SPILLOVERS

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Overview

Research at Banco de Portugal is characterized by independence, scientific rigor, openness, and closeness to its mission. In a central bank, these principles are self-reinforcing and this issue of Spillovers is testimony of this virtuous interaction.

The e-book released by Banco de Portugal on "Portuguese Economic Growth: A view on structural features, blockages and reforms" is a collective effort from many internal and external economists, tackling relevant policy issues grounded on solid research. In this issue of Spillovers, João Amador and Pedro Duarte Neves present the e-book and highlight some of the lessons that emerge from the numerous contributions. I invite everyone to consult the e-book frequently: there are insights to learn on every turn of the (electronic) page.

The Portuguese Household Finance and Consumption Survey is a unique source of granular information on net wealth, assets, and debt in the euro area. The data and results for Portugal have now been published, as described in this issue of Spillovers. A dedicated page at Banco de Portugal's website has been set up to enhance the dissemination of these data and related research conducted at Banco de Portugal and in the Eurosystem. This is a burgeoning research field at the core of the public debate. I thus expect many new projects to be launched using this rich database in the near future.

Banco de Portugal has embodied the goal of catalyzing research using the uniquely rich Portuguese micro databases. The Microdata Laboratory of Banco de Portugal (BPLIM) has been providing these data to researchers worldwide. I invite all those interested in microdata to visit BPLIM's recently launched website. You will find detailed information on the data, on all ongoing projects, as well as many useful applications developed by the BPLIM team and made available to the research community. I am confident that BPLIM will simultaneously contribute to enhance knowledge on the Portuguese economy and the scientific frontier using the Portuguese economy as a laboratory.

2020 will be filled with challenges for central banks. Within the Eurosystem, the review of the ECB's monetary policy strategy will be overriding. These are occasions where the frontier of economic thought is called upon and where economics embodies elements of art and science. Banco de Portugal will be closely engaged in these discussions, and high quality research will constitute the foundation for our policy advice. The principles outlined in the beginning of this Overview will be our compass in this journey.

Nuno Alves
Head of the Economics and Research Department

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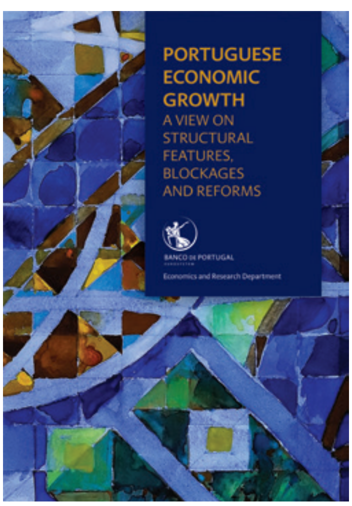
E-book "Portuguese Economic Growth: A view on structural features, blockages and reforms"

By João Amador

On October 14th, Banco de Portugal launched, in electronic format, the book The Portuguese Economic Growth: A View on Structural Features, Blockages and Reforms, developed by a group of economists from the Economics and Research Department, in connection with other departments and various external entities, including universities. Overall, the list of contributors amounts to 43 economists, affiliated in four departments of Banco de Portugal and 17 external institutions. Therefore, the book is a collective effort where the Economics and Research Department benefited from its extensive external network of co-authorships.

This book aims to contribute to the discussion about Portuguese economic growth, identifying several structural features and, whenever possible, points towards challenges to be addressed. Conversely, in some areas, progress is underlined. The book is organized along nine chapters, each one containing a small number of short sections. Each section formulates a research question relevant for understanding structural features, blockages and reforms with an impact on Portuguese economic growth. All sections are written in a simple and concise way, most of them referring to existing studies where a deeper analysis can be found. The short length of the sections and their simplified content aims at facilitating access to a non-specialized economic audience.



The book takes a supply side approach, discussing aspects of Portuguese economic growth from the perspective of the production function. This implies focusing on the quantity and quality of inputs, the functioning of markets and the broad institutional setup. The 1st chapter of the book offers an analysis of the Portuguese potential output growth using estimated models and growth accounting methodologies. The role of capital, labour and technology is highlighted, while also including some aspects on demography and human capital. The questions specifically related to human capital, such as education premia and mismatches are included in the 2nd chapter. Next, the 3rd chapter of the book discusses some features of the Portuguese labour market, notably sources of variation in real wages, nominal wage rigidities and recent reforms. In the 4th chapter the book addresses questions related to the management and organization of Portuguese firms. These aspects have been increasingly acknowledged in the literature as important drivers of firms' performance and overall productivity. In particular, the profile of Portuguese managers, their experience in foreign markets as a driver for exports and the role of newcomers in the face of crisis are discussed.

The 5th chapter of the book collects contributions that study the borrowing constraints in Portuguese firms, the impact of bank shocks on investment decisions and the allocation of credit according to the productivity of firms. Discussions about the quality and quantity of inputs, as well as those on the functioning of the labour market, must be complemented by an assessment of firms' dynamics and the implicit reallocation of resources in the economy, which is shaped by existing distortions and by the action of competition forces. This latter set of dimensions constitutes the bulk of the 6th chapter of the book. Internationalization is not an element of the production function per se but it emerges as a key decision by firms, which may strongly determine their performance and thus impact on economic growth. In this setup, aspects related to the participation of Portuguese firms in international trade of goods and services, their resilience in the face of crisis, as well as the specificities of those in the tourism sector are addressed in the 7th chapter. Finally, regulatory costs, which are also acknowledged as important elements driving productivity, are discussed in the 8th chapter, with a special emphasis on the judicial system.

The book uses multiple analytical tools, ranging from growth accounting decompositions to DSGE models and, mostly, micro econometric methods. Indeed, the book is also a very good illustration of the role played by detailed Portuguese micro-level databases in the research agenda of the Economics and Research Department of Banco de Portugal.

What do we learn with the e-book "Portuguese Economic Growth: A view on structural features, blockages and reforms"?

By Pedro Duarte Neves[1]

The e-book "Portuguese Economic Growth: A view on structural features, blockages and reforms" is a notable contribution to the debate about Portuguese economic growth. It identifies the key structural characteristics of the economy and provides a very good basis for discussion on possible policy action aiming for a stronger growth in productivity. This article is organised into three main points: a summary of the key structural features of the Portuguese economy, as identified in the e-book; a summary on the main economic trends that, over the next decade, will likely affect the EU and Portugal; and, finally, some possible lessons drawn from the e-book on how economic policy and economic agents should adjust to successfully face those new challenges with the final aims of stronger productivity growth and a more resilient economy.

1. Structural features of the portuguese economy

The e-book provides a very rich analysis of the key structural features of the Portuguese economy with regard to the use of productive factors and the functioning of the labour market. Let us mention some of them[2]:

- Low capital-labour ratios (about 20 per cent below the EU average);
- A legacy of low qualifications of the labour force, albeit this has been gradually reduced with the generational renewal in the labour market;
- Low levels of educational achievements at management level (also below EU reference levels);
- High levels of returns to schooling, in particular for university degree-holders, which increase with experience;
- Evidence of positive social externalities associated with the increase in average levels of schooling;
- A strikingly high proportion of employees earning the minimum wage (22 per cent in total, 40 per cent for new employees);
- A very marked duality between open-ended and fixed-term contracts, which continues to be a distinctive feature of the Portuguese labour market;
- Pro-cyclicality of real wages.

The e-book also provides a very rich set of structural characteristics that became apparent throughout the recent adjustment process of the Portuguese economy, mainly with regard to the extremely successful adjustment of the external sector:

- Marked increase in the importance of external markets to Portuguese firms;
- Healthy demography of international traders of goods and services, with a significant role for the extensive margin;

1 Former Vice-Governor of Banco de Portugal (2006-2017). The opinions expressed in this article are those of the author and do not necessarily coincide with those of Banco de Portugal.
2 Throughout this article no specific references will be made to individual sections of the e-book.

