming events and announcements

Seminars

October 20th | 2016
Sovereign Debt and Structural Reforms
Fabrizio Zilibotti • University of Zurich

October 31st | 2016
Do Central Banks Face a Positive-profit Constraint?
Martin Schmalz • University of Michigan

November 7th | 2016
Migrant Wages, Human Capital Accumulation and Return Migration
Jérôme Adda • Università Bocconi

November 9th | 2016
On the Persistence of Monetary Trading: Memory is Money
Guilherme Carmona • University of Surrey

November 21st | 2016
to be announced
Jesús Gonzalo • Universidad Carlos III de Madrid

November 22nd | 2016
Fiscal Multipliers and Financial Crises
Miguel Faria-e-Castro • New York University

December 14th | 2016
to be announced
Gauti B. Eggertsson • Brown University

December 19th | 2016
to be announced
Sara Moreira • University of Chicago

March 7th | 2017
Diagnostic Expectations and Credit Cycles
Nicola Gennaioli • Università Bocconi

Conferences

November 21st | 2016

8th Banco de Portugal's Conference on "Desenvolvimento Económico Português no Espaço Europeu"

9:00 | Opening address
Carlos da Silva Costa, Banco de Portugal, Governor

9:45 | **Keynote Lecture:** How to fix the Eurozone?
Francesco Giavazzi, IGIER, Università Bocconi and CEPR

10:45 | Coffee break

11:15 | **Panel:** The processo of European integration: view from Portugal
Chair: Helena Garrido, journalist
Carlos da Silva Costa, Banco de Portugal, Governor
António Barreto, Instituto de Ciências Sociais
António Vitorino, Notre Europe, President

12:15 | Q&A

13:00 | Lunch

14:00 | **Studies on the Portuguese Economy I**
Chair: Pedro Pita Barros, Nova SBE

| The Effect of Bank Shocks on Firm-Level and Aggregate Investment
João Amador, Banco de Portugal
Arne J. Nagengast

| Productivity and Organization in Portuguese Firms
Luca D. Opromolla, Banco de Portugal
Lorenzo Caliendo, Giordano Mion and Esteban Rossi-Hansberg

| Wage Inequality
Pedro Portugal, Banco de Portugal

15:45 | Coffee break

16:15 | **Studies on the Portuguese Economy II**
Chair: Rui Albuquerque, Boston College Carroll School of Management

Partnership

Partnership: Pedro Magalhães, Fundação Francisco Manuel dos Santos
The best master thesis on the portuguese economy

17:45 | Closing remarks
Pedro Duarte Neves, Banco de Portugal, Vice-Governor

Participation is free of charge. Participants are requested to register (on a first come, first served basis) to http://www.bportugal.pt/en-US/EstudosEconomicos/Conferencias/Pages/2016DesenvolvimentoEconomicoPortugues.aspx

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

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