- Marked increase in tourism activities in the economy (the travel and tourism surplus reached 6 per cent of GDP, more than doubling the 2010 figure);
- The gradual reorientation of resources to tradable sectors from non-tradable ones translated into gains in aggregate productivity in manufacturing and tradable services;
- The economy moved to a small surplus in the current account balance, following a persistent deficit of 8 to 10 per cent of GDP over the previous decade;
- However, the adjustment of the economy has not been instantaneous and therefore some misallocation of resources has persisted during the adjustment period, impairing aggregate productivity growth.

In this context, the evolution of the Portuguese export sector offers one of the few examples of considerable gains during the recent double-dip recession and also during the subsequent recovery. The success of the Portuguese export sector over the current decade (2010-2018) can be convincingly characterised by three economic indicators:

- Total nominal exports have grown by 64 per cent, which is even more impressive bearing in mind the prevailing environment of price stability; exports of goods have increased by 53 per cent; exports of services have grown by 88 per cent, driven by the remarkable growth of tourism revenue of around 130 per cent.
- Market share gains in external markets accounted for about half of the increase in Portuguese real exports.
- The weight of the external sector – measured by the exports to GDP ratio – reached 44 per cent in 2018, which reflects a marked increase of 16 percentage points in comparison to the average figure over the period 1995-2007 (28 per cent).

In parallel, and in line with what happened in the main advanced economies, the weight of services in the economy keeps increasing, currently contributing to around three-quarters of the value added of the economy, about half of private consumption and with exports of services amounting to around one-sixth of GDP.

2. Global trends to 2030: how will they affect advanced economies?

Some trends will make the world, the EU and the Portuguese economy change over the next 10 years. Let us mention the five key global trends – three from the supply side and two from the demand side – that are likely to shape the developments of the world economy up to 2030.

Ageing: over the next decade labour force growth will be -0.5 per cent per year in the EU and +0.4 per cent in the US (around 1 p.p. and 0.8 p.p. below the last decade), therefore reducing potential supply growth.

Automation: many studies conclude that between 14 and 20 per cent of jobs in advanced economies are highly automatable and that the effects of automation will vary considerably across different sectors penalising relatively more low/medium educational levels and in particular routine processing activities.

Sustainability: addressing climate change challenges will affect economic sectors differently and, if financial markets do not adequately price-in the required policy response, it is possible that a forceful, abrupt and disorderly market response will occur.

Digital demand: the consumer demand profile is changing rapidly with increasing preferences for digital services through the emergence of new business models and threats for firms that do not adapt the retail channel in a timely way.

Global power: a marked shift in world economic power is taking place; in purchasing power parities, the E7 was half of the G7 in 1995[3], today the E7 is about the same size as the G7, by 2040, the E7 will be double the G7.

3 G7 comprises US, UK, FR, DE, JP, CA and IT; E7 comprises China, India, Indonesia, Brazil, Russia, Mexico and Turkey.

Table 1 suggests how those ongoing trends will likely affect **growth** (i.e. average potential growth), **dispersion** (how heterogeneously economic agents are affected, in particular firms), and **asymmetry** (how the distribution of income is affected, with a focus on households). The combined effects are, *ceteris paribus*, likely to be the following:

- Potential growth will remain, at best, at current low levels;
- Dispersion of economic performance across firms is very likely to increase, reflecting the effects of disruptive technologies, asymmetric pressures to adjust to the new sustainability binding restrictions, adjustment to digital preferences and adjustment to more distant and less known markets;
- Finally, asymmetry in income distribution is also likely to increase, reflecting stronger demand for a specialised labour force, the decline of labour demand for routine processes, and the employment reduction in sectors more asymmetrically affected by the identified trends.

Table 1 • The key economic trends and their likely impact on the economy

	Growth	Dispersion	Asymmetry
Ageing	--		
Automation	+	+++	+++
Sustainability		++	
Digital demand		++	+
Global Power	+	++	

Interpretation: (+) means a positive impact on the column variable, measured in a scale from (+) to (+++); the same applies to a negative impact on the column variable.

3. How economic policy and economic agents should adjust?

The Portuguese economy, like those of the EU and the advanced economies, will be impacted by the foreseen trends. It is therefore extremely relevant to be ready to mitigate possible negative effects and to take advantage of the opportunities that will also be created. The e-book provides useful insights for economy policy. In a context in which, as explained above, there is no good reason to anticipate an increase in potential output growth, it is important to identify opportunities for gains in productivity growth, through economic policy action and economic reforms. The key results of the e-book on this are the following:

- Reinforcing human capital, management capacities and the capital-labour ratio are decisive to obtaining productivity gains;
- It is therefore crucial to act in those dimensions as a productivity (TFP) shock produces as similar and lasting positive impacts as an external demand shock, and the benefits of the most recent one are not far from being exhausted;
- Product markets are far from being the perfect competition paradigm, meaning that gains can be achieved through a more competitive environment;
- Imperfections in the functioning of labour and product markets should be tackled in an integrated way;
- Regulatory costs negatively impact productivity performances and perceptions.

The e-book also provides some encouragement for the implementation of policy reforms, as it identifies two case studies illustrating how policy reforms have produced positive outcomes in the past: the reform in insolvency procedures translated into more efficient restructuring and exiting, and therefore into a more efficient allocation of resources; the reform in enforcement procedures in the judicial system translated into a reduction of durations.

In a context of higher volatility and more frequent disruptive adjustments, it is important to identify how, on one hand, firms will be prepared to be more resilient and, on the other hand, how employees will be ready to face future challenges with more confidence. Let us start with the key learnings from the e-book, with regard to lessons for improving the resilience of firms:

- Newcomer CEOs present a significant advantage in managing firms during difficult times;
- The presence of managers with export experience increases the probability to start (or continue) to export and are also associated with higher levels of exports;
- Firms that fail to reorganise are unable to exploit the opportunities to increase productivity;
- Firms with higher levels of leverage and short-term debt have higher difficulties in refinancing during moments of crisis;
- Credit constrained firms are less likely to invest and to survive;
- In similar financial situations, exporting firms have higher survival probabilities;
- Non-tourism service traders that are multi-service suppliers and have multi-country activity tend to be more productive and therefore more profitable.

As previously mentioned, future developments are expected to have a significant impact on labour demand, with an increase in the demand for specialised labour and a decline in labour demand for routine processes and/or a less qualified labour force, raising prospects for an increase in income inequality. The correct policy action to face these new challenges are out of the scope of the e-book, but certainly constitutes the most important issue for national debate. How to promote the acquisition, development and effective use of the relevant professional skills – in particular when automation and digital evolution are changing the economy – requires an urgent national debate on the necessary public and private actions. Investment in human capital should be the national priority for the next decade.

The Portuguese Household Finance and Consumption Survey

On November 13 the third wave of the Portuguese Household Finance and Consumption Survey (ISFF, according to the Portuguese acronym) was released. The main results of the survey are available on the new ISFF page at the Banco de Portugal website. This page also includes information on access to the microdata by researchers.

The ISFF is part of the Eurosystem project, Household Finance and Consumption Survey (HFCS) that aims to collect harmonized household level data across euro area countries to conduct studies on monetary policy and financial stability issues. The main focus of the survey is the household's assets and liabilities. It also includes data on income, consumption, savings, socio-demographic characteristics, expectations and attitudes. The survey is conducted every three years since 2010. Currently, central banks from all the euro area countries and from some other European countries, such as Croatia, Hungary and Poland participate in this project.

The implementation of the survey is decentralized at the national level. In Portugal, this survey is a shared project of Banco de Portugal and Statistics Portugal. The methodology of the ISFF follows the principles agreed by the countries participating in the project which are based on international best practices. The Economics and Research Department of Banco de Portugal participates actively in all phases of the survey, from sample design and questionnaire definition to the production of the final microdata, which involves editing and imputation of missing data. This deep involvement is due to a strong commitment in having a high quality database on the financial situation of households that is thought to be useful for research. The department already has a long tradition of promoting the collection of this type of data. In fact, the ISFF followed the Households' Wealth and Indebtedness Survey (IPEF, according to the Portuguese acronym), which was carried out in 1994, 2000 and 2006.

The ISFF data is very useful to study the behaviour of households in areas related to saving and consumption decisions, portfolio allocations, participation in debt, and liquidity constraints and other. The data can also be used to assess the impact of macroeconomic shocks or policy changes on different types of households and the response of such households to various shocks. Finally, the survey contributes to a better understanding of the behaviour of macroeconomic aggregates, as it allows the identification of the groups of households where certain assets and debts are concentrated. The ISFF page at the Banco de Portugal website discloses the list of studies published using this data, both by Banco de Portugal and other institutions.

By Luísa Farinha, Sónia Costa, Renata Mesquita and Luís Martins

In every issue, we ask experts to briefly present and discuss two papers written by staff members. In this issue, the guest is Miguel de Faria e Castro.

Miguel de Faria e Castro (Ph.D. New York University) is an Economist in the Research Division of the Federal Reserve Bank of St. Louis. His research interests are at the intersection of macroeconomics and finance, with special emphasis on topics such as fiscal and monetary policy, and financial regulation. He has taught at New York University, New York University's Stern School of Business, and Nova School of Business and Economics. His research has been published in the *Review of Economic Studies* and the *Journal of Monetary Economics*.

Featured published paper

Ercolani, Valerio and João Valle e Azevedo. 2019. "How can the government spending multiplier be small at the zero lower bound?". Macroeconomic Dynamics, 23:3457-3482.

In response to the Great Recession, central banks all over the world lowered interest rates to almost zero, and even below zero in some jurisdictions. As conventional monetary policy became constrained by this zero lower bound (ZLB), governments also undertook unprecedented fiscal stimulus in an effort to exit the recession. Several authors (i.e., Christiano, Eichenbaum, and Rebelo, 2011) have pointed out that within a class of DSGE models with nominal rigidities (New Keynesian models) fiscal policy can be unusually effective when nominal interest rates are not responsive to economic conditions (which is typically the case when they are constrained at zero). Thus, the dollar-value of an increase in GDP per dollar spent by the government can be very high (the so-called fiscal multiplier).

In this article, however, the authors argue that this prediction is at odds with the empirical evidence:

Ramey and Zubairy (2018), for example, find fiscal multipliers at the ZLB that are lower than unity (the typical threshold to evaluate whether a multiplier is "high" or "low"). The authors argue that a simple technical modification to the standard New Keynesian model can bring it closer to the empirical evidence, and generate smaller fiscal multipliers at the ZLB.

In standard models, it is assumed that government spending consists of goods that are "thrown in the ocean". The government purchases resources that need to be produced by the private sector, but these purchases do not directly affect agent preferences or behavior in any way. In this paper, the authors relax this assumption and assume that government spending enters household preferences as a substitute for private consumption. They argue that this is a reasonable assumption: think about an increase in public services, such as healthcare. The more the government spends with public healthcare, the less agents need to privately spend to obtain the same level of consumption.

In the standard set-up, spending does not enter preferences (or enters in a separable way). Whenever the government purchases goods, it is effectively reducing the amount of goods that private agents can purchase (keeping total production constant). Agents try to offset this and stay as close as possible to their previous level of consumption. This is achieved by working/producing more: this is one of the transmission channels through which government spending raises output. In the case of substitutable government consumption, agents are happy when the government raises spending, and do not feel as much the need to offset the increase in spending by raising their own private consumption. This then means they have smaller incentives to work/produce more, and as a result spending has a less stimulative effect.

The authors conduct a series of experiments in the context of a calibrated New Keynesian model, and find that the fiscal multiplier at the ZLB is half the size when substitutability between private and public consumption is introduced. They show that this finding is robust to alternative financing schemes (whether this spending is financed using taxes or de deficits). These are important findings that highlight the importance of understanding and validating certain specific model assumptions when studying the macroeconomic effects of fiscal policy.

Featured article from *Banco de Portugal Economic Studies*

Júlio, Paulo and José R. Maria. 2019. "The countercyclical capital buffer: A DSGE approach". *Banco de Portugal Economic Studies*

In response to the global financial crisis, regulators from all over the world joined efforts to reform financial regulation at the global level. That directives that resulted from that coordinated effort became collectively known as Basel III, and one of its main pillars is known as the countercyclical capital buffer (CCyB). Capital buffers (or requirements) refer to a set of regulations to which banks are subject, which force them to hold a minimum set of capital so that they can absorb fluctuations in the value of their assets without failing, or triggering a financial panic. These buffers are typically fixed by the regulator; the CCyB, in turn, allows regulators to raise (and lower) these buffers depending on the state of the economy. If, for example, regulators think that the economy is experiencing a credit boom that may increase the risk of a financial crises (or an episode of forced deleveraging), they can use the CCyB to force banks to hold more capital than they typically do.

The CCyB is first and foremost a tool of macroprudential policy, and it may entail some trade offs: on one hand, raising the CCyB during a period of expansion can strengthen the financial system and make it more resilient in the face of an adverse shock. On the other hand, it also makes it more costly for banks to lend, which can lead to less credit being intermediated and less investment and growth as a result. For this reason, it is important to understand what are the effects of the CCyB on different macroeconomic variables. In this article, the authors study the macroeconomic effects of the CCyB in the context of a calibrated dynamic stochastic general equilibrium model of a small open economy in the euro area.

The model features a banking sector that intermediates resources between depositors (domestic and foreign) and entrepreneurs who produce capital/investment goods. These entrepreneurs can default on their loans, and this can cause the value of bank assets and capital to fluctuate. Banks face a capital requirement: if their capital falls, this constraint may bind, which forces them to reduce lending, and which in turn reduces investment in this economy (and thus reduces output, wages, etc.).

The authors study how the economy responds to different types of the shocks in the absence and in the presence of a CCyB. To model the CCyB, they allow the regulator to change the parameter that governs the tightness of the bank capital requirement; this parameter becomes a simple function of the credit to GDP ratio. To evaluate the effects of the CCyB, they simulate four types of boom-bust cycles in the economy, each driven by a different type of shock. The first two cycles are driven by "real" shocks (i.e., shocks that are not directly related to the financial sector): productivity growth, and efficiency of investment. The latter two cycles are driven by "financial" shocks: a change in the default probability of entrepreneurs, and a change in bank profitability.

They find that whether the CCyB is useful in stabilizing the boom-bust cycle or not depends ultimately on the cyclical properties of credit. In the case of a cycle fueled by (expectations of) productivity growth, credit is countercyclical. This means that the buffer is not raised in the boom part of the cycle, but is raised during the bust. This raises output volatility. For the other types of shocks, however, credit is procyclical and so the CCyB rule raises the buffer during the boom. This means that banks enter the bust better capitalized, and both credit and output contract less when the economy enters in a recession. It also means that output rises by less during the boom. Thus the CCyB is effective at reducing macroeconomic volatility for these types of shocks, but by how much depends on the exact type of shock.

All in all, these results are encouraging for regulators, as they show that the CCyB can be effective in moderating macroeconomic volatility and the severity of recessions. They also show, however, that the nature of the underlying shock that is driving the cycle is important for how useful the CCyB will be and, in practice, business cycles will likely be driven by combinations of all these shocks.

Recently published

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

Mathematical and quantitative methods

- Iskrev, Nikolay. 2019 "On the sources of information about latent variables in DSGE models" European Economic Review, 119:318-332. (Jel Codes: C32, C51, C52, E32).

Forthcoming

- Sergio Correia, Paulo Guimarães and Tom Zylkin. 2019. "PPMLHDFE: Fast Poisson Estimation with High-Dimensional Fixed Effects". Stata Journal. (JEL Codes: C25, C23, C87, C55).

Macroeconomics and monetary economics

- Ercolani, Valerio and Valle e Azevedo, João. 2019. "How Can The Government Spending Multiplier Be Small At The Zero Lower Bound?" Macroeconomic Dynamics, 23(8): 3457-3482. (JEL Codes: E32, E62).
- Kilponen, Juha, Massimiliano Pisani, Sebastian Schmidt, Vesna Corbo, Tibor Hledik, Josef Hollmayr, Samuel Hurtado, Paulo Júlio, Dmitry Kulikov, Matthieu Lemoine, Matija Lozej, Henrik Lundval, José R. Maria, Brian Micallef, Dimitris Papageorgiou, Jakub Rysanek, Dimitrios Sideris, Carlos Thomas and Gregory de Walque. 2019. "Comparing Fiscal Consolidation Multipliers across Models in Europe." International Journal of Central Banking, vol. 15(3), pages 285-320, September. (JEL Codes: E62, E63, E12, E13, E17).

Forthcoming

- Antunes, António, and Valerio Ercolani. 2019. "Public debt expansions and the dynamics of the household borrowing constraint." Review of Economic Dynamics. (JEL Codes: E21, E44, E62, H60).
- Chari, V. V., Juan Pablo Nicolini and Pedro Teles. 2019."Optimal Capital Taxation Revisited". Journal of Monetary Economics. (JEL Codes: E60, E61, E62).
- Portugal, Pedro and António Rua. 2019. "How the Ins and Outs Shape Differently the U.S. Unemployment Over Time and Across Frequencies". European Economic Review. (JEL Codes: E21, E60, F40).

Financial economics

- Farinha, Luísa, Marina-Eliza Spaliara and Serafeim Tsoukas. 2019. "Bank Shocks and Firm Performance: New evidence from the Sovereign Debt Crisis." Journal of Financial Intermediation, Volume 40: 100818 (JEL Codes: F32, F34, G15, G21, E44).

International economics

- João Amador, Sónia Cabral, and Birgitte Ringstad. 2019. "International trade in services: firm-level evidence for Portugal." Portuguese Economic Journal, 18(3): 127–163. (JEL code: F14).

Health, education, and welfare

Forthcoming

- Reis, Hugo. 2020. "Girls' Schooling Choices and Home Production: Evidence from Pakistan." International Economic Review. (JEL Codes: I25, I28).

Labour and demographic economics

Forthcoming

- Carneiro, Pedro, Sokbae Lee, and Hugo Reis. 2020. "Please call me John: The First name and assimilation of immigrants in the United States." Labour Economics. (JEL Codes: J15, N32).
- Raposo, Pedro, Pedro Portugal, and Anabela Carneiro. 2019. "The sources of the wage losses of displaced workers: the role of the reallocation of workers into firms, matches, and job titles". Journal of Human Resources. (JEL Codes: C10, E24, E32).

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.

From Micro to Macro: A Note on the Analysis of Aggregate Productivity Dynamics Using Firm-Level Data • Carlos Robalo Marques, Daniel A. Dias

In the empirical literature, the analysis of aggregate productivity dynamics using firm-level productivity has mostly been based on changes in the mean of log-productivity. This paper shows that there can be substantial quantitative and qualitative differences in the results relative to when the analysis is based on changes in the mean of productivity, and discusses the circumstances under which such differences are likely to happen. We use firm-level data for Portugal for the period 2006-2015 to illustrate the point. When the mean of productivity is used, we estimate that TFP and labor productivity for the whole economy increased by 17.7 percent and 5.2 percent, respectively, over this period. But, when the mean of log-productivity is used, we estimate that these two productivity measures declined by 4.3 percent and 1.8 percent, respectively. Similarly disparate results are obtained for productivity decompositions regarding the contributions for productivity growth of surviving, entering and exiting rms.

Bank Funding and the Survival of Start-ups • Luísa Farinha, Sónia Félix, João A. C. Santos

We document that start-ups with more access to long-term bank loans and those with more available credit in their credit lines survive longer. These findings do not appear to be driven by bank selection. Start-ups (including those founded by entrepreneurs without a business track record) that access these funding sources, in particular long-term loans, right at the beginning of their lives - when it is arguably more dicult for banks to identify winners - survive longer. Further, our findings continue to hold when we control for unobserved heterogeneity in start-ups, and when we instrument for banks' lending decisions. In addition, our findings do not seem to be entirely driven by bank monitoring because we do not find that accessing short-term bank loans yields similar results. Our results suggest that reducing uncertainty about future access to bank funding helps start-ups survive longer, possibly because it offers them insurance against future shocks and/or affords them the opportunity to make investments that they would not consider otherwise.

Trends and cycles under changing economic conditions • Cláudia Duarte, José R. Maria, Sharmin Sazedj

The identification of trends and cycles is often a challenging task under sizeable changes in economic conditions. We solve this problem with a flexible unobserved components model, featuring an (unobserved) evolving trend inflation drift to cope with distinct inflationary periods and data-driven low frequency movements to partly influence ex ante key trend components. In the long run the model displays a balanced growth path, in addition to other standard restrictions (e.g. nil output and labour market slacks). We estimate the model with Bayesian techniques using two datasets, one for the euro area and another for Portugal, two economies displaying distinct macroeconomic environments over the last four decades, and conclude that Portugal witnessed (i) a steeper deceleration of potential output, since the 1990s; (ii) a pervasively higher volatility in labour and product markets; and (iii) a long-lived interruption in convergence trends after the 2000s. Results are robust to sensitivity analyses. Parameter uncertainty is, nevertheless, significant.

Time vs. Risk Preferences, Bank Liquidity Provision and Financial Fragility • Ettore Panetti

How important is it to distinguish relative risk aversion (RRA) from the intertemporal elasticity of substitution (IES) to understand bank liquidity provision and financial fragility? To answer this question, I develop a banking theory in which depositors feature Epstein-Zin preferences. In equilibrium, banks provide liquidity when RRA is sufficiently high (low) only for IES larger (smaller) than 1. Under the same conditions, banks might be fragile, i.e. subject to possible self-fulfilling depositors' runs. A time-consistent deposit freeze resolves banks' fragility if RRA is sufficiently low and IES is sufficiently larger than 1.

Sovereign exposures in the Portuguese banking system: determinants and dynamics • Maria Manuel Campos, Álvaro Pina, Ana Rita Mateus

This paper studies the dynamics of the exposure of the Portuguese banking system to the domestic public sector over 2008-2016 and assesses possible underlying motivations. The analysis relies on a new dataset built from granular information that provides full coverage of the Portuguese banking sector and the public sector. The results suggest that moral suasion was an important driver of the evolution of sovereign exposures during the euro area crisis: domestic banks provided financing to the sovereign when the Treasury needed to issue debt amidst rising yields and, although to a smaller extent, when State-Owned Enterprises faced funding shortages in international markets. Moreover, increases in central bank funding are also related to increases in holdings of sovereign debt securities. These findings mainly hold for medium-sized and large banks. In contrast, we find no evidence of gambling for resurrection behaviour by banks with lower prudential capital or depressed profitability.

The Financial Channels of Labor Rigidities: Evidence from Portugal • Ettore Panetti, Alessandro Sforza, Edoardo M. Acabbi

How do credit shocks affect labor market reallocation, firms' exit and other real outcomes? How do labor-market rigidities impact their propagation? To answer these questions, we match administrative data on worker, firms, banks and credit relationships in Portugal, and conduct an event study of the interbank market freeze at the end of 2008. Our results highlight that the credit shock had significant effects on employment dynamics and firms' survival. These findings are entirely driven by the interaction of the credit shock with labor market frictions, determined by rigidities in labor costs and exposure to working-capital financing, which we label "labor-as-leverage" and "labor-as-investment" financial channels. The credit shock explains about 29 percent of the employment loss among large Portuguese firms between 2008 and 2013, and contributes to productivity losses due to increased labor misallocation.

ECB, BoE and Fed Monetary-Policy announcements: price and volume effects on European securities markets • Ana Paula Serra, Eurico Ferreira

As a response to the recent global financial crisis, the main central banks implemented several programs of unconventional monetary policies. This paper assesses the announcement effects of the policy measures taken by the European Central Bank, the Bank of England and the Federal Reserve on European securities markets. We measure the impact of these announcements on government bond and stock prices and trading volumes. Using the event study methodology, we evaluate the reaction of some of the major European market indices around the announcement dates of unconventional monetary policies, over the period between 2008 and 2016. Our results show that the overall impact of the announcements of unconventional monetary policy measures is significant for European stock markets. Further, results suggest that the impact was more significant with the announcement of "Forward Guidance" and "Asset Purchases" policy measures, respectively, on stock prices and trading volumes. If events are categorized using a narrow definition of "Forward Guidance", the effects for this category are positive but not always statistically significant.

Monthly Forecasting of GDP with Mixed Frequency Multivariate Singular Spectrum Analysis • António Rua, Dimitrios Thomakos, Emmanuel Sirimal Silva, Hossein Hassani

The literature on mixed-frequency models is relatively recent and has found applications across economics and finance. The standard application in economics considers the use of (usually) monthly variables (e.g. industrial production) in predicting/fitting quarterly variables (e.g. real GDP). In this paper we propose a Multivariate Singular Spectrum Analysis (MSSA) based method for mixed frequency interpolation and forecasting, which can be used for any mixed frequency combination. The novelty of the proposed approach rests on the grounds of simplicity within the MSSA framework. We present our method using a combination of monthly and quarterly series and apply MSSA decomposition and reconstruction to obtain monthly estimates and forecasts for the quarterly series. Our empirical application shows that the suggested approach works well, as it offers forecasting improvements on a dataset of eleven developed countries over the last 50 years. The implications for mixed frequency modelling and forecasting, and useful extensions of this method, are also discussed.

Testing for breaks in the cointegrating relationship: On the stability of government bond markets' equilibrium • Paulo M.M. Rodrigues, Michelle Voges, Philipp Sibbertsen

In this paper, test procedures for no fractional cointegration against possible breaks in the persistence structure of a fractional cointegrating relationship are introduced. The tests proposed are based on the supremum of the Hassler and Breitung (2006) test statistic for no cointegration over possible breakpoints in the long-run equilibrium. We show that the new tests correctly standardized converge to the supremum of a chi-squared distribution, and that this convergence is uniform. An in-depth Monte Carlo analysis provides results on the finite sample performance of our tests. We then use the new procedures to investigate whether there was a dissolution of fractional cointegrating relationships between benchmark government bonds of ten EMU countries (Spain, Italy, Portugal, Ireland, Greece, Belgium, Austria, Finland, the Netherlands and France) and Germany with the beginning of the European debt crisis.

The Neutrality of Nominal Rates: How Long is the Long Run? • João Valle e Azevedo, Pedro Teles

How can inflation be raised in economies such as Japan and the euro area where it has been below the objective for quite some time? We estimate an empirical model aimed at identifying the effects of permanent and temporary monetary shocks for the U.S., Japan, France, the U.K., Germany and the euro area. We find that the permanent monetary shock leads to a permanent rise in nominal rates and inflation. Importantly, the short-run effects of this permanent shock are similar to the long-run effects: inflation responds positively and immediately to a permanent rise in nominal rates, confirming the results in Uribe (2017, 2018). We also reinvestigate the long-run relation between inflation and nominal short interest rates. Using data for 41 developed countries covering the last 50 years, we document a strong, yet below one-for-one relationship between nominal rates and inflation, that tends to be less visible over the more recent period, characterized by inflation targeting at low common levels.

Euro area fiscal policy changes: stylised features of the past two decades • Cláudia Braz, Nicolas Carnot

The paper provides a narrative of euro area fiscal policy changes since 1997, the year when Maastricht criteria were met for inception of the euro. Changes in the budget balance are decomposed into a discretionary component, a cyclical component and a net residual, with each component broken down in turn into broad categories of expenditure and revenues. The paper then examines the output effects of fiscal changes. We summarise our findings in six stylised features. In brief, fiscal changes and fiscal effects are relatively large. They stem in similar proportions from discretionary actions and from the automatic stabilisers. Discretionary changes tend to involve both revenue and expenditure measures and do not appear systematically driven by cyclical developments. Fiscal changes as a whole have contributed to smooth the euro area growth path, but mostly due to the automatic stabilisers.

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. The journal intends to be a reference publication in that debate, and is directed to a relatively specialized public on economic issues.

July 2019

Regulatory costs and performance of Portuguese firms • João Amador, Sónia Cabral and Birgitte Ringstad.

Euro area credit market: who contributed to the recent recovery? • Carla Soares.

The import content of final demand in Portugal: Nominal and real evolution • Fátima Cardoso and António Rua.

Economics synopsis **Business models and firm performance** • Luca David Opromolla.

October 2019

An analytical assessment of the risks to the sustainability of the Portuguese public debt • Cláudia Braz and Maria Manuel Campos.

Portuguese labour market synthetic indicators • Carlos Melo Gouveia.

The countercyclical capital buffer: A DSGE approach • Paulo Júlio and José R. Maria.

Economics synopsis **The Economics of The European Deposit Insurance Scheme** • Ettore Panetti.

Seminars

2019

Jul. 5 **Monetary Policy and the Predictability of Nominal Exchange Rates** • Martin Eichenbaum • Northwestern University

Jul. 8 **Strengthening the Euro Area: the role of national structural reforms in enhancing resilience** • Romain Duval • International Monetary Fund

Aug. 20 **Regulating Financial Networks Under Uncertainty** • Carlos Ramírez • Federal Reserve Board

Sep. 20 **Women's Liberation as a Financial Innovation** • David Weiss • Tel Aviv University

25 **Exchange Rate Exposure and Firm Dynamics** • Liliana Varela • London School of Economics

Oct. 9 **Mismatch Cycles** • Ana Figueiredo • Erasmus University Rotterdam

15 **Price Selection** • Carlos Carvalho • Pontifícia Universidade Católica do Rio de Janeiro

16 **A Model of Intermediation, Money, Interest, and Prices** • Saki Bigio • University of California, Los Angeles

23 **Banks as Patient Lenders: Evidence from a Tax Reform** • Vasso Ioannidou • Lancaster University

25 **Financial Frictions and the Wealth Distribution** • Galo Nuño Barrau • Banco de España

28 **Bottom-up Markup Fluctuations** • Basile Grassi • Bocconi University

Nov. 8 **Global Portfolio Rebalancing and Exchange Rates** • Nelson Camanho • Queen Mary University of London School of Economics and Finance

15 **Tradability and the Labor-Market Impact of Immigration: Theory and Evidence from the U.S.** • Ariel Burstein • UCLA

20 **Hedger of Last Resort: Evidence from Brazil on FX Interventions, Local Credit and Global Financial Cycles** • Andrea Polo • Luiss University

Dec. 2 **Dynamic Scoring of Tax Reforms in The European Union** • Sara Riscado • Joint Research Centre da Comissão Europeia

2 **What Happened to U.S. Business Dynamism?** • Sina Ates • Federal Reserve Board

2 **What's Driving the Decline in Entrepreneurship?** • Nicholas Kozeniauskas • Banco de Portugal & Católica-Lisbon

3 **Good Dispersion, Bad Dispersion** • Matthias Kehrig • Duke

3 **Dispersion in Financing Costs and Development** • Cézar Santos • Banco de Portugal & FGV EPGE

3 **Technology Gaps, Trade and Income** • Thomas Sampson • LSE

3 **International Trade and Innovation Dynamics with Endogenous Markups** • Pau Roldan • Banco de España

4 **Can Wealth Buy Health? A Model of Pecuniary and Non-Pecuniary Investments in Health** • Johanna Wallenius • Stockholm School of Economics

13 **Slow Debt, Deep Recessions** • Joachim Jungherr • Bonn University

16 **Market Concentration and Uniform Pricing: Evidence from Bank Mergers** • Nuno Paixão • Bank of Canada

Courses

2019

Nov. 6-8 **Competitive Search and Labor Sorting** • Philipp Kircher • European University Institute

From the 6th to the 8th of November, Professor Philipp Kircher (EUI) taught the course Competitive Search and Labor Sorting at the Economics and Research Department. The course was divided into two parts. The first half of the course focused on introducing competitive search models. Search models in general are used to describe situations in which economic agents need time to find a trading opportunity: searching for a house to buy or looking for a job, for example. Competitive search models are a subset of such models in which agents can usually direct their search towards certain goods or firms that post prices or wages. The second part of the course dealt with concepts from sorting under two-sided heterogeneity; that is, which workers work for which firms and how this sorting affects the wage inequality among workers.

The course started by introducing new concepts in the theory of labor search. In particular, the first topic was the concept of competitive search, in which firms post wages strategically to attract workers. The commonalities and differences to random search models were discussed. For a homogeneous-worker directed search framework, Prof. Kircher started with the basic setup and its micro-foundations. He then moved on to more advanced topics such as optimal unemployment insurance and firm dynamics. The first part of the course concluded with a study of his joint work with Leo Kaas: "Efficient Dynamics in a Frictional Labor Market" (American Economic Review, 2015). This paper discusses a competitive search model with firm dynamics along business cycles.

The second part of the course introduced two-sided heterogeneity where both firms (or jobs) and workers differ in skills and productivity. In these models, production depends non-trivially on which worker is employed by which firm. To lead over to this, Prof. Kircher briefly introduced key notions of matching theory, both with small (one-worker) and large (many-worker) firms. Key insights on wage dispersion between workers were discussed, as well as implications for structural change. Then sorting was embedded into a frictional-market setup where workers have to search for jobs. Similarities to models of marriage markets were briefly discussed. A key theme studied in this portion of the course was skill mismatch, because it takes workers too long to find the right trading partners. Finally, there was a discussion about how to work with such models empirically: identification (identifying model parameters from data), changes in the sorting patterns due to search frictions, and wage and employment implications.

By Cézar Santos

Dec. 9-13 **Introduction to Macroeconomic and Macrofinancial Modeling in the IRIS Toolbox** • Jaromir Benes • Consultant (OGResearch)

A course focused primarily on the IRIS Toolbox, with a dedicated session on key macrofinancial topics.

Jaromir Benes is an economist with several contributions in the field. He worked in leading international institutions, such as the International Monetary Fund, and published several papers on the interactions between the financial sector and the real economy (e.g. Jaromir, Kumhof and Laxton (2014a, 2014b), or Jaromir and Kumhof (2015)). Jaromir is also a renowned modeler involved in the creation and development of the IRIS Toolbox, an open-source code for macroeconomic modeling and forecasting (currently available at https://github.com), maintained and supported by the Global Projection Model Network (https://igpmn.org).

The course featured intensive hands-on sessions using the IRIS toolbox. It evolved from introductory data handling techniques promptly available in the toolbox (filtering, aggregation, seasonality, etc), towards relatively complex model solutions, such as: (i) semi-structural empirical models (including how to handle trends and unobserved components); (ii) reduced-form models with and without error correction terms; (iii) VARs and BVARs; (iv) calibration and estimation of Dynamic Structural General Equilibrium (DSGE) models; (v) simulation of linearized DSGE models (including the manipulation of structural shocks and reverse engineering techniques, the distinction between anticipated and unanticipated events, and advanced conditioning and exogenizing techniques); and, finally (vi) nonlinearities in DSGE models.

The course also featured a dedicated session on the main questions behind current macroprudential and financial stability modeling, including the challenges associated with Basel III. This session highlighted the importance of understanding (i) bank credit and deposit (money) creation; (ii) aggregate risk on balance sheets; (iii) deleveraging processes; (iv) the need for robust, not necessarily optimal, macroprudential policy; (v) the role of judgment in financial stability analysis; and (vi) the need to connect top-down with bottom-up approaches.

Benes, Jaromir, Michael Kumhof and Douglas Laxton (2014a), Financial Crises in DSGE Models: A Prototype Model, IMF *Working Paper* No. 14/57.

Benes, Jaromir, Michael Kumhof and Douglas Laxton (2014b), Financial Crises in DSGE Models: Selected Applications of MAPMOD, IMF *Working Paper* No. 14/56.

Benes, Jaromir and Michael Kumhof (2015). Risky bank lending and countercyclical capital buffers. Journal of Economic Dynamics and Control, vol. 58, issue C, 58-80.

By José R. Maria

Conferences and other events

2019

Nov. 28-29 PRISMA (Price-setting Microdata Analysis Network) • Lisbon

The PRISMA research network is a collaborative endeavor set up in 2018 involving National Central Banks of the Eurosystem and the European Central Bank (ECB). The main research goal is to investigate different sources of microeconomic price data (e.g. data underlying official price indexes such as the Harmonized Index of Consumer Prices and the Producer Price Index, scanner data, and online prices) in order to assess the price setting behavior of economic agents and the main drivers underpinning inflation dynamics from the point-of-view of monetary policy. Fernando Martins from the Economics and Research Department is the representative from the Banco de Portugal in the Network.

A meeting of the PRISMA took place from 28 to 29 November 2019 at Banco de Portugal. The meeting gathered prominent researchers and policy advisers of the field and included presentations and discussions of ongoing research projects.

On the 28th November, João Amador (Banco de Portugal) opened the meeting. The meeting was chaired by Luca Dedola (ECB).

Nicoletta Berardi (Banque de France) presented the paper "Everyday regular prices", which addresses the (ir) relevance of temporary sales in price setting. The authors use scanner data for an Everyday Low Price (EDLP) retailer, i.e. a retailer which does not engage in temporary sales. The authors studied several features of price-setting behavior, namely the price trajectories and rigidity, the frequency and size of price changes, the relation between the price adjustment and the cycle, the non-trivial number of small price changes, the synchronization of the price changes, the synchronization at the aisle (i.e. synchronization across product categories), the association between the features of heterogeneity in price setting and rational inattention "à la" Reis (2006). The main conclusions are that the prices of an EDLP are everyday regular prices considering that they are sticky as regular prices elsewhere and that the evidence is broadly consistent with state-dependent price setting in multiproduct firms.

Arne Nagengast (Deutsche Bundesbank) presented the paper "Dynamic pricing and the exchange rate pass-through: Evidence from transaction-level data". The authors analyze the relationship between dynamic pricing and the exchange rate pass-through (ERPT). To that end, they construct a theoretical model featuring seasonality of demand and capacity shocks, as well as advance purchases and information acquisition. The authors conduct an empirical analysis using a transaction-level dataset of package tours. The empirical analysis consists of (i) a transaction-level pass-through regression, (ii) an assessment of clearance sales and consumer heterogeneity, (iii) an analysis of demand and capacity costs, and (iv) an investigation of advance-purchases and information acquisition. They conclude that indeed there is a noticeable effect of dynamic pricing on the ERPT.

Cristina Conflitti (Banca d'Italia) presented the paper "What's behind firms' inflation forecasts?" The authors investigate the drivers of businesses' inflation expectations at the firm level in Italy, as well as the magnitude of the pass-through from wages to prices. The authors assess the main channels of this transmission mechanism using a survey on inflation expectations of Italian businesses.

Sotiris Blanas (Banque Nationale de Belgique) presented a set of basic statistics using micro-level Producer Price Index (PPI) data for Belgium and Denmark, namely the medians and means of the frequency of price changes, the implied durations of such changes, the same set of statistics disaggregated by sector and by product category, and the time-series evolution of these statistics.

Erwan Gautier (Banque de France) presented "Preliminary descriptive statistics on the Consumer Price Index (CPI) microdata in Austria, Belgium, France, and Italy". The author reviewed several statistics computed for these countries, e.g. the frequencies of price changes (with and without sales), the average size of price changes, the distribution of price changes, the heterogeneity of price changes across product categories, and the evolution of price-changes over time.

On the 29th November, the Keynote speaker Fernando Alvarez (University of Chicago) presented the paper "The analytics of monetary shocks with generalized hazard functions". The authors introduce the concept of generalized hazard function, i.e. the probability of a price change depending on the deviation from the ideal price. The author presented the firm's problem, the inversion result, the derivation of the steady-state statistics and the sufficient statistics, as well as the power-generalized hazard function. The authors analyze the popular models in the literature by Caballero and Engel (2007) and Dotsey, King and Wollman (1999).

Keynote speaker Raphael Schoenle (Federal Reserve Bank of Cleveland and Brandeis University) presented the paper "Raising the target: How much extra room does it really give?" The authors present new empirical evidence on the relation between the inflation target and the frequency of price changes, using annual US data on the frequency of price changes.

Chiara Osbat (ECB) and Luckas Henkel (ECB) presented an update on the web scraping activities recently conducted by the ECB. The project was outlined and the scope of the project was discussed.

Peter Karadi (ECB) presented an update on scanner data analysis and inflation measurement. The author conducted a comparison between the data for Germany, the Netherlands, and the USA. Several methodological issues were addressed, notably the data cleaning and manipulation procedure, the weighing scheme, and the measurement of inflation.

Erwan Gautier (Banque de France) chaired a "tour de table" on the practicalities on the CPI microdata. Several data issues were discussed, namely the harmonization efforts across countries, the definition of a common sample, the steps to take regarding the data manipulation and cleaning, the measurement of sales, the sharing of codes and outputs, and the use and availability of expenditure weights.

Finally, Luca Dedola (ECB) discussed an overview on the work for the ECB strategy review and possible PRISMA contributions, notably for the definition of the optimal inflation objective, the measurement of inflation, the underlying inflation, and the assessment of the gap between the current inflation and the objective. Chiara Osbat (ECB) discussed alternative platforms for sharing information among PRISMA participants.

By Fernando Martins

Dec. 5-6 G4 Workshop on Structural Reforms Banco de Portugal, Banco de España, Banque de France and Banca D'italia: Blockages to Economic Growth • Lisbon

On 5 and 6 December, 2019, Banco de Portugal hosted the Workshop on Structural Reforms with the participation of experts from Banco de Portugal, Banco de España, Banque de France and Banca d'Italia. This workshop meets regularly and provides an informal venue to discuss structural issues in each of the four countries, with an emphasis on reforms lately announced or implemented.

This meeting had as a generic heading "Blockages to economic growth", and the Portuguese contribution was fully based on the ebook "Portuguese Economic Growth: A View on Structural Features, Blockages and Reforms", recently published by Banco de Portugal. Such a contribution encompassed the key-note address by João Amador, who gave an overview of the content of the ebook, and the presentation of four selected sections. In a first session devoted to potential output, José Ramos Maria made a presentation about "Trends and cycles under changing economic conditions", dealing with the long-run trend of deceleration and divergence vis-a-vis the euro area of potential output for Portugal. António Ribeiro dos Santos presented related work studying "How have technological progress and efficiency developments contributed to Portuguese growth?". On the basis of the estimation an international stochastic production frontier, this work concluded for the existence of large efficiency gaps for the Portuguese economy. In a separate session about human capital, Maria Manuel Campos delivered a presentation about "Is it still worth investing in education in Portugal?" and concluded that higher educational levels continue to be associated with higher wages. Finally, Manuel Coutinho Pereira presented "How has the improvement in workers' educational attainment impacted educational mismatches in Portugal?", focusing on the evolution of educational mismatches (under- and over-education) in Portugal over the last two decades.

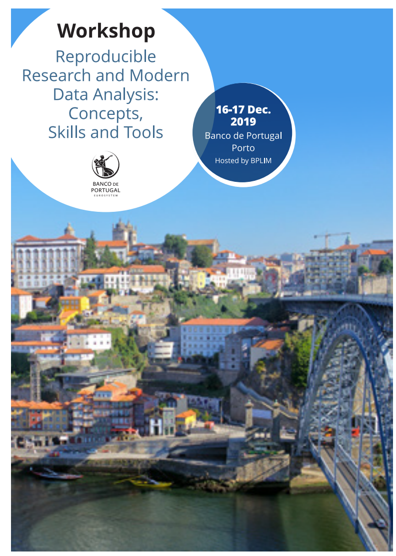
The session conducted by Banca d'Italia was devoted to the difficulties in the picking-up of potential growth and productivity that the Italian economy has shown in recent years. Roberto Torrini started by reviewing the latest developments regarding utilization of labour and capital and total factor productivity. In addition, Roberto presented on-going work on a new methodology for the estimation of potential output, given that usual approaches tend to underestimate the size of the negative output gap still prevailing in Italy. Lastly, he addressed the long-term growth prospects, pointing out in particular that labour input will provide little support to economic growth, due to declining working age population. Paolo Sestito undertook the second intervention in which he gave a summary of structural reform initiatives currently on the agenda in Italy.

The session led by Banco de España encompassed two interventions as well. In the first one, "Markups in low productivity economies: The case of Spain (2004-2016)", Aitor Lacuesta showed that markups increased in Spain during the recession and have remained high along the recovery phase and that such developments have been led by small and unproductive firms. The second intervention, by Eduardo Gutiérrez, was devoted to a paper on "Tariff Protectionist Measures and Spanish Goods Exports". This paper shows that protectionist policies have had a negative and persistent impact on Spanish exports.

In the session conducted by Banque de France, Pauline Lesterquy started with by giving an overview of recently launched reforms in France and went on by addressing aspects related to small- and medium-sized firms such as demography and financing structure. The last part of Pauline's intervention focused on barriers to the growth of young and small firms, going through topics including access to financing, term payments and impact of size-contingent regulations. In addition, she made reference to the association between productivity and insolvency and bankruptcy law, management quality and infrastructure supporting innovation. Jean-Stéphane Mésonnier was in charge of the second intervention, presenting the paper "Start-up costs and the capital structure of young firms". This paper studies the relationship between start-up costs and the structure of capital of firms and heterogeneity in the response to banking shocks.

By Manuel Coutinho Pereira

Dec. 16-17 Workshop on Reproducible Research and Modern Data Analysis: Concepts, Skills and Tools • Porto



On December 16-17 the Microdata Laboratory of Banco de Portugal (BPLIM) organized a Workshop on the general topic of "Reproducible Research and Modern Data Analysis: Concepts, Skills and Tools". The workshop started with an overview presentation by Christophe Bontemps and Valerie Orozco, econometricians of the Toulouse School of Economics and authors of the paper: "How To Make A Pie: Reproducible Research for Empirical Economics & Econometrics". In the presentation the authors underlined the importance of reproducible research in empirical economics and econometrics and proposed simple principles to follow. They illustrated these principles stressing the need for good programming habits and the use of adequate tools with a particular focus on their implementation in most popular statistical software and programming languages. The initial introductory talk was followed by more focused presentations that addressed topics of increased complexity.

Sergiy Radiakin, a senior economist in the Development Data Group of the World Bank, made a presentation titled "Programming Tips for Empirical Researchers". In the presentation Sergiy highlighted the need for proper organization of the research process and the program codes in order to simplify the production and reproduction of the research results. The presentation consisted of a collection of tips for researchers with many examples for users of the Stata software.

In the following presentation Luís Fonseca, a Ph.D. student in Economics at London Business School, explained why economists need to incorporate version control in their code. Luís explained the workings of *git*, a software that tracks how code and other files change across time. The software also allows for easy reversal of changes, collaboration, and other useful features. Luís also mentioned the use of online platforms (such as GitHub) commonly used to host *git* repositories.

The next presentation was by Sergio Correia, an economist at the Board of Governors of the Federal Reserve. In his presentation, titled "Academic writing in Markdown (with Pandoc/Panflute)", Sergio showed the Markdown language as well as two other tools, *pandoc* and *panflute* that combined with Markdown permit the writing of fully-fledged academic papers and presentations.

Building on the previous presentation Julia Schulte-Cloos, a research fellow at LMU Munich, offered an introduction to interactive document generation with *RMarkdown*. The presentation, "Interactive document generation with *Rmarkdown*", focused on visualizing data when relying on different output formats (presentations, dashboards, *shiny* applications).

Miguel Portela, a consultant of the Economics and Research Department and professor at the University of Minho, discussed how to enhance the research workflow by using literate programming. The presentation "Literate programming with Stata, R, Julia and Python" showed how to combine key features of different statistical packages and Latex as the typesetting system to produce highly automated reports or research papers.

The presentation of Rui Quintino, a strategy advisor for AI & Analytics at DevScope, discussed the Jupyter notebook, a widely used tool in Data Science and Machine Learning. Under the title "Jupyter Notebooks: Introduction, Tips & Tools", Rui introduced the features that make Jupyter so powerful, also sharing several tips, tools, and practices that help get the most out of notebooks and avoid known challenges.

The final technical presentation was that of Hareem Naveed, a senior data scientist with Munich Re's Integrated Analytics team. In her talk, "Docker for Reproducible Research", Hareem showed the basics of working with Docker containers and illustrated how researchers can use Docker containers to create reproducible work flows and ease model development.

The workshop concluded with a round table dedicated to the topic of "Reproducible Research with Confidential Data". Besides Christophe Bontemps, the roundtable included Stefan Bender, Head of the Research Data and Service Center of the Deutsche Bundesbank and honorary professor at the School of Social Science at the University of Mannheim, Andrew Engeli, Head of Policy at the Secure Research Service of the Office for National Statistics, and Christophe Pérignon, Professor of Finance and Associate Dean for Research at HEC Paris, France. Christophe is also one of the founders of CASCAD, the first Certification Agency for Scientific Code and Data.

With over 95 participants in total, the Workshop had 51 external participants of which 20 came from international institutions.

By Paulo Guimarães

Dec. 18 Meeting of INEXDA (International network for exchanging experience on statistical handling of granular data • Porto

In December 18, BPLIM hosted the 3rd **Workshop of the INEXDA Working Group on Data Access**. INEXDA – the International Network for Exchanging Experience on Statistical Handling of Granular Data – is an international cooperative project with the overall aim of exchanging experiences on the statistical handling of granular data for research purposes that counts Banco de Portugal as one of its five founding members. The meeting had the participation of representatives from Deutsche Bundesbank, Banca d' Italia, Banco de Espana, European Central Bank, Eurostat and Banco de México.

By Paulo Guimarães

Meet our researchers

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

Carlos Robalo Marques is an economist at the Economics and Research Department, since 1988. He has worked in the Portuguese Economy Division and in the Monetary Policy Division, and is currently working in the Structural Studies Division. He was an invited teacher at Nova School of Business and Economics. His general areas of research are applied econometrics, firm-level prices, wages and productivity. His work has been published in several journals such as the *European Economic Review, Journal of Macroeconomics, Oxford Bulletin of Economics and Statistics, Labour Economics and Scandinavian Journal of Economics.*

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

My recent research has been directed to the exploration of rich micro data sets at the firm level, with a special focus on three main topics. The first topic addresses the importance of market distortions/frictions and their implications for *misallocation* of resources and productivity dynamics.

The second investigates whether crises have *cleansing* or *scarring effects* on the economy, through their impacts on productivity of intensified resource reallocation involving surviving, entering and exiting firms.

Finally, a more recent project studies how the geometric mean, which has been extensively used in the literature to compute aggregate productivity from firm-level data, can distort the results and lead to misleading conclusions about aggregate productivity dynamics and productivity decompositions.

Sónia Costa is an economist at the Economics and Research Department of Banco de Portugal since 1999. After working in the Monetary Policy Division, she moved to the Financial Intermediation Division, where her main responsibility has been the implementation of the Portuguese Household Finance and Consumption Survey. She holds a BA and a Master in Economics from Nova School of Business and Economics. Her work has been published in the *International Journal of Central Banking, International Journal of Forecasting* and in the *Journal of International Money and Finance*.

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

My current research interests are mainly related to the use of micro data to study household finance issues. I have been exploring the richness of the Portuguese Household Finance and Consumption Survey dataset to characterize the distribution of wealth among households in Portugal and to study their indebtedness levels and vulnerabilities. Another line of research I have been working on is the role of heterogeneous characteristics of banks on their lending. Using micro level databases available at the Banco de Portugal, I have studied the role of banks in the transmission of foreign prudential and monetary policies to credit granted in Portugal and also the different behaviour of domestic and non-domestic banks in the housing credit market. Finally, I am interested in empirical macro finance subjects, having worked on issues such as the determinants of sovereign bond yield spreads, the forward premium of interest rates, equilibrium real exchange rates and monetary conditions indexes.

Visiting researchers

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.

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.

Tatsuro Senga • Queen Mary University of London

José Garcia-Louzão • Autonoma University of Barcelona

Valerio Ercolani • Bank of Italy

Antonio Rubia • University of Alicante

John Addison • Durham University

Consultants

Miguel Portela • University of Minho

Miguel Gouveia • Católica Lisbon

Upcoming events and announcements

2020

Seminars

Mar. 4	Isaac Baley Gaytán • Universitat Pompeu Fabra
10	Petra Todd • University of Pennsylvania
11	Ellen McGrattan • University of Minnesota
17	Caterina Mendicino • Banco Central Europeu
25	Gastón Navarro • Federal Reserve Board
Apr. 1	Michael Waugh • New York University
15	Denis Gromb • HEC Paris
16	Per Krusell • Stockholm University
22	Luigi Paciello • Einaudi Institute for Economics and Finance
29	Uday Rajan • University of Michigan
May 8	Christian Moser • Columbia Business School
13	Manuel Adelino • Duke University
27	Joel David • Federal Reserve Bank of Chicago

Conferences

Mar. 23	**Global cooperation challenges today: lessons from Bretton Woods**
Apr. 27	**BdP/Suomen Pankki Workshop on the Euro Area Monetary Policy Challenges**
Jun. 7-8	**Workshop on Labour Economics**
Jun.12-13	**3rd Conference on New Trends and Developments in Econometrics**

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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